

## Technical plastics for the rolling mill industry

Lubricating pumps  
Couplings

**SCHWARTZ**  
TECHNICAL PLASTICS







Machine and wear parts in our technical plastic have been used successfully by the rolling mill industry for decades. Schwartz is one of the leading manufacturers of these materials. Our LAMINEX®, MITELA® and LAMIGAMID® qualities are known all over the world to stand for quality and performance, and the company's achievements over the last 75 years have truly been pioneering.

1924 Company founded. Produces friction bearings for rolling stands in duroplastic LAMINEX®.

1952 Company begins to manufacture coupling elements from extruded polyamide. Programme expanded to include slipper pads for universal couplings and cloverleaf inserts for coupling boxes.

1967 The company introduces its first casting system for cast polyamide and seeks applications in rolling mills for high plastic material.

1969 Development of an all-plastic carrying roller for the transportation of sheets and strips, since when the LAMIGAMID® carrying has proved itself in countless conveyor systems.

1969 The company also commences production of mandrel segments for coilers and de-coilers.

1969 Development of the type SC spindle lubricating pump and application for patent. Today, the SC is used to ensure the optimum lubrication of many universal couplings in heavy-duty rolling stands all over the world.

1970 Successful installation of the first Securex couplings in conveyor systems.

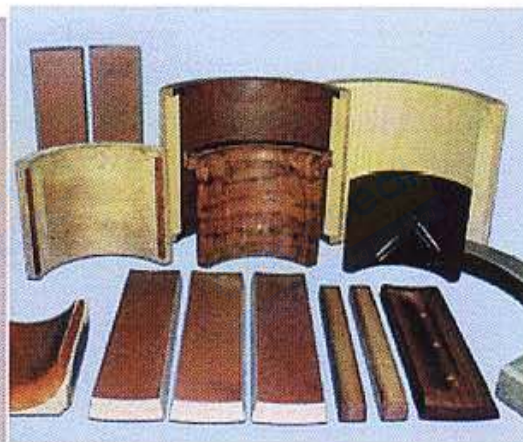
1972 LAMIGAMID® 510 included in the programme; used for wear plates on components and stand windows.

1985 Development of folding rings, used to secure components axially to plastic rollers.

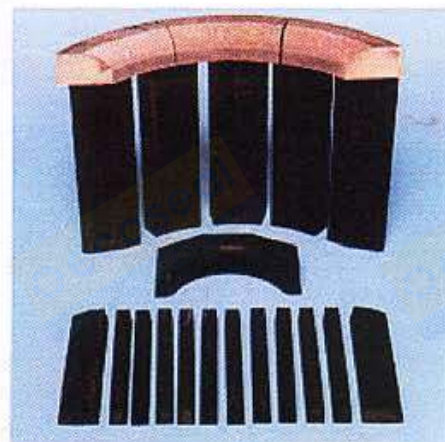
1996 Commenced manufacture of the high-performance PA12G - our patented LAMIGAMID® 1200. The material is used to make heavy-duty wear plates for components and stand windows, and slipper pads.



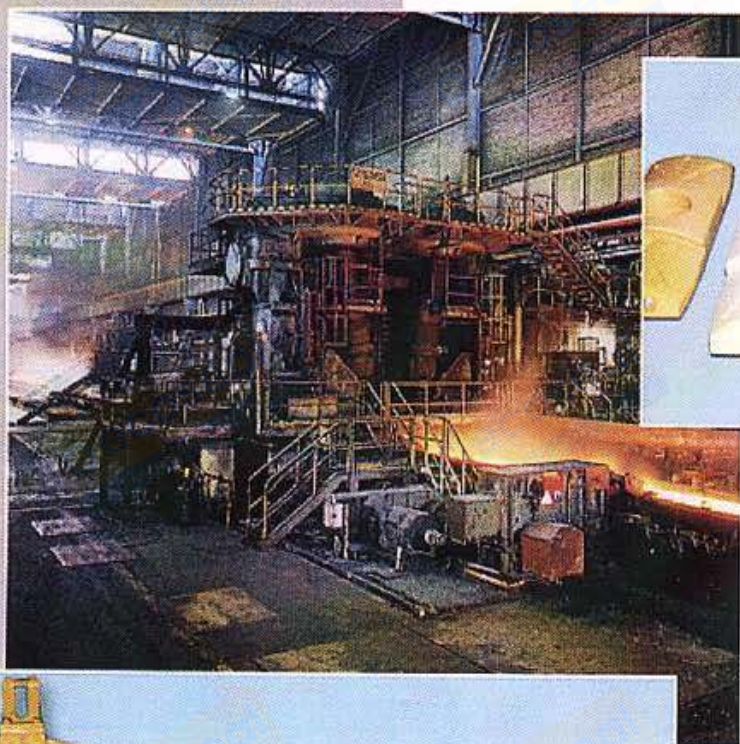
# Products for block, profile, bar and wire rolling mills



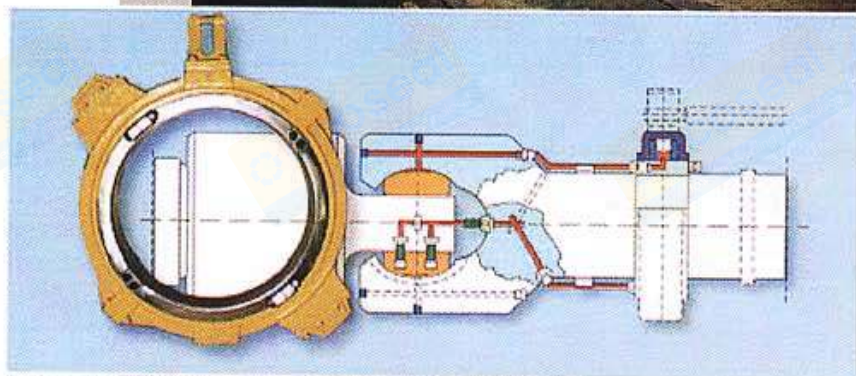
Roll neck bearings in  
LAMINEX® and MITELA®



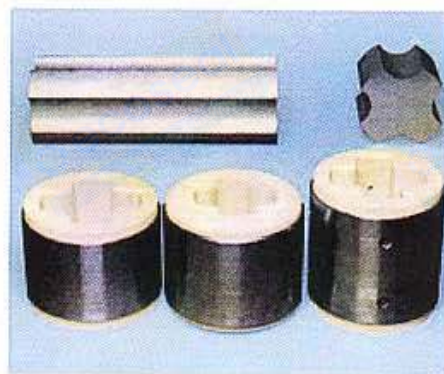
Friction bearings LAMINEX® 2010



Coupling elements  
- slipper pads  
- cloverleaf inserts  
in various LAMIGAMID® qualities



Grease lubricating pump,  
used to lubricate bronze or plastic slipper pads in universal  
articulated spindles

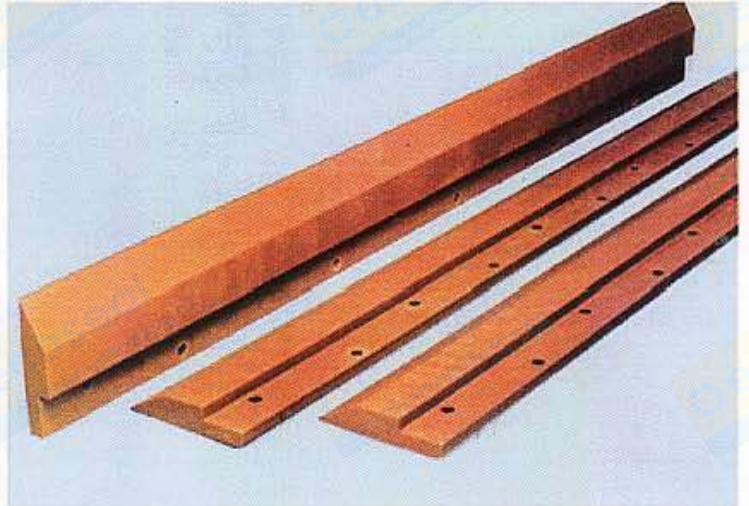


Coupling muffs in LAMIGAMID® with  
steel bindings, aluminium spindles

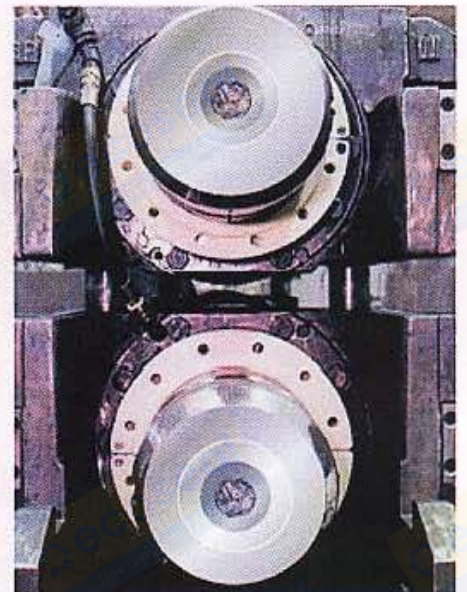
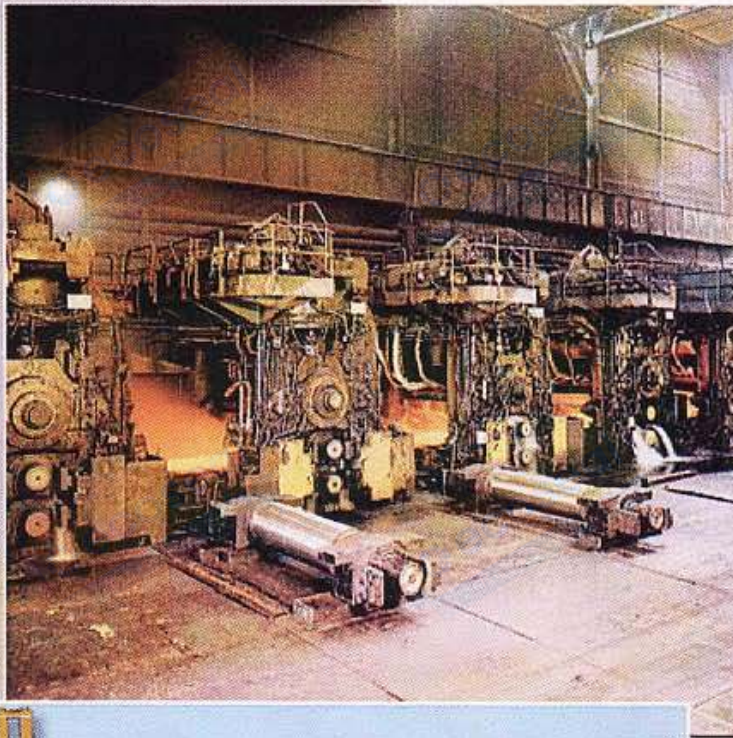


## Products for hot rolling mills

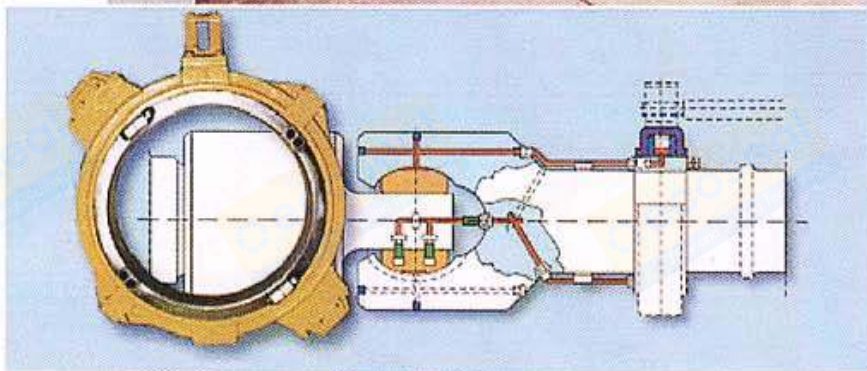
### Roughing stands Finishing group



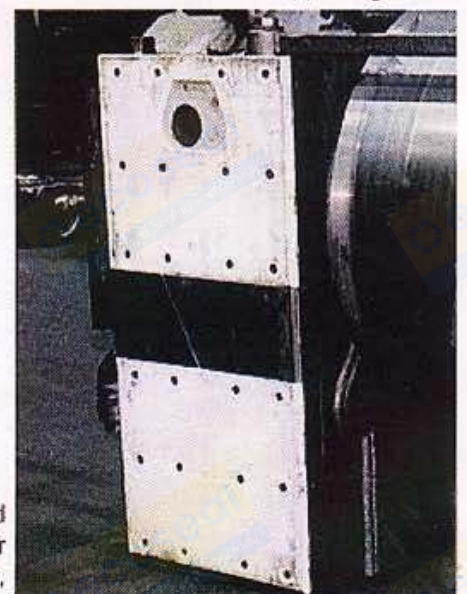
Roller strips in LAMINEX® 2010



Folding rings in  
LAMIGAMID® 300 for working and  
supporting rollers



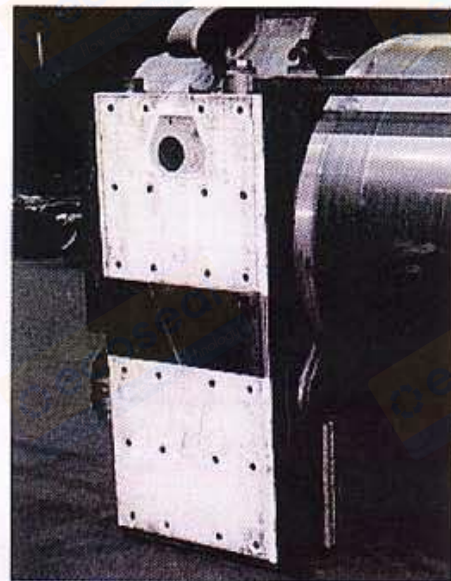
Grease lubricator for lubricating articulated spindles  
in roughing and finishing stands



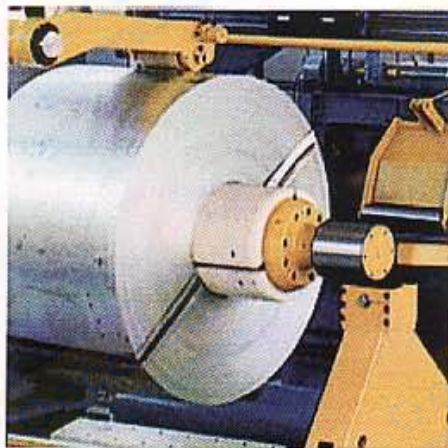
Wear plates in LAMIGAMID® 510 and  
LAMIGAMID® 700 for installation housings for  
working and supporting rollers,  
and stand windows



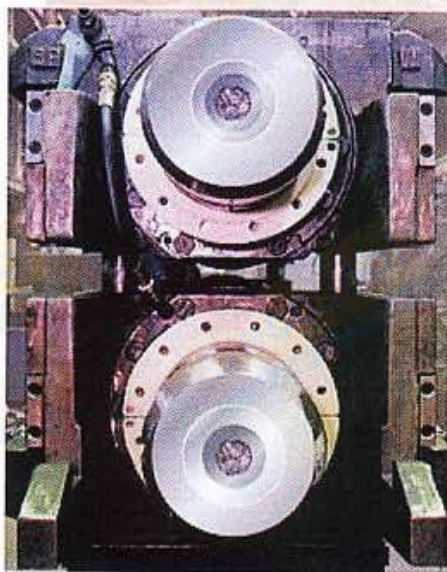
## Products for cold strip mills and service operations



Wear plates in LAMIGAMID® 510 and 700 for the installation housings of working and supporting rollers, and stand windows



Mandrel segments in LAMIGAMID® 310 for coilers and de-coilers



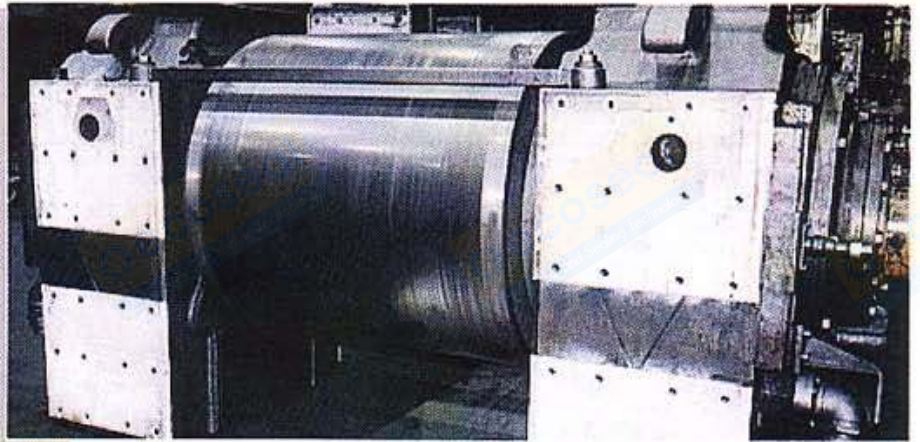
Folding rings in LAMIGAMID® 300 for securing components to working and supporting rollers



Support rollers in LAMIGAMID® 310 for the loop section of staining strips, roller tables and roller baskets



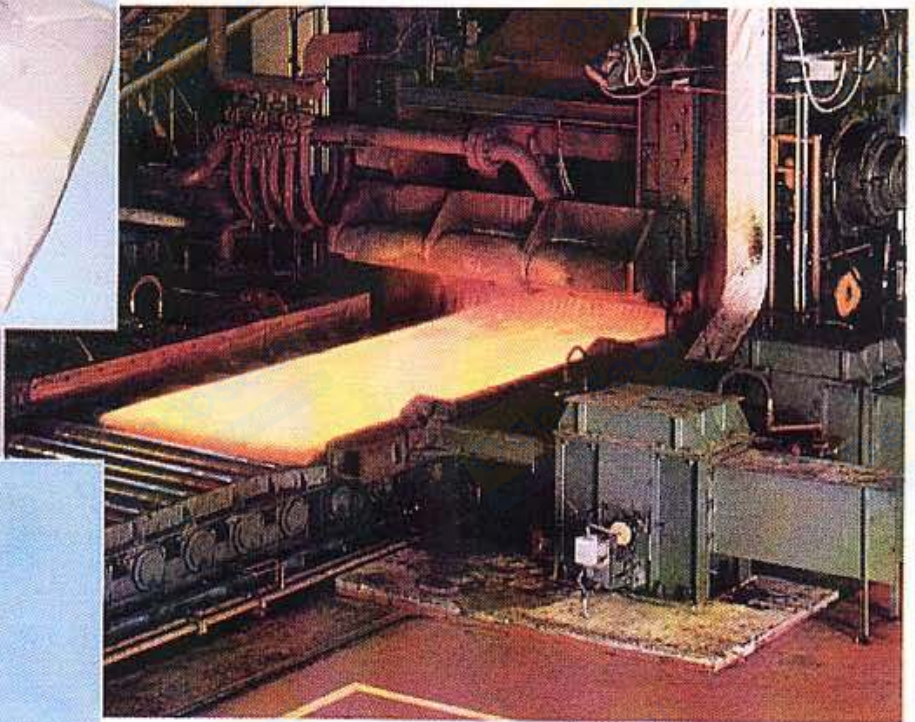
## Products for heavy plate stands



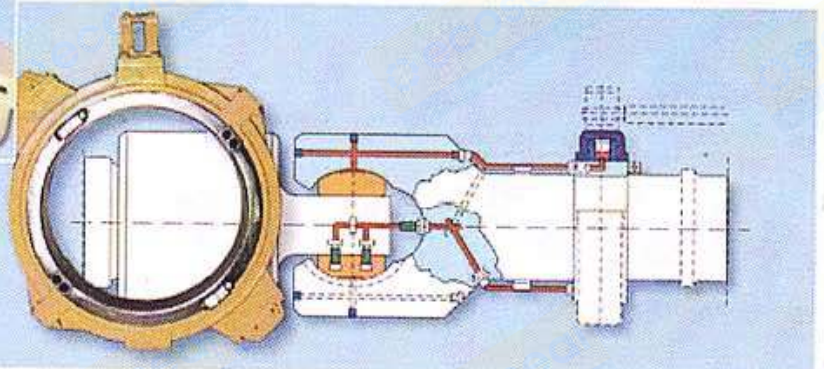
Wear plates in LAMIGAMID® 510 and 700 for components in working and supporting rollers, and stand windows



Slipper pads in various LAMIGAMID® qualities



Folding rings in LAMIGAMID® 300, used to attach components to working and supporting rollers



Grease lubricators for lubricating articulated spindles with bronze or slipper pads

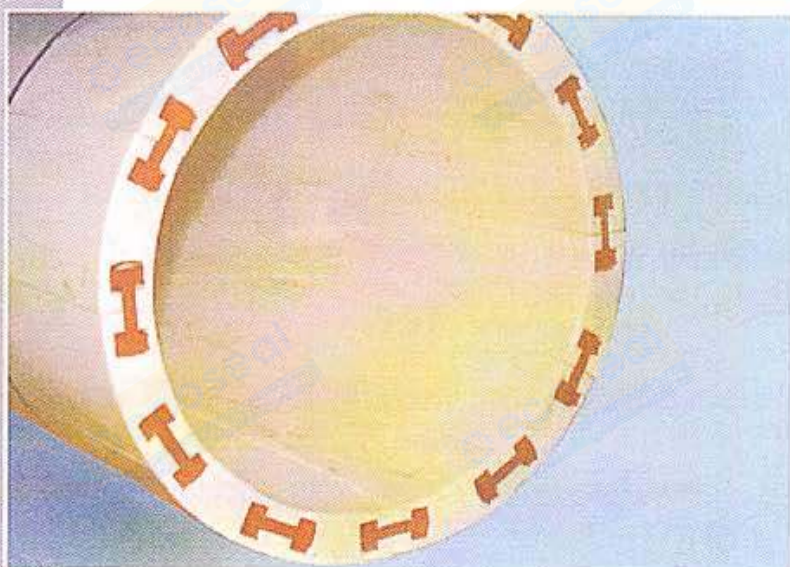


## Special products

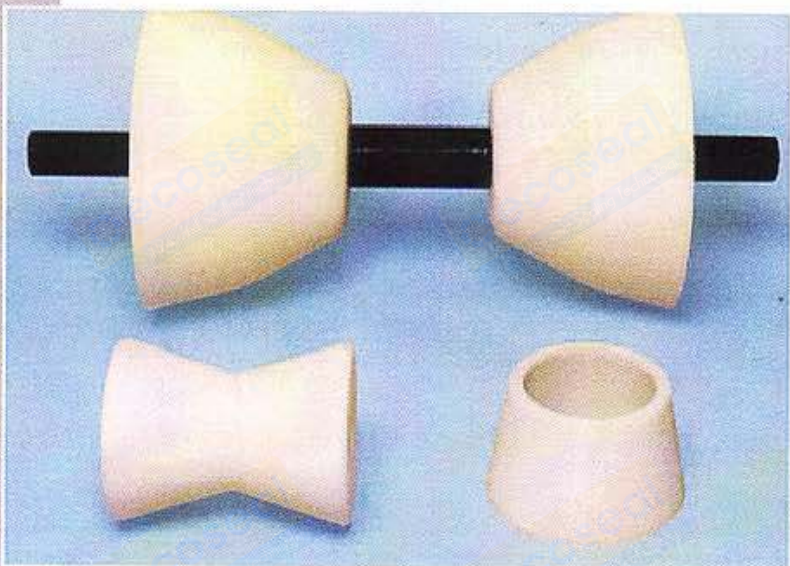
Coil supports in  
LAMIGAMID® 300  
for coils weighing up to 45t



Mandrel bushes in  
LAMIGAMID® 300  
with elastic spacer profiles  
in LAMIGOM®



Diabolo rollers in  
LAMIGAMID® 300,  
used for transporting tubes



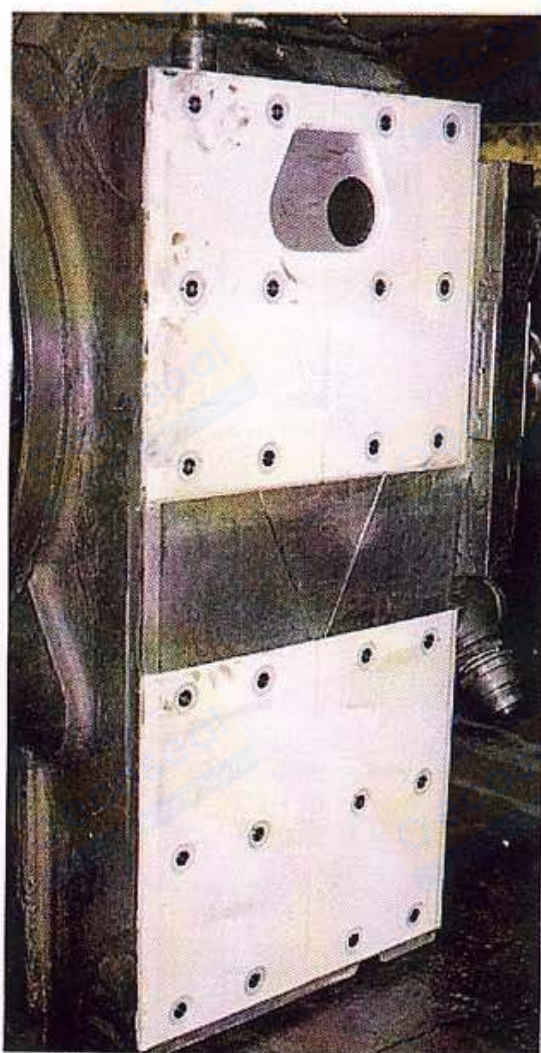




VDEh

**SCHWARTZ**   
TECHNISCHE KUNSTSTOFFE

## Wear plates in LAMIGAMID®



Wear plates are used in working and supporting rollers and in the windows of hot and cold rolling mills. These plates are often made of bronze, steel or metal alloys.

The disadvantages of these metal plates are as follows:

- because they are hard, they are unable to reduce shocks, blows and vibration
- they usually require continuous lubrication
- they are usually very heavy, and often a crane is needed to install and/or remove them.

We have solved this problem: with wear plates in LAMIGAMID® 510 or LAMIGAMID 700®.

### APPLICATIONS:

In all steel and non-ferrous rolling mills

- hot strip rolling mills
- cold strip rolling mills
- wire and fine section mills
- medium profile mills
  
- working roll components
- supporting roll components
- stand windows

LAMIGAMID® 510 and LAMIGAMID 700® are both thermoplastics that are able to cope with high loads.

The advantages of LAMIGAMID® wear plates are as follows:

- shocks and blows are efficiently absorbed thanks to the low module of elasticity
- the bearings last longer
- because plastics expand lengthways, the components fit tightly in the windows. This means that even small tolerances can be observed for the rolled stock
- no movement - no chatter marks
- the coefficient of friction of both LAMIGAMID® qualities is considerably lower than that of metals. This reduces wear, thereby increasing the standing times of our wear plates
- our wear plates require no lubrication
- due to the coefficient of friction, the components and stands are subject to less wear
- both materials have a very low specific weight. Wear plates in LAMIGAMID®510 and LAMIGAMID® 700 are easier and quicker to install, and no lifting equipment is needed.

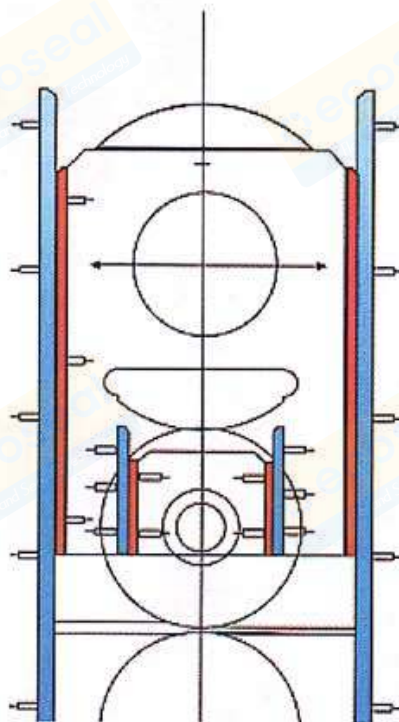
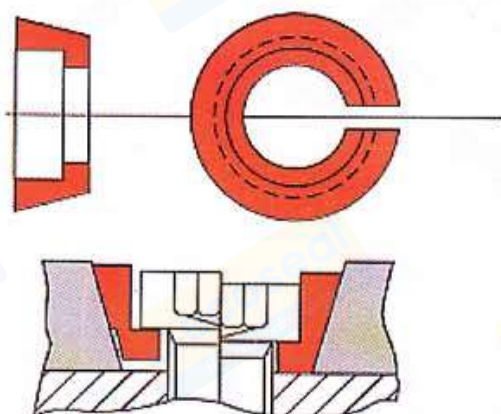




There are, however, two points that do need to be observed if you choose synthetic wear plates: moisture absorption and thermal expansion.

There can be marked differences between the moisture absorbing properties of various thermoplastic materials. The materials we use absorb either no moisture at all, or else only a negligible amount; they do not swell up.

When designing the wear plates, the designer must allow for the fact that **LAMIGAMID® 510** and **LAMIGAMID® 700** have a comparatively high coefficient of thermal expansion, that is to say, the plates will expand as the temperature increases. In order to prevent them from being ejected, we have designed a special fixation system with conical and split plastic bushes which are ideal for securing the wear plates; see sketch.



Component wear plates in **LAMIGAMID® 510** can also be used together with metal wear plates. Blows and vibration are best reduced using a combination of **LAMIGAMID® 510** and **LAMIGAMID® 700**.

Wear plates in **LAMIGAMID® 510** can always be used in components in hot and cold rolling mills. However, there are some restrictions concerning **LAMIGAMID® 700** in cold mill stands and hot strip finishing groups, in hot strip blooming stands and plate stands.

Our plastic wear plates are used in countless works all over the world, whose owners and operators understand and appreciate the advantages they offer.

## We also supply other products in technical plastics:

- snap rings in **LAMIGAMID® 300**
- mandrel segments in **LAMIGAMID® 310**
- supporting or transportation rollers in **LAMIGAMID® 310**
- roll strippers in **LAMINEX® 2010**
- lubricating pumps for the lubrication of bronze or synthetic slipper pads in universal spindle couplings

## As well as:

Schwartz GmbH

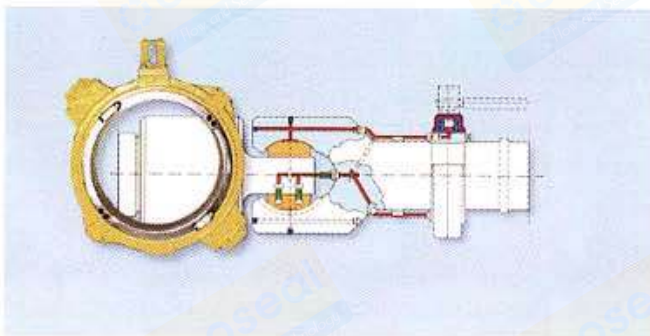
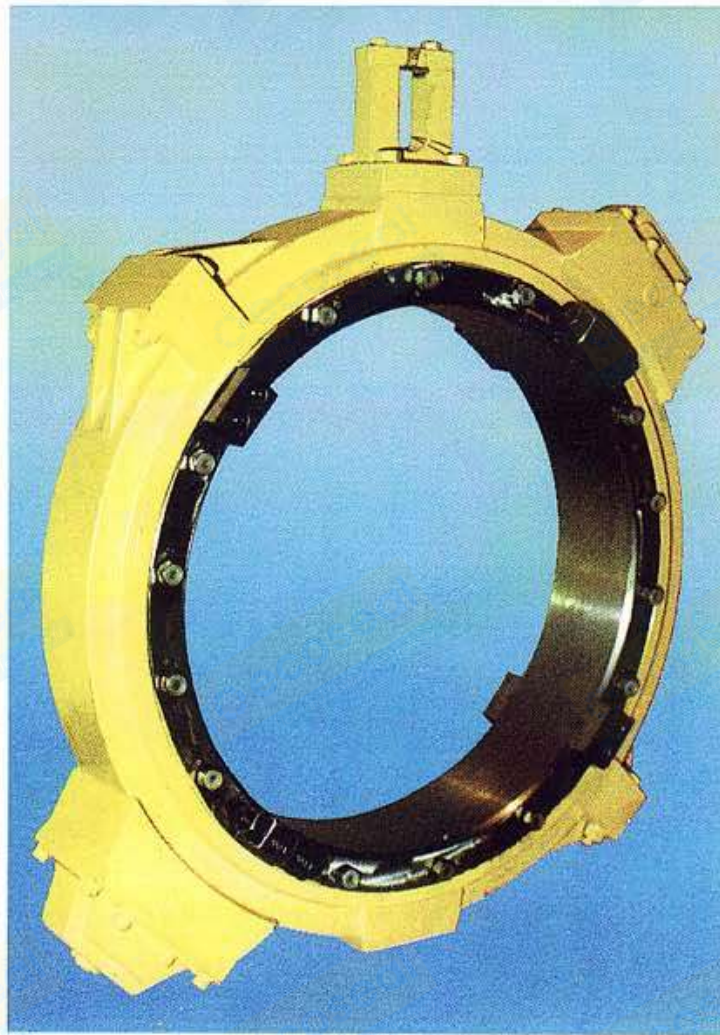
The information contained in this leaflet is based on the current state of our knowledge and is intended solely to provide further details on our products and possible applications thereof. It is not intended to ensure the meaning, specific features or properties of the products or their suitability for a specific purpose or application. Any patented rights are to be observed.

TI 00022\_B.DOC Datum: March 2000



## **SPINDLE GREASE LUBRICATOR PUMP TYPE SC**

**For continuous lubrication of slipper pads  
at universal couplings.**





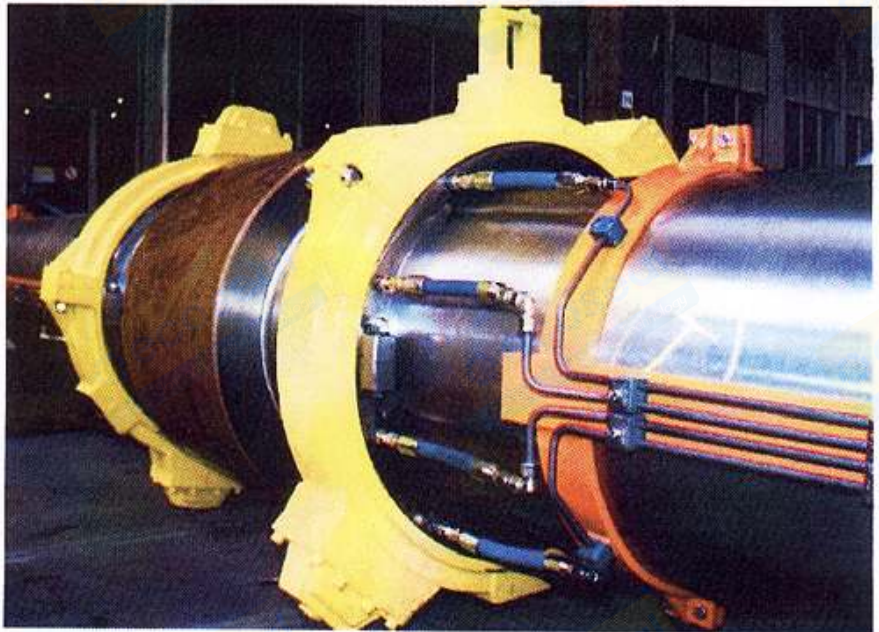
## The SPINDLE GREASE LUBRICATOR PUMP of Schwartz

The best solution for lubrication problems with universal joint drive spindles

Slipper bearings in coupling heads of universal joint drive spindles need an extremely effective lubrication performed in relatively small intervals due to the high loads they are opposed to. This particular tribology problem was the motive for Schwartz to develop the grease distributing SPINDLE GREASE LUBRICATOR PUMP Type SC.

The Lubricator is mounted onto the universal joint spindle (see photo). Grease carrying tubes connect the outlets of the lubricator pump with the coupling heads and slipper pads.

The lubricator follows the principle of a gear pump and thus allowing grease supply at very high pressure (see also illustration next side). Depending on size and point of installation, rollside or motorside, the lubricators feed between 40 gr and 250 gr of grease per hour and press it with pressures up to 100 bar between the contacting surfaces of slipper bearings and coupling heads.



### Advantages of the SPINDLE GREASE LUBRICATOR PUMP

- Slipper bearings of bronze or engineering plastics are lubricated as effectively as coupling heads or spade end couplings with smallest quantities in shortest intervals and with relatively high pressure. This high pressure lubrication leads to essential prolongation of the service life of slippers. It is the reason for reduced wear in the steel parts of the coupling. This results in considerable cost savings.
- The design of the lubricator demands its concentric fixation onto the spindle. The lubricator has no grease container which need to be refilled. Therefore contrary to other known grease distributing systems the lubricator avoids imbalance which can be the reason for rather high repair costs.
- The conceptional design of the lubricator as an integrated element of the drive spindle effects the start and determines the duration of its action. Once the spindles begin to rotate the lubricators automatically feed grease to the slippers. This makes the lubricator independent from the human factor.
- The lubricator is subject to very little wear provided it is correctly fastened onto the drive spindle. Different possibilities exist for each situation.

The STP lubricator is the grease supply and distribution system of greatest reliability for universal joint drive spindles. It has proven its efficiency around the world.

If you like to get more detailed prospectus and references, please write and demand the technical questionnaire enabling us to work out the most suitable proposal.



## The design of the lubricator:

(see sketch no.2, part A)

A **geared inner ring of steel (1)** is rigidly fastened around the **spindle (2)** with which it rotates. An **outer ring of cast iron (3)** glides on the shoulders of the inner ring; by means of a holding device, the outer ring is prohibited from rotating. Onto each flank of the geared part of the inner ring a **shoulder-ring (4)** in steel is bolted.

Two  **housings in cast iron (5)** are fastened on the circumference of the outer ring being 180° apart from each other. In these housings, **gear wheels of LAMIGAMID (6)** mounted in roller bearings are combing with the geared inner ring.

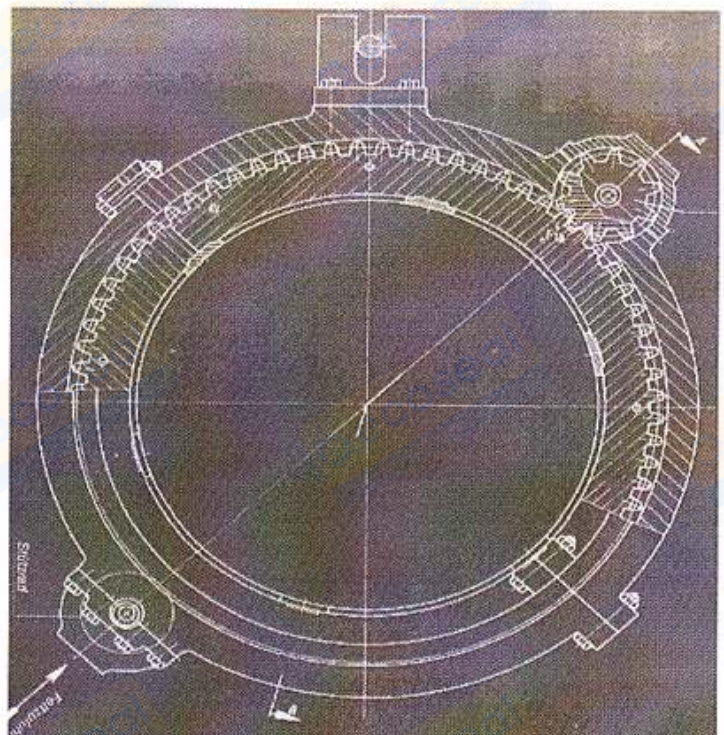
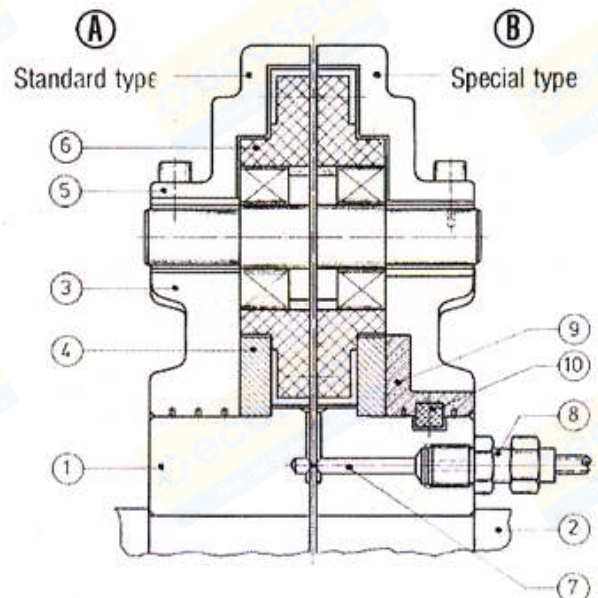
The bottom gear wheel acts as a support for the outer ring and guarantees a uniform distribution of grease between all teeth of the inner ring. The top gear wheel effects the pumping pressure by which the grease is pressed through the leading tube.

All gear teeth of the inner ring are channelled in their crown part. Through these channels runs the grease. As many pairs of teeth as there are lubricant outlets to the slippers or to the coupling head do not have these grease channels. At the bottom of each such pair of teeth, having no grease channel, a bore is drilled **(7)** with the leading drill tube which is connected via a **valve of no return (8)**.

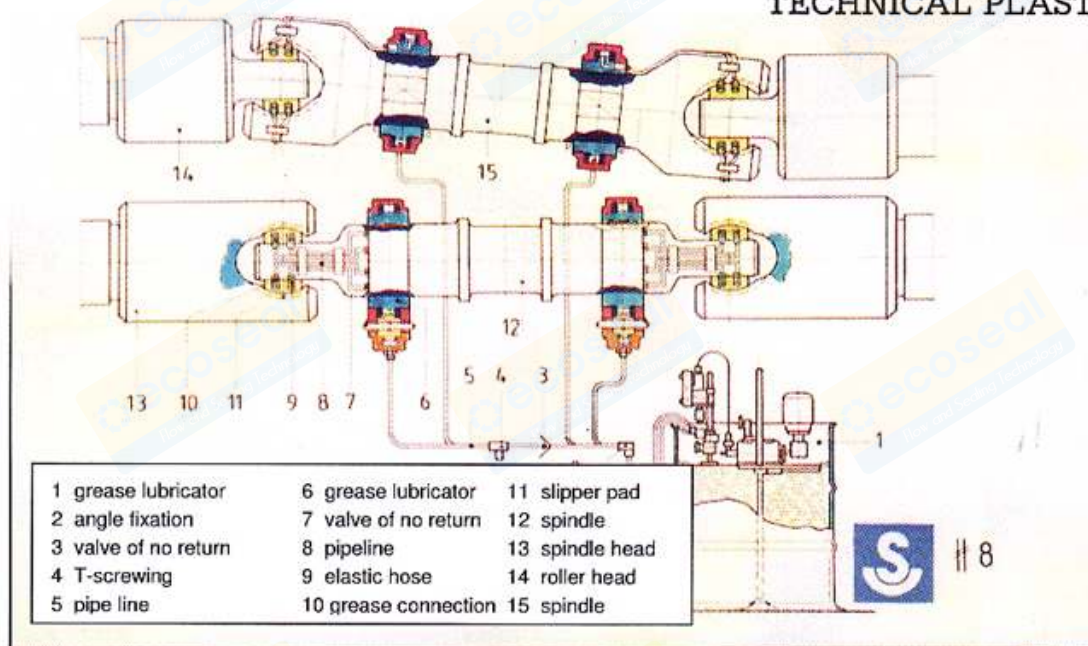
The pairs of teeth together with the shoulder rings form pressure chambers. The rotating spindle with the inner ring is forwarding these pressure chambers to the top gear wheel where the actual pumping action is effected. By means of the consecutive rotations the top gear wheel presses the grease through the bores, the check valves and the tubes to the slippers and coupling heads.

Next to the above described type of STP lubricator two further special designs exist. One type having an outer ring made in aluminium is especially designed for drive spindles with rotations of over 400 RPM. Its design is to a large extent equal to the second special type (**sketch no.2, part B**) having additional **angled wear rings in bronze (9)**.

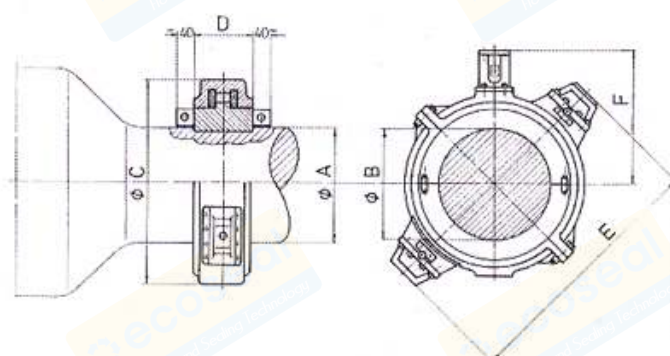
Sketch No. 2







15 different sizes for spindle diameters from 160 mm to 730 mm have been designed for horizontal mill stands.



- A = Spindle Diameter
- B = Max. inside diameter of pump
- C = Outside diameter pump
- D = Width of pump
- E = distance between gear flange
- F = design dimension between spindle center and fixation ring of pump

size	Ø A [mm]	Ø B [mm]	Ø C [mm]	D [mm]	E [mm]	F [mm]	weight [kg]
01	bis 185	196	360	126	565	345	96
02	186 – 210	220	380	126	589	350	100
03	211 – 235	245	410	126	615	370	110
04	236 – 260	270	446	126	649	390	120
05	261 – 290	300	470	126	673	400	130
06	291 – 330	340	520	126	761	425	140
07	331 – 360	378	556	126	793	445	150

size	Ø A [mm]	Ø B [mm]	Ø C [mm]	D [mm]	E [mm]	F [mm]	weight [kg]
1	361 – 400	412	606	126	811	470	160
2	401 – 440	450	650	126	889	490	190
3	441 – 490	506	700	126	937	517	225
4	491 – 540	550	750	140	1017	540	261
5	541 – 590	596	808	140	1065	570	315
6	591 – 640	656	880	150	1165	610	398
7	641 – 685	700	940	150	1225	640	450
8	686 – 750	742	980	162	1265	667	495

For further information please contact our local representative or directly

Schwartz Technical Plastics