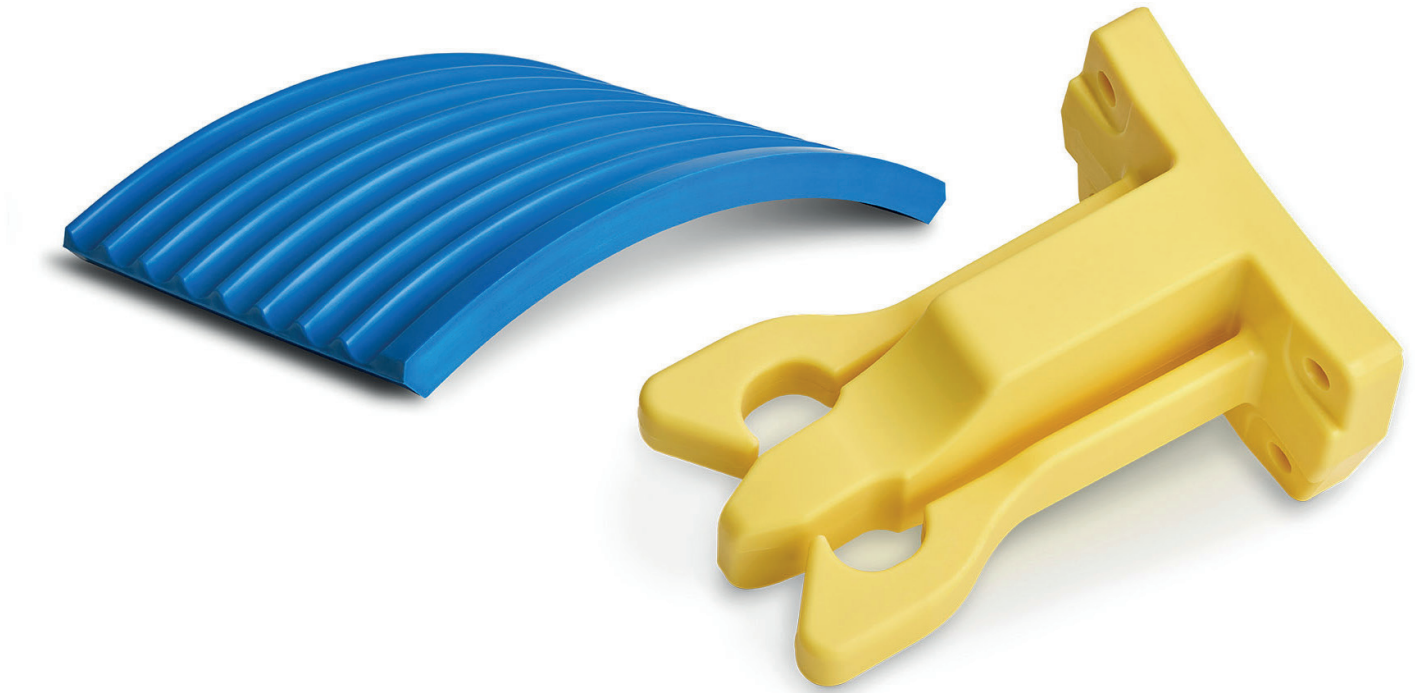


alphaxrim



Nyrim

SHOCK RESISTANT AND ROBUST

# ALPHARIM PRODUCTS FOR APPLICATIONS UNDER ROUGH CONDITIONS

**alpharim** uses Nyrin from Brüggemann for **alpharim** products.

Nyrin casting is a specialised casting process suitable for small and medium quantities and for semi-finished or moulded parts. The products are highly robust, abrasion-resistant and suitable for applications involving extreme loads. A polymer additive has been added to the PA 6 C base material to create an especially impact-resistant polyamide 6 block copolymer. The material properties can be adjusted depending on the specific application. Composites, insert components and textile reinforcements can also be manufactured.



alpharim products have a unique profile of properties with a wide range of variation in impact resistance, stiffness and strength at low temperatures, primarily influenced by the percentage of elastomer.

## WHY ALPHARIM?

### Highly versatile and resilient material

Finished parts made of **alpharim** offer optimal properties:

- » No brittleness and breakage
- » Outstanding mechanical properties
- » UV resistant as proven in numerous outdoor applications for many years
- » Material properties can be adjusted for specific applications
- » Robust, abrasion resistant parts for extreme loads
- » Can be utilised in place of aluminium and steel parts in certain cases where weight is an issue
- » Usage temperature: -60 °C bis +120 °C

### Robust, abrasion-resistant parts for extreme loads

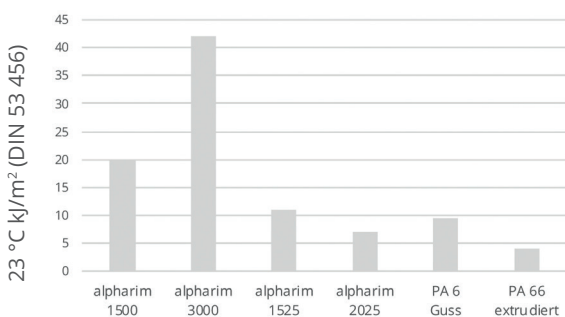
RIM production (reaction injection moulding) is a pressureless moulded casting process offering many advantages:

- » Parts have very low or no internal tensions
- » Combination of different wall thicknesses
- » Parts up to 35 kg
- » Processing with economical aluminium tools allow for series of between 300 - 100,000 pieces
- » Insertion of parts and textile reinforcement are possible
- » Composites can be manufactured using glass or carbon fibres

# PROFILE OF PROPERTIES FOR ALPHARIM

## Impact resistance

**alpharim** products do not show brittle fractures. The material maintains its tough properties down to -60 °C, and is an excellent choice for cryo-applications under high mechanical loads. **alpharim** is extremely impact resistant, which differentiates it from common PA 6 and allows for applications that could previously only be handled with metal materials.



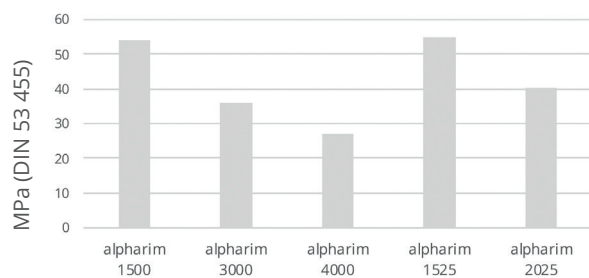
## Slide and friction

Sliding properties can be improved through the addition of lubricants fitting to the applications. Example coefficients of friction vary by type and external conditions:

- » Dry running: 0.25-0.35
- » Water lubricated: 0.15-0.25
- » Grease or oil lubricated: 0.05-0.12

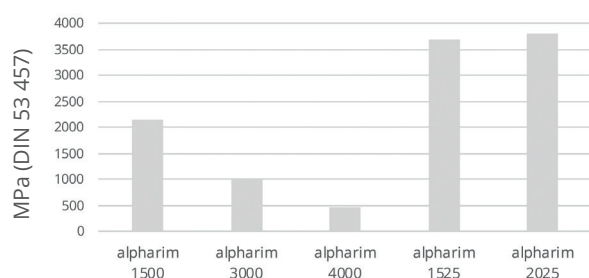
## Tensile strength

Although **alpharim** does not show brittle fracturing, the strength of the material is comparable to a PA 6. Its strength is determined, for instance, by its tensile strength.



## E modulus

The linear-elastic behaviour and resulting proportional relationship between stress and strain for **alpharim** is similar to PA 6.

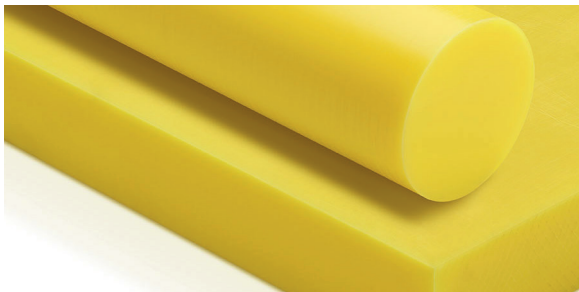




## ALPHARIM DELIVERY FORMS: SEMI-FINISHED PRODUCTS, PARTS AND COMPOSITES

### Semi-finished products: plates and rods

**alpharim** plates can be supplied in thicknesses from 10 to 150 mm. **alpharim** rods are available in diameters between 30 and 180 mm.



### alpharim parts

Producing parts using the RIM process (Reaction Injection Moulding) is a good choice especially when

- » quantities are too high for machining, making such production unprofitable or
- » injection moulding processes cannot be used because walls are too thick or quantities are too low.



### alpharim composites

**alpharim** composites are polymerised in situ. This creates multi-phase materials with a reinforcing layer (carbon or fibreglass) chemically bonded to the matrix during the manufacturing process. This product differs significantly from ex-situ composites, in which the reinforcing layer is bond to the matrix through an additional process (such as infiltration). The insitu process for **alpharim** composites allows for a wide range of different reinforcements for different properties, which are then combined with a high level of impact resistance. These variations are manufactured individually and customer specific. With **alpharim** composites the positive properties of the seperate components can be fully utilized:

- » Modification with elastomere
- » Resistance to low temperatures
- » Weldability
- » High wear resistance
- » High impact resistance
- » Usable as insert for injection moulding
- » Recyclable



# INDUSTRIAL APPLICATIONS OF ALPHARIM MOULDED PARTS

The industrial applications of **alpharim** moulded parts are diverse: Casting without additional pressure makes it possible to produce different wall thicknesses and components that weigh up to 35 kg. In contrast to injection moulding, **alpharim** moulded casting can be used to produce moulded parts with a high weight, thick walls, and quantities of just a few thousand parts.

The mechanical properties offer invaluable advantages for machine and equipment construction. **alpharim** moulded parts can be used, for instance, as housing covers for equipment and machinery. In tool construction, **alpharim** offers the advantage of extremely high impact resistance with high mechanical strength to match. The material does not become brittle or break even under drastic deformation. This combination is used, for instance, in spring relief blocks. These are utilised as spacer blocks between the two halves of a press tool when the tool is not in use.

## Winter technology: Components for transport systems

**alpharim** is used whenever high toughness in combination with strong mechanical properties even below freezing temperatures is required. **alpharim** shows stable properties over the entire temperature range from -60 °C to +100 °C. The UV stability for outdoor applications has also been tested many times.



## Transport: Covers on switch / turnout systems

Covers on switch systems, for instance, can stand up to high impact loads occurring suddenly, even at low temperatures. Impacts may occur due to blocks of ice, for instance, which come off of trains at high speeds. For such covers on switch systems, impact strength is therefore considered to be a major advantage of the **alpharim** material.



## PRESSING TECHNOLOGY: SPRING RELIEF BLOCKS

### Safety for workers and machinery

In tools weighing several tonnes, such as for presses, relief must be provided for the spring assemblies during storage. This can either be done through the use of compression springs or spring relief blocks which are made from wood, metal, or a variety of plastics.

If the relief elements are accidentally not removed before the tools are taken into operation, they can be subjected to severe stresses, particularly on the first pressing movement. This can cause them to bend or break or in the worst case, an explosive rupture can occur. As a result the tools can be damaged, but the potential danger for employees is the greater risk here.



Spring relief blocks made from **alpharim** 1500 yellow demonstrate extreme toughness combined with high mechanical strength. Therefore, if a press is inadvertently closed with the reliefs blocks still inside, they will not break or burst but instead deform. In addition, the tool will not be damaged if a relief block has been positioned above a tool recess (pocket).

### Demonstration of impact strength

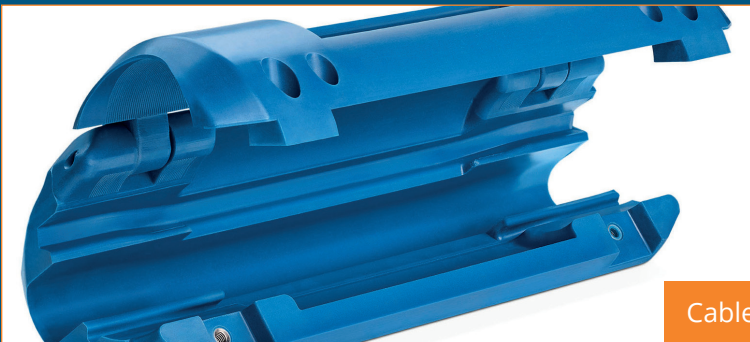
Follow this link: <https://alpharim.at/en/spring-relief-blocks/>  
or scan the QR code to watch the video:



## USE CASES



High impact cover for ultra cold temperatures



Cable clamp for drilling elements



Track pad for track vehicles



Components for transport systems