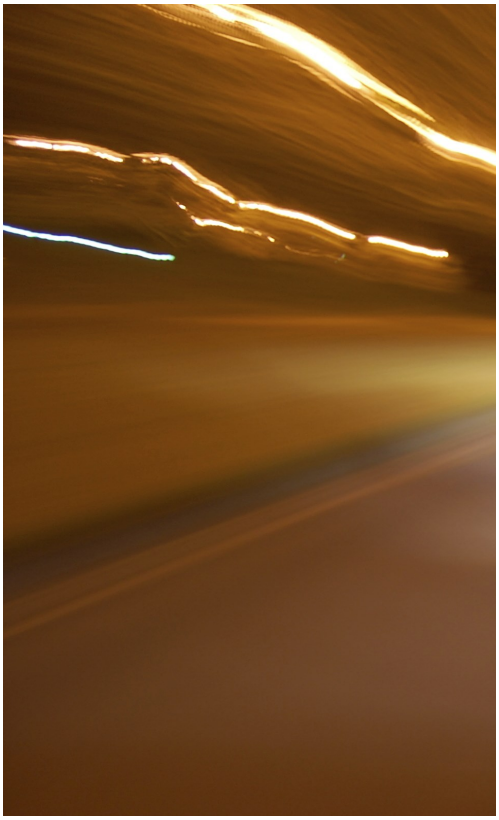
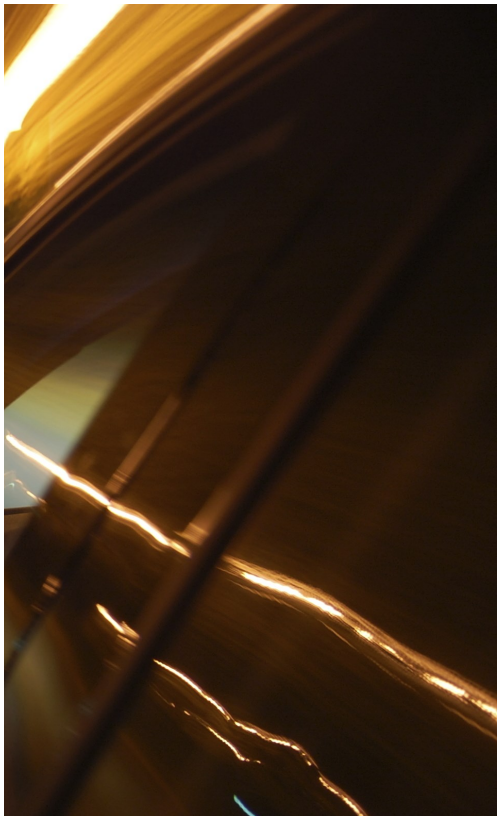
TENMAT
ADVANCED MATERIALS





HIGH PERFORMANCE SLIP COATS

TENMAT
ADVANCED MATERIALS

INNOVATION

SAFETY

SERVICE

QUALITY

TENMAT is a leading manufacturer of specialised, high performance engineering materials and components with over 100 years of experience.

TENMAT stands for innovation, safety products, commitment to our customers and the latest quality standards worldwide.

A World of Materials

The diversified product range includes, composite wear parts and bearings, engineering ceramics, hard metals, high temperature resistant materials, and passive fire protection solutions.

Commitment to Quality

TENMAT operates a ISO 9001:2008 Quality Management System for the design, development and manufacture of specialized high performance engineering materials and components.

Engineers in Composites

Award Winning Products

In 2012 and 2013 **TENMAT**'s commitment to the development of high quality products and materials was awarded with the prestigious Queen's Awards.

Eager to maintain its best-in-class position, **TENMAT** is constantly working with its customers and partners to develop revolutionary solutions and materials, such as slipcoats for automotive weather seals and cutting edge ceramic coatings for hyper performance brake discs.

Driven Personality

RAILKO HIGH PERFO

Railko PV103 and Railko ***X***tra Glide slip coats are used and specified by major car manufacturers world wide for automotive weather seal applications.

These proven slip coats create a low friction surface that is long lasting and wear resistant.

Compared to older systems using floc, weather seals with Railko co-extruded slip coats give advantages of lower cost, less operations, and simpler processing.

Railko PV103 has excellent abrasion resistance and low friction.
Raillko ***X***tra Glide is a more flexible grade to suit modern light weight weather seals without metal support and does not scuff or mar on installation.

Key Features:

- Low coefficient of friction
- Low stick slip
- Abrasion resistant
- Stable to light and weather
- Resistant to cleaning fluids

Customer Benefits:

- Easy and smooth glass movement
- Long wear life
- No bleed out
- No marking on glass
- No colour fade

Application Thickness

Railko slip coats are co-extruded at a recommended thicknesses from 100 to 150 micron. The exact thickness depends on a number of factors and there are applications where a lesser or greater thickness is applied.

The thickness is chosen to be give a thick enough layer to provide durability during life time cycle testing and to retain flexibility where needed.

It is unusual to apply Railko slip coats at less than 100 micron thickness, however low loaded areas with little abrasion requirements can be coated with only 60 microns.

Rarely, thicknesses of around 200 micron are applied in areas needing high wear resistance, such as in the base of glass run channels, where there is uneven movement of the window due to an imbalance of the window actuators.

Examples of the thickness of Railko slip coats in production profiles are given below:

	Profile A Europe	**Profile B Europe**	**Profile C USA**
Thickness on lips	80 - 110	90 - 110	80 - 100
Thickness on base	120 – 150	120 – 150	100 – 120
Comment	-	Polypropylene support	No metal support

RMANCE SLIP COATS

Functional testing of the weather seal

The weather seal is subject to several types of testing: Friction, wear, aging, and glass cycles.

Friction Test:

The coefficient of friction is measured on the co-extruded profile typically on a friction sled where two runners of co-extruded strip cut from the profile are attached to the base of the sled. The weight of the sled, the exact shape of co-extruded strip (lips are often tapered), and the contact area with the glass influence the tested value. The sliding force to move the window in the frame is done either on the complete window assembly or on small scale mock ups.

With these variations the typically measured coefficient of friction values on co-extruded profiles are:

- **Railko PV103: 0.15**
- **Railko *X*tra Glide: 0.15 - 0.25**

The coefficient of friction of Railko slip coats is not dependent on the thickness of the slip coat. However, the dynamic response of functional lips will change due to the thickness of the applied slip coat. This may be noticed in window sliding force tests.

Wear Test:

Abrasion tests are typically done on sections cut from the weather seal. Glass chisel tests for abrasion resistance use different weights for base and lip applications.

PV103 and ***X***tra Glide pass the 10,000 cycles glass chisel test.

Aging Test:

Aging tests use aggravated conditions of heat, sunlight, etc. to speed up the natural aging process. Railko slip coats pass the most stringent aging tests of car manufacturers around the world, such as the Exterior Weatherometer SAE J1960 with 3 max delta E and the Interior Weatherometer SAE J1885 with 3 max delta E.

Glass Cycle Test:

Slip coats are subject to complete in-door life cycle tests with the window, and tests on small sections of co-extruded profile cut from the weather seal.

PV103, as well as ***X***tra Glide, pass the 40,000 cycles in door window cycle tests

Overmoulding

The glass run channels and the header are joined by corner over-moulding. It is important that a stable slip coat with good over-moulding properties is chosen. Railko slip coats show excellent bonding to the over-moulding.

Competitor slip coats suffer from what is described as oil bleed out, bloom, or exudation. This refers to oil or wax type materials that migrate to the surface of the slip coat and prevent good over-moulding. This poor over-moulding and the development of splits may be visible immediately after over-moulding or may develop over time when the weather seal is in service.

RAILKO PV103

High Performance Slip Coats for Glass Run Channels

RAILKO PV103 slip coat is used and specified by major car manufacturers worldwide for glass run channel applications. This proven slip coat creates a low friction surface that is long-lasting, smooth and wear resistant.

Typical RAILKO PV103 is co-extruded onto bends of TPV, SEBS and EPDM to improve the long-term performance of weather seals.

RAILKO PV103 slip coat is chosen where durability and abrasion resistance are key requirements.

RAILKO PV103 is available worldwide through our global network of distributors.

RAILKO PV103 automotive slip coats are supplied as pellets in bags of 50lb/22.7kg.

Key Features:

- Low Coefficient of Friction
- Low Stick Slip
- Abrasion Resistant
- Stable to light and weather
- Resistant to cleaning fluids

Customer Benefits:

- Easy and smooth glass movement
- Long wear life
- No bleed out
- No marking on glass
- No colour fade

PROPERTY	UNITS	PV103
Hardness	Shore D	64
Density	g / cm^3	0.9
Flexural Modulus (ISO 178)	MPa	660
Coefficient of Friction[1]	µ	0.15 - 0.25
Extrusion Temperature[2]	°C	210 - 230
Melt Flow (190°C / 5kg / 10min)	g	0.9 min

1) The Coefficient of Friction is measured on the slip coat on the co-extruded Glass Run Channel. The measured value of the Coefficient of Friction is dependent on the test method and the shape of the Glass Run Channel.
2) The extrusion temperature conditions will depend on the extruder type and feed rate.

RAILKO

RAILKO Xtra Glide

High Performance Slip Coats for Glass Run Channels

Iss. 09/17

RAILKO Xtra glide slip coat has been specifically developed for the automotive industry to provide a smooth and durable surface for Glass Run Channels.

RAILKO Xtra Glide slip coat is co-extruded onto TPV, SEBS, and EPDM profiles to create a low friction surface that is durable, smooth and wear resistant.

Glass Run Channels with RAILKO Xtra Glide slip coat can be bent during installations into the assembly frame without showing signs of scuff or mar.

RAILKO Xtra Glide is the ideal solution for thin, flexible cross sections and is available worldwide through our global network of distributors.

RAILKO Xtra Glide automotive slip coats are supplied as pellets in bags of 50lb/22.7kg.

Key Features:

- Low Coefficient of Friction
- Low Stick Slip
- Abrasion Resistant
- Stable to light and weather
- Resistant to cleaning fluids

Customer Benefits:

- Easy and smooth glass movement
- Long wear life
- No bleed out
- No marking on glass
- No colour fade
- No scuff or mar on installation

PROPERTY	UNITS	Xtra Glide
Hardness	Shore D	50
Density	g / cm^3	0.96
Tensile Strength	MPa	10
Flexural Modulus (ISO 178)	MPa	220
Coefficient of Friction[1]	μ	0.15 - 0.25
Extrusion Temperature[2]	°C	180-210
Melt Flow (190°C / 5kg / 10min)	g	1.45 min

1) The Coefficient of Friction is measured on the slip coat on the co-extruded Glass Run Channel. The measured value of the Coefficient of Friction is dependent on the test method and the shape of the Glass Run Channel.
2) The extrusion temperature conditions will depend on the extruder type and feed rate.

TENMAT
ADVANCED MATERIALS

FEROFORM RAILKO FEROGLIDE FEROBIDE

REFRAVER REFEL ARCLEX

FIREFLY NITRASIL

TENMAT is committed to the highest standards in customer service and our international staff is looking forward to assist you.

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