

**Table summarizing of properties of deicing agents. Adapted from Local Road Research Board, 2012, Ketcham et al., 1996 and Levelton Consultants Ltd., 2008.**

Link to this table

Category	Type	Lowest Practical Melting Temperature <sup>1,2</sup>	Potential for corrosion impairment <sup>3</sup>				Environmental Impact <sup>3</sup>		
			Atmospheric Corrosion to Metals	Concrete Matrix	Concrete Reinforcing	Water Quality/Aquatic Live	Air Quality	Soils	Vegetation
Chloride Based Deicers	Sodium Chloride	15°F	High; will initiate and accelerate corrosion	Low/moderate; Will exacerbate scaling; low risk of paste attack	High: Will initiate corrosion of rebar	Moderate: Excessive chloride loading/metals contaminants; ferrocyanide additives	Low: Leads to reduced abrasives use	Moderate/High: Sodium accumulation breaks down soil structure and decreases permeability and soil stability; potential for metals to mobilize	High: Spray causes foliage damage; osmotic stress harms roots, chloride toxicosis
	Calcium Chloride	-20°F	High; Will initiate and accelerate corrosion; higher potential for corrosion related to hygroscopic properties	Low/moderate; Will exacerbate scaling; low risk of paste attack	High: Will initiate corrosion of rebar	Moderate: Excessive chloride loading; heavy metal contamination	Low: Leads to reduced abrasives use	Low/Moderate: Improves soil structure; increases permeability; potential for metals to mobilize	High: Spray causes foliage damage; osmotic stress harms roots, chloride toxicosis
	Magnesium Chloride	-10°F	High; Will initiate and accelerate corrosion; higher potential for corrosion related to hygroscopic properties	Moderate/high: Will exacerbate scaling; risk of paste deterioration from magnesium	High: Will initiate corrosion of rebar, evidence suggest MgCl <sub>2</sub> has the highest potential for corrosion of chloride produces	Moderate: Excessive chloride loading; heavy metal contamination	Low: Leads to reduced abrasives	Low/Moderate: Improves soil structure; increases permeability; potential for metals to mobilize	High: Spray causes foliage damage; osmotic stress harms roots, chloride toxicosis
Acetate Based Deicers	Calcium Magnesium Acetate	20°F	Low/moderate; Potential to initiate and accelerate corrosion due to elevated conductivity	Moderate/high: Will exacerbate scaling; risk of pate deterioration from magnesium reactions	Low; probably little or no effect	High: Organic content leading to oxygen demand	Low: Leads to reduced abrasives use	Low/Moderate: Improves soil structure; increases permeability; potential for metals to mobilize	Low: Little or no adverse effect; osmotic stress at high levels
	Potassium Acetate	-15°F	Low/moderate; Potential to initiate and accelerate corrosion due to elevated conductivity		Low; probably little or no effect	High: Organic content leading to oxygen demand	Low: Leads to reduced abrasives use		
	Sodium Acetate	-20°F							

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			Atmospheric Corrosion to Metals	Concrete Matrix	Concrete Reinforcing	Water Quality/Aquatic Live	Air Quality	Soils	Vegetation
Carbohydrates	Beet Juice	NA	Low; Potential to initiate and accelerate corrosion due to elevated conductivity claims of mitigation of corrosion require further evaluation	Low; Probably little or no effect	Low; Probably little or no effect; claims of mitigation of corrosion require further evaluation	High Organic matter leading to oxygen demand; nutrient enrichment by phosphorus and nitrogen; heavy metals	Low: Leads to reduced abrasive use	Low; Probably little or no effect; limited information available	Low; Probably little or no effect
	Molasses	NA							
	Corn Syrup	NA							

**Source:**

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