Non-Chloride Deicer Data Sheet

Description

Glycol-based deicers are those that contain glycol, glycerol, and glycerin. Two common glycol-based deicers include propylene glycol and ethylene glycol, these can be an alternative to chloride-based deicers as they provide a very low freezing temperature and can act as an anti-caking agent to improve ice melting capability. Glycols can be sourced as a byproduct of biodiesel manufacturing. Generally glycol-based deicers are used at airports to deice aircraft.

Pros
- Low Effective Temperature
- Non-Corrosive

Cons
- Glycols can negatively impact environment (increased BOD)
- Damaging impacts to concrete pavements
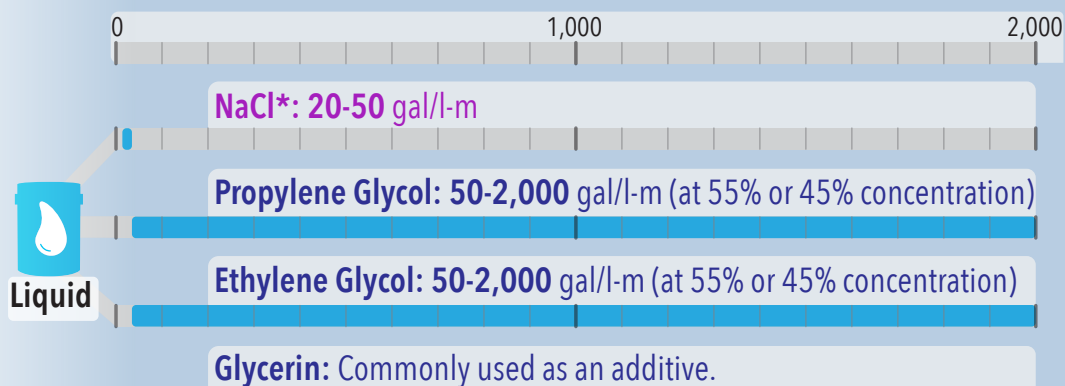
Effective temperature °F

- NaCl*: 15
- Glycerin: -20
- Propylene: -27
- Ethylene: -27

Application Rate

Liquid

	0	1,000	2,000

- **NaCl*: 20-50** gal/l-m
- **Propylene Glycol: 50-2,000** gal/l-m (at 55% or 45% concentration)
- **Ethylene Glycol: 50-2,000** gal/l-m (at 55% or 45% concentration)
- **Glycerin:** Commonly used as an additive.

Eutectic temperature °F

- NaCl*: -6
- Ethylene: -45
- Glycerin: -53
- Propylene: -76

Cost

Liquid

$	0	50	100

	Cost per lane-mile	
	Low	High
NaCl*: $0.10-$1.00/gal	$2	$50
Propylene Glycol: $10-$20/gal	$500	$40,000
Ethylene Glycol: $14-$40/gal	$700	$80,000
Glycerin $10-$30/gal		

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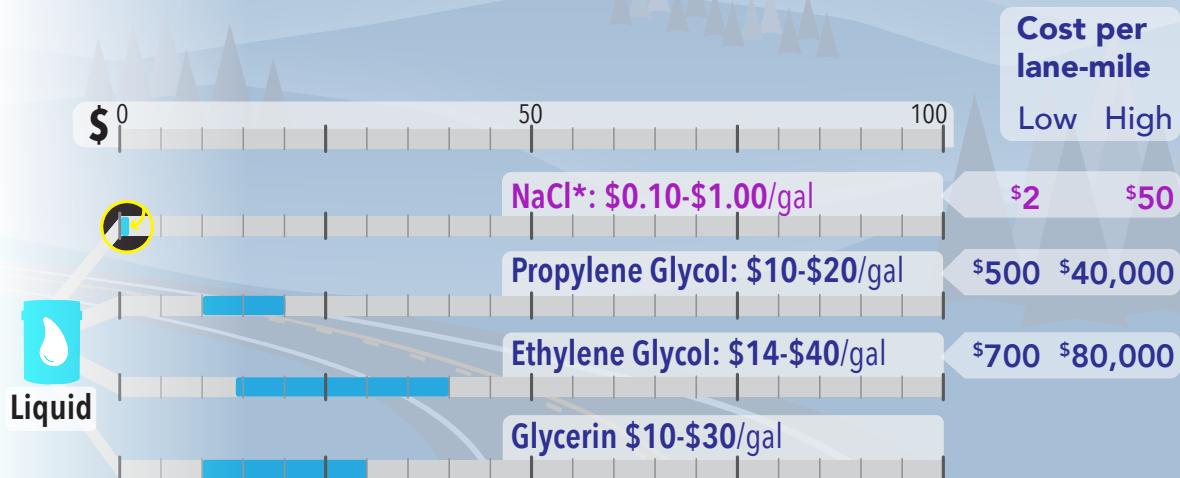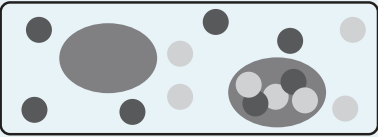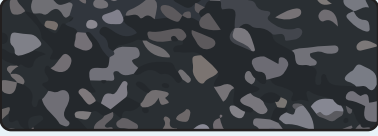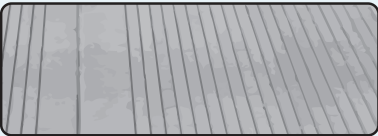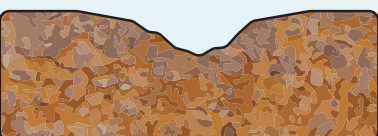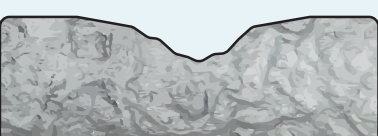
GLYCOLS

Impacts	NaCl*	Propylene Glycol	Ethylene Glycol	Glycerin
BOD COD	Low	High	High	High
Ecological Toxicity	Low to Moderate	Low to Moderate	Low to Moderate	Low to Moderate
Asphalt Pavements	Low to Moderate	Limited data available	Limited data available	Limited data available
Concrete Pavements	High	High	High	High
Mild Steel Corrosion	High	Non-corrosive	Non-corrosive	Non-corrosive
Galvanized Steel Corrosion	High	Moderate	Moderate	Moderate (Based on glycol data)

Storage and Handling

- All equipment surfaces that are frequently exposed to deicing products should be routinely rinsed with warm water to prevent accumulation.
- Keep containers tightly closed in a dry, cool and well-ventilated place.
- For propylene glycol, store in tightly sealed original UV resistance containers, away from direct heat and strong oxidizing agents. Product should be stored in clear or semitransparent containers.
- For ethylene glycol, do not store with strong acids/bases. Containers may be hazardous when empty due to product residue.
- For glycerin, keep container closed when not in use, protect from freezing, store at temperatures below 120°F, water contamination should be avoided. Incompatible with oxidizers, boron trifluoride/calcium oxide.
- All liquids should be stored with secondary containment.
- All solids should be stored on non-permeable surfaces and covered from the elements.
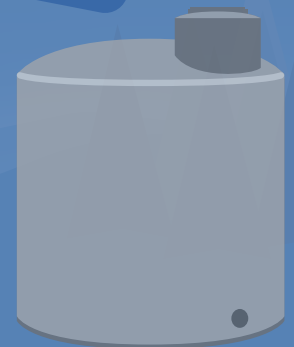
NaCl is included as a reference for comparison to the non-chloride deicers in this data sheet.