

## **Reformulated, pre-wetted road deicer recognized by EPA** *Cargill dedicates years of R&D to develop eco-friendlier formula*

When Cargill Deicing Technology officially decided to increase their environmental commitment, they weren't making empty promises. Not only did the producer of anti-icing and deicing products and systems change their mission statement to reflect a greener focus, they also backed up it up by earning an EPA recognition for their ClearLane<sup>®</sup> enhanced deicer product.

“This is a product our customers have come to trust and depend on, and it now has an even greater environmentally friendly formulation without adding cost or reducing performance,” said Sean Riley, marketing manager with Cargill Deicing Technology. “The EPA recognition is a win-win-win situation: a win for the environment, a win for our customers, and a win for the public.”

Called the Design for the Environment (DfE) label, the EPA recognition stems from a partnership between the Cargill and the EPA that seeks to promote innovative chemical products, technologies and practices that benefit human health and the environment.

“In our business, there are many misconceptions about how our products affect the environment,” Riley said. “Having support from the EPA with this recognition helps us educate customers and the public on how our products help increase safety and reduce environmental impact.”

### **From chemical to more natural: The R&D process.**

The enhanced deicer product that earned the DfE label is a road deicer used by municipalities and private contractors to help prevent dangerous conditions on icy winter roads. Considered a “treated salt” or “pre-wetted salt” product, this type of deicer is already recognized as a more environmentally friendly alternative to standard road salt because it can be used at lower application rates, which means fewer chlorides are being released into the environment. Reformulating the deicer to earn the EPA recognition involved making the environmentally friendly product even greener while maintaining critical deicing performance.



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“Our new formulation is the result of several years of research and development into further increasing the environmental safety of the product by developing alternative additives that would not compromise the deicing properties,” said Scott Koefod, Ph.D., principal scientist at Cargill.

Pre-wetted salt has been available for the past 10 years to treat winter roadways and the product is most commonly blended with a magnesium chloride or calcium chloride brine to encourage faster melting and help the product stick to the road. This treated salt typically contains other performance enhancing additives such as freezing point depressants, corrosion inhibitors and colorants. Cargill’s reformulation process involved replacing traditional additives with natural materials while achieving similar performance.

“A major goal in developing more environmentally friendly products is always trying to do as much as possible with as little as possible,” Koefod said. “With the deicer reformulation we sought to identify performance enhancers that would be effective at the smallest addition rates possible so the less chemical we have to add to a product, the less chemical is going out into the environment.”

Throughout the research and development process, Koefod and his team made several advancements to the product by replacing chemical additives with natural substitutes. Often the results were more effective than the traditional chemicals, such as the corrosion inhibitor, a performance additive that helps reduce corrosion on application vehicles.

“We identified a safe, food-grade natural corrosion inhibitor which is produced by fermentation,” Koefod said. “It is up to 20 times more effective than other commonly used corrosion inhibitors for these types of products, which enables us to greatly reduce our additive levels. This in turn reduces the product’s environmental impact.”

Other natural additives in the reformulation include a food colorant additive that helps winter maintenance workers see how much product is on the road, and allows the public to see that a road has been treated. A food-grade, viscosity-modifying additive which virtually eliminates leaching was also developed, as leaching is a common problem associated with pre-wetted deicing products.



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As a pre-wetted deicer, the salt is, of course, wet. The challenge with this characteristic is that the salt can only hold so much liquid, and if the excess liquid runs or “leaches” out of the salt pile, it causes wasteful, often harmful salt distribution into the environment. In the original formulation, Cargill’s deicing product offered high anti-leaching properties, which was a performance characteristic essential to carry over into the new formulation.

“We spent over a year researching how to make a pre-wetted deicer that could be ‘buffered’ against the absorption of excess moisture and still not leach,” Koefod said. “This required the development of test methods, which had not previously existed, to measuring leaching in a controlled manner so that we could explore different approaches to preventing it. Ultimately, we identified a food-grade, natural viscosity-modifying additive that can be added at extremely low levels (less than 0.02%), which has proven to practically eliminate the potential for leaching.”

Throughout the entire reformulation process, Cargill worked closely with EPA staff to understand their expectations for qualifying the deicer under the DfE recognition. Koefod and his team collected a variety of data to substantiate product performance and environmental characteristics, which was then sent, with full formulation information, to a third-party, independent reviewer.

“The third-party reviewer performed a toxicology profile on all of the ingredients and processing aids,” Koefod said. “Processing aids are basically anything that is either in or comes into contact with the product. The final report was then sent to the EPA DfE office for final evaluation. We received confirmation of being awarded the recognition in the summer of 2011.”

### **EPA-recognized: Just in time for winter.**

Now that the enhanced deicer product has received the DfE recognition, many customers can expect to use the new formulation at some point during the 2011 – 2012 winter season. Distribution facilities in Burnsville, Minn.; Cleveland, Ohio; and White River Junction, Vt. will be the first to ship the new formulation and various other locations will follow suit as the season progresses.



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“As we deplete existing inventories over the course of this winter in our other North American supply chain network, we will begin to ship the new product in those markets,” Riley said. “By the winter of 2012 - 2013, all of our customers will be receiving the improved formulation.”

Part of rolling out the new formulation for Cargill will involve educating municipalities and contractors on the performance of the product, environmental benefits and application use. One characteristic of the product is that it achieves desired results by using less product per application when compared to traditional rock salt.

“We want to make sure our customers are aware of the new formulation and reassure them that there will be no change in performance, and so far the feedback has been overwhelmingly positive,” Riley said. “We are also working to educate end-users and the public so everyone can understand the science behind the product that helps keep them safe on winter roadways and how that product is now even better for the environment.”

### **A greener future.**

The DfE recognition for their ClearLane® enhanced deicer product is only the beginning for Cargill Deicing Technology and their environmental commitment. Partnering with the EPA provides Cargill the opportunity to work with EPA chemists, environmental scientists and risk reduction staff to investigate materials to further improve the health and environmental impacts of their products, now and in the future.

“Not only are we striving to continually research and improve the products we sell, we additionally work with our customers to encourage best practices that will give optimal performance and the least possible environmental impact,” Riley said. “Our overarching goal is to create a family of deicing and anti-icing products that ensure public safety, customer satisfaction and reduce harmful effects on the environment.”