

News Release



November 18, 2015

Ashland advances true-to-life consumer and clinical evaluations of personal-care ingredients across the globe

BRIDGEWATER, NJ – Ashland (NYSE: ASH) has fully integrated its research and development facilities across the globe to better support true-to-life consumer and clinical evaluations of its personal-care ingredient portfolio. The integration affords Ashland the ability to measure the relative performance of its portfolio based on representative populations in major markets.

“Moving clinical testing to the areas consumers will use our ingredients has been a priority for Ashland for more than five years,” said Linda Foltis, vice president of care specialties research and development (R&D), Ashland Specialty Ingredients. “Consumer and clinical panels can now be based on a true representation of the population using prototype formulations that contain our ingredients. Ingredients and formulation architecture can be further evaluated based on actual climate, geography, and environmental conditions. At the same time, Ashland can evaluate how ingredients, incorporated into prototype formulations, are most likely to be used by consumers in real-world conditions. This comprehensive evaluation system allows us to gain insights into the way consumers experience our ingredients and formulation architecture.”

Ashland is conducting consumer panel and clinical studies in major markets, such as Shanghai, China; Mumbai, India; the Netherlands; and the United States. Taking into account out-of-the-laboratory variables, such as environmental effects, Ashland now offers a complete picture of the performance and value of its ingredient portfolio in virtually any market around the world.

Most recently, Ashland evaluated the effects of Dermostatyl™ IS biofunctional in a skin-care formula, following a clinical study conducted in Shanghai. Using advanced imaging techniques to assess change in the skin tone of volunteers living in the region, the company determined, on a quantitative basis, the benefits of using Dermostatyl IS on representative skin types. Taking skin tone measurements with a spectrophotometer and converting those measurements to individual typology angle (ITA), Ashland substantiated the ingredient benefits by quantifying the degree of change in skin tone over the 56-day study period.

Ashland has also commercialized hair-styling polymers based in part on consumer evaluations conducted in Mumbai. Its new styling ingredient, AquaStyle™ SH-100 polymer, is demonstrated in this and other consumer evaluations to provide long-lasting hold in high-humidity conditions. The polymer, designed primarily for crystal-clear gels, is also recognized in consumer evaluations for easy pick-up from the container, even spreading on hair, and low tack during use.

From the laboratory to true-to-life evaluations

Initially testing ingredients in the laboratory, Ashland has furthered its capabilities with *in vivo* raman and fluorescence spectroscopy techniques to complement *in vitro* capabilities. These

measurement capabilities enable Ashland to evaluate cosmetic active delivery to skin from product application; ensuring technologies developed deliver predicted performance *in vivo*.

Moreover, Ashland's experts in rheology have developed novel techniques to explore the rheological profiles of various skin-care product forms, such as using large amplitude oscillatory shear (LAOS) measurements that correlate with product application. These measurements can be used to generate Lissajous plots, which visually depict the product's texture "fingerprint" and its breakdown as a function of shear, temperature, interfacial chemistry and tribology. Consumer panel studies complement the *in vitro* measurements, whereby the combination of studies provides significant insights into the development of textures for application in regional and global skin-care formulations.

"By establishing quantifiable benchmarks in the laboratory, Ashland can correlate consumer and clinical evaluation programs to account for real-life conditions and to establish links to consumer preferences," stated Foltis.

"And, by integrating clinical and consumer testing capabilities across the globe, Ashland is able to substantiate ingredient claims based on studies conducted in one or more countries. Utilizing a true cross section of a given population in our consumer testing facilities, allows us to assess how ingredients perform, within a consumer regimen, and ascertain how they can be adopted for use in other markets around the world," Foltis added.

About Ashland Specialty Ingredients

Ashland Specialty Ingredients is the leading global producer of cellulose ethers and a global leader in vinyl pyrrolidones. It offers industry-leading products, technologies and resources for solving formulation and product-performance challenges. Using natural, synthetic and semisynthetic polymers derived from plant and seed extract, cellulose ethers and vinyl pyrrolidones, as well as acrylic and polyurethane-based adhesives, Specialty Ingredients offers comprehensive and innovative solutions for today's demanding consumer and industrial applications. Key customers include: pharmaceutical companies; makers of personal care products, food and beverages; manufacturers of paint, coatings and construction materials; packaging and converting; and oilfield service companies.

About Ashland

Ashland Inc. (NYSE: ASH) is a global leader in providing specialty chemical solutions to customers in a wide range of consumer and industrial markets, including adhesives, architectural coatings, automotive, construction, energy, food and beverage, personal care and pharmaceutical. Through our three business units – Ashland Specialty Ingredients, Ashland Performance Materials and Valvoline – we use good chemistry to make great things happen for customers in more than 100 countries. Visit ashland.com to learn more.

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