

## TOR Armor™ Top-of-Rail Friction Modifier

TOR Armor™ is a top-of-rail friction modifier (TOR FM) that is specifically designed to provide optimum friction at the wheel-rail interface. TOR Armor™ substantially reduces noise, wear, and lateral forces. These high lateral forces lead to loosened tie plates and fasteners, and can result in low rail rollover.

During normal rolling, TOR Armor™ acts as a lubricant. But when wheel creep occurs the sliding friction immediately converts to “positive friction”, controlling the creep condition and returning the wheels to a healthy rolling motion. The result is a substantial reduction of vibrations, corrugations and high-frequency squealing.

The positive friction generated by TOR Armor™ reduces lateral creep, thus reducing lateral forces. Measurements on instrumented track have shown a reduction of over 50% (compared to dry track) on the first train to come by after application of the product.

TOR Armor™ contains no solvents or latex. It dries quickly between the wheel and the rail due to frictional heat, but it will not harden in the holding tank or at the ports of the applicator. It will not corrode holding tanks, pumps or other steel components. The carry-down distance will depend on conditions such as curvature, braking and gradient, but 3 miles (5 km) is achievable in the majority of cases. In some cases, reductions in lateral forces have been measured at 6 miles from the applicator. The long carry distance often results in a reduction in the number of applicators needed.

TOR Armor™ does not affect braking or tractive effort.

### BENEFITS:

- WEAR - Reduces or eliminates creep, hunting (also known as yaw), and corrugations.
- NOISE - Stops or substantially reduces high-pitched squeal.
- LATERAL FORCES - Greatly reduces rail damage by reducing lateral forces and angle of attack.
- QUIET - Smoother, quieter ride for transit customers.
- LONG CARRY DOWN - Fewer applicators needed.
- ALL SEASON - A single grade can be used from 10°F (-12°C) up to the hottest summer conditions.
- ADHESION - Improves adhesion on stretches of track that are prone to low friction. This can result in allowing more cars to be added.
- LOW CONSUMPTION – 300 ml (1.25 cups) per 1000 axles for freight, 175 ml (0.75 cup) per 1000 axles for transit rail.
- SAFE - contains no heavy metals, petroleum solvent or hazardous ingredients. The liquid components consist of biodegradable oils and water.

### APPLICATIONS:

TOR Armor™ optimizes friction at the wheel / rail interface. It is suitable for use on both freight and transit rail cars.

CHARACTERISTICS		
Grade	TOR Armor™ Low Temp	TOR Armor™
Appearance	Smooth Dark Gray Paste	Smooth Dark Gray Paste
Usable Temperature range, °F (°C)	-40 (-40) to 60 (16)	10 (-12) to 140 (60)

### PACKAGING

Non-returnable Totes	Drums	Kegs	Pails
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LIMITED WARRANTY: The Whitmore Manufacturing Company makes the Limited Express Warranty that at the date of delivery, its goods shall be free from defects in Whitmore's materials and workmanship and shall meet the express written statements of quality, if any, made by Whitmore in connection with the sale of the goods. Other than such Limited Express Warranty, there are no express warranties made with respect to the sale of goods and all implied warranties existing under the law are expressly disclaimed and negated, particularly, Whitmore NEGATES AND DISCLAIMS THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. All other liability, either in contract or tort, including without limitation, strict liability found in Section 402A of the Restatement of Torts or otherwise, is negated and disclaimed. The sole remedy for Whitmore's breach of such Limited Express Warranty shall be a refund of the purchase price of its goods, and Whitmore shall have no responsibility for incidental or consequential damages sustained as a result of the use of the goods, whether sustained to the goods themselves or to other property. Data listed are subject to usual manufacturing variations.