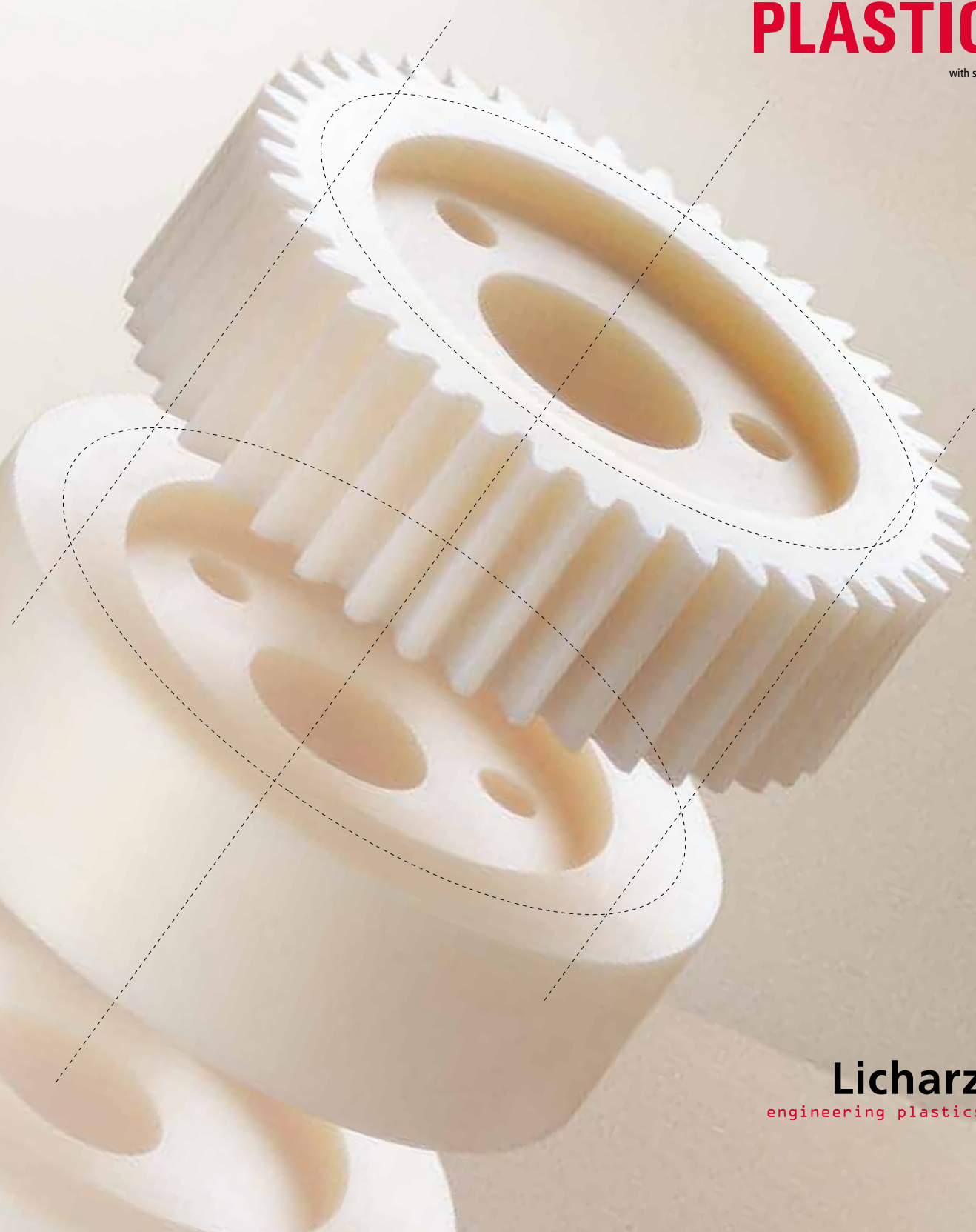


DESIGNING WITH ENGINEERING

# PLASTICS

with survey tables





**LICHARZ**

**THERMOPLASTIC SLIDER PADS**

*The competitive edge through engineered components made of plastic*

# Plastic slider pads

## 1. Thermoplastic slider pads

In the same way that friction bearing bushes are used to arrange the bearings of a shaft for rotational and up and down movements, the same plastics can of course be used for linear movements in the form of slider pads. Basically all the plastics listed in the "Friction bearings" chapter are suitable for use as slider pads. However, several are especially suitable. These will be described in the following with their advantages.

### 1.1 Materials

Plastics that are used as slider pads require good sliding properties as well as high stability and elasticity and creep resistance. These requirements are fulfilled especially well by **LiNOTAM**. The high stability compared to other thermoplastics allows higher loads. The good elasticity ensures that deformation is reversed when the material is subjected to impact load peaks. Assuming that the load remains below the permissible limit, this ensures that permanent deformation is avoided to a great extent.

The oil-filled modification **LiNOTAMGLIDE** is available for highly loaded slider pads. The oil which is embedded in the molecular structure reduces sliding friction by around 50% and also considerably reduces sliding abrasion.

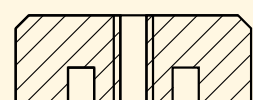
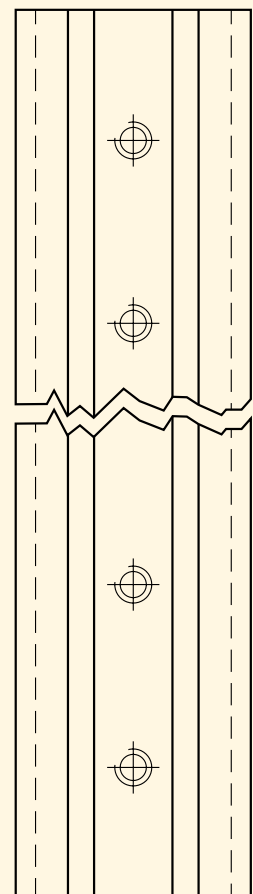
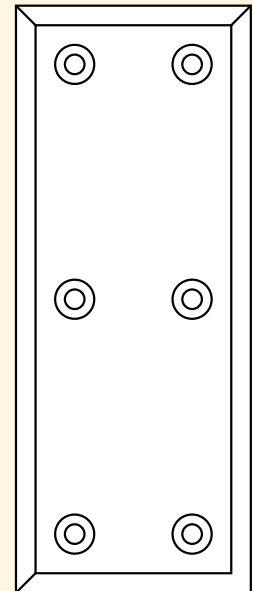
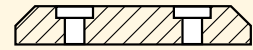
PET is best suited for applications where a high level of moisture is expected. The material has high mechanical stability, creep resistance, dimensional stability and good sliding properties. Water absorption is low and has virtually no effect on the mechanical or electrical properties.

However, PET is not as wear resistant as polyamides. But PET-GL is available as a modified grade with a solid lubricant. This has improved sliding properties and much better wear resistance.

## 2. Design information

### 2.1 Friction heat

As opposed to friction bearings that operate continuously at high speeds, most slider pads and guide rails usually work under conditions that minimise the development of friction heat. The running speeds are relatively slow and operation is more intermittent than continuous. Under these conditions, it is unlikely that friction heat builds up to a level that could cause increased wear or a breakdown in the component.



## 2.2 Pressure and running speed

As a rule, when dimensioning and designing sliding elements, the design engineers consider the pressure and speed ratio. If the pressure and speed ratios are unfavourable, the resulting friction heat leads to excess wear and even to a premature breakdown of the component. However, experience in the design and operation of slider pads has shown that it is generally unnecessary to calculate the pressure and speed values due to the favourable operating conditions of slider pads. Instead of this, the following limiting pressure values can be used as a basis for most guide rail applications. The values apply at a standard temperature of 23 °C.

PA	PET	Load	Movement	Lubrication
28 MPa	21 MPa	interrupted	interrupted	periodic
14 MPa	10 MPa	continuous	interrupted	periodic
3.5 MPa	2.5 MPa	continuous	continuous	none

## 2.3 Lubrication

Again the statements regarding dry running and the use of lubricants from the “Friction bearings” chapter apply. Basically it must be said that initial lubrication at installation considerably improves the service life and running behaviour. The materials that have been modified with lubricant, such as **LINNOTAMGLIDE** and **LINNOTAMGLIDE PRO**, have much longer service lives than all other plastics.

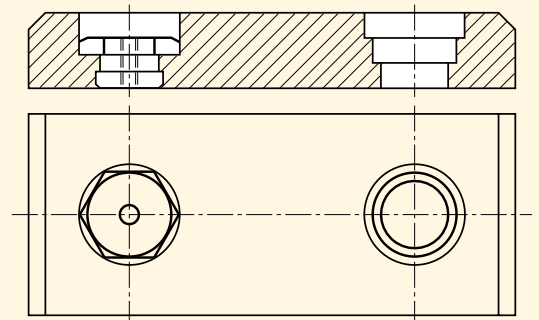
## 2.4 Mounting

Polyamide slider pads or guide rails with a mechanical sliding function are generally mounted on steel constructions.

Countersunk screws or machine screws can be used without any problem for applications at room temperature and normal climatic conditions (50% RH). For operating conditions with high humidity, we recommend that you consider using PET/PET-GL.

If a higher ambient temperature is expected, the approx. 10 times higher linear expansion of plastic compared to steel must be considered. Firmly screwed plastic rails can corrugate due to linear expansion. To prevent this from happening, the mounting points should be less than 100 mm apart. In the case of longer sliding rails, one single fixed point screw is advised. The other screws in oblong holes should be able to absorb the thermal expansion. Instead of oblong holes, the rails can also be held in grooves, T-slots or similar. Changes in length caused by extreme ambient conditions have no effect on the fixing or function.

Figure 1: Example of threaded inserts



# Plastic slider pads

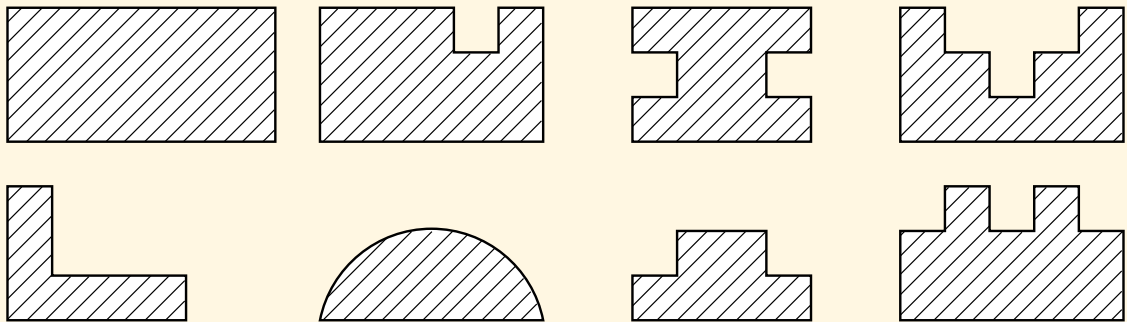
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For polyamide slider pads in high performance applications such as telescopic booms on mobile cranes, we recommend special nuts that are pressed into hexagonal holes on the slider pads. By pressing the nut into the hexagonal hole it cannot fall out or loosen. The bottom of the slide plate should be absolutely flush.

Under full torque, the polyamide is held under pressure by the threaded insert and the insert sits on the steel support. For mountings such as this, pad thicknesses of 12-25 mm are adequate for optimum performance.

## 2.5 Applications and examples of shapes

Slide and guide pads in telescopic cranes, garbage presses, car body presses, road and rail vehicles, timber processing machines and plants, packaging and filling plants, transport and conveyor systems, chain guides, etc.



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