

**Heavy-Duty.
Large structural components – high loads.**



Extreme conditions. High demands for plastic materials.



ENSINGER high-performance plastics are being used more frequently in large machinery and plant. Even under extreme conditions engineering plastics fulfil high demands for mechanical strength, reliability and safety.

Plastic components may at first sight not be recognizable in large plant. Only after function and performance are considered do the special properties of plastics come to light.

The excellent characteristics of ENSINGER high-performance plastics in heavy duty areas:

- | Reliable sliding material in machine parts such as slide bearings, track rollers, rope pulleys, cog wheels, spindle nuts, for track guides and as guide rails
- | Excellent vibration dampening
- | Good chemical resistance
- | Weight reduction compared with metals due to low density

Approvals

Before plastics can be approved for use in large functional parts, they have to fulfil high safety requirements as part of a number of performance tests. This is also true for ENSINGER plastics. Already tested and approved: rope pulleys from ENSINGER for ship cranes.

- | Electrical insulation or specific electrical conductivity
- | High thermal insulation properties when compared with metals
- | Use of highly productive manufacturing processes such as injection moulding, profile extrusion or straightforward machining ability.

A further characteristic of plastics is the low after sales cost of service, transport and maintenance. Decisive advantages for cost-intensive installations in large plants are the high degree of plant safety and the reliability of plastics.



ENSINGER industry know-how.

Economic solutions are in demand. The use of typical plastic properties in classic metal domains is therefore a trump card. At ENSINGER we can demonstrate the latest technical solutions, engineering plastics present for use in heavy equipment.

I Offshore

Safety and reliability are important in sea travel and marine technology. Easy to slide and with good thermal insulation, pipe clamps made of TECALUBE and seals made of PEEK materials are totally reliable.

I Transportation

ENSINGER plastic components made of TECAST have proven their strength in cable railways, lifts, crane and conveyor systems: they are abrasion resistant, non-corroding, reduce noise and possess excellent emergency dry running properties.

I Mining

In machine parts exposed to kinetic friction ENSINGER sliding plastics resist extreme environments such as dirty and moist. Available with good electrical conductivity, they offer protection against the danger of explosion.

I Winter technology

Plastic components produced by the RIM process are also capable of withstanding the high demands of impact strength, abrasion resistance and service life even at extreme minus temperatures (e.g. ski chair-lifts, caterpillar tracked snow cat).

I Chemical industry

ENSINGER's chemically resistant and abrasion resistant TECAPEEK PVX replaces non-ferrous metals and stainless steel in dynamic seals, ball valve seats and bearings.

I Beverage industry

Plastic components are completely suitable for the entire drinks container process, from cleaning to filling to packaging. The advantages of ENSINGER plastics: wear resistant, low surface abrasion, corrosion-safe, suitable for contact with food-stuffs.

I Automation technology

ENSINGER has a suitable standard material or special grade for every application, from vibration conveyors to seals under high vacuum or grab arms for hot glass.

I Shipping

ENSINGER engineering plastics are used as rope pulleys in ships' cranes where they reduce costs and offer advantages in use because of their weight saving, non-corroding properties and by increasing service life.



Support rings and gaskets for ICH Holland. **TECAPEEK** guarantees dimensional stability, accurate tolerances and good chemical resistance.



Chair-lift guide for DOPPEL-MAYR – shape-retaining, abrasion resistant and tough against knocks, even at low temperatures thanks to **TECARIM**.



Very heavy-duty, weather-resistant and sea-water resistant – these characteristics mean that ENSINGER plastics have received certification by Lloyds of Germany.

ENSINGER production processes for perfect products.

Perfect products are the result of high precision manufacturing processes and the most modern process technology. The wide range of production processes used at ENSINGER permits the optimum production process to be linked to the final product.

I PA casting

Using anionic polymerisation semi-finished products can be made with large dimensions in extremely tough TECAST and mono-cast parts in TECAST DC. Centrifugally cast tubes are available up to 4.2 metres long and up to 710 mm diameter, custom cast parts up to 800 kg.

I RIM

Production of moulded parts using the RIM process (Reaction Injection Moulding) is particularly recommended if a machining process or injection moulding is uneconomical. Metal inlay materials and strengthening parts can be integrated into the moulded component using this process.

I Semi-finished products

ENSINGER produces more than 100 different semi-finished plastics using different process technologies.

I Machining operations

Parts can be produced with high precision and very narrow tolerances on modern CNC-controlled machining centres. Complex geometries can be achieved using simultaneous four and five axis machining. Combined turning and milling offer cost effective small and large scale finished parts.

I Injection moulding

The most modern process technology and long-standing experience are pre-requisites for perfect solutions.

I Compression moulded semi-finished products

Cost-effective solutions are possible using compression moulded semi-finished parts made of high-performance plastics: The geometry of the compression moulded semi-finished part is made as close as possible to that of the finished part.



ENSINGER engineering expertise.

I Project management

Ask. Think. Succeed.
The ENSINGER company philosophy stands for project management of the highest standard. In partnership with our customer we develop tailor-made innovations based on many years of experience. The know-how of our specialists, modern tool construction, rational production processes, an inexhaustible range of materials and certified quality management ensure new and creative engineering solutions.

I Development

The specific requirements of our customers determine what we do. Our consultant engineers not only have a sound knowledge of applications, but also experience of different branches of industry. Individual and convincing solutions are worked out with you together in a dialogue of partnership.

I Production

Semi-finished and finished products of the highest quality combined with a world-wide distribution network are the foundation of our customer service. Using the most modern logistics and production facilities in Germany and abroad, we are able to supply either "just in time", special deliveries in the shortest possible time or delivery at regular intervals – fully in accordance with your requirements.

I Testing and approvals

Quite often an application is not accepted before extensive approval testing has been undertaken. ENSINGER supports product approval of plastic components with industry-specific know-how and material certification.



Automobile production and logistics: Jigs, fixtures and part holders in **TECAST** provide smooth operation in assembly parts.



TECAST in functionally decisive components: rope pulleys, support plates, telescopic sliding parts.



Threaded scrolls made of **TECAST** permit a trouble-free operation in container circuits.

ENSINGER plastics for heavy-duty applications



Across ice and snow: Wheel guidings and wheels for LEITNER-SNOW. **TECARIM** withstands extreme loads.

Plastics offer many advantages over metals. Today ENSINGER plastic materials replace metal components in numerous industries. In this respect the superior properties of plastics really show through, often where plastic and metal components are combined.

ENSINGER has made it a priority to develop the potential range of capabilities of plastics in combination with metals. Our objective is to create highly efficient solutions for individual customer requirements.

An important argument for the use of plastics with heavy loads is the good sliding and abrasion behaviour in dry conditions. Combinations of plastic and metal or plastic and plastic are playing an increasingly important role where high loads and high friction levels exist in modern heavy-duty machinery.

Using readily available engineering and high temperature plastics as the starting point, ENSINGER develops new plastics with special property profiles for various heavy load applications.

I **TECAST**

Versatile bearing material with high strength and toughness.
Chemically resistant and electrically insulating.

I **TECAMID 6, 66**

Good sliding properties with high wear resistance. The addition of glass fibre offers high rigidity and strength. Chemically resistant.

I **TECARIM**

Very good strength and extreme toughness at minus temperatures. Good impact strength and chemical resistance.

I **TECAFORM**

Very good sliding behaviour. Abrasion resistant. Resistant to organic solvents. Suitable for contact with foodstuffs.

I **TECAFLON PVDF**

Very good chemical resistance. Suitable for contact with foodstuffs. Resistant to hydrolysis and UV.

I **TECAFLON PTFE**

Chemically resistant plastic with excellent insulation. High UV resistance.

I **TECAPEEK**

Hydrolysis resistant high temperature plastic with high strength. Chemically resistant and electrically insulating.

**Headquarters and European Stock
ENSINGER GmbH**

Postfach 11 61 · PLZ 71150
Rudolf-Diesel-Straße 8
71154 Nufringen
Telefon +49 (0) 70 32 / 8 19-0
Telefax +49 (0) 70 32 / 8 19-100
Internet:
<http://www.ensinger-online.com>
e-mail:
info@ensinger-online.com
Info-Line:
+49 (0) 1 80 / 3 81 98 19

**Brazil
ENSINGER Ltda.**

Av. São Borja 3185
93.032-000 São Leopoldo-RS
Telefone +55 51 / 5 88 25 42
Telefax +55 51 / 5 88 25 42
e-mail: ensinger@ensinger.com.br

**Germany
ENSINGER GmbH**

Postfach 15 24 · PLZ 93405
Thierlsteiner Straße 14
93413 Cham
Telefon +49 (0) 99 71 / 3 96-0
Telefax +49 (0) 99 71 / 3 96-5 20
e-mail: info@ensinger-online.com

ENSINGER GmbH

Postfach 11 54 · PLZ 59603
Borsigstraße 7
59609 Anröchte
Telefon +49 (0) 29 47 / 97 22-0
Telefax +49 (0) 29 47 / 97 22-77
e-mail: info@ensinger-online.com

THERMIX GmbH

Goetheplatz 4
88214 Ravensburg
Telefon +49 751 / 3 54 52-0
Telefax +49 751 / 3 54 52-22
Internet: www.thermix.de
e-mail: info@thermix.de

**France
ENSINGER France SARL**

3, Chemin de la Vierge
B.P. 614
95196 Goussainville
Téléphone +33 1 / 39 33 92 50
Téléfax +33 1 / 39 88 45 75
e-mail: ensinger-france@wanadoo.fr

**Great Britain
ENSINGER Limited**

Llantrisant Business Park
Llantrisant, Pontyclun
Mid Glamorgan CF72 8LF
Telephone +44 (0) 14 43 / 23 74 00
Telefax +44 (0) 14 43 / 23 73 42
Internet:

<http://www.ensinger.ltd.uk>
e-mail: sales@ensinger.ltd.uk
Further Factories in GB:
Waterlooville, Hampshire
PO7 7XX

Irlam, Manchester
M44 6FB
Bridgwater, Somerset
TA6 6TS
Bishop's Stortford, Herts
CM23 5PE
East Kilbride, Glasgow
G74 4QZ
Birmingham, West Midlands
B7 4SN

**Italy
ENSINGER Italia S.R.L.**

Via Franco Tosi 1/3
20020 Olcella di Busto Garolfo
Telefono +39 03 31 / 56 83 48
Telefax +39 03 31 / 56 78 22
e-mail: home@ensinger.it

**Japan
ENSINGER Japan Co., Ltd.**

Kojimachi NK Building
2-14-2, Kojimachi
Chiyoda-ku, Tokyo 102-0083
Tel. +81 3-35 56-25 21
Fax +81 3-35 56-25 20
e-mail: osk-ens@tke.att.ne.jp

**Austria
ENSINGER Sintimid GmbH**

Werkstrasse 3
4860 Lenzing
Telefon +43 76 72 / 7 01 28 00
Telefax +43 76 72 / 9 68 65
e-mail: office@ensinger-sintimid.at

ENSINGER TecaRIM GmbH

Floetzerweg 184
4030 Linz
Telefon +43 7 32 / 38 63 84-0
Telefax +43 7 32 / 38 63 84-10
e-mail: office@ensinger.at

**Poland
ENSINGER Polska Sp. z o.o.**

ul. Spółdzielcza 2a
64-100 Leszno
Tel. +48 65 / 5 29 58 10
Fax +48 65 / 5 29 58 11
e-mail: ensinger@le.onet.pl

**Singapore
ENSINGER International GmbH**

(Singapore Branch)
63 Hillview Avenue # 04-07
Lam Soon Industrial Building
Singapore 669569
Tel. +65 5 52 41 77
Fax +65 5 52 51 77
e-mail: ensinger@singnet.com.sg

**Spain
ENSINGER S.A.**

Girona, 21-27
08120 La Llagosta
Barcelona
Teléfono +34 (0) 93 57 45 76
Fax +34 (0) 93 57 42 30
e-mail: info@ensinger-plastics.com

**Czech Republic
ENSINGER s.r.o.**

Prumyslořá 991
P.O. Box 15
334 41 Dobruřka
Telefon +420 (0) 37 / 7 97 20 56
Telefax +420 (0) 37 / 7 97 20 59
e-mail: ensinger@top.cz

**USA
ENSINGER Inc.**

365 Meadowlands Boulevard
Washington, PA 15301
Telephone +1 (724) 746-60 50
Telefax +1 (724) 746-92 09
e-mail: ensinger@ensinger-ind.com

Your specialist supplier: