

TOR Armor® Biodegradable Top-of-Rail Friction Modifier

TOR Armor® is a top-of-rail friction modifier (TOR FM) that is specifically designed to provide a friction coefficient between 0.3 and 0.4 at the wheel-rail interface. TOR Armor® substantially reduces noise, wear, and lateral forces. 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 or toxic materials. 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 vast 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** – Will carry 3-5 miles (5-8 km).
- **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. Easily passes the OECD 301B test for “Ready Biodegradability”.

APPLICATIONS:

TOR Armor® optimizes friction at the wheel / rail interface.

US Patent No. 9,617,498, No. 10,214,225 and patents pending.

CHARACTERISTICS

Brookfield Visc. (Spindle 6 @ 60 rpm, 23°C)	15,000
Specific Gravity , g/cc @ 60°F (15.5°C)	1.270
Flash Point (closed cup).	None
% Effective solids	10 - 15
Application Rate (Per 1000 Axles)	
Transit	175 ml
Freight	300 ml
Mixed	220 ml
Appearance	Smooth Dark Gray Paste
Usable Temperature range , °F (°C)	10 (-12) to 140 (60)

PACKAGING

Non-returnable Totes	Drums	Kegs	Pails
-------------------------	-------	------	-------

For warranty information, scan the QR code.
You can also email us at sales@whitmores.com
Or write to the Sales Department at the address below.

930 Whitmore Drive • Rockwall, Texas 75087 • USA • (972) 771-1000 • 800-699-6318
An ISO 9001 and ISO 14001 registered company • www.whitmores.com

