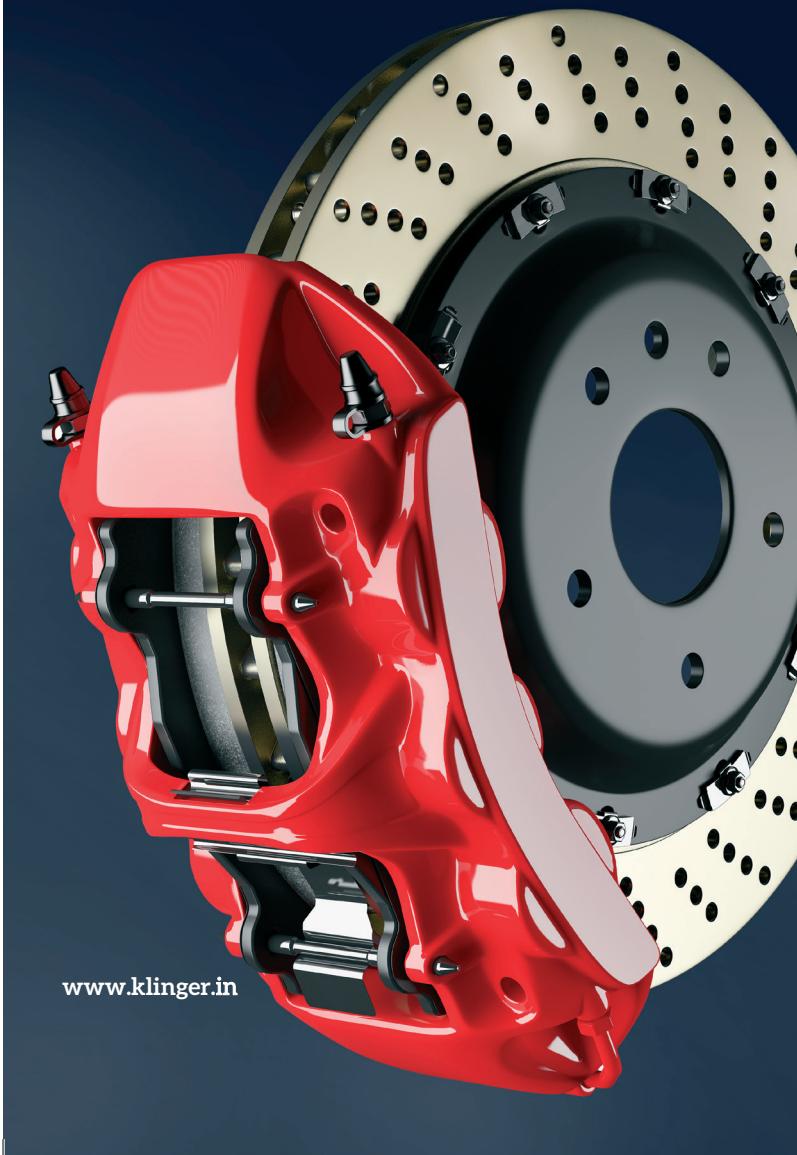


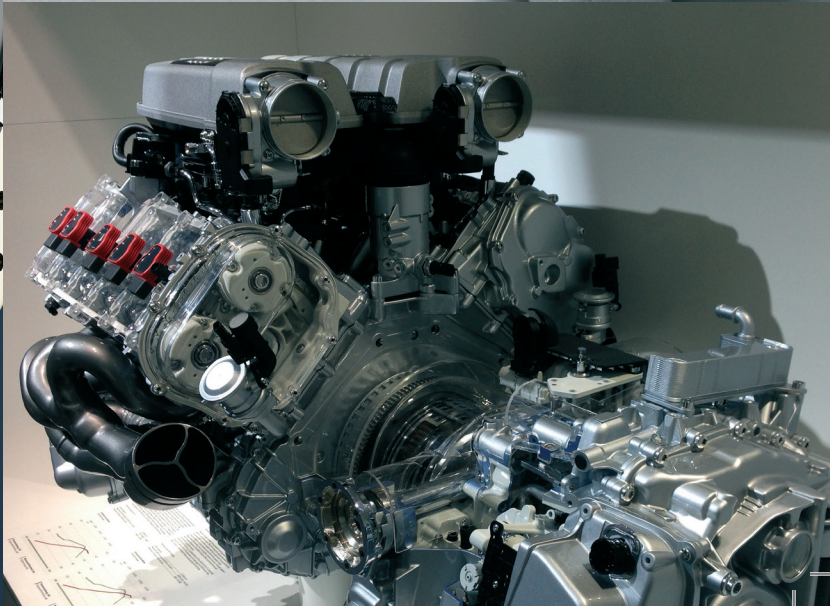


KLINGER®

POLYSTRAT
Leading performance



www.klinger.in





ABOUT US

KLINGER AG EGLISWIL

Your expert for high-temperature laminates and rubber coated steel.

Klinger AG Egliswil was established in 1980 as the KLINGER Group's competence center for high temperature gasket materials made of flexible graphite and mica, as well as for rubber coated steel. Our materials are in service at many leading companies of our key markets on all continents who rely on the quality of our materials every day. Millions of cars and trucks are equipped with seals and brake shims made of KLINGER Polystrat, sealing fluids and gases on board and ensuring that disk brakes do their job silently and smoothly.

COMPETENCE YOU CAN RELY ON

Our materials are in service in critical applications under harsh conditions. They withstand extreme temperatures and temperature cycles, high pressures and aggressive media – for years. Their uncompromising performance is decisive for the safety of the plants and the employees of our customers as well as for our environment.

It is our claim to always supply our customers with the best available solutions under technical and commercial aspects. For that reason, technical customer support is of paramount importance in what we do. This includes the professional selection of adequate materials and advice for proper handling and installation. No matter in which country of the world your plants are located a KLINGER service & distribution company or an official KLINGER distribution partner will be there to provide that important support.



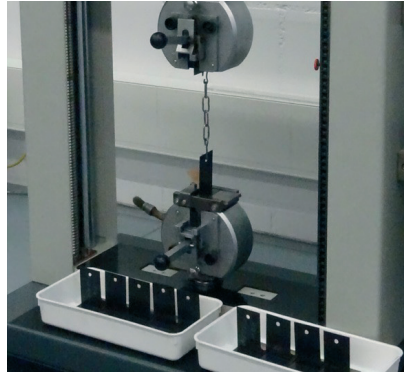
A stylized blue icon consisting of several parallel diagonal lines of varying lengths, creating a sense of depth and movement.

ABOUT US COMPETENCIES



PRODUCT DEVELOPMENT

The product development department of KLINGER represents the central development competency for high performance materials. Furthermore the entire KLINGER Group benefits from their know-how.



MATERIAL TESTING

KLINGER Switzerland operates a test laboratory offering the broadest scope of state-of-the-art test equipment. This ensures that customers can rely on the highest level of quality at any given time.



QUALITY MANAGEMENT

In order to offer future generations a world worth living in, KLINGER Switzerland focuses on the highest quality and environmental compatibility in its' own processes and the entire supply chain.



KEY COMPETENCE – RUBBER COATED STEEL

We constantly work on rubber compounds, steel combinations and surface treatments with the aim of optimizing properties that are key in sealing and in vibration and noise damping shim applications. In close cooperation with our suppliers we test characteristics of different materials for their suitability in our applications. We apply state of the art technology to make sure that our materials perform to the expectations of our demanding automotive and industrial customers.



KLINGER POLYSTRAT

PRODUCT BASICS

KLINGER® Polystrat has a steel base, generally coated with a rubber layer on each side creating a noise damping material for brake pads and a sealing material for powertrain and compressor applications

The materials are based on a composition of:

- » Cold-rolled carbon steel or stainless steel
- » NBR, AEM or FKM rubber with a smooth or texturized surface
- » Pressure and temperature resistant acrylic glue
- » Release liner

Shim material:

- » The damping material has a good resistance to fuel and brake fluid
- » Available with different rubber thicknesses, metal materials and thicknesses, adhesives, color-coatings and release liners

Gasket material:

- » The rubber compounds have a good resistance to oil, fuel and water / glycol according to ASTM F146
- » The mechanical stability allows for easy assembly especially for complex shapes or large gaskets
- » Gaskets with nitrile rubber allow a continuous service temperature up to 130 °C and gaskets with ethylene acrylic rubber up to 180 °C
- » With FKM reaching a temperature resistance of up to 200°C

KLINGER® Polystrat uses only high-quality raw materials and proven production processes which ensure that we can seal any relevant chemical present in the applications that need to be supported.

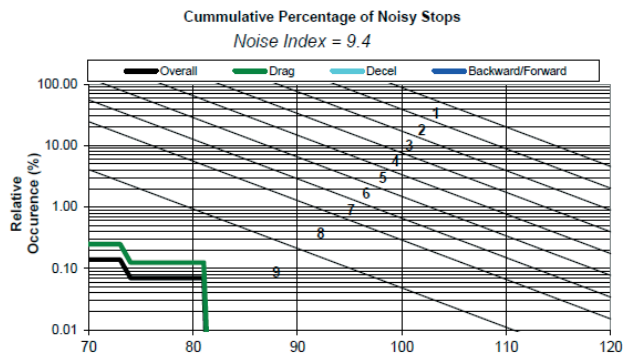
Chemical resistance of the rubber layer	No embrittlement and delamination
Fuel B 72 h, RT	Resistant
FAM A 48 h, RT	Resistant
Diesel fuel 72 h, RT	Resistant
Oil IRM 903 72 h, RT	Resistant
Motor oil SAE 15W-40 24 h, 125°C	Resistant
Brake fluid DOT 4 72 h, 100°	Resistant
Coolant Glysantin® 30 (50:50) 125 h, 125°C	Resistant

KLINGER POLYSTRAT

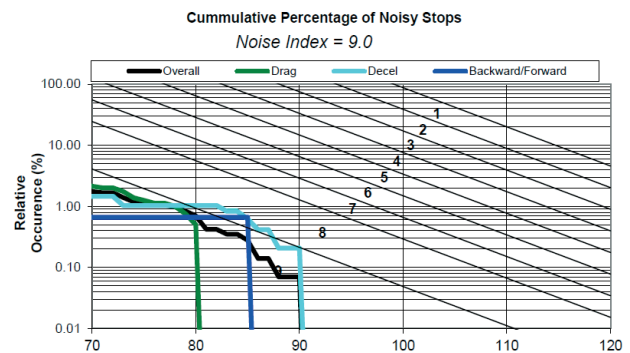
PROVEN AS THE LEADING RUBBER COATED STEEL CHOICE

Anti-Noise Shim application for Passenger brake pads. The shim serves to reduce the noise, vibrations and harshness (NVH) resulting from the braking process.

Polystrat shows advantages in the test:



The competitor material is louder:



NVH-Test Result:

No brake squeal: included Anti-Noise-Shim
Noisy Stops defined as those with Max SPL > 70dB(A)

Polystrat is proving precision at supply when considering supply time as well as end-user demands and tolerances. At Klinger we are in the production more flexible than any other supplier in the market. The production is optimized to assure quick supply – At Klinger we have tools such as security stock defined per customer needs, the flexibly production line assure smaller batch demands and therefore a fast reaction to any requests and wishes from the market.

Furthermore Klinger quality management enables that what it supplied it in accordance with the requested considering tolerances and product specification.

Material	End-user demand in mm	KLINGER Polystrat Standard Thickness & Tolerance
Rubber	0.100	0.100 ±0.005mm
Steel	0.380	0.380 ±0.020mm
Rubber	0.100	0.100 ±0.005mm
PS-adhesive	0.085	0.080 ±0.010mm
Total thickness	0.665	0.660 ±0.040mm



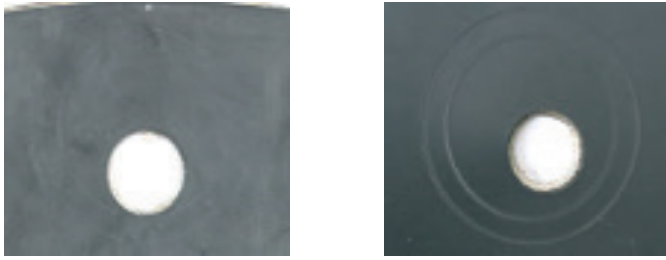
KLINGER POLYSTRAT

PROVEN AS THE LEADING RUBBER COATED STEEL CHOICE


The Piston Penetration test checks the quality of the shim elastomer and the rubber-metal bond.

The test temperature is 215 °C. The loading force is 30KN. The hold time is 60 seconds.

KLINGER Polystrat shows no delamination or damage after the piston penetration test.

Piston Penetration (High Temperature)		
	Competition	Polystrat
		
After test		
Deformation	191.5µm	223µm

When testing the compressibility and resilience at a maximum load of 31.25KN with a loading rate at 0.75KN/s (Number of cycle: 2x and at 30 seconds) by observing and comparison of the deformation and resilience KLINGER Polystrat is showing much better results.

Compressibility		
	Competition	Polystrat
		
After test		
Deformation	82.0µm	72.5µm

KLINGER POLYSTRAT

PROVEN AS THE LEADING RUBBER COATED STEEL CHOICE

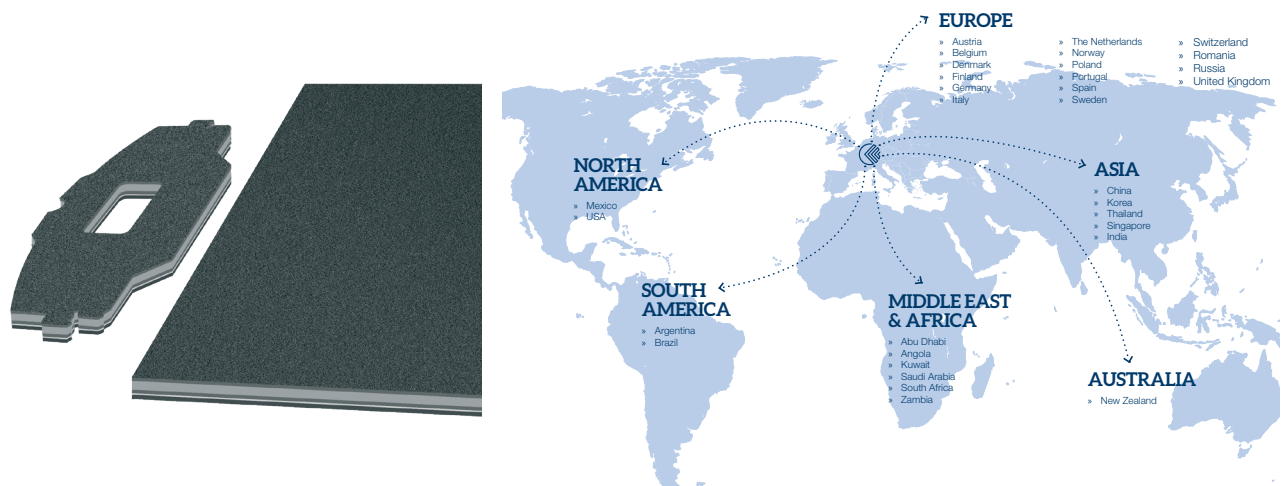
Salt Spray tests the corrosion resistance of the test sample using a NaCl solution (concentration: 5% NaCl) over a test duration of 24h and 72h - per the ASTM B117 test standard.

KLINGER Polystrat shows a slightly improved corrosion resistance performance especially in the short-term test.

Salt Spray		Competition	Polystrat
	After 24h		
	After 72h		

DELIVERING PRECISION, SAFETY AND TRUST WITH ADVANTAGE FOR THE END-USERS

KLINGER Switzerland has EN ISO 9001 as well as ISO 14001 certification. Our products are approved by major OE and Aftermarket customers. The KLINGER Polystrat product range can be accessed world-wide within the KLINGER network.



ONE GLOBAL NETWORK FOR TRUSTED PRODUCTS AND SERVICES



All information is based on years of experience in production and operation of sealing elements. However, in view of the wide variety of possible installation and operating conditions one cannot draw final conclusions in all application cases regarding the behaviour in gasket joint. The data may not, therefore, be used to support any warranty claims. This edition cancels all previous issues. Subject to change without notice.

Certified acc. to DIN EN ISO 9001:2015 Subject to technical alterations.
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