



TECHNICAL Bulletin

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INFORMATION ON MAGNESIUM CHLORIDE AND CALCIUM CHLORIDE

ACTIVE DATE 12.07.2010

This bulletin is to make users of Crimson Fire & Crimson Fire Aerial products aware of damage that can occur due to chemicals used to de-ice roads. State maintenance crews use several different chemicals as liquid anti-ice or snow and ice clearing chemicals. *See list below.* These chemicals are often sprayed on roadways prior to arrival of storms thereby having longer exposure and not immediately being diluted by snow or water.

- Chemical Name Abbreviation
- Calcium Chloride CaCl₂
- Sodium Chloride (road salt) NaCl
- Magnesium Chloride MgCl₂
- Calcium Magnesium Acetate CaMg₂{CH₃COO}₂
- Potassium Acetate KC₂H₃O₂

Of these, calcium chloride is probably the most destructive because it attracts moisture more readily. Calcium chloride absorbs water vapor from air at 40% humidity vs. magnesium chloride at 75%.

Corrosion from these chemicals is seen on chrome, aluminum, and even stainless steel and concrete. Significant damage can result from as little as a single winter season.

Since the magnesium chloride solution has higher viscosity and stronger hydrophilicity properties than sodium chloride, for example, it adheres and crystallizes on the surfaces of metals under dry conditions and then becomes a corrosive agent when wetted.

If these chemicals are deposited on painted surfaces that have been pitted by rocks or gravel or scratched thereby exposing bare metal, the chemically induced corrosion will eat away at the metal substrate undetected until the paint starts blistering. Therefore, it's very important to replace chipped or scratched paint immediately through use of touch-up paint provided with each unit.

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A very aggressive vehicle washing practice is the most effective preventative maintenance tool available to operators. It's important to note that a coating of magnesium chloride is extremely difficult to get clean and keep clean. It's also important to note that the washing system should not use recycled water because it generally contains a higher percentage of sodium chloride than water straight from the source. Other corrosion fighting techniques include:

- Frequently inspect and clean entrapment areas of debris. It's best not to block off or try to seal entrapment areas because despite your best efforts corrosion could get started and remain unnoticed.
- Drain holes should be inspected and cleared frequently
- Proper use of a common ground
- Frequently inspect and spray electrical connectors with moisture inhibitors
- Use dielectric grease
- Frequently inspect structural and safety related components for corrosion and take immediate corrective action when corrosion is observed
- Replace chipped or scratched paint immediately after thoroughly cleaning the bare metal and surrounding surface using touch-up paint provided with each unit
- Frequently wax painted surfaces

Crimson Fire & Crimson Fire Aerials strongly recommends that our products be frequently inspected and maintained. It's extremely important to frequently and thoroughly wash these products to remove the corrosive chemicals deposited as a result of the use of these corrosive snow and ice clearing chemicals. Not doing so will result in unwanted corrosion which may cause unsafe conditions and deteriorate the product appearance including promoting bubbling of paint coatings.

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