responsibly solving for a better world

annual report fiscal 2022

ashland.com / responsibly solving for a better world

Ashland™
always solving

advancing our strategy

operating resilience

disciplined pricing in an inflationary environment

improved mix management with widespread capacity constraints

improved planning despite challenging supply-chain issues

strategic focus

margin expansion and free cash flow conversion

refining innovation portfolio management process

advancing M&A strategy and opportunity portfolio

ESG priorities embedded in our long-term strategy

innovation & growth

strong growth in new product introductions

alignment with markets and customer drivers

technology differentiation

strengthening innovation portfolio management

capital allocation

expanding cellulosic capacity

production capabilities beyond North America and Europe

robust 3-year growth capital plan underway

◀ Cover: Female farmer from Rajasthan, India. Global megatrends are shaping Ashland's agenda including the aging population and need for affordable healthcare, the rising middle class, global urbanization, ESG and more.

2022 highlights*

sales of **$2.4 billion** up 13 percent

adjusted EBIT of **$349 million** up roughly 39%

adjusted EBIT margin **14.6%** up from 11.9%

adjusted EBITDA of **$590 million** up 19%

adjusted EBITDA margin of **24.7%** up 130 basis points

adjusted EPS (excluding intangible amortization) **of $5.70 up 14%**

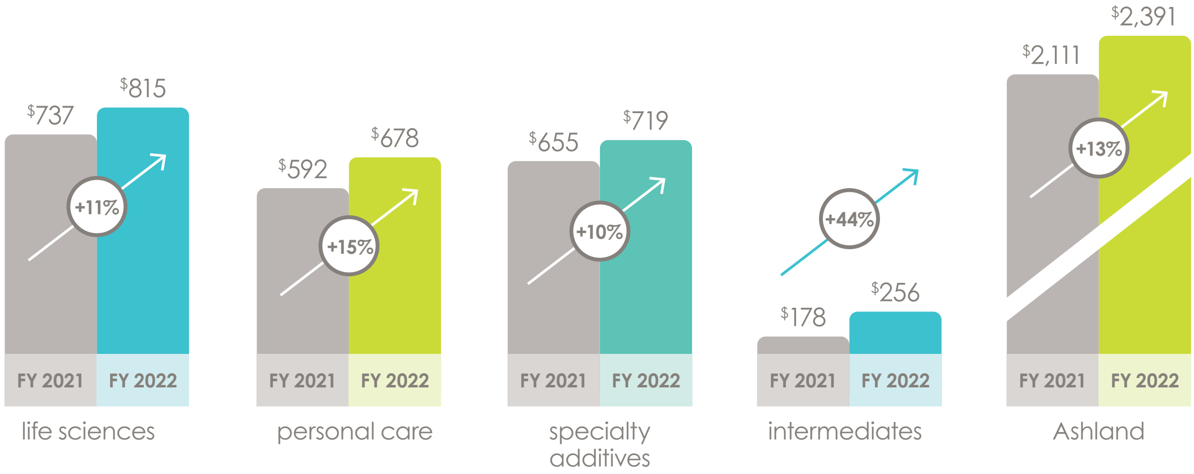
FCF **$80 million** down from $361 million driven by higher capital expenditures and working capital

contents

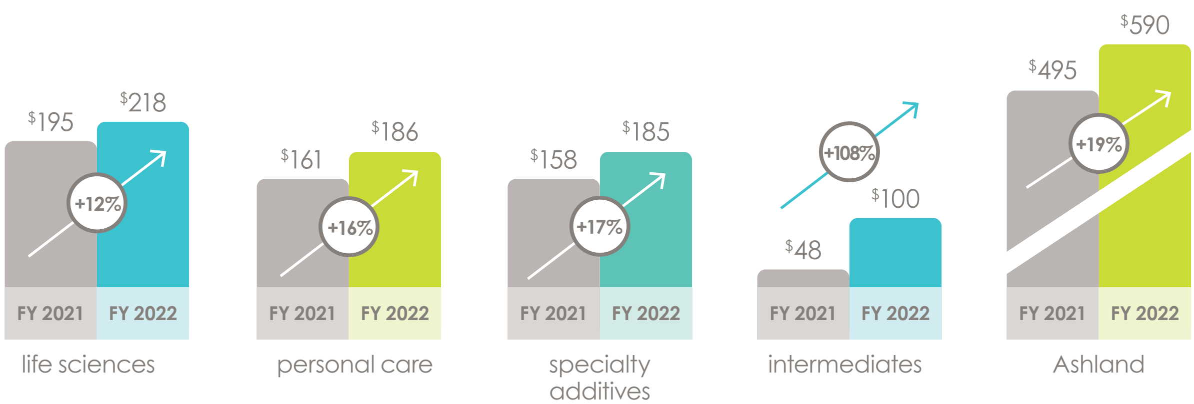
*This Annual Report includes certain non-GAAP measures. Such measurements are not prepared in accordance with U.S. GAAP and should not be construed as an alternative to reported results determined in accordance with U.S. GAAP. Management believes the use of such non-GAAP measures assists investors in understanding the ongoing operating performance of the company and its segments. The non-GAAP information provided may not be consistent with the methodologies used by other companies. All non-GAAP amounts have been reconciled with reported U.S. GAAP results, which are included in the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section of this Annual Report.

This Annual Report contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These forward-looking statements are not historical facts and generally are identified by words such as "anticipates," "believes," "estimates," "expects," "is likely," "predicts," "projects," "forecasts," "may," "will," "should," and "intends" and the negative of these words or other comparable terminology. Although Ashland believes that its expectations are based on reasonable assumptions, such expectations are subject to risks and uncertainties that are difficult to predict and may be beyond Ashland's control. Please see "Item 1A. Risk Factors" and "Use of estimates, risks and uncertainties" in Note A of Notes to Consolidated Financial Statements in this Annual Report. Unless legally required, Ashland undertakes no obligation to update any forward-looking statements made in this Annual Report, whether as a result of new information, future events or otherwise.

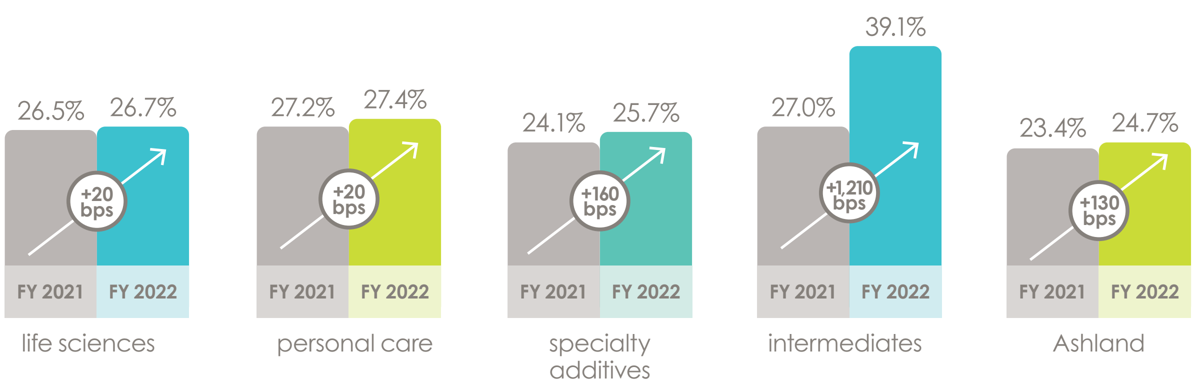
sales growth



adjusted EBITDA growth



adjusted EBITDA margin expansion



All figures are presented on an adjusted basis. "Management's Discussion and Analysis of Financial Condition and Results of Operations" section of this Annual Report reconciles adjusted amounts to amounts reported under GAAP, including reconciliations of net income to EBITDA and adjusted EBITDA, operating income to adjusted operating income, income from continuing operations to adjusted income from continuing operations, diluted earnings per share to adjusted diluted earnings per share and adjusted diluted earnings per share, excluding amortization expense.

Ashland™
always solving

a note from our Chair and CEO

Guillermo Novo

Dear Shareholders,

Over the last two years, the COVID-19 pandemic has disrupted supply chains, delayed investments, and increased variability across many industries. Ashland delivered against a backdrop of global uncertainty while change was the only constant. Looking ahead, heightened concerns exist over a recession, inflation, costs for energy, labor, and raw materials, European supply-chain reliability, and the ongoing impacts from extreme weather.

Meanwhile, societal, economic, and technological trends are shaping the future of industrial and consumer-facing companies. Demographics and a growing middle class are shifting consumption patterns. By 2030 approximately 5.3 billion people will have middle-class spending power[1] and one in six people[2] around the world will be over 60 years of age. Regarding technology and innovation, up to 60 percent of the global economy's physical inputs could be produced using biology[3]. Companies facing consumer, investor and regulatory pressure are ramping up their sustainability commitments, including managing their supply chain carbon footprints (scope 3 emissions).

Amid the disruptions this year, Ashland delivered sales and earnings results that surpassed our original expectations. We completed numerous steps to further strengthen and enhance our balance sheet including closing on the sale of the Performance Adhesives business and using proceeds to repurchase a significant number of our shares and reduce our outstanding debt.

We have begun large capital investments in Hopewell, Virginia, to increase production for Natrosol™ HEC. In Doel, Belgium we are significantly increasing capacity for Benecel™ cellulose ethers while also expanding Viatel™ bioresorbable polymers manufacturing and R&D capabilities in Mullingar, Ireland. And we are building a new biofunctionals facility in Nanjing, China. Each investment supports the growing demand for products sold to specialty additives, life sciences and personal care applications, underscoring our commitment to customers, and each is a decisive element of our growth strategy.

This year we experienced strong, resilient demand from our consumer-focused end markets resulting in sold out positions across many product lines. Our commercial and operations teams were able to continue our stated strategy of mix improvements and also drove productivity gains. Global supply-chain and logistics challenges remained elevated throughout the year. Cost inflation for raw materials combined with freight and inflation were significant, and our teams did an excellent job recovering inflation and maintaining our overall margins. Our operations teams executed at a high level to drive robust plant loading and operating discipline.

Additionally, we are demonstrating a clear link between our long-range strategic plans and environment, social and governance (ESG) progress. Our 2021 ESG report, available digitally, frames the company's progress across a detailed materiality matrix that shows the interrelationships between ESG issues while at the same time reinforcing the company's commitment to solving some of its industries' most challenging business issues.

I am proud of Ashland's very strong performance this year. Our ability to respond quickly and operate nimbly is the result of the intentional changes we made to the company over the past three years, and I want to thank our global solvers for their passion, resilience, and execution during these very turbulent times.

operating against a backdrop of global uncertainty

The landscape for 2023 includes the war in Ukraine, an impending energy crisis, inflationary pressures,

"We are investing in sustainable, profitable growth and accelerating the pace and impact of innovations. Our capacity expansions for high-value products in key markets are on schedule. And our ability to respond quickly and operate nimbly is the result of deliberate changes made over the last three years."

and the ever-present risk of Covid-related lockdowns. These uncertainties can impact business results. Only through rapid response, extreme focus, and a long-range view of delivering for our customers, will we turn a pressure to survive into an opportunity to thrive.

Ashland is a company designed for change and trained for agility. We selected our business model, grounded in science, moderated by experience in the industries we serve. Sales and adjusted EBITDA for fiscal 2022 were well above our original expectations at the beginning of the year.

In the face of significant 2022 headwinds, Ashland's customer order dynamics remained strong, and we continued to take appropriate pricing actions to recover costs across all segments. Global supply-chain challenges showed signs of abating yet overall tightness in global markets led our businesses to take signifcant, proactive steps to improve the mix of the high-value products we sell. That willingness to act fast enables us to continue to invest in future-forward, sustainable innovations to drive profitable growth – accelerating the pace and impact of new product introductions to meet customers' needs.

While we cannot prevent the storms of change in 2023, we have worked hard to have the biggest umbrella of products, services, supply chain, operations, and customer support as we enter the new fiscal year. Whether it is a research portfolio that continues to deliver during a downturn, manufacturing sites that drive out costs and conserve energy, or stabilizing critical raw materials through inventive investments in our suppliers' businesses, Ashland's ability to adapt translates into resilience, an attribute that pays dividends in good times and bad.

And beyond those fluctuating circumstances, whether political, social, or economic, Ashland's commitment to solving never wavers. With locations that span the globe and expertise founded on local experience and tempered with global knowledge, we will be resilient in the face of challenges, agile in the service of customers and compassionate in our commitment to employees and communities. In the end, sustainable, profitable growth is the only way to grow.

the sun never sets on Ashland innovation

Innovation has been the central theme of our strategy and who we are as a company. With a passion for problem solving that extends far beyond the lab bench, this year we strengthened our innovation portfolio with a record number of product launches while accelerating the pace, creating value for our customers and for Ashland, with a renewed commitment to people and planet.

These new products have significantly higher sales growth potential, and it has been rewarding to see them receive recognition from customers and many awards in the industries we serve.

Of note, the United States Food and Drug Administration (FDA) Center for Drug Evaluation and Research Office of New Drugs has accepted Ashland Viatel™ bioresorbable mPEG-PDLLA pharmaceutical excipient in the review cycle of the FDA Novel Excipient Review Pilot Program.

The voluntary program is the first time the FDA will allow excipient manufacturers to obtain review of certain novel excipients prior to their use in drug formulations[4].

Also noteworthy, Ashland was recognized with the Commitment to Life Award in the Human Rights category by Natura&Co for Ashland's Responsible Solvers™ sustainable guar farming and education program using science, technology, engineering, and math (STEM) to train men and women farmers in Rajasthan, India. Successful results include helping farmers lower their production cost while increasing their crop yield approximately 30 percent. This helped increase farmers' income and expand the local economy in nearby small villages.

This year Ashland introduced an innovative line of rheology modifiers under the Aquaflow™ solid thickener trade name for the architectural coatings market. Our first grade, Aquaflow™ eco-300, was recognized with a Ringier Technology Innovation Award recognizing Ashland for meeting the need for biocide-free rheology additives. The product is a one-hundred percent active solid dosage form, enabling a lower carbon footprint in transportation.

consumer market focused

Also this year, Ashland systematically identified and tackled the thorniest problems concentrating on areas rich in opportunities to innovate and drive value for customers while leveraging innovation and expertise from one business across others.

As Ashland wields expertise in research and innovation, we know we are a part of something bigger. Today's end-users seek products with transparency. They desire organic, natural, biodegradable, and sustainable-in-use products. More information about our businesses is contained in the pages that follow.

the year ahead

In 2023, we will continue a path of change, fine-tuning our ways of working to best support product and process choices that are sustainable and innovative.

We expect a recessionary environment and believe our core markets will remain relatively strong. Although resilient, we are not immune to softening of consumer demand and expect to see some customer destocking in several markets and regions during the early part of the year. Energy and labor inflation will be broader based, and raw material inflation will vary by technology. As such, there will be more supply and pricing arbitrage in certain parts of the world. We also expect continued negative impact from unfavorable foreign currency.

Continued pricing and mix actions will carry over based on the initiatives taken during fiscal 2022, and we will take additional steps as needed to recover any additional cost inflation. We expect to be capacity constrained until our new capacity comes online in late calendar 2023 and into 2024.

Moving forward, each business decision is a step towards confronting complex challenges and solving them in practical and elegant ways to unlock new opportunities for innovation, impact, and growth.

We'll ensure our operations consider the planet and nimbly respond to macro and business trends to sustain our cutting edge. And by responsibly solving for a better world, we will do our part pushing the boundaries of what is possible to ultimately have a positive impact that ranges from local to global, for a better now and a better future.

Regardless of potential headwinds and volatility, we expect to deliver meaningful sales and earnings growth in fiscal year 2023.

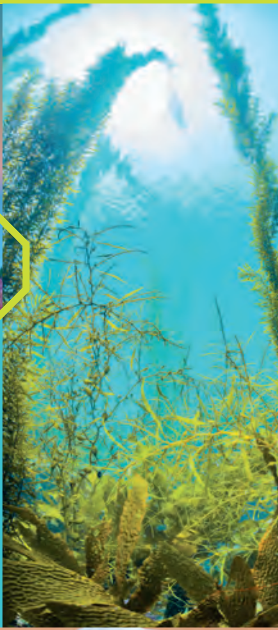
I am pleased by the resilience and execution demonstrated by our solvers this year and look forward to the opportunities that lie ahead.

Sincerely,

Guillermo Novo
Chair and Chief Executive Officer
Ashland

[1] World Reimagined: The Rise of the Global Middle Class | Nasdaq
[2] Ageing and health (who.int)
[3] The Bio Revolution: Innovations transforming economies, societies, and our lives | McKinsey
[4] https://www.fda.gov/drugs/development-approval-process-drugs/pilot-program-review-innovation-and-modernization-excipients-prime

responsibly solving for a better world



innovating
for ethical,
responsible and
sustainable
products and
processes

Ashland™
always solving

a passion for problem solving

We are all immersed in the physical world. While a growing number of people around the globe can work, consume, and interact by digital means, the day-to-day minutiae of human lives remains physical. From swallowing a pill to washing our hands, from brushing our teeth to painting a wall, we touch, taste, or smell the physical world in thousands of small ways each day.

Ashland additives and specialty ingredients underpin those interactions. Among many things, our solutions enable paints' performance, and hair conditioner curl-defining power. Our innovations engender trust and ensure medicines and active ingredients can be delivered in new ways and over varying spans of time.

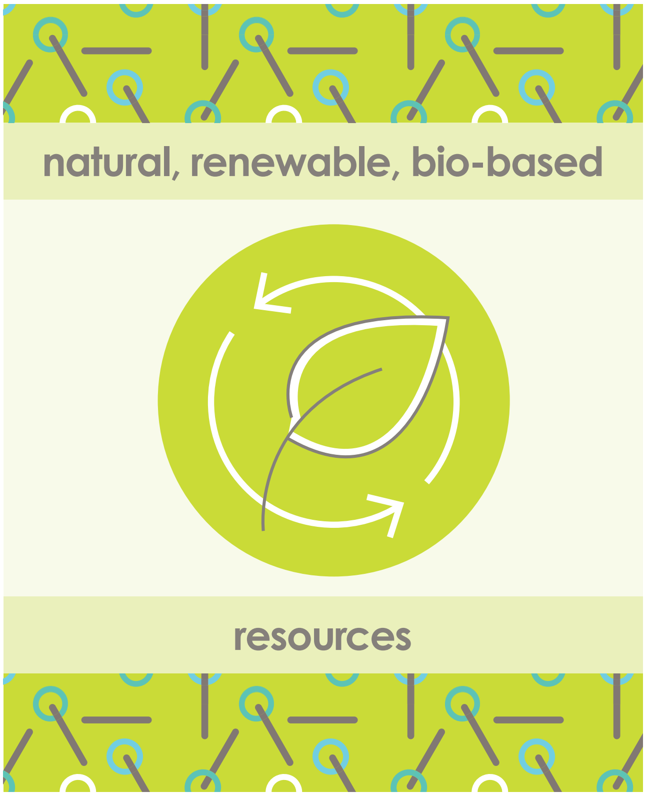
And those tangible interactions are only a small part of Ashland's influence. We interact with the world on a much larger and deeper scale. Whether through age-old processes like farming or cutting-edge technologies using artificial intelligence and bioscience, Ashland has the power to change, shape, and restore consumers' lives and ecosystems for the better.

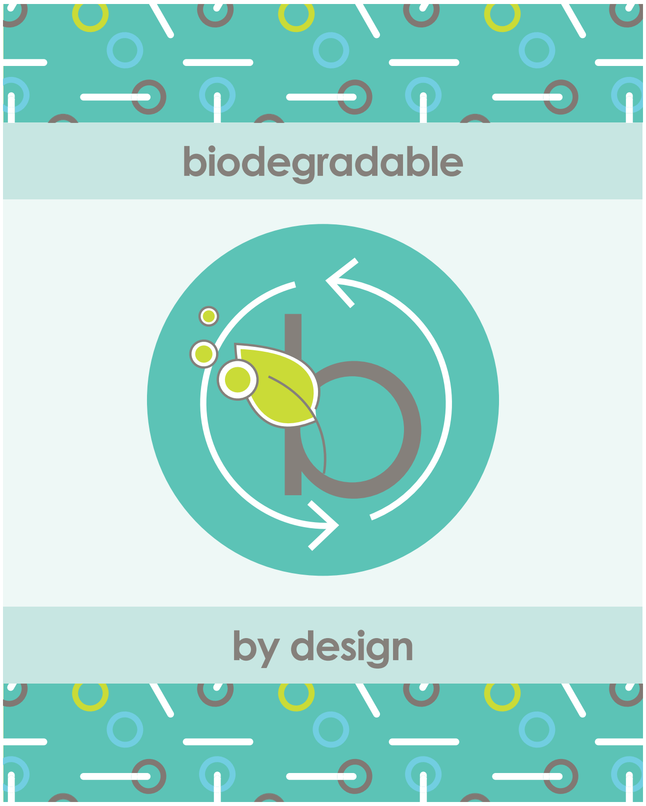
As a global, consumer market-focused additives and specialty ingredients company, we're acutely conscious of the power of applied science to transform the efficacy, usability, and allure of industrial and consumer products, and of the power of research and innovation to raise the standard of products' integrity and profitability. Ashland's solutions shape human interactions with the physical world from macroscale to nanoscale, considering a deep sense of responsibility to ecosystems, communities, customers, and economies in which we operate.

Ashok Kalyana
Senior Vice President,
General Manager,
Life Sciences

Xiaolan Wang
Senior Vice President,
General Manager,
Personal Care

Min Chong
Senior Vice President,
General Manager,
Specialty Additives
& Intermediates





innovating with speed and impact*

Ashland is at the forefront of designing, synthesizing and producing additives and specialty ingredients that are essential to everyday life. Our materials deliver key functional attributes including sustainability, rheology, solubilization, film formation, stiffness, flexibility, and more that enable our customers' products to provide the benefits consumers demand. Our solutions address key global megatrends and emerging technologies, and our products range from oral solid dose pharmaceuticals, long-acting injectables, natural, nature-derived and biodegradable ingredients for personal care, water-based solutions for paint, and lithium ion battery innovations.

Our solid expertise in polymer science, with deep understanding of polymer design and assembly enables us to produce a wide variety of homopolymers, copolymers, graft copolymers and crosslinked copolymers on platforms constructed from natural and synthetic building blocks. Nearly 80 percent of our new pipeline innovations are sustainable.

"Ashland has leadership positions in pharmaceuticals, personal care, and coatings. And, we're increasing the speed and impact of our innovations for our customers. As we innovate, we are taking a thoughtful approach about our portfolio of products. We recognize that ESG is integral to our future. Our teams of scientists and engineers are passionate about responsibly solving for a better world."

Osama Musa
Senior Vice President and Chief Technology Officer

* aligned with the UN Sustainable Development Goals

Ashland™
always solving

from pediatrics to geriatrics, responsibly solving for a healthier world

life sciences

Working collaboratively with our customers, Ashland's pharmaceutical scientists are the solvers helping to answer some of the most complex and important medical challenges of our time.

We are the 'expert's expert,' the trusted advisors helping pharmaceutical companies develop safe, high-quality, effective ingredients for formulating and manufacturing medicine.

Our conscious-to-cutting-edge innovations and unparalleled portfolio of products help save lives, make and keep patients well, and reduce the effects of chronic disease.

Ashland is the leader in products and technologies for tablets, which are the most affordable drug delivery systems available. This affordability helps improve the health of people in all corners of the world. We enable tablets to be made faster, stronger, and lighter, thus lowering the cost to pharmaceutical manufacturers.

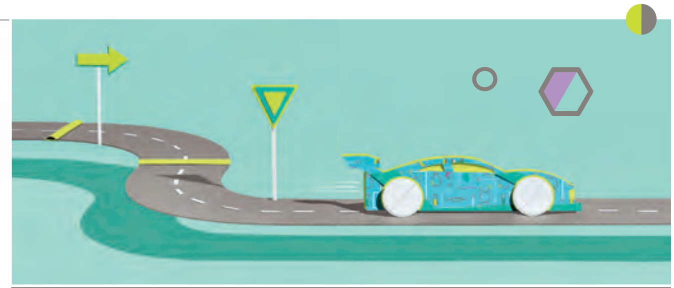
Our innovative tablet coatings can mask taste and make medicine easier to swallow. Ashland's expertise in controlled release functionality and long-acting injectables means patients can take less medicine, fewer times, with less cost, in more comfortable and tolerable ways.

Beyond pharmaceutical ingredients for diagnostic films, our medical products can help improve patient outcomes when they have special treatment needs. Ashland's nutrition and nutraceutical offerings support people in their quest for healthier life choices. And the focus of our agricultural segment is to grow more food on less land by increasing the efficacy and lowering usage rate of crop protection products.

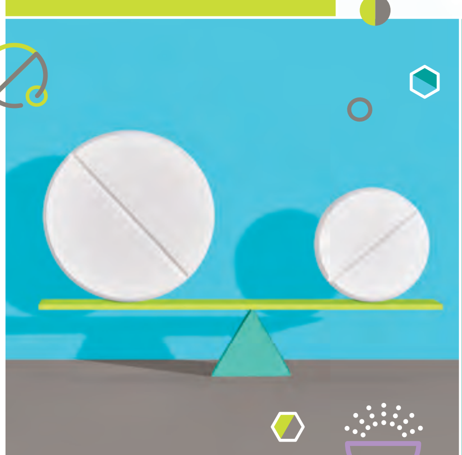
Building on a strong reputation of trust, reliability, and high-quality in this regulated space, Ashland is responsibly solving for a healthier world.

new product innovation highlights

vialose™ trehalose dihydrate is a functional ingredient used to protect and stabilize proteins for biologic medicines and the newest addition to Ashland's portfolio of injectable formulations



benecel™ xrf hpmc is a fine particle size grade designed for optimal performance in large scale, high-speed tableting



klucel™ xtend hpc oral matrix former is expected to become the new gold standard for extended-release tablets, because it presents an option for easier tablet swallowability or a reduction in the number of tablets required for frequent medication, helping improve patient compliance with drug regimens especially for those with chronic disease or other serious illness

nutrapress™ chw organic chewable base is a complete system containing an organic binder, sweetener, flow aid, and lubricant, made with a patent-pending technology

ashland.com / efficacy usability allure integrity profitability™
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personal care

The demand for conscious ingredients and ways of working, from one end of the value chain to the other, is both an innovation and growth opportunity for Ashland.

Increasingly, consumers of personal care products look for plant-derived substitutes for ingredients that would otherwise be extracted from animals or derived from petroleum. They seek materials that 'leave no trace' in the environment at the end of their useful product life.

As a global innovator in personal care solutions, Ashland is taking a leading position in natural, nature-derived and biodegradable ingredients, polysaccharide-based rheology, premium biofunctionals actives, microbial protection, hair fixatives, and more.

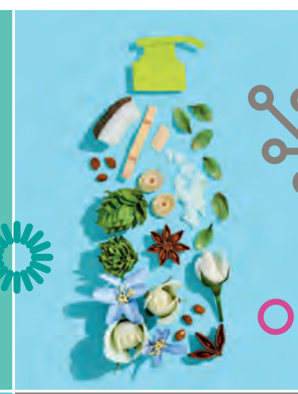
Our conscious-to-cutting-edge research and development enables us to utilize more natural and sustainable raw materials, renewable energy, and clean and efficient manufacturing processes. Our in-house measurement and testing for biodegradation, seeks to advance industry standards and conversations around ingredient life cycles.

Ashland's portfolio of solutions enables us to meet customers' performance criteria while responding positively toward the planet and society in general. Our personal care business has the size, flexibility and global footprint to further our customers' portfolios while delivering high-margin growth for Ashland.

This year, we are proud to have earned an array of industry certifications and recognition including EcoVadis gold. For us, its about promises made and promises kept. On this page, we're highlighting just a few of our newest innovations.

new product innovation highlights

caressense™ biofunctional is a phytofermented extract from fresh, organic jasmine, sustainably grown in Provence, France. Inspired by research on the connection between skin and emotions, and the "science of love," biologically activate the sensors of touch, releasing "feel-good" molecules inside the skin; the product delivers age-relaxing benefits with emotional, well-feeling, improved immune defense, and a healthy-looking effect; it was developed using the power of a novel, sustainable, patented phytofermentology™ technology, creating a unique signature composition



styleze™ es-dura ingredient is a plant-based, hair care ecostyler for leading-edge styling performance and sustainability; this novel ingredient draws on Ashland's expertise in guar-based polysaccharides to deliver outstanding all-weather style durability; it was developed to give a uniquely strong sustainability profile offering naturally derived, biodegradable, vegan and clean INCI claims in hair styling, conditioning, and treatment formulations

sensiva™ go natural multifunctional is a COSMOS validated, 100-percent natural origin-based, and readily biodegradable new antimicrobial; it has broad spectrum efficacy combined with well-known humectant properties; the carefully selected ingredients are highly effective and gentle on the skin; its wide applicability, effectiveness and broad pH range make it the perfect fit for natural-driven formulations around the globe

In 2021, Ashland partnered with the SM Sehgal Foundation on a STEM education program focused on small holding farmers in the Sriganganagar district of Rajasthan, India; using sustainable agronomic practices and water conservation, they increased annual guar harvests while respecting sourcing relationships and cultures of local villages; in the end, farmers lowered production cost and increased crop yield by about 30 percent which expanded the local villages' economies

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always solving

responsibly enabling a better world

specialty additives and intermediates

For architectural coatings, global trends remain consistent. Safety, durability, improved indoor air quality, no odor, and enhanced resistance to mildew and mold are driving the market.

Ashland's portfolio delivers on those trends by providing customers with a wide range of water- and cellulose-based additives that enhance the sustainability of high-quality paint formulations.

Today's consumers want "clean" water-based coatings that are safe to apply and responsibly made with low/no VOCs and no odor. Their interest in caring for the environment means delivering responsibly made products with lower carbon emissions that reduce the carbon footprints of Ashland, our customers and consumers themselves. At the same time, consumers expect improved performance and productivity with ease of application and "one-coat hide" leading the charge, followed closely by enhanced durability and stain resistance.

This focus on safe, environmentally responsible, high-performance products set the stage for increased transparency of our raw material chain, greater detail in how our products are used and detailed, science-based goals that include less packaging, lighter products and streamlined supply chain logistics that build trust with consumers and shareholders alike.

That transparency and agility in the face of change informs our entire ESG strategy as empowered and accountable teams respond quickly and responsibly to local needs while adhering to global disciplines. It's a strategy that delivers an environmentally responsible value chain, allows customers to make accurate claims to consumers about attractive features of their products, all while maintaining profitability and reinvestment economics for Ashland's business.

new product innovation highlights

aquaflow™ eco 300 nonionic synthetic associative thickeners (NSATs) are efficient thickeners for high-performance waterborne paints and coatings; these NSATs build rheology in paints and coatings through self-association and interaction with other ingredients; this high shear effective rheology modifier meets the need for biocide-free rheology additives and addresses positive environmental desires by delivering the product in a 100-percent active solid dosage form

culminal™ methylcellulose derivatives generated game-changing solutions in rheology, application, and processing characteristics as they are widely used in advanced ceramics as green strength binders for ceramic extrusion

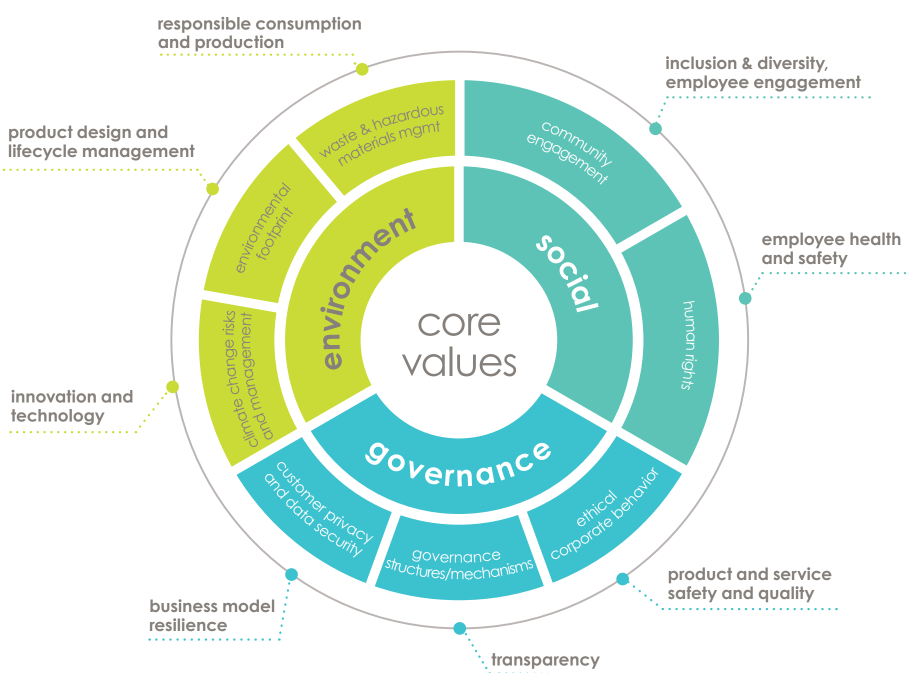
aquaflow™ rheology modifiers are based on hydrophobically-modified polyacetal-polyether (HM-PAPE) chemistry and are designed to function as a drop-in replacement for urethane-type (HEUR) thickeners and work well in conjunction with hydroxyethylcellulose (HEC/HMHEC) and other nonionic cellulose ethers

we are expanding global capabilities to support the growth of the strategic lithium-ion batteries (LiB) segment; Ashland scientists specializing in LiB applications in Düsseldorf, Germany, spent time this year at our Research Center in Wilmington, Delaware to leverage learnings and technology and better support leading European customers' demands regionally

ESG is critical to our long-term business strategy

Environment, social and governance (ESG) is embedded in Ashland's strategy and operating plans as an impetus and growth opportunity, turning the potential for change into action and driving real business growth.

Ashland launched its ESG Report in preparation for releasing Science Based Targets.It frames the company's progress across a detailed materiality matrix that shows the interrelationships between ESG issues.



environment

sourcing
Ashland is responsibly sourcing raw materials

operations
we are going deeper and broader to ensure responsible operations

solutions
many innovations are natural, nature-derived, biodegradable and sustainable-in-use

social

The most important asset of any great company is its people. At Ashland, we extend that mindset beyond our walls and into the wider world. It's part of our community outreach, supplier agreements, capital deployment, and customer relationships. As lifelong passionate problem solvers, we know diversity is a competitive advantage, that having more, and different voices leads to better solutions, and that equity is the lifeblood of any excellent reputation.

I&D

Ashland's inclusion and diversity (I&D) vision is to cultivate a diverse, safe, and inclusive environment where every employee is respected, valued, and has an equal opportunity to develop, succeed, and feel heard.

STEM

We put a unique spin on the typical Science, Technology, Engineering and Mathematics (STEM) program by framing its efforts within our larger purpose to responsibly solve for a better world.

governance

For Ashland, our core values are the foundation from which we have built our company. In today's rapidly changing world, we know we must do more than solve problems. We must be completely transparent about our processes and actions along the way.

EcoVadis, one of the world's largest and trusted providers of business sustainability ratings has ranked over 100,000 companies globally. In October, the ratings agency announced that Ashland achieved a Gold EcoVadis rating, placing the company among the top five percent of companies evaluated.

always solving™

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

☑ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended September 30, 2022

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _________ to ___________

Commission file number 333-211719

ASHLAND INC.

Delaware	81-2587835
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

8145 Blazer Drive
Wilmington, Delaware 19808
Telephone Number (302) 995-3000

Securities Registered Pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol	Name of each exchange on which registered
Common Stock, par value $.01 per share	ASH	New York Stock Exchange

Securities Registered Pursuant to Section 12(g) of the Act: None

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☑ No ☐

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☑

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark whether the registrant has filed a report on attestation to its management's assessment of the effectiveness of its internal control over financial reporting under section 404(b) of the Sarbanes-Oxley Act (15 U.S.C 7262 (b)) by the registered public accounting firm that prepared or issued its audit report. Yes ☑ No ☐

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large Accelerated Filer ☑	Accelerated Filer ☐
Non-Accelerated Filer ☐	Smaller Reporting Company ☐
Emerging Growth Company ☐	

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☑

At March 31, 2022, the aggregate market value of voting stock held by non-affiliates of the Registrant was approximately $5,366,723,000. In determining this amount, the Registrant has assumed that its directors and executive officers are affiliates. Such assumption shall not be deemed conclusive for any other purpose.

At October 31, 2022, there were 54,147,528 shares of Registrant's common stock outstanding.

Documents Incorporated by Reference

Portions of Registrant's Proxy Statement (Proxy Statement) for its Annual Meeting of Stockholders are incorporated by reference into Part III of this annual report on Form 10-K to the extent described herein.

TABLE OF CONTENTS

PART I

ITEM 1. BUSINESS

GENERAL

Ashland Inc. is a Delaware corporation, with its headquarters and principal executive offices at 8145 Blazer Drive, Wilmington, Delaware 19808. Ashland Inc. is the legal successor to Ashland Global Holdings Inc. effective August 1, 2022, after a legal restructuring effort to simplify the corporate entity structure. Ashland Global Holdings Inc. had been established in 2016 in connection with the spin-off of a former business segment, while legacy Ashland Inc. had been converted to Ashland LLC. In connection with the 2022 restructuring efforts, Ashland LLC has been eliminated. The terms "Ashland" and the "Company" as used herein include Ashland Inc., its predecessors, and its consolidated subsidiaries, except where the context indicates otherwise.

Ashland is a global specialty additives and materials company with a conscious and proactive mindset for sustainability. The company serves customers in a wide range of consumer and industrial markets including, architectural coatings, construction, energy, food and beverage, nutraceuticals, personal care and pharmaceutical. With approximately 3,900 employees worldwide, Ashland serves customers in more than 100 countries.

Ashland's reportable segments include: Life Sciences; Personal Care (formerly Personal Care and Household); Specialty Additives; and Intermediates (formerly Intermediates and Solvents). Unallocated and Other includes corporate governance activities and certain legacy matters.

On August 31, 2021, Ashland announced its agreement with Arkema, a French société anonyme, to sell its Performance Adhesive business for $1.7 billion. The sale was completed on February 28, 2022. Ashland recognized an after-tax gain of $726 million on sale within the income (loss) from discontinued operations caption of the Statements of Consolidated Comprehensive Income (Loss) during fiscal 2022. The transaction represented a strategic shift in Ashland's business and had a major effect on Ashland's operations and financial results. As a result, the assets, liabilities, operating results and cash flows related to Performance Adhesives have been classified as discontinued operations for all periods presented within the Consolidated Financial Statements.

Life Sciences is comprised of pharmaceuticals, nutrition, nutraceuticals, agricultural chemicals, diagnostic films (formerly known as advanced materials) and fine chemicals. Pharmaceutical solutions include controlled release polymers, disintegrants, tablet coatings, thickeners, solubilizers and tablet binders. Nutrition solutions include thickeners, stabilizers, emulsifiers and additives for enhancing mouthfeel, controlling moisture migration, reducing oil uptake and binding structured foods. Nutraceutical solutions include products for weight management, joint comfort, stomach and intestinal health, sports nutrition and general wellness. The nutraceutical business also provides custom formulation, toll processing and particle engineering solutions. Customers include pharmaceutical, food, beverage, nutraceuticals and supplements manufacturers, hospitals and radiologists and industrial manufacturers.

Personal Care is comprised of biofunctionals, microbial protectants (preservatives), skin care, sun care, oral care, hair care and household solutions. These businesses have a broad range of natural, nature-derived, biodegradable, and high-performance ingredients for customer-driven solutions to help protect, renew, moisturize and revitalize skin and hair, and provide solutions for toothpastes, mouth washes and rinses, denture cleaning and care for teeth. Household supplies nature-derived rheology ingredients, biodegradable surface wetting agents, performance encapsulates, and specialty polymers for household, industrial and institutional cleaning products. Customers include formulators at large multinational branded consumer products companies and smaller, independent boutique companies.

Specialty Additives is comprised of rheology- and performance-enhancing additives serving the architectural coatings, construction, energy, automotive and various industrial markets. Solutions include coatings additives for architectural paints, finishes and lacquers, cement- and gypsum- based dry mortars, ready-mixed joint compounds, synthetic plasters for commercial and residential construction, and specialty materials for industrial applications. Products include rheology modifiers (cellulosic and associative thickeners), foam control agents, surfactants and wetting agents, pH neutralizers, advanced ceramics used in catalytic converters, and environmental filters, ingredients that aid the manufacturing process of ceramic capacitors, plasma display panels and solar cells, ingredients for textile printing, thermoplastic metals and alloys for welding. Products help improve desired functional outcomes through rheology modification and control, water retention, workability, adhesive strength, binding power, film formation, deposition and suspension and emulsification. Customers include global paint manufacturers, electronics and automotive manufacturers, textile mills, the construction industry and welders.

Intermediates is comprised of the production of 1,4 butanediol (BDO) and related derivatives, including n-methylpyrrolidone. These products are used as chemical intermediates in the production of engineering polymers and polyurethanes, and as specialty process solvents in a wide array of applications including electronics, pharmaceuticals, water filtration membranes and more. BDO is also supplied to Life Sciences, Personal Care, and Specialty Additives for use as a raw material.

Unallocated and Other generally includes items such as certain significant company-wide restructuring activities, corporate governance costs and legacy costs or activities that relate to divested businesses that are no longer operated by Ashland.

Available Information - Ashland's Internet address is http://www.ashland.com. On this website, Ashland makes available, free of charge, its annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and any amendments to those reports, as well as any beneficial ownership reports of officers and directors filed on Forms 3, 4 and 5. All such reports are available as soon as reasonably practicable after they are electronically filed with, or electronically furnished to, the Securities and Exchange Commission (SEC). Ashland also makes available, free of charge on its website, its Corporate Governance Guidelines, Board Committee Charters, Director Independence Standards and global code of conduct that applies to Ashland's directors, officers and employees. These documents are also available in print to any stockholder who requests them. Information contained on Ashland's website referenced here or elsewhere in this Annual Report is not part of this Annual Report on Form 10-K and is not incorporated by reference in this document. The SEC maintains an Internet site (http://www.sec.gov) that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC.

LIFE SCIENCES

Life Sciences is a leading supplier of excipients and tablet coating systems to the pharmaceutical, nutrition and nutraceutical industries. Excipients include a comprehensive range of polymers for use as tablet binders, super disintegrants, sustained-release agents and drug solubilizers, as well as a variety of coating formulations for immediate, delayed, and sustained release applications. Core products include cellulosics and vinyl pyrrolidone polymers which are used primarily in oral solid dosage drug formulations. The portfolio also includes branded and proprietary nutraceutical ingredients and expertise in nutraceutical formulation, particle engineering and contract manufacturing. Its nutrition portfolio provides functional benefits in areas such as thickening, texture control, thermal gelation, structure enhancement, water binding, clarification and stabilization. Its core products include cellulose gums and vinyl pyrrolidone polymers which are used in a wide range of offerings for bakery, beverage, dairy, desserts, meat products, pet food, prepared foods, sauces and savory products.

Life Sciences operates throughout the Americas, Europe and Asia Pacific. It has 20 manufacturing and lab facilities in nine countries which serve its various end markets. It has manufacturing facilities and labs in Wilmington, Delaware; Calvert City, Kentucky; Kearny, Paterson, S. Hackensack and Totowa, New Jersey; Columbus, Ohio; Fiskeville, Rhode Island; Texas City, Texas; and Ogden, Utah within the United States; Cabreuva and Sao Paolo, Brazil; Shanghai, China; Dusseldorf, Germany; Hyderabad, India; Mullingar, Ireland; Jaumave and Mexico City, Mexico; Bangkok, Thailand; and Istanbul, Turkey.

Life Science markets and distributes its products in the Americas, Europe, the Middle East, Africa and Asia Pacific.

For fiscal 2022, the following Life Sciences product categories were 10% or greater of Ashland's total consolidated sales:

Product	% of Life Sciences sales	% of Ashland total consolidated sales
Cellulosics	38%	38%
Polyvinylpyrrolidones (PVP)	38%	20%

PERSONAL CARE

The Personal Care portfolio of oral care products delivers active ingredients in toothpaste and mouthwashes; provides bioadhesive functionality for dentures; delivers flavor, texture and other functional properties; and provides product binding to ensure form and function throughout product lifecycle.

The Personal Care portfolio of hair care products includes advanced styling polymers, fixatives, conditioning polymers, emulsifiers, preservatives, rheology modifiers and biofunctional actives.

The Personal Care portfolio of ingredients and solutions for skin care, sun care, and cosmetics focuses on natural and sustainable solutions. Ashland's Personal Care business includes biofunctional actives, preservatives, and specialty polymers to provide functionality such as water resistance and rheology. Ashland's natural ingredients include a wide range of cellulose, guar, and cassia derivatives; unique active ingredients derived from botanical sources using exclusive Ashland technologies such as Zeta Fraction™ and PSR technology; emollients based on natural chemistries; encapsulation technology derived from alginates; and efficacious preservative blends inspired by nature.

The Personal Care portfolio of products and technologies is used in many types of cleaning and fragrance applications, including fabric care, home care and dishwashing. Personal Care products are used in a variety of applications for viscosity enhancement, particle suspension, rheology modification, stabilization and fragrance enhancement.

Personal Care operates throughout the Americas, Europe and Asia Pacific. It has 16 manufacturing and lab facilities in nine countries which serve its various end markets and participates in one joint venture. It has manufacturing facilities and labs in Freetown, Massachusetts; Chatham, New Jersey; Ossining, New York; Merry Hill, North Carolina; Summerville, South Carolina; Kenedy, Texas; and Menomonee Falls, Wisconsin within the United States; Sao Paulo, Brazil; Shanghai, China; Sophia Antipolis, France; Hamburg, Germany; Mumbai, India; Mexico City, Mexico; Zwijndrecht, Netherlands and Bradford and Poole, United Kingdom.

Personal Care markets and distributes its products in the Americas, Europe, the Middle East, Africa and Asia Pacific.

For fiscal 2022, the following Personal Care product categories were 10% or greater of Ashland's total consolidated sales:

Product	% of Personal Care	% of Ashland total consolidated sales
Cellulosics	18%	38%
Polyvinylpyrrolidones (PVP)	19%	20%

SPECIALTY ADDITIVES

Specialty Additives offers industry-leading products, technologies and resources for solving formulation and product-performance challenges. Using synthetic and semisynthetic polymers derived from polyester and polyurethane-based adhesives, and plant and seed extract, Specialty Additives offers comprehensive and innovative solutions for industrial applications.

Key customers include manufacturers of paint, coatings and construction materials; packaging and converting companies; and oilfield service companies.

The areas of expertise include organic and synthetic chemistry, colloid science, rheology, structural analysis and microbiology.

The solutions provide an array of properties, including thickening and rheology control, binding power, film formation, conditioning and deposition, colloid stabilization and suspension.

Specialty Additives is composed of various end use markets. Many of the products of the end markets are produced in shared manufacturing facilities, to better manage capacity and achieve desired returns.

Specialty Additives provides products and services to over 30 industries. Ashland offers a broad spectrum of organo- and water-soluble polymers that are derived from both natural and synthetic resources. Product lines include derivatized cellulose polymers, synthetics, and vinyl pyrrolidone polymers that impart effective functionalities to serve a variety of industrial markets and specialized applications. Many of the products within Specialty Additives function as performance additives that deliver high levels of end-user value in formulated products. In other areas, such as plastics and textiles, Specialty Additives' products function as a processing aid, improving the quality of end products and reducing manufacturing costs.

Specialty Additives is a recognized leader in rheology solutions for waterborne architectural paint and coatings. Products include hydroxyethylcellulose (HEC), which provides thickening and application properties for interior and exterior paints, and nonionic synthetic associative thickeners (NSATs), which are APEO-free liquid synthetics for high-performance paint and industrial coatings. The Specialty Additives market complements its rheology offering with a broad portfolio of performance foam-control agents, surfactants and wetting agents, dispersants and pH neutralizers.

Specialty Additives is a major producer and supplier of cellulose ethers and companion products for the construction industry. These products control properties such as water retention, open time, workability, adhesion, stabilization, pumping, sag resistance, rheology, strength, appearance and performance in dry-mortar formulations.

Specialty Additives is a leading global manufacturer of synthetic- and cellulosic-based products for drilling fluids, oil-well cement slurries, completion and workover fluids, fracturing fluids and production chemicals. Specialty Additives offers the oil and gas industry solutions for drilling, stimulation, completion, cementing and production applications.

Specialty Additives operates throughout the Americas, Europe and Asia Pacific. It has 12 manufacturing and lab facilities in nine countries which serve its various end markets. Specialty Additives has manufacturing facilities and labs in Huntsville, Alabama; Parlin, New Jersey; and Hopewell, Virginia within the United States and Doel-Beveren, Belgium; Nanjing and Shanghai, China; Alizay, France; Dusseldorf, Germany; Mumbai, India; Zwijndrecht, the Netherlands; Singapore, Singapore; and Bradford and Newton Aycliffe, United Kingdom.

Specialty Additives markets and distributes its products in the Americas, Europe, the Middle East, Africa and Asia Pacific.

For fiscal 2022, the following Specialty Additives products were 10% or greater of Ashland's total consolidated sales:

Product	% of Specialty Additives sales	% of Ashland total consolidated sales
Cellulosics	66%	38%
Polyvinylpyrrolidones (PVP)	7%	20%

INTERMEDIATES

Intermediates is a leading producer of BDO and related derivatives, including n-methylpyrrolidone. These products are used as chemical intermediates in the production of engineering polymers and polyurethanes, and as specialty process solvents in a wide array of applications including electronics, pharmaceuticals, water filtration membranes and more. BDO is also supplied to Life Sciences, Personal Care and Specialty Additives for use as a raw material.

Key customers include Ashland's Life Sciences, Personal Care and Specialty Additives segments, general industrial manufacturers, plastics and polymers producers, pharmaceutical companies, agricultural firms and producers of electronic components and systems.

Intermediates has a manufacturing facility in Lima, Ohio, while some derivatives are produced at Life Sciences facilities in Texas City, Texas and Calvert City, Kentucky. Intermediates markets and distributes its products in the Americas, Europe, and Asia Pacific.

MISCELLANEOUS

Environmental Matters

Ashland maintains a companywide environmental policy overseen by the Environmental, Health, Safety and Quality Committee of Ashland's Board of Directors. Ashland's Environmental, Health, Safety, Quality and Regulatory Affairs (EHSQ&RA) department has the responsibility to ensure that Ashland's businesses worldwide maintain environmental compliance in accordance with applicable laws and regulations. This responsibility is carried out via training; widespread communication of EHSQ&RA policies; information and regulatory updates; formulation of relevant policies, procedures and work practices; design and implementation of EHSQ&RA management systems; internal auditing; monitoring of legislative and regulatory developments that may affect Ashland's operations; assistance to the businesses in identifying compliance issues and opportunities for voluntary actions that go beyond compliance; and incident response planning and implementation.

Federal, state and local laws and regulations relating to the protection of the environment have a significant impact on how Ashland conducts its businesses. In addition, Ashland's operations outside the United States are subject to the environmental laws of the countries in which they are located. These laws include regulation of air emissions and water discharges, waste handling, remediation and product inventory, registration and regulation. New laws and regulations may be enacted or adopted by various regulatory agencies globally. The costs of compliance with any new laws or regulations cannot be estimated until the manner in which they will be implemented has been more precisely defined.

At September 30, 2022, Ashland's reserves for environmental remediation and related environmental litigation amounted to $211 million, reflecting Ashland's estimates of the most likely costs that will be incurred over an extended period to remediate identified conditions for which the costs are reasonably estimable, without regard to any third-party recoveries. Engineering studies, historical experience and other factors are used to identify and evaluate remediation alternatives and their related costs in determining the estimated reserves for environmental remediation. Environmental remediation reserves are subject to uncertainties that affect Ashland's ability to estimate its share of the costs. Such uncertainties involve the nature and extent of contamination at each site and the extent of required cleanup efforts under existing environmental regulations. Although it is not possible to predict with certainty the ultimate costs of environmental remediation, Ashland currently estimates that the upper end of the reasonably possible range of future costs for identified sites could be as high as approximately $465 million. No individual remediation location is significant, as the largest reserve for any site is 13% of the remediation reserve. Ashland regularly adjusts its reserves as environmental remediation continues. Environmental remediation expense, net of insurance receivables, amounted to $66 million in 2022 compared to $51 million in 2021 and $48 million in 2020.

Product Control, Registration and Inventory - Many of Ashland's products and operations are subject to chemical control laws of the countries in which they are located. These laws include regulation of chemical substances and inventories under the Toxic Substances Control Act (TSCA) in the United States and the Registration, Evaluation and Authorization of Chemicals (REACH) regulation in Europe. Under REACH, additional testing requirements, documentation, risk assessments and registrations are occurring and will continue to occur and may adversely affect Ashland's costs of products produced in or imported into the European Union. Examples of other product control regulations include right to know laws under the Global Harmonized System (GHS) for hazard communication, regulation of chemicals used in the manufacture of pharmaceuticals and personal care products and that contact food under the Food, Drug and Cosmetics Act in the United States, the Framework Regulation in Europe and other product control requirements for chemical weapons, drug precursors and import/export. New laws and regulations may be enacted or adopted by various regulatory agencies globally. The costs of compliance with any new laws or regulations cannot be estimated until the manner in which they will be implemented has been more precisely defined.

Remediation - Ashland currently operates, and in the past has operated, various facilities at which, during the normal course of business, releases of hazardous substances have occurred. Additionally, Ashland has known or alleged potential environmental liabilities at a number of third-party sites. Federal and state laws, including but not limited to the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and various other remediation laws, require that contamination caused by hazardous substance releases be assessed and, if necessary, remediated to meet applicable standards. Some of these laws also provide for liability for related damage to natural resources, and claims for alleged property and personal injury damage which can also arise related to contaminated sites. Laws in other jurisdictions in which Ashland operates require that contamination caused by such releases at these sites be assessed and, if necessary, remediated to meet applicable standards.

Air - In the United States, the Clean Air Act (CAA) imposes stringent limits on facility air emissions, establishes a federally mandated operating permit program, allows for civil and criminal enforcement actions and sets limits on the volatile or toxic content of many types of industrial materials and consumer products. The CAA establishes national ambient air quality standards (NAAQS) with attainment deadlines and control requirements based on the severity of air pollution in a given geographical area. Various state clean air acts implement, complement and, in many instances, add to the requirements of the federal CAA. The requirements of the CAA and its state counterparts have a significant impact on the daily operation of Ashland's businesses and, in many cases, on product formulation and other long-term business decisions. Other countries where Ashland operates also have laws and regulations relating to air quality. Ashland's businesses maintain numerous permits and emission control devices pursuant to these clean air laws.

The United States Environmental Protection Agency (USEPA) has increased its frequency in reviewing the NAAQS. The USEPA has stringent standards for particulate matter, ozone and sulfur dioxide. Throughout 2022, state and local agencies continued to implement options for meeting the newest standards. Particulate matter strategies include dust control measures for construction sites and reductions in emission rates allowed for industrial operations. Options for ozone include emission controls for certain types of sources, reduced limits on the volatile organic compound content of industrial materials and consumer products, and requirements on the transportation sector. Most options for sulfur dioxide focus on coal and diesel fuel combustion sources. It is not possible at this time to estimate the potential financial impact that these newest standards may have on Ashland's operations or products. Ashland will continue to monitor and evaluate these standards to meet these and all air quality requirements.

Solid Waste - Ashland's businesses are subject to various laws relating to and establishing standards for the management of hazardous and solid waste. In the United States, Ashland's facilities are subject to RCRA and its regulations governing generators of hazardous waste. Ashland has implemented systems to oversee compliance with the RCRA regulations. In addition to regulating current waste disposal practices, RCRA also addresses the environmental effects of certain past waste disposal operations, the recycling of wastes and the storage of regulated substances in underground tanks. Ashland has the remediation liability for certain facilities subject to these regulations. Other countries where Ashland operates also have laws and regulations relating to hazardous and solid waste, and Ashland has systems in place to oversee compliance.

Water - Ashland’s businesses maintain numerous discharge permits. In the United States, such permits may be required by the National Pollutant Discharge Elimination System of the Clean Water Act and similar state programs. Other countries have similar laws and regulations requiring permits and controls relating to water discharge.

Climate Change and Related Regulatory Developments - Ashland has been collecting energy use data and calculating greenhouse gas (GHG) emissions for many years. Ashland evaluates the potential impacts from both climate change and the anticipated GHG regulations to facilities, products and other business interests, as well as the strategies commonly considered by the industrial sector to reduce the potential impact of these risks. These risks are generally grouped as impacts from legislative, regulatory and international developments, impacts from business and investment trends and impacts to Company assets from the physical effects of climate change. North American, European and other regional regulatory developments are monitored continuously for material impacts to Ashland’s operations, and some facilities are subject to promulgated rules. Proposed and pending climate legislation is monitored for impact and Ashland is taking steps to strengthen climate reporting to meet anticipated disclosure requirements. Business and investment trends are expected to drive an increase in the demand for products that improve energy efficiency, reduce energy use and increase the use of renewable resources. At this time, Ashland cannot estimate the impact of this expected demand increase to its businesses. Physical effects from climate change have the potential to affect Ashland’s assets in areas prone to sea level rise or extreme weather events much as they do the general public and other businesses. Due to the uncertainty of these matters, Ashland cannot estimate the impact at this time of GHG-related developments on its operations or financial condition.

Competition

Ashland competes in the highly fragmented additives and specialty ingredients industries. The participants in these industries offer a varied and broad array of product lines designed to meet specific customer requirements. Participants compete with service and product offerings on a global, regional and/or local level subject to the nature of the businesses and products, as well as the end-markets and customers served. Competition is based on several key criteria, including product performance and quality, product price, product availability and security of supply, responsiveness of product development in cooperation with customers, customer service, industry knowledge and technical capability. Certain key competitors are significantly larger than Ashland and have greater financial resources, leading to greater operating and financial flexibility. The industry has become increasingly global as participants have focused on establishing and maintaining leadership positions outside of their home markets. Many of these segments’ product lines face domestic and international competition, due to industry consolidation, pricing pressures and competing technologies. To improve its competitive position, as Ashland narrows its focus, the Company is building and leveraging the Ashland corporate brand as a differentiator to create value and better communicate the capabilities, promise and scale of the Company, making it easier to introduce new product lines and applications.

Intellectual Property

Ashland has a broad intellectual property portfolio which is an important component of its business. Ashland relies on patents, trade secrets, formulae and know-how to protect and differentiate its products and technologies. In addition, the reportable segments own valuable trademarks which identify and differentiate its products from its competitors. Ashland also uses licensed intellectual property rights from third-parties.

Raw Materials

Ashland purchases its raw materials from multiple sources of supply in the United States and other countries and believes that raw material supplies will be available in quantities sufficient to meet demand in fiscal 2023. All of Ashland’s reportable segments were impacted, to varying degrees, by the volatility of raw materials costs in fiscal 2022, and these conditions may continue in fiscal 2023, especially those of hydrocarbon derivatives, cotton linters or wood pulp origin. Similarly, energy costs are a significant component of production costs.

Research and Development

Ashland's program of research and development is focused on defining the needs of the marketplace and framing those needs into technology platforms. Ashland has the capability to develop and deliver the intellectual property required to grow and protect those platforms. Ashland is focused on developing new chemistries, market-changing technologies and customer driven solutions at numerous technology centers located in the Americas, Europe and the Asia Pacific regions.

Seasonality

Ashland's business may vary due to seasonality. Ashland's business units typically experience stronger demand during warmer weather months.

Human Capital

Employee Health and Safety - Cultivating a safety culture is intentional at Ashland and is best shown by its commitment to a Zero Incident Culture (ZIC). ZIC begins with the vision, values, beliefs, and actions of Ashland's leaders demonstrating that zero incidents is possible. It means developing processes where compliance is the minimum expectation, allowing employees to proactively manage safety above compliance on the journey to zero.

As an indication of its commitment to Responsible Care, Ashland obtained a third-party certification to RC14001, which includes the internationally recognized ISO 14001 certification and adds additional health, safety, security, and chemical industry requirements. Currently, Ashland has 24 international sites participating on a group RC14001 certification. Also, as part of its commitment to health and safety, 16 of the Company's sites have obtained an additional ISO 45001 certification, an international health and safety management system.

As part of ZIC, the Company strives every day to achieve zero incidents. Ashland continues to make good progress on its journey. For the year ended September 30, 2022, the Company had a Total Preventable Recordable Rate (TPRR) of 0.58 compared to 0.73 for the year ended September 30, 2021.

Ashland has implemented several tools for communicating lessons learned from injuries, process safety incidents, and environmental releases. Immediately following an event, flash reports are developed and shared to communicate key lessons learned across the Company with a review call within 48 hours with EHS and Operations Leadership. Additionally, incidents and root causes/corrective and preventive actions are reviewed monthly with Company leadership and EHS leaders globally to discuss areas for improvement and highlight the importance of identifying and addressing management system errors.

Ashland has implemented the "Good Catch" Program aimed at identifying underlying unsafe conditions or behaviors that could lead to an undesirable outcome. Employees are encouraged to report good catches that fall into one of three categories – substandard conditions, near misses, and suggestions. These are tracked with the goal of continuing to increase overall reporting of identified good catches year to year.

Environmental - Ashland has a conscious and proactive mindset for sustainability and has established a renewable annual trust for ongoing and future environmental remediation and related litigation cash outlays. The initiative follows Ashland's announcement in February 2021 to align its operations with the ambitious aim of the Paris Climate Accord to limit global temperature rise to 1.5°C above preindustrial levels. At that time, Ashland also became a signatory to the United Nations Global Compact and is making the United Nations principles part of the Company's business strategy, culture, and day-to-day operations. Ashland has targets to reduce its environmental footprint (including energy usage, GHG emissions, and hazardous waste generation). These targets and progress towards meeting them can be found on: https://www.ashland.com/esg/esg-overview, which is not incorporated by reference into the Annual Report on Form 10-K.

COVID-19 - The COVID-19 pandemic has challenged the world in unprecedented ways, affecting millions of people and countless institutions around the world. Ashland's Incident Management Teams (IMT) have operated with the focus of keeping its employees, customers, and families safe while continuing to provide essential additives and specialty ingredients during this crisis.

Since the beginning of its ZIC journey over 20 years ago, Ashland has focused on preparedness and prevention and established an IMT which executed pandemic response plans. The COVID-19 IMT was formed in early January 2020 to support its China and Asia-Pacific operations and scaled to five regional teams under the direction of the Global IMT and Executive Leadership Team. Ashland continued the IMT for COVID-19 through the end of September 2022 and will continue the Science Intelligence Unit (SIU) meetings to review the current situations.

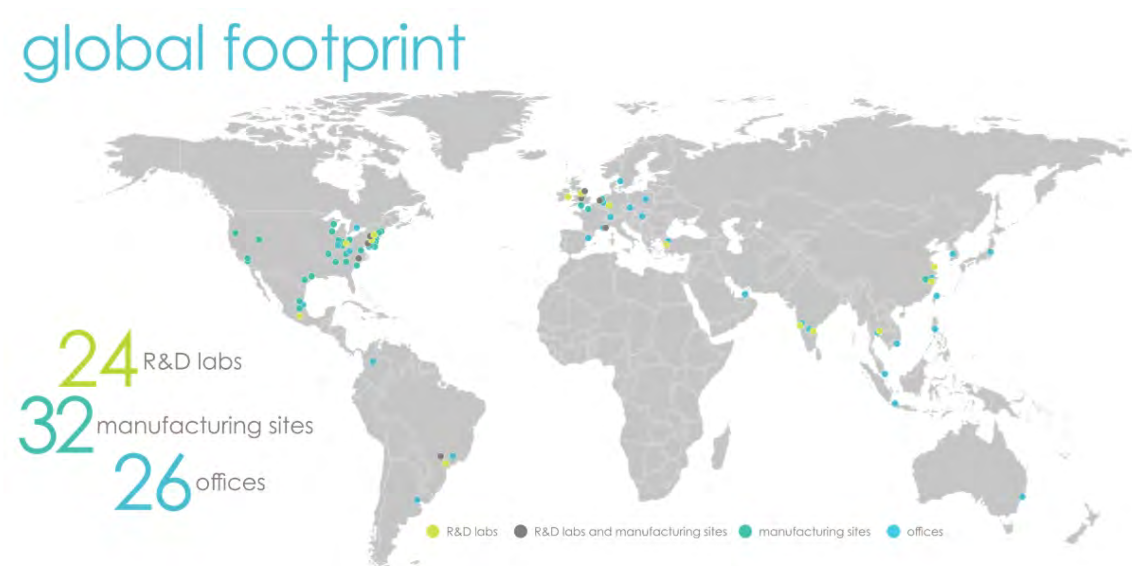
Ashland's safety, health, purchasing, information technology, supply chain, and human resource teams have worked with the Company's facilities to rapidly implement workplace changes, obtain personal protective equipment, and provide sanitization supplies to its employees while developing a reserve of materials to ensure continued safe operations.

Ashland's first priority is always the health and well-being of its employees, customers, and communities. Since the start of the pandemic, the Company's focus has shifted from managing an immediate crisis to building in the flexibility needed to adjust for regional differences and changing conditions. Employees have been able to return to their work sites globally.

Human Capital Management - Ashland's global workforce is its greatest asset. Ashland is committed to continuously evaluating and strengthening the growth-minded and innovative culture by attracting and developing exceptional global talent, supporting employees' physical, emotional, and financial well-being, and recognizing and rewarding performance. To achieve the highest return, Ashland is building an inclusive and high-integrity organization where everyone belongs, feels inspired to excel, and does the right thing.

As of September 30, 2022, Ashland had approximately 3,900 employees who thrive on developing practical, innovative, and simple solutions to complex problems for customers in more than 100 countries. The employees' global demographics consist of approximately 69% male employees and approximately 31% female employees, and in the U.S., approximately 26% of its employees self-identify as ethnically diverse.

Ashland's global footprint is geographically located as follows:



Competitive Pay and Benefits - Ashland is committed to paying its employees in a fair and equitable manner, regardless of race or gender, and has implemented global total rewards tools to promote equitable remuneration. The Company provides a total compensation package that is designed to be competitive with the markets in which it competes for talent. Ashland believes employees should be compensated equitably based on performance, skills, and experience.

Ashland reviews pay equity annually in conjunction with its annual performance review, merit, and promotion processes. In 2022, the Company completed an in-depth analysis of its pay equity globally using a number of factors to determine if a pay gap existed based on any protected factors (gender, age, race, veteran status). Overall findings were encouraging, identifying only a few employees that had a disparity in pay requiring further analysis and corrective action. Ashland reviews the process annually to ensure that its policies, procedures, and training continue to provide pay equity within the Company.

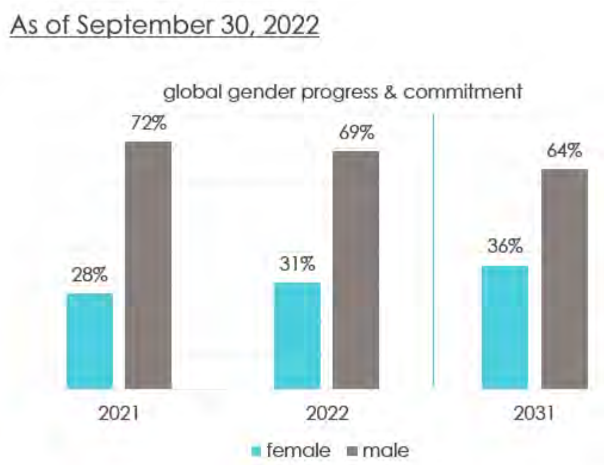
The Company's compensation programs are globally aligned, and, where possible, its total rewards plans include base salary, short and long-term incentives, benefits, financial, and special recognition programs. The Company routinely reviews its total rewards practices in the markets in which it operates to ensure its plans allow for the recruitment and retention of the talent it needs to be successful.

Ashland also offers a competitive global benefits program to support employees through all life stages. The following benefit plans are available to employees depending on local markets in which the Company operates that include plan specific features such as on-site and on-demand resources:

- Health care benefits including medical, prescription, dental and/or vision
- Wellness initiatives:
  - Global EAP (employee assistance program)
  - Flu vaccination resources
- Paid time off
- Voluntary benefits
- Life and accident coverage
- Disability coverage
- Retirement plans
- Tuition reimbursement
- Business travel accident

Inclusion and Diversity - The company believes one powerful and necessary way to live that purpose is to proactively strengthen both the diversity of the workforce and the inclusiveness of the culture. In 2022, Ashland established a global inclusion and diversity strategy focused on belonging, accountability, community engagement, recruitment, and internal mobility. These priorities serve as the basis of the global and local objectives and initiatives that advance Ashland's collective progress towards equity. The company and its leadership team are committed to creating a collaborative environment that leverages the talents of a diverse global workforce to drive sustainable growth and innovation that creates value for its shareholders, customers, employees, and the communities in which it operate.

Ashland's commitment to inclusion and diversity starts at the top with its Board and executive leadership. The company's board of directors is comprised of eleven individuals with diverse experience and credentials, selected for their business acumen and ability to challenge and add value to management. These directors have held significant leadership positions and bring a depth of experience across a wide variety of industries, providing the Company with unique insights and fresh perspectives. The demographics of the Company's board of directors is 45% diverse, including females and diverse males. See "Item 10 – Directors, Executive Officers, and Corporate Governance" for further information related to Ashland's board of directors. The Company's management is led by its President and Chief Executive Officer and the other members of the Executive Committee ("EC"). The demographics of the EC include 33% women and 45% who identify as ethnically diverse individuals. Further information related to its EC is included under the caption “Information About the Company’s Executive Officers” under Item X within Part I of this Form 10-K.



Talent Management - Ashland is dedicated to creating a purpose-driven people ecosystem that enables personal and professional growth at every level while minimizing risk to the business. The Company deploys a disciplined annual talent review and succession process to identify and develop a leadership pipeline that accelerates business results and minimizes attrition. The talent management process includes a performance management process that seeks to provide employees on-going feedback to enhance their performance in support of business objectives. As part of Ashland's commitment to professional development, it offers associate’s and bachelor’s undergraduate, graduate, and PhD tuition assistance to eligible employees.

In 2022, the Company elevated the skillset of its leaders as it moved to a hybrid work environment and established a foundation for inclusivity and allyship in practice. Ashland launched a global Culture Survey, with an 83% response rate, that provided us with valuable insight to prioritize investments in the tools, resources, and processes that will make a positive impact on employee’s well-being, engagement, and career growth. Ashland remains committed to continuously listening and evolving its people practices to align with and drive the Company’s purpose and business success.

Forward-Looking Statements

This annual report on Form 10-K contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). These forward-looking statements are not historical facts and generally are identified by words such as “anticipates,” “believes,” “estimates,” “expects,” “is likely,” “predicts,” “projects,” “forecasts,” “objectives,” “may,” “will,” “should,” “plans,” and “intends” and the negative of these words or other comparable terminology. Although Ashland believes that its expectations are based on reasonable assumptions, such expectations are subject to risks and uncertainties that are difficult to predict and may be beyond Ashland’s control. As a result, Ashland cannot assure that the expectations contained in such statements will be achieved. Important factors that could cause actual results to differ materially from those contained in such statements are discussed under “Use of estimates, risks and uncertainties” in Note A of Notes to Consolidated Financial Statements in this annual report on Form 10-K. For a discussion of other factors and risks that could affect Ashland’s expectations and operations, see “Item 1A. Risk Factors” in this annual report on Form 10-K.

ITEM 1A. RISK FACTORS

The following discussion of “risk factors” identifies the most significant factors that may adversely affect Ashland’s business, operations, financial position or future financial performance. This information should be read in conjunction with Management’s Discussion and Analysis and the consolidated financial statements and related notes incorporated by reference into this annual report on Form 10-K. The following discussion of risks is designed to highlight what Ashland believes are important factors to consider when evaluating its expectations. These factors could cause future results to differ from those in forward-looking statements and from historical trends.

COVID-19 Pandemic

The COVID-19 pandemic could have a material adverse effect on Ashland's business operations, results of operations, cash flows and financial position.

Ashland continues to closely monitor the impact of the COVID-19 pandemic on all aspects of its business and geographies, including how the pandemic will impact customers, employees, suppliers, vendors, business partners and distribution channels. The COVID-19 pandemic has and may create significant volatility, uncertainty and economic disruption, which may materially and adversely affect Ashland's business operations, cash flows, liquidity and financial position. The extent to which the COVID-19 pandemic continues to impact Ashland will depend on numerous evolving factors and future developments that are difficult to predict, including: the severity of the virus and any related variants; the duration of the outbreak; governmental, business and other actions in response to the pandemic (which could include limitations on Ashland's operations or mandates to provide products or services); the impact of the pandemic on Ashland's supply chain; the impact of the pandemic on economic activity; the extent and duration of the effect on consumer confidence and spending, customer demand and buying patterns including spending on discretionary categories; the health of and the effect on Ashland's workforce and its ability to meet staffing needs through the operations and other critical functions, particularly if employees are quarantined as a result of exposure; any impairment in value of tangible or intangible assets which could be recorded as a result of weaker economic conditions; the impact on Ashland's business and the global economy from governmental actions related to international trade; and the potential effects on internal controls including those over financial reporting as a result of changes in working environments such as shelter-in-place and similar orders that are applicable to employees and business partners, among others. In addition, if the pandemic continues to create disruptions or volatility in the credit or financial markets, or impacts Ashland's credit ratings, it could adversely affect Ashland's ability to access capital on favorable terms and continue to meet its liquidity needs, all of which are highly uncertain and cannot be predicted. In addition, Ashland cannot predict the continued impact that the COVID-19 pandemic will have on its customers, suppliers, vendors, and other business partners, and each of their financial conditions; however, any material effect on these parties could adversely impact Ashland. The impact of the COVID-19 pandemic may also exacerbate other risks discussed in this Item 1A any of which could have a material effect on Ashland. This situation is changing rapidly and additional impacts may arise that Ashland is not aware of currently.

Business Operations, Financial Performance and Growth

Ashland has set aggressive growth goals for its businesses, including increasing sales, cash flow and margins, in order to achieve its long term strategic objectives. Ashland's successful execution of its growth strategies and business plans to facilitate that growth involves a number of risks.

Ashland has set aggressive growth goals for its businesses in order to meet long term strategic objectives and improve shareholder value. Ashland's failure to meet one or more of these goals or objectives would negatively impact Ashland's potential value and its businesses. One of the most important risks is that Ashland might fail to adequately execute its business and growth plans, by optimizing the efficient use of its physical and intangible assets. Aspects of that risk include changes to global economic environment, changes to the competitive landscape, attraction and retention of skilled employees, the potential failure of product innovation plans, failure to comply with existing or new regulatory schemes, failure to maintain a competitive cost structure and other risks outlined in greater detail in this Item 1A.

Business disruptions from natural, operational and other catastrophic risks could seriously harm Ashland's operations and financial performance. In addition, a catastrophic event at one of Ashland's facilities or involving its products or employees could lead to liabilities that could further impair its operations and financial performance.

Business disruptions, including those related to operating hazards inherent with the production of chemicals, natural disasters, severe weather conditions, supply or logistics disruptions, increasing costs for energy, temporary plant and/or power outages, information technology systems and network disruptions, cyber-security breach, terrorist attacks, armed conflict, war, pandemic diseases, fires, floods or other catastrophic events, could seriously harm Ashland's operations, as well as the operations of its customers and suppliers, and may adversely impact Ashland's financial performance. Although it is impossible to predict the occurrence or consequences of any such events, they could result in reduced demand for Ashland's products, make it difficult or impossible for Ashland to manufacture its products or deliver products to its customers or to receive raw materials from suppliers, or create delays and inefficiencies in the supply chain. In addition to leading to a serious disruption of Ashland's businesses, a catastrophic event at one of our facilities or involving our products or employees could lead to substantial legal liability to or claims by parties allegedly harmed by the event.

While Ashland maintains business continuity plans that are intended to allow it to continue operations or mitigate the effects of events that could disrupt its business, Ashland cannot provide assurances that its plans would fully protect it from all such events. In addition, insurance maintained by Ashland to protect against property damage, loss of business and other related consequences resulting from catastrophic events is subject to various deductibles and coverage limitations, depending on the nature of the risk insured. This insurance may not be sufficient to cover all of Ashland's damages or damages to others in the event of a catastrophe. In addition, insurance related to these types of risks may not be available now or, if available, may not be available in the future at commercially reasonable rates.

Climate change impacts including supply chain disruptions, operational impacts, and geopolitical events may impact Ashland's business operations.

Ashland sources a large number of raw materials from third party suppliers globally. These products include both natural and synthetic materials derived from plants, animal products, organic and petroleum based raw materials. Disruptions to the global supply chain due to climate related impacts or geopolitical events are possible and exist as external risk factors that the Company can respond to but not control. These events could limit the supply of key raw materials to the Company, or could have significant impacts to pricing. Ashland works with multiple raw material suppliers to mitigate lack of availability from a single supplier, however in some cases products with limited numbers of suppliers may become difficult to obtain.

Ashland has manufacturing operations in areas vulnerable to coastal storms which may increase in magnitude and impact due to climate change. Ashland continues to implement response and resilience measures such as storm hardening and business continuity planning, however increasingly large and unprecedented weather events may pose a risk to business operations in vulnerable areas. Storms could cause business interruptions, incur additional restoration costs, and impact product availability and pricing.

Consumer preference is increasingly impacted by awareness of and a response to climate change. Consumers are increasingly demanding responsibly sourced and manufactured products. An inability to respond to consumer demands through environmental, social and governance (ESG) innovation could lead to a loss of sales to competitors providing more sustainable product offerings.

Energy availability and pricing has been impacted by geopolitical events and may be impacted by climate related legislation and regulations. As climate legislation increases in many countries, the availability of conventional and nonrenewable energy may be increasingly limited and prices may continue to increase. Where demand exceeds energy capacity, energy disruptions such as brown out or black out events are possible, leading to business interruption and quality/operational impacts. Failure to respond to or mitigate this risk could lead to increased cost and business impacts.

Ashland's customers could change their products in a way that reduces the demand for Ashland's products.

Ashland produces and sells specialty materials that are used by its customers for a broad range of applications. Many of these Ashland materials become part of end products that are sold to consumers. Changes in consumer preferences and demands can lead to certain Ashland customers making changes to their products. In other instances, Ashland's customers may change their products or production techniques to take advantage of newer technologies, alternative chemistries, more effective formulations, or improved processes, or in response to various market, technical or regulatory changes.

Such changes in Ashland's customers' products or production techniques may cause these customers to reduce consumption of Ashland's products or eliminate their need entirely. Ashland may not be able to supply products that meet the customers' new requirements. Such lost sales opportunities may not be replaced by those offering equal revenue potential or margin. It is important for Ashland to continue developing new products, and new applications of existing products to replace such lost business. Otherwise, Ashland faces the risk of a loss of market share, margins and cash flow if it is unable to manage a potential change in the demands of its products.

Ashland's substantial global operations subject it to risks of doing business in foreign countries, which could adversely affect its business, financial condition and results of operations.

Greater than half of Ashland's net sales for fiscal 2022 were to customers outside of North America. Ashland expects sales from international markets to continue to represent an even larger portion of the Company's sales in the future. Also, a significant portion of Ashland's manufacturing capacity is located outside of the United States. Accordingly, Ashland's business is subject to risks related to the differing legal, political, cultural, social and regulatory requirements and economic conditions of many jurisdictions.

The global nature of Ashland's business presents difficulties in hiring and maintaining a workforce in certain countries. Fluctuations in exchange rates may affect product demand and may adversely affect the profitability in U.S. dollars of products and services provided in foreign countries. In addition, foreign countries may impose additional withholding taxes or otherwise tax Ashland's foreign income, or adopt other restrictions on foreign trade or investment, including currency exchange controls. The imposition of new tariffs or trade quotas, or an impairment of existing trade agreements is also a risk that could impair Ashland's financial performance.

Certain legal and political risks are also inherent in the operation of a company with Ashland's global scope. For example, in November 2018, the United States reached an agreement with Canada and Mexico on the United States-Mexico-Canada Trade Agreement (USMCA), which replaced the North American Free Trade Agreement (NAFTA) effective July 1, 2020. Among other things, USMCA includes revised country of origin rules and various labor provisions. In addition, the United Kingdom's exit from the European Union (E.U.) could disrupt European supply chains or customs regimes. Ashland's ability to do business and execute its growth strategies could be adversely affected by either of these changes or other changes to trade policy and trade relationships. Ashland could also be impacted negatively if the ongoing trade disputes between the United States and China, or those between the United States and the E.U. were to worsen. In addition, it may be more difficult for Ashland to enforce its agreements or collect receivables through foreign legal systems. There is a risk that foreign governments may nationalize private enterprises in certain countries where Ashland operates. In certain countries or regions, terrorist activities and the response to such activities may threaten Ashland's operations more than those in the United States. In Europe, the effect of economic sanctions imposed on Russia and/or Russia's reaction to the sanctions could adversely impact Ashland's performance and results of operations. The risks associated with localized or regional armed conflict in many parts of the world remain high and could disrupt and/or adversely impact Ashland's businesses. Social and cultural norms in certain countries may not support compliance with Ashland's corporate policies including those that require compliance with substantive laws and regulations. Also, changes in general economic and political conditions in countries where Ashland operates, particularly in Europe, the Middle East and emerging markets, are a risk to Ashland's financial performance.

As Ashland continues to operate its business globally, its success will depend, in part, on its ability to anticipate and effectively manage these and other related risks. There can be no assurance that the consequences of these and other factors relating to its multinational operations will not have an adverse effect on Ashland's business, financial condition or results of operations.

Adverse developments in the global economy and potential disruptions of financial markets could negatively impact Ashland's customers and suppliers, and therefore have a negative impact on Ashland's results of operations.

A global or regional economic downturn may reduce customer demand or inhibit Ashland's ability to produce and sell products. Ashland's business and operating results are sensitive to global and regional economic downturns, credit market tightness, declining consumer and business confidence, fluctuating commodity prices, volatile exchange rates, changes in interest rates, sovereign debt defaults and other challenges, including those related to international sanctions and acts of aggression or threatened aggression that can affect the global economy. In the event of adverse developments or stagnation in the economy or financial markets, Ashland's customers may experience deterioration of their businesses, reduced demand for their products, cash flow shortages and difficulty obtaining financing. As a result, existing or potential customers might delay or cancel plans to purchase products and may not be able to fulfill their obligations to Ashland in a timely fashion. Further, suppliers may experience similar conditions, which could impact their ability to fulfill their obligations to Ashland. A weakening or reversal of the current economic conditions in the global economy or a substantial part of it could negatively impact Ashland's business, results of operations, financial condition and ability to grow.

Ashland's substantial indebtedness may adversely affect its business, results of operations and financial condition.

Ashland maintains a substantial amount of debt. Ashland's substantial indebtedness could adversely affect its business, results of operations and financial condition by, among other things:

- requiring Ashland to dedicate a substantial portion of its cash flow from operations to pay principal and interest on its debt, which would reduce the availability of Ashland's cash flow to fund working capital, capital expenditures, acquisitions, execution of its growth strategy and other general corporate purposes;
- limiting Ashland's ability to borrow additional amounts to fund working capital, capital expenditures, acquisitions, debt service requirements, execution of its growth strategy and other purposes;
- making Ashland more vulnerable to adverse changes in general economic, industry and regulatory conditions and in its business by limiting Ashland's flexibility in planning for, and making it more difficult for Ashland to react quickly to, changing conditions;
- placing Ashland at a competitive disadvantage compared with those of its competitors that have less debt and lower debt service requirements;
- making Ashland more vulnerable to increases in interest rates if debt is refinanced; and
- making it more difficult for Ashland to satisfy its financial obligations.

In addition, Ashland may not be able to generate sufficient cash flow from its operations to repay its indebtedness when it becomes due and to meet its other cash needs. If Ashland is not able to pay its debts as they become due, it could be in default under its credit facility or other indebtedness. Ashland might also be required to pursue one or more alternative strategies to repay indebtedness, such as selling assets, refinancing or restructuring its indebtedness or selling additional debt or equity securities. Ashland may not be able to refinance its debt or sell additional debt or equity securities or its assets on favorable terms, if at all, and if Ashland must sell its assets, it may negatively affect its ability to generate revenues.

Competition

Failure to develop and market new products and production technologies could impact Ashland's competitive position and have an adverse effect on its businesses and results of operations.

The specialty additives and materials industry is subject to periodic technological change and ongoing product improvements. In order to maintain margins and remain competitive, Ashland must successfully develop and introduce new products or improvements that appeal to its customers and ultimately to global consumers. Ashland plans to grow earnings, in part, by focusing on developing markets and solutions to meet increasing demand in those markets, including demand for personal care and pharmaceutical products which are subject to lengthy regulatory approval processes. The fast change in Ashland's industry and those of its customers necessitates that Ashland continue the development of new technologies to replace older technologies whose demand or market position may be fading. Ashland's efforts to respond to changes in customer demand in a timely and cost-efficient manner to drive growth could be adversely affected by difficulties or delays in product development, including the inability to identify viable new products, successfully complete research and development, obtain regulatory approvals, obtain intellectual property protection or gain market acceptance of new products. Due to the lengthy development process, technological challenges and intense competition, there can be no assurance that any of the products Ashland is currently developing, or could develop in the future, will achieve substantial commercial success.

The competitive nature of Ashland's markets may delay or prevent Ashland from passing increases in raw materials or energy costs on to its customers. In addition, certain of Ashland's suppliers may be unable to deliver products or raw materials or fulfill contractual requirements. The occurrence of either event could adversely affect Ashland's results of operations.

Rising and volatile raw material prices, especially those of hydrocarbon derivatives, cotton linters or wood pulp, may negatively impact Ashland's costs, results of operations and the valuation of its inventory. Similarly, energy costs are a significant component of certain of Ashland's product costs. Ashland is not always able to raise prices in response to such increased costs, and its ability to pass on the costs of such price increases is dependent upon market conditions. Likewise, reductions in the valuation of Ashland's inventory due to market volatility may not be recovered and could result in losses.

Ashland purchases certain products and raw materials from suppliers, often pursuant to written supply contracts. If those suppliers are unable to meet Ashland's orders in a timely manner or choose to terminate or not fulfill contractual arrangements, Ashland may not be able to make alternative supply arrangements. Also, domestic and global government regulations related to the manufacture, transport or import of certain raw materials may impede Ashland's ability to obtain those raw materials on commercially reasonable terms. Certain Ashland businesses rely on agricultural output of clary sage, aloe, guar, and cotton linters, and the availability of these materials can be severely impacted by crop yields, weather events, and other factors. If Ashland is unable to obtain and retain qualified suppliers under commercially acceptable terms, its ability to manufacture and deliver products in a timely, competitive and profitable manner or grow its business successfully could be adversely affected.

Ashland faces competition from other companies, which places downward pressure on prices and margins and may adversely affect Ashland's businesses and results of operations.

Ashland operates in highly competitive markets, competing against a number of domestic and foreign companies. Competition is based on several key criteria, including product performance and quality, product price, product availability and security of supply, responsiveness of product development in cooperation with customers and customer service, as well as the ability to bring innovative products or services to the marketplace. Certain key competitors are significantly larger than Ashland and have greater financial resources, leading to greater operating and financial flexibility. As a result, these competitors may be better able to withstand changes in conditions within the relevant industry, changes in the prices of raw materials and energy and changes in general economic conditions. In addition, competitors' pricing decisions could compel Ashland to decrease its prices, which could negatively affect its margins and profitability. Additional competition in markets served by Ashland could adversely affect margins and profitability and could lead to a reduction in market share. Also, Ashland competes in certain markets that are declining and has targeted other markets for growth opportunities. Competitive and pricing pressures could also impact Ashland's production volumes, which can in turn reduce cost efficiency. If Ashland's strategies for dealing with declining markets and leveraging opportunity markets are not successful, its businesses and results of operations could be negatively affected.

Human Capital

Ashland's success depends upon its ability to attract and retain key employees and the identification and development of talent to succeed senior management.

Ashland's success depends on its ability to attract and retain key personnel, and Ashland relies heavily on its management team. The inability to recruit and retain key personnel or the unexpected loss of key personnel may adversely affect Ashland's operations. Also, a substantial portion of Ashland's U.S.-based employees will be retirement-eligible within the next several years. That, combined with the relatively small number of middle tier managers with substantial experience in place to replace this group of retirement eligible employees, increases the potential negative impact of the risk that key employees could leave the Company. Additionally, the Company's redesign and cost reduction program may result in key employees departing who may not be replaced. This risk of unwanted employee turnover also is substantial in positions that require certain technical expertise and geographically in developing markets which Ashland has targeted for growth, especially in Asia, South America and Eastern Europe. In addition, because of its reliance on its management team, Ashland's future success depends, in part, on its ability to identify and develop talent to succeed its senior management and other key positions throughout the organization. If Ashland fails to identify and develop successors, the Company is at risk of being harmed by the departures of these key employees.

Intellectual Property and Cyber Threats

Ashland uses information technology (IT) systems to conduct business and these IT systems are at risk of potential disruption and cyber security threats.

Ashland's businesses rely on their IT systems to operate efficiently and in some cases, to operate at all. Ashland employs third parties to manage and maintain a significant portion of its IT systems, including, but not limited to data centers, IT infrastructure, network, client support and end user services, as well as the functions of backing up and securing those systems. A partial or complete failure of Ashland's IT systems or those of our third parties managing, providing or servicing them for any amount of time more than several hours could result in significant business disruption causing harm to Ashland's reputation, results of operations or financial condition. In addition, the nature of our businesses, the markets we serve, and the extensive geographic profile of our operations make Ashland a target of cyber security threats. Despite steps Ashland takes to mitigate or eliminate them, cyber security threats in general are increasing and becoming more advanced and could occur as a result of the activity of hackers, employee error or employee misconduct. A breach of our IT systems could lead to the loss and destruction of trade secrets, confidential information, proprietary data, intellectual property, customer and supplier data, and employee personal information, and could disrupt business operations which could adversely affect Ashland's relationships with business partners and harm our brands, reputation, and financial results.

Ashland may not be able to effectively protect or enforce its intellectual property rights.

Ashland relies on the patent, trademark, trade secret and copyright laws of the United States and other countries to protect its intellectual property rights. The laws of some countries may not protect Ashland's intellectual property rights to the same extent as the laws of the United States. Failure of foreign countries to have laws to protect Ashland's intellectual property rights or an inability to effectively enforce such rights in foreign countries could result in the loss of valuable proprietary information, which could have an adverse effect on Ashland's business and results of operations.

Even in circumstances where Ashland has a patent on certain technologies, such patents may not provide meaningful protection against competitors or against competing technologies. In addition, any patent applications submitted by Ashland may not result in an issued patent. There can be no assurance that Ashland's intellectual property rights will not be challenged, invalidated, circumvented or rendered unenforceable. Ashland could also face claims from third parties alleging that Ashland's products or processes infringe on their proprietary rights. If Ashland is found liable for infringement, it could be responsible for significant damages, prohibited from using certain products or processes or required to modify certain products and processes. Any such infringement liability could adversely affect Ashland's product and service offerings, profitability and results of operations.

Ashland also has substantial intellectual property associated with its know-how and trade secrets that are not protected by patent or copyright laws. Ashland protects these rights by entering into confidentiality and non-disclosure agreements with most of its employees and with third parties. There can be no assurance that such agreements will not be breached or that Ashland will be able to effectively enforce them. In addition, Ashland's trade secrets and know-how may be improperly obtained by other means, such as a breach of Ashland's information technologies security systems or direct theft. Any unauthorized disclosure of any of Ashland's material know-how or trade secrets could adversely affect Ashland's business and results of operations.

Legal Risks, Regulatory Compliance and Litigation

Ashland's business exposes it to potential product liability claims and recalls, which could adversely affect its financial condition and performance.

The development, manufacture and sale of specialty materials and other products by Ashland, including products produced for the food, beverage, personal care, pharmaceutical and nutritional supplement industries, involve an inherent risk of exposure to product liability claims, product recalls, product seizures and related adverse publicity. Ashland also produces products that are subject to rigorous specifications and quality standards, with an expectation from its customers around these strict requirements. A product liability claim, recall or judgment against Ashland, or a customer complaint on product specifications, could also result in substantial and unexpected expenditures, affect consumer or customer confidence in its products, and divert management's attention from other responsibilities. Although Ashland maintains product liability insurance, there can be no assurance that this type or level of coverage is adequate or that Ashland will be able to continue to maintain its existing insurance or obtain comparable insurance at a reasonable cost, if at all. A product recall or a partially or completely uninsured product liability judgment against Ashland could have a material adverse effect on its reputation, results of operations and financial condition.

Ashland has incurred, and will continue to incur, substantial costs as a result of environmental, health and safety, and hazardous substances liabilities and related compliance requirements. These costs could adversely impact Ashland's cash flow, and, to the extent they exceed Ashland's established reserves for these liabilities, its results of operations.

Ashland is subject to extensive federal, state, local and foreign laws, regulations, rules and ordinances relating to pollution, protection of the environment and human health and safety, and the generation, storage, handling, treatment, disposal and remediation of hazardous substances and waste materials. Ashland has incurred, and will continue to incur, significant costs and capital expenditures to comply with these laws and regulations.

Environmental, health and safety regulations change frequently, and such regulations and their enforcement have tended to become more stringent over time. Accordingly, changes in environmental, health and safety laws and regulations and the enforcement of such laws and regulations could interrupt Ashland's operations, require modifications to its facilities or cause Ashland to incur significant liabilities, costs or losses that could adversely affect its profitability. Actual or alleged violations of environmental, health or safety laws and regulations could result in restrictions or prohibitions on plant operations as well as substantial damages, penalties, fines, civil or criminal sanctions and remediation costs. In addition, under some environmental laws, Ashland may be strictly liable and/or jointly and severally liable for environmental damages and penalties.

Ashland is also subject to various federal, state, local and foreign environmental laws and regulations that require environmental assessment or remediation efforts (collectively, environmental remediation) at multiple locations. Ashland uses engineering studies, historical experience and other factors to identify and evaluate remediation alternatives and their related costs in determining the estimated reserves for environmental remediation. Environmental remediation reserves are subject to numerous inherent uncertainties that affect Ashland's ability to estimate its share of the applicable costs. Such uncertainties involve the nature and extent of contamination at each site, the extent of required cleanup efforts under existing environmental regulations, widely varying costs of alternate cleanup methods, changes in environmental regulations, the potential effect of continuing improvements in remediation technology and the number and financial strength of other potentially responsible parties at multiparty sites. There may also be situations in which certain environmental liabilities are not known to Ashland or are not probable and estimable. As a result, Ashland's actual costs for environmental remediation could affect Ashland's cash flow and, to the extent costs exceed established reserves for those liabilities, its results of operations.

Ashland is responsible for, and has financial exposure to, liabilities from pending and threatened claims, including those alleging personal injury caused by exposure to asbestos, which could adversely impact Ashland's results of operations and cash flow.

There are various claims, lawsuits and administrative proceedings pending or threatened, including those alleging personal injury caused by exposure to asbestos, against Ashland and its current and former subsidiaries. Such actions are with respect to commercial matters, product liability, toxic tort liability and other matters that seek remedies or damages, some of which are for substantial amounts. While these actions are being contested, their outcome is not predictable. Ashland's results could be adversely affected by financial exposure to these liabilities. Insurance maintained by Ashland to protect against claims for damages alleged by third parties is subject to coverage limitations, depending on the nature of the risk insured. This insurance may not be sufficient to cover all of Ashland's liabilities to others. In addition, insurance related to these types of risks may not be available now or, if available, may not be available in the future at commercially reasonable rates. Ashland's ability to recover from its insurers for asbestos liabilities could also have an adverse impact on its results of operations. Projecting future asbestos costs is subject to numerous variables that are extremely difficult to predict. In addition to the significant uncertainties surrounding the number of claims that might be received, other variables include the type and severity of the disease alleged by each claimant, the long latency period associated with asbestos exposure, dismissal rates, costs of medical treatment, the impact of bankruptcies of other companies that are co-defendants in claims, uncertainties surrounding the litigation process from jurisdiction to jurisdiction and from case to case, and the impact of potential changes in legislative or judicial standards. Furthermore, any predictions with respect to these variables are subject to even greater uncertainty as the projection period lengthens. In light of these inherent uncertainties, Ashland believes that its asbestos reserves represent the best estimate within a range of possible outcomes. As a part of the process to develop these estimates of future asbestos costs, a range of long-term cost models was developed. These models are based on national studies that predict the number of people likely to develop asbestos-related diseases and are heavily influenced by assumptions regarding long-term inflation rates for indemnity payments and legal defense costs, as well as other variables mentioned previously. Because of the inherent uncertainties in projecting future asbestos liabilities and establishing appropriate reserves, Ashland's actual asbestos costs could adversely affect its results of operations and, to the extent they exceed its reserves, could adversely affect its results of operations.

The impact of changing laws or regulations or the manner of interpretation or enforcement of existing rules could adversely impact Ashland's financial performance and restrict its ability to operate its business or execute its strategies.

New laws or regulations, or changes in existing laws or regulations or the manner of their interpretation or enforcement, could increase Ashland's cost of doing business and restrict its ability to operate its business or execute its strategies. This includes, among other things, the possible taxation under U.S. law of certain income from foreign operations, the possible taxation under foreign laws of certain income Ashland reports in other jurisdictions, tariffs or quotas levied on Ashland products, raw materials or key components by certain countries, regulations related to the protection of private information of Ashland's employees and customers, regulations issued by the U.S. Food and Drug Administration (and analogous non-U.S. agencies) affecting Ashland and its customers, compliance with The U.S. Foreign Corrupt Practices Act (and analogous non-U.S. laws) and the European Union's Registration, Authorization and Restriction of Chemicals (REACH) regulation (and analogous non-EU initiatives), and potential operational impacts of General Data Protection Regulation (GDPR). Uncertainty associated with the passage of new laws, application of executive authority beyond the legislative process, as well as changes in and enforcement of existing laws, can limit Ashland's ability to make and execute business plans effectively. In addition, compliance with laws and regulations is complicated by Ashland's substantial and growing global footprint, which will require significant and additional resources to comprehend and ensure compliance with applicable laws in the more than one hundred countries where Ashland conducts business. Compliance with current and future regulations is further complicated by uncertainty around the reevaluation of international agreements by various countries, including the United States, and the resulting impact on regulatory regimes, customs regulations, tariffs, sanctions, and other transnational protocols.

Taxation

Imposition of new taxes, disagreements with tax authorities or additional tax liabilities could adversely affect Ashland's business, financial condition, reputation or results of operations.

Ashland's products are made, manufactured, distributed or sold in more than 100 countries and territories. A significant portion of Ashland's revenues are generated outside the United States. As such, Ashland is subject to taxes in the United States as well as numerous foreign countries. Ashland's future effective tax rates could be affected by changes in the mix of earnings in countries with differing tax rates, changes in the valuation of deferred tax assets and liabilities, changes in liabilities for uncertain tax positions, cost of repatriations or changes in tax laws, regulations, administrative practices or their interpretation. Moreover, because Ashland is subject to the regular examination of its income tax returns by various tax authorities, the economic and political pressure to increase tax revenues in these jurisdictions may make resolving tax disputes even more difficult, and the final resolution of tax audits and any related litigation may differ from our historical provisions and accruals resulting in an adverse impact on our business, financial condition, reputation or results of operations. The Tax Cuts and Jobs Act (the Tax Act), enacted in December 2017, made significant changes to US tax law; many other countries or organizations, including those where Ashland has significant operations, are actively considering or enacting changes to tax laws which could significantly impact our tax rate and cash flows. The increasingly complex global tax environment, including changes in how United States multinational corporations are taxed, could adversely affect Ashland's business, financial condition or results of operations.

Other than the one-time transition tax enacted by the Tax Act, Ashland will continue to be indefinitely reinvested in our foreign earnings. As such, Ashland has not accrued income taxes or foreign withholding taxes on undistributed earnings for most non-US subsidiaries because those earnings are intended to be indefinitely reinvested in the operations of those subsidiaries. If these earnings are needed for Ashland's operations in the United States, the repatriation of such earnings could adversely affect its business, results of operations or financial condition.

The IPO of Valvoline and final distribution of its shares could result in significant tax liability to Ashland and its stockholders.

Ashland believes that the Valvoline IPO and certain related internal transactions should be nontaxable transactions for U.S. federal income tax purposes and has obtained written opinions of counsel to that effect. Ashland also obtained a written opinion of counsel to the effect that the final distribution should qualify for non-recognition of gain and loss under Section 355 of the Internal Revenue Code of 1986, as amended (the "Code"). The opinions are based on certain assumptions and representations as to factual matters from Ashland and Valvoline, as well as certain covenants by those parties. The opinions cannot be relied upon if any of the assumptions, representations or covenants is incorrect, incomplete or inaccurate or is violated in any material respect, or if there are changes in law with retroactive effect. The opinions are not binding on the IRS or the courts, and it is possible that the IRS or a state or local taxing authority could take the position that the internal transactions, the final distribution or the receipt of proceeds from the Valvoline IPO resulted in the recognition of significant taxable gain by Ashland, in which case Ashland may be subject to material tax liabilities.

If the final distribution were determined not to qualify for non-recognition of gain and loss, then Ashland would recognize gain as if it had sold Valvoline common stock in a taxable transaction in an amount up to the fair market value of the Valvoline common stock it distributed in the final distribution. The tax liability resulting from such gain could have a material impact on Ashland's operations.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Ashland's corporate headquarters is located in Wilmington, Delaware. Principal offices of other major operations are located in Wilmington, Delaware (Life Sciences, Specialty Additives, Intermediates and Corporate); Bridgewater, New Jersey (Personal Care and Corporate); and Dublin, Ohio (Corporate) within the United States and Hyderabad, India; Warsaw, Poland; and Schaffhausen, Switzerland (each of which are shared service centers of Ashland's and house Corporate and direct business segment personnel). All of these locations are leased, except for the Wilmington, Delaware site which is owned. Principal manufacturing, marketing and other materially important physical properties of Ashland and its subsidiaries are described within the applicable business units under "Item 1" in this annual report on Form 10-K. All of Ashland's physical properties are owned or leased. Ashland believes its physical properties are suitable and adequate for the Company's business. Additional information concerning leases may be found in Note K of Notes to Consolidated Financial Statements in this annual report on Form 10-K.

ITEM 3. LEGAL PROCEEDINGS

The following is a description of Ashland's material legal proceedings. Ashland's threshold for disclosing material environmental legal proceedings involving a governmental authority where potential monetary sanctions are involved is $1 million.

Asbestos-Related Litigation

Ashland is subject to liabilities from claims alleging personal injury caused by exposure to asbestos. Such claims result primarily from indemnification obligations undertaken in 1990 in connection with the sale of Riley Stoker Corporation (Riley), a former subsidiary. Although Riley was neither a producer nor a manufacturer of asbestos, its industrial boilers contained some asbestos containing components provided by other companies.

Hercules LLC (Hercules) (formerly Hercules Incorporated), an indirect wholly-owned subsidiary of Ashland, is also subject to liabilities from asbestos-related personal injury lawsuits involving claims which typically arise from alleged exposure to asbestos fibers from resin encapsulated pipe and tank products which were sold by one of Hercules' former subsidiaries to a limited industrial market.

Ashland and Hercules are also defendants in lawsuits alleging exposure to asbestos at facilities formerly or presently owned or operated by Ashland or Hercules.

For additional detailed information regarding liabilities arising from asbestos-related litigation, see "Management's Discussion and Analysis - Critical Accounting Policies - Asbestos Litigation" and Note N of Notes to Consolidated Financial Statements in this annual report on Form 10-K.

Environmental Proceedings

(a) *CERCLA and Similar State Law Sites* - Under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 and similar state laws, Ashland and its subsidiaries may be subject to joint and several liability for cleanup costs in connection with alleged releases of hazardous substances at sites where it has been identified as a "potentially responsible party" (PRP). As of September 30, 2022, Ashland and its subsidiaries have been identified as a PRP by U.S. federal and state authorities, or by private parties seeking contribution, for the cost of environmental investigation and/or cleanup at 81 sites. These sites are currently subject to ongoing investigation and remedial activities, overseen by the United States Environmental Protection Agency (USEPA) or a state agency, in which Ashland or its subsidiaries are typically participating as a member of a PRP group. Generally, the types of relief sought include remediation of contaminated soil and/or groundwater, reimbursement for past costs of site cleanup and administrative oversight and/or long-term monitoring of environmental conditions at the sites. The ultimate costs are not predictable with assurance.

(b) *Lower Passaic River, New Jersey Matters* - Ashland, through two formerly owned facilities, and International Specialty Products (ISP), through a now-closed facility, have been identified as PRPs, along with approximately 70 other companies (the Cooperating Parties Group or the CPG), in a May 2007 Administrative Order of Consent (AOOC) with the USEPA. The parties are required to perform a remedial investigation and feasibility study (RI/FS) of the entire 17 miles of the Passaic River. In June 2007, the USEPA separately commenced a Focused Feasibility Study (FFS) as an interim measure. In accordance with the 2007 AOOC, in June 2012 the CPG voluntarily entered into another AOOC for an interim removal action focused solely at mile 10.9 of the Passaic River. The allocations for the 2007 AOOC and the 2012 removal action are based on interim allocations, are immaterial and have been accrued. In April 2014, the USEPA released the FFS. The CPG submitted the Draft RI/FS Report on April 30, 2015. The USEPA has released the FFS Record of Decision for the lower 8 miles and reached an agreement with another chemical company to conduct and pay for the remedial design. This chemical company has sued Ashland, ISP and numerous other defendants to recover past and future costs pursuant to the CERCLA. Ashland's motion to dismiss was partially granted, and the surviving claims are in the early stages of discovery. Ashland and ISP participated in an USEPA allocation process that resulted in a partial settlement with the EPA. Possible future allocation proceedings and the lawsuit are not expected to be material to Ashland.

For additional information regarding environmental matters and reserves, see Note N of Notes to Consolidated Financial Statements in this annual report on Form 10-K.

Other Pending Legal Proceedings

In addition to the matters described above, there are other various claims, lawsuits and administrative proceedings pending or threatened against Ashland and its current and former subsidiaries. Such actions are with respect to commercial matters, product liability, toxic tort liability, employment matters and other environmental matters which seek remedies or damages, some of which are for substantial amounts. While Ashland cannot predict with certainty the outcome of such actions, it believes that adequate reserves have been recorded and losses already recognized with respect to such actions were immaterial as of September 30, 2022. There is a reasonable possibility that a loss exceeding amounts already recognized may be incurred related to these actions; however, Ashland believes that such potential losses were immaterial as of September 30, 2022.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

ITEM X. INFORMATION ABOUT OUR EXECUTIVE OFFICERS

The following is a list of Ashland's current executive officers, their ages and their positions and offices during the last five years.

GUILLERMO NOVO (age 60) is Chair and Chief Executive Officer of Ashland Inc. since December 31, 2019. Mr. Novo has served as a director of Ashland's Board since May 22, 2019. Most recently, Mr. Novo served as the President and CEO of Versum Materials, Inc., a premier specialty materials company, and was a member of the board of directors. Mr. Novo also served as a director of Bemis Company until May 2019.

J. KEVIN WILLIS (age 57) is Senior Vice President and Chief Financial Officer of Ashland Inc. since May 2013.

YVONNE WINKLER VON MOHRENFELS (age 56) is Senior Vice President, General Counsel and Secretary of Ashland Inc. since January 2021. Previously, Ms. Winkler von Mohrenfels served as Deputy General Counsel with Ashland Inc. from June 2020 to December 2020; Assistant General Counsel from February 2019 to May 2020 and Senior Group Counsel from August 2016 to February 2019.

XIAOLAN WANG (age 58) is Senior Vice President and General Manager, Personal Care of Ashland Inc. since February 2020. Most recently, Dr. Wang served as Senior Vice President and General Manager, Business Line Interface and Performance from January 2019 to January 2020 and Senior Vice President and General Manager, Business Line Household Care from April 2016 to December 2018 of Evonik Nutrition & Care at Evonik Industries AG.

MIN CHONG (age 51) is Senior Vice President and General Manager, Specialty Additives and Intermediates of Ashland Inc. since January 2020. Most recently, Mr. Chong served as Senior Vice President and General Manager, Crosslinkers at Evonik Industries AG/ADR from January 2017 to December 2019.

ASHOK S. KALYANA (age 50) is Senior Vice President and General Manager, Life Sciences of Ashland Inc. since January 2020. Most recently, Mr. Kalyana was Vice President Business Development and Commercial, APAC at Tate & Lyle Asia Pacific PTE LTD from August 2019 to January 2020. Previously, Mr. Kalyana was the APAC Business Director, Coatings from November 2015 to July 2019 and Global Marketing Director, Coatings from January 2014 to November 2019 at Dow Chemical Co.

OSAMA M. MUSA (age 54) is Senior Vice President and Chief Technology Officer of Ashland Inc. since November 2018. Previously, Dr. Musa served as Vice President, ASI Technology from November 2014 to November 2018.

EILEEN M. DRURY (age 54) is Senior Vice President and Chief Human Resources Officer of Ashland Inc. since November 2021. Previously, Ms. Drury served as Vice President Human Resources from August 2020 to November 2021 and Director, Human Resources from April 2019 to August 2020. Ms. Drury served as HR Business Partner for various groups within Ashland Inc. from 2011 to 2019.

ERIC N. BONI (age 53) is Vice President, Finance and Principal Accounting Officer of Ashland Inc. since January 2020. Previously, Mr. Boni served as Vice President, Finance from January 2019 to January 2020 and Vice President, Finance and Treasurer from September 2016 to January 2019.

Each executive officer is elected by the Board of Directors of Ashland to a term of one year, or until a successor is duly elected, at the annual meeting of the Board of Directors, except in those instances where the officer is elected other than at an annual meeting of the Board of Directors, in which case his or her tenure will expire at the next annual meeting of the Board of Directors unless the officer is re-elected.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

On September 20, 2016, Ashland Inc. became an indirect wholly owned subsidiary of Ashland Global Holdings Inc., and Ashland Inc.'s common stock ceased trading on the New York Stock Exchange (NYSE). Ashland Global Holdings Inc.'s Common Stock began trading on NYSE under the symbol "ASH" on September 20, 2016.

On August 1, 2022, Ashland Global Holdings Inc. changed its name to Ashland Inc. and continued to trade on NYSE under the symbol "ASH".

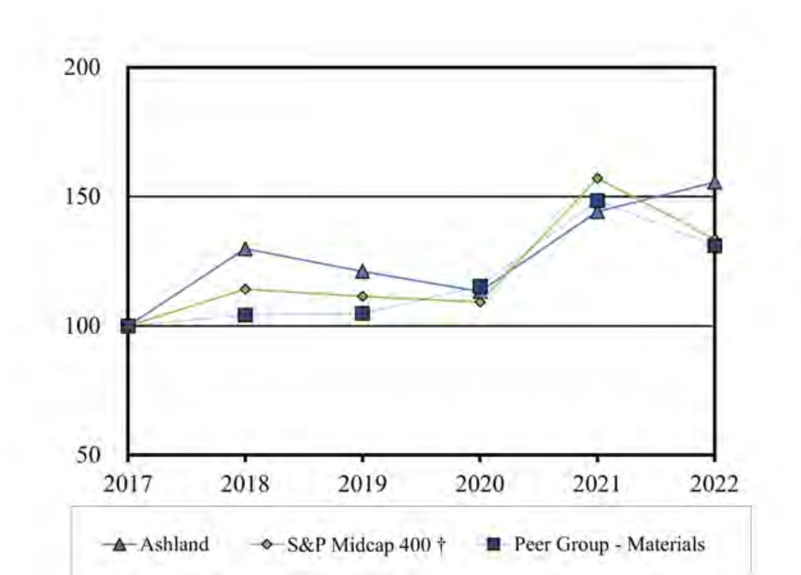
At October 31, 2022, there were approximately 9,058 holders of record of Ashland's Common Stock. Ashland Common Stock is listed on the NYSE (ticker symbol ASH) and has trading privileges on Nasdaq.

There were no sales of unregistered securities required to be reported under Item 5 of Form 10-K.

FIVE-YEAR TOTAL RETURN PERFORMANCE GRAPH

The following graph compares Ashland's five-year cumulative total shareholder return with the cumulative total return of the S&P MidCap 400† index and one peer group of companies. Ashland is listed in the S&P MidCap 400† index. The cumulative total shareholder return assumes the reinvestment of dividends. On May 12, 2017, Ashland completed the final separation of Valvoline Inc. with the pro rata distribution of 2.745338 shares of Valvoline Inc. common stock for every share of Ashland Common Stock to Ashland stockholders. The effect of the final separation of Valvoline Inc. is reflected in the cumulative total return of Ashland Common Stock as a reinvested dividend.

COMPARISON OF FIVE-YEAR CUMULATIVE TOTAL RETURN
ASHLAND, S&P MIDCAP 400† INDEX AND PEER GROUP



	2017	2018	2019	2020	2021	2022
Ashland	100	130	121	113	144	156
S&P MidCap 400†	100	114	111	109	157	133
Peer Group - Materials	100	104	105	115	148	131

The peer group consists of the following industry indices:

- *Peer Group – Materials:* S&P 500† Materials (large-cap) and S&P MidCap 400† Materials. As of September 30, 2022, this peer group consisted of 48 companies.

Purchase of Company Common Stock

Share repurchase activity during the three months ended September 30, 2022 was as follows:

Q4 Fiscal Periods	Total Number of Shares Purchased	Average Price Paid per Share, including commission	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Dollar Value of Shares That May Yet Be Purchased Under the Plans or Programs (in millions) (a)
July 1, 2022 to July 31, 2022	—	$ —	—	$ 500
August 1, 2022 to August 31, 2022	—	—	—	500
September 1, 2022 to September 30, 2022	—	—	—	500
Total	—		—	500

(a) During May 2022, Ashland's Board of Directors approved a new evergreen $500 million stock repurchase program which replaced the previous stock repurchase program. Ashland's stock repurchase program does not obligate it to acquire any specific number of shares. Under the program, shares may be repurchased in privately negotiated and/or open market transactions, including under plans complying with Rule 10b5-1 of the Exchange Act.

ITEM 6. [RESERVED]

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

See Management's Discussion and Analysis of Financial Condition and Results of Operations on pages M-1 through M-41.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

See Quantitative and Qualitative Disclosures about Market Risk on page M-42.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The consolidated financial statements of Ashland presented in this annual report on Form 10-K are listed in the index on page F-1.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Disclosure Controls and Procedures – As of September 30, 2022, Ashland, under the supervision and with the participation of Ashland's management, including Ashland's Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of Ashland's disclosure controls and procedures as defined in Exchange Act Rules 13a-15(e) and 15d-15(e). Based upon that evaluation, the Chief Executive Officer and Chief Financial Officer concluded that the disclosure controls and procedures were effective as of September 30, 2022.

Internal Control over Financial Reporting - See Management's Report on Internal Control Over Financial Reporting on page F-2 and the Reports of the Independent Registered Public Accounting Firm on pages F-3 and F-4.

Changes in Internal Control over Financial Reporting – There have been no changes in Ashland's internal control over financial reporting that occurred during the quarter ended September 30, 2022, that have materially affected, or are reasonably likely to materially affect, Ashland's internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

None.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

There is hereby incorporated by reference the information to appear under the caption "Proposal One - Election of Directors" in Ashland's Proxy Statement, which will be filed with the SEC within 120 days after September 30, 2022. See also the list of Ashland's executive officers and related information under "Information About Our Executive Officers" in Part I - Item X in this annual report on Form 10-K.

There is hereby incorporated by reference the information to appear under the caption "Corporate Governance - Governance Principles" in Ashland's Proxy Statement.

There is hereby incorporated by reference the information to appear under the caption "Corporate Governance - Stockholder Nominations of Directors" in Ashland's Proxy Statement.

There is hereby incorporated by reference the information to appear under the caption "Audit Committee Report" regarding Ashland's audit committee and audit committee financial experts, as defined under Item 407(d)(4) and (5) of Regulation S-K in Ashland's Proxy Statement.

There is hereby incorporated by reference the information to appear under the caption "Corporate Governance – Delinquent Section 16(a) Reports" in Ashland's Proxy Statement.

ITEM 11. EXECUTIVE COMPENSATION

There is hereby incorporated by reference the information to appear under the captions "Compensation of Directors," "Corporate Governance - Compensation Committee Interlocks and Insider Participation," and "Executive Compensation," in Ashland's Proxy Statement.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

There is hereby incorporated by reference the information to appear under the captions "Ashland Common Stock Ownership of Certain Beneficial Owners," and "Ashland Common Stock Ownership of Directors and Executive Officers of Ashland" in Ashland's Proxy Statement.

The following table summarizes the equity compensation plans under which Ashland Common Stock may be issued as of September 30, 2022.

	Equity Compensation Plan Information		
Plan Category	**Number of securities to be issued upon exercise of outstanding options, warrants and rights**	**Weighted-average exercise price of outstanding options, warrants and rights**	**Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))**
	(a)	**(b)**	**(c)**
Equity compensation plans approved by security holders	787,173 (1)	$ 63.85 (2)	9,987,473 (3)
Equity compensation plans not approved by security holders	52,915 (4)	—	1,279,313 (5)
Total	840,088	$ 63.85 (2)	11,266,786

(1) This figure includes 85,617 net shares that could be issued under stock-settled SARs under the Amended and Restated 2011 Ashland Inc. Incentive Plan ("2011 Incentive Plan"), 246,714 net shares that could be issued under stock-settled SARs, 9,419 net shares that could be issued under stock-settled SARs, 49,582 shares that could be issued under stock settled restricted stock units under the Ashland Global Holdings Inc. 2018 Omnibus Incentive Compensation Plan (the "2018 Omnibus Plan"), based upon the closing price of Ashland Common Stock on the NYSE as of September 30, 2022 of $94.97. Additionally, this figure includes 113,243 performance units for the fiscal 2020-2022 performance period payable in Ashland Common Stock under the 2018 Incentive Plan, 116,913 performance units for the fiscal 2021-2023 performance period payable in Ashland Common Stock under the 2018 Omnibus Plan and 149,548 performance units for the fiscal 2022-2024 performance period payable in Ashland Common Stock under the 2021 Omnibus Plan, estimated assuming target performance is achieved. Also included in the figure are 16,137 shares to be issued under the pre-2005 Deferred Compensation Plan for Employees payable in Ashland Common Stock upon termination of employment or service with Ashland.

(2) The weighted-average exercise price excludes shares in Ashland Common Stock which may be distributed under the deferred compensation plans and the deferred restricted stock, and performance share units and restricted stock units which may be distributed under the 2011 Incentive Plan, the 2015 Incentive Plan and the 2018 Omnibus Plan, as described in footnotes (1) and (4) in this table.

(3) This figure includes 6,166,772 available for issuance under the Ashland Global Holdings Inc. 2021 Omnibus Plan, 122,839 shares available for issuance under the pre-2005 Deferred Compensation Plan for Employees (closed) and 369,766 shares available for issuance under the pre-2005 Deferred Compensation Plan for Non-Employee Directors (closed). Under the 2018 Incentive Plan, full-value awards, which include all awards other than stock options and SARs, reduce the share reserve on a 2-to-1 basis. The remaining balance of shares available for grant under the 2018 Omnibus Plan are now available for grant under the 2021 Omnibus Plan and are included in the numbers of shares available for issuance under the 2021 Omnibus Plan. This figure also includes 80,311 shares available for issuance under the 2006 Incentive Plan, 2,568,664 shares available for issuance under the 2011 Incentive Plan and 679,121 shares available for issuance under the 2015 Incentive Plan; however, these plans are closed for new issuances and the only shares remaining to be issued are shares paid in lieu of dividends and for the 2015 Incentive Plan, shares to be issued for unvested performance units and restricted stock units.

(4) This figure includes 38,492 shares to be issued under the Deferred Compensation Plan for Employees (2005), which is described in the "Non-Qualified Deferred Compensation-Ashland Employees' Deferral Plan" section of Ashland's proxy statement, and 14,423 shares to be issued under the Deferred Compensation Plan for Non-Employee Directors (2005), which is described in the "Compensation of Directors" section of Ashland's proxy statement, payable in Ashland Common Stock upon termination of employment or service with Ashland. Because these plans are not equity compensation plans as defined by the rules of the NYSE, neither plan required approval by Ashland's stockholders.

(5) This figure includes 617,486 shares available for issuance under the Deferred Compensation Plan for Employees (2005) and 661,827 shares available for issuance under the Deferred Compensation Plan for Non-Employee Directors (2005). Because these plans are not equity compensation plans as defined by the rules of the NYSE, neither plan required approval by Ashland's stockholders.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

There is hereby incorporated by reference the information to appear under the captions "Corporate Governance - Director Independence and Certain Relationships," "Corporate Governance - Related Person Transaction Policy," and "Audit Committee Report" in Ashland's Proxy Statement.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

There is hereby incorporated by reference the information with respect to principal accounting fees and services to appear under the captions "Audit Committee Report" and "Proposal Two - Ratification of Independent Registered Public Accountants" in Ashland's Proxy Statement.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) Documents filed as part of this Report

(1) Financial Statements; and

(2) See Item 15(b) in this annual report on Form 10-K

The consolidated financial statements of Ashland presented in this annual report on Form 10-K are listed in the index on page F-1.

Schedules other than that listed above have been omitted because of the absence of the conditions under which they are required or because the information required is shown in the consolidated financial statements or the notes thereto. Separate financial statements of unconsolidated affiliates are omitted because each company does not constitute a significant subsidiary using the 20% tests when considered individually.

(b) Documents required by Item 601 of Regulation S-K

2.1	–	Stock and Asset Purchase Agreement, dated as of February 18, 2014, between Ashland Inc. and CD&R Seahawk Bidco, LLC (filed as Exhibit 2.1 to Ashland's Form 8-K filed on February 24, 2014 (SEC File No. 001-32532), and incorporated herein by reference).
2.2	–	Sale and Purchase Agreement related to the ASK Chemicals Group, dated April 8, 2014, among Ashland Inc., Ashland International Holdings, Inc., Clariant Produkte (Deutschland) GmbH, Clariant Corp., mertus 158. GmbH, Ascot US Bidco Inc. and Ascot UK Bidco Limited (filed as Exhibit 2.1 to Ashland's Form 8-K filed on April 14, 2014 (SEC File No. 001-32532), and incorporated herein by reference).
2.3	–	Agreement and Plan of Merger dated May 31, 2016, by and among Ashland Inc., Ashland Global Holdings Inc. and Ashland Merger Sub Corp. (filed as Exhibit 2.1 to Ashland's Form 8-K filed on May 31, 2016 (SEC File No. 001-32532), and incorporated herein by reference).
2.4	–	Stock and Asset Purchase Agreement, dated November 14, 2018, between Ashland Global Holdings Inc. and INEOS Enterprises Holdings Limited (pursuant to Item 601(b)(2) of Regulation S-K, exhibits, schedules and certain annexes to the Stock and Asset Purchase Agreement have been omitted; exhibits, schedules and annexes will be supplementally provided to the SEC upon request) (filed as Exhibit 2.1 to Ashland's Form 8-K filed on November 20, 2018 (SEC File No. 333-211719), and incorporated herein by reference.)
2.5	–	First Amendment to Stock and Asset Purchase Agreement, dated July 1, 2019, between Ashland Global Holdings Inc. and INEOS Enterprises Holdings Limited (pursuant to Item 601(b)(2) of Regulation S-K, exhibits, schedules and certain annexes to the Stock and Asset Purchase Agreement have been omitted; exhibits, schedules and annexes will be supplementally provided to the SEC upon request) (filed as Exhibit 2.1 to Ashland's Form 8-K filed on July 8, 2019 (SEC File No. 333-211719) and incorporated herein by reference).
2.6	–	Second Amendment to Stock and Asset Purchase Agreement, dated July 30, 2019, between Ashland Global Holdings Inc. and INEOS Enterprises Holdings Limited (pursuant to Item 601(b)(2) of Regulation S-K, exhibits, schedules and certain annexes to the Stock and Asset Purchase Agreement have been omitted; exhibits, schedules and annexes will be supplementally provided to the SEC upon request (filed as Exhibit 2.1 to Ashland's Form 8-K filed on August 2, 2019 (SEC File No. 333-211719) and incorporated herein by reference).
2.7	–	Asset Purchase Agreement dated July 25, 2020, by and between Ashland LLC and AOC Materials LLC (filed as Exhibit 2.1 to Ashland's Form 8-K filed on July 27, 2020 (SEC File No. 333-211719 and incorporated herein by reference).
2.8	–	Master Asset Purchase Agreement, dated January 18, 2021, entered into by and between Schülke & Mayr GmbH, ISP Marl Holdings and Ashland Industries Europe GmbH (filed as Exhibit 2.1 to Ashland's Form 8-K filed on January 22, 2021 (SEC File No.333-211719) and incorporated herein by reference).

2.9	–	Amendment Agreement to the Master Purchase Agreement regarding the acquisition of the Personal Care Business of Schülke & Mayr GmbH dated April 29, 2021, filed as Exhibit 2.2 to Ashland's Form 10-Q filed on July 29, 2021 (SEC File No.333-211719) and incorporated herein by reference).
2.10	–	Purchase and Sale Agreement, dated as of August 30, 2021, between Ashland LLC and Arkema, filed as Exhibit 2.1 to Ashland's Form 8-K filed on August 31, 2021 (SEC File No.333-211719) and incorporated herein by reference).
2.11	–	Amendment No. 1 to the Purchase and Sale Agreement, dated as of February 28, 2022, by and between Arkema and Ashland LLC (filed as Exhibit 2.1 to Ashland's Form 8-K filed on February 28, 2022 (SEC File No.333-211719) and incorporated herein by reference).
2.12	–	Stock Purchase Agreement, dated April 14, 2017, by and among Ashland LLC, Pharmachem Laboratories, Inc., the holders of common stock of Pharmachem Laboratories, Inc., Dr. David Peele, and Photon SH Representative LLC, solely as the shareholders' representative (filed as Exhibit 2.1 to Ashland's Form 8-K filed on May 18, 2017 (SEC File No. 333-211719) and incorporated herein by reference).
2.13	–	Amendment No. 1 to the Stock Purchase Agreement, dated May 16, 2017, by and among Ashland LLC, Pharmachem Laboratories, Inc., the holders of common stock of Pharmachem Laboratories, Inc., Dr. David Peele, and Photon SH Representative LLC, solely as the shareholders' representative (filed as Exhibit 2.2 to Ashland's Form 8-K filed on May 18, 2017 (SEC File No. 333-211719) and incorporated herein by reference).
2.14	–	Amendment No. 2 to the Stock Purchase Agreement, dated August 23, 2017, by and among Ashland LLC, Pharmachem Laboratories, Inc., the holders of common stock of Pharmachem Laboratories, Inc., Dr. David Peele, and Photon SH Representative LLC, solely as the shareholders' representative (filed as Exhibit 10.84 to Ashland's Form 10-K for the fiscal year ended September 30, 2017 (SEC File No. 333-211719), and incorporated by reference herein).
3.1	–	Amended and Restated Articles of Incorporation of Ashland Global Holdings Inc. (filed as Exhibit 3.1 to Ashland's Form 8-K filed on September 20, 2016 (SEC File No. 001-32532)) and incorporated by reference herein).
3.2	–	Certificate of Ownership & Merger, amending the Company's Amended and Restated Certificate of Incorporation (filed as Exhibit 3.1 to Ashland's Form 8-K filed on August 1, 2022 (SEC File No. 001-32532) and incorporated by reference herein).
3.3	–	By-laws of Ashland Inc. (Amended and Restated as of September 20, 2022) (filed as Exhibit 3.1 to Ashland's Form 8-K filed on September 20, 2022 (SEC File No. 333-211719) and incorporated by reference herein).
4.1	–	Pursuant to Item 601(b)(4)(iii)(A) of Regulation S-K, copies of instruments defining the rights of holders of long-term debt of Ashland and all of its subsidiaries are not filed, Ashland agrees to furnish a copy of such instruments with the SEC upon request.
4.2	–	Warrant Agreement dated July 27, 1999 between Hercules and The Chase Manhattan Bank, as warrant agent (filed as Exhibit 4.4 to Hercules' Form 8-K filed on July 28, 1999 (SEC File No. 001-00496), and incorporated herein by reference).
4.3	–	Form of Series A Junior Subordinated Deferrable Interest Debentures (filed as Exhibit 4.5 to Hercules' Form 8-K filed on July 28, 1999 (SEC File No. 001-00496), and incorporated herein by reference).
4.4	–	Form of CREST^{SM} Unit (filed as Exhibit 4.7 to Hercules' Form 8-K filed on July 28, 1999 (SEC File No. 001-00496), and incorporated herein by reference).
4.5	–	Form of Warrant (filed as Exhibit 4.8 to Hercules' Form 8-K filed on July 28, 1999 (SEC File No. 001-00496), and incorporated herein by reference).
4.6	–	Form of $100,000,000 6.6% Debenture due August 27, 2027 (filed as Exhibit 4.2 to Hercules' Form 8-K filed on July 30, 1997 (SEC File No. 001-00496), and incorporated herein by reference).

4.7	–	Indenture, dated as of August 7, 2012, between Ashland Inc. and U.S. Bank N.A., as Trustee (filed as Exhibit 4.1 to Ashland's Form 8-K filed on September 21, 2012 (SEC File No. 001-32532), and incorporated herein by reference).
4.8	–	First Supplemental Indenture, dated as of February 26, 2013, between Ashland Inc. and U.S. Bank National Association, as Trustee, in respect of the senior notes due 2022 (filed as Exhibit 4.11 to Ashland's Form 10-K for the fiscal year ended September 30, 2013 (SEC File No. 001-32532), and incorporated herein by reference).
4.9	–	Indenture, dated as of February 26, 2013, between Ashland Inc. and U.S. Bank National Association, as Trustee (filed as Exhibit 4.3 to Ashland's Form 8-K filed on February 27, 2013 (SEC File No. 001- 32532), and incorporated herein by reference).
4.10	–	First Supplemental Indenture, dated as of February 26, 2013, between Ashland Inc. and U.S. Bank National Association, as Trustee, in respect of the senior notes due 2016, 2018 and 2043 (filed as Exhibit 4.4 to Ashland's Form 8-K filed on February 27, 2013 (SEC File No. 001-32532), and incorporated herein by reference).
4.11	–	Second Supplemental Indenture, dated as of March 14, 2013, between Ashland Inc. and U.S. Bank National Association, as Trustee, in respect of the senior notes due 2043 (filed as Exhibit 4.2 to Ashland's Form 8-K filed on March 18, 2013 (SEC File No. 001-32532), and incorporated herein by reference).
4.12**	–	First Supplemental Indenture as of August 1, 2022, to the Trust Indenture in respect of the 2031 Notes dated as of August 18, 2021, by and among Ashland Global Holdings Inc. (now Ashland Inc.), U.S. Bank Trust Company, National Association, as trustee (attached hereto and incorporated herein by reference).
4.13	–	Third Supplemental Indenture dated October 19, 2016, among Ashland LLC, Ashland Global Holdings Inc. and US Bank National Association, to the Indenture dated as of February 26, 2013 between Ashland LLC and US Bank National Association (filed as Exhibit 4.2 to Ashland's Form 8-K filed on October 20, 2016 (SEC File No. 333-211719), and incorporated herein by reference).
4.14**	–	Fourth Supplemental Indenture dated August 1, 2022, to the Trust Indenture dated as of February 26, 2013, between Ashland Global Holdings Inc. (now Ashland Inc.) and U.S. Bank Trust Company, National Association, as trustee (attached hereto and incorporated herein by reference).
4.15	–	Indenture dated January 23, 2020, among Ashland Services B.V., Ashland Global Holdings Inc., Ashland LLC and U.S. Bank National Association, as trustee, in respect of the Senior Euro-Denominated Notes due 2028 (filed as Exhibit 4.1 to Ashland's Form 8-K filed on January 23, 2020 (SEC File No. 333-211719) and incorporated herein by reference).
4.15(a)	–	Description of Capital Stock (filed as Exhibit 4.14(a) to Ashland's Form 10-K for the fiscal year ended September 30, 2019 (SEC File No. 333-211719) and incorporated herein by reference).
4.15(b)	–	Description of 6.875% Senior Notes due 2043 (filed as Exhibit 4.14(b) to Ashland's Form 10-K for the fiscal year ended September 30, 2019 (SEC File No. 333-211719) and incorporated herein by reference).
4.15(c)	–	Description of 4.750% Senior Notes due 2022 (filed as Exhibit 4.14(c) to Ashland's Form 10-K for the fiscal year ended September 30, 2019 (SEC File No. 333-211719) and incorporated herein by reference).
4.16	–	Indenture dated August 18, 2021, among Ashland LLC, Ashland Global Holdings Inc. and U.S. Bank National Association, as trustee, in respect of the Notes due 2031 (filed as Exhibit 4.1 to Ashland's Form 8-K filed on August 18, 2021 (SEC File No. 333-211719), and incorporated herein by reference).

The following Exhibits 10.1 through 10.80 are contracts or compensatory plans or arrangements or management contracts required to be filed as exhibits pursuant to Items 601(b)(10)(ii)(A) and 601(b)(10)(iii)(A) and (B) of Regulation S-K.

10.1	–	Amended and Restated Ashland Inc. Deferred Compensation Plan for Non-Employee Directors (2005) (filed as Exhibit 10.4 to Ashland's Form 10-K for the fiscal year ended September 30, 2008 (SEC File No. 001-32532), and incorporated herein by reference).

10.2	–	Amendment to the Amended and Restated Ashland Inc. Deferred Compensation Plan for Non-Employee Directors (2005) (filed as Exhibit 10.4 to Ashland's Form 10-Q for the quarter ended March 31, 2015 (SEC File No. 001-32532), and incorporated herein by reference).
10.3	–	Amended and Restated Ashland Global Holdings Inc. Deferred Compensation Plan for Non-Employee Directors (2005) effective as of January 1, 2017 (filed as Exhibit 10.4 to Ashland's Form 10-Q for the quarter ended December 31, 2016 (SEC File No. 333-211719), and incorporated herein by reference).
10.4	–	Amended and Restated Ashland Inc. Deferred Compensation Plan for Employees (2005) (filed as Exhibit 10.3 to Ashland's Form 10-K for the fiscal year ended September 30, 2008 (SEC File No. 001-32532) and incorporated herein by reference).
10.5		Ashland Global Holdings Inc. Deferred Compensation Plan for Employees (Amended and Restated Effective as of May 22, 2019) (filed as Exhibit 10.1 to Ashland's Form10-Q for the quarter ended June 30, 2019 (SEC File No. 333-211719), and incorporated herein by reference).
10.6		Ashland Global Holdings Inc. Deferred Compensation Plan for Non-Employee Directors (Amended and Restated as of May 22, 2019) (filed as Exhibit 10.2 to Ashland's Form 10-Q for the quarter ended June 30, 2019 (SEC File No. 333-21179), and incorporated herein by reference).
10.7	–	Ashland Supplemental Defined Contribution Plan for Certain Employees (filed as Exhibit 10.3 to Ashland's Form 10-Q for the quarter ended March 31, 2011 (SEC File No. 001-32532), and incorporated herein by reference) (Frozen).
10.8	–	Amended and Restated 2011 Ashland Inc. Incentive Plan (filed as Exhibit 10.2 to Ashland's Form 8-K filed on February 1, 2013 (SEC File No. 001-32532), and incorporated herein by reference).
10.9	–	Amended and Restated 2015 Ashland Global Holdings Inc. Incentive Plan (filed as Exhibit 10.21 to Ashland's Form 10-K for the fiscal year ended September 30, 2016 (SEC File No. 333-211719), and incorporated by reference herein).
10.10	–	Form of Stock Appreciation Rights Award Agreement under the Amended and Restated 2011 Ashland Inc. Incentive Plan (filed as Exhibit 10.16 to Ashland's Form 10-K for the fiscal year ended September 30, 2014 (SEC File No. 001-32532), and incorporated herein by reference).
10.11	–	Form of Restricted Stock Award Agreement under the Amended and Restated 2011 Ashland Inc. Incentive Plan (filed as Exhibit 10.18 to Ashland's Form 10-K for the fiscal year ended September 30, 2014 (SEC File No. 001-32532), and incorporated herein by reference).
10.12	–	Form of Restricted Stock Award Agreement under the Amended and Restated 2015 Ashland Global Holdings Inc. Incentive Plan (filed as Exhibit 10.5 to Ashland's Form 10-Q for the quarter ended March 31, 2015 (SEC File No. 001-32532), and incorporated herein by reference).
10.13	–	Form of Stock Appreciation Rights Award Agreement under the Amended and Restated 2015 Ashland Global Holdings Inc. Incentive Plan (filed as Exhibit 10.7 to Ashland's Form 10-Q for the quarter ended March 31, 2015 (SEC File No. 001-32532), and incorporated herein by reference).
10.14	–	Form of Restricted Stock Award Agreement under the Amended and Restated 2015 Ashland Global Holdings Inc. Incentive Plan (Double-Trigger Form) (filed as Exhibit 10.2 to Ashland's Form 8-K filed on July 20, 2015 (SEC File No. 001-32532), and incorporated herein by reference).
10.15	–	Form of Performance-Based Restricted Stock Award Agreement (filed as Exhibit 10.3 to Ashland's Form 8-K filed on October 9, 2015 (SEC File No. 001-32532), and incorporated herein by reference).
10.16	–	Form of Restricted Stock Award Agreement under the Amended and Restated 2015 Ashland Global Holdings Inc. Incentive Plan (Double-Trigger Form) (filed as Exhibit 10.37 to Ashland's Form 10-K for the fiscal year ended September 30, 2016 (SEC File No. 333-211719), and incorporated by reference herein).
10.17	–	Form of Restricted Stock Unit Award Agreement under the Amended and Restated 2015 Ashland Global Holdings Inc. Incentive Plan (Double-Trigger Form) (filed as Exhibit 10.38 to Ashland's Form 10-K for the fiscal year ended September 30, 2016 (SEC File No. 333-211719), and incorporated by reference herein).

10.18	– Form of Stock Appreciation Rights Award Agreement under the Amended and Restated 2015 Ashland Global Holdings Inc. Incentive Plan (Double-Trigger Form) (filed as Exhibit 10.39 to Ashland's Form 10-K for the fiscal year ended September 30, 2016 (SEC File No. 333-211719), and incorporated by reference herein).
10.19	– Form of Performance Unit (LTIP) Award Agreement under the Amended and Restated 2015 Ashland Global Holdings Inc. Incentive Plan (Double-Trigger Form) (filed as Exhibit 10.40 to Ashland's Form 10-K for the fiscal year ended September 30, 2016 (SEC File No. 333-211719), and incorporated by reference herein).
10.20	– Form of Indemnification Agreement between Ashland and members of its Board of Directors (filed as Exhibit 10.2 to Ashland's Form 8-K filed on September 20, 2016 (SEC File No. 333-211719), and incorporated herein by reference).
10.21	– Form of Cash-Settled Performance Unit (LTIP) Award Agreement under the Amended and Restated 2015 Ashland Global Holdings Inc. Incentive Plan (Double-Trigger Form) (filed as Exhibit 10.59 to Ashland's Form 10-K for the fiscal year ended September 30, 2016 (SEC File No. 333-211719), and incorporated by reference herein).
10.22	– Amended and Restated Hercules Deferred Compensation Plan effective January 1, 2008 (filed as Exhibit 10.8 to Ashland's Form 10-K for the fiscal year ended on September 30, 2010 (SEC File No. 001-32532), and incorporated herein by reference).
10.23	– Amendment to the Amended and Restated Hercules Deferred Compensation Plan dated September 30, 2016 (annuity cash-out) (filed as Exhibit 10.61 to Ashland's Form 10-K for the fiscal year ended September 30, 2016 (SEC File No. 333-211719), and incorporated by reference herein).
10.24	– Ashland Global Holdings Inc. 2018 Omnibus Incentive Compensation Plan (filed as Exhibit 10.1 to Ashland's Form 8-K filed on January 26, 2018 (SEC File No. 333-211719), and incorporated herein by reference).
10.25	– Form of Stock-Settled Restricted Stock Unit Award Agreement under the Ashland Global Holdings Inc. 2018 Omnibus Incentive Compensation Plan (filed as Exhibit 10.2 to Ashland's Form 8-K filed on January 26, 2018 (SEC File No. 333-211719), and incorporated herein by reference).
10.26	– Form of Restricted Stock Award Agreement under the Ashland Global Holdings Inc. 2018 Omnibus Incentive Compensation Plan (filed as Exhibit 10.3 to Ashland's Form 8-K filed on January 26, 2018 (SEC File No. 333-211719), and incorporated herein by reference).
10.27	– Form of Stock Appreciation Rights Award Agreement under the Ashland Global Holdings Inc. 2018 Omnibus Incentive Compensation Plan (filed as Exhibit 10.4 to Ashland's Form 8-K filed on January 26, 2018 (SEC File No. 333-211719), and incorporated herein by reference).
10.28	– Form of Performance Unit Award Agreement under the Ashland Global Holdings Inc. 2018 Omnibus Incentive Compensation Plan (filed as Exhibit 10.5 to Ashland's Form 8-K filed on January 26, 2018 (SEC File No. 333-211719), and incorporated herein by reference).
10.29	– Form of Cash-Settled Restricted Stock Unit Award Agreement under the Ashland Global Holdings Inc. 2018 Omnibus Incentive Compensation Plan (filed as Exhibit 10.6 to Ashland's Form 8-K filed on January 26, 2018 (SEC File No. 333-211719), and incorporated herein by reference).
10.30	– Ashland Global Holdings Inc. NonQualified Defined Contribution Plan (Amended and Restated as of May 22, 2019) (filed as Exhibit 10.3 to Ashland's Form 10-Q for the quarter ended June 30, 2019 (SEC File No. 333-211719), and incorporated herein by reference).
10.31	– Ashland Global Holdings Inc. Supplemental Defined Contribution Plan for Certain Employees (Amended and Restated as of May 22, 2019) (filed as Exhibit 10.39 to Ashland's Form 10-K filed on November 25, 2019 (SEC File No. 333-211719) and incorporated herein by reference).
10.32	– Form of Restricted Stock Award Agreement under the Ashland Global Holdings Inc. 2018 Omnibus Incentive Compensation Plan (with pro-rata vesting upon death, disability and retirement) (filed as Exhibit 10.5 to Ashland's Form 10-Q for the quarter ended June 30, 2019 (SEC File No. 333-211719), and incorporated herein by reference).

10.33	–	Form of Stock Appreciation Rights Award Agreement (Stock Settled) under the Ashland Global Holdings Inc. 2018 Omnibus Incentive Compensation Plan (with pro-rata vesting upon death, disability and retirement) (filed as Exhibit 10.6 to Ashland's Form 10-Q for the quarter ended June 30, 2019 (SEC File No. 333-211719), and incorporated herein by reference).
10.34	–	Form of Restricted Stock Unit Award Agreement under the Ashland Global Holdings Inc. 2018 Omnibus Incentive Compensation Plan (with pro-rata vesting upon death, disability and retirement) (filed as Exhibit 10.7 to Ashland's Form 10-Q for the quarter ended June 30, 2019 (SEC File No. 333-211719), and incorporated herein by reference).
10.35	–	Form of Stock-Settled Performance Unit Award Agreement under the Ashland Global Holdings Inc. 2018 Omnibus Incentive Compensation Plan (with pro-rata vesting upon death, disability and retirement) (filed as Exhibit 10.8 to Ashland's Form 10-Q for the quarter ended June 30, 2019 (SEC File No. 333-211719), and incorporated herein by reference).
10.36	–	Offer Letter dated as of October 8, 2019, entered into by Guillermo Novo and Ashland Global Holdings Inc. (filed as Exhibit 10.1 to Ashland's Form 8-K filed on October 8, 2019 (SEC File No. 333-211719) and incorporated herein by reference).
10.37	–	Letter Agreement dated as of October 8, 2019, entered into by William A. Wulfsohn and Ashland Global Holdings Inc. (filed as Exhibit 10.2 to Ashland's Form 8-K filed on October 8, 2019 (SEC File No. 333-211719) and incorporated herein by reference).
10.38	–	Separation Agreement and General Release between Jack William Heitman, Jr. A and Ashland LLC, effective as of December 31, 2019 (filed as Exhibit 10.2 to Ashland's Form 10-Q filed on January 29, 2020 (SEC File No: 333-211719) and incorporated herein by reference).
10.39	–	Separation Agreement and General Release between William A. Wulfsohn and Ashland LLC, effective as of December 31, 2019 (filed as Exhibit 10.3 to Ashland's Form 10-Q filed on January 29, 2020 (SEC File No: 333-211719) and incorporated herein by reference).
10.40	–	Form of Chief Executive Officer Change in Control Agreement (filed as Exhibit 10.4 to Ashland's Form 10-Q filed on January 29, 2020 (SEC File No. 333-211719) and incorporated herein by reference).
10.41	–	Amendment to Ashland's Severance Pay Plan dated January 29, 2020 (filed as Exhibit 10.1 to Ashland's Form 10-Q filed on May 6, 2020 (SEC File No: 333-211719) and incorporated herein by reference).
10.42	–	Letter Agreement by and between Ashland Global Holdings Inc. and Peter J. Ganz, dated May 19, 2020 (filed as Exhibit 10.1 to Ashland's Form 8-K filed on May 22, 2020 (SEC File No. 333-211719) and incorporated herein by reference).
10.43	–	Consulting Agreement by and between Ashland Global Holdings Inc. and Peter J. Ganz, dated May 19, 2020 (filed as Exhibit 10.2 to Ashland's Form 8-K filed on May 22, 2020 (SEC File No. 333-211719) and incorporated herein by reference).
10.44	–	Ashland Global Holdings Inc. 2021 Omnibus Incentive Compensation Plan (filed as Exhibit 10.1 to Ashland's Form 8-K filed on February 3, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.45	–	Form of Stock-Settled Restricted Stock Unit Award Agreement (filed as Exhibit 10.2 to Ashland's Form 8-K filed on February 3, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.46	–	Form of Restricted Share Award Agreement (filed as Exhibit 10.3 to Ashland's Form 8-K filed on February 3, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.47	–	Form of Stock Appreciation Rights Award Agreement (filed as Exhibit 10.4 to Ashland's Form 8-K filed on February 3, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.48	–	Form of Performance Unit Award Agreement (filed as Exhibit 10.5 to Ashland's Form 8-K filed on February 3, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.49	–	Form of Cash-Settled Restricted Stock Unit Award Agreement (filed as Exhibit 10.6 to Ashland's Form 8-K filed on February 3, 2021 (SEC File No. 333-211719) and incorporated herein by reference).

10.50	–	Separation Agreement and General Release between Peter S. Ganz and Ashland LLC, effective as of December 31, 2020 (filed as Exhibit 10.3 to Ashland's Form 10-Q filed on February 4, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.51	–	Separation Agreement and General Release between Keith Silverman and Ashland LLC, effective as of November 30, 2020 (filed as Exhibit 10.4 to Ashland's Form 10-Q filed on February 4, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.52	–	Ashland Global Holdings Inc. Senior Leadership Severance Plan (filed as Exhibit 10.1 to Ashland's Form 8-K filed on August 6, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.53	–	Form of Cash Settled Restricted Stock Equivalent Award Agreement for Non-U.S. Participants under the Ashland Global Holdings Inc. 2021 Omnibus Incentive Compensation Plan (filed as Exhibit 10.2 to Ashland's Form 8-K filed on August 6, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.54	–	Form of Cash Settled Performance Unit Award Agreement for Non-U.S. Participants under the Ashland Global Holdings Inc. 2021 Omnibus Incentive Compensation Plan (filed as Exhibit 10.3 to Ashland's Form 8-K filed on August 6, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.55	–	Form of Stock Settled Performance Unit Agreement for U.S. Employees under the Ashland Global Holdings Inc. 2021 Omnibus Incentive Compensation Plan (filed as Exhibit 10.4 to Ashland's Form 8-K filed on August 6, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.56	–	Form of Restricted Stock Unit Agreement for U.S. Employees under the Ashland Global Holdings Inc. 2021 Omnibus Incentive Compensation Plan (filed as Exhibit 10.5 to Ashland's Form 8-K filed on August 6, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.57	–	Form of Stock-Settled Performance Unit Agreement for (Germany) under the Ashland Global Holdings Inc. 2021 Omnibus Incentive Compensation Plan (filed as Exhibit 10.6 to Ashland's Form 8-K filed on August 6, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.58	–	Form of Restricted Stock Unit Agreement for (Germany) under the Ashland Global Holdings Inc. 2021 Omnibus Incentive Compensation Plan (filed as Exhibit 10.7 to Ashland's Form 8-K filed on August 6, 2021 (SEC File No. 333-211719) and incorporated herein by reference).
10.59	–	Form of Chief Executive Officer Change in Control Agreement (filed as Exhibit 10.69 to Ashland's Form 10-K for the fiscal year ended September 30, 2021, filed on November 22, 2021 (SEC File No. 333-211719), and incorporated by reference herein.
10.60**	–	Ashland Inc. Senior Leadership Severance Plan (Effective as of September 19, 2022).
10.61**	–	Form of Stock-Settled Performance Unit Agreement for US Employees, effective as of September 19, 2022 under the Ashland Global Holdings Inc. 2021 Omnibus Incentive Compensation Plan.
10.62**	–	Form of Cash-Settled Performance Unit (PSU) Award Agreement for Non-US Participants, effective as of September 19, 2022 under the Ashland Global Holdings Inc. 2021 Omnibus Incentive Compensation Plan.
10.63**	–	Form of Restricted Stock Unit (RSU) Award Agreement for US Participants, effective as of September 19, 2022 under the Ashland Global Holdings Inc. 2021 Omnibus Incentive Compensation Plan.
10.64**	–	Form of Cash-Settled Restricted Equivalent (RSE) Award Agreement for Non-US Participants, effective as of September 19, 2022 under the Ashland Global Holdings Inc. 2021 Omnibus Incentive Compensation Plan.
10.65**		Amendment No. 1 effective as of November 17, 2022, to the Ashland Global Holdings Inc. Deferred Compensation Plan for Non-Employee Directors (Amended and Restated as of May 2019).
10.66**		Ashland Inc. Independent Director Deferred Compensation Program effective as of November 17, 2022.
10.67**		Form of Restricted Stock Unit Agreement (Independent Directors), effective as of November 17, 2022.

10.68	–	Credit Agreement dated as of January 10, 2020, among Ashland Global Holdings Inc., Ashland Chemco Inc., Ashland LLC, Ashland Services B.V., each lender from time to time party thereto, the Bank of Nova Scotia, as administrative agent, swing line lender and a letter of credit issuer, each other letter of credit issuer from time to time party thereto and Citibank, N.A., as syndication agent (filed as Exhibit 10.1 to Ashland's Form 8-K filed on January 10, 2020 (SEC File No. 333-211719) and incorporated herein by reference).
10.69	–	Amended and Restated Credit Agreement dated as of July 22, 2022, among Ashland Global Holdings Inc., Ashland Chemco Inc., Ashland LLC, Ashland Services B.V., each lender from time to time party thereto, the Bank of Nova Scotia, Houston Branch, as administrative agent, swing line lender and a letter of credit issuer, each other letter of credit issuer from time to time party thereto and Citibank, N.A., as syndication agent (filed as Exhibit 10.1 to Ashland's Form 8-K filed on July 22, 2022 (SEC File No. 333-211719) and incorporated herein by reference).
10.70	–	Second Amended and Restated Purchase and Sale Agreement, dated March 17, 2021, by and among Ashland LLC and Ashland Specialty Ingredients G.P., as originators, Ashland LLC, as initial servicer, and CVG Capital III LLC, as purchaser (filed as Exhibit 10.1 to Ashland's Form 8-K filed on March 18, 2021 (SEC File No.333-211719) and incorporated herein by reference).
10.71	–	Receivables Purchasing Agreement, dated March 17, 2021, by and among CVG Capital III LLC, PNC Bank, National Association, as administrative agent, PNC Bank Capital Markets LLC, as structuring agent, Ashland LLC, as initial servicer, and certain other persons from time to time party thereto (filed as Exhibit 10.2 to Ashland's Form 8-K filed on March 18, 2021 (SEC File No.333-211719) and incorporated herein by reference).
10.72	–	First Amendment as of February 22, 2022, to the Receivables Purchase Agreement dated March 17, 2021, by and among CVG Capital III LLC, PNC Bank, National Association, as administrative agent, Ashland LLC, as initial servicer, and certain other persons identified as Purchasers, LC, LC Participants and Group Agents and other persons from time to time identified as parties thereto (filed as Exhibit 10.1 to Ashland's Form 8-K filed on February 28, 2022 (SEC File No.333-211719) and incorporated herein by reference).
10.73	–	Assignment Agreement dated February 22, 2022, between CVG Capital III LLC and Ashland LLC (filed as Exhibit 10.2 to Ashland's Form 8-K filed on February 28, 2022 (SEC File No.333-211719) and incorporated herein by reference).
10.74**	–	First Amendment as of August 1, 2022, to the Second Amended and Restated Purchase and Sale Agreement, dated March 17, 2021, by and among Ashland Inc. as an originator and servicer, and Ashland Specialty Ingredients G.P., as originator, and CVG Capital III LLC, as purchaser.
10.75**	–	Second Amendment as of August 1, 2022, to the Receivables Purchase Agreement dated March 17, 2021, by and among CVG Capital III LLC, PNC Bank, National Association, as administrative agent, Ashland Inc. in its individual capacity and as initial servicer, and certain other persons identified as Purchasers, LC, LC Participants and Group Agents and other persons from time to time identified as parties thereto.
10.76	–	Assumption Agreement dated September 20, 2016, by and between Ashland Global Holdings Inc. and Ashland Inc. (filed as Exhibit 10.1 to Ashland's Form 8-K filed on September 20, 2016 (SEC File No. 333-211719), and incorporated herein by reference).
10.77	–	Separation Agreement dated as of September 22, 2016, between and among Ashland Global Holdings Inc. and Valvoline Inc. (filed as Exhibit 10.1 to Ashland's Form 8-K filed on September 28, 2016 (SEC File No. 333-211719), and incorporated herein by reference).
10.78	–	Tax Matters Agreement dated as of September 22, 2016, between and among Ashland Global Holdings Inc. and Valvoline Inc. (filed as Exhibit 10.4 to Ashland's Form 8-K filed on September 28, 2016 (SEC File No. 333-211719), and incorporated herein by reference).
10.79	–	Employee Matters Agreement dated as of September 22, 2016, between and among Ashland Global Holdings Inc. and Valvoline Inc. (filed as Exhibit 10.5 to Ashland's Form 8-K filed on September 28, 2016 (SEC File No. 333-211719), and incorporated herein by reference).

10.80	–	Agreement, dated January 22, 2019, by and amount Ashland Global Holdings Inc., Cruiser Capital Advisors, LLC, Keith M. Rosenbloom, Cruiser Capital Master Fund LP, Metamorphosis IV LLC, William H. Joyce, Metamorphosis Master Fund LP, Cruiser Capital Metamorphosis Advisors, LLC, Cruiser Capital, LLC, Cruiser Capital, Ltd., the William H. Joyce Revocable Trust and the Joyce Family Irrevocable Trust (filed as Exhibit 10.1 to Ashland's Form 8-K filed on January 22, 2019 (SEC File No. 333-211719), and incorporated herein by reference).
10.81	–	Master Confirmation – Uncollared Accelerated Share Repurchase, dated May 6, 2019, between Ashland Global Holdings Inc. and Goldman Sachs (filed as Exhibit 10.1 to Ashland's Form 8-K filed on May 7, 2019 (SEC File No. 333-211719) and incorporated herein by reference).
10.82	–	Master Confirmation - Uncollared Accelerated Share Repurchase, dated September 2, 2021, between Ashland Global Holdings Inc. and JPMorgan Chase Bank, National Association (filed as Exhibit 10.1 to Ashland's Form 8-K filed on September 7, 2021 (SEC File No. 333-211719), and incorporated herein by reference).
10.83		Amendment dated November 22, 2021 to the Master Confirmation (as supplemented by the Supplemental Confirmation) – Uncollared Accelerated Share Repurchase September 2, 2021, between Ashland Global Holdings Inc. and JPMorgan Chase Bank, National Association (filed as Exhibit 10.1 to Ashland's Form 10-Q filed on February 3, 2022 (SEC File No. 333-211719), and incorporated herein by reference).
21**	–	List of Subsidiaries.
23.1**	–	Consent of Ernst & Young LLP.
23.2**	–	Consent of Gnarus Advisors LLC.
24**	–	Power of Attorney.
31.1**	–	Certification of Guillermo Novo, Chief Executive Officer of Ashland, pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2**	–	Certification of J. Kevin Willis, Chief Financial Officer of Ashland, pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32**	–	Certification of Guillermo Novo, Chief Executive Officer of Ashland, and J. Kevin Willis, Chief Financial Officer of Ashland, pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS*		Inline XBRL Instance Document.
101.SCH*		Inline XBRL Taxonomy Extension Schema Document.
101.CAL*		Inline XBRL Taxonomy Extension Calculation Linkbase Document.
101.DEF*		Inline XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB*		Inline XBRL Taxonomy Extension Label Linkbase Document.
101.PRE*		Inline XBRL Taxonomy Extension Presentation Linkbase Document.
104		Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101).

* Attached as Exhibit 101 to this report are the following documents formatted in XBRL (Extensible Business Reporting Language): (i) Statements of Consolidated Comprehensive Income (Loss) for years ended September 30, 2022, 2021 and 2020; (ii) Consolidated Balance Sheets at September 30, 2022 and 2021; (iii) Statements of Consolidated Equity at September 30, 2022, 2021 and 2020; (iv) Statements of Consolidated Cash Flows for years ended September 30, 2022, 2021 and 2020; and (v) Notes to Consolidated Financial Statements.

** Filed herewith.

SM Service mark, Ashland or its subsidiaries, registered in various countries.

™ Trademark, Ashland or its subsidiaries, registered in various countries.

† Trademark owned by a third party.

Upon written or oral request, a copy of the above exhibits will be furnished at cost.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

ASHLAND INC.
(Registrant)
By:
/s/ J. Kevin Willis
J. Kevin Willis
Senior Vice President and Chief Financial Officer
Date: November 21, 2022

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant, in the capacities indicated, on November 21, 2022.

Signatures	Capacity
/s/ Guillermo Novo Guillermo Novo	Chair of the Board, Chief Executive Officer and Director (Principal Executive Officer)
/s/ J. Kevin Willis J. Kevin Willis	Senior Vice President and Chief Financial Officer (Principal Financial Officer)
/s/ Eric N. Boni Eric N. Boni	Vice President, Finance and Principal Accounting Officer (Principal Accounting Officer)
* Steven D. Bishop	Director
* Brendan M. Cummins	Director
* William G. Dempsey	Director
* Suzan F. Harrison	Director
* Jay V. Ihlenfeld	Director
* Wetteny Joseph	Director
* Susan L. Main	Director
* Jerome A. Peribere	Director
* Ricky C. Sandler	Director
* Janice J. Teal	Director

*By: /s/ Yvonne Winkler von Mohrenfels
Yvonne Winkler von Mohrenfels
Attorney-in-Fact

Date: November 21, 2022

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ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion should be read in conjunction with the Consolidated Financial Statements and the accompanying Notes to Consolidated Financial Statements for the years ended September 30, 2022, 2021 and 2020.

BUSINESS OVERVIEW

Ashland profile

Ashland is a global specialty additives and materials company with a conscious and proactive mindset for sustainability. The company serves customers in a wide range of consumer and industrial markets including architectural coatings, construction, energy, food and beverage, nutraceuticals, personal care and pharmaceutical. With approximately 3,900 employees worldwide, Ashland serves customers in more than 100 countries.

Ashland's sales generated outside of North America were 68% in 2022 and 2021, and 67% in 2020. respectively. Sales by region expressed as a percentage of total consolidated sales were as follows:

Sales by Geography	2022	2021	2020
North America (a)	32%	32%	33%
Europe (a)	35%	36%	36%
Asia Pacific	24%	23%	22%
Latin America & other	9%	9%	9%
	100%	100%	100%

(a) Ashland includes only U.S. and Canada in its North American designation and includes Europe, the Middle East and Africa in its Europe designation.

Reportable segments

Ashland's reportable segments include Life Sciences, Personal Care, Specialty Additives and Intermediates. Unallocated and Other includes corporate governance activities and certain legacy matters. The contribution to sales by each reportable segment expressed as a percentage of total consolidated sales for the year ended September 30 were as follows:

Sales by Reportable Segment	2022	2021	2020
Life Sciences	34%	35%	35%
Personal Care	28%	28%	31%
Specialty Additives	30%	31%	29%
Intermediates	8%	6%	5%
	100%	100%	100%

KEY DEVELOPMENTS

Business Results

Ashland's net income was $927 million ($181 million income from continuing operations and $746 million income from discontinued operations) in 2022 compared to income of $220 million ($173 million income from continuing operations and $47 million income from discontinued operations) in 2021. Results for Ashland's continuing operations for 2022 and 2021 were impacted by restructuring costs of $5 million in 2022 and $10 million in 2021, environmental reserve adjustments of $53 million in 2022 and $45 million in 2021, and unrealized losses of $102 million and unrealized gains of $21 million on restricted investment securities. Fiscal 2022 also included $42 million of gains associated with the sale of two excess and unused parcels of land and a $22 million gain on pension and other postretirement plan remeasurements. Additionally, the prior year included $17 million of debt restructuring costs, $13 million restructuring related impairment charges, and a $4 million charge for inventory adjustments. Discontinued operations were primarily driven by the change in results of the Performance Adhesives business including the $726 million gain as a result of the sale of that business during fiscal 2022. Ashland's Adjusted EBITDA is $590 million for the current year compared to $495 million in the prior year (see U.S. GAAP reconciliation under consolidated review). The $95 million increase in Adjusted EBITDA was primarily driven by disciplined pricing leading to cost recovery in a high-inflation environment and improved product mix partially offset by higher raw material and operating costs, unfavorable currency exchange and higher selling, general and administration costs.

Uncertainty relating to the Ukraine and Russia conflict

Business disruptions, including those related to the ongoing conflict between Ukraine and Russia continue to impact businesses around the globe. While it is impossible to predict the effects of the conflict such as possible escalating geopolitical tensions (including the imposition of existing and additional sanctions by the U.S and the European Union on Russia), worsening macroeconomic and general business conditions, supply chain interruptions and unfavorable energy markets, the impact could be material. Ashland is closely monitoring the situation and maintains business continuity plans that are intended to continue operations or mitigate the effects of events that could disrupt its business.

Ashland does not have manufacturing operations in Russia, Ukraine, or Belarus. Ashland sells (or previously sold) additives and specialty ingredients to manufacturers in these countries for their use in pharmaceuticals, personal care, and coatings applications. Sales to Russia and Belarus were previously limited and our products were primarily used in products and applications that are essential to the population's wellbeing and currently support our customers' humanitarian efforts. We have sales controls in place to ensure that future potential sales into the region are only to support critical pharmaceutical or personal hygiene products which are essential for the general population and in accordance with any applicable sanctions. Sales to Ukraine, Russia, and Belarus represent less than 1% of total consolidated sales and less than 1% of total consolidated assets (related to accounts receivable).

Uncertainty relating to the COVID-19 pandemic

Ashland continues to closely monitor the impact of the COVID-19 pandemic on all aspects of its business and geographies, including how it will impact customers, employees, suppliers, vendors, business partners and distribution channels. Ashland is unable to predict the impact that the COVID-19 pandemic will have on its future financial position and operating results due to numerous uncertainties. These uncertainties include the severity of the virus and any variants, the duration of the outbreak, governmental, business or other actions, impacts on Ashland’s supply chain, the effect on customer demand, or changes to Ashland’s operations. The health of Ashland’s workforce and its ability to meet staffing needs throughout the critical functions cannot be predicted and is vital to operations. Further, the impacts of a potential worsening of global economic conditions and the continued disruptions to, and volatility in, the credit and financial markets, consumer spending as well as other unanticipated consequences remain unknown. In addition, Ashland cannot predict the impact that the COVID-19 pandemic will have on its customers, vendors, suppliers and other business partners; however, any material effect on these parties could adversely impact Ashland.

Ashland continues to successfully navigate the uncertain environment associated with the COVID-19 pandemic. Through fiscal year 2022, Ashland has not experienced any additional major operating surprises related to the COVID-19 pandemic, continues to maintain supply chains in a challenging environment, had strong safety performance in the face of unprecedented pressures and improved operating discipline across each of its businesses. Ashland businesses continue to show resiliency in the face of difficult economic circumstances. While sales were up in the year period-over-period, continued supply-chain and labor-shortage challenges inhibited Ashland's ability to meet strong overall customer demand. Ashland’s overall liquidity remains strong and Ashland is more than able to meet its operating cash needs and other investing and financing cash requirements at this time, including those necessary to grow the business as economic conditions improve.

The situation surrounding the COVID-19 pandemic remains fluid, and Ashland is actively managing its response in collaboration with customers, government officials, team members and business partners. For further information regarding the impact of the COVID-19 pandemic on the Company, please see Item 1A, Risk Factors in this report, which is incorporated herein by reference.

Other significant items

Performance Adhesives

Ashland completed the sale of its Performance Adhesives business segment on February 28, 2022, resulting in proceeds to Ashland of approximately $1.7 billion, net of transaction costs. Ashland recognized an after-tax gain of $726 million within the income from discontinued operations caption of the Statement of Consolidated Comprehensive Income (Loss) for the twelve months ended September 30, 2022 related to the sale of Performance Adhesives. Since this transaction represented a strategic shift in Ashland's business and had a major effect on Ashland's operations and financial results, the operating results and cash flows related to Performance Adhesives have been reflected as discontinued operations in the statement of Consolidated Comprehensive Income (Loss) and Statements of Condensed Consolidated Cash Flows. See Note C of the Notes to the Consolidated Financial Statements for more information. Certain indirect corporate costs included within the selling, general and administrative expense caption of the Statement of Consolidated Comprehensive Income (Loss) that were previously allocated to the Performance Adhesives segment do not qualify for classification within discontinued operations and are now reported as selling, general and administrative expense within continuing operations on a consolidated basis and within the Unallocated and other segment. These costs were $9 million, $15 million, and $20 million during the twelve months ended September 30, 2022, 2021, and 2020, respectively.

Debt Repayment Activities

Ashland used a portion of the proceeds from the sale of its Performance Adhesives segment to prepay $250 million of principal on its Term loan A, reduce $240 million of outstanding borrowing under the 2020 Revolving Credit Facility, reduce $102 million of outstanding borrowing under the Foreign Accounts Receivable Securitization Facility, and repay the $23 million outstanding balance on its European short-term loan facility during 2022.

2022 Stock repurchase program

On May 25, 2022, Ashland's board of directors authorized a new, evergreen $500 million common share repurchase program (2022 stock repurchase program). The new authorization terminates and replaces the company's 2018 $1 billion share repurchase program, which had $150 million outstanding at the date of termination.

2018 Stock repurchase program

In September 2021, under the 2018 stock repurchase program, Ashland entered into an accelerated share repurchase agreement (2021 ASR Agreement). Under the 2021 ASR Agreement, Ashland paid an initial purchase price of $450 million and received an initial delivery of 3.9 million shares of common stock during September 2021. The bank exercised its early termination option under the 2021 ASR Agreement in February 2022, and an additional 0.7 million shares were repurchased, bringing the total shares repurchased upon settlement to 4.6 million.

On March 1, 2022, under the 2018 stock repurchase program, Ashland entered into an agreement to repurchase an aggregate amount of $200 million of Ashland common stock using open-market purchases under rule 10b-18. On April 8, 2022, Ashland completed repurchases under this agreement repurchasing a total of 2.15 million shares for a total amount of $200 million.

Operational business model changes and restructurings

As previously disclosed, during the second quarter of fiscal year 2020, Ashland changed the manner in which it manages the business moving from a functionally led to a business led organization. This new business-centric operational model required redesign of core operating systems and processes leading to a realignment in both the selling, general and administrative and research and development costs (SARD) associated with each business. In addition to the realignment of SARD, a productivity review with a focus on cost of goods sold (COGS) was also initiated. Based on these initiatives, Ashland targeted the following savings:

- $50 million of incremental SARD cost savings
- $50 million of incremental COGS productivity savings

As of September 30, 2022, Ashland has achieved all of its target run-rate cost savings under these initiatives.

RESULTS OF OPERATIONS – CONSOLIDATED REVIEW

Consolidated review

Net income

Ashland's net income (loss) is primarily affected by results within operating income (loss), net interest and other expense, other net periodic benefit income (loss), net income (loss) on acquisitions and divestitures, income tax expense (benefit), discontinued operations and other significant events or transactions that are unusual or nonrecurring.

Key financial results for 2022, 2021 and 2020 included the following:

- Ashland's net income/loss amounted to income of $927 million in 2022, income of $220 million in 2021 and loss of $508 million in 2020, or income of $16.41, income of $3.59 and loss of $8.39 diluted earnings per share, respectively.
- Discontinued operations, which are reported net of taxes, resulted in income of $746 million in 2022, and $47 million each in 2021 and 2020. Fiscal 2022 includes a $726 million gain associated with the sale of the Performance Adhesives business.
- Results from continuing operations, which excludes results from discontinued operations, amounted to income of $181 million and $173 million in 2022 and 2021, respectively, and loss of $555 million in 2020. Fiscal 2020 includes a non-cash pre-tax goodwill impairment charge of $530 million.
- The effective income tax was an income tax expense rate of 12% for 2022, and income tax benefit rates of 28% and 4% for 2021 and 2020, respectively. These rates were impacted by certain tax specific key items and tax discrete items.
- Ashland incurred pre-tax net interest and other expense of $149 million, $56 million and $119 million during 2022, 2021 and 2020, respectively. This includes charges for $16 million and $59 million for debt refinancing costs during fiscal 2021 and 2020, respectively, and $1 million and $8 million for accelerated debt issuance costs during 2021 and 2020, respectively, as well as losses of $102 million and gains of $21 million, and $20 million on restricted investments during 2022, 2021 and 2020, respectively.
- Other net periodic benefit income (loss) totaled income of $22 million during 2022, loss of $1 million in 2021, and income of $3 million in 2020.
- Operating income/loss amounted to income of $333 million and $192 million in 2022 and 2021, respectively, and loss of $461 million in 2020. Fiscal 2020 included a non-cash goodwill impairment charge of $530 million.

For further information on the items reported above, see the discussion in the comparative Statements of Consolidated Comprehensive Income (Loss) caption review analysis.

Operating income

Operating income/loss was income of $333 million in 2022 compared to income of $192 million and a loss of $461 million in 2021 and 2020, respectively. The current and prior years' operating income included certain key items that were excluded to arrive at Adjusted EBITDA and are quantified in the table below in the "EBITDA and Adjusted EBITDA" section. These operating key items for the applicable periods are summarized as follows:

- Restructuring, separation and other costs – Ashland periodically implements company-wide cost reduction programs related to acquisitions, divestitures and other cost reduction programs in order to enhance profitability through streamlined operations and an improved overall cost structure. Ashland often incurs severance, facility and integration costs associated with these programs. See Note E in the Notes to Consolidated Financial Statements for further information on the restructuring activities.
- Environmental reserve adjustments – Ashland is subject to various federal, state and local environmental laws and regulations that require environmental assessment or remediation efforts (collectively environmental remediation) at multiple locations. As a result of these activities, Ashland recorded adjustments during each year to its environmental

liabilities and receivables primarily related to previously divested businesses or non-operational sites. See Note N of the Notes to Consolidated Financial Statements for more information.

- Income/loss on acquisitions/divestitures – Ashland recorded income of $42 million during 2022 related to pre-tax gains related to the sale of excess corporate property, and $11 million during 2021. The income in 2021 includes $3 million of expense relating to the Schülke acquisition and a $14 million gain related to the sale of a Specialty Additives facility.
- Inventory adjustments – During 2021, Ashland recorded non-cash charges related to the fair value adjustment of inventory acquired from Schülke at the date of acquisition during the current year. During 2020, Ashland incurred charges associated with a program to reduce overall inventory levels as part of a working capital efficiency program. While successful in managing inventory levels, these actions resulted in increased expense primarily related to abnormal production variances due to plant shutdowns.
- Asset impairments – Ashland recognized impairment charges to certain assets during 2021. See Note E of the Notes to Consolidated Financial Statements for more information.
- Goodwill impairment – During 2020, Ashland realigned its operations into five reportable segments which resulted in a reassessment of the Company's reporting units used to evaluate goodwill impairment. The impairment test under the new reporting unit structure concluded that the carrying value of the Personal Care and the Specialty Additives reporting units exceeded their fair value, resulting in a $530 million non-cash pre-tax goodwill impairment charge in 2020. See note H and Critical Accounting Policies for additional information.

Operating income/loss for 2022, 2021 and 2020 included depreciation and amortization of $241 million, $244 million and $235 million, respectively.

Non-operating key items affecting EBITDA

During the current and prior years, there were certain key items that were not included in operating income but were excluded to arrive at Adjusted EBITDA. These non-operating key items for the applicable periods are summarized as follows:

- Gain/loss on pension and other postretirement plan remeasurements - Ashland recognized actuarial gains and losses for defined benefit pension and other postretirement benefit plans annually in the fourth quarter of each fiscal year and whenever a plan is determined to qualify for a remeasurement during a fiscal year. See Note M of the Notes to Consolidated Financial Statements for more information.

Statements of Consolidated Comprehensive Income (Loss) – caption review

A comparative analysis of the Statements of Consolidated Comprehensive Income (Loss) by caption is provided as follows for the years ended September 30, 2022, 2021 and 2020.

(In millions)	2022	2021	2020	2022 change	2021 change
Sales	$ 2,391	$ 2,111	$ 2,016	$ 280	$ 95

The following table provides a reconciliation of the change in sales between fiscal years 2022 and 2021 and between fiscal years 2021 and 2020.

(In millions)	2022 change	2021 change
Volume	$ 15	$ (3)
Product pricing/mix	289	20
Currency exchange	(77)	46
Acquisition	53	32
Change in sales	$ 280	$ 95

Sales for 2022 increased $280 million, or 13%, compared to 2021. Favorable volume, including the acquisition of Schülke within the Personal Care reportable segment, and product pricing/mix associated with cost inflation pricing actions increased sales by $68 million and $289 million, respectively, partially offset by unfavorable foreign currency exchange of $77 million.

Sales for 2021 increased $95 million, or 5%, compared to 2020. The acquisition of Schülke within the Personal Care reportable segment, product pricing/mix and foreign currency exchange increased sales by $32 million, $20 million and $46 million, respectively. These increases were partially offset by unfavorable volume, which decreased sales by $3 million.

(In millions)	2022	2021	2020	2022 change	2021 change
Cost of sales	$ 1,561	$ 1,441	$ 1,417	$ 120	$ 24
Gross profit as a percent of sales	34.7%	31.7%	29.7%		

Fluctuations in cost of sales are driven primarily by the effects of challenges in shipping and logistics in the current year, the impact of the COVID-19 pandemic, raw material prices, volume and changes in product mix, currency exchange, acquisitions and divestitures and other certain charges incurred as a result of changes or events within the businesses or restructuring activities.

The following table provides a reconciliation of the changes in cost of sales between fiscal years 2022 and 2021 and between fiscal years 2021 and 2020.

(In millions)	2022 change	2021 change
Volume	$ 8	$ 5
Price/mix	91	(7)
Currency exchange	(39)	22
Operating costs (plant)	29	(16)
Acquisition	31	20
Change in cost of sales	$ 120	$ 24

Cost of sales for 2022 increased $120 million compared to 2021. Price/mix, which includes cost inflation associated with plant manufacturing and shipping costs, and higher volume, including Schülke, and higher operating costs increased cost of sales by $91 million, $39 million, and $29 million, respectively. These increases were partially offset by foreign currency exchange, which decreased cost of sales by $39 million. Disciplined pricing and mix actions by Ashland's commercial teams continue to improve operating margins as gross profit as a percentage of sales expanded 3.0 percentage points during the current period.

Cost of sales for 2021 increased $24 million compared to 2020. Foreign currency exchange, the Schülke acquisition, and higher volume increased cost of sales by $22 million, $20 million, and $5 million, respectively. These increases were partially offset by the impact of lower price/mix and lower costs which decreased cost of sales by $7 million and $16 million, respectively.

(In millions)	2022	2021	2020	2022 change	2021 change
Selling, general and administrative expense	$ 393	$ 358	$ 400	$ 35	$ (42)
As a percent of sales	16.4%	17.0%	19.8%		

Selling, general and administrative expense for 2022 increased $35 million compared to 2021, while expenses as a percent of sales decreased 0.6 percentage points. Key drivers of the fluctuation in selling, general and administrative expense compared to 2021 were:

- Expense of $5 million and $10 million comprised of key items for severance, lease abandonment and other restructuring costs during 2022 and 2021, respectively;
- $53 million and $45 million in net environmental-related expenses during 2022 and 2021, respectively (see Note N for more information);
- $10 million related to a capital project impairment during 2021; and

- Increases associated with the following:
    - o Higher incentive pay of $14 million;
    - o Lower transition services income from INEOS of $10 million;
    - o Higher deferred and stock compensation expense of $8 million;
    - o Higher expense of $6 million related to the acquisition of the personal care business of Schülke;
    - o Higher salary, benefits and travel and entertainment expenses of $2 million.

Selling, general and administrative expense for 2021 decreased $42 million compared to 2020, while expenses as a percent of sales decreased 2.8 percentage points. Key drivers of the fluctuation in selling, general and administrative expense compared to 2020 were:

- $45 million and $36 million in net environmental-related expenses during 2021 and 2020, respectively (see Note N for more information);
- $10 million and $58 million of key items for severance, lease abandonment and other restructuring costs during 2021 and 2020, respectively;
- $15 million and $20 million of stranded divestiture costs during 2021 and 2020, respectively;
- $10 million related to a capital project impairment during 2021; and
- Unfavorable currency exchange of $7 million and lower variable compensation expense.

(In millions)	2022	2021	2020	2022 change	2021 change
Research and development expense	$ 55	$ 50	$ 56	$ 5	$ (6)

Research and development expense increased $5 million in 2022 compared to 2021 primarily due to increased incentive accruals and the Schülke acquisition. In 2021, the $6 million decrease compared to 2020 was a result of achieved cost savings and other costs.

(In millions)	2022	2021	2020	2022 change	2021 change
Intangibles amortization expense	$ 94	$ 90	$ 84	$ 4	$ 6

Amortization expense increased by $4 million in 2022 compared to 2021 primarily due to the amortization of intangible assets associated with the Schülke acquisition.

Amortization expense increased by $6 million in 2021 compared to 2020 primarily due to the amortization of intangible assets associated with the Schülke acquisition.

(In millions)	2022	2021	2020	2022 change	2021 change
Equity and other income	$ 3	$ 9	$ 8	$ (6)	$ 1

Equity and other income's decrease in 2022 compared to 2021 was primarily related to a gain on sale of corporate assets of roughly $4 million in 2021, while 2020 included a liquidation gain of $3 million.

(In millions)	2022	2021	2020	2022 change	2021 change
Goodwill impairment	$ —	$ —	$ 530	$ —	$ (530)

Ashland recorded an impairment charge of $530 million in 2020. See Note H Goodwill and Other Intangibles for additional information.

(In millions)	2022	2021	2020	2022 change	2021 change
Income on acquisitions and divestitures	$ 42	$ 11	$ 2	$ 31	$ 9

Income on acquisitions and divestitures during 2022 primarily relates to a $42 million gain on the sale of excess corporate real estate.

Income on acquisitions and divestitures during 2021 primarily relates to a $14 million gain related to the sale of a Specialty Additives facility. This was partially offset by a $3 million expense in transaction net costs associated with the personal care acquisition of Schülke, including a gain of $1 million associated with foreign currency derivatives entered into to mitigate the foreign exchange exposure of the purchase price.

Net income (loss) on divestitures during 2020 primarily related to the sale of corporate assets and post-closing adjustments for certain divestitures.

(In millions)	2022	2021	2020	2022 change	2021 change
Net interest and other expense					
Interest expense	$ 62	$ 69	$ 88	$ (7)	$ (19)
Interest income	(4)	(1)	(1)	(3)	—
Loss on the accounts receivable sale program	1	1	—	—	1
Loss on early retirement of debt	—	16	59	(16)	(43)
Loss (income) from restricted investments	86	(33)	(30)	119	(3)
Other financing costs	4	4	3	—	1
	$ 149	$ 56	$ 119	$ 93	$ (63)

Net interest and other expense increased by $93 million in 2022 compared to 2021. Interest expense decreased $7 million primarily due to lower debt levels during 2022 compared to 2021. Restricted investments loss of $86 million and income of $33 million included mark-to-market losses of $102 million compared to gains of $21 million for 2022 and 2021, respectively. See Note F for more information on the restricted investments.

Net interest and other expense decreased by $63 million in 2021 compared to 2020. Interest expense decreased by $19 million due to lower average debt levels, lower cost of debt related to the debt restructuring activity during 2020 and lower accelerated debt issuance costs and original issuance discount costs of $7 million in 2021 compared to 2020. Ashland incurred $16 million of debt refinancing costs during 2021 compared to $59 million during 2020. See Note I for more information on the refinancing activity. The investment securities income of $33 million in 2021 compared to $30 million in 2020 represents investment income related to restricted investments discussed in Note F of the Notes to the Consolidated Financial Statements.

(In millions)	2022	2021	2020	2022 change	2021 change
Other net periodic benefit income (loss)	$ 22	$ (1)	$ 3	$ 23	$ (4)

Other net periodic benefit income during 2022 primarily included actuarial gains of $25 million and expected return on plan assets of $7 million, offset by interest cost of $10 million.

Other net periodic benefit expense during 2021 primarily included interest cost of $8 million and a $1 million loss on pension and other postretirement plan remeasurements, offset by expected return on plan assets of $8 million.

Other net periodic benefit income during 2020 primarily included interest cost of $9 million, offset by expected return on plan assets of $11 million and a $1 million gain on pension and other postretirement plan remeasurements.

(In millions)	2022	2021	2020	2022 change	2021 change
Income tax expense (benefit)	$ 25	$ (38)	$ (22)	$ 63	$ (16)
Effective tax rate	12%	28%	(4)%		

The 2022 effective tax rate was impacted by jurisdictional income mix, as well as favorable discrete items of $15 million primarily related to uncertain tax positions and restructuring activities.

The 2021 effective tax rate was impacted by jurisdictional income mix, as well as favorable discrete items of $59 million primarily related to the sale of a Specialty Additives facility and uncertain tax positions.

The 2020 effective tax rate was impacted by nondeductible goodwill impairment of $527 million as well as $15 million favorable tax discrete items primarily from the tax benefit related to the Swiss Tax Reform enacted in the first quarter.

Adjusted income tax expense (benefit)

Key items are defined as the financial effects from significant transactions that may have caused short-term fluctuations in net income and/or operating income which Ashland believes do not accurately reflect Ashland's underlying business performance and trends. Tax specific key items are defined as the financial effects from tax specific financial transactions, tax law changes or other matters that fall within the definition of key items as previously described. The effective tax rate, excluding key items, which is a non-GAAP measure, has been prepared to illustrate the ongoing tax effects of Ashland's operations. Management believes investors and analysts use this financial measure in assessing Ashland's business performance and that presenting this non-GAAP measure on a consolidated basis assists investors in better understanding Ashland's ongoing business performance and enhancing their ability to compare period-to-period financial results.

The effective tax rates during 2022, 2021 and 2020 were significantly impacted by the following tax specific key items:

- Uncertain tax position - Includes the impact from the settlement of uncertain tax positions with various tax authorities;
- Valuation allowances - Includes the impact from the release of certain foreign tax credit valuation allowances during 2022; and
- Restructuring and separation activity – Includes the impact from company-wide cost reduction programs, and the impact of the sale of a Specialty Additives facility.

The following table is a calculation of the effective tax rate, excluding the impact of these key items:

(In millions)	2022	2021	2020
Income (loss) from continuing operations before income taxes	$ 206	$ 135	$ (577)
Key items (pre-tax) (a)	96	56	719
Adjusted income from continuing operations before income taxes	$ 302	$ 191	$ 142
Income tax expense (benefit)	25	(38)	(22)
Income tax rate adjustments:			
Tax effect of key items (b)	21	11	35
Tax specific key items: (c)			
Uncertain tax positions	8	53	(3)
Valuation allowance	4	—	—
Restructuring and separation activity	(3)	13	—
Other tax reform related activity	—	(6)	20
Total income tax rate adjustments	30	71	52
Adjusted income tax expense (benefit)	$ 55	$ 33	$ 30
Effective tax rate, excluding key items (Non-GAAP) (d)	18%	17%	21%

(a) See Adjusted EBITDA reconciliation table disclosed below in this Management, Discussion and Analysis for a summary of the key items, before tax.

(b) The tax rate specific to the jurisdiction in which the key item originates is used to calculate the tax effect of key items.

(c) For additional information on the effect that these tax specific key items had on EPS, see the Adjusted Diluted EPS table disclosed below in this Management Discussion and Analysis.

(d) Due to rounding conventions, the effective tax rate presented may not recalculate precisely based on the numbers disclosed within this table.

The following table provides a reconciliation of tax specific key items within the statutory federal income tax with the provision for income taxes summary disclosed in Note L of the Notes to Consolidated Financial Statements.

(In millions)	2022	2021	2020
Tax effect of key items computed at applicable statutory rate (a)	$ 21	$ 11	$ 35
Tax reform	—	—	25
Uncertain tax positions	8	53	(4)
Deemed inclusions, foreign dividends and other restructuring	—	—	(4)
Valuation allowance changes	4	(8)	—
Other items	(3)	15	—
	$ 30	$ 71	$ 52

(In millions)	2022	2021	2020	2022 change	2021 change
Income (loss) from discontinued operations (net of taxes)					
Performance Adhesives	$ 41	$ 64	$ 64	$ (23)	$ —
Composites and Marl Facility	2	—	4	2	(4)
Asbestos-related litigation	(14)	(9)	(18)	(5)	9
Water Technologies	4	(3)	—	7	(3)
Distribution	(7)	(5)	(8)	(2)	3
Valvoline	(6)	3	(24)	(9)	27
Gain (loss) on disposal of discontinued operations					
Performance Adhesives	726	—	—	726	—
Composites/Marl facility	—	(4)	29	4	(33)
Water Technologies	—	1	—	(1)	1
	$ 746	$ 47	$ 47	$ 699	$ —

As a result of the divestiture of the Performance Adhesives segment and the divestiture of the Composites segment (including the Maleic business) and Marl facility, the related operating results have been reflected as discontinued operations (net of tax) within the Statements of Consolidated Comprehensive Income (Loss). See Note C for more information on these transactions. In

2022, the sales and pre-tax income included in discontinued operations were $171 million and $33 million, respectively, for the Performance Adhesives segment. In 2021, the sales and pre-tax income included in discontinued operations were $372 million and $83 million, respectively, for the Performance Adhesives segment. In 2020, the sales and pre-tax income included in discontinued operations were $310 million and $74 million for the Performance Adhesives segment, respectively, and $51 million and $9 million for the Composites segment (including the Maleic business) and Marl Facility, respectively. In 2022, a $726 million gain on disposal was recorded associated with the February 28, 2022 closing of the Performance Adhesives business segment divestiture. In 2020, a $29 million gain on disposal was recorded in the fourth quarter associated with the September 30, 2020 closing of the sale of the Maleic business.

Asbestos-related activity during 2022, 2021 and 2020 included after-tax net adjustments to the asbestos reserves and receivables of $14 million of expense, $9 million of expense and $18 million of expense, respectively, including the adjustments for the annual update.

The Valvoline activity within 2022, 2021 and 2020 primarily represents subsequent adjustments that were made in conjunction with the post-closing disputes and Tax Matters Agreement.

The activity for Water Technologies and Distribution were primarily related to post-closing adjustments associated with environment remediation reserves.

Other comprehensive income (loss)

A comparative analysis of the components of other comprehensive income (loss) is provided below for the last three fiscal years ended September 30.

(In millions)	2022	2021	2020	2022 change	2021 change
Other comprehensive income (loss) (net of taxes)					
Unrealized translation gain (loss)	$ (197)	$ 7	$ 27	$ (204)	$ (20)
Unrealized gain (loss) on commodity hedges	(1)	4	—	(5)	4
Pension and postretirement obligation adjustment	1	—	—	1	—
	$ (197)	$ 11	$ 27	$ (208)	$ (16)

Total other comprehensive income (loss), net of tax, decreased $208 million in 2022 as compared to 2021 as a result of the following components.

- In 2022, the change in unrealized gain (loss) from foreign currency translation adjustments resulted in a loss of $197 million, compared to a gain of $7 million during 2021. The fluctuations in unrealized translation gains and losses were primarily due to translating foreign subsidiary financial statements from local currencies to U.S. Dollars.
- In 2022, a $1 million unrealized loss on commodity hedges was recorded compared to a gain of $4 million during 2021. See Note F for more information.
- In 2022, a $1 million pension and postretirement obligation adjustment was recorded.

Total other comprehensive income (loss), net of tax, decreased $16 million in 2021 as compared to 2020 as a result of the following components.

- In 2021, the change in unrealized gain (loss) from foreign currency translation adjustments resulted in a gain of $7 million, compared to a gain of $27 million during 2020. The fluctuations in unrealized translation gains and losses were primarily due to translating foreign subsidiary financial statements from local currencies to U.S. Dollars.
- In 2021, a $4 million unrealized gain on commodity hedges was recorded. See Note F for more information.

Use of non-GAAP measures

Ashland has included within this document the following non-GAAP measures, on both a consolidated and reportable segment basis, which are not defined within U.S. GAAP and do not purport to be alternatives to net income or cash flows from operating activities as a measure of operating performance or cash flows:

- EBITDA – net income (loss), plus income tax expense (benefit), net interest and other expenses, and depreciation and amortization.
- Adjusted EBITDA – EBITDA adjusted for discontinued operations and key items (including remeasurement gains and losses related to pension and other postretirement plans).
- Adjusted EBITDA margin – Adjusted EBITDA divided by sales.
- Adjusted diluted earnings per share (EPS) – income (loss) from continuing operations, adjusted for key items, net of tax, divided by the average outstanding diluted shares for the applicable period.
- Adjusted diluted earnings per share (EPS) excluding intangibles amortization expense – Adjusted earnings per share adjusted for intangibles amortization expense net of tax, divided by the average outstanding diluted shares for the applicable period.
- Free cash flow – operating cash flows less capital expenditures.
- Ongoing free cash flow – operating cash flows less capital expenditures and certain other adjustments as applicable.
- Ongoing free cash flow conversion – ongoing free cash flow divided by adjusted EBITDA.

Management believes the use of EBITDA and Adjusted EBITDA measures on a consolidated and reportable segment basis assists investors in understanding the ongoing operating performance by presenting comparable financial results between periods. Ashland believes that by removing the impact of depreciation and amortization and excluding certain non-cash charges, amounts spent on interest and taxes and certain other charges that are highly variable from year to year, EBITDA and Adjusted EBITDA provide Ashland's investors with performance measures that reflect the impact to operations from trends in changes in sales, margin and operating expenses, providing a perspective not immediately apparent from net income and operating income. The adjustments Ashland makes to derive the non-GAAP measures of EBITDA and Adjusted EBITDA exclude items which may cause short-term fluctuations in net income and operating income and which Ashland does not consider to be the fundamental attributes or primary drivers of its business. EBITDA and Adjusted EBITDA provide disclosure on the same basis as that used by Ashland's management to evaluate financial performance on a consolidated and reportable segment basis and provide consistency in our financial reporting, facilitate internal and external comparisons of Ashland's historical operating performance and its segments and provide continuity to investors for comparability purposes.

The Adjusted diluted EPS metric enables Ashland to demonstrate what effect key items have on an earnings per diluted share basis by taking income (loss) from continuing operations, adjusted for key items after tax that have been identified in the Adjusted EBITDA table, and dividing by the average outstanding diluted shares for the applicable period. Ashland's management believes this presentation is helpful to illustrate how the key items have impacted this metric during the applicable period.

The Adjusted diluted EPS, excluding intangibles amortization expense metric enables Ashland to demonstrate the impact of non-cash intangibles amortization expense on EPS, in addition to the key items previously mentioned. Ashland's management believes this presentation is helpful to illustrate how previous acquisitions impact applicable period results.

The free cash flow metrics enable Ashland to provide a better indication of the ongoing cash being generated that is ultimately available for both debt and equity holders as well as other investment opportunities. Unlike cash flow provided by operating activities, free cash flow and ongoing free cash flow includes the impact of capital expenditures from continuing operations and other significant items impacting cash flow, providing a more complete picture of current and future cash generation. Free cash flow has certain limitations, including that it does not reflect adjustment for certain non-discretionary cash flows such as mandatory debt repayments. The amount of mandatory versus discretionary expenditures can vary significantly between periods.

Although Ashland may provide forward-looking guidance for Adjusted EBITDA, Adjusted diluted EPS and ongoing free cash flow, Ashland is not reaffirming or providing forward-looking guidance for U.S. GAAP-reported financial measures or a reconciliation of forward-looking non-GAAP financial measures to the most directly comparable U.S. GAAP measure because it is unable to predict with reasonable certainty the ultimate outcome of certain significant items that affect these metrics such as domestic and international economic, political, legislative, regulatory and legal actions. In addition, certain economic conditions, such as recessionary trends, inflation, interest and monetary exchange rates, government fiscal policies and changes in the prices of certain key raw materials, can have a significant effect on operations and are difficult to predict with certainty.

These non-GAAP measures should be considered supplemental in nature and should not be construed as more significant than comparable measures defined by U.S. GAAP. Limitations associated with the use of these non-GAAP measures include that these measures do not present all of the amounts associated with our results as determined in accordance with U.S. GAAP. The non-GAAP measures provided are used by Ashland management and may not be determined in a manner consistent with the methodologies used by other companies. EBITDA and Adjusted EBITDA provide a supplemental presentation of Ashland's operating performance on a consolidated and reportable segment basis. Adjusted EBITDA generally includes adjustments for items that impact comparability between periods. In addition, certain financial covenants related to Ashland's 2022 Credit Agreement are based on similar non-GAAP measures and are defined further in the sections that reference this metric.

In accordance with U.S. GAAP, Ashland recognizes actuarial gains and losses for defined benefit pension and other postretirement benefit plans annually in the fourth quarter of each fiscal year and whenever a plan is determined to qualify for a remeasurement during a fiscal year. Actuarial gains and losses occur when actual experience differs from the estimates used to allocate the change in value of pension and other postretirement benefit plans to expense throughout the year or when assumptions change, as they may each year. Significant factors that can contribute to the recognition of actuarial gains and losses include changes in discount rates used to remeasure pension and other postretirement obligations on an annual basis or upon a qualifying remeasurement, differences between actual and expected returns on plan assets and other changes in actuarial assumptions, for example, the life expectancy of plan participants. Management believes Adjusted EBITDA, which includes the expected return on pension plan assets yet excludes both the actual return on pension plan assets and the impact of actuarial gains and losses, provides investors with a meaningful supplemental presentation of Ashland's operating performance (see the Adjusted EBITDA reconciliation table for additional details on exact amounts included within this non-GAAP measure related to pension and other postretirement plans). Management believes these actuarial gains and losses are primarily financing activities that are more reflective of changes in current conditions in global financial markets (and in particular interest rates) that are not directly related to the underlying business. For further information on the actuarial assumptions and plan assets referenced above, see Note M of the Notes to Consolidated Financial Statements.

EBITDA and Adjusted EBITDA

EBITDA totaled income of $1,342 million, income of $482 million and a loss of $176 million for 2022, 2021 and 2020, respectively. EBITDA and Adjusted EBITDA results in the following table have been prepared to illustrate the ongoing effects of Ashland's operations, which exclude certain key items previously described. Management believes the use of such non-GAAP measures on a consolidated and reportable segment basis assists investors in understanding the ongoing operating performance by presenting the financial results between periods on a more comparable basis.

(In millions)	2022	2021	2020
Net income (loss)	$ 927	$ 220	$ (508)
Income tax expense (benefit)	25	(38)	(22)
Net interest and other financing expense	149	56	119
Depreciation and amortization	241	244	235
EBITDA	1,342	482	(176)
Income from discontinued operations (net of taxes)	(746)	(47)	(47)
Key items included in EBITDA:			
Goodwill impairment	—	—	530
Restructuring, separation and other costs	5	10	58
Environmental reserve adjustments	53	43	34
Inventory adjustments	—	4	51
Asset impairments	—	13	—
Income on acquisitions and divestitures (a)	(42)	(11)	—
Loss (gain) on pension and other postretirement plan remeasurements	(22)	1	(1)
Total key items included in EBITDA	(6)	60	672
Adjusted EBITDA (b)	$ 590	$ 495	$ 449
Total key items included in EBITDA	$ (6)	$ 60	$ 672
Accelerated amortization of debt issuance costs	—	1	8
Debt refinancing costs (c)	—	16	59
Unrealized (gain) loss on securities	102	(21)	(20)
Total key items, before tax	$ 96	$ 56	$ 719

(a) Excludes income of $2 million during 2020, related to ongoing adjustments of previous divestiture transactions.

(b) Includes $8 million, $6 million and $4 million during 2022, 2021 and 2020, respectively, of net periodic pension and other postretirement expense recognized ratably through the fiscal year. These expenses are comprised of service cost, interest cost, expected return on plan assets, and amortization of prior service credit and are disclosed in further detail in Note M of the Notes to Consolidated Financial Statements.

(c) Debt refinancing costs during 2021 included a $16 million loss on early retirement of debt and a $1 million charge for accelerated debt issuance costs. Debt refinancing costs during 2020 included $59 million loss on early retirement of debt. All debt refinancing costs were recorded within the net interest and other financing expense caption on the Statements of Consolidated Comprehensive Income (Loss). See Note I of the Notes to Consolidated Financial Statements for more information.

Diluted EPS and Adjusted Diluted EPS

The following table reflects the U.S. GAAP calculation for the income (loss) from continuing operations adjusted for the cumulative diluted EPS effect for key items after tax that have been identified in the Adjusted EBITDA table in the previous section. Key items are defined as the financial effects from significant transactions that may have caused short-term fluctuations in net income and/or operating income which Ashland believes do not accurately reflect Ashland's underlying business performance and trends. The Adjusted Diluted EPS for the income (loss) from continuing operations and Adjusted Diluted EPS from continuing operations excluding intangibles amortization expense in the following table have been prepared to illustrate these ongoing effects on Ashland's operations. Management believes investors and analysts use this financial measure in assessing Ashland's business performance and that presenting this non-GAAP measure on a consolidated basis assists investors in better understanding Ashland's ongoing business performance and enhancing their ability to compare period-to-period financial results.

	2022	2021	2020
Diluted EPS from continuing operations (as reported)	$ 3.20	$ 2.82	$ (9.16)
Key items, before tax:			
Goodwill impairment	—	—	8.75
Restructuring, separation and other costs (including accelerated depreciation)	0.09	0.16	0.95
Environmental reserve adjustments	0.95	0.70	0.58
Inventory adjustments	—	0.07	0.83
Asset impairments	—	0.21	—
Income on acquisitions and divestitures	(0.75)	(0.18)	—
Loss (gain) on pension and other postretirement plan remeasurements	(0.40)	0.02	(0.01)
Unrealized gain on securities	1.82	(0.34)	(0.33)
Accelerated amortization of debt issuance costs	—	0.02	0.13
Debt refinancing costs	—	0.26	0.97
Key items, before tax	1.71	0.92	11.87
Tax effect of key items (a)	(0.38)	(0.18)	(0.58)
Key items, after tax	1.33	0.74	11.29
Tax specific key items:			
Uncertain tax positions	(0.15)	(0.87)	0.05
Restructuring and separation activity	0.06	(0.21)	—
Valuation allowance	(0.07)	—	—
Other tax reform related activity	—	0.10	(0.33)
Tax specific key items (b)	(0.16)	(0.98)	(0.28)
Total key items	1.17	(0.24)	11.01
Adjusted diluted EPS from continuing operations (non-GAAP)	$ 4.37	$ 2.58	$ 1.85
Amortization expense adjustment (net of tax) (c)	1.33	1.17	1.08
Adjusted diluted EPS from continuing operations (non-GAAP) excluding intangibles amortization expense	$ 5.70	$ 3.75	$ 2.93

(a) Represents the diluted EPS impact from the tax effect of the key items that are previously identified above.

(b) Represents the diluted EPS impact from tax specific financial transactions, tax law changes or other matters that fall within the definition of tax specific key items. For additional explanation of these tax specific key items, see the income tax expense (benefit) discussion within the following caption review section.

(c) Amortization expense adjustment (net of tax) tax rates were 20.0%, 20.0% and 21.0% for the years ended 2022, 2021 and 2020, respectively.

RESULTS OF OPERATIONS – REPORTABLE SEGMENT REVIEW

Ashland's reportable segments include Life Sciences, Personal Care, Specialty Additives, and Intermediates. Unallocated and Other includes corporate governance activities and certain legacy matters. The historical segment information has been recast to conform to the current segment structure.

Results of Ashland's reportable segments are presented based on its management and internal accounting structure. The structure is specific to Ashland; therefore, the financial results of Ashland's reportable segments are not necessarily comparable with similar information for other companies. Ashland allocates all significant costs to its reportable segments except for certain significant company-wide restructuring activities, certain corporate governance costs and other costs or activities that relate to former businesses that Ashland no longer operates. The service cost component of pension and other postretirement benefits costs is allocated to each reportable segment on a ratable basis; while the remaining components of pension and other postretirement benefits costs are recorded within the other net periodic benefit income (loss) caption on the Statements of Consolidated Comprehensive Income (Loss). Ashland refines its expense allocation methodologies to the reportable segments from time to time as internal accounting practices are improved, more refined information becomes available and the industry or market changes. Significant revisions to Ashland's methodologies are adjusted for all segments on a retrospective basis. This includes charges in prior years for indirect corporate costs previously allocated to Performance Adhesives. These costs are now reflected in Unallocated and Other for all periods presented.

The following table shows sales, operating income, depreciation and amortization and EBITDA by reportable segment for each of the last three years ended September 30.

(In millions)	2022	2021	2020
Sales			
Life Sciences	$ 815	$ 737	$ 708
Personal Care	678	592	615
Specialty Additives	719	655	589
Intermediates	256	178	129
Intersegment sales (a)	(77)	(51)	(25)
	$ 2,391	$ 2,111	$ 2,016
Operating income (loss)			
Life Sciences	$ 155	$ 130	$ 123
Personal Care (b)	102	73	(296)
Specialty Additives (b)	103	61	(132)
Intermediates	87	35	(10)
Unallocated and Other (b)	(114)	(107)	(146)
	$ 333	$ 192	$ (461)
Depreciation expense			
Life Sciences	$ 35	$ 36	$ 33
Personal Care	37	39	41
Specialty Additives	63	66	62
Intermediates	12	12	13
Unallocated and Other	—	1	2
	$ 147	$ 154	$ 151
Amortization expense			
Life Sciences	$ 28	$ 28	$ 27
Personal Care	47	42	36
Specialty Additives	18	19	19
Intermediates	1	1	1
Unallocated and Other	—	—	1
	$ 94	$ 90	$ 84
EBITDA (c)			
Life Sciences	$ 218	$ 194	$ 183
Personal Care	186	154	(219)
Specialty Additives	184	146	(51)
Intermediates	100	48	4
Unallocated and Other	(114)	(106)	(143)
	$ 574	$ 436	$ (226)

(a) Intersegment sales from Intermediates are accounted for at prices that approximate fair value. All other intersegment sales are accounted for at cost.

(b) Includes income on acquisitions and divestitures, net for fiscal 2022, 2021 and 2020 within Unallocated and Other. Includes a fixed asset impairment of $3 million related to Personal Care and a capital project impairment of $10 million related to Specialty Additives for the year ended September 30, 2021.

(c) Excludes income from discontinued operations and other net periodic benefit income (loss). See the Statement of Consolidated Comprehensive Income (Loss) for applicable amounts excluded.

Life Sciences

Life Sciences is comprised of pharmaceuticals, nutrition, nutraceuticals, agricultural chemicals, diagnostic films (formerly known as advanced materials) and fine chemicals. Pharmaceutical solutions include controlled release polymers, disintegrants, tablet coating, thickeners, solubilizers, and tablet binders. Nutrition solutions include thickeners, stabilizers, emulsifiers and additives for enhancing mouthfeel, controlling moisture migration, reducing oil uptake and binding structured foods. Nutraceutical solutions include products for weight management, joint comfort, stomach and intestinal health, sports nutrition and general wellness. The nutraceutical business also provide custom formulation, toll processing and particle engineering solutions. Customers include pharmaceutical, food, beverage, nutraceuticals and supplements manufacturers, hospitals and radiologists and industrial manufacturers.

2022 compared to 2021

Life Sciences' sales for the current year increased $78 million to $815 million compared to 2021. Favorable pricing/mix and higher volume increased sales by $75 million and $28 million, respectively, while unfavorable foreign currency exchange decreased sales by $25 million.

Operating income increased $25 million to $155 million compared to 2021. Favorable price/mix and higher volume increased operating income by $54 million and $10 million, respectively, partially offset by unfavorable foreign currency exchange and higher costs which decreased operating income by $16 million and $23 million, respectively.

EBITDA for the current year increased $24 million to $218 million compared to 2021. Adjusted EBITDA increased $23 million to $218 million. Adjusted EBITDA margin increased 0.2 percentage points in the current period to 26.7%.

2021 compared to 2020

Life Sciences' sales for 2021 increased $29 million to $737 million compared to 2020. Favorable currency exchange, favorable volume and favorable pricing increased sales by $14 million, $11 million and $4 million, respectively.

Operating income increased $7 million to $130 million compared to 2020. Favorable foreign currency exchange and higher volume increased operating income $12 million and $3 million, respectively, offset by unfavorable pricing and higher production costs, and environmental reserve adjustments of $14 million, $4 million, and $1 million, respectively. Additionally, there were $11 million of inventory control costs in 2020 compared to zero in 2021.

EBITDA for 2021 increased $11 million to $194 million compared to 2020. Adjusted EBITDA was flat year over year, while adjusted EBITDA margin decreased 1.0 percentage points in the current period to 26.5%.

EBITDA and Adjusted EBITDA reconciliation

The EBITDA and Adjusted EBITDA amounts presented within this business section are provided as a means to enhance the understanding of financial measurements that Ashland has internally determined to be relevant measures of comparison for each segment. Each of these non-GAAP measures is defined as follows: EBITDA (operating income plus depreciation and amortization), Adjusted EBITDA (EBITDA adjusted for key items as applicable), and Adjusted EBITDA margin (Adjusted EBITDA divided by sales). Ashland does not allocate items to each reportable segment below operating income, such as interest expense and income taxes. As a result, reportable segment EBITDA and Adjusted EBITDA are reconciled directly to operating income since it is the most directly comparable Statements of Consolidated Comprehensive Income (Loss) caption.

The following EBITDA presentation for the years ended September 30, 2022, 2021 and 2020, is provided as a means to enhance the understanding of financial measurements that Ashland has internally determined to be relevant measures of comparison for the results of Life Sciences.

The key items during year ended September 30, 2021 related to environmental reserve adjustments of $1 million.

The key items during year ended September 30, 2020 related to inventory control measures of $11 million and restructuring costs of $1 million.

	Life Sciences		
(In millions)	2022	2021	2020
Operating income	$ 155	$ 130	$ 123
Depreciation and amortization	63	64	60
EBITDA	218	194	183
Restructuring and other costs	—	—	1
Environmental reserve adjustments	—	1	—
Inventory control measures	—	—	11
Adjusted EBITDA	$ 218	$ 195	$ 195

Personal Care

Personal Care is comprised of biofunctionals, microbial protectants (preservatives), skin care, sun care, oral care, hair care and household solutions. These businesses have a broad range of natural, nature-derived, biodegradable, and high-performance ingredients for customer driven solutions to help protect, renew, moisturize and revitalize skin and hair, and provide solutions for toothpastes, mouth washes and rinses, denture cleaning and care for teeth. Household supplies nature-derived rheology ingredients, biodegradable surface wetting agents, performance encapsulates, and specialty polymers for household, industrial and institutional cleaning products. Customers include formulators at large multinational branded consumer products companies and smaller, independent boutique companies.

On April 30, 2021, Ashland completed the $312 million acquisition of the personal care business from Schülke. The completion of the acquisition is expected to strengthen the profitable growth of the personal care segment, enhance the specialty ingredients solutions and expand the biotechnology and microbiology technical competencies.

2022 compared to 2021

Personal Care's sales for the current year increased $86 million to $678 million compared to 2021. Favorable product pricing/mix and volume, including the impact of the Schülke acquisition, increased sales by $40 million and $68 million, respectively. Unfavorable currency exchange decreased sales by $22 million.

Operating income/loss for the current year increased $29 million to income of $102 million compared to 2021. Favorable price/mix, lower costs and higher volume, including the impact of the Schülke acquisition increased operating income by $16 million, $13 million and $6 million, respectively. Unfavorable currency exchange decreased operating income by $6 million.

EBITDA for the current year increased $32 million to $186 million compared to 2021. Adjusted EBITDA increased $25 million to $186 million. Adjusted EBITDA margin increased 0.2 percentage points in the current period to 27.4%.

2021 compared to 2020

Personal Care's sales for 2021 decreased $23 million to $592 million compared to 2020. Unfavorable volume and product pricing decreased sales by $64 million and $3 million, respectively. These decreases were partially offset by the Schülke acquisition and foreign currency, which increased sales by $32 million and $12 million, respectively.

Operating income/loss for 2021 increased $369 million to income of $73 million compared to 2020. Favorable foreign currency exchange, lower costs, a prior year goodwill impairment and prior year inventory control costs increased operating income by $6 million, $37 million, $356 million and $13 million, respectively. These increases were partially offset by an inventory adjustment related to the Schülke acquisition, lower volume, unfavorable price/mix, a plant restructuring related impairment charge, and storm related unplanned plant shutdown costs which decreased operating income by $4 million, $23 million, $2 million, $3 million, and $11 million, respectively.

EBITDA for 2021 increased $373 million to income of $154 million compared to 2020. Adjusted EBITDA increased $11 million to $161 million. Adjusted EBITDA margin increased 2.8 percentage points in the current period to 27.2%.

EBITDA and Adjusted EBITDA reconciliation

The following EBITDA presentation (as defined and described in the section above) for the years ended September 30, 2022, 2021 and 2020, is provided as a means to enhance the understanding of financial measurements that Ashland has internally determined to be relevant measures of comparison for the results of Personal Care.

The key items during year ended September 30, 2021 related to inventory adjustments of $4 million and an asset impairment of $3 million.

The key items during year ended September 30, 2020 related to a goodwill impairment of $356 million and $13 million in inventory control measures.

	Personal Care		
(In millions)	2022	2021	2020
Operating income (loss)	$ 102	$ 73	$ (296)
Depreciation and amortization	84	81	77
EBITDA	186	154	(219)
Inventory adjustment	—	4	—
Asset impairment	—	3	—
Goodwill impairment	—	—	356
Inventory control measures	—	—	13
Adjusted EBITDA	$ 186	$ 161	$ 150

Specialty Additives

Specialty Additives is comprised of rheology- and performance-enhancing additives serving the architectural coatings, construction, energy, automotive and various industrial markets. Solutions include coatings additives for architectural paints, finishes and lacquers, cement- and gypsum- based dry mortars, ready-mixed joint compounds, synthetic plasters for commercial and residential construction, and specialty materials for industrial applications. Products include rheology modifiers (cellulosic and associative thickeners), foam control agents, surfactants and wetting agents, pH neutralizers, advanced ceramics used in catalytic converters, and environmental filters, ingredients that aid the manufacturing process of ceramic capacitors, plasma display panels and solar cells, ingredients for textile printing, thermoplastic metals and alloys for welding. Products help improve desired functional outcomes through rheology modification and control, water retention, workability, adhesive strength, binding power, film formation, deposition and suspension and emulsification. Customers include global paint manufacturers, electronics and automotive manufacturers, textile mills, the construction industry, and welders.

2022 compared to 2021

Specialty Additives sales for the current year increased $64 million to $719 million compared to 2021. Favorable product pricing/mix increased sales by $99 million. Unfavorable volume and currency exchange decreased sales by $10 million and $25 million, respectively.

Operating income/loss for the current year increased $42 million to $103 million compared to 2021. Favorable pricing/mix and a capital project impairment in the prior year period increased operating income by $54 million and $10 million, respectively. Higher costs, lower volume and unfavorable foreign currency decreased operating income by $18 million, $2 million and $2 million, respectively.

EBITDA for the current year increased $38 million to $184 million compared to 2021, Adjusted EBITDA increased $27 million to $185 million and Adjusted EBITDA margin increased 1.6 percentage points in 2022 to 25.7%.

2021 compared to 2020

Specialty Additives sales for 2021 increased $66 million to $655 million compared to 2020. Higher volume, favorable currency exchange, and product pricing increased sales by $44 million, $19 million, and $3 million, respectively.

Operating income/loss for 2021 increased $193 million to $61 million compared to 2020. Higher volume, favorable price/mix, foreign currency exchange, a prior year goodwill impairment charge and prior year inventory control costs increased operating income by $12 million, $14 million, $2 million, $174 million and $18 million, respectively. Those improvements were partially offset by higher production costs and a capital project impairment of $17 million and $10 million, respectively.

EBITDA for 2021 increased $197 to $146 million compared to 2020, Adjusted EBITDA increased $15 million to $158 million and Adjusted EBITDA margin decreased 0.2 percentage points in 2021 to 24.1%.

EBITDA and adjusted EBITDA reconciliation

The following EBITDA presentation (as defined and described in the section above) for the years ended September 30, 2022, 2021 and 2020 below is provided as a means to enhance the understanding of financial measurements that Ashland has internally determined to be relevant measures of comparison for the results of Specialty Additives.

The key items during 2022 included $1 million related to environmental reserve adjustments within Specialty Additives.

The key items during 2021 included $10 million and $2 million related to a capital project impairment and environmental reserve adjustments within Specialty Additives, respectively.

The key items during 2020 included $174 million related to Goodwill impairment, $18 million for inventory control measures and $2 million of environmental reserve adjustments.

	Specialty Additives		
(In millions)	2022	2021	2020
Operating income (loss)	$ 103	$ 61	$ (132)
Depreciation and amortization (a)	81	85	81
EBITDA	184	146	(51)
Goodwill impairment	—	—	174
Asset impairment	—	10	—
Inventory control measures	—	—	18
Environmental reserve adjustments	1	2	2
Adjusted EBITDA	$ 185	$ 158	$ 143

Intermediates

Intermediates is comprised of the production of 1,4 butanediol (BDO) and related derivatives, including n-methylpyrrolidone. These products are used as chemical intermediates in the production of engineering polymers and polyurethanes, and as specialty process solvents in a wide array of applications including electronics, pharmaceuticals, water filtration membranes and more. BDO is also supplied to Life Sciences, Personal Care, and Specialty Additives for use as a raw material.

2022 compared to 2021

Intermediates' sales for 2022 increased $78 million to $256 million compared to 2021. Improved product pricing/mix increased sales by $100 million, partially offset by unfavorable volumes and unfavorable foreign currency exchange which decreases sales by $17 million and $5 million, respectively.

Operating income/loss for 2022 increased $52 million to income of $87 million compared to 2021. Price/mix increased operating income by $75 million, and was partially offset by higher costs, lower volume and unfavorable foreign currency which decreased operating income by $13 million, $6 million and $4 million, respectively.

EBITDA and Adjusted EBITDA for 2022 increased $52 million to $100 million compared to 2021. Adjusted EBITDA margin increased 12.1 percentage points in 2022 to 39.1%.

2021 compared to 2020

Intermediates' sales for 2021 increased $49 million to $178 million compared to 2020 primarily due to higher product pricing, higher volume, and favorable foreign exchange increasing sales $31 million, $17 million, and $1 million, respectively.

Operating income/loss for 2021 increased $45 million to income of $35 million compared to 2020. Pricing/mix, lower production costs, prior year inventory adjustments, and favorable foreign exchange increased operating income by $28 million, $9 million, $9 million, and $1 million, respectively. This increase was partially offset by unfavorable volume which decreased operating income by $2 million.

EBITDA for 2021 increased $44 million to $48 million compared to 2020, while Adjusted EBITDA increased $35 million to $48 million. Adjusted EBITDA margin increased 16.9 percentage points in 2021 to 27.0%.

EBITDA and Adjusted EBITDA reconciliation

The following EBITDA presentation (as defined and described in the section above) for the years ended September 30, 2022, 2021 and 2020 is provided as a means to enhance the understanding of financial measurements that Ashland has internally determined to be relevant measures of comparison for the results of Intermediates.

Key items for 2020 included inventory control measures of $9 million.

	Intermediates		
(In millions)	2022	2021	2020
Operating income (loss)	$ 87	$ 35	$ (10)
Depreciation and amortization	13	13	14
EBITDA	100	48	4
Inventory control measures	—	—	9
Adjusted EBITDA	$ 100	$ 48	$ 13

Unallocated and other

The following table summarizes the key components of the Unallocated and other segment's operating income (loss) for each of the last three years ended September 30.

	Unallocated and Other		
(In millions)	2022	2021	2020
Restructuring activities	$ (14)	$ (25)	$ (78)
Environmental expenses	(51)	(40)	(33)
Legal settlement/reserve	—	—	(2)
Income on acquisitions and divestitures, net	42	11	2
Other expenses (primarily governance and legacy expenses)	(91)	(53)	(35)
Total expense	$ (114)	$ (107)	$ (146)

Unallocated and other recorded expense of $114 million, $107 million and $146 million for 2022, 2021 and 2020 respectively. The charges for restructuring activities of $14 million, $25 million and $78 million during 2022, 2021 and 2020, respectively, were primarily comprised of the following items:

- $5 million, $10 million and $58 million of severance, lease abandonment and other restructuring costs related to company-wide cost reduction programs during 2022, 2021 and 2020, respectively, and;
- $9 million, $15 million and $20 million of stranded divestiture costs during 2022, 2021 and 2020, respectively.

The remaining items included: $51 million, $40 million and $33 million for environmental expenses in 2022, 2021 and 2020, respectively, and $2 million for legal settlement reserves in 2020, and income of $42 million, $11 million and $2 million from acquisitions and divestitures in 2022, 2021 and 2020, respectively. See income on acquisitions and divestitures caption review above for additional details.

Other expenses between periods were driven by increases in governance and legacy expenses associated with foreign currency, deferred compensation, stock compensation and incentive compensation.

FINANCIAL POSITION

Liquidity

Ashland had $646 million in cash and cash equivalents as of September 30, 2022, of which $230 million was held by foreign subsidiaries and had no significant limitations that would prohibit remitting the funds to satisfy corporate obligations. In certain circumstances, if such amounts were repatriated to the United States, additional taxes might need to be accrued and paid depending on the source of the earnings remitted. Ashland currently has no plans to repatriate any amounts for which additional taxes would need to be accrued. However, due to the Tax Act enacted in 2018, Ashland may reassess this position as it pertains to future earnings.

Ashland has taken actions and may continue to take actions intended to increase its cash position and preserve financial flexibility in light of current uncertainty in global markets. During July 2022, Ashland enacted an amendment to the 2020 credit agreement. The amended credit agreement (the 2022 Credit Agreement) provides for a $600 million five-year revolving credit facility (the 2022 Revolving Credit Facility). Proceeds of borrowings under the 2022 Revolving Credit Facility are intended to provide ongoing working capital and for other general corporate purposes. During 2022, Ashland prepaid its Term loan A principal balance of $250 million and repaid the existing balance on its European short-term loan facility for $23 million. As of September 30, 2022, Ashland has total remaining borrowing capacity of $680 million available under the Revolving Credit Facility and foreign Accounts Receivable Securitization Facility. Ashland had zero available liquidity under the U.S. Accounts Receivable Sales Program as of September 30, 2022. Ashland has no maturities related to revolving credit facilities or bonds until fiscal 2027. See Note I for more information.

Ashland believes that cash flow from operations, availability under existing credit facilities and arrangements, current cash and investment balances and the ability to obtain other financing, if necessary, will provide adequate cash funds for Ashland's foreseeable working capital needs, capital expenditures at existing facilities, dividend payments and debt service obligations. Ashland's cash requirements are subject to change as business conditions warrant and opportunities arise. The timing and size of any new business ventures or acquisitions that the Company may complete may also impact its cash requirements.

Ashland's cash flows from operating, investing and financing activities, as reflected in the Statements of Consolidated Cash Flows, are summarized as follows.

(In millions)	2022	2021	2020
Cash provided (used) by:			
Operating activities from continuing operations	$ 193	$ 466	$ 227
Investing activities from continuing operations	(102)	(367)	(85)
Financing activities from continuing operations	(896)	(426)	9
Discontinued operations	1,252	80	69
Effect of currency exchange rate changes on cash and cash equivalents	(11)	3	2
Net increase (decrease) in cash and cash equivalents	$ 436	$ (244)	$ 222

Ashland paid income taxes of $406 million, of which $339 million related to discontinued operations, during 2022 compared to $1 million in 2021 and $91 million in 2020. Cash receipts for interest income were $4 million in 2022, and $1 million in 2021 and 2020, respectively, while cash payments for interest expense amounted to $56 million in 2022, $62 million in 2021 and $77 million in 2020.

Operating activities

The following discloses the cash flows associated with Ashland's operating activities for 2022, 2021 and 2020, respectively.

(In millions)	2022	2021	2020
Cash flows provided (used) by operating activities from continuing operations			
Net income (loss)	$ 927	$ 220	$ (508)
Income from discontinued operations (net of tax)	(746)	(47)	(47)
Adjustments to reconcile income from continuing operations to cash flows from operating activities			
Depreciation and amortization	241	244	235
Original issue discount and debt issuance cost amortization	7	7	15
Deferred income taxes	(35)	(26)	(42)
Distributions from equity affiliates	—	1	1
Gain from sales of property and equipment	—	(4)	—
Stock based compensation expense - Note P	18	15	14
Excess tax benefits on stock based compensation	1	2	1
Loss on early retirement of debt	—	16	59
Loss (income) from restricted investments	86	(33)	(30)
Income on acquisitions and divestitures - Notes B and C	(42)	(15)	(3)
Impairments	—	13	530
Pension contributions	(5)	(8)	(6)
Loss (gain) on pension and other postretirement plan remeasurements	(22)	1	(1)
Change in operating assets and liabilities (a)	(237)	80	9
Total cash flows provided by operating activities from continuing operations	$ 193	$ 466	$ 227

(a) Excludes changes resulting from operations acquired or sold.

Cash flows provided by operating activities from continuing operations, a major source of Ashland's liquidity, amounted to $193 million in 2022, $466 million in 2021 and $227 million in 2020.

Operating Activities - Operating Assets and Liabilities

The cash results during each year were primarily driven by net income, excluding discontinued operation results, adjusted for certain non-cash items including depreciation and amortization (including debt issuance cost amortization), income on acquisitions and divestitures as well as changes in working capital, which are fluctuations within accounts receivable, inventory, trade payables and accrued expenses.

The following details certain changes in key operating assets and liabilities for 2022, 2021 and 2020, respectively.

(In millions)	2022	2021	2020
Cash flows from assets and liabilities (a)			
Accounts receivable	$ (23)	$ 72	$ 2
Inventories	(141)	41	64
Trade and other payables	34	3	(46)
Other assets and liabilities	(107)	(36)	(11)
Change in operating assets and liabilities	$ (237)	$ 80	$ 9

(a) Excludes changes resulting from operations acquired or sold.

Changes in net working capital accounted for outflows of $130 million in 2022, and inflows of $116 million in 2021 and $20 million in 2020, and were driven by the following:

- Accounts receivable – Changes in accounts receivable resulted in outflows of $23 million, and inflows of $72 million, and $2 million in 2022, 2021 and 2020, respectively, and were primarily related to $17 million and $92 million of inflows from the U.S. Accounts Receivable Sales Program in 2022 and 2021, respectively, and to sales volumes in each period.
- Inventory – Changes in inventory resulted in cash outflows of $141 million in 2022 and inflows of $41 million in 2021 and $64 million in 2020 and were primarily driven by inventory management activities, including significant plant shut-downs in the fourth quarter of 2020. Additionally, 2022 was impacted by cost inflation and management efforts to rebuild inventory levels globally in response to global supply-chain challenges.
- Trade and other payables – Changes in trade and other payables resulted in cash inflows of $34 million in 2022, cash inflows of $3 million in 2021 and cash outflows of $46 million in 2020, respectively, and primarily related to the timing of certain payments.

The remaining cash outflows of $107 million, $36 million and $11 million in 2022, 2021 and 2020, respectively, were primarily due to income taxes paid or income tax refunds, interest paid, and adjustments to certain accruals and other long-term assets and liabilities such as payments associated with environmental remediation.

Operating Activities - Other

Operating cash flows for 2022 included income from continuing operations of $181 million and significant non-cash adjustments of $241 million for depreciation and amortization, $18 million for stock-based compensation expense, $86 million of losses from restricted investments, $22 million gain on pension and other postretirement plan remeasurements, $35 million for deferred taxes, and $42 million of income on acquisitions and divestitures.

Operating cash flows for 2021 included income from continuing operations of $173 million and significant non-cash adjustments of $244 million for depreciation and amortization, $15 million for stock-based compensation expense, $16 million for losses on early retirement of debt, $33 million of income from restricted investments, $26 million for deferred taxes, $15 million of income on acquisitions and divestitures and $13 million for impairment charges.

Operating cash flows for 2020 included loss from continuing operations of $555 million and significant non-cash adjustments of $530 million for a goodwill impairment charge, $235 million for depreciation and amortization, $59 million loss on early retirement of debt, $15 million original issue discounts and debt issuance cost amortization, $42 million for deferred income taxes, $14 million related for stock-based compensation expense and $30 million income from restricted investments.

Investing activities

The following discloses the cash flows associated with Ashland's investing activities for 2022, 2021 and 2020.

(In millions)	2022	2021	2020
Cash flows provided (used) by investing activities from continuing operations			
Additions to property, plant and equipment	$ (113)	$ (105)	$ (133)
Proceeds from disposal of property, plant and equipment	51	5	5
Purchase of operations - net of cash acquired	—	(309)	—
Proceeds from sale or restructuring of operations	—	14	9
Proceeds from settlement of Company-owned life insurance contracts	3	91	8
Company-owned life insurance payments	(4)	(6)	(6)
Net purchases of funds restricted for specific transactions	(74)	(91)	(3)
Reimbursement from restricted investments	35	33	35
Proceeds from sale of securities	87	149	21
Purchase of securities	(87)	(149)	(21)
Proceeds from the settlement of derivative instruments	—	1	—
Total cash flows used by investing activities from continuing operations	$ (102)	$ (367)	$ (85)

Cash used by investing activities was $102 million in 2022 compared to $367 million and $85 million in 2021 and 2020, respectively. The significant cash investing activities for the current year primarily related to cash outflows of $113 million for capital expenditures and $74 million restricted for investment trust purposes for environmental. Additionally, there were inflows of $51 million from the disposal of excess corporate property and reimbursements of $35 million from the restricted renewable annual investment trusts.

The 2021 year included cash outflows of $105 million for capital expenditures and $309 million related to the purchase of the Schülke personal care business. Additionally, there were reimbursements of $33 million from the restricted renewable annual investment trusts and $14 million of proceeds from the sale of a manufacturing facility as well as post-closing adjustments. During the fourth quarter of fiscal 2021, Ashland liquidated $90 million in company owned life insurance contracts to initiate the environmental trust as part of restricted investments.

The 2020 year included cash outflows of $133 million for capital expenditures. Additionally, there were reimbursements of $35 million from the restricted renewable annual investment trusts and $9 million of proceeds from the sale of a manufacturing facility.

Financing activities

The following discloses the cash flows associated with Ashland's financing activities for 2022, 2021 and 2020, respectively.

(In millions)	2022	2021	2020
Cash flows provided (used) by financing activities from continuing operations			
Proceeds from issuance of long-term debt	$ —	$ 450	$ 804
Repayment of long-term debt	(250)	(411)	(767)
Premium on long-term debt repayment	—	(16)	(59)
Proceeds from (repayment of) short-term debt	(365)	84	115
Repurchase of common stock	(200)	(450)	—
Debt issuance costs	(2)	(6)	(11)
Cash dividends paid	(70)	(70)	(66)
Stock based compensation employee withholding taxes paid in cash	(9)	(7)	(7)
Total cash flows provided (used) by financing activities from continuing operations	$ (896)	$ (426)	$ 9

Cash used by financing activities was $896 million for 2022, $426 million for 2021, and $9 million inflow for 2020. Significant cash financing activities for 2022 included outflows of $250 million for the full prepayment of the term loan A and short-term debt repayment of $365 million. See note I for additional information. 2022 also included cash dividends paid of $1.27 per share, for a total of $70 million and common stock repurchases of $200 million.

Significant cash financing activities for 2021 included $411 million for the full repayment of the 4.750% notes due 2022, $16 million of premiums paid on the retirement of the aforementioned notes, $450 million of proceeds from the issuance of new 3.375% senior notes due 2031, payments of $6 million of new debt issuance costs, and short-term debt of $84 million. See note I for additional information. 2021 also included cash dividends paid of $1.15 per share, for a total of $70 million and common stock repurchases of $450 million.

Significant cash financing activities for 2020 included proceeds from issuance of long-term debt, repayment of long-term debt, premiums paid on retirement of long-term debt, and debt issuance costs paid of $804 million, $767 million, $59 million and $11 million, respectively, all related to debt refinancing activity. See note I for additional information. 2020 also included short-term cash inflows of $115 million, primarily related to draws on the 2020 Revolving Credit Facility and cash dividends paid of $1.10 per share, for a total of $66 million.

Cash provided (used) by discontinued operations

The following discloses the cash flows associated with Ashland's discontinued operations for 2022, 2021 and 2020, respectively.

(In millions)	2022	2021	2020
Cash provided (used) by discontinued operations			
Operating cash flows	$ (406)	$ 94	$ (24)
Investing cash flows	1,658	(14)	93
Total cash provided (used) by discontinued operations	$ 1,252	$ 80	$ 69

Cash flows for discontinued operations in 2022, 2021 and 2020 primarily related to net cash inflows of $1.3 billion (which includes net proceeds from the completed sale of the Performance Adhesives business segment of $1.7 billion in 2022) related to the divestiture of the Performance Adhesives business segment including $339 million in cash tax payments associated with the transaction in 2022; Inflows of $88 million related to the Performance Adhesives segment and a $30 million cash inflow for a tax refund associated with the Composites divestiture in 2021; $80 million inflows related to the Performance Adhesives segment, $98 million inflows related to the sale of the Maleic business and $59 million cash outflows for tax payments associated with the sale of the Composites business and Marl facility in 2020. The remaining cash flows for discontinued operations for these years related to other previously divested businesses, including net payments of asbestos and environmental liabilities related to those divested businesses.

Free cash flow and other liquidity resources

The following represents Ashland's calculation of free cash flow and ongoing free cash flow for the disclosed periods. Free cash flow does not reflect adjustments for certain non-discretionary cash flows such as mandatory debt repayments.

	September 30		
(In millions)	2022	2021	2020
Cash flows provided by operating activities from continuing operations	$ 193	$ 466	$ 227
Less:			
Additions to property, plant and equipment	(113)	(105)	(133)
Free cash flow	80	361	94
Cash (inflows) outflows from U.S. Accounts Receivable Sales Program (a)	(17)	(92)	—
Restructuring-related payments (b)	10	44	30
Environmental and related litigation payments (c)	54	38	29
Ongoing free cash flow	$ 127	$ 351	$ 153
Adjusted EBITDA (d)	590	495	449
Ongoing free cash flow conversion (e)	22%	71%	34%

(a) Represents activity associated with the U.S. Accounts Receivable Sales Program impacting each period presented.

(b) Restructuring payments incurred during each period.

(c) Represents cash outflows associated with environmental and related litigation payments which will be reimbursed by the environmental trust.

(d) See adjusted EBITDA reconciliation.

(e) Ongoing free cash flow divided by Adjusted EBITDA.

Working capital (current assets minus current liabilities, excluding long-term debt due within one year) amounted to $1,215 million and $792 million as of September 30, 2022 and September 30, 2021, respectively. The increase in working capital was the primary reason of the $224 million decline in ongoing free cash flow between periods primarily as a result of increased inventories to navigate supply-chain issues as well as cost inflation and increased accounts receivable as a result of higher sales volumes. Higher cash tax payments of $39 million also negatively impacted ongoing free cash flow between periods. Liquid assets (cash, cash equivalents and accounts receivable) amounted to 190% and 65% of current liabilities (excluding current liabilities held for sale) as of September 30, 2022 and September 30, 2021, respectively.

The following summary reflects Ashland's cash, investment securities and unused borrowing capacity as of September 30, 2022, 2021 and 2020.

	September 30		
(In millions)	2022	2021	2020
Cash and investment securities			
Cash and cash equivalents	$ 646	$ 210	$ 454
Restricted investments (a)	374	421	331
Unused borrowing capacity			
Revolving credit facility	$ 581	$ 356	$ 500
2018 accounts receivable securitization (foreign)	99	—	—
Accounts receivable sales program (U.S.)	—	12	—

(a) Includes $245 million, $333 million and $331 million related to the Asbestos trust and $129 million, $88 million and zero related to the Environmental trust as of September 30, 2022, 2021 and 2020 respectively.

The borrowing capacity remaining under the $600 million revolving credit facility was $581 million due to an outstanding balance of zero, as well as a reduction of $19 million for letters of credit outstanding at September 30, 2022. In total, Ashland's available liquidity position, which includes cash, the revolving credit facilities and accounts receivable securitization facilities, was $1,326 million at September 30, 2022 as compared to $566 million at September 30, 2021 and $954 million at September 30, 2020. Ashland had zero liquidity available under the U.S. Accounts Receivable Sales Program as of September 30, 2022 compared to $12 million as of September 30, 2021. Ashland also maintained $374 million of restricted investments to pay for future asbestos claims and environmental remediation and litigation. For further information, see Note I within the Notes to Consolidated Financial Statements.

Capital resources

Debt

The following summary reflects Ashland's debt as of September 30, 2022 and 2021.

	September 30	
(In millions)	2022	2021
Short-term debt (includes current portion of long-term debt)	$ —	$ 374
Long-term debt (less current portion and debt issuance cost discounts) (a)	1,270	1,596
Total debt	$ 1,270	$ 1,970

(a) Includes $14 million and $17 million of debt issuance cost discounts as of September 30, 2022 and 2021, respectively.

During July 2022, Ashland enacted an amendment to the 2020 credit agreement which provides for a $600 million five-year revolving credit facility. Proceeds of borrowings under the 2022 Revolving Credit Facility are intended to provide ongoing working capital and for other general corporate purposes. During fiscal 2021, Ashland completed the issuance of 3.375% senior unsecured notes due 2031 with an aggregate principal amount of $450 million. Ashland used the net proceeds of the offering to redeem its obligations under the existing 4.750% senior notes due 2022 for a total of $411 million.

Debt as a percent of capital employed was 28% at September 30, 2022 and 42% at September 30, 2021. At September 30, 2022, Ashland's total debt had an outstanding principal balance of $1,321 million, discounts of $37 million and debt issuance costs of $14 million. Ashland had no long-term debt (excluding debt issuance costs) maturing within the next 4 years and $4 million due in fiscal 2027.

Credit Agreements and Refinancing

Note Issuances

During August 2021, Ashland, through one of its subsidiaries, completed the issuance of 3.375% senior unsecured notes due 2031 with an aggregate principal amount of $450 million (the 2031 Notes). The notes are guaranteed on an unsecured basis by Ashland. Ashland used the net proceeds of the offering (after deducting initial purchasers' discounts and other fees and expenses) to redeem its obligations under the existing 4.750% senior notes due 2022 described below in debt repayments, and to pay fees and expenses associated therewith.

Ashland incurred $6 million of new debt issuance costs in connection with the 2031 Notes, which is amortized using the effective interest method over the 2031 Notes' term and was included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss).

During January 2020, a subsidiary of Ashland, Ashland Services B.V., completed the issuance of 2.00% senior unsecured notes due 2028 with an aggregate principal amount of €500 million (the 2028 Notes). The notes are senior unsecured obligations of Ashland Services B.V and are guaranteed on an unsecured basis by Ashland.

Ashland incurred $8 million of new debt issuance costs in connection with the 2028 Notes, which is amortized using the effective interest method over the 2028 Notes’ term.

2020 Credit Agreement

During January 2020, Ashland, through two of its subsidiaries, entered into a new senior unsecured credit agreement (the 2020 Credit Agreement) with a group of lenders, replacing the 2017 Credit Agreement. The 2020 Credit Agreement provided for (i) a $600 million unsecured five-year revolving credit facility (the 2020 Revolving Credit Facility) and (ii) a $250 million unsecured five-year term loan facility (the 2020 Term Loan Facility). Proceeds of borrowings under the 2020 Revolving Credit Facility were used to refinance the Ashland’s existing 2017 Credit Agreement, to provide ongoing working capital and for other general corporate purposes.

Ashland incurred $4 million of new debt issuance costs in connection with the 2020 Credit Agreement, of which $1 million was expensed immediately during 2020 within the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss). The remaining balance is amortized using the straight-line method.

During July 2022, Ashland, through two of its subsidiaries, enacted an amendment to the 2020 credit agreement. The amended credit agreement (the 2022 Credit Agreement) provides for a $600 million five-year revolving credit facility (the 2022 Revolving Credit Facility). The 2022 Credit Agreement and the obligations of Ashland Services B.V. under the 2022 Revolving Credit Facility are guaranteed by Ashland.

At Ashland’s option, loans issued under the 2022 Credit Agreement will bear interest at (a) in the case of loans denominated in U.S. dollars, either Term SOFR or an alternate base rate and (b) in the case of loans denominated in Euros, EURIBOR, in each case plus the applicable interest rate margin. Loans will initially bear interest at Term SOFR or EURIBOR plus 1.250% per annum, in the case of Term SOFR borrowings or EURIBOR borrowings, respectively, or at the alternate base rate plus 0.250% per annum, in the case of alternate base rate borrowings, through and including the date of delivery of a quarterly compliance certificate and thereafter the interest rate will fluctuate between Term SOFR or EURIBOR plus 1.250% per annum and Term SOFR or EURIBOR plus 1.750% per annum (or between the alternate base rate plus 0.250% per annum and the alternate base rate plus 0.750% per annum), based upon the Consolidated Net Leverage Ratio (as defined in the Credit Agreement) at such time. Term SOFR borrowings are subject to a credit spread adjustment of 0.10% per annum. In addition, the Company will initially be required to pay fees of 0.125% per annum on the daily unused amount of the Revolving Facility through and including the date of delivery of a quarterly compliance certificate, and thereafter the fee rate will fluctuate between 0.125% and 0.275% per annum, based upon the Consolidated Net Leverage Ratio. Borrowings under the 2022 Credit Agreement may be prepaid at any time without premiums.

As a result of the amendment of the 2020 Credit Agreement, Ashland recognized a $1 million charge for accelerated amortization of previously capitalized debt issuance costs during 2022, which is included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss). Ashland also incurred $2 million of new debt issuance costs in connection with the 2022 Credit Agreement, of which $1 million was expensed immediately during 2022 within the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss). The remaining balance is amortized using the straight-line method.

The 2022 Credit Agreement contains financial covenants for leverage and interest coverage ratios akin to those in effect under the 2020 Credit Agreement. The 2022 Credit Agreement contains usual and customary representations, warranties and affirmative and negative covenants, including financial covenants for leverage and interest coverage ratios, limitations on liens, additional indebtedness, further negative pledges, investments, mergers, sale of assets and restricted payments, and other customary limitations.

Debt repayments and repurchases

Cash repatriation

During 2022 and 2021, Ashland repatriated approximately $250 million and $131 million, respectively, in cash that was primarily used to repay existing debt, principally portions of the 4.75% senior notes due 2022, the 6.875% senior notes due 2043 and the 6.5% junior notes in 2020 (as previously discussed).

2022 Debt repayments and repurchases

2020 Credit Agreement

During 2022, Ashland prepaid its Term loan A principal balance of $250 million.

Other Debt

During 2022, Ashland repaid the outstanding balance on its European short-term loan facility for $23 million.

2021 Debt repayments and repurchases

Redemption of 4.750% senior notes due 2022

During 2021, Ashland redeemed all of its outstanding 4.750% senior notes due 2022 (the 2022 Notes), of which approximately $411 million were outstanding. Ashland recognized a $1 million charge related to accelerated accretion on debt discounts and accelerated amortization of previously capitalized debt issuance costs, which is included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss).

Total premiums paid for all the tender offers in 2021 noted above were $16 million, which is included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss).

2020 Debt repayments and repurchases

Tender offers of 4.750% senior notes due 2022

During 2020, Ashland executed tender offers of the 2022 Notes. As a result of these repurchases, the carrying values of the 2022 Notes was reduced by $670 million. Ashland recognized a $5 million charge related to accelerated accretion on debt discounts and accelerated amortization of previously capitalized debt issuance costs, which is included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss).

Tender offers of 6.875% notes due 2043

During 2020, Ashland executed tender offers of its 6.875% notes due 2043 (the 2043 Notes). As a result of these repurchases, the carrying values of the 2043 Notes was reduced by $92 million. Ashland recognized a $1 million charge related to accelerated accretion on debt premiums and accelerated amortization of previously capitalized debt issuance costs, which is included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss).

Tender offers of 6.500% Junior Subordinated Debentures due 2029

During 2020, Ashland executed tender offers of Hercules LLC's 6.500% junior subordinated debentures due 2029 (the 2029 Junior Debentures). As a result of these repurchases, the carrying values of the 2029 Junior Debentures was reduced by $2 million.

Total premiums paid for all the tender offers in 2020 noted above were $59 million, which is included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss).

Accounts receivable facilities and off-balance sheet arrangements

U.S. accounts receivable sales program

On March 17, 2021, a wholly-owned, bankruptcy-remote special purpose entity and consolidated Ashland subsidiary (SPE) entered into an agreement with a group of entities (buyers) to sell certain trade receivables, without recourse beyond the pledged receivables, of two other U.S. based Ashland subsidiaries. Under the agreement, Ashland can transfer whole receivables up to a limit established by the buyer, which is currently set at $125 million between February and October of each year and up to $100 million all other times. Ashland's continuing involvement is limited to servicing the receivables, including billing, collections and remittance of payments to the buyers as well as a limited guarantee on over-collateralization. The arrangement terminates on May 31, 2023, unless terminated earlier pursuant to the terms of the agreement.

Ashland determined that any receivables transferred under this agreement are put presumptively beyond the reach of Ashland and its creditors, even in bankruptcy or other receivership. Ashland received a true sale at law and non-consolidation opinions to support the legal isolation of these receivables. Ashland accounts for the receivables transferred to buyers as sales. Ashland recognizes any gains or losses based on the excess of proceeds received net of buyer's discounts and fees compared to the carrying value of the assets. Proceeds received, net of buyer's discounts and fees, are recorded within the operating activities of the Statements of Consolidated Cash Flows. Losses on sale of assets, including related transaction expenses are recorded within the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss). Ashland regularly assesses its servicing obligations and records them as assets or liabilities when appropriate. Ashland also monitors its obligation with regards to the limited guarantee and records the resulting guarantee liability when warranted. When applicable, Ashland discloses the amount of the receivable that serves as over-collateralization as a restricted asset.

Ashland recognized a $1 million loss within the Statements of Consolidated Comprehensive Income (Loss) for 2022 and 2021, respectively, within the net interest and other expense caption associated with sales under the program. Ashland has recorded $110 million of sales against the buyer's limit, which was $125 million at September 30, 2022, compared to $113 million of sales against the buyer's limit, which was $125 million at September 30, 2021. Ashland transferred $136 million and $167 million in receivables to the SPE as of September 30, 2022 and 2021, respectively. Ashland recorded liabilities related to its service obligations and limited guarantee as of September 30, 2022 and 2021 of less than $1 million. As of September 30, 2022, the year-to-date gross cash proceeds received for receivables transferred and derecognized was $312 million, of which $315 million was collected by Ashland in our capacity as a servicer of the receivables and remitted to the buyer. The difference of $3 million represents the impact of a net reduction in account receivable sales volume during the current year.

2018 foreign accounts receivable securitization

During July 2018, Ashland entered into a €115 million accounts receivable securitization facility (the Program) for the transfer by certain subsidiaries of Ashland (the Sellers) directly or indirectly to Ester Finance Titrisation (the Purchaser), a wholly-owned subsidiary of Crédit Agricole Corporate and Investment Bank (the Arranger), of certain receivables and/or collections originated by the Sellers towards certain corporate debtors located in multiple European jurisdictions and denominated in multiple currencies. The Program originally had a term of two years, but was extended to August 2021 in September 2019. During July 2021, the termination date of the Program was extended to July 2023. During July 2020, the available funding for qualified receivables under the accounts receivable securitization facility decreased from €115 million to €100 million.

Under the Program, each Seller will assign, on an ongoing basis, certain of its accounts receivable and the right to the collections on those accounts receivable to the Purchaser. Under the terms of the Program, the Sellers could, from time to time, obtain up to €100 million from the Purchaser through the sale of an undivided interest in such accounts receivable and collections. Ashland accounts for the securitization facility as secured borrowings, and the receivables sold pursuant to the facility are included in the Consolidated Balance Sheets as accounts receivable. Fundings under the Program will be repaid as accounts receivable are collected, with new fundings being advanced (through daily advanced purchase price) as new accounts receivable are originated by the Sellers and assigned to the Purchaser, with settlement occurring monthly. Ashland classifies any borrowings under this facility as a short-term debt instrument within the Consolidated Balance Sheets. Once sold to the Purchaser, the accounts receivable and rights to collection described above are separate and distinct from each Sellers' own assets and are not available to its creditors should such Sellers become insolvent.

At September 30, 2022 and 2021, the outstanding amount of accounts receivable transferred by Ashland to the Purchaser was $162 million and $152 million, respectively, and there were zero and $117 million, respectively, of borrowings (denominated in multiple currencies) under the facility. The weighted-average interest rate for this instrument was 0.5% and 0.6% for 2022 and 2021, respectively.

Other debt

At September 30, 2022 and 2021, Ashland held other debt totaling $63 million and $83 million, respectively, comprised primarily of a European short-term loan facility, the 6.50% notes due 2029 and other notes.

Available borrowing capacity and liquidity

The borrowing capacity remaining under the $600 million 2022 Revolving Credit Facility was $581 million due to an outstanding balance of zero, as well as a reduction of $19 million for letters of credit outstanding at September 30, 2022. Ashland's total borrowing capacity at September 30, 2022 was $680 million, which included $99 million of available capacity from the foreign 2018 accounts receivable securitization facility.

Additionally, Ashland has zero available liquidity under its current U.S. Accounts Receivable Sales Program.

Covenants related to current Ashland debt agreements

Ashland's debt contains usual and customary representations, warranties and affirmative and negative covenants, including financial covenants for leverage and interest coverage ratios, limitations on liens, additional subsidiary indebtedness, restrictions on subsidiary distributions, investments, mergers, sale of assets and restricted payments and other customary limitations. As of September 30, 2022, Ashland was in compliance with all debt agreement covenant restrictions.

The maximum consolidated net leverage ratio permitted under Ashland's most recent credit agreement (the 2022 Credit Agreement) is 4.0. The 2022 Credit Agreement defines the consolidated net leverage ratio as the ratio of consolidated indebtedness minus unrestricted cash and cash equivalents to consolidated EBITDA (Covenant Adjusted EBITDA) for any measurement period. In general, the 2022 Credit Agreement defines Covenant Adjusted EBITDA as net income plus consolidated interest charges, taxes, depreciation and amortization expense, fees and expenses related to capital market transactions and proposed or actual acquisitions and divestitures, restructuring and integration charges, certain environmental charges, non-cash stock and equity compensation expense, and any other nonrecurring expenses or losses that do not represent a cash item in such period or any future period; less any non-cash gains or other items increasing net income. The computation of Covenant Adjusted EBITDA differs from the calculation of EBITDA and Adjusted EBITDA, which have been reconciled on page M-14. In general, consolidated indebtedness includes debt plus all purchase money indebtedness, banker's acceptances and bank guaranties, deferred purchase price of property or services, attributable indebtedness and guarantees. At September 30, 2022, Ashland's calculation of the consolidated net leverage ratio was 1.1.

The minimum required consolidated interest coverage ratio under the 2022 Credit Agreement is 3.0. The 2022 Credit Agreement defines the consolidated interest coverage ratio as the ratio of Covenant Adjusted EBITDA to consolidated interest charges for any measurement period. At September 30, 2022, Ashland's calculation of the consolidated interest coverage ratio was 10.8.

Any change in Covenant Adjusted EBITDA of $100 million would have an approximate 0.2x effect on the consolidated net leverage ratio and a 1.8x effect on the consolidated interest coverage ratio. Any change in consolidated indebtedness of $100 million would affect the consolidated net leverage ratio by approximately 0.2x.

Ashland credit ratings

Ashland's corporate credit ratings remained unchanged at BB+ by Standard & Poor's and Ba1 by Moody's Investor Services. As of September 30, 2022, both Moody's Investor Services and Standard & Poor's outlook remained at stable. Subsequent changes to these ratings or outlook may have an effect on Ashland's borrowing rate or ability to access capital markets in the future.

Additional capital resources

Ashland cash projection

Ashland believes that cash flow from operations, availability under existing credit facilities and arrangements, current cash and investment balances and the ability to obtain other financing, if necessary, will provide adequate cash funds for the Company's foreseeable working capital needs, capital expenditures at existing facilities, pending acquisitions, dividend payments and debt service obligations. The Company's cash requirements are subject to change as business conditions warrant and opportunities arise. The timing and size of any new business ventures or acquisitions that the Company may complete may also impact its cash requirements.

Ashland expects the following material cash funding requirements from known contractual obligations at September 30, 2022:

(In millions)	Total	Less than 1 year	More than 1 year
Material Cash Funding Requirements Contractual obligations			
Raw material and service contract purchase obligations (a)	$ 53	$ 27	$ 26
Employee benefit obligations (b)	57	7	50
Operating lease obligations (c)	151	20	131
Interest payments (d)	645	54	591
Unrecognized tax benefits (e)	84	3	81
One-time transition tax (f)	46	5	41
Total contractual obligations	$ 1,036	$ 116	$ 920
Other commitments			
Letters of credit (g)	$ 48	$ 48	$ —

(a) Includes raw material and service contracts where minimal committed quantities and prices are fixed.

(b) Includes estimated funding of Ashland's qualified U.S. and non-U.S. pension plans for 2022 as well as projected benefit payments through 2030 under Ashland's unfunded pension and other postretirement benefit plans. Excludes the benefit payments from the pension plan trust funds. See Note M of the Notes to Consolidated Financial Statements for additional information.

(c) Includes leases for office buildings, transportation equipment, warehouses and storage facilities and other equipment. For further information, see Note K of the Notes to Consolidated Financial Statements.

(d) Includes interest expense on both variable and fixed rate debt assuming no prepayments. Variable interest rates have been assumed to remain constant through the end of the term at rates that existed as of September 30, 2022.

(e) Due to uncertainties in the timing of the effective settlement of tax positions with respect to taxing authorities, Ashland is unable to determine the timing of payments related to noncurrent unrecognized tax benefits, including interest and penalties. Therefore, these amounts were included in the "More than 1 year" column.

(f) As a result of the Tax Act enacted during fiscal year 2018, Ashland has currently recorded a $46 million liability for the one-time transition tax. This liability will be payable over five years.

(g) Ashland issues various types of letters of credit as part of its normal course of business.

Total Equity

Total equity was $3,220 million and $2,752 million at September 30, 2022 and September 30, 2021, respectively. During 2022, there were increases of $927 million for net income, $8 million for common shares issued under stock incentive plans, and a $1 million gain on pension and postretirement obligation adjustments. The increases were partially offset by decreases of $197 million for deferred translation losses, $1 million for unrealized losses on commodity hedges, $200 million for repurchases of common stock and $70 million for dividends paid during 2022.

Stock repurchase programs

On May 25, 2022, Ashland's board of directors authorized a new, evergreen $500 million common share repurchase program (2022 stock repurchase program). The new authorization terminates and replaces the company's 2018 $1 billion share repurchase program, which had $150 million outstanding at the date of termination. As of September 30, 2022, $500 million remained available for repurchase under the 2022 stock repurchase program.

Stock repurchase program agreements

In September 2021, under the 2018 stock repurchase program, Ashland announced that it entered into an accelerated share repurchase agreement (2021 ASR Agreement). Under the 2021 ASR Agreement, Ashland paid an initial purchase price of $450 million and received an initial delivery of 3.9 million shares of common stock during September 2021. The bank exercised its early termination option under the 2021 ASR Agreement in February 2022, and an additional 0.7 million shares were repurchased, bringing the total shares repurchased upon settlement to 4.6 million.

On March 1, 2022, under the 2018 stock repurchase program, Ashland entered into an agreement to repurchase an aggregate amount of $200 million of Ashland common stock using open-market purchases under rule 10b-18. On April 8, 2022, Ashland completed repurchases under this agreement repurchasing a total of 2.15 million shares for a total amount of $200 million.

Stockholder dividends

Ashland paid dividends per common share of $1.27, $1.15 and $1.10 during 2022, 2021 and 2020, respectively.

In May 2022, the Board of Directors of Ashland announced a quarterly cash dividend of 33.5 cents per share to eligible stockholders at record, which represented an increase from the previous quarterly cash dividend of 30.0 cents per share. This dividend was paid in the third and fourth quarters of fiscal 2022.

In May 2021, the Board of Directors of Ashland announced a quarterly cash dividend of 30.0 cents per share to eligible stockholders at record, which represented an increase from the previous quarterly cash dividend of 27.5 cents per share. This dividend was paid in the third and fourth quarters of fiscal 2021 and the first and second quarters of fiscal 2022.

In May 2019, the Board of Directors of Ashland announced a quarterly cash dividend of 27.5 cents per share to eligible stockholders at record, which represented an increase from the previous quarterly cash dividend of 25.0 cents per share. This dividend was paid in each quarter of fiscal 2020 and the first and second quarters of fiscal 2021.

Capital expenditures

Capital expenditures were $113 million for 2022 and averaged $117 million during the last three years. Ashland expects capital expenditures over the next three years of approximately $190 million in 2023 and $165 million annually the next two years. A summary of capital expenditures by reportable segment during 2022, 2021 and 2020 follow.

(In millions)	2022	2021	2020
Life Sciences	$ 28	$ 27	$ 51
Personal Care	14	7	13
Specialty Additives	61	67	59
Intermediates	7	2	5
Unallocated and Other	3	2	5
Total capital expenditures	$ 113	$ 105	$ 133

A summary of the capital employed in Ashland's current operations, which is calculated by adding equity to capital investment, as of the end of the last two years is as follows.

(In millions)	2022	2021
Capital employed (a)		
Life Sciences	$ 1,801	$ 1,857
Personal Care	994	1,082
Specialty Additives	1,379	1,447
Intermediates	138	132

(a) Excludes the assets and liabilities classified within unallocated and other which primarily includes debt and other long-term liabilities such as asbestos and pension. The net liability in unallocated and other was $1,092 million and $2,313 million as of September 30, 2022 and 2021, respectively. Additionally, net assets held for sale were zero million and $547 million as of September 30, 2022 and 2021, respectively.

OFF-BALANCE SHEET ARRANGEMENTS

As part of its normal course of business, Ashland is a party to various financial guarantees and other commitments. These arrangements involve elements of performance and credit risk that are not included in the Consolidated Balance Sheets. The possibility that Ashland would have to make actual cash expenditures in connection with these obligations is largely dependent on the performance of the guaranteed party, or the occurrence of future events that Ashland is unable to predict. The fair value of these guarantees are not significant.

NEW ACCOUNTING PRONOUNCEMENTS

For a discussion and analysis of recently issued accounting pronouncements and its impact on Ashland, see Note A of Notes to Consolidated Financial Statements.

CRITICAL ACCOUNTING ESTIMATES

The preparation of Ashland's Consolidated Financial Statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, sales and expenses, and the disclosures of contingent assets and liabilities. Significant items that are subject to such estimates and assumptions include, but are not limited to, environmental remediation, asbestos litigation, the accounting for goodwill and other intangible assets and income taxes. Although management bases its estimates on historical experience and various other assumptions that are believed to be reasonable under the circumstances, actual results could differ significantly from the estimates under different assumptions or conditions. Management has reviewed the estimates affecting these items with the Audit Committee of Ashland's Board of Directors.

Environmental remediation and asset retirement obligations

Ashland is subject to various federal, state and local environmental laws and regulations that require environmental assessment or remediation efforts (collectively environmental remediation) at multiple locations. At September 30, 2022, such locations included 76 sites where Ashland has been identified as a potentially responsible party under Superfund or similar state laws, 111 current and former operating facilities and about 1,125 service station properties, of which 17 are being actively remediated. See Note N of the Notes to Consolidated Financial Statements for additional information.

Ashland's reserves for environmental remediation and related environmental litigation amounted to $211 million at September 30, 2022 compared to $207 million at September 30, 2021 of which $157 million at September 30, 2022 and $152 million at September 30, 2021 were classified in other noncurrent liabilities on the Consolidated Balance Sheets. The remaining reserves were classified in accrued expenses and other liabilities on the Consolidated Balance Sheets.

The total reserves for environmental remediation reflect Ashland's estimates of the most likely costs that will be incurred over an extended period to remediate identified conditions for which the costs are reasonably estimable, without regard to any third-party recoveries. Engineering studies, historical experience and other factors are used to identify and evaluate remediation alternatives and their related costs in determining the estimated reserves for environmental remediation. Ashland continues to discount certain environmental sites and regularly adjusts its reserves as environmental remediation continues. Ashland has estimated the value of its probable insurance recoveries associated with its environmental reserve based on management's interpretations and estimates surrounding the available or applicable insurance coverage. At September 30, 2022 and 2021, Ashland's recorded receivable for these probable insurance recoveries was $21 million and $16 million, respectively, of which $17 million and $13 million, respectively, were classified in other noncurrent assets in the Consolidated Balance Sheets.

During 2022, 2021 and 2020, Ashland recognized $66 million, $50 million and $48 million of expense, respectively, for certain environmental liabilities related to normal ongoing remediation cost estimate updates for sites, which is consistent with Ashland's historical environmental accounting policy.

Environmental remediation reserves are subject to uncertainties that affect Ashland's ability to estimate its share of the costs. Such uncertainties involve the nature and extent of contamination at each site and the extent of required cleanup efforts under existing environmental regulations, with varying costs of alternate cleanup methods. Although it is not possible to predict with certainty the ultimate costs of environmental remediation, Ashland currently estimates that the upper end of the reasonably possible range of future costs for identified sites could be as high as approximately $465 million. The largest reserve for any site is 13% of the remediation reserve.

Asbestos litigation

Ashland and Hercules have liabilities from claims alleging personal injury caused by exposure to asbestos. To assist in developing and annually updating independent reserve estimates for future asbestos claims and related costs, Ashland has retained third party actuarial experts Gnarus Advisors, LLC (Gnarus). The methodology used by Gnarus to project future asbestos costs is based largely on recent experience, including claim-filing and settlement rates, disease mix, open claims and litigation defense. The claim experience of Ashland and Hercules are separately compared to the results of previously conducted third party epidemiological studies estimating the number of people likely to develop asbestos-related diseases. Those studies were undertaken in connection with national analyses of the population expected to have been exposed to asbestos. Using that information, Gnarus estimates a range of the number of future claims that may be filed, as well as the related costs that may be incurred in resolving those claims. Changes in asbestos-related liabilities and receivables are recorded on an after-tax basis within the discontinued operations caption in the Statements of Consolidated Comprehensive Income (Loss). See Note N of the Notes to Consolidated Financial Statements for additional information.

Ashland asbestos-related litigation

The claims alleging personal injury caused by exposure to asbestos asserted against Ashland result primarily from indemnification obligations undertaken in 1990 in connection with the sale of Riley, a former subsidiary. The amount and timing of settlements and number of open claims can fluctuate from period to period.

Ashland asbestos-related liability

From the range of estimates, Ashland records the amount it believes to be the best estimate of future payments for litigation defense and claim settlement costs. Ashland reviews this estimate and related assumptions quarterly and annually updates the results of a non-inflated, non-discounted approximate 40-year model developed with the assistance of Gnarus.

During the most recent update completed during 2022, it was determined that the liability for Ashland asbestos-related claims should be increased by $16 million. Total reserves for asbestos claims were $305 million at September 30, 2022 compared to $320 million at September 30, 2021.

Ashland asbestos-related receivables

Ashland has insurance coverage for certain litigation defense and claim settlement costs incurred in connection with its asbestos claims, and coverage-in-place agreements exist with the insurance companies that provide substantially all of the coverage that will be accessed.

For the Ashland asbestos-related obligations, Ashland has estimated the value of probable insurance recoveries associated with its asbestos reserve based on management's interpretations and estimates surrounding the available or applicable insurance coverage, including an assumption that all solvent insurance carriers remain solvent. Substantially all of the estimated receivables from insurance companies are expected to be due from domestic insurers, all of which are solvent.

At September 30, 2022, Ashland's receivable for recoveries of litigation defense and claim settlement costs from insurers amounted to $101 million (excluding the Hercules receivable for asbestos claims). Receivables from insurers amounted to $100 million at September 30, 2021. During 2022, the annual update of the model used for purposes of valuing the asbestos reserve and its impact on valuation of future recoveries from insurers, was completed. This model update resulted in a $7 million increase in the receivable for probable insurance recoveries.

Hercules asbestos-related litigation

Hercules has liabilities from claims alleging personal injury caused by exposure to asbestos. Such claims typically arise from alleged exposure to asbestos fibers from resin encapsulated pipe and tank products which were sold by one of Hercules' former subsidiaries to a limited industrial market. The amount and timing of settlements and number of open claims can fluctuate from period to period.

Hercules asbestos-related liability

From the range of estimates, Ashland records the amount it believes to be the best estimate of future payments for litigation defense and claim settlement costs. Ashland reviews this estimate and related assumptions quarterly and annually updates the results of a non-inflated, non-discounted approximate 40-year model developed with the assistance of Gnarus. As a result of the most recent annual update of this estimate, completed during 2022, it was determined that the liability for Hercules asbestos-related claims should be increased by $15 million. Total reserves for asbestos claims were $213 million at September 30, 2022 compared to $217 million at September 30, 2021.

Hercules asbestos-related receivables

For the Hercules asbestos-related obligations, certain reimbursement obligations pursuant to coverage-in-place agreements with insurance carriers exist. As a result, any increases in the asbestos reserve have been partially offset by probable insurance recoveries. Ashland has estimated the value of probable insurance recoveries associated with its asbestos reserve based on management's interpretations and estimates surrounding the available or applicable insurance coverage, including an assumption that all solvent insurance carriers remain solvent. The estimated receivable consists exclusively of solvent domestic insurers.

As of September 30, 2022 the receivables from insurers amounted to $52 million compared to $47 million as of September 30, 2021. During 2022, the annual update of the model used for purposes of valuing the asbestos reserve and its impact on valuation of future recoveries from insurers was completed. This model update resulted in a $7 million increase in the receivable for probable insurance recoveries.

Asbestos litigation cost projection

Projecting future asbestos costs is subject to numerous variables that are difficult to predict. In addition to the uncertainties surrounding the number of claims that might be received, other variables include the type and severity of the disease alleged by each claimant and the related costs incurred in resolving those claims, dismissal rates, uncertainties surrounding the litigation process from jurisdiction to jurisdiction and from case to case. Furthermore, any predictions with respect to these variables are subject to even greater uncertainty as the projection period lengthens. In light of these inherent uncertainties, Ashland believes that the asbestos reserves for Ashland and Hercules represent the best estimate within a range of possible outcomes. As a part of the process to develop these estimates of future asbestos costs, a range of long-term cost models was developed. These models are based on national studies that predict the number of people likely to develop asbestos-related diseases and are heavily influenced by assumptions regarding long-term inflation rates for indemnity payments and legal defense costs, as well as other variables mentioned previously. Ashland has currently estimated in various models ranging from approximately 40 year periods that it is reasonably possible that total future litigation defense and claim settlement costs on an inflated and undiscounted basis could range as high as approximately $456 million for the Ashland asbestos-related litigation (current reserve of $305 million) and approximately $317 million for the Hercules asbestos-related litigation (current reserve of $213 million), depending on the combination of assumptions selected in the various models. If actual experience is worse than projected, relative to the number of claims filed, the severity of alleged disease associated with those claims or costs incurred to resolve those claims, or actuarial refinement or improvements to the assumptions used within these models are initiated, Ashland may need to further increase the estimates of the costs associated with asbestos claims and these increases could be material over time.

Accounting for goodwill and other intangible assets

Goodwill

Ashland accounts for goodwill and other intangible assets acquired in a business combination in conformity with current accounting guidance which does not allow for goodwill and indefinite-lived intangible assets to be amortized.

Ashland reviews goodwill for impairment annually as of July 1 or when events and circumstances indicate an impairment may have occurred. Ashland tests goodwill for impairment by comparing the estimated fair value of the reporting units to the related carrying value. If the fair value of the reporting unit is lower than its carrying amount, goodwill is written down for the amount by which the carrying amount exceeds fair value. However, the loss recognized cannot exceed the carrying amount of goodwill. Reporting units are defined as either operating segments or one level below the operating segments for which discrete financial information is available and reviewed by the business management. Ashland determined that its reporting units are Life Sciences, Personal Care, Specialty Additives and Intermediates.

Ashland makes various estimates and assumptions in determining the estimated fair value of each reporting unit using a combination of discounted cash flow models and valuations based on earnings multiples for guideline public companies in each reporting unit's industry peer group, when externally quoted market prices are not readily available. Discounted cash flow models are reliant on various assumptions, including projected business results, long-term growth factors and weighted-average cost of capital. Management judgement is involved in estimating these variables, and they include uncertainties since they are forecasting future events. Ashland performs sensitivity analyses by using a range of inputs to confirm the reasonableness of the long-term growth rate and weighted average cost of capital estimates. Additionally, Ashland compares the indicated equity value to Ashland's market capitalization and evaluates the resulting implied control premium/discount to determine if the estimated enterprise value is reasonable compared to external market indicators.

Ashland performed its annual goodwill impairment using the quantitative approach as of July 1, 2022 and concluded there was no impairment as of that date. The impairment test at July 1, 2022 concluded that all reporting units had fair values significantly in excess of its respective carrying amounts. Ashland compared the total fair values of the reporting units to Ashland's market capitalization at July 1, 2022 to determine if the fair values are reasonable compared to external market indicators. Ashland believes its valuation models are reasonable estimates of fair value and reflect appropriate levels of conservatism. Subsequent to this annual impairment test, no additional indications of an impairment were identified.

Assumptions inherent in the valuation methodologies include estimates of future projected business results (principally revenue and EBITDA), long-term growth rates, and the weighted-average cost of capital. Ashland performed sensitivity analyses by using a range of inputs to confirm the reasonableness of long-term growth rate and weighted average cost of capital estimates. Significant assumptions utilized in the impairment analysis included the weighted-average cost of capital, ranging between 10.5% and 11.8%, and terminal growth rate, ranging between 2.0% and 4.0% depending on the reporting unit. Based on sensitivity analysis performed on two key assumptions in the discounted cash flow model at July 1, 2022, a 1% decrease in the long-term growth factor assumption or a 1% increase in the weighted average cost of capital assumption across each of Ashland's reporting units would not have resulted in a fair value below the respective reporting units carrying value. For further information, see Note H of Notes to the Consolidated Financial Statements.

Finite-lived intangible assets

Finite-lived intangible assets principally consist of certain trademarks and trade names, intellectual property, and customer relationships. These intangible assets are amortized on a straight-line basis over their estimated useful lives. The cost of trademarks and trade names is amortized principally over 3 to 20 years, intellectual property over 3 to 20 years and customer and supplier relationships over 10 to 24 years. Ashland reviews finite-lived intangible assets for impairment whenever events or changes in circumstances indicate the carrying amount of an asset may not be recoverable. Ashland monitors these changes and events on at least a quarterly basis.

Amortization expense recognized on finite-lived intangible assets was $94 million for 2022, $90 million for 2021 and $84 million for 2020.

Other indefinite-lived intangible assets

Other indefinite-lived intangible assets include certain trademarks and trade names. Ashland reviews these intangible assets for possible impairment annually as of July 1 or whenever events or changes in circumstances indicate that carrying amounts may not be recoverable. If the carrying value of an individual indefinite-lived intangible asset exceeds its fair value, the asset is written down to its fair value and the amount of the write down is the impairment charge. Similar to its annual assessment for goodwill, Ashland performs a quantitative test for impairment.

When a quantitative analysis is performed, Ashland tests these assets using a "relief-from-royalty" valuation method to determine the fair value. Significant assumptions inherent in the valuation methodologies include, but are not limited to, future projected business results, growth rates, the weighted-average cost of capital for a market participant, and royalty and discount rates.

In conjunction with the July 1 annual assessment of indefinite-lived intangible assets, Ashland's quantitative approach models did not indicate any impairment, as each indefinite-lived intangible asset's fair value exceeded their carrying values.

Ashland's assessment of an impairment on any of these assets classified currently as having indefinite lives, including goodwill, could change in future periods if significant events happen and/or circumstances change that effect the previously mentioned assumptions. Significant assumptions inherent in the valuation methodologies include, but are not limited to, such estimates as future projected business results, growth rates, the weighted average cost of capital for a market participant, and royalty and discount rates. For further information, see Note H of Notes to Consolidated Financial Statements.

Income taxes

Ashland is subject to income taxes in the United States and numerous foreign jurisdictions. Judgment in the forecasting of taxable income using historical and projected future operating results is required in determining Ashland's provision for income taxes and the related assets and liabilities. The provision for income taxes includes income taxes paid, currently payable or receivable, and deferred taxes. Under U.S. GAAP, deferred tax assets and liabilities are determined based on differences between financial reporting and tax basis of assets and liabilities and are measured using enacted tax rates and laws that are expected to be in effect when the differences reverse. Deferred tax assets are also recognized for the estimated future effects of tax loss and credit carryforwards. The effect on deferred taxes of changes in tax rates is recognized in the period in which the enactment date occurs. Valuation allowances are established when necessary on a jurisdictional basis to reduce deferred tax assets to the amounts expected to be realized. Deferred taxes are not provided on the unremitted earnings of subsidiaries outside of the United States when it is expected that these earnings are indefinitely reinvested. In the event that the actual outcome of future tax consequences differs from Ashland's estimates and assumptions due to changes or future events such as tax legislation, geographic mix of earnings, completion of tax audits or earnings repatriation plans, the resulting change to the provision for income taxes could have a material effect on the Statement of Consolidated Comprehensive Income (Loss) and Consolidated Balance Sheet.

The recoverability of deferred tax assets and the recognition and measurement of uncertain tax positions are subject to various assumptions and judgment by Ashland. If actual results differ from the estimates made by Ashland in establishing or maintaining valuation allowances against deferred tax assets, the resulting change in the valuation allowance would generally impact earnings or other comprehensive income depending on the nature of the respective deferred tax asset. Additionally, the positions taken with regard to tax contingencies may be subject to audit and review by tax authorities, which may result in future taxes, interest and penalties. Positive and negative evidence is considered in determining the need for a valuation allowance against deferred tax assets, which includes such evidence as historical earnings, projected future earnings, tax planning strategies and expected timing of reversal of existing temporary differences.

In determining the recoverability of deferred tax assets Ashland gives consideration to all available positive and negative evidence including reversals of deferred tax liabilities (other than those with an indefinite reversal period), projected future taxable income, tax planning strategies and recent financial operations. Ashland attaches the most weight to historical earnings due to their verifiable nature. In evaluating the objective evidence that historical results provide, Ashland considers three years of cumulative income or loss. In addition, Ashland has reflected increases and decreases in our valuation allowance based on the overall weight of positive versus negative evidence on a jurisdiction by jurisdiction basis.

EFFECTS OF INFLATION AND CHANGING PRICES

Ashland's financial statements are prepared on the historical cost method of accounting in accordance with U.S. GAAP and, as a result, do not reflect changes in the purchasing power of the U.S. dollar. Monetary assets (such as cash, cash equivalents and accounts receivable) lose purchasing power as a result of inflation, while monetary liabilities (such as accounts payable and indebtedness) result in a gain, because they can be settled with dollars of diminished purchasing power. As of September 30, 2022, Ashland's monetary assets exceed its monetary liabilities, leaving it currently more exposed to the effects of future inflation. While inflation rose significantly during 2022 and is expected to increase through fiscal 2023, the company managed to reduce its impact on its results of operations and financial liquidity through the use of select derivative programs, disciplined pricing and cost actions. See item 1A - Risk Factors for additional information.

Certain of the industries in which Ashland operates are capital-intensive, and replacement costs for its plant and equipment generally would substantially exceed their historical costs. Accordingly, depreciation and amortization expense would be greater if it were based on current replacement costs. However, because replacement facilities would reflect technological improvements and changes in business strategies, such facilities would be expected to be more productive than existing facilities, mitigating at least part of the increased expense.

OUTLOOK

Ashland issued its financial outlook for fiscal 2023 as shown in the table below.

	FY2023 Outlook
Key Operating Metrics	
Sales	$2.5 - $2.7 billion
Adjusted EBITDA	$600 - $650 million

Ashland is unable to reconcile forward-looking adjusted EBITDA to forward-looking net income, the most closely comparable GAAP financial measure, because the information needed to provide such reconciliation would require unreasonable efforts.

FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements including, without limitation, statements made under the caption “Management’s Discussion and Analysis of Financial Condition and Results of Operation” (MD&A), within the meaning of Section 27A of the Securities Act of 1933, as amended and Section 21E of the Securities Exchange Act of 1934, as amended. Ashland has identified some of these forward-looking statements with words such as “anticipates,” “believes,” “expects,” “estimates,” “is likely,” “predicts,” “projects,” “forecasts,” “objectives,” “may,” “will,” “should,” “plans” and “intends” and the negative of these words or other comparable terminology. Ashland may from time to time make forward-looking statements in its Annual Report to Stockholders, quarterly reports and other filings with the Securities and Exchange Commission (SEC), news releases and other written and oral communications. These forward-looking statements are based on Ashland’s expectations and assumptions, as of the date such statements are made, regarding Ashland’s future operating performance and financial condition and expected effects of the COVID-19 pandemic on Ashland’s business, as well as the economy and other future events or circumstances. Ashland’s expectations and assumptions include, without limitation, those mentioned within the MD&A, internal forecasts and analyses of current and future market conditions and trends, management plans and strategies, operating efficiencies, cost savings and economic conditions (such as prices, supply and demand, cost of raw materials, and the ability to recover raw-material cost increases through price increases), and risks and uncertainties associated with the following: the impact of acquisitions and/or divestitures Ashland has made or may make (including the possibility that Ashland may not realize the anticipated benefits from such transactions); Ashland’s substantial indebtedness (including the possibility that such indebtedness and related restrictive covenants may adversely affect Ashland’s future cash flows, results of operations, financial condition and its ability to repay debt); execution risks associated with our growth strategies; the competitive nature of our business; severe weather, natural disasters, public health crises (including the COVID-19 pandemic), cyber events and legal proceedings and claims (including product recalls, environmental and asbestos matters); the effects of the COVID-19 pandemic and the ongoing Ukraine and Russia conflict on the geographies in which Ashland operates, the end markets Ashland serves and on Ashland’s supply chain and customers; and without limitation, risks and uncertainties affecting Ashland that are contained in “Use of estimates, risks and uncertainties” in Note A of Notes to Consolidated Financial Statements and in Item 1A of this Annual Report Form 10-K. Various risks and uncertainties may cause actual results to differ materially from those stated, projected or implied by any forward-looking statements. The extent and duration of the COVID-19 pandemic on our business and operations remains uncertain. Factors that influence the impact on our business and operations include the duration and extent of the pandemic, the extent of imposed or recommended containment and mitigation measures, and the general economic consequences of the pandemic. Ashland believes its expectations and assumptions are reasonable, but there can be no assurance that the expectations reflected herein will be achieved. Unless legally required, Ashland undertakes no obligation to update any forward-looking statements made in this Form 10-K whether as a result of new information, future events or otherwise. Information on Ashland’s website is not incorporated into or a part of this Form 10-K.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Ashland conducts business in a variety of foreign currencies. Accordingly, Ashland regularly uses foreign currency derivative instruments to manage exposure on certain transactions denominated in foreign currencies to curtail potential earnings volatility effects of certain assets and liabilities, including short-term inter-company loans, denominated in currencies other than Ashland's functional currency of an entity. These derivative contracts generally require exchange of one foreign currency for another at a fixed rate at a future date and generally have maturities of less than twelve months. All contracts are valued at fair value with net changes in fair value recorded within the selling, general and administrative expense caption. The impacts of these contracts were largely offset by gains and losses resulting from the impact of changes in exchange rates on transactions denominated in non-functional currencies.

As of September 30, 2022 and 2021, Ashland had not identified any significant credit risk on open derivative contracts. The potential loss from a hypothetical 10% adverse change in foreign currency rates on Ashland's open foreign currency derivative instruments would be largely offset by gains resulting from the impact of changes in exchange rates on transactions denominated in non-functional currencies. Ashland did not have any significant open hedging contracts with respect to commodities or any related raw material requirements as of and for the year ended September 30, 2022.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Management is responsible for the preparation and integrity of the Consolidated Financial Statements and other financial information included in this annual report on Form 10-K. Such financial statements are prepared in accordance with accounting principles generally accepted in the United States. Accounting principles are selected, and information is reported which, using management's best judgment and estimates, present fairly Ashland's consolidated financial position, results of operations and cash flows. The other financial information in this annual report on Form 10-K is consistent with the Consolidated Financial Statements.

Ashland's management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rules 13a-15(f) and 15d-15(f). Ashland's internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of Ashland's Consolidated Financial Statements. Ashland's internal control over financial reporting is supported by a code of business conduct which summarizes our guiding values such as obeying the law, adhering to high ethical standards and acting as responsible members of the communities where we operate. Compliance with that Code forms the foundation of our internal control systems, which are designed to provide reasonable assurance that Ashland's assets are safeguarded, and its records reflect, in all material respects, transactions in accordance with management's authorization. The concept of reasonable assurance is based on the recognition that the cost of a system of internal control should not exceed the related benefits. Management believes that adequate internal controls are maintained by the selection and training of qualified personnel, by an appropriate division of responsibility in all organizational arrangements, by the establishment and communication of accounting and business policies, and by internal audits.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements and even when determined to be effective, can only provide reasonable assurance with respect to financial statement preparation and presentation. Also, projections of any evaluation of effectiveness to future periods are subject to the risks that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

The Board, subject to stockholder ratification, selects and engages the independent auditors based on the recommendation of the Audit Committee. The Audit Committee, composed of directors who are not members of management, reviews the adequacy of Ashland's policies, procedures, controls and risk management strategies, the scope of auditing and other services performed by the independent auditors, and the scope of the internal audit function. The Committee holds meetings with Ashland's internal auditor and independent auditors, with and without management present, to discuss the findings of their audits, the overall quality of Ashland's financial reporting and their evaluation of Ashland's internal controls. The report of Ashland's Audit Committee can be found in Ashland's Proxy for its 2023 Annual Meeting.

Management assessed the effectiveness of Ashland's internal control over financial reporting as of September 30, 2022. Management conducted its assessment utilizing the framework described in *Internal Control - Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework). Based on this assessment, management believes that Ashland maintained effective internal control over financial reporting as of September 30, 2022.

Ernst & Young LLP, an independent registered public accounting firm, has audited and reported on the Consolidated Financial Statements of Ashland Inc. and Consolidated Subsidiaries as of and for the year ended September 30, 2022 and the effectiveness of Ashland's internal control over financial reporting as of September 30, 2022. The reports of the independent registered public accounting firm are contained in this Annual Report on Form 10-K.

/s/ Guillermo Novo
Guillermo Novo
Chair of the Board and Chief Executive Officer

/s/ J. Kevin Willis
J. Kevin Willis
Senior Vice President and Chief Financial Officer
November 21, 2022

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Ashland Inc.

Opinion on Internal Control Over Financial Reporting

We have audited Ashland Inc. and Consolidated Subsidiaries' internal control over financial reporting as of September 30, 2022, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework), (the COSO criteria). In our opinion, Ashland Inc. and Consolidated Subsidiaries (the Company) maintained, in all material respects, effective internal control over financial reporting as of September 30, 2022, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of September 30, 2022 and 2021, the related consolidated statements of comprehensive income (loss), equity and cash flows for each of the three years in the period ended September 30, 2022, and the related notes and our report dated November 21, 2022 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Ernst & Young LLP

Grandview Heights, Ohio
November 21, 2022

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Ashland Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Ashland Inc. and Consolidated Subsidiaries (the Company) as of September 30, 2022 and 2021, the related consolidated statements of comprehensive income (loss), equity and cash flows for each of the three years in the period ended September 30, 2022, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at September 30, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended September 30, 2022, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of September 30, 2022, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework), and our report dated November 21, 2022 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Valuation of Environmental Remediation Reserves

Description of the Matter	At September 30, 2022, the reserves for environmental remediation amounted to $211 million. As discussed within Note N of the consolidated financial statements, the reserves for environmental remediation reflect Ashland’s estimates of the most likely costs that will be incurred over an extended period to remediate identified conditions for which the costs are reasonably estimable and probable of being incurred, without regard to any third-party recoveries. The Company uses engineering studies, historical experience and other factors to identify and evaluate remediation alternatives and their related costs in determining the estimated reserves for environmental remediation. Ashland regularly adjusts its reserves as environmental remediation continues. Auditing the environmental remediation reserve was complex due to inherent uncertainties that affect Ashland’s ability to estimate probable costs. Such uncertainties include the nature and extent of contamination at each site, and the nature and extent of required cleanup efforts.
How We Addressed the Matter in Our Audit	We obtained an understanding, evaluated the design and tested the operating effectiveness of relevant controls over Ashland’s environmental remediation process. For example, we tested controls over the Company’s annual reserve setting training process, management’s identification and monitoring of new and existing sites, and management’s development of the environmental reserve estimates. We also tested management’s controls over the completeness and accuracy of the underlying data used in the reserve estimates. To test the environmental reserves, we performed audit procedures that included, among others: assessing the appropriateness of Ashland’s policies and procedures and testing management’s development of the environmental reserve estimates. We obtained an understanding of the reserve estimates through discussions with Ashland’s remediation project managers. We also involved our environmental reserve subject matter specialists to evaluate the reasonableness of management’s reserve estimates, including consideration of information available on regulatory databases in the public domain that was assessed for possible contrary evidence. With the support of our environmental reserve subject matter specialists, we evaluated whether the environmental reserve estimates were appropriate based on engineering studies and historical experience.

Valuation of Asbestos Litigation Reserves

Description of the Matter	At September 30, 2022, the reserves for asbestos litigation amounted to $518 million. As discussed within Note N of the consolidated financial statements, Ashland has liabilities from claims alleging personal injury caused by exposure to asbestos. Ashland retained third party actuarial experts to assist in developing and annually updating independent reserve estimates for future asbestos claims and related costs given various assumptions. The methodology used by the actuarial experts to project future asbestos costs is based largely on recent experience, including claim-filing and settlement rates, disease mix, open claims and litigation defense. Further, the claim experience identified is compared to the results of previously conducted third party epidemiological studies estimating the number of people likely to develop asbestos-related diseases. Using that information, the Company estimates a range of the number of future claims that may be filed, as well as the related costs that may be incurred in resolving those claims. Ashland records the amount it believes to be the best estimate of future payments for litigation defense and claim settlement costs using the results of a non-inflated, non-discounted approximate 40-year model developed with the assistance of the Company's third party actuarial experts. Auditing the Company's asbestos litigation reserve is complex and highly judgmental due to uncertainty associated with the estimate of projected future asbestos costs. The methodology employed by management to develop the estimate of projected future asbestos costs is subject to assumptions such as the number of claims that may be received in the future, the type and severity of disease alleged by claimant, the related costs incurred in resolving those claims, and the dismissal rates. These assumptions have a significant effect on the asbestos litigation reserve.
How We Addressed the Matter in Our Audit	We obtained an understanding, evaluated the design and tested the operating effectiveness of internal controls over the asbestos litigation reserves process. These include controls over management's assessment of the assumptions utilized within the estimate, management's oversight of asbestos trends including claims movement and costs incurred, and the completeness and accuracy of the underlying data utilized to project future costs. To evaluate the reasonableness of the reserve for asbestos litigation, our audit procedures included testing the completeness and accuracy of the underlying claims data provided to management's actuarial experts utilized to project future costs. Additionally, we evaluated the claims and spend activity from legal letters obtained from internal and external legal counsel. Furthermore, we involved our actuarial subject matter specialists to assist in the evaluation of the methodologies and assumptions applied by management's experts as described above to determine the appropriateness of the asbestos litigation reserve, and to independently prepare an estimated range of the liability. We then assessed the reasonableness of the Company's recorded reserve against our independently calculated range.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2014.
Grandview Heights, Ohio
November 21, 2022

Ashland Inc. and Consolidated Subsidiaries
Statements of Consolidated Comprehensive Income (Loss)
Years Ended September 30

(In millions except per share data)	2022	2021	2020
Sales	$ 2,391	$ 2,111	$ 2,016
Cost of sales	1,561	1,441	1,417
Gross profit	830	670	599
Selling, general and administrative expense	393	358	400
Research and development expense	55	50	56
Intangibles amortization expense - Note H	94	90	84
Equity and other income	3	9	8
Goodwill impairment - Note H	—	—	530
Income on acquisitions and divestitures, net - Note B and C	42	11	2
Operating income (loss)	333	192	(461)
Net interest and other expense - Note I	149	56	119
Other net periodic benefit income (loss) - Note M	22	(1)	3
Income (loss) from continuing operations before income taxes	206	135	(577)
Income tax expense (benefit) - Note L	25	(38)	(22)
Income (loss) from continuing operations	181	173	(555)
Income from discontinued operations (net of income tax) - Note D	746	47	47
Net income (loss)	$ 927	$ 220	$ (508)
PER SHARE DATA - NOTE A			
Basic earnings per share			
Income (loss) from continuing operations	$ 3.26	$ 2.85	$ (9.16)
Income from discontinued operations	13.45	0.78	0.77
Net income (loss)	$ 16.71	$ 3.63	$ (8.39)
Diluted earnings per share			
Income (loss) from continuing operations	$ 3.20	$ 2.82	$ (9.16)
Income from discontinued operations	13.21	0.77	0.77
Net income (loss)	$ 16.41	$ 3.59	$ (8.39)
COMPREHENSIVE INCOME (LOSS)			
Net income (loss)	$ 927	$ 220	$ (508)
Other comprehensive income (loss), net of tax			
Unrealized translation gain (loss)	(197)	7	27
Unrealized gains (losses) on commodity hedges	(1)	4	—
Pension and postretirement obligation adjustment	1	—	—
Other comprehensive income (loss)	(197)	11	27
Comprehensive income (loss)	$ 730	$ 231	$ (481)

See Notes to Consolidated Financial Statements.

Ashland Inc. and Consolidated Subsidiaries
Consolidated Balance Sheets
At September 30

(In millions)	2022	2021
Assets		
Current assets		
Cash and cash equivalents	$ 646	$ 210
Accounts receivable (a) - Notes A and I	402	369
Inventories - Note A	629	473
Other assets	91	68
Current assets held for sale - Note C	—	597
Total current assets	1,768	1,717
Noncurrent assets		
Property, plant and equipment - Note G		
Cost	3,050	3,066
Accumulated depreciation	1,712	1,639
Net property, plant and equipment	1,338	1,427
Goodwill - Note H	1,312	1,430
Intangibles - Note H	963	1,099
Operating lease assets, net - Note K	107	124
Restricted investments - Note F	313	384
Asbestos insurance receivable (b) - Notes A and N	138	134
Deferred income taxes - Note L	20	30
Other assets - Note J	254	267
Total noncurrent assets	4,445	4,895
Total assets	$ 6,213	$ 6,612
Liabilities and Equity		
Current liabilities		
Short-term debt - Note I	$ —	$ 365
Current portion of long-term debt	—	9
Trade and other payables	265	236
Accrued expenses and other liabilities	269	251
Current operating lease obligations - Note K	19	23
Current liabilities held for sale - Note C	—	50
Total current liabilities	553	934
Noncurrent liabilities		
Long-term debt - Note I	1,270	1,596
Asbestos litigation reserve - Note N	472	490
Deferred income taxes - Note L	176	237
Employee benefit obligations - Note M	103	144
Operating lease obligations - Note K	94	110
Other liabilities - Note J	325	349
Total noncurrent liabilities	2,440	2,926
Commitments and contingencies - Notes K and N		
Equity - Notes O and P		
Common stock, par value $.01 per share, 200 million shares authorized	1	1
Issued 54 million and 57 million shares in 2022 and 2021		
Paid-in capital	135	327
Retained earnings	3,653	2,796
Accumulated other comprehensive loss	(569)	(372)
Total equity	3,220	2,752
Total liabilities and equity	$ 6,213	$ 6,612

(a) Accounts receivable includes an allowance for credit losses of $4 million and $3 at September 30, 2022 and 2021, respectively
(b) Asbestos insurance receivable includes an allowance for credit losses of $3 million at both September 30, 2022 and 2021.
See Notes to Consolidated Financial Statements.

Ashland Inc. and Consolidated Subsidiaries
Statements of Consolidated Equity

(In millions)	Common stock	Paid-in capital	Retained earnings	Accumulated other comprehensive income (loss) (a)	Total
Balance at September 30, 2019	$ 1	$ 756	$ 3,224	$ (410)	$ 3,571
Total comprehensive income (loss)					
Net loss			(508)		(508)
Other comprehensive income				27	27
Dividends, $1.10 per common share			(67)		(67)
Compensation expense and common shares issued under stock incentive and other plans (c) (d)		13			13
Balance at September 30, 2020	1	769	2,649	(383)	3,036
Adoption of new accounting pronouncements (b)			(2)		(2)
Total comprehensive income					
Net income			220		220
Other comprehensive income				11	11
Dividends, $1.15 per common share			(71)		(71)
Compensation expense and common shares issued under stock incentive and other plans (c) (d)		8			8
Repurchase of common stock (e)		(450)			(450)
Balance at September 30, 2021	1	327	2,796	(372)	2,752
Total comprehensive income (loss)					
Net income			927		927
Other comprehensive loss				(197)	(197)
Dividends, $1.27 per common share			(70)		(70)
Compensation expense and common shares issued under stock incentive and other plans (c) (d)		8			8
Repurchase of common stock (e)		(200)			(200)
Balance at September 30, 2022	$ 1	$ 135	$ 3,653	$ (569)	$ 3,220

(a) At September 30, 2022 and 2021, the accumulated other comprehensive loss of $569 million and $372 million, respectively, was comprised of net unrealized translation losses of $571 million and $374 million, respectively, unrecognized prior service costs as a result of certain employee benefit plan amendments of $1 million and $2 million, respectively, and unrealized gains on commodity hedges of $3 million and $4 million, respectively.

(b) Represents the cumulative-effect adjustment related to the adoption of the new guidance related to the measurement of credit losses on financial instruments during fiscal 2021. See note A for more information.

(c) Includes income tax expense resulting from the exercise of stock appreciation rights of zero in a 2022, and $1 million each in 2021 and 2020.

(d) Common shares issued were 168,270, 183,281, and 391,180 for 2022, 2021 and 2020, respectively.

(e) Common shares repurchased were 2,853,312 for 2022 and 3,922,423 for 2021.

See Notes to Consolidated Financial Statements.

Ashland Inc. and Consolidated Subsidiaries
Statements of Consolidated Cash Flows
Years Ended September 30

(In millions)	2022	2021	2020
Cash flows provided (used) by operating activities from continuing operations			
Net income (loss)	$ 927	$ 220	$ (508)
Income from discontinued operations (net of tax)	(746)	(47)	(47)
Adjustments to reconcile income from continuing operations to cash flows from operating activities			
Depreciation and amortization	241	244	235
Original issue discount and debt issuance cost amortization	7	7	15
Deferred income taxes	(35)	(26)	(42)
Distributions from equity affiliates	—	1	1
Gain from sales of property and equipment	—	(4)	—
Stock based compensation expense - Note P	18	15	14
Excess tax benefits on stock based compensation	1	2	1
Loss on early retirement of debt	—	16	59
Loss (income) from restricted investments	86	(33)	(30)
Income on acquisitions and divestitures - Notes B and C	(42)	(15)	(3)
Impairments	—	13	530
Pension contributions	(5)	(8)	(6)
Loss (gain) on pension and other postretirement plan remeasurements	(22)	1	(1)
Change in operating assets and liabilities (a)	(237)	80	9
Total cash flows provided by operating activities from continuing operations	193	466	227
Cash flows provided (used) by investing activities from continuing operations			
Additions to property, plant and equipment	(113)	(105)	(133)
Proceeds from disposal of property, plant and equipment	51	5	5
Purchase of operations - net of cash acquired	—	(309)	—
Proceeds from sale or restructuring of operations	—	14	9
Proceeds from settlement of Company-owned life insurance contracts	3	91	8
Company-owned life insurance payments	(4)	(6)	(6)
Net purchases of funds restricted for specific transactions	(74)	(91)	(3)
Reimbursement from restricted investments	35	33	35
Proceeds from sale of securities	87	149	21
Purchase of securities	(87)	(149)	(21)
Proceeds from the settlement of derivative instruments	—	1	—
Total cash flows used by investing activities from continuing operations	(102)	(367)	(85)
Cash flows provided (used) by financing activities from continuing operations			
Proceeds from issuance of long-term debt	—	450	804
Repayment of long-term debt	(250)	(411)	(767)
Premium on long-term debt repayment	—	(16)	(59)
Proceeds from (repayment of) short-term debt	(365)	84	115
Repurchase of common stock	(200)	(450)	—
Debt issuance costs	(2)	(6)	(11)
Cash dividends paid	(70)	(70)	(66)
Stock based compensation employee withholding taxes paid in cash	(9)	(7)	(7)
Total cash flows provided (used) by financing activities from continuing operations	(896)	(426)	9
Cash provided (used) by continuing operations	(805)	(327)	151
Cash provided (used) by discontinued operations			
Operating cash flows	(406)	94	(24)
Investing cash flows	1,658	(14)	93
Total cash provided (used) by discontinued operations	1,252	80	69
Effect of currency exchange rate changes on cash and cash equivalents	(11)	3	2
Increase (decrease) in cash and cash equivalents	436	(244)	222
Cash and cash equivalents - beginning of year	210	454	232
Cash and cash equivalents - end of year	$ 646	$ 210	$ 454
Changes in assets and liabilities (a)			
Accounts receivable	$ (23)	$ 72	$ 2
Inventories	(141)	41	64
Trade and other payables	34	3	(46)
Other assets and liabilities	(107)	(36)	(11)
Change in operating assets and liabilities	$ (237)	$ 80	$ 9
Supplemental disclosures			
Interest paid	$ 56	$ 62	$ 77
Income taxes paid (including discontinued operations)	406	1	91

(a) Excludes changes resulting from operations acquired or sold.

See Notes to Consolidated Financial Statements.

NOTE A – SIGNIFICANT ACCOUNTING POLICIES

Principles of consolidation and basis of presentation

The accompanying Consolidated Financial Statements have been prepared in accordance with accounting principles generally accepted in the United States of America (U.S. GAAP) and U.S. Securities and Exchange Commission (SEC) regulations. The Consolidated Financial Statements include the accounts of Ashland Inc. (Ashland) (formerly Ashland Global Holdings Inc.) and its majority owned subsidiaries and, when applicable, entities for which Ashland has a controlling financial interest or is the primary beneficiary. Investments in joint ventures and 20% to 50% owned affiliates where Ashland has the ability to exert significant influence are accounted for under the equity method. All intercompany transactions and balances have been eliminated. Additionally, certain prior period data, primarily related to discontinued operations, have been reclassified in the Consolidated Financial Statements and accompanying notes to conform to the current period presentation.

Ashland is comprised of the following reportable segments: Life Sciences, Personal Care, Specialty Additives and Intermediates. Unallocated and Other includes corporate governance activities and certain legacy matters. See Note R for more information.

Use of estimates, risks and uncertainties

The preparation of Ashland's Consolidated Financial Statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses, and the disclosures of contingent assets and liabilities. Significant items that are subject to such estimates and assumptions include, but are not limited to, environmental remediation, asbestos litigation, the accounting for goodwill and other intangible assets and income taxes. Although management bases its estimates on historical experience and various other assumptions that are believed to be reasonable under the circumstances, actual results could differ significantly from the estimates under different assumptions or conditions.

Ashland's results are affected by domestic and international economic, political, legislative, regulatory and legal actions. Economic conditions, such as recessionary trends, inflation, interest and monetary exchange rates, government fiscal policies and changes in the prices of certain key raw materials, can have a significant effect on operations. While Ashland maintains reserves for anticipated liabilities and carries various levels of insurance, Ashland could be affected by civil, criminal, regulatory or administrative actions, claims or proceedings relating to asbestos, environmental remediation or other matters.

Cash and cash equivalents

Cash and cash equivalents include cash on hand and highly liquid investments maturing within three months after purchase.

Allowance for credit losses on accounts receivable

Effective with the October 1, 2020 adoption of ASU 2016-13, "Financial Instruments - Credit Losses" (Topic 326), Ashland records an allowance for credit losses using the expected credit loss model. Ashland estimates expected credit losses based on relevant information about past events, including historical experience, current conditions, and reasonable and supportable forecasts that affect the collectability of the reported amount. When measuring expected credit losses, Ashland pools assets with similar country risk and credit risk characteristics. Each period the allowance for credit losses is adjusted through earnings to reflect expected credit losses over the remaining lives of the assets.

A progression of activity in the allowance for credit losses is presented in the following table.

(In millions)	2022	2021	2020
Allowance for credit losses - beginning of year	$ 3	$ 3	$ 3
Adjustments to allowances for credit losses	2	1	2
Reserves utilized	(1)	(1)	(2)
Allowance for credit losses - end of year	$ 4	$ 3	$ 3

Inventories

Inventories are carried at the lower of cost or net realizable value. Inventories are stated at cost using the weighted-average cost method. This method values inventories using average costs for raw materials and most recent production costs for labor and overhead.

The following summarizes Ashland's inventories as of the Consolidated Balance Sheet dates.

(In millions)	2022	2021
Finished products	$ 391	$ 282
Raw materials, supplies and work in process	238	191
	$ 629	$ 473

A progression of activity in the inventory reserves, which reduce the amounts of finished products and raw materials, supplies and work in process reported, is presented in the following table.

(In millions)	2022	2021	2020
Inventory reserves - beginning of year	$ 13	$ 16	$ 19
Adjustments to inventory reserves	3	2	3
Reserves utilized	(3)	(5)	(6)
Inventory reserves - end of year	$ 13	$ 13	$ 16

Property, plant and equipment

The cost of property, plant and equipment is depreciated by the straight-line method over the estimated useful lives of the assets. Buildings are depreciated principally over 12 to 35 years and machinery and equipment principally over 2 to 25 years. Such costs are periodically reviewed for recoverability when impairment indicators are present. Such indicators include, among other factors, operating losses, unused capacity, market value declines and technological obsolescence. Recorded values of asset groups of property, plant and equipment that are not expected to be recovered through undiscounted future net cash flows are written down to current fair value, which generally is determined from estimated discounted future net cash flows (assets held for use) or net realizable value (assets held for sale). See Note G for additional information related to property, plant and equipment.

Leasing arrangements

Ashland determines if an arrangement contains a lease at inception based on whether or not it has the right to control the asset during the contract period and other facts and circumstances.

Operating lease right-of-use assets represent Ashland's right to use an underlying asset for the lease term and lease liabilities represent Ashland's obligation to make lease payments arising from the lease, both of which are recognized based on the present value of the future minimum lease payments over the lease term at the commencement date. Leases with a lease term of 12 months or less at inception are not recorded within the Consolidated Balance Sheet and are expensed on a straight-line basis over the lease term within the Statements of Consolidated Comprehensive Income (Loss). The lease term is determined by assuming the exercise of renewal options that are reasonably certain. As most leases do not provide an implicit interest rate, Ashland used its incremental borrowing rate based on the information available at commencement date in determining the present value of future payments. When contracts contain lease and non-lease components, Ashland generally accounts for both components as a single lease component.

For additional information, see Note K for additional information on leasing arrangements.

Goodwill and other intangibles

Ashland tests goodwill and other indefinite-lived intangible assets for impairment annually as of July 1 and when events and circumstances indicate an impairment may have occurred. Ashland reviews goodwill for impairment based on its identified reporting units. Ashland determined that its reporting units are Life Sciences, Personal Care, Specialty Additives and Intermediates. Ashland tests goodwill for impairment by comparing the carrying value to the estimated fair value of its reporting units. If the fair value of the reporting unit is lower than its carrying amount, goodwill is written down for the amount by which the carrying amount exceeds the fair value. However, the loss recognized cannot exceed the carrying amount of goodwill.

Using the quantitative approach, Ashland makes various estimates and assumptions in determining the estimated fair value of each reporting unit using a combination of discounted cash flow models and valuations based on earnings multiples for guideline public companies in each reporting unit's industry peer group, when externally quoted market prices are not readily available. Discounted cash flow models are reliant on various assumptions, including projected business results, long-term growth factors and weighted-average cost of capital. Management judgement is involved in estimating these variables, and they include uncertainties since they are forecasting future events. Ashland performs sensitivity analyses by using a range of inputs to confirm the reasonableness of the long-term growth rate and weighted average cost of capital. Additionally, Ashland compares the indicated equity value to Ashland's market capitalization and evaluates the resulting implied control premium/discount to determine if the estimated enterprise value is reasonable compared to external market indicators.

Ashland tests at least annually its indefinite-lived intangible assets, principally trademarks and trade names. If the carrying value of an individual indefinite-lived intangible asset exceeds its fair value, such individual indefinite-lived intangible asset is written down by an amount equal to such excess. Ashland performs a quantitative impairment test for the trademarks and trade names during which, trademarks and trade names are valued using a "relief-from-royalty" valuation method compared to the carrying value. Assumptions inherent in the valuation methodologies include, but are not limited to, such estimates as future projected business results, growth rates, the weighted-average cost of capital for a market participant, and royalty and discount rates.

Finite-lived intangible assets principally consist of certain trademarks and trade names, intellectual property, and customer lists. These intangible assets are amortized on a straight-line basis over their estimated useful lives. The cost of trademarks and trade names is amortized principally over 3 to 20 years, intellectual property over 3 to 20 years and customer and supplier relationships over 10 to 24 years. Ashland reviews finite-lived intangible assets for impairment whenever events or changes in circumstances indicate the carrying amount of an asset may not be recoverable. Ashland monitors these changes and events on at least a quarterly basis. The intangibles amortization expense caption within the Statement of Consolidated Comprehensive Income (Loss) includes amortization expense related to trademarks and trade names, intellectual property and customer and supplier relationships. Intangible assets classified as finite are amortized on a straight-line basis over their estimated useful lives. For further information on goodwill and other intangible assets, see Note H.

Derivative instruments

Ashland regularly uses derivative instruments to manage its exposure to fluctuations in foreign currencies and certain commodities. All derivative instruments are recognized as either assets or liabilities on the balance sheet and are measured at fair value. Changes in the fair value of all derivatives are recognized immediately in the Statements of Consolidated Comprehensive Income (Loss) unless the derivative qualifies as a hedge of future cash flows or a hedge of a net investment in a foreign operation. Gains and losses related to an instrument that qualifies for hedge accounting are either recognized in the Statements of Consolidated Comprehensive Income (Loss) immediately to offset the gain or loss on the hedged item, or deferred and recorded in the stockholders' equity section of the Consolidated Balance Sheets as a component of accumulated other comprehensive income and subsequently recognized in the Statements of Consolidated Comprehensive Income (Loss) when the hedged item affects net income. For additional information on derivative instruments, see Note F.

Restricted investments

On January 13, 2015, Ashland and Hercules LLC (formerly Hercules Incorporated), an indirect wholly-owned subsidiary of Ashland that was acquired in fiscal 2009, entered into a comprehensive settlement agreement related to certain insurance coverage for asbestos bodily injury claims with Underwriters at Lloyd's, certain London companies and Chartis (AIG) member companies, along with National Indemnity Company and Resolute Management, Inc., under which Ashland and Hercules received a total of $398 million (the January 2015 asbestos insurance settlement). During 2015, Ashland placed $335 million of the settlement funds into a renewable annual trust for asbestos (Asbestos trust) that Ashland determined is restricted for the purpose of paying ongoing and future litigation defense and claim settlement costs incurred in conjunction with asbestos claims. These funds are presented primarily as noncurrent assets within the restricted investments caption of the Consolidated Balance Sheets, with $27 million classified within other current assets in the Consolidated Balance Sheets as of September 30, 2022 and 2021.

As of September 30, 2022 and 2021, the funds within the Asbestos trust had a balance of $245 million and $333 million, respectively, and were primarily invested in public equity, U.S. government bonds and investment grade corporate bond investments with a portion maintained in demand deposits.

On September 8, 2021, Ashland established a renewable annual trust for environmental remediation (Environmental trust) that Ashland determined is restricted for ongoing and future environmental remediation and related litigation costs. These funds are presented primarily as noncurrent assets within the restricted investments caption of the Consolidated Balance Sheets, with $34 million and $10 million classified within other current assets in the Consolidated Balance Sheets as of September 30, 2022 and 2021, respectively. As of September 30, 2022 and 2021, the funds within the Environmental trust had a balance of $129 million and $88 million, respectively, and were primarily invested in public equity, U.S. government bonds and investment grade corporate bond investments with a portion maintained in demand deposits.

The funds within these trusts are classified as investment securities reported at fair value. Interest income and gains and losses on the investment securities are reported in the net interest and other expense caption in the Statements of Consolidated Comprehensive Income (Loss). See Note F for additional information regarding the fair value of these investments within the trusts.

Revenue recognition

Ashland's revenue is measured as the amount of consideration it expects to receive in exchange for transferring goods and is recognized when performance obligations are satisfied under the terms of contracts or purchase orders with customers. Ashland generally utilizes standardized language for the terms of contracts or purchase orders.

A performance obligation is deemed to be satisfied by Ashland when control of the product or service is transferred to the customer. The transaction price of a contract or purchase order, or the amount Ashland expects to receive upon satisfaction of all performance obligations, is determined by reference to the contract's terms. Ashland generally collects the cash from its customers within 60 days of the product delivery date. Sales and other similar taxes collected from customers on behalf of third parties are excluded from the contract price.

All of Ashland's revenue is derived from contracts or purchase orders with customers, and nearly all contracts or purchase orders with customers contain one performance obligation for the transfer of goods where such performance obligation is satisfied at a point in time. Control of a product is deemed to be transferred to the customer generally upon shipment or delivery. Costs for shipping and handling activities, whether performed before or after the customer obtains control of the goods, are accounted for as fulfillment costs when not reimbursed.

Costs incurred to obtain contracts with customers are not significant and are expensed immediately as the period of performance is generally one year or less. Ashland records credit losses in specific situations when it is determined that the customer is unable to meet its financial obligation.

Expense recognition

Cost of sales include material and production costs, as well as the costs of inbound and outbound freight, purchasing and receiving, inspection, warehousing, internal transfers and all other distribution network costs. Selling, general and administrative expense includes sales and marketing costs, advertising, customer support, environmental remediation, corporate and divisional administrative and other costs. Advertising costs ($2 million in 2022, $1 million in 2021 and $2 million in 2020) and research and development costs ($55 million in 2022, $50 million in 2021 and $56 million in 2020) are expensed as incurred.

Income taxes

Ashland is subject to income taxes in the United States and numerous foreign jurisdictions. The provision for income taxes includes income taxes paid, currently payable or receivable, and deferred taxes. Ashland recognizes the income tax benefit from an uncertain tax position only if it is more likely than not that the tax position will be sustained on examination by taxing authorities, based on the technical merits of the position. Ashland evaluates and adjusts these accruals based on changing facts and circumstances. Deferred tax assets and liabilities are determined based on differences between financial reporting and tax basis of assets and liabilities, and are measured using enacted tax rates and laws that are expected to be in effect when the differences reverse. Deferred tax assets are also recognized for the estimated future effects of tax loss and credit carryforwards. The effect on deferred taxes of changes in tax rates is recognized in the period in which the enactment date occurs. Taxes due on future Global Intangible Low-Taxed Income (GILTI) inclusions in U.S. are recognized as a current period expense when incurred. Valuation allowances are established when necessary on a jurisdictional basis to reduce deferred tax assets to the amounts expected to be realized. In the event that the actual outcome of future tax consequences differs from Ashland's estimates and assumptions due to changes or future events such as tax legislation, geographic mix of earnings, completion of tax audits or earnings repatriation plans, the resulting change to the provision for income taxes could have a material effect on the Statements of Consolidated Comprehensive Income (Loss) and Consolidated Balance Sheets. For additional information on income taxes, see Note L.

A progression of activity in the tax valuation allowances is presented in the following table.

(In millions)	2022	2021	2020
Tax valuation allowances - beginning of year	$ 74	$ 75	$ 83
Adjustments to valuation allowances	(19)	9	2
Reserves utilized	1	(10)	(10)
Tax valuation allowances - end of year	$ 56	$ 74	$ 75

Asbestos-related litigation

Ashland is subject to liabilities from claims alleging personal injury caused by exposure to asbestos. Such claims result from indemnification obligations undertaken in 1990 in connection with the sale of Riley Stoker Corporation (Riley) and the acquisition of Hercules in November 2008. Although Riley, a former subsidiary, was neither a producer nor a manufacturer of asbestos, its industrial boilers contained some asbestos-containing components provided by other companies. Hercules, an indirect wholly-owned subsidiary of Ashland, has liabilities from claims alleging personal injury caused by exposure to asbestos. Such claims typically arise from alleged exposure to asbestos fibers from resin encapsulated pipe and tank products sold by one of Hercules' former subsidiaries to a limited industrial market.

Ashland retained Gnarus Advisors LLC (Gnarus) to assist in developing and annually updating independent reserve estimates for future asbestos claims and related costs given various assumptions. The methodology used to project future asbestos costs is based largely on Ashland's recent experience, including claim-filing and settlement rates, disease mix, open claims, and litigation defense. Ashland's claim experience is compared to the results of previously conducted epidemiological studies estimating the number of people likely to develop asbestos-related diseases. Those studies were undertaken in connection with national analyses of the population expected to have been exposed to asbestos. Using that information, Gnarus estimates a range of the number of future claims that may be filed, as well as the related costs that may be incurred in resolving those claims. Ashland records the amount it believes to be the best estimate of future payments for litigation defense and claim settlement costs using the results of a non-inflated, non-discounted approximate 40-year model. For additional information on asbestos-related litigation, see Note N.

Environmental remediation

Accruals for environmental remediation are recognized when it is probable a liability has been incurred and the amount of that liability can be reasonably estimated. Such costs are charged to expense if they relate to the remediation of conditions caused by past operations or are not expected to mitigate or prevent contamination from future operations. Accruals for environmental remediation reflect Ashland's estimates of the most likely costs that will be incurred over an extended period of time to remediate identified conditions for which costs are reasonably estimatible and probable of being incurred, without regard to any third-party recoveries, and are regularly adjusted as environmental assessments and remediation efforts continue. For additional information on environmental remediation, see Note N.

Pension and other postretirement benefits

The funded status of Ashland's pension and other postretirement benefit plans is recognized in the Consolidated Balance Sheets. The funded status is measured as the difference between the fair value of plan assets and the benefit obligation at September 30, the measurement date. For defined benefit pension plans, the benefit obligation is the projected benefit obligation (PBO) and for the other postretirement benefit plans, the benefit obligation is the accumulated postretirement benefit obligation (APBO). The PBO represents the actuarial present value of benefits expected to be paid upon retirement based on estimated future compensation levels. The APBO represents the actuarial present value of postretirement benefits attributed to employee services already rendered. The measurement of the benefit obligation is based on Ashland's estimates and actuarial valuations. These valuations reflect the terms of the plans and use participant-specific information such as compensation, age and years of service, as well as certain assumptions that require judgment, including, but not limited to, estimates of discount rates, rate of compensation increases, interest rates and mortality rates. The fair value of plan assets represents the current market value of assets held by an irrevocable trust fund for the sole benefit of participants. For additional information regarding plan assumptions and the current financial position of the pension and other postretirement plans, see Note M.

Ashland recognizes the change in the fair value of plan assets and net actuarial gains and losses annually in the fourth quarter of each fiscal year and whenever a plan is determined to qualify for a remeasurement. The remaining components of pension and other postretirement benefits expense are recorded ratably on a quarterly basis. Pension and other postretirement benefits adjustments charged directly to cost of sales that are applicable to inactive participants are excluded from inventoriable costs. The service cost component of pension and other postretirement benefits costs is allocated to each reportable segment on a ratable basis; while the remaining components of pension and other postretirement benefits costs are recorded within the other net periodic benefit income (costs) caption on the Statements of Consolidated Comprehensive Income (Loss).

Foreign currency translation

Operations outside the United States are measured primarily using the local currency as the functional currency. Upon consolidation, the results of operations of the subsidiaries and affiliates whose functional currency is other than the U.S. dollar are translated into U.S. dollars at the average exchange rates for the year while assets and liabilities are translated at year-end exchange rates. Adjustments to translate assets and liabilities into U.S. dollars are recorded in the stockholders' equity section of the Consolidated Balance Sheets as a component of accumulated other comprehensive income (loss) and are included in net earnings only upon sale or substantial liquidation of the underlying foreign subsidiary or affiliated company.

Stock incentive plans

Ashland recognizes compensation expense for stock incentive plans awarded to key employees and directors, primarily in the form of stock appreciation rights (SARs), restricted stock and restricted stock units, performance shares and other non-vested stock awards, that are generally based upon the grant-date fair value over the appropriate vesting period. Ashland utilizes several industry accepted valuation models to determine the fair value. For further information concerning stock incentive plans, see Note P.

Earnings per share

The following is the computation of basic and diluted earnings per share (EPS) from continuing operations attributable to Ashland. Earnings per share are reported under the treasury stock method. SARs and warrants for each reported year whose grant price was greater than the market price of Ashland Common Stock at the end of each fiscal year were not included in the computation of earnings per share from continuing operations per diluted share because the effect of these instruments would be antidilutive. The total number of these shares outstanding was 1.2 million for 2022, 1.2 million for 2021 and 1.7 million for 2020.

(In millions except per share data)	2022	2021	2020
Numerator			
Numerator for basic and diluted EPS - Income (loss) from continuing operations, net of tax	$ 181	$ 173	$ (555)
Denominator			
Denominator for basic EPS - Weighted-average common shares outstanding	55	60	61
Share based awards convertible to common shares (a)	1	1	—
Denominator for diluted EPS - Adjusted weighted - average shares and assumed conversions	56	61	61
EPS from continuing operations			
Basic	$ 3.26	$ 2.85	$ (9.16)
Diluted	3.20	2.82	(9.16)

(a) As a result of the loss from continuing operations for 2020, the effect of approximately one million share-based awards convertible to common shares would be antidilutive. In accordance with US GAAP, they have been excluded from the diluted EPS calculation.

Other accounting pronouncements

In June 2016, the FASB issued amended accounting guidance related to the measurement of credit losses on financial instruments. The amended accounting guidance changes the impairment model for most financial assets to require measurement and recognition of expected credit losses for financial assets held. This guidance became effective for Ashland on October 1, 2020. As a result, Ashland recorded a $3 million increase in its allowance for credit losses, primarily related to asbestos receivables, and a $2 million decrease to retained earnings, net of tax, reflecting the cumulative effect on retained earnings. Under the new expected credit loss model, Ashland records an allowance for credit losses inherent in its receivables from revenue transactions and reinsurance recoverables. The allowance for credit losses is a valuation account deducted from the amortized cost basis of the assets to present their net carrying value at the amount expected to be collected. Ashland estimates expected credit losses based on relevant information about past events, including historical experience, current conditions, and reasonable and supportable forecasts that affect the collectability of the reported amount. When measuring expected credit losses, Ashland pools assets with similar country risk and credit risk characteristics. Each period the allowance for credit losses is adjusted through earnings to reflect expected credit losses over the remaining lives of the assets. No significant credit losses were incurred in 2022 and 2021.

NOTE B – ACQUISITIONS

Personal Care acquisition

On April 30, 2021, Ashland completed its acquisition of the personal care business of Schülke & Mayr GmbH (Schülke), a portfolio company of the global investment organization EQT. Ashland has included the purchase of this business within the Personal Care reporting segment.

Purchase price allocation

The acquisition was recorded by Ashland using the purchase method of accounting in accordance with applicable U.S. GAAP whereby the total purchase price was allocated to tangible and intangible assets acquired and liabilities assumed based on respective fair values.

The all-cash purchase price of Schülke was $312 million. Ashland incurred acquisition related transaction cost of $4 million during the twelve months ended September 30, 2021, which are recorded within the income on acquisitions and divestitures caption within the Statement of Consolidated Comprehensive Income (Loss). Within this same caption, Ashland recognized income of $1 million during the year ended September 30, 2021, associated with gains on foreign derivative exchange contracts entered into to mitigate the exposure of the Euro dominated purchase price. The following table summarizes the finalized values of the assets acquired and liabilities assumed at the date of acquisition.

Purchase price allocation (in millions)		At April 30, 2021 As Adjusted
Assets:		
Cash and cash equivalents	$	3
Accounts receivable		6
Inventories		12
Net property, plant and equipment		3
Goodwill		131
Intangibles		183
Liabilities:		
Trade and other payables		(3)
Deferred income taxes		(17)
Employee benefit obligations		(6)
Total purchase price (a)	$	312

(a) Total purchase price less acquired cash and cash equivalents was $309 million.

Goodwill was calculated as the excess of the consideration transferred over the net assets recognized and represents the estimated future economic benefits arising from other assets acquired that could not be individually identified and separately recognized. The factors contributing to the recognition of goodwill were based on strategic and synergistic benefits expected to be realized from the acquisition. A portion of the goodwill associated with foreign asset deal entities is expected to be deductible for income tax purposes.

Intangible assets identified

The purchase price allocation included $183 million of certain definite-lived intangible assets which are being amortized over the estimated useful life in proportion to the economic benefits consumed. The determination of the useful lives is based upon various industry studies, historical acquisition experience, economic factors, and future cash flows of the combined company. In addition, Ashland reviewed certain technological trends and also considered the relative stability and retention rates in the current Schülke personal care customer base.

The following details the total intangible assets identified as of April 30, 2021.

Intangible asset type (in millions)		Value	Weighted-average amortization period (years)
Trademarks and trade names	$	41	20
Intellectual property		24	8
Customer and supplier relationships		118	20
Total	$	183	

NOTE C – DIVESTITURES

Performance Adhesives

On February 28, 2022, Ashland completed the sale of its Performance Adhesives business to Arkema, a French société anonyme. Proceeds from the sale were approximately $1.7 billion, net of transaction costs. Ashland recognized a $726 million after-tax gain on sale within the Income (loss) from Discontinued Operations caption of the Statements of Consolidated Comprehensive Income (Loss) for the twelve months ended September 30, 2022.

The transaction represented a strategic shift in Ashland's business and had a major effect on Ashland's operations and financial results. Accordingly, the operating results and cash flows related to Performance Adhesives have been reflected as discontinued operations in the Statements of Consolidated Comprehensive Income (Loss) and Statements of Consolidated Cash Flows, while the assets and liabilities that were sold have been classified within the Consolidated Balance Sheets as held for sale in periods preceding the sale. See Note D for the results of operations for Performance Adhesives for all periods presented.

Certain indirect corporate costs included within the selling, general and administrative expense caption of the Statements of Consolidated Comprehensive Income (Loss) that were previously allocated to the Performance Adhesives segment do not qualify for classification within discontinued operations and are now reported as selling, general and administrative expense within continuing operations on a consolidated basis and within the Unallocated and other segment. These costs were $9 million, $15 million and $20 million during the twelve months ended September 30, 2022, 2021 and 2020 respectively.

Maleic

On September 30, 2020, Ashland completed the sale of its Maleic business to AOC Materials LLC (AOC). Net proceeds from the sale were approximately $98 million. As a result of the sale, Ashland recognized a $29 million after-tax gain within the Statement of Consolidated Comprehensive Income (Loss) within the income from discontinued operations caption for the twelve months ended September 30, 2020.

Since the Maleic business was operated under the Composites business and Marl facility disposal group which signified a strategic shift in Ashland's business and had a major effect on Ashland's operations and financial results, the operating results and cash flows related to the Maleic business, have been reflected as discontinued operations in the Statements of Consolidated Comprehensive Income (Loss) and Statements of Consolidated Cash Flows. See Note D of the Notes to Consolidated Financial Statements for the results of operations for the Maleic business, for all periods presented.

Other manufacturing facility sales

During 2020, Ashland entered into a definitive sale agreement to sell a Specialty Additives facility, the assets and liabilities of which were classified as held for sale as of September 30, 2020. During 2021, Ashland completed the sale of the Specialty Additives facility. Net proceeds received from the sale were approximately $20 million ($14 million and $6 million received during the twelve months September 30 2021 and 2020, respectively). The company recognized a pre-tax gain of $14 million recorded within the income on acquisitions and divestitures caption in the Statements of Consolidated Comprehensive Income (Loss) for the twelve months ended September 30, 2021.

Ashland determined this transaction did not qualify for discontinued operations treatment since it did not represent a strategic shift that had or will have a major effect on Ashland's operations and financial results.

Other corporate assets

Ashland sometimes pursues to divest corporate assets, primarily related to land and buildings. When sales for these assets are expected to close within 12 months, they are classified as held for sale. During 2022, Ashland completed the sale of two excess land properties with a net book value of $8 million as of September 30, 2021. Ashland received net proceeds of approximately $50 million and recorded pre-tax gain of $42 million within the income on acquisitions and divestitures caption within the Statement of Consolidated Comprehensive Income (Loss) for 2022. During 2020, Ashland completed the sale of an office building with a net book value of $6 million and received net proceeds of $5 million. As a result, Ashland recognized a loss of $1 million before tax. The loss was reported within the income on acquisitions and divestitures caption within the Statement of Consolidated Comprehensive Income (Loss) for 2020

Held for sale classification

The assets and liabilities of the Performance Adhesives segment, along with other properties, have been reflected as assets and liabilities held for sale as described above. As a result, in accordance with U.S. GAAP standards, depreciation and amortization were not being recorded within the Statements of Consolidated Comprehensive Income (Loss) and the Consolidated Balance Sheets. There were no assets classified as held for sale as of September 30, 2022. These assets and liabilities were comprised of the following components as of September 30, 2021:

(In millions)		2021
Accounts receivable, net	$	26
Inventories		27
Net property, plant and equipment		80
Goodwill		453
Operating lease assets, net		10
Other assets		1
Current assets held for sale	$	597
Trade and other payables	$	33
Accrued expenses and other liabilities		7
Current operating lease obligations		1
Operating lease obligations		9
Current labilities held for sale	$	50

NOTE D – DISCONTINUED OPERATIONS

Ashland has divested certain businesses that have qualified as discontinued operations. The operating results from these divested businesses and subsequent adjustments related to ongoing assessments and activities of certain retained liabilities and tax items have been recorded within the discontinued operations caption in the Statements of Consolidated Comprehensive Income (Loss) for all periods presented and are discussed further within this note.

As previously described in Note C, Ashland completed the sale of its Performance Adhesives segment to Arkema during 2022. Ashland determined that this disposal group qualified as a discontinued operation, in accordance with U.S. GAAP, since it represents a strategic shift for Ashland and had a major effect on Ashland's operations and financial results. Accordingly, the operating results and cash flows for the Performance Adhesives segment have been classified as discontinued operations within the Consolidated Financial Statements for all periods presented.

Ashland has completed the previously announced sale its Maleic business to AOC during 2020. Ashland determined that this business (which was part of the Composites and the Marl facility disposal group) qualified as a discontinued operation, in accordance with U.S. GAAP, since it represents a strategic shift for Ashland and had a major effect on Ashland's operations and financial results. Accordingly, the operating results and cash flows for the Maleic business have been classified as discontinued operations within the Consolidated Financial Statements for all periods presented.

During 2019, Ashland completed the sale of the Composites business and Marl facility. Ashland determined that this sale qualifies as a discontinued operation, in accordance with U.S. GAAP, since Ashland does not have significant continuing involvement in the Composites business. Ashland has made subsequent adjustments to the discontinued operations caption related to this sale.

During 2017, Ashland completed the separation of Valvoline Inc. (Valvoline). Ashland determined that this sale qualified as a discontinued operation, in accordance with U.S. GAAP, since Ashland does not have significant continuing involvement in the Valvoline business. Ashland has made subsequent adjustments to the discontinued operations caption related to the separation.

During 2014, Ashland completed the sale of the Ashland Water Technologies (Water Technologies) business. Ashland determined that this sale qualified as a discontinued operation, in accordance with U.S. GAAP, since Ashland does not have significant continuing involvement in the Water Technologies business. Ashland has made subsequent adjustments to the discontinued operations caption related to the sale.

During 2011, Ashland completed the sale of substantially all of the assets and certain liabilities of its global distribution business, which previously comprised the Ashland Distribution (Distribution) reportable segment. Ashland determined that this sale qualified as a discontinued operation, in accordance with U.S. GAAP, since Ashland does not have significant continuing involvement in the Distribution business. Ashland has made subsequent adjustments to the discontinued operations caption related to the sale.

Ashland is subject to liabilities from claims alleging personal injury caused by exposure to asbestos. Such claims result primarily from indemnification obligations undertaken in 1990 in connection with the sale of Riley Stoker Corporation (Riley), a former subsidiary, which qualified as a discontinued operation and from the acquisition during 2009 of Hercules LLC (formerly Hercules Incorporated), an indirect wholly-owned subsidiary of Ashland. Adjustments to the recorded litigation reserves and related insurance receivables are recorded within the discontinued operations caption. See Note N for more information related to the adjustments on asbestos liabilities and receivables.

Due to the ongoing assessment of certain matters associated with previous divestitures, subsequent adjustments to these divestitures may continue in future periods in the discontinued operations caption in the Statements of Consolidated Comprehensive Income (Loss). Components of amounts reflected in the Statements of Consolidated Comprehensive Income (Loss) related to discontinued operations are presented in the following table for each of the years ended September 30.

(In millions)	2022	2021	2020
Income (loss) from discontinued operations			
Performance Adhesives	$ 33	$ 83	$ 74
Composites/Marl facility (including Maleic)	—	(1)	9
Valvoline	(7)	(33)	(24)
Water Technologies	5	(4)	—
Distribution	(9)	(6)	(10)
Asbestos-related litigation	(17)	(11)	(18)
Gain on disposal of discontinued operations			
Performance Adhesives	1,063	—	—
Composites/Marl facility (including Maleic)	—	(4)	37
Water Technologies	—	1	—
Income before taxes	1,068	25	68
Income tax benefit (expense)			
Benefit (expense) related to income (loss) from discontinued operations			
Performance Adhesives	8	(19)	(10)
Composites/Marl facility (including Maleic)	2	1	(5)
Valvoline	1	36	—
Water Technologies	(1)	1	—
Distribution	2	1	2
Asbestos-related litigation	3	2	—
Expense related to gain on disposal of discontinued operations			
Performance Adhesives	(337)	—	—
Composites/Marl facility (including Maleic)	—	—	(8)
Income from discontinued operations (net of taxes)	$ 746	$ 47	$ 47

Performance adhesives divestiture

The following table presents a reconciliation of the captions within Ashland's Statements of Consolidated Income (Loss) for the income from discontinued operations attributable to the Performance Adhesives segment for each of the years ended September 30.

(In millions)	2022	2021	2020
Income(loss) from discontinued operations attributable to Performance Adhesives			
Sales	$ 171	$ 372	$ 310
Cost of sales	(122)	(256)	(202)
Selling, general and administrative expense	(12)	(25)	(24)
Research and development expense	(4)	(8)	(8)
Intangible amortization expense	—	(1)	(1)
Pretax operating income of discontinued operations	33	82	75
Other net periodic benefit income (loss)	—	1	(1)
Pretax income of discontinued operations	33	83	74
Income tax expense	8	(19)	(10)
Income from discontinued operations	$ 41	$ 64	$ 64

Composites and Marl divestiture

The following table presents a reconciliation of the captions within Ashland's Statements of Consolidated Income (Loss) for the income from discontinued operations attributable to the Maleic business for 2020. The Maleic business, which was sold during 2020 to AOC, was operated under the Composites business and Marl facility disposal group, and is therefore reported in discontinued operations. No items were reportable for this table during 2022 and 2021.

(In millions)	2020
Income(loss) from discontinued operations attributable to Composites/Marl facility disposal group	
Sales	$ 51
Cost of sales	(35)
Selling, general and administrative expense	(9)
Equity and other income	2
Pretax income of discontinued operations	9
Income tax expense	(5)
Income from discontinued operations	$ 4

NOTE E – RESTRUCTURING ACTIVITIES

Company-wide restructuring activities

Ashland periodically implements company-wide restructuring programs related to acquisitions, divestitures and other cost reduction programs in order to enhance profitability through streamlined operations and an improved overall cost structure.

Fiscal 2020 restructuring costs

During 2022, 2021 and 2020, Ashland incurred severance income of $2 million, $1 million and expense of $51 million, respectively, attributable to executive management changes and business management changes within the organization initiated in fiscal 2020. As of September 30, 2022 and 2021, the severance reserves associated with this transition were $1 million and $6 million, respectively.

The following table details at September 30, 2022 and 2021, the amount of restructuring severance reserves related to this program. The severance reserves were primarily recorded within accrued expenses and other liabilities in the Consolidated Balance Sheet as of September 30, 2022 and 2021.

(In millions)	Severance costs	
Balance as of September 30, 2020	$	39
Restructuring reserve		(1)
Utilization (cash paid)		(32)
Balance as of September 30, 2021	$	6
Restructuring reserve		(2)
Utilization (cash paid)		(3)
Balance as of September 30, 2022	$	1

Impairments

During 2021, Ashland incurred $3 million of asset impairment charges related to restructuring activities at a plant originating from the shutdown of a product line recorded within the cost of sales caption of the Statements of Consolidated Comprehensive Income (Loss). In addition, Ashland incurred a $10 million capital project impairment recorded within the selling, general and administrative expense caption of the Statements of Consolidated Comprehensive Income (Loss).

NOTE F – FAIR VALUE MEASUREMENTS

As required by U.S. GAAP, Ashland uses applicable guidance for defining fair value, the initial recording and periodic remeasurement of certain assets and liabilities measured at fair value and related disclosures for instruments measured at fair value. Fair value accounting guidance establishes a fair value hierarchy, which prioritizes the inputs to valuation techniques used to measure fair value into three broad levels. The fair value hierarchy gives the highest priority to quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). An instrument's categorization within the fair value hierarchy is based upon the lowest level of input that is significant to the instrument's fair value measurement. The three levels within the fair value hierarchy are described as follows.

Level 1 – Observable inputs such as unadjusted quoted prices in active markets for identical assets or liabilities.

Level 2 – Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. These include quoted prices for similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.

Level 3 – Unobservable inputs for the asset or liability for which there is little, if any, market activity at the measurement date. Unobservable inputs reflect Ashland's own assumptions about what market participants would use to price the asset or liability. The inputs are developed based on the best information available in the circumstances, which might include Ashland's own financial data such as internally developed pricing models, discounted cash flow methodologies, as well as instruments for which the fair value determination requires significant management judgment.

For assets that are measured using quoted prices in active markets (Level 1), the total fair value is the published market price per unit multiplied by the number of units held without consideration of transaction costs. Assets and liabilities that are measured using significant other observable inputs (Level 2) are primarily valued by reference to quoted prices of similar assets or liabilities in active markets, adjusted for any terms specific to that asset or liability. For all other assets and liabilities for which unobservable inputs are used (Level 3), fair value is derived through the use of fair value models, such as a discounted cash flow model or other standard pricing models that Ashland deems reasonable.

The following table summarizes financial instruments subject to recurring fair value measurements as of September 30, 2022. For additional information on fair value hierarchy measurements of pension plan asset holdings, see Note M.

(In millions)	Carrying value	Total fair value	Quoted prices in active markets for identical assets Level 1	Significant other observable inputs Level 2	Significant unobservable inputs Level 3
Assets					
Cash and cash equivalents	$ 646	$ 646	$ 646	$ —	$ —
Restricted investments (a) (b)	374	374	374	—	—
Investments of captive insurance company (c)	9	9	9	—	—
Foreign currency derivatives (d)	1	1	—	1	—
Commodity derivatives (d)	4	4	—	4	—
Total assets at fair value	$ 1,034	$ 1,034	$ 1,029	$ 5	$ —
Liabilities					
Foreign currency derivatives (e)	$ 9	$ 9	$ —	$ 9	$ —
Commodity derivatives (e)	1	1	—	1	—
Total liabilities at fair value	$ 10	$ 10	$ —	$ 10	$ —

(a) Included in restricted investments and $61 million within other current assets in the Consolidated Balance Sheets.

(b) Includes $245 million related to the Asbestos trust and $129 million related to the Environmental trust. See Note A for additional details.

(c) Included in other noncurrent assets in the Consolidated Balance Sheets.

(d) Included in accounts receivable in the Consolidated Balance Sheets.

(e) Included in accrued expenses and other liabilities in the Consolidated Balance Sheets.

The following table summarizes financial instruments subject to recurring fair value measurements as of September 30, 2021.

(In millions)	Carrying value	Total fair value	Quoted prices in active markets for identical assets Level 1	Significant other observable inputs Level 2	Significant unobservable inputs Level 3
Assets					
Cash and cash equivalents	$ 210	$ 210	$ 210	$ —	$ —
Restricted investments (a) (b)	421	421	421	—	—
Investments of captive insurance company (c)	8	8	8	—	—
Foreign currency derivatives	1	1	—	1	—
Commodity derivatives (d)	5	5	—	5	—
Total assets at fair value	$ 645	$ 645	$ 639	$ 6	$ —
Liabilities					
Foreign currency derivatives (e)	$ 2	$ 2	$ —	$ 2	$ —

(a) Included in restricted investments and $37 million within other current assets in the Consolidated Balance Sheets.

(b) Includes $333 million related to the Asbestos trust and $88 million related to the Environmental trust. See Note A for additional details.

(c) Included in other noncurrent assets in the Consolidated Balance Sheets.

(d) Included in accounts receivable in the Consolidated Balance Sheets.

(e) Included in accrued expenses and other liabilities in the Consolidated Balance Sheets.

Restricted investments

As discussed in Note A, Ashland maintains certain investments in a company restricted renewable annual trusts for the purpose of paying future asbestos indemnity and defense costs and future environmental remediation and related litigation costs. The financial instruments are designated as investment securities, classified as Level 1 measurements within the fair value hierarchy. These securities were classified primarily as noncurrent restricted investment assets, with $61 million and $37 million classified within other current assets, in the Consolidated Balance Sheets for the periods ended in September 30, 2022 and 2021, respectively.

The following table presents gross unrealized gains and losses for the restricted securities as of September 30, 2022 and 2021:

(In millions)	Adjusted Cost	Gross Unrealized Gain	Gross Unrealized Loss	Fair Value
As of September 30, 2022				
Demand deposit	$ 6	$ —	$ —	$ 6
Equity mutual fund	186	20	(25)	181
Fixed income mutual fund	234	—	(47)	187
Fair value	$ 426	$ 20	$ (72)	$ 374
As of September 30, 2021				
Demand deposit	$ 6	$ —	$ —	$ 6
Equity mutual fund	143	44	(1)	186
Fixed income mutual fund	223	7	(1)	229
Fair value	$ 372	$ 51	$ (2)	$ 421

The following table presents the investment income, net gains and losses, funds restricted for specific transactions and disbursements related to the investments within the restricted investments portfolio during 2022, 2021 and 2020.

(In millions)	2022	2021	2020
Investment income	$ 16	$ 12	$ 10
Net gains (losses)	(102)	21	20
Funds restricted for specific transactions	74	91	3
Disbursements	(35)	(33)	(35)

Foreign currency derivatives

Ashland conducts business in a variety of foreign currencies. Accordingly, Ashland regularly uses foreign currency derivative instruments to manage exposure on certain transactions denominated in foreign currencies to curtail potential earnings volatility effects of certain assets and liabilities, including short-term inter-company loans denominated in currencies other than Ashland's functional currency of an entity. These derivative contracts generally require exchange of one foreign currency for another at a fixed rate at a future date and generally have maturities of less than twelve months. All contracts are valued at fair value with net changes in fair value recorded within the selling, general and administrative expense caption. The impacts of these contracts were largely offset by gains and losses resulting from the impact of changes in exchange rates on transactions denominated in non-functional currencies.

The following table summarizes the gains and losses recognized during 2022, 2021 and 2020 within the Statements of Consolidated Comprehensive Income (Loss).

(In millions)	2022	2021	2020
Foreign currency derivative gain (loss) (a)	$ (40)	$ 4	$ 5

(a) Includes a $1 million gain reported within the income from acquisitions and divestitures captured for fiscal 2021.

The following table summarizes the fair values of the outstanding foreign currency derivatives as of September 30, 2022 and 2021 included in accounts receivable and accrued expenses and other liabilities of the Consolidated Balance Sheets.

(In millions)	2022	2021
Foreign currency derivative assets	$ 1	$ 1
Notional contract values	133	150
Foreign currency derivative liabilities	$ 9	$ 2
Notional contract values	535	212

Commodity derivatives

To manage its exposure to the market price volatility of natural gas consumed by its U.S. plants during the manufacturing process, Ashland regularly enters into forward contracts that are designated as cash flow hedges. See Note A for more information.

The following table summarizes the gains and losses recognized during 2022, 2021, 2020 within the cost of sales caption of the Statements of Consolidated Comprehensive Income (Loss).

(In millions)	2022	2021	2020
Commodity derivative gain	$ 10	$ 1	$ —

The following table summarizes the fair values of the outstanding commodity derivatives as of September 30, 2022 and 2021 included in accounts receivable and accrued expenses and other liabilities of the Consolidated Balance Sheets.

(In millions)	2022	2021
Commodity derivative assets	$ 4	$ 5
Notional contract values	13	6
Commodity derivative liabilities	$ 1	$ —
Notional contract values	9	—

Other financial instruments

At September 30, 2022 and 2021, Ashland's long-term debt (including the current portion and excluding debt issuance cost discounts) had a carrying values of $1,284 million and $1,622 million, respectively, compared to a fair value of $1,102 million and $1,794 million, respectively. The fair values of long-term debt are based on quoted market prices or, if market prices are not available, the present values of the underlying cash flows discounted at Ashland's incremental borrowing rates, which are deemed to be Level 2 measurements within the fair value hierarchy.

NOTE G – PROPERTY, PLANT AND EQUIPMENT

The following table describes the various components of property, plant and equipment within the Consolidated Balance Sheets as of September 30, 2022 and 2021.

(In millions)	2022	2021
Land	$ 138	$ 142
Buildings	458	452
Machinery and equipment	2,324	2,278
Construction in progress	130	194
Total property, plant and equipment (gross)	3,050	3,066
Accumulated depreciation	(1,712)	(1,639)
Total property, plant and equipment (net)	$ 1,338	$ 1,427

The following table summarizes various property, plant and equipment charges recognized during 2022, 2021, 2020 within the Statements of Consolidated Comprehensive Income.

(In millions)	2022	2021	2020
Depreciation	$ 147	$ 154	$ 151
Capitalized interest	1	2	2

NOTE H – GOODWILL AND OTHER INTANGIBLES

Goodwill

Ashland performed its annual goodwill impairment test using the quantitative approach as of July 1, 2022 and concluded that the reporting unit fair values for all reporting units exceeded their carrying values. No impairment existed as of that date and no subsequent impairment indicators have been identified.

The following is a progression of goodwill by reportable segment for the years ended September 30, 2022 and 2021.

(In millions)	Life Sciences	Personal Care (a)	Specialty Additives (a)	Intermediates (a)	Total
Balance at September 30, 2020	$ 861	$ —	$ 444	$ —	$ 1,305
Acquisitions (b)	—	131	—	—	131
Currency translation and other	(5)	(2)	1	—	(6)
Balance at September 30, 2021	856	129	445	—	1,430
Currency translation and other	(69)	(11)	(38)	—	(118)
Balance at September 30, 2022	$ 787	$ 118	$ 407	$ —	$ 1,312

(a) As of September 30, 2022 and 2021, there was accumulated impairment of $356 million, $174 million, and $90 million related to the Personal Care, Specialty Additives, and Intermediates reportable segments, respectively. The accumulated impairments for Personal Care and Specialty Additives were recorded in fiscal 2020 within the goodwill impairment caption of the Statements of Consolidated Comprehensive Income (Loss).

(b) Relates to the acquisition of the Schülke personal care business during 2021. See Note B for more information.

Other intangible assets

Intangible assets principally consist of trademarks and trade names, intellectual property and customer and supplier relationships. Intangible assets classified as finite are amortized on a straight-line basis over their estimated useful lives. The cost of trademarks and trade names is amortized principally over 3 to 20 years, intellectual property over 3 to 20 years, and customer and supplier relationships over 10 to 24 years.

Ashland performed its annual impairment test for other indefinite lived intangible assets using the quantitative approach as of July 1, 2022 and concluded that the assets fair values exceeded their carrying values. No impairment existed as of that date.

Other intangible assets were comprised of the following as of September 30, 2022 and 2021.

	2022			2021		
(In millions)	Gross carrying amount	Accumulated amortization	Net carrying amount	Gross carrying amount	Accumulated amortization	Net carrying amount
Definite-lived intangible assets						
Trademarks and trade names	$ 95	$ (37)	$ 58	$ 101	$ (32)	$ 69
Intellectual property	718	(523)	195	750	(495)	255
Customer and supplier relationships	801	(369)	432	849	(352)	497
Total definite-lived intangible assets	1,614	(929)	685	1,700	(879)	821
Indefinite-lived intangible assets						
Trademarks and trade names	278	—	278	278	—	278
Total intangible assets	$ 1,892	$ (929)	$ 963	$ 1,978	$ (879)	$ 1,099

Amortization expense recognized on intangible assets was $94 million for 2022, $90 million for 2021 and $84 million for 2020, and is included in the intangibles amortization expense caption of the Statements of Consolidated Comprehensive Income (Loss). As of September 30, 2022, all of Ashland's intangible assets that had a carrying value were being amortized except for certain trademarks and trade names that have been determined to have indefinite lives. Estimated amortization expense for future periods is $94 million in 2023, $79 million in 2024, $74 million in 2025, $70 million in 2026 and $47 million in 2027. The amortization expense for future periods is an estimate. Actual amounts may change from such estimated amounts due to fluctuations in foreign currency exchange rates, additional intangible asset acquisitions and divestitures, potential impairment, accelerated amortization, or other events.

Goodwill and Other Intangible assets

Ashland's assessment of an impairment on any of these assets classified currently as having indefinite lives, including goodwill, could change in future periods if significant events happen and/or circumstances change that effect the previously mentioned assumptions such as: a significant change in projected business result, a divestiture decision, increase in Ashland's weighted-average cost of capital rates, decrease in growth rates or assumptions, economic deterioration that is more severe or of a longer duration than anticipated, or another significant economic event.

NOTE I – DEBT

The following table summarizes Ashland's current and long-term debt at September 30, 2022 and 2021.

(In millions)		2022		2021
3.375% Senior Notes, due 2031	$	450	$	450
2.00% Senior Notes, due 2028 (Euro 500 million principal)		489		580
6.875% notes, due 2043		282		282
Term loan A		—		250
Accounts receivable securitizations		—		117
6.50% junior subordinated notes, due 2029		60		57
Revolving credit facility		—		225
Other (a)		(11)		9
Total debt		1,270		1,970
Short-term debt (includes current portion of long-term debt)		—		(374)
Long-term debt (less current portion and debt issuance costs)	$	1,270	$	1,596

(a) Other includes $14 million and $17 million of debt issuance costs as of September 30, 2022 and 2021, respectively. Additionally, as of September 30, 2021 Other included a European short-term loan facility with an outstanding balance of $23 million.

At September 30, 2022, Ashland's total debt had an outstanding principal balance of $1,321 million, discounts of $37 million and debt issuance costs of $14 million. As of September 30, 2022, Ashland had no long-term debt (excluding debt issuance costs) maturing within the next 4 years and $4 million due in fiscal 2027.

Credit Agreements and Refinancing

Note Issuances

During August 2021, Ashland, through one of its subsidiaries, completed the issuance of 3.375% senior unsecured notes due 2031 with an aggregate principal amount of $450 million (the 2031 Notes). The notes are guaranteed on an unsecured basis by Ashland. Ashland used the net proceeds of the offering (after deducting initial purchasers' discounts and other fees and expenses) to redeem its obligations under the existing 4.750% senior notes due 2022 described below in debt repayments, and to pay fees and expenses associated therewith.

Ashland incurred $6 million of new debt issuance costs in connection with the 2031 Notes, which is amortized using the effective interest method over the 2031 Notes' term and was included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss).

During January 2020, a subsidiary of Ashland, Ashland Services B.V., completed the issuance of 2.00% senior unsecured notes due 2028 with an aggregate principal amount of €500 million (the 2028 Notes). The notes are senior unsecured obligations of Ashland Services B.V and are guaranteed on an unsecured basis by Ashland.

Ashland incurred $8 million of new debt issuance costs in connection with the 2028 Notes, which is amortized using the effective interest method over the 2028 Notes' term.

2020 Credit Agreement

During January 2020, Ashland, through two of its subsidiaries, entered into a new senior unsecured credit agreement (the 2020 Credit Agreement) with a group of lenders, replacing the 2017 Credit Agreement. The 2020 Credit Agreement provided for (i) a $600 million unsecured five-year revolving credit facility (the 2020 Revolving Credit Facility) and (ii) a $250 million unsecured five-year term loan facility (the 2020 Term Loan Facility). Proceeds of borrowings under the 2020 Revolving Credit Facility were used to refinance the Ashland's existing 2017 Credit Agreement, to provide ongoing working capital and for other general corporate purposes.

Ashland incurred $4 million of new debt issuance costs in connection with the 2020 Credit Agreement, of which $1 million was expensed immediately during 2020 within the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss). The remaining balance is amortized using the straight-line method.

During July 2022, Ashland, through two of its subsidiaries, enacted an amendment to the 2020 credit agreement. The amended credit agreement (the 2022 Credit Agreement) provides for a $600 million five-year revolving credit facility (the 2022 Revolving Credit Facility). The 2022 Credit Agreement and the obligations of Ashland Services B.V. under the 2022 Revolving Credit Facility are guaranteed by Ashland.

At Ashland's option, loans issued under the 2022 Credit Agreement will bear interest at (a) in the case of loans denominated in U.S. dollars, either Term SOFR or an alternate base rate and (b) in the case of loans denominated in Euros, EURIBOR, in each case plus the applicable interest rate margin. Loans will initially bear interest at Term SOFR or EURIBOR plus 1.250% per annum, in the case of Term SOFR borrowings or EURIBOR borrowings, respectively, or at the alternate base rate plus 0.250% per annum, in the case of alternate base rate borrowings, through and including the date of delivery of a quarterly compliance certificate and thereafter the interest rate will fluctuate between Term SOFR or EURIBOR plus 1.250% per annum and Term SOFR or EURIBOR plus 1.750% per annum (or between the alternate base rate plus 0.250% per annum and the alternate base rate plus 0.750% per annum), based upon the Consolidated Net Leverage Ratio (as defined in the Credit Agreement) at such time. Term SOFR borrowings are subject to a credit spread adjustment of 0.10% per annum. In addition, the Company will initially be required to pay fees of 0.125% per annum on the daily unused amount of the Revolving Facility through and including the date of delivery of a quarterly compliance certificate, and thereafter the fee rate will fluctuate between 0.125% and 0.275% per annum, based upon the Consolidated Net Leverage Ratio. Borrowings under the 2022 Credit Agreement may be prepaid at any time without premiums.

As a result of the amendment of the 2020 Credit Agreement, Ashland recognized a $1 million charge for accelerated amortization of previously capitalized debt issuance costs during 2022, which is included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss). Ashland also incurred $2 million of new debt issuance costs in connection with the 2022 Credit Agreement, of which $1 million was expensed immediately during 2022 within the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss). The remaining balance is amortized using the straight-line method.

The 2022 Credit Agreement contains financial covenants for leverage and interest coverage ratios akin to those in effect under the 2020 Credit Agreement. The 2022 Credit Agreement contains usual and customary representations, warranties and affirmative and negative covenants, including financial covenants for leverage and interest coverage ratios, limitations on liens, additional indebtedness, further negative pledges, investments, mergers, sale of assets and restricted payments, and other customary limitations.

Debt repayments and repurchases

Cash repatriation

During 2022 and 2021, Ashland repatriated approximately $250 million and $131 million, respectively, in cash that was primarily used to repay existing debt, principally portions of the 4.75% senior notes due 2022, the 6.875% senior notes due 2043 and the 6.5% junior notes in 2020 (as previously discussed).

2022 Debt repayments and repurchases

2020 Credit Agreement

During 2022, Ashland prepaid its Term loan A principal balance of $250 million.

Other Debt

During 2022, Ashland repaid the outstanding balance on its European short-term loan facility for $23 million.

2021 Debt repayments and repurchases

Redemption of 4.750% senior notes due 2022

During 2021, Ashland redeemed all of its outstanding 4.750% senior notes due 2022 (the 2022 Notes), of which approximately $411 million were outstanding. Ashland recognized a $1 million charge related to accelerated accretion on debt discounts and accelerated amortization of previously capitalized debt issuance costs, which is included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss).

Total premiums paid for all the tender offers in 2021 noted above were $16 million, which is included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss).

2020 Debt repayments and repurchases

Tender offers of 4.750% senior notes due 2022

During 2020, Ashland executed tender offers of the 2022 Notes. As a result of these repurchases, the carrying values of the 2022 Notes was reduced by $670 million. Ashland recognized a $5 million charge related to accelerated accretion on debt discounts and accelerated amortization of previously capitalized debt issuance costs, which is included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss).

Tender offers of 6.875% notes due 2043

During 2020, Ashland executed tender offers of its 6.875% notes due 2043 (the 2043 Notes). As a result of these repurchases, the carrying values of the 2043 Notes was reduced by $92 million. Ashland recognized a $1 million charge related to accelerated accretion on debt premiums and accelerated amortization of previously capitalized debt issuance costs, which is included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss).

Tender offers of 6.500% Junior Subordinated Debentures due 2029

During 2020, Ashland executed tender offers of Hercules LLC's 6.500% junior subordinated debentures due 2029 (the 2029 Junior Debentures). As a result of these repurchases, the carrying values of the 2029 Junior Debentures was reduced by $2 million.

Total premiums paid for all the tender offers in 2020 noted above were $59 million, which is included in the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss).

Accounts receivable facilities and off-balance sheet arrangements

U.S. accounts receivable sales program

On March 17, 2021, a wholly-owned, bankruptcy-remote special purpose entity and consolidated Ashland subsidiary (SPE) entered into an agreement with a group of entities (buyers) to sell certain trade receivables, without recourse beyond the pledged receivables, of two other U.S. based Ashland subsidiaries. Under the agreement, Ashland can transfer whole receivables up to a limit established by the buyer, which is currently set at $125 million between February and October of each year and up to $100 million all other times. Ashland's continuing involvement is limited to servicing the receivables, including billing, collections and remittance of payments to the buyers as well as a limited guarantee on over-collateralization. The arrangement terminates on May 31, 2023, unless terminated earlier pursuant to the terms of the agreement.

Ashland determined that any receivables transferred under this agreement are put presumptively beyond the reach of Ashland and its creditors, even in bankruptcy or other receivership. Ashland received a true sale at law and non-consolidation opinions to support the legal isolation of these receivables. Ashland accounts for the receivables transferred to buyers as sales. Ashland recognizes any gains or losses based on the excess of proceeds received net of buyer's discounts and fees compared to the carrying value of the assets. Proceeds received, net of buyer's discounts and fees, are recorded within the operating activities of the Statements of Consolidated Cash Flows. Losses on sale of assets, including related transaction expenses are recorded within the net interest and other expense caption of the Statements of Consolidated Comprehensive Income (Loss). Ashland regularly assesses its servicing obligations and records them as assets or liabilities when appropriate. Ashland also monitors its obligation with regards to the limited guarantee and records the resulting guarantee liability when warranted. When applicable, Ashland discloses the amount of the receivable that serves as over-collateralization as a restricted asset.

Ashland recognized a $1 million loss within the Statements of Consolidated Comprehensive Income (Loss) for 2022 and 2021, respectively, within the net interest and other expense caption associated with sales under the program. Ashland has recorded $110 million of sales against the buyer's limit, which was $125 million at September 30, 2022, compared to $113 million of sales against the buyer's limit, which was $125 million at September 30, 2021. Ashland transferred $136 million and $167 million in receivables to the SPE as of September 30, 2022 and 2021, respectively. Ashland recorded liabilities related to its service obligations and limited guarantee as of September 30, 2022 and 2021 of less than $1 million. As of September 30, 2022, the year-to-date gross cash proceeds received for receivables transferred and derecognized was

$312 million, of which $315 million was collected by Ashland in our capacity as a servicer of the receivables and remitted to the buyer. The difference of $3 million represents the impact of a net reduction in account receivable sales volume during the current year.

2018 foreign accounts receivable securitization

During July 2018, Ashland entered into a €115 million accounts receivable securitization facility (the Program) for the transfer by certain subsidiaries of Ashland (the Sellers) directly or indirectly to Ester Finance Titrisation (the Purchaser), a wholly-owned subsidiary of Crédit Agricole Corporate and Investment Bank (the Arranger), of certain receivables and/or collections originated by the Sellers towards certain corporate debtors located in multiple European jurisdictions and denominated in multiple currencies. The Program originally had a term of two years, but was extended to August 2021 in September 2019. During July 2021, the termination date of the Program was extended to July 2023. During July 2020, the available funding for qualified receivables under the accounts receivable securitization facility decreased from €115 million to €100 million.

Under the Program, each Seller will assign, on an ongoing basis, certain of its accounts receivable and the right to the collections on those accounts receivable to the Purchaser. Under the terms of the Program, the Sellers could, from time to time, obtain up to €100 million from the Purchaser through the sale of an undivided interest in such accounts receivable and collections. Ashland accounts for the securitization facility as secured borrowings, and the receivables sold pursuant to the facility are included in the Consolidated Balance Sheets as accounts receivable. Fundings under the Program will be repaid as accounts receivable are collected, with new fundings being advanced (through daily advanced purchase price) as new accounts receivable are originated by the Sellers and assigned to the Purchaser, with settlement occurring monthly. Ashland classifies any borrowings under this facility as a short-term debt instrument within the Consolidated Balance Sheets. Once sold to the Purchaser, the accounts receivable and rights to collection described above are separate and distinct from each Sellers' own assets and are not available to its creditors should such Sellers become insolvent.

At September 30, 2022 and 2021, the outstanding amount of accounts receivable transferred by Ashland to the Purchaser was $162 million and $152 million, respectively, and there were zero and $117 million, respectively, of borrowings (denominated in multiple currencies) under the facility. The weighted-average interest rate for this instrument was 0.5% and 0.6% for 2022 and 2021, respectively.

Other debt

At September 30, 2022 and 2021, Ashland held other debt totaling $63 million and $83 million, respectively, comprised primarily of a European short-term loan facility, the 6.50% notes due 2029 and other notes.

Available borrowing capacity and liquidity

The borrowing capacity remaining under the $600 million 2022 Revolving Credit Facility was $581 million due to an outstanding balance of zero, as well as a reduction of $19 million for letters of credit outstanding at September 30, 2022. Ashland's total borrowing capacity at September 30, 2022 was $680 million, which included $99 million of available capacity from the foreign 2018 accounts receivable securitization facility.

Additionally, Ashland has zero available liquidity under its current U.S. Accounts Receivable Sales Program.

Covenants related to current Ashland debt agreements

Ashland's debt contains usual and customary representations, warranties and affirmative and negative covenants, including financial covenants for leverage and interest coverage ratios, limitations on liens, additional subsidiary indebtedness, restrictions on subsidiary distributions, investments, mergers, sale of assets and restricted payments and other customary limitations. As of September 30, 2022, Ashland was in compliance with all debt agreement covenant restrictions.

The maximum consolidated net leverage ratio permitted under Ashland's most recent credit agreement (the 2022 Credit Agreement) is 4.0. The 2022 Credit Agreement defines the consolidated net leverage ratio as the ratio of consolidated indebtedness minus unrestricted cash and cash equivalents to consolidated EBITDA (Covenant Adjusted EBITDA) for any measurement period. In general, the 2022 Credit Agreement defines Covenant Adjusted EBITDA as net income plus consolidated interest charges, taxes, depreciation and amortization expense, fees and expenses related to capital market transactions and proposed or actual acquisitions and divestitures, restructuring and integration charges, certain environmental charges, non-cash stock and equity compensation expense, and any other nonrecurring expenses or losses that do not represent a cash item in such period or any future period; less any non-cash gains or other items increasing net income. The computation of Covenant Adjusted EBITDA differs from the calculation of EBITDA and Adjusted EBITDA, which have been reconciled within Item 7 of this document.

In general, consolidated indebtedness includes debt plus all purchase money indebtedness, banker's acceptances and bank guaranties, deferred purchase price of property or services, attributable indebtedness and guarantees. At September 30, 2022, Ashland's calculation of the consolidated net leverage ratio was 1.1.

The minimum required consolidated interest coverage ratio under the 2022 Credit Agreement is 3.0. The 2022 Credit Agreement defines the consolidated interest coverage ratio as the ratio of Covenant Adjusted EBITDA to consolidated interest charges for any measurement period. At September 30, 2022, Ashland's calculation of the consolidated interest coverage ratio was 10.8.

Guarantee of senior notes

Ashland Inc. fully and unconditionally guaranteed the 2.00% notes due 2028 and has no significant independent assets or operations.

Net interest and other expense (income)

(In millions)	2022	2021	2020
Interest expense (a)	$ 62	$ 69	$ 88
Interest income	(4)	(1)	(1)
Loss on the accounts receivables sale program	1	1	—
Investment securities loss (income) (b)	86	(33)	(30)
Other financing costs (c)	4	20	62
	$ 149	$ 56	$ 119

(a) Includes $1 million, $1 million and $8 million of accelerated accretion and/or amortization for original issue discounts and debt issuance costs during 2022, 2021 and 2020, respectively.

(b) Represents investment loss related to the restricted investments discussed in Note F.

(c) Includes costs of $16 million related to early redemption premium payments for the 2022 notes during 2021, and $59 million related to early redemption premium payments for the 2022 Notes, 2043 Notes and 2029 Junior Debentures during 2020.

The following table details the debt issuance cost and original issue discount amortization included in interest expense during 2022, 2021 and 2020.

(In millions)	2022	2021	2020
Normal amortization	$ 6	$ 6	$ 7
Accelerated amortization (a)	1	1	8
Total	$ 7	$ 7	$ 15

(a) Fiscal year 2022 includes $1 million of accelerated debt issuance costs for the 2020 credit agreement. 2021 includes $1 million of accelerated debt issuance cost for the 2022 Notes. Fiscal year 2020 includes $2 million of accelerated accretion of the recorded debt discount for the 2022 Notes, 2029 Junior Debentures and 2043 Notes, while the remaining amounts in each year related to the accelerated amortization of debt issuance costs.

NOTE J – OTHER NONCURRENT ASSETS AND LIABILITIES

The following table provides the components of other noncurrent assets in the Consolidated Balance Sheets as of September 30.

(In millions)	2022	2021
Deferred compensation investments	$ 85	$ 92
Tax and tax indemnity receivables	2	9
Life insurance policies	73	63
Manufacturing catalyst supplies	25	28
Defined benefit plan assets	21	28
Equity and other unconsolidated investments	3	4
Land use rights	6	7
Environmental insurance receivables	17	13
Debt issuance costs	2	3
Other	20	20
	$ 254	$ 267

Deferred compensation investments

Deferred compensation investments consist of insurance policies valued at cash surrender value. Gains and losses related to deferred compensation investments are immediately recognized within the selling, general and administrative expense caption on the Statements of Consolidated Comprehensive Income (Loss). These investments had losses of $2 million during 2022 and gains of $10 million during both 2021 and 2020, respectively. During 2022, Ashland liquidated $5 million of deferred compensation investments, which were reinvested in company owned life insurance assets. During 2021, Ashland liquidated $90 million of deferred compensation investments to fund the Environmental trust. Ashland did not liquidate any deferred compensation investments during 2020. These cash inflows exclude company-owned life insurance death benefits of $3 million, $1 million and $7 million for 2022, 2021 and 2020, respectively. See Note A for additional details.

The following table provides the components of other noncurrent liabilities in the Consolidated Balance Sheets as of September 30.

(In millions)		2022		2021
Tax liabilities	$	127	$	145
Environmental remediation reserves	$	157		152
Deferred compensation		25		31
Other		16		21
	$	325	$	349

NOTE K – LEASING ARRANGEMENTS

Ashland leases certain office buildings, transportation equipment, warehouses and storage facilities, and equipment. Substantially all of Ashland's leases are operating leases or short-term leases. Real estate leases represented over 85% of the total lease liability at September 30, 2022 and 2021, respectively. See Note A for additional information related to Ashland's leasing policies.

The components of lease cost recognized within the Statements of Consolidated Comprehensive Income (Loss) were as follows:

(In millions)	Location		2022		2021		2020
Lease cost:							
Operating lease cost	Selling, General & Administrative	$	13	$	13	$	14
Operating lease cost	Cost of Sales		16		15		15
Variable lease cost	Selling, General & Administrative		5		3		5
Variable lease cost	Cost of Sales		4		3		3
Short-term leases	Cost of Sales		3		3		5
Total lease cost (a)		$	41	$	37	$	42

(a) Includes $2 million lease termination fee in fiscal 2022.

The following table summarizes Ashland's lease assets and liabilities as presented in the Consolidated Balance Sheet at September 30:

(In millions)		2022		2021
Assets				
Operating lease assets, net	$	107	$	124
Total lease assets	$	107		124
Liabilities				
Current operating lease obligations	$	19	$	23
Non-current operating lease obligations		94		110
Total lease liabilities	$	113	$	133

Ashland often has options to renew lease terms for buildings and other assets. The exercise of lease renewal options are generally at Ashland's sole discretion. In addition, certain lease arrangements may be terminated prior to their original expiration date at Ashland's discretion. Ashland evaluates renewal and termination options at the lease commencement date to determine if it is reasonably certain to exercise the option on the basis of economic factors. The weighted average remaining lease term for operating leases as of September 30, 2022 and 2021 was approximately 17 and 15 years, respectively.

Residual value guarantees are not common within Ashland's lease agreements nor are restrictions or covenants imposed by leases. Ashland has elected the practical expedient to combine lease and non-lease components. The discount rate implicit within the leases is generally not determinable. Therefore, Ashland determines the discount rate based on its incremental borrowing rate. The incremental borrowing rate is determined using a buildup method resulting in an estimated range of secured borrowing rates matching the lease term and the currency of the jurisdiction in which lease payments are made, adjusted for impacts of collateral. Consideration was given to Ashland’s own relevant debt issuances as well as debt instruments of comparable companies with similar credit characteristics. The weighted average discount rate used to measure operating lease liabilities as of September 30, 2022 and 2021 was 2.6% and 2.8%, respectively. There are no leases that have not yet commenced but that create significant rights and obligations for Ashland.

Right-of-use assets exchanged for new operating lease obligations was $14 million and $23 million for the twelve months ended September 30, 2022 and 2021, respectively. This includes $1 million of right-of-use assets and operating lease obligations recorded as a result of the purchase of Schülke personal care business during 2021.

The following table provides cash paid for amounts included in the measurement of operating lease liabilities for during 2022 and 2021:

(In millions)	2022	2021	2020
Operating cash flows from operating leases	$ 29	$ 29	$ 27

The following table summarizes Ashland's maturities of lease liabilities as of September 30, 2022:

(In millions)	2022
2023	$ 20
2024	17
2025	12
2026	9
2027	7
Thereafter	86
Total lease payments	151
Less amount of lease payment representing interest	(38)
Total present value of lease payments	$ 113

NOTE L – INCOME TAXES

Income Tax Provision

A summary of the provision for income taxes related to continuing operations follows.

(In millions)	2022	2021	2020
Current			
Federal	$ 3	$ (35)	$ (4)
State	7	(2)	(7)
Foreign	50	25	31
	60	(12)	20
Deferred	(35)	(26)	(42)
Income tax expense (benefit)	$ 25	$ (38)	$ (22)

Foreign net operating loss carryforwards primarily relate to certain European and Asian Pacific operations and generally may be carried forward. U.S. state net operating loss carryforwards relate to losses within certain states and generally may be carried forward. Temporary differences that give rise to significant deferred tax assets and liabilities as of September 30 are presented in the following table.

(In millions)	2022	2021
Deferred tax assets		
Foreign net operating loss carryforwards (a)	$ 23	$ 30
Employee benefit obligations	18	30
Environmental, self-insurance and litigation reserves (net of receivables)	116	99
State net operating loss carryforwards (net of unrecognized tax benefits) (b)	19	32
Compensation accruals	29	24
Credit carryforwards (net of unrecognized tax benefits) (c)	20	19
Other items	21	11
Other lease liability	17	20
Valuation allowances (d)	(56)	(74)
Total deferred tax assets	207	191
Deferred tax liabilities		
Goodwill and other intangibles (e)	169	201
Property, plant and equipment	175	179
Right of use assets	16	18
Other	3	—
Total deferred tax liabilities	363	398
Net deferred tax liability	$ (156)	$ (207)

(a) Gross net operating loss carryforwards of $93 million will expire in future years beyond 2023 or have no expiration.

(b) Apportioned net operating loss carryforwards generated of $585 million will expire in future years as follows: $106 million in 2023, $83 million in 2024 and the remaining balance in other future years.

(c) Credit carryforwards consist primarily of foreign tax credits of $17 million expiring in future years, and state tax credits of $3 million that will expire in 2026 and other future years.

(d) Valuation allowances primarily relate to certain state and foreign net operating loss carryforwards and certain federal credit carryforwards.

(e) The total gross amount of goodwill as of September 30, 2022 expected to be deductible for tax purposes is $44 million.

The U.S. and foreign components of income from continuing operations before income taxes and a reconciliation of the statutory federal income tax with the provision for income taxes follow. The foreign components of income from continuing operations disclosed in the following table exclude any allocations of certain corporate expenses incurred in the U.S.

(In millions)	2022	2021	2020
Income (loss) from continuing operations before income taxes			
United States	$ (133)	$ (96)	$ (642)
Foreign	339	231	65
Income (loss) from continuing operations before income taxes	$ 206	$ 135	$ (577)
Income taxes computed at U.S. statutory rate	$ 43	$ 28	$ (121)
Increase (decrease) in amount computed resulting from			
Tax reform (a)	—	—	(23)
Uncertain tax positions	(6)	(49)	9
Deemed inclusions, foreign dividends and other restructuring (b)	40	25	35
Foreign tax credits	(32)	(20)	(14)
Valuation allowance changes (c)	(4)	4	(1)
Research and development credits	(2)	(3)	(6)
State taxes	(4)	(5)	(4)
Goodwill impairment	—	2	95
International rate differential	(27)	(18)	(2)
Other items (d)	17	(2)	10
Income tax expense (benefit)	$ 25	$ (38)	$ (22)

(a) 2020 includes a benefit of $23 million from Swiss tax reform.

(b) 2022 includes $31 million primarily related to GILTI permanent adjustment. 2021 includes $17 million primarily related to GILTI permanent adjustments. 2020 includes $33 million primarily related to GILTI permanent adjustments.

(c) 2022 includes $4 million related to state NOL's. 2021 includes $13 million related to certain foreign tax credits partially offset by $5 million related to state NOL's and $4 million related to foreign jurisdictions.

(d) 2022 includes $8 million related to withholding tax. 2021 includes $14 million related to the sale of a Specialty Additives facility partially offset by miscellaneous other items. 2020 includes $4 million for foreign withholding taxes.

Unrecognized tax benefits

U.S. GAAP prescribes a recognition threshold and measurement attribute for the accounting and financial statement disclosure of tax positions taken or expected to be taken in a tax return. The evaluation of a tax position is a two-step process. The first step requires Ashland to determine whether it is more likely than not that a tax position will be sustained upon examination based on the technical merits of the position. The second step requires Ashland to recognize in the financial statements each tax position that meets the more likely than not criteria, measured at the amount of benefit that has a greater than 50% likelihood of being realized. Ashland had $84 million and $82 million of unrecognized tax benefits at September 30, 2022 and 2021, respectively, recorded within other noncurrent liabilities. As of September 30, 2022, the total amount of unrecognized tax benefits that, if recognized, would affect the tax rate for continuing and discontinued operations was $56 million. The remaining unrecognized tax benefits relate to tax positions for which ultimate deductibility is highly certain but for which there is uncertainty as to the timing of such deductibility. Recognition of these tax benefits would not have an impact on the effective tax rate.

Ashland recognizes interest and penalties related to uncertain tax positions as a component of income tax expense (benefit) in the Statements of Consolidated Comprehensive Income (Loss). Such interest and penalties totaled a $3 million expense in 2022, $15 million benefit in 2021 and $8 million expense in 2020. Ashland had $10 million and $11 million in interest and penalties related to unrecognized tax benefits accrued as of September 30, 2022 and 2021, respectively.

Changes in unrecognized tax benefits were as follows:

(In millions)		
Balance at September 30, 2020 **(a)**	$	171
Increases related to positions taken on items from prior years		8
Decreases related to positions taken on items from prior years		(70)
Increases related to positions taken in the current year		11
Lapse of statute of limitations		(20)
Settlements		(18)
Balance at September 30, 2021	$	82
Decreases related to positions taken on items from prior years		(5)
Increases related to positions taken in the current year		19
Lapse of statute of limitations		(12)
Balance at September 30, 2022	$	84

(a) Ashland has indemnity receivables from Valvoline and Pharmachem for zero and $1 million of the gross unrecognized tax benefits at September 30, 2022 and 2021, respectively, recorded within other noncurrent assets.

From a combination of statute expirations and audit settlements in the next twelve months, Ashland expects a decrease in the amount of accrual for uncertain tax positions of between $3 million and $6 million for continuing operations. For the remaining balance as of September 30, 2022, it is reasonably possible that there could be material changes to the amount of uncertain tax positions due to activities of the taxing authorities, settlement of audit issues, reassessment of existing uncertain tax positions or the expiration of applicable statute of limitations; however, Ashland is not able to estimate the impact of these items at this time.

Ashland or one of its subsidiaries files income tax returns in the U.S. federal jurisdiction and various state and foreign jurisdictions. Foreign taxing jurisdictions significant to Ashland include Brazil, China, Germany, Mexico, Netherlands, Spain, Switzerland and United Kingdom. Ashland is subject to U.S. federal income tax examinations by tax authorities for periods after September 30, 2018 and U.S. state income tax examinations by tax authorities for periods after September 30, 2015. With respect to countries outside of the United States, with certain exceptions, Ashland's foreign subsidiaries are subject to income tax audits for years after 2017.

NOTE M – EMPLOYEE BENEFIT PLANS

Pension plans

Ashland and its subsidiaries have several contributory and noncontributory qualified defined benefit pension plans that generally cover international employees and a small portion of certain U.S. manufacturing union employees. Pension obligations for applicable employees of non-U.S. consolidated subsidiaries are provided for in accordance with local practices and regulations of the respective countries. The majority of these foreign pension plans are closed to new participants while those that remain open relate to areas where jurisdictions require plans to operate within the applicable country.

Benefits for those eligible for Ashland's U.S. pension plans generally are based on employees' years of service and compensation during the years immediately preceding their retirement. The remaining U.S. plans are still open for enrollment for qualifying union employees within certain manufacturing sites.

Other postretirement benefit plans

Ashland and its subsidiaries maintain limited health care for certain eligible employees in the U.S. who are retired or disabled. Ashland shares the costs of providing health care coverage with certain eligible retired employees through premiums, deductibles and coinsurance provisions. Ashland funds its share of the costs of the postretirement benefit plans as the benefits are paid.

Postretirement health care plans include a limit on Ashland's share of costs for recent and future retirees. The assumed pre-65 health care cost increase trend rate as of September 30, 2022 was 6.6% and continues to be reduced to 4.5% in 2039 and thereafter. The assumptions used to project the liability anticipate future cost-sharing changes to the written plans that are consistent with the increase in health care costs.

Plan Amendments and Remeasurements

Following the completion of the sale of its Performance Adhesives business segment on February 28, 2022, the post-retirement benefits for approximately 40 employees transferred to Arkema, all of whom participated in a non-contributory defined benefit plan in the U.S., were frozen. This resulted in a decrease in total expected future years of service within the plan and required Ashland to remeasure the plan as February 28, 2022. As a result, Ashland recorded a $1 million actuarial gain within the other net periodic benefit income (loss) caption of the Statements of Consolidated Comprehensive Income (Loss) for fiscal 2022.

Net periodic benefit loss (income) allocation

Consistent with Ashland's historical accounting policies, service cost for continuing operations is proportionately allocated to each reportable segment, excluding the Unallocated and other segment, while all other costs for continuing operations are recorded within the Unallocated and other segment.

The following table summarizes the components of pension and other postretirement benefit costs for continuing operations and the assumptions used to determine net periodic benefit loss (income) for the plans.

	Pension benefits			Other postretirement benefits		
(In millions)	2022	2021	2020	2022	2021	2020
Net periodic benefit loss (income)						
Service cost (a)	$ 4	$ 5	$ 5	$ 1	$ 1	$ 1
Interest cost (b)	8	6	7	2	2	2
Curtailment, settlement and other (b)	(1)	—	—	—	—	—
Expected return on plan assets (b)	(7)	(8)	(11)	—	—	—
Actuarial (gain) loss (b)	(16)	3	1	(8)	(2)	(2)
	$ (12)	$ 6	$ 2	$ (5)	$ 1	$ 1
Weighted-average plan assumptions (c)						
Discount rate for service cost	2.99%	1.81%	1.84%	3.19%	3.15%	3.39%
Discount rate for interest cost	3.33%	1.69%	2.16%	2.10%	1.93%	2.76%
Rate of compensation increase	2.50%	2.53%	2.51%			
Expected long-term rate of return on plan assets	2.89%	2.43%	3.05%			

(a) Service cost is classified within the selling, general and administrative expense and cost of sales captions on the Statements of Consolidated Comprehensive Income (Loss).
(b) These components are classified within the other net periodic benefit income (loss) caption on the Statements of Consolidated Comprehensive Income (Loss).
(c) The plan assumptions discussed are a blended weighted-average rate for Ashland's U.S. and non-U.S. plans.

The changes in prior service credit recognized in accumulated other comprehensive income during both 2022 and 2021 were less than $1 million each. At September 30, 2022, Ashland expects to recognize less than $1 million of the prior service credit in accumulated other comprehensive income as net periodic benefit income (loss) during the next fiscal year.

At September 30, 2022 and 2021, the amounts included in accumulated other comprehensive income are shown in the following table.

	Pension		Postretirement	
(In millions)	2022	2021	2022	2021
Prior service cost	$ 2	$ 2	$ —	$ —

Obligations and funded status

Actuarial valuations are performed for the pension and other postretirement benefit plans to determine Ashland's obligation for each plan. In accordance with U.S. GAAP, Ashland recognizes the unfunded status of the plans as a liability in the Consolidated Balance Sheets. Summaries of the change in benefit obligations, plan assets, funded status of the plans, amounts recognized in the balance sheet, and assumptions used to determine the benefit obligations for 2022 and 2021 are as follows:

	Pension plans		Other postretirement benefit plans	
(In millions)	2022	2021	2022	2021
Change in benefit obligations				
Benefit obligations at October 1	$ 422	$ 418	$ 47	$ 50
Service cost	4	5	1	1
Interest cost	8	6	2	1
Participant contributions	—	—	—	—
Benefits paid	(16)	(16)	(6)	(3)
Actuarial (gain) loss	(123)	2	(8)	(2)
Curtailments	(1)	(1)	—	—
Foreign currency exchange rate changes	(38)	8	—	—
Other (including acquisitions)	(1)	3	—	—
Settlements	(5)	(3)	—	—
Benefit obligations at September 30	$ 250	$ 422	$ 36	$ 47
Change in plan assets				
Value of plan assets at October 1	$ 351	$ 347	$ —	$ —
Actual return on plan assets	(100)	7	—	—
Employer contributions	5	7	—	—
Participant contributions	—	—	—	—
Benefits paid	(16)	(16)	—	—
Foreign currency exchange rate changes	(33)	10	—	—
Settlements	(5)	(3)	—	—
Other	(1)	(1)	—	—
Value of plan assets at September 30	$ 201	$ 351	$ —	$ —
Unfunded status of the plans	$ (49)	$ (71)	$ (36)	$ (47)
Amounts recognized in the balance sheet				
Other assets (noncurrent)	$ 21	$ 28	$ —	$ —
Accrued expenses and other liabilities	(3)	(3)	(4)	(4)
Employee benefit obligations	(67)	(96)	(32)	(43)
Net amount recognized	$ (49)	$ (71)	$ (36)	$ (47)
Weighted-average plan assumptions				
Discount rate	5.09%	2.06%	2.98%	2.75%
Rate of compensation increase	2.50%	2.53%		

The accumulated benefit obligation for all pension plans was $245 million at September 30, 2022 and $415 million at September 30, 2021. All Ashland pension plans are either qualified U.S. or non-US plans. Information for pension plans with an accumulated benefit obligation in excess of plan assets follows:

(In millions)	2022	2021
Projected benefit obligation	$ 146	$ 216
Accumulated benefit obligation	141	209
Fair value of plan assets	76	117

Plan assets

The expected long-term rate of return on pension plan assets was 2.89% and 2.43% for September 30, 2022 and 2021, respectively. The basis for determining the expected long-term rate of return is a combination of future return assumptions for various asset classes in Ashland's investment portfolio, historical analysis of previous returns, market indices and a projection of inflation.

The following table summarizes the various investment categories that the pension plan assets are invested in and the applicable fair value hierarchy that the financial instruments are classified within these investment categories as of September 30, 2022. For additional information and a detailed description of each level within the fair value hierarchy, see Note F.

(In millions)	Total fair value	Quoted prices in active markets for identical assets Level 1	Significant other observable inputs Level 2	Significant unobservable inputs Level 3
Cash and cash equivalents	$ 1	$ 1	$ —	$ —
U.S. Government securities	10	—	10	—
Non-U.S. Government securities	24	—	24	—
Corporate debt instruments	90	—	90	—
Listed real assets	9	—	9	—
Asset-backed securities	17	—	17	—
Corporate stocks	27	—	27	—
Insurance contracts	23	—	23	—
Total assets at fair value	$ 201	$ 1	$ 200	$ —

The following table summarizes the various investment categories that the pension plan assets are invested in and the applicable fair value hierarchy that the financial instruments are classified within these investment categories as of September 30, 2021.

(In millions)	Total fair value	Quoted prices in active markets for identical assets Level 1	Significant other observable inputs Level 2	Significant unobservable inputs Level 3
Cash and cash equivalents	$ 6	$ 6	$ —	$ —
U.S. Government securities	18	—	18	—
Non-U.S. Government securities	74	—	74	—
Corporate debt instruments	149	—	149	—
Listed real assets	16	—	16	—
Asset-backed securities	22	—	22	—
Corporate stocks	41	—	41	—
Insurance contracts	25	—	25	—
Total assets at fair value	$ 351	$ 6	$ 345	$ —

Ashland's pension plan holds a variety of investments designed to diversify risk. Investments classified as a Level 1 fair value measure principally represent marketable securities priced in active markets. Cash and cash equivalents and public equity and debt securities are well diversified and invested in U.S. and international small-to-large companies across various asset managers and styles. Investments classified as a Level 2 fair value measure principally represents fixed-income securities and other investment grade corporate bonds and debt obligations.

Investments and Strategy

In developing an investment strategy for its defined benefit plans, Ashland has considered the following factors: the nature of the plans' liabilities, the allocation of liabilities between active, deferred and retired members, the funded status of the plans, the applicable investment horizon, the respective size of the plans and historical and expected capital market returns. Ashland's U.S. pension plan assets are managed by outside investment managers, which are monitored against investment return benchmarks and Ashland's established investment strategy. Investment managers are selected based on an analysis of, among other things, their investment process, historical investment results, frequency of management turnover, cost structure and assets under management. Assets are periodically reallocated between investment managers to maintain an appropriate asset mix and diversification of investments and to optimize returns.

The current asset allocation for the U.S. plans is 42.5% fixed income securities, 42% equity securities and 15.5% other securities. Fixed income securities primarily include cash and cash equivalents, long duration corporate debt obligations and U.S. government debt obligations. In addition, Ashland's non-U.S. plan fixed income securities include insurance contracts. Equity securities are comprised solely of traditional public equity investments. Investment managers may employ a limited use of derivatives to gain efficient exposure to markets.

Ashland's investment strategy and management practices relative to plan assets of non-U.S. plans generally are consistent with those for U.S. plans, except in those countries where investment of plan assets is dictated by applicable regulations. Although the investment allocation may vary based on funding percentages and whether plans are still accruing additional liabilities, the weighted-average asset allocations for Ashland's U.S. and non-U.S. plans at September 30, 2022 and 2021 by asset category follow.

		Actual at September 30	
(In millions)	Target	2022	2021
Plan assets allocation			
Equity securities	5 - 45%	14%	13%
Fixed income securities	55 - 95%	81%	82%
Other	0 - 5%	5%	5%
		100%	100%

Cash flows

During 2022 and 2021, Ashland contributed less than $1 million and $2 million to its U.S. pension plans, respectively, and $5 million and $6 million to its non-U.S. pension plans, respectively. Ashland does not expect to contribute to its U.S. pension plans and expects to contribute approximately $4 million to its non-U.S. pension plans during 2023.

The following benefit payments, which reflect future service expectations, are projected to be paid from plan assets in each of the next five years and in aggregate for five years thereafter.

(In millions)	Pension benefits	Other postretirement benefits
2023	$ 15	$ 3
2024	15	3
2025	15	3
2026	16	3
2027	17	3
2028 - 2032	84	15

Other plans

Ashland sponsors savings plans to assist eligible employees in providing for retirement or other future needs. Under such plans, company contributions amounted to $23 million, $21 million, and $24 million in 2022, 2021 and 2020, respectively. Ashland also sponsors various other employee benefit plans, some of which are required by different countries. The total noncurrent liabilities associated with these plans were $4 million and $5 million for September 30, 2022 and 2021, respectively.

NOTE N – LITIGATION, CLAIMS AND CONTINGENCIES

Asbestos litigation

Ashland and Hercules have liabilities from claims alleging personal injury caused by exposure to asbestos. To assist in developing and annually updating independent reserve estimates for future asbestos claims and related costs, Ashland has retained third party actuarial experts Gnarus. The methodology used by Gnarus to project future asbestos costs is based largely on recent experience, including claim-filing and settlement rates, disease mix, open claims and litigation defense. The claim experience of Ashland and Hercules are separately compared to the results of previously conducted third party epidemiological studies estimating the number of people likely to develop asbestos-related diseases. Those studies were undertaken in connection with national analyses of the population expected to have been exposed to asbestos. Using that information, Gnarus estimates a range of the number of future claims that may be filed, as well as the related costs that may be incurred in resolving those claims. Changes in asbestos-related liabilities and receivables are recorded on an after-tax basis within the discontinued operations caption in the Statements of Consolidated Comprehensive Income (Loss).

Ashland asbestos-related litigation

The claims alleging personal injury caused by exposure to asbestos asserted against Ashland result primarily from indemnification obligations undertaken in 1990 in connection with the sale of Riley, a former subsidiary. The amount and timing of settlements and number of open claims can fluctuate from period to period. A summary of Ashland asbestos claims activity, excluding Hercules claims, follows.

(In thousands)	2022	2021	2020
Open claims - beginning of year	46	49	53
New claims filed	2	2	2
Claims settled	(1)	(1)	(1)
Claims dismissed	(3)	(4)	(5)
Open claims - end of year	44	46	49

Ashland asbestos-related liability

From the range of estimates, Ashland records the amount it believes to be the best estimate of future payments for litigation defense and claim settlement costs. Ashland reviews this estimate and related assumptions quarterly and annually updates the results of a non-inflated, non-discounted approximate 40-year model developed with the assistance of Gnarus.

During the most recent update completed during 2022, it was determined that the liability for Ashland asbestos-related claims should be increased by $16 million. Total reserves for asbestos claims were $305 million at September 30, 2022 compared to $320 million at September 30, 2021.

A progression of activity in the asbestos reserve is presented in the following table.

(In millions)	2022	2021	2020
Asbestos reserve - beginning of year	$ 320	$ 335	$ 352
Reserve adjustment	16	12	13
Amounts paid	(31)	(27)	(30)
Asbestos reserve - end of year (a)	$ 305	$ 320	$ 335

(a) Included $29 million classified in accrued expenses and other liabilities on the Consolidated Balance Sheets as of September 30, 2022 and 2021.

Ashland asbestos-related receivables

Ashland has insurance coverage for certain litigation defense and claim settlement costs incurred in connection with its asbestos claims, and coverage-in-place agreements exist with the insurance companies that provide substantially all of the coverage that will be accessed.

For the Ashland asbestos-related obligations, Ashland has estimated the value of probable insurance recoveries associated with its asbestos reserve based on management's interpretations and estimates surrounding the available or applicable insurance coverage, including an assumption that all solvent insurance carriers remain solvent. Substantially all of the estimated receivables from insurance companies are expected to be due from domestic insurers, all of which are solvent.

At September 30, 2022, Ashland's receivable for recoveries of litigation defense and claim settlement costs from insurers amounted to $101 million (excluding the Hercules receivable for asbestos claims discussed below). Receivables from insurers amounted to $100 million at

September 30, 2021. During 2022, the annual update of the model used for purposes of valuing the asbestos reserve and its impact on valuation of future recoveries from insurers, was completed. This model update resulted in a $7 million increase in the receivable for probable insurance recoveries.

A progression of activity in the Ashland insurance receivable is presented in the following table.

(In millions)	2022	2021	2020
Insurance receivable - beginning of year	$ 100	$ 103	$ 123
Receivable adjustment (a)	7	6	1
Insurance settlement	—	—	(10)
Amounts collected	(6)	(9)	(11)
Insurance receivable - end of year (b)	$ 101	$ 100	$ 103

(a) 2021 includes a $2 million reserve adjustment related to allowances for credit losses as a result of Ashland's adoption of the new credit measurement standard described in Note A. The total allowance for credit losses was $2 million as of September 30,2022.

(b) Included $12 million classified in accounts receivable on the Consolidated Balance Sheets as of September 30, 2022 and 2021.

Hercules asbestos-related litigation

Hercules has liabilities from claims alleging personal injury caused by exposure to asbestos. Such claims typically arise from alleged exposure to asbestos fibers from resin encapsulated pipe and tank products which were sold by one of Hercules' former subsidiaries to a limited industrial market. The amount and timing of settlements and number of open claims can fluctuate from period to period. A summary of Hercules' asbestos claims activity follows.

(In thousands)	2022	2021	2020
Open claims - beginning of year	12	12	13
New claims filed	1	1	1
Claims dismissed	(2)	(1)	(2)
Open claims - end of year	11	12	12

Hercules asbestos-related liability

From the range of estimates, Ashland records the amount it believes to be the best estimate of future payments for litigation defense and claim settlement costs. Ashland reviews this estimate and related assumptions quarterly and annually updates the results of a non-inflated, non-discounted approximate 40-year model developed with the assistance of Gnarus. As a result of the most recent annual update of this estimate, completed during 2022, it was determined that the liability for Hercules asbestos-related claims should be increased by $15 million. Total reserves for asbestos claims were $213 million at September 30, 2022 compared to $217 million at September 30, 2021.

A progression of activity in the asbestos reserve is presented in the following table.

(In millions)	2022	2021	2020
Asbestos reserve - beginning of year	$ 217	$ 229	$ 252
Reserve adjustments	15	8	(3)
Amounts paid	(19)	(20)	(20)
Asbestos reserve - end of year (a)	$ 213	$ 217	$ 229

(a) Included $18 million classified in accrued expenses and other liabilities on the Consolidated Balance Sheets as of September 30, 2022 and 2021.

Hercules asbestos-related receivables

For the Hercules asbestos-related obligations, certain reimbursement obligations pursuant to coverage-in-place agreements with insurance carriers exist. As a result, any increases in the asbestos reserve have been partially offset by probable insurance recoveries. Ashland has estimated the value of probable insurance recoveries associated with its asbestos reserve based on management's interpretations and estimates surrounding the available or applicable insurance coverage, including an assumption that all solvent insurance carriers remain solvent. The estimated receivable consists exclusively of solvent domestic insurers.

As of September 30, 2022 and 2021, the receivables from insurers amounted to $52 million and $47 million, respectively. During 2022, the annual update of the model used for purposes of valuing the asbestos reserve and its impact on valuation of future recoveries from insurers was completed. This model update resulted in a $7 million increase in the receivable for probable insurance recoveries.

A progression of activity in the Hercules insurance receivable is presented in the following table.

(In millions)	2022	2021	2020
Insurance receivable - beginning of year	$ 47	$ 47	$ 49
Receivable adjustment (a)	7	1	(2)
Amounts collected	(2)	(1)	—
Insurance receivable - end of year (b)	$ 52	$ 47	$ 47

(a) 2021 includes a $1 million reserve adjustment related to allowances for credit losses as a result of Ashland's adoption of the new credit measurement standard described in Note A. The total allowance for credit losses was $1 million as of September 30,2022.

(b) Included $3 million and $1 million classified in accounts receivable on the Consolidated Balance Sheets as of September 30, 2022 and 2021, respectively.

Asbestos litigation cost projection

Projecting future asbestos costs is subject to numerous variables that are difficult to predict. In addition to the uncertainties surrounding the number of claims that might be received, other variables include the type and severity of the disease alleged by each claimant and the related costs incurred in resolving those claims, mortality rates, dismissal rates, uncertainties surrounding the litigation process from jurisdiction to jurisdiction and from case to case. Furthermore, any predictions with respect to these variables are subject to even greater uncertainty as the projection period lengthens. In light of these inherent uncertainties, Ashland believes that the asbestos reserves for Ashland and Hercules represent the best estimate within a range of possible outcomes. As a part of the process to develop these estimates of future asbestos costs, a range of long-term cost models was developed. These models are based on national studies that predict the number of people likely to develop asbestos-related diseases and are heavily influenced by assumptions regarding long-term inflation rates for indemnity payments and legal defense costs, as well as other variables mentioned previously. Ashland has currently estimated in various models ranging from approximately 40 year periods that it is reasonably possible that total future litigation defense and claim settlement costs on an inflated and undiscounted basis could range as high as approximately $456 million for the Ashland asbestos-related litigation (current reserve of $305 million) and approximately $317 million for the Hercules asbestos-related litigation (current reserve of $213 million), depending on the combination of assumptions selected in the various models. If actual experience is worse than projected, relative to the number of claims filed, the severity of alleged disease associated with those claims or costs incurred to resolve those claims, or actuarial refinement or improvements to the assumptions used within these models are initiated, Ashland may need to further increase the estimates of the costs associated with asbestos claims and these increases could be material over time.

Environmental remediation and asset retirement obligations

Ashland is subject to various federal, state and local environmental laws and regulations that require environmental assessment or remediation efforts (collectively environmental remediation) at multiple locations. At September 30, 2022, such locations included 76 sites where Ashland has been identified as a potentially responsible party under Superfund or similar state laws, 111 current and former operating facilities and about 1,225 service station properties, of which 17 are being actively remediated.

Ashland’s reserves for environmental remediation and related environmental litigation amounted to $211 million at September 30, 2022 compared to $207 million at September 30, 2021, of which $157 million at September 30, 2022 and $152 million at September 30, 2021 were classified in other noncurrent liabilities on the Consolidated Balance Sheets. The remaining reserves were classified in accrued expenses and other liabilities on the Consolidated Balance Sheets.

The following table provides a reconciliation of the changes in the environmental remediation reserves during 2022 and 2021.

(In millions)	2022	2021
Environmental remediation reserve - beginning of year	$ 207	$ 200
Disbursements	(63)	(44)
Revised obligation estimates and accretion	67	51
Environmental remediation reserve - end of year	$ 211	$ 207

The total reserves for environmental remediation reflect Ashland’s estimates of the most likely costs that will be incurred over an extended period to remediate identified conditions for which the costs are reasonably estimable, without regard to any third-party recoveries. Engineering studies, historical experience and other factors are used to identify and evaluate remediation alternatives and their related costs in determining the estimated reserves for environmental remediation. Ashland continues to discount certain environmental sites and regularly adjusts its reserves as environmental remediation continues. Ashland has estimated the value of its probable insurance recoveries associated with its environmental reserve based on management’s interpretations and estimates surrounding the available or applicable insurance coverage. At

September 30, 2022 and 2021, Ashland's recorded receivable for these probable insurance recoveries was $21 million and $16 million, respectively, of which $17 million and $13 million was classified in other noncurrent assets in the respective Consolidated Balance Sheets.

During 2022, 2021 and 2020, Ashland recognized $66 million, $50 million and $48 million of expense, respectively, for certain environmental liabilities related to normal ongoing remediation cost estimate updates for sites, which is consistent with Ashland's historical environmental accounting policy.

Components of environmental remediation expense included within the selling, general and administrative expense caption of the Statements of Consolidated Comprehensive Income (Loss) are presented in the following table for the years ended September 30, 2022, 2021 and 2020.

(In millions)	2022	2021	2020
Environmental expense	$ 66	$ 50	$ 48
Accretion	1	1	1
Legal expense	4	4	5
Total expense	71	55	54
Insurance receivable	(5)	(4)	(6)
Total expense, net of receivable activity (a)	$ 66	$ 51	$ 48

(a) Net expense of $13 million, $6 million and $12 million for the fiscal years ended September 30, 2022, 2021 and 2020, respectively, related to divested businesses which qualified for treatment as discontinued operations and for which certain environmental liabilities were retained by Ashland. These amounts are classified within the income from discontinued operations caption of the Statements of Consolidated Comprehensive Income (Loss).

Environmental remediation reserves are subject to uncertainties that affect Ashland's ability to estimate its share of the costs. Such uncertainties involve the nature and extent of contamination at each site and the extent of required cleanup efforts under existing environmental regulations. Although it is not possible to predict with certainty the ultimate costs of environmental remediation, Ashland currently estimates that the upper end of the reasonably possible range of future costs for identified sites could be as high as approximately $465 million. The largest reserve for any site is 13% of the remediation reserve.

Other legal proceedings and claims

In addition to the matters described above, there are other various claims, lawsuits and administrative proceedings pending or threatened against Ashland and its current and former subsidiaries. Such actions are with respect to commercial matters, product liability, toxic tort liability, and other environmental matters, which seek remedies or damages, some of which are for substantial amounts. While Ashland cannot predict with certainty the outcome of such actions, it believes that adequate reserves have been recorded and losses already recognized with respect to such actions were immaterial as of September 30, 2022 and 2021. There is a reasonable possibility that a loss exceeding amounts already recognized may be incurred related to these actions; however, Ashland believes that such potential losses were immaterial as of September 30, 2022.

NOTE O – EQUITY ITEMS

Stock repurchase programs

On May 25, 2022, Ashland's board of directors authorized a new, evergreen $500 million common share repurchase program (2022 stock repurchase program). The new authorization terminates and replaces the company's 2018 $1 billion share repurchase program, which had $150 million outstanding at the date of termination. As of September 30, 2022, $500 million remained available for repurchase under the 2022 stock repurchase program.

Stock repurchase program agreements

In September 2021, under the 2018 stock repurchase program, Ashland announced that it entered into an accelerated share repurchase agreement (2021 ASR Agreement). Under the 2021 ASR Agreement, Ashland paid an initial purchase price of $450 million and received an initial delivery of 3.9 million shares of common stock during September 2021. The bank exercised its early termination option under the 2021 ASR Agreement in February 2022, and an additional 0.7 million shares were repurchased, bringing the total shares repurchased upon settlement to 4.6 million.

On March 1, 2022, under the 2018 stock repurchase program, Ashland entered into an agreement to repurchase an aggregate amount of $200 million of Ashland common stock using open-market purchases under rule 10b-18. On April 8, 2022, Ashland completed repurchases under this agreement repurchasing a total of 2.15 million shares for a total amount of $200 million.

Stockholder dividends

Ashland paid dividends per common share of $1.27, $1.15 and $1.10 during 2022, 2021 and 2020, respectively.

In May 2022, the Board of Directors of Ashland announced a quarterly cash dividend of 33.5 cents per share to eligible stockholders at record, which represented an increase from the previous quarterly cash dividend of 30.0 cents per share. This dividend was paid in the third and fourth quarters of fiscal 2022.

In May 2021, the Board of Directors of Ashland announced a quarterly cash dividend of 30.0 cents per share to eligible stockholders at record, which represented an increase from the previous quarterly cash dividend of 27.5 cents per share. This dividend was paid in the third and fourth quarters of fiscal 2021 and the first and second quarters of fiscal 2022.

In May 2019, the Board of Directors of Ashland announced a quarterly cash dividend of 27.5 cents per share to eligible stockholders at record, which represented an increase from the previous quarterly cash dividend of 25.0 cents per share. This dividend was paid in each quarter of fiscal 2020 and the first and second quarters of fiscal 2021.

Shares reserved for issuance

At September 30, 2022, 17.6 million common shares were reserved for issuance under stock incentive and deferred compensation plans.

Other comprehensive income (loss)

Components of other comprehensive income (loss) recorded in the Statements of Consolidated Comprehensive Income (Loss) are presented in the following table, before tax and net of tax effects.

(In millions)	Before tax	Tax (expense) benefit	Net of tax
Year ended September 30, 2022			
Other comprehensive income (loss)			
Unrealized translation loss	$ (199)	$ 2	$ (197)
Unrealized loss on commodity hedges	(2)	1	(1)
Pension and postretirement obligation adjustment	1	—	1
Total other comprehensive gain (loss)	$ (200)	$ 3	$ (197)
Year ended September 30, 2021			
Other comprehensive income (loss)			
Unrealized translation gain	$ 8	$ (1)	$ 7
Unrealized gain on commodity hedges	5	(1)	4
Total other comprehensive gain (loss)	$ 13	$ (2)	$ 11
Year ended September 30, 2020			
Other comprehensive income (loss)			
Unrealized translation gain	$ 28	$ (1)	$ 27
Total other comprehensive gain (loss)	$ 28	$ (1)	$ 27

Summary of Stockholders' Equity

A reconciliation of changes in stockholders' equity are as follows:

(In millions)	2022	2021	2020
Common stock and paid in capital			
Balance, beginning of period	$ 328	$ 770	$ 757
Common shares issued under stock incentive and other plans (a)	8	8	13
Common shares purchased under repurchase program (b)	(200)	(450)	—
Balance, end of period	136	328	770
Retained earnings			
Balance, beginning of period	2,796	2,649	3,224
Adoption of new accounting pronouncements (c)	—	(2)	—
Net income (loss)	927	220	(508)
Regular dividends	(70)	(71)	(67)
Balance, end of period	3,653	2,796	2,649
Accumulated other comprehensive income (loss)			
Balance, beginning of period	(372)	(383)	(410)
Unrealized translation gain (loss)	(197)	7	27
Unrealized gain (loss) on commodity hedges	(1)	4	—
Pension and postretirement obligation adjustment	1	—	—
Balance, end of period	(569)	(372)	(383)
Total stockholders' equity	$ 3,220	$ 2,752	$ 3,036
Cash dividends declared per common share	$ 1.27	$ 1.15	$ 1.10

(a) Common shares issued were 168,270, 183,281 and 391,180 for 2022, 2021 and 2020, respectively.

(b) Common shares repurchased were 2,853,312 and 3,922,423 for 2022 and 2021, respectively.

(c) Represents the cumulative-effect adjustment related to the adoption of the new guidance related to the measurement of credit losses on financial instruments during fiscal 2021. See Note A for more information.

NOTE P – STOCK INCENTIVE PLANS

Ashland has stock incentive plans under which key employees or directors are granted performance share awards or nonvested stock awards. Each program is typically a long-term incentive plan designed to link employee compensation with increased shareholder value or reward superior performance and encourage continued employment with Ashland. Ashland recognizes compensation expense for the grant date fair value of stock-based awards over the applicable vesting period and accounts for forfeitures when they occur across all stock-based awards.

The components of Ashland's pretax compensation expense for stock-based awards (net of forfeitures) and associated income tax benefits are as follows.

(In millions)	2022 (a)	2021 (b)	2020 (c)
SARs	$ 1	$ 2	$ 5
Nonvested stock awards	12	10	10
Performance share awards	11	6	1
	$ 24	$ 18	$ 16
Income tax benefit	$ 6	$ 4	$ 4

(a) The year ended September 30, 2022 included $4 million and $2 million of expense related to cash-settled nonvested restricted stock awards and cash-settled performance units, respectively.

(b) The year ended September 30, 2021 included $3 million and zero of expense related to cash-settled nonvested restricted stock awards and cash-settled performance units, respectively.

(c) The year ended September 30, 2020 included $2 million and zero of expense related to cash-settled nonvested restricted stock awards and cash-settled performance units, respectively.

Stock Appreciation Rights

SARs were granted to employees or directors at a price equal to the fair market value of the stock on the date of grant and typically become exercisable over periods of one to three years. Unexercised SARs lapse ten years after the date of grant. Ashland estimates the fair value of SARs granted using the Black-Scholes option-pricing model. This model requires several assumptions, which Ashland has developed and updates based on historical trends and current market observations. The accuracy of these assumptions is critical to the estimate of fair value for these equity instruments. The following table illustrates the weighted-average of key assumptions used within the Black-Scholes option-pricing model. The risk-free interest rate assumption was based on the U.S. Treasury yield curve in effect at the time of the grant for the expected term of the instrument. The dividend yield reflects the assumption that the current dividend payout will continue with no anticipated increases. The volatility assumption was calculated by utilizing peer companies because historical volatility was not considered reflective of future volatility given the divestitures discussed in Notes C and D. The expected life is based on the mid-point of the weighted average time to vest and contractual term. Ashland did not grant any SARs during 2022 or 2021.

(In millions except per share data)	2020
Weighted-average fair value per share of SARs granted	$ 16.15
Assumptions (weighted-average)	
Risk-free interest rate	1.7%
Expected dividend yield	1.4%
Expected volatility	23.0%
Expected life (in years)	6

A progression of activity and various other information relative to SARs and previously issued and vested stock options is presented in the following table.

(In thousands except per share data)	2022 Number of common shares	2022 Weighted-average exercise price per share	2021 Number of common shares	2021 Weighted-average exercise price per share	2020 Number of common shares	2020 Weighted-average exercise price per share
Outstanding - beginning of year	1,543	$ 62.14	1,993	$ 61.11	2,102	$ 57.94
Granted	—	—	—	—	314	77.58
Exercised	(392)	57.32	(386)	54.44	(271)	46.00
Forfeitures and expirations	(9)	54.70	(64)	77.17	(152)	78.27
Outstanding - end of year (a)	1,142	63.85	1,543	62.14	1,993	61.11
Exercisable - end of year	1,094	63.24	1,415	60.68	1,609	57.31

(a) Exercise prices per share for SARs outstanding at September 30, 2022 ranged from $37.37 to $47.63 for 101 thousand shares, from $57.96 to $59.95 for 523 thousand shares, and from $67.16 to $82.34 for 518 thousand shares. The weighted-average remaining contractual life of outstanding SARs was 4.5 years and exercisable SARs and stock options was 4.3 years

The total intrinsic value of SARs exercised was $19 million in 2022, $12 million in 2021 and $8 million in 2020. The actual tax benefit realized from the exercised SARs was $4 million in 2022, $3 million in 2021 and $2 million in 2020. The total grant date fair value of SARs that vested during 2022, 2021 and 2020 was $1 million, $1 million and $4 million, respectively. As of September 30, 2022, there was less than $1 million of total unrecognized compensation costs related to SARs. That cost is expected to be recognized over a weighted-average period of 0.3 years. As of September 30, 2022, the aggregate intrinsic value of outstanding SARs and exercisable SARs was $36 million and $35 million, respectively.

Nonvested stock awards

Nonvested stock awards are granted to employees or directors at a price equal to the fair market value of the stock on the date of grant and generally vest over a one-to-three-year period. However, such shares or units are subject to forfeiture upon termination of service before the vesting period ends. Beginning in 2016, these awards were primarily granted as stock units that will convert to shares upon vesting, while the grants in prior years were generally made in nonvested shares. Only nonvested stock awards granted in the form of shares entitle employees or directors to vote the shares. Dividends on nonvested stock awards granted are in the form of additional units or shares of nonvested stock awards, which are subject to vesting and forfeiture provisions.

A progression of activity and various other information relative to nonvested stock awards is presented in the following table.

(In thousands except per share data)	2022 Number of common shares	2022 Weighted-average grant date fair value	2021 Number of common shares	2021 Weighted-average grant date fair value	2020 Number of common shares	2020 Weighted-average grant date fair value
Nonvested - beginning of year	211	$ 76.10	199	$ 74.57	215	$ 73.26
Granted	80	92.34	93	78.96	140	75.42
Vested	(72)	78.81	(69)	75.10	(125)	72.43
Forfeitures	(10)	80.06	(12)	79.02	(31)	77.99
Nonvested - end of year	209	82.55	211	76.10	199	74.57

The total grant date fair value of nonvested stock awards that vested during 2022, 2021 and 2020 was $6 million, $5 million and $9 million, respectively. As of September 30, 2022, there was $6 million of total unrecognized compensation costs related to nonvested stock awards. That cost is expected to be recognized over a weighted-average period of 1.6 years.

Cash-settled nonvested stock awards

Certain nonvested stock awards are granted to employees and are settled in cash upon vesting. As of September 30, 2022, 76 thousand cash-settled nonvested stock awards were outstanding. The value of these cash-settled nonvested stock awards changes in connection with changes in the fair market value of the Ashland Common Stock. These awards generally vest over a period of three years. The expense recognized related to cash-settled nonvested stock awards was $6 million, $3 million, and $2 million during 2022, 2021 and 2020, respectively.

Performance awards

Ashland sponsors a long-term incentive plan that awards performance shares/units to certain key employees that are tied to Ashland's overall financial performance relative to the financial performance of selected industry peer groups and/or internal targets. Awards are granted annually, with each award covering a three-year vesting period. Nonvested performance shares/units do not entitle employees to vote the shares or to receive any dividends thereon.

Each awarded performance share is convertible to one share of Ashland Common Stock and recorded as a component of stockholders' equity. Performance measures used to determine the actual number of performance shares issuable upon vesting includes 60:40 weighting of Ashland's total shareholder return (TSR) performance and Ashland's return on net assets (RONA) performance as compared to internal targets. TSR relative to peers is considered a market condition while RONA is considered a performance condition in accordance with U.S. GAAP.

The following table shows the performance shares/units granted for all plans that award Ashland Common Stock.

(In thousands)	Vesting period	Target shares/units granted (a)	Weighted-average fair value per share/unit (a)
Fiscal Year 2022	October 1, 2021 - September 30, 2024	110	$ 131.33
Fiscal Year 2021	October 1, 2020 - September 30, 2023	122	$ 90.44
Fiscal Year 2020	October 1, 2019 - September 30, 2022	110	$ 88.65

(a) At the end of the performance period, the actual number of shares/units awarded can range from zero to 200% of the target shares/units granted, which is assumed to be 100%. Both the shares granted and weighted-average fair value per share/unit are as of the grant date.

For these awards, the fair value of the performance unit awards is equal to the fair market value of Ashland's Common Stock as of the end of each reporting period. Compensation cost is recognized over the requisite service period if it is probable that the performance condition will be satisfied.

The fair values of the TSR portion of the performance share awards and TSR modifier of the performance unit awards are calculated using a Monte Carlo simulation valuation model using key assumptions included in the following table. Compensation cost is recognized over the requisite service period regardless of whether the market condition is satisfied.

	2022	2021	2020
Risk-free interest rate	1.18%	0.2%	1.6%
Expected dividend yield	1.3%	1.6%	1.4%
Expected life (in years)	3	3	3
Expected volatility	33.4%	32.7%	20.5%

The following table shows changes in nonvested performance shares/units for all plans that award Ashland Common Stock or cash (fiscal year 2017 only).

	2022		2021		2020	
(In thousands except per share data)	Shares/ Units	Weighted-average grant date fair value	Shares/ Units	Weighted-average grant date fair value	Shares/ Units	Weighted-average grant date fair value
Nonvested - beginning of year	253	$ 88.66	227	$ 80.86	260	$ 76.59
Granted	110	131.33	122	90.44	110	88.65
Vested	(1)	96.32	(79)	68.93	(92)	77.09
Forfeitures	(52)	85.78	(17)	89.36	(51)	82.53
Nonvested - end of year	310	105.78	253	88.66	227	80.86

As of September 30, 2022, there was $13 million of total unrecognized compensation costs related to nonvested performance share/unit awards. That cost is expected to be recognized over a weighted-average period of approximately 1.7 years.

NOTE Q – REVENUE

Trade receivables

Trade receivables are defined as receivables arising from contracts with customers and are recorded within the accounts receivable caption within the Consolidated Balance Sheets. Ashland's trade receivables were $369 million and $308 million as of September 30, 2022 and September 30, 2021, respectively. See Note I for additional information on Ashland's program to sell certain receivables on a revolving basis to third party banks up to an aggregate purchase limit.

Disaggregation of revenue

Ashland disaggregates its revenue from contracts with customers by segment and geographical region, as Ashland believes these categories best depict how management reviews the financial performance of its operations for the twelve months ended September 30, 2022, 2021 and 2020. Ashland includes only U.S. and Canada in its North America designation and includes Europe, the Middle East and Africa in its Europe designation. See the following tables for details (Intersegment sales eliminations have been excluded. See Note R for additional information.):

Sales by geography						
(In millions)		2022		2021		2020
Life Sciences						
North America	$	244	$	229	$	226
Europe		267		242		229
Asia Pacific		218		192		181
Latin America & other		86		74		72
	$	815	$	737	$	708

(In millions)		2022		2021		2020
Personal Care						
North America	$	198	$	180	$	185
Europe		270		240		258
Asia Pacific		126		100		97
Latin America & other		84		72		75
	$	678	$	592	$	615

(In millions)		2022		2021		2020
Specialty Additives						
North America	$	247	$	203	$	199
Europe		258		246		218
Asia Pacific		182		171		134
Latin America & other		32		35		38
	$	719	$	655	$	589

(In millions)		2022		2021		2020
Intermediates						
North America	$	163	$	114	$	73
Europe		39		28		24
Asia Pacific		43		29		26
Latin America & other		11		7		6
	$	256	$	178	$	129

For fiscal 2022, Ashland had two product categories that represented 10% or greater of Ashland's total consolidated sales which were cellulosics representing 38% of total consolidated sales and polyvinylprrolidones (PVP) representing 20% of total consolidated sales.

NOTE R – REPORTABLE SEGMENT INFORMATION

Ashland determines its reportable segments based on how operations are managed internally for the products and services sold to customers, including how the results are reviewed by the chief operating decision maker, which includes determining resource allocation methodologies used for reportable segments. Operating income and EBITDA are the primary measures of performance that are reviewed by the chief operating decision maker in assessing each reportable segment's financial performance. Ashland does not aggregate operating segments to arrive at these reportable segments.

Change in reportable segments

On February 28, 2022, Ashland completed the sale of its Performance Adhesives segment. The operating results and cash flows for the Performance Adhesives segment have been classified as discontinued operations within the Consolidated Financial Statements for all periods presented. As a result, Ashland’s reportable segments include Life Sciences, Personal Care, Specialty Additives, and Intermediates.

Unallocated and Other includes corporate governance activities and certain legacy matters. The historical segment information has been recast to conform to the current segment structure.

Reportable segment business descriptions

Life Sciences is comprised of pharmaceuticals, nutrition, nutraceuticals, agricultural chemicals, diagnostic films (formerly known as advanced materials) and fine chemicals. Pharmaceutical solutions include controlled release polymers, disintegrants, film coatings, solubilizers, and tablet binders. Nutrition solutions include for thickeners, stabilizers, emulsifiers and additives for enhancing mouthfeel, controlling moisture migration, reducing oil uptake and controlling color. Nutraceutical solutions include products for weight management, joint comfort, stomach and intestinal health, sports nutrition and general wellness, and provide custom formulation, toll processing and particle engineering solutions. Customers include pharmaceutical, food, beverage, nutraceuticals and supplements manufacturers, hospitals and radiologists and industrial manufacturers.

Personal Care is comprised of biofunctionals, microbial protectants (preservatives), skin care, sun care, oral care, hair care and household. These businesses have a broad range of natural, nature-derived, biodegradable, and high-performance ingredients for customer-driven solutions to help protect, renew, moisturize and revitalize skin and hair, and provide solutions for toothpastes, mouth washes and rinses, denture cleaning and care for teeth. Household supplies nature-derived rheology ingredients, biodegradable surface wetting agents, performance encapsulates, and specialty polymers for household, industrial and institutional cleaning products. Customers include formulators at large multinational branded consumer products companies and smaller, independent boutique companies.

Specialty Additives is comprised of rheology and performance-enhancing additives serving the architectural coatings, construction, energy, automotive and various industrial markets. Solutions include coatings additives for architectural paints, finishes and lacquers, cement and gypsum based dry mortars, ready-mixed joint compounds, synthetic plasters for commercial and residential construction, and specialty materials for industrial applications. Products include rheology modifiers (cellulosic and associative thickeners), foam control agents, surfactants and wetting agents, pH neutralizers, advanced ceramics used in catalytic converters, and environmental filters, ingredients that aid the manufacturing process of ceramic capacitors, plasma display panels and solar cells, ingredients for textile printing, thermoplastic metals and alloys for welding. Products help improve desired functional outcomes through rheology modification and control, water retention, workability, adhesive strength, binding power, film formation, deposition and suspension and emulsification. Customers include global paint manufacturers, electronics and automotive manufacturers, textile mills, the construction industry, and welders.

Intermediates is comprised of the production of 1,4 butanediol (BDO) and related derivatives, including n-methylpyrrolidone. These products are used as chemical intermediates in the production of engineering polymers and polyurethanes, and as specialty process solvents in a wide array of applications including electronics, pharmaceuticals, water filtration membranes and more. Butanediol is also supplied to Life Sciences, Personal Care, and Specialty Additives for use as a raw material.

Unallocated and Other generally includes items such as certain significant company-wide restructuring activities, corporate governance costs and legacy costs or activities that relate to divested businesses that are no longer operated by Ashland.

International data

Information about Ashland's domestic and international operations follows. Ashland has no operations in any individual international country or single customer that represented more than 10% of sales in 2022, 2021 or 2020.

	Sales to external customers			Net assets (liabilities)		Property, plant and equipment - net	
(In millions)	2022	2021	2020	2022	2021	2022	2021
United States	$ 731	$ 637	$ 623	$ 1,857	$ 1,520	$ 1,042	$ 1,092
International	1,660	1,474	1,393	1,363	1,232	296	335
	$ 2,391	$ 2,111	$ 2,016	$ 3,220	$ 2,752	$ 1,338	$ 1,427

Reportable segment results

Results of Ashland's reportable segments are presented based on its management and internal accounting structure. The structure is specific to Ashland; therefore, the financial results of Ashland's reportable segments are not necessarily comparable with similar information for other comparable companies. Ashland allocates all costs to its reportable segments except for certain significant company-wide restructuring activities, certain corporate governance costs and other costs or activities that relate to former businesses that Ashland no longer operates. The service cost component of pension and other postretirement benefits costs is allocated to each reportable segment on a ratable basis; while the remaining components of pension and other postretirement benefits costs are recorded within the other net periodic benefit income (loss) caption of the Statement of Consolidated Comprehensive Income (loss). Ashland refines its expense allocation methodologies to the reportable segments from time to time as internal accounting practices are improved, more refined information becomes available and the industry or market changes. Significant revisions to Ashland's methodologies are adjusted for all segments on a retrospective basis. This includes changes in prior years for indirect corporate costs previously allocated to Performance Adhesives. These costs are now reflected in Unallocated and Other for all periods presented.

Ashland determined that disclosing sales by specific product was impracticable due to the highly customized and extensive portfolio of products offered to customers and since no one product or a small group of products could be aggregated together to represent a majority of revenue within a reportable segment.

The following table presents various financial information for each reportable segment for the years ended September 30, 2022, 2021 and 2020.

Ashland Inc. and Consolidated Subsidiaries
Reportable Segment Information
Years Ended September 30

(In millions)	2022	2021	2020
Sales			
Life Sciences	$ 815	$ 737	$ 708
Personal Care	678	592	615
Specialty Additives	719	655	589
Intermediates	256	178	129
Intersegment sales (a)	(77)	(51)	(25)
	$ 2,391	$ 2,111	$ 2,016
Equity income			
Life Sciences	$ —	$ —	$ —
Personal Care	1	—	—
Specialty Additives	—	—	—
Intermediates	—	—	—
	$ 1	$ —	$ —
Other income (expense)			
Life Sciences	$ —	$ —	$ 1
Personal Care	—	2	—
Specialty Additives	—	—	1
Intermediates	—	—	—
Unallocated and Other	2	7	6
	$ 2	$ 9	$ 8
Equity and other income	$ 3	$ 9	$ 8
Operating income (loss)			
Life Sciences	$ 155	$ 130	$ 123
Personal Care (b)	102	73	(296)
Specialty Additives (b)	103	61	(132)
Intermediates	87	35	(10)
Unallocated and Other (b)	(114)	(107)	(146)
	$ 333	$ 192	$ (461)

(In millions)		2022		2021		2020
Depreciation expense						
Life Sciences	$	35	$	36	$	33
Personal Care		37		39		41
Specialty Additives		63		66		62
Intermediates		12		12		13
Unallocated and Other		—		1		2
	$	147	$	154	$	151
Amortization expense						
Life Sciences	$	28	$	28	$	27
Personal Care		47		42		36
Specialty Additives		18		19		19
Intermediates		1		1		1
Unallocated and Other		—		—		1
	$	94	$	90	$	84
EBITDA (c)						
Life Sciences	$	218	$	194	$	183
Personal Care		186		154		(219)
Specialty Additives		184		146		(51)
Intermediates		100		48		4
Unallocated and Other		(114)		(106)		(143)
	$	574	$	436	$	(226)
Additions to property, plant and equipment						
Life Sciences	$	28	$	27	$	51
Personal Care		14		7		13
Specialty Additives		61		67		59
Intermediates		7		2		5
Unallocated and Other		3		2		5
	$	113	$	105	$	133

(In millions)		2022		2021
Assets				
Life Sciences	$	1,905	$	1,945
Personal Care (d)		1,073		1,145
Specialty Additives		1,567		1,636
Intermediates		170		160
Unallocated and Other (e)		1,498		1,726
	$	6,213	$	6,612
Property, plant and equipment - net				
Life Sciences	$	422	$	451
Personal Care		153		159
Specialty Additives		603		651
Intermediates		56		61
Unallocated and Other		104		105
	$	1,338	$	1,427

(a) Intersegment sales from Intermediates are accounted for at prices that approximate fair value. All other intersegment sales are accounted for at cost.

(b) Includes income on acquisitions and divestitures, net for fiscal 2022, 2021 and 2020 within Unallocated and Other. Includes a fixed asset impairment of $3 million related to Personal Care and a capital project impairment of $10 million related to Specialty Additives for the year ended September 30, 2021.

(c) Excludes income from discontinued operations and other net periodic benefit income (loss). See the Statement of Consolidated Comprehensive Income (Loss) for applicable amounts excluded.

(d) See Note B for acquired assets associated with the Schülke personal care business on April 30, 2021.

(e) Includes assets held for sale for the year ended September 30, 2021.

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board of directors

Guillermo Novo [b]
Chair and CEO,
Ashland Inc.

Steven D. Bishop [2, 4]
Former CEO, Proctor & Gamble
Consumer Health Care

Brendan M. Cummins [1, 4a]
Former CEO,
Ciba Specialty Chemicals

William G. Dempsey, Ph.D. [2, 3a]
Former Executive Vice President,
Global Pharmaceuticals,
Abbott Laboratories

Suzan F. Harrison [1, 3]
Former President,
Colgate-Palmolive Global Oral Care

Dr. Jay V. Ihlenfeld [2, 4, c]
Former Senior Vice President,
3M Company

Wetteny Joseph [1, 2]
Chief Financial Officer,
Zoetis, Inc.

Susan L. Main [1a, 3]
Senior Vice President and
Chief Financial Officer,
Teledyne Technologies
Incorporated

Jerome A. Peribere [3, 4]
Former President and CEO,
Sealed Air Corp.

Ricky C. Sandler [1, 3]
Chief Executive Officer,
Chief Investment Officer,
Eminence Capital, LP

Janice J. Teal, Ph.D. [2a, 4]
Former Group Vice President
and Chief Scientific Officer,
Avon Products Inc.

committees

(1) Audit
(2) Environmental, Health, Safety and Quality
(3) Governance and Nominating
(4) Compensation

[a] Committee chair
[b] Officer/Director
[c] Lead Independent Director

executive officers

Guillermo Novo
Chair and CEO

Eric N. Boni
Vice President, Finance and
Principal Accounting Officer

Min Chong
Senior Vice President and General
Manager, Specialty Additives
and Intermediates

Eileen M. Drury
Senior Vice President and
Chief Human Resources Officer

Ashok Kalyana
Senior Vice President and General
Manager, Life Sciences

Osama Musa, Ph.D.
Senior Vice President and
Chief Technology Officer

Xiaolan Wang, Ph.D.
Senior Vice President and
General Manager, Personal Care

J. Kevin Willis
Senior Vice President and
Chief Financial Officer

P. Yvonne Winkler von Mohrenfels
Senior Vice President,
General Counsel and Secretary

corporate governance

Ashland is governed, temporarily, by an 11-member board of directors, 10 of whom are independent directors under New York Stock Exchange (NYSE) guidelines. The board conducted seven meetings in fiscal 2022. During fiscal 2022, the board operated the following committees, all of which consisted entirely of outside directors: Audit; Environmental, Health, Safety and Quality; Governance and Nominating; and Compensation. These four committees met a total of 22 times. This included quarterly meetings of the Audit Committee to review Ashland's quarterly financial performance, associated news releases, and Form 10-Q and Form 10-K filings with the U.S. Securities and Exchange Commission. Ashland's Chief Executive Officer (CEO) and Chief Financial Officer have each submitted certifications concerning the accuracy of financial and other information in Ashland's annual report on Form 10-K, as required by Section 302(a) of the Sarbanes-Oxley Act of 2002. The certifications are filed as exhibits to Ashland's 2022 annual report on Form 10-K. In addition, the NYSE requires that the CEO of a listed company annually certifies that he or she is not aware of any violation by the company of NYSE corporate governance listing standards. Ashland's Chair and CEO, Guillermo Novo, certified Ashland's compliance with the NYSE corporate governance listing standards on February 22, 2022.

*This Annual Report includes certain non-GAAP measures. Such measurements are not prepared in accordance with U.S. GAAP and should not be construed as an alternative to reported results determined in accordance with U.S. GAAP. Management believes the use of such non-GAAP measures assists investors in understanding the ongoing operating performance of the company and its segments. The non-GAAP information provided may not be consistent with the methodologies used by other companies. All non-GAAP amounts have been reconciled with reported U.S. GAAP results, which are included in the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section of this Annual Report.

Forward-Looking Statements: This Annual Report includes forward-looking statements, as described in the enclosed Form 10-K.

shareholder information

corporate headquarters

Ashland Inc.
8145 Blazer Drive
Wilmington, DE 19808

financial information

Ashland's annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and any amendments to those reports, as well as any beneficial ownership reports of officers and directors filed electronically on Forms 3, 4 and 5, are available at ashland.com.

Paper copies also are available upon request and at no charge. Requests for these and other stockholder and security analyst inquiries should be directed to:

Seth A. Mrozek
Director, Investor Relations
Ashland
Wilmington, DE 19808
Tel +1 302 594 5010
samrozek@ashland.com

ticker symbol: ASH

Fiscal 2022 closing stock prices per common share:

High:	$110.51	06/07/22
Low:	$85.05	03/07/22
Year-end:	$94.97	09/30/22

annual meeting

Notice of the annual meeting and availability of proxy materials is mailed to shareholders in December, along with instructions for viewing proxy materials online. Stockholders may also request printed copies of the proxy statement and annual report by following the instructions included in the Notice.

stock information

Ashland is incorporated under the laws of Delaware. Ashland common stock is listed on the New York Stock Exchange and also has trading privileges on NASDAQ.

Questions regarding shareholder accounts, dividends or the dividend reinvestment plan should be directed to Ashland's transfer agent and registrar:

EQ Shareowner Services
1110 Centre Point Curve, Suite 101
Mendota Heights, MN 55120

Mailing Address:
EQ Shareowner Services
P.O. Box 64874
St. Paul, MN 55164
Tel +1 855 598 5486 toll-free (U.S.)
+1 651 450 4064 (non-U.S.)
www.shareowneronline.com

dividends

Ashland's current quarterly cash dividend is 33.5 cents per share. Ashland's historical practice has been to pay dividends on the 15th day of March, June, September and December if declared by the board of directors. Ashland's board of directors has declared a dividend every quarter since December 1936.

Ashland offers electronic deposit of dividend checks. For more information, please contact EQ Shareowner Services at
+1 855 598 5486
+1 651 450 4064 (outside the U.S.)

independent registered public accounting firm

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