

# FLEXIBILITY, ACCESSIBILITY, VALUE

**Kelsan® Solutions** ARE RICH IN FEATURES AND TECHNOLOGY THAT DELIVER POWERFUL FRICTION CONTROL SOLUTIONS

## WHY KELSAN® ?

- Kelsan®, with over 100 satisfied customers, has a proven track record of providing effective and reliable solutions.
- Our products are produced under tight quality control governed by our ISO 9001:2000 certification.
- We have in-house R&D and field technicians including several PhD's and certified engineers that are constantly improving existing products and creating innovative new products.
- Kelsan's dedicated design engineering and production team use FEA analysis software to produce locomotive and customer specific delivery systems.

## COMPLETE FRICTION CONTROL SOLUTIONS

Kelsan Technologies is not simply a product supplier. We are dedicated to providing our customers with comprehensive cost effective friction control solutions.....sustained solutions.



Our engineers partner with customers, freight locomotive and original equipment manufacturers to identify system challenges, measure baseline data, establish mutually acceptable performance criteria, and deliver pertinent solution. Kelsan's professional technical staff provides engineering services for product installation, systems maintenance, and long-term customer care. Following installation, Kelsan offers training seminars for vehicle and track personnel, and we conduct periodic after-sales system checks to ensure that system benefits are sustained.

## EXCLUSIVE TECHNOLOGY PROVIDERS

Proprietary technology is the foundation of Kelsan's success. Our research and development team is constantly adding and improving its product line in order to continue bringing leading-edge friction control solutions to our freight customers.

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ISO 9001: 2000 CERTIFIED

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KELSAN TECHNOLOGIES CORP.

INNOVATIVE ThinFilm FRICTION CONTROL



## Kelsan® Trackside Transit Solution

Intelligent Trackside/Wayside TOR Friction Control System

**Kelsan® KELTRACK® Liquid Top-of-Rail Friction Modifier**  
**Portec Rail Protector IV® Trackside Top-of-Rail Application System**

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**Kelsan® delivers robust, integrated friction control solutions** that offer transit authorities unprecedented power and flexibility in managing operational issues. The dynamics of the wheel/rail interface present a multitude of problems for transit operators, from excessive noise to a wide range of unacceptable component wear conditions.

**Kelsan® KELTRACK®** is a proprietary, proven Top of Rail (TOR) friction control product that is revolutionizing wheel/rail interface dynamics by reducing noise, lateral forces and rail wear. The effectiveness of this product is well documented, and successfully implemented worldwide by leading edge transit operators.



Kelsan® KELTRACK®, in partnership with Portec Rail Products Inc. PROTECTOR® IV delivery system, solves a number of key problems in the rail industry. This proprietary friction modifier and delivery equipment has been engineered to provide significantly reduced wheel squeal in targeted curves, a reduction in lateral force without affecting the braking or signaling of transit vehicles, and reduced rail wear.

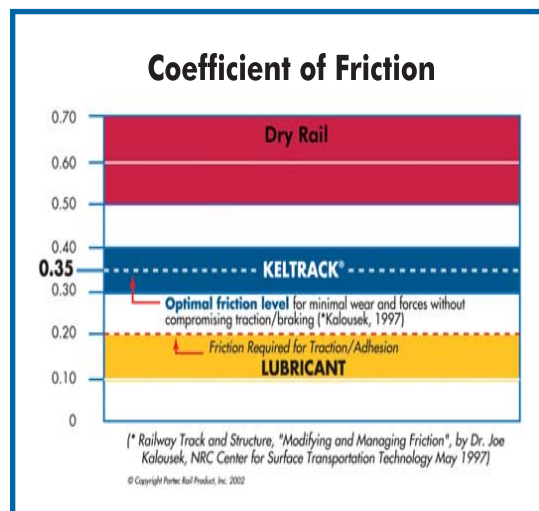
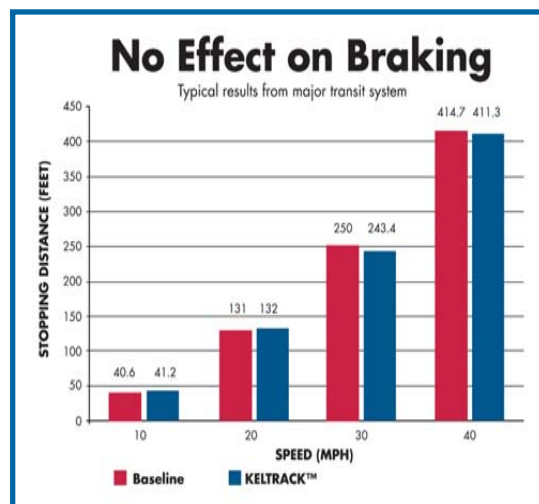
## What is KELTRACK®?

Kelsan® KELTRACK® is a water based liquid friction modifier that provides 'positive' friction between the wheel and rail. Designed for application on transit systems through a Portec Rail Products Inc. PROTECTOR® IV trackside top of rail applicator, it provides very effective control of wheel squeal in targeted curves. Maintaining the optimum intermediate coefficient of friction (0.35) minimizes any impact to braking and traction. Kelsan® KELTRACK® has also been shown to have no impact on signaling.

Kelsan® KELTRACK® has achieved unsurpassed, documented noise reduction in locations identified as being of particular concern. Targeting specific curves provides the most effective and efficient solution for customers dealing with this issue.

## What is Friction Control?

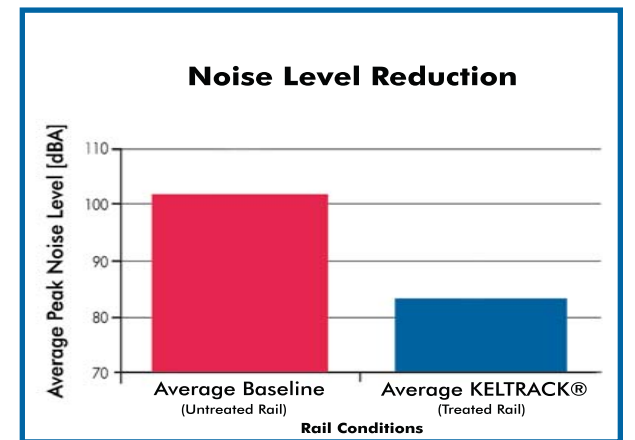
Kelsan® KELTRACK® is designed to provide an intermediate coefficient of friction on the top of the rail. It is water based liquid friction modifier that is applied directly to the top of rail in targeted areas. When the water evaporates, the material remains present as a thin, dry film. In contrast with standard lubricants (oil or grease), Kelsan® KELTRACK® has an intermediate coefficient of friction (0.35) which means it will not affect traction or braking. This intermediate friction level on the top of the rail is optimum for minimizing wear, energy and lateral forces in a safe and reliable manner.



## TARGETED CURVE NOISE REDUCTION

The unique properties of Kelsan® KELTRACK®, and the precise, controllable and reliable advantages of Portec's application system combine to deliver a highly effective targeted curve noise reduction solution without impacting critical braking or signaling performance. Wheels experiencing lateral creep in curves are subject to roll slip oscillations as a result of the frictional characteristics of the interface layer between the wheel and rail. These roll slip oscillations are amplified in the wheel web leading to the familiar squeal as trains negotiate a curve. Noise reduction results have been achieved of up to 27 decibels. Eliminate the noise at it's source.

- Significant reduction in noise levels
- Targeted curve applications
- No effect on braking or signaling
- Environmentally friendly, non-toxic & non-flammable



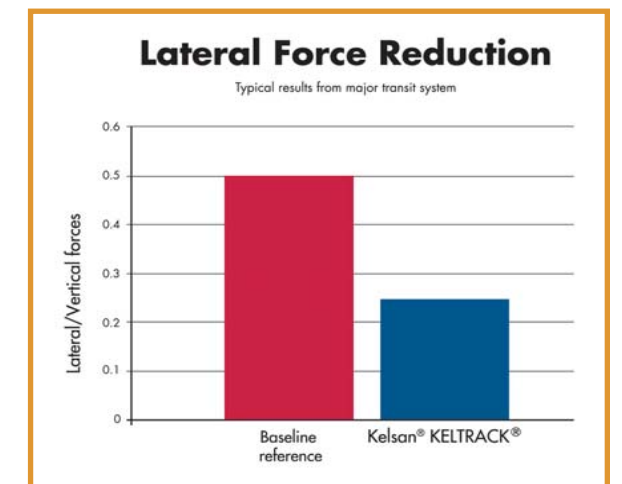
## EXTEND RAIL LIFE

The unique properties of Kelsan® KELTRACK® dramatically reduce lateral and flanging forces, thereby reducing rail wear. By controlling the friction at the top of the rail, Kelsan® KELTRACK® reduces the harmful effects of lateral forces.

- Reduce costly rail replacement
- Decrease lateral forces by up to 50%
- Decrease potential for derailment

### How is Kelsan® KELTRACK® applied?

In co-operation with Portec Rail Products Inc., Kelsan® KELTRACK® is applied using a model of the PROTECTOR® IV Trackside Friction Control System. The DC Solar power option is ideal in even the coldest of climates. When AC power is close and convenient, a universal power conditioning device allows for voltage input of 100 – 240 volts at 50 to 60 Hz, including lightning surge protection.



**Dependable Quality**  
Kelsan® KELTRACK® is manufactured to meet Kelsan's highest level of quality. Kelsan is an ISO 9001:2000 registered company for design, manufacturing and technical sales support of friction control systems.

KELTRACK® Trackside Friction Modifier shown is for photographic purposes only. Application rates are considerably less.



**KELSAN®**