

Technical Bulletin

Proper Use of Cryotech E36 and NAAC

Customers frequently ask how to properly use runway deicing chemicals when dealing with snow, freezing rain and ice packs.

Cryotech manufactures and markets both solid and liquid runway deicers. Both are acetate-based and easily biodegrade, they are considered safe for the environment. They serve complimentary purposes during airport winter operations.

Liquid E36® (potassium acetate) is generally used as an anti-icer to prevent snow and ice from bonding to the surface. The snow and ice can then be easily removed by broom or plow. Solid NAAC® (sodium acetate) is used as a deicer. It is also applied early in the storm but its purpose is to melt through an existing pack and break ice-to-pavement bonds prior to mechanical removal.

E36 is more efficient than a solid deicer when applied as an anti-icer because it takes less energy to prevent surface bonding than to break existing bonds. Therefore, early liquid application followed by mechanical removal of snow and ice accumulation provides the best and most efficient method for combating winter storms.

“Early application” means applying just before the event or as precipitation begins to fall. E36 rates range from 0.5-1.5 gallons per thousand square feet (25-75-grams/square meter) depending on weather conditions.

It is also important to evenly apply the fluid using low-pressure, large droplet nozzles. Runways can then be cleaned mechanically until bonds reform and dilution requires additional applications.

How long will it last? E36 dilution from water generated by melt raises the solution freeze point. At some level of dilution it becomes ineffective. Other conditions such as air and surface temperatures, type and amount of precipitation, and application rates also affect how long liquid deicers will last. The clearest signals that dilution has occurred are low friction and unsatisfactory snow or ice patches remaining after mechanical removal. Dilution can also be determined by computer-monitored roadway sensors. Re-application is necessary when dilution occurs.

Solid NAAC is most efficient when applied as a deicer on top of pack, but always early in the storm when possible. Pack results from surface bonding of snow and ice and is difficult to remove with liquid deicers. It is common for pack to build up in high speed turnout areas, landing zones, as well as in secondary operating areas like ramps and taxiways that may not receive anti-icing treatments.

NAAC is applied on the wet area, ice, or pack. As it combines with moisture, NAAC changes from a solid to a liquid. This exothermic phase change – unique to NAAC – releases heat allowing each pellet to quickly penetrate the pack and break the surface bonds. Application rates range from 5-15 pounds per thousand square feet (25-75 grams per square meter).

Here again, it is important to achieve even application. Because NAAC is produced as spherical pellets it spreads more evenly than flaked products. Spherical pellets are also more effective because they penetrate faster and deeper than flakes, which tend to dilute and refreeze.

In certain conditions, E36 may be used with NAAC to assist with breaking up heavy pack. After holes are formed by NAAC, E36 is applied over the top and thereby has a direct route to the pavement surface. This dual application speeds the deicing process.

E36 is also recommended as a prewetting agent for NAAC to jump-start its phase change. This prewet also causes the solid to stick to the surface, minimizing product loss from jet blast and wind. During freezing rain, NAAC may be helpful when applied with E36. This dual application extends operations by minimizing dilution of the liquid.

NAAC and E36 should not be combined during routine anti-icing operations. E36 is more efficient and the addition of NAAC is generally not helpful. The exception is use in the aforementioned freezing rain condition.

Technical assistance and on-site training are available by calling Cryotech at (800)346-7237.