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Best Practices of Using Prewet Deicer for Winter Mobility in the Pacific Northwest

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Abstract: More than 70% of the U.S. roads and about 70% of the U.S. population are located in cold regions, where winter weather tends to reduce both the average traffic speed and traffic volume, whereas the implementation of winter road maintenance (WRM) operations tends to mitigate such reductions. Applying pre-wet deicers to roads during adverse winter weather is a cost-effective tactic to improve transportation safety and mobility in cold climates. Pre-wet deicers have a small amount of liquid product applied to solid salt or salt/sand mixture which speeds up the process of ice melting and ice penetration and significantly reduces deicer bounce-and-scatter loss. While many roadway agencies use pre-wet deicers, there is not enough reliable data to determine optimal pre-wetting rates or product type.

This webinar will first explain why best practices are needed in WRM operations and the multi-dimensional implications, and then present the results of an in-depth survey of the Pacific Northwest on pre-wetting practices. Subsequently, the webinar will share the results of laboratory tests that quantified the ice melting, frictional behavior, and variation in snow-pavement bond strength of salt pre-wetted with various liquid deicers and at various rates. Pre-wetting is commonly performed by Pacific Northwest state departments of transportation with 10–12 gal./t being the most common pre-wetting rate. The laboratory tests confirmed that the pre-wetting liquid-to-solid application rate in the range of 8–16 gal./t is reasonable for increasing the speed and total ice melting capacity (IMC) of solid salt. Relative to dry salt, pre-wetting significantly reduced snow-pavement bond strength but did not show a consistently beneficial effect of increased friction. The best performing pre-wetting liquid concerning friction and snow-pavement bond was beet juice modified salt brine at a pre-wetting rate of 8.7 gal./t.



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