MAG® Environmental and Safety Considerations

MAG is less irritating to the skin. MAG, unlike calcium chloride, is not naturally occlusive (gumminess) and when it first comes in contact with moisture, magnesium chloride is unlikely to irritate the skin or burn the skin when it contacts moist skin surfaces.

MAG corrodes metal surfaces less. Tests show MAG to be significantly less corrosive than calcium chloride and sodium chloride on steel, tin, and aluminum.

MAG is safer around vegetation. When used as directed, MAG is safe to use around plants and foliage. In fact, magnesium chloride is used as an ingredient in some fertilizers.

MAG is safer on concrete. Tests by the Strategic Highway Research Program, Washington, D.C., using 3% solutions (representative dilution of ice melting brines) show that calcium chloride caused 31 times and sodium chloride caused 33 times the amount of concrete spalling than MAG.

MAG is safer for use around animals and humans. MAG is much less toxic than calcium chloride, potassium chloride and sodium chloride based on data provided by the U.S. Department of Health and Human Services. In fact, a form of MAG is used as a mineral supplement in some farm animal feedstocks.

MAG is environmentally friendly. On a pound for pound basis, MAG contains approximately 22%, 29%, 39%, and 43% less chlorides than potassium chloride, calcium chloride (77%), calcium chloride (90%) and sodium chloride respectively, while still maintaining its high performance level. The application of MAG results in significantly less chloride runoff and pollution than potassium chloride, calcium chloride and sodium chloride.

Available Chloride Content

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Chloride Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Chloride</td>
<td>61.2%</td>
</tr>
<tr>
<td>Calcium Chloride (90%)</td>
<td>57.6%</td>
</tr>
<tr>
<td>Calcium Chloride (77%)</td>
<td>49.2%</td>
</tr>
<tr>
<td>Potassium Chloride</td>
<td>44.9%</td>
</tr>
<tr>
<td>MAG</td>
<td>34.9%</td>
</tr>
</tbody>
</table>

www.meltsnow.com

800-637-4504
**MAG® Ice Melting Performance**

Ice melting performance is measured not only by the speed of the melting action but also by the quantity of melted water produced per unit of ice melter used. The following graph compares the ice melting performance of MAG, calcium chloride and sodium chloride.

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**MAG® As An Ice Melter**

MAG® is the best ice melt on the market. Compared to calcium chloride and sodium chloride (Rock Salt, WAG®), MAG® is less corrosive towards metal surfaces, creates less concrete scaling, is non-erosive, and is environmentally safer.

The principal characteristics of MAG® compared to calcium chloride and sodium chloride are:

- **Corrosion – Tin (mils/year):**
  - MAG®: 10.5
  - Calcium Chloride (Pellet): 2.7
  - Sodium Chloride: 40.6

- **Corrosion – Steel (mils/year):**
  - MAG®: 57.6%
  - Calcium Chloride (Pellet): 61.2%
  - Sodium Chloride: 34.5%

- **Concrete Spalling/Chipping (Grams):**
  - MAG®: 38 g
  - Calcium Chloride (Pellet): 223 g

- **Other Ice Melters**
  - Baking Soda
  - Detergent
  - Vitamin C
  - Potassium
  - Cyanide

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**MAG® Is Much LESS Toxic Than Salt and Calcium Chloride**

Accidental ingestion by pets, animals and children is a concern to all of us. MAG® is much safer than all other popular ice melting chemicals because of its very low toxicity. The following is a chart of common domestic chemicals (marked low key) compared to calcium chloride and sodium chloride.

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**MAG® Is Less Corrosive Than Other Ice Melters**

MAG® is commonly used in the workplace. As this chart shows, MAG® is less corrosive on steel while still offering effective work, piping, building infrastructure and more. MAG® is also safe on all metals that can be exposed to water.

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**MAG® Is Less Damaging to Concrete Than Calcium Chloride and Sodium Chloride**

All ice melting chemicals lower the freezing point of water and increase the volume of melted water produced per unit of ice melter used. The following graph compares the ice melting performance of MAG, calcium chloride and sodium chloride.

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**Toxicity of Common Chemicals**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Toxicity Level</th>
<th>LD50</th>
<th>MLD50</th>
<th>MCAC</th>
<th>MCL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Chloride</td>
<td>(Highly Toxic)</td>
<td>5000</td>
<td>1200</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Calcium Chloride</td>
<td>(Medium Toxic)</td>
<td>1000</td>
<td>1000</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>MAG®</td>
<td>(Low Toxicity)</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
</tbody>
</table>

---

**Ice Melting Performance**

Toxicity results are from the U.S. Dept. of Health & Human Services Registry of Toxic Effects of Chemical Substances (Rock Salt).

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**Bitumen® Eutectic Temp˚F**

<table>
<thead>
<tr>
<th>Ice Melter</th>
<th>Practical Temp˚F</th>
<th>Eutectic Temp˚F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Chloride</td>
<td>-25˚F</td>
<td>-13˚F</td>
</tr>
<tr>
<td>Calcium Chloride</td>
<td>-25˚F</td>
<td>-13˚F</td>
</tr>
<tr>
<td>MAG®</td>
<td>-20˚F</td>
<td>-7˚F</td>
</tr>
</tbody>
</table>

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**Corrosion & Spalling**

- MAG® is less corrosive than calcium chloride.
- MAG® is less spalling compared to calcium chloride.

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**Safety for People, Pets, Concrete and the Environment**

- Safer for people, pets, concrete and the environment.
- MAG® is Softer than Baking Soda.
- MAG® is Safer than Detergent.
- MAG® is Safer than Vitamin C.
- MAG® is Safer than Potassium.
- MAG® is Safer than Cyanide.

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