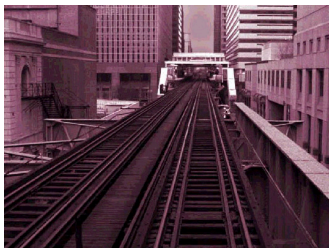


Zero Gravity Third Rail®: Technical Information

DESCRIPTION



Zero Gravity Third Rail Anti-Icer is a specially formulated non-conductive, diethylene glycol and propylene glycol based winter operating agent for electrified third rails. It is formulated using Zero Gravity Smart fluid technology to make the fluid non-newtonian. This technology, developed by NASA/AMES Research Institute, has been patented and licensed to improve this anti-icers ability to stay in place. This same liquid transforms into an extremely resilient film that will stay in place even on vertical surfaces. It's not easily washed off the rail with snow and rain and it will retain its anti-icing properties.

APPLICATIONS



Zero Gravity Third Rail Anti-Icer is a winter operating agent designed for anti-icing electrified third rails. It is applied prior to and during winter storm events to prevent ice formation on third rails. It is applied by spraying, either with a specially designed system or with a plastic hand sprayer suitable for use around high voltage locations. It is a higher viscosity material that is very fluid during applications. Yet, when "at rest" on the third rail it regains its high viscosity and becomes gel-like to remain in place on vertical surfaces. It's also effective in removing ice glaze from third rails when applied directly to the ice glaze.

PHYSICAL PROPERTIES



Boiling point:	>473°F (>245°C)
Specific Gravity:	1.04 - 1.08 (Kg/Liter)
Weight per Gallon (US):	8.66 - 9.00 (lbs/gal) (US)
Appearance:	Viscous, orange tinted liquid
Odor:	Slight
Solubility in Water:	Complete
Incompatibilities:	Strong oxidizing materials
Flammability:	Non-flammable, non-combustible
Stability:	Stable (under normal handling conditions)
Corrosiveness:	Non-corrosive
Pour Point:	< -30°F
Viscosity (68F):	150 - 200 cps
Viscosity (-20F):	600 - 850 cps
Shelf-Life	2 years in unopened, sealed container

Zero Gravity Third Rail®: Frequently Asked Questions

What is Zero Gravity Third Rail Anti-Icer?

Zero Gravity Third Rail is a winter anti-icer used to prevent ice glazing on the Third Rail. It is glycol or glycerin-based, along with a proprietary material that we have licensed from NASA Ames Research Institute, that makes the product non-newtonian so it stays in place.

How long does Zero Gravity Third Rail (ZGTRA) last?

This is difficult to be specific as each snow event differs and each location has unique characteristics. Generally when snow or ice is forecasted, dispensing equipment is dispatched to begin applications and applications are repeated until the event is over. Applications may be as frequent as 30 minutes or up to 2 to 4 hours. Usually it will depend on your storm fighting program plan. As always it is better to err on the side of caution and do a few more applications than to stretch the applications too far and create a problem or train stoppage.

Does ZGTRA wash away?

ZGTRA may be washed off during heavy rains. If your transit line has protective cover boards, the application would be offered some protection against wash-off. This would be a factor when the storm starts out as rain then turns to snow.

How much ZGTRA do you have to use?

Typical recommendation is 3-6 gallons per rail mile and this can be easily applied by using a portable Ice Slicer® Delivery System.

Is ZGTRA conductive?

ZGTRA is non-conductive. It will not act as an insulator and will not support current to carry electricity. It will not shunt installed joints.

Is ZGTRA corrosive?

ZGTRA is non-corrosive.

Will ZGTRA build up on the rail or pack up?

No.

Is ZGTRA diluted with anything before applying?

No. Apply ZGTRA as shipped from Midwest. There is no thinning required.

How do you apply ZGTRA?

ZGTRA should be applied using a custom-designed portable Ice Slicer Delivery System. These are designed to apply both left and right sides as the power rails shift from side to side. The system will detect this alternation automatically and deliver the predetermined amount based on train speed,

pressure setting, and nozzle selection.

If the third rail is already frozen, will it thaw the ice?

ZGTRA is designed as an anti-icer instead of a deicer. It will not generate heat, which is exactly why it is non-corrosive and non-conductive, unlike salts or chlorides. It will strip a thin ice glaze but a thick layer would be more difficult to thaw. ZGTRA will also work well in conjunction with sleet scraper shoes or it could be heated to aid removing thick ice.

Is ZGTRA biodegradable?

Yes, ZGTRA will bio-degrade.

Is ZGTRA flammable?

No. ZGTRA is not flammable because it does not contain any alcohols or methanols.

Will ZGTRA stain hands or work clothes?

No. ZGTRA is very clean. It is orange in color and will wash off hands with soap and water. Likewise, clothes will not be stained when washed with typical laundry detergents.

What is the shelf life of ZGTRA?

As a company policy we normally recommend using the product within a year, once it has been opened. But this product will not separate or settle. ZGTRA would be fine beyond the one year recommendation and can be used from the previous winter.

Who uses ZGTRA?

ZGTRA is widely used by many Mass Transit Authorities along with some hospitals with patient movers using third rail power, steel mills with third rail cranes and equipment and people mover systems for airports.

How Is ZGTRA Packaged?

ZGTRA is supplied in 5-gallon plastic pails, 55-gallon plastic drums, 275-gallon steel-caged totes, and also in Midwest bulk truckloads of 1,000 gallons & up.

What other applications can utilize ZGTRA?

ZGTRA can be used on crane rails, chains, hoists, ropes (marine) and other applications. Contact us if you have a specific ice or freezing problem.

Can ZGTRA be used on steps?

No, because it aids lubricity and would be a slipping hazard for any surfaces one would be walking on.