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## DuPont™ CAPSTONE® Repellents and Surfactants – An Overview

### A New Generation of Short-Chain Surface Protection Products

DuPont has developed a new line of surface protection products based on more sustainable short-chain technologies, six or fewer fluorinated carbons, that deliver superior performance, are supported by extensive environmental, health and safety testing, and cannot break down into PFOA in the environment.

### DuPont - A Leader in Surface Protection

DuPont has a history of more than two hundred years of safety and innovation. DuPont strives to put science to work to help customers, and their customers, grow businesses while contributing to social and environmental progress worldwide.

DuPont researchers have repeatedly put science to work creating products that deliver exceptional value and performance for customers. Guided by core values and sustainability goals, DuPont assesses the entire product life cycle including worker exposure, consumer use and environmental fate. DuPont scientists have conquered the challenge of developing surface protection products that deliver the performance expected by customers, and have favorable environmental, health and safety characteristics.

### Regulatory

DuPont™ Capstone® repellents and surfactants are registered and approved for sale in the countries in which they are sold. In the United States, DuPont products are manufactured and sold under consent orders with the U.S. Environmental Protection Agency (EPA) and meet our commitment to the U.S. EPA 2010/15 PFOA Stewardship Program. Moreover, the necessary REACH pre-registrations are being made for Capstone® repellents and surfactants.

### Knowledge Foundation

DuPont has developed and continues to expand our comprehensive knowledge of Capstone® repellents and surfactants. Extensive studies show products, raw materials and potential degradation products have a favorable environmental, health and safety profile, rapid bioelimination and are not bioaccumulative. DuPont™ Capstone® repellents and surfactants are safe for workers, consumers and the environment when used as intended.

### Short-Chain Technology

Capstone® repellents and surfactants are based on short-chain technology consisting of six or fewer fluorinated carbons,  $F(CF_2)_n-$  where  $n \leq 6$ , bound to a “delivery system” such as a polymer or surfactant.

### Environmental, Health and Safety

Comprehensive toxicology data on products, raw materials and a potential degradation product, perfluorohexanoic acid (PFHxA), provide a knowledge foundation to show that Capstone® repellents and surfactants are safe for workers, consumers and the environment when used as intended. Toxicological assessments included mammalian acute, sub-chronic, reproductive and developmental toxicity as well as aquatic studies. In addition, extensive data show that Capstone® repellents and surfactants and PFHxA have rapid bioelimination and are not bioaccumulative according to global regulatory criteria.

Scientific studies conducted by DuPont have been shared in presentations at international scientific conferences and as publications in peer-reviewed scientific and trade journals. The specific hazards for each Capstone® repellent and surfactant products are described in the individual product M/SDS.

In addition, toxicology studies specific to a particular product use and exposure profile are conducted as needed (for example, inhalation). Ask your DuPont sales or technical representative for more information.



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### Facts about Short-Chain Chemistry

#### - Not All “C6” are the Same

Capstone® repellents and surfactants made from raw materials with six fluorinated carbons, sometimes called “C6”, are unique and completely different in chemistry, and environmental, health and safety profile when compared to “C6” perfluorohexane sulfonate (PFHxS) commonly made by electrochemical fluorination (ECF). Substantial scientific study data confirm this, clearly showing that not all “C6” chemistry is the same.

#### - C4 and C6, The Data Tells the Story

DuPont™ Capstone® repellents and surfactants have environmental, health and safety characteristics that are as good as or better than comparable C4 materials. For example, the environmental, health and safety profile of the “C6” degradation product PFHxA is as good as or better than the degradation products from alternative “C4” chemistry: perfluorobutanoic acid (PFBA) and perfluorobutane sulfonate (PFBS).

### Favorable Product Environmental Profile

DuPont has conducted numerous scientific studies to assess the environmental fate of its products and raw materials. These studies provide a foundation of knowledge for Capstone® repellents and surfactants regarding their ultimate fate from industrial use, consumer use and disposal. For example, the potential degradation product of six-fluorinated carbon functionality, perfluorohexanoic acid (PFHxA), has rapid bioelimination, low toxicity and is not bioaccumulative according to global regulatory criteria.

DuPont further minimizes the environmental footprint of Capstone® repellents and surfactants by removing residual unreacted raw materials and by-products, such as PFHxA, using patented manufacturing technology.

### Summary

Capstone® repellents and surfactants provide more sustainable, high value-in-use solutions for surface protection needs. Capstone® repellents and surfactants are created upon a foundation of knowledge demonstrating a favorable environmental, health and safety profile.

As a leader in surface protection solutions, DuPont continues to develop innovative, more sustainable products that deliver maximum performance and continue to reduce the environmental footprint along the value chains in which the products are used.

For additional product stewardship details and information on Capstone® repellents and surfactants, go to [www.capstone.dupont.com](http://www.capstone.dupont.com) and access the Capstone® Product Stewardship Detail Document.

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