LICHARZ

Plastic components
CNC machining to perfection


RENISHAW

Efficient manufacturing of high-precision spare parts

Mechanical and plant engineering is currently facing major challenges: the industry demands increasingly faster and more efficient applications. Safety and sustainability are top priorities. At the same time, cost pressure is increasing. Engineering plastics can be moulded into almost any shape and, thanks to the individual formulations of our materials, can be specifically adapted to a wide range of application conditions. Plastic components are lightweight, robust, durable and very economical to manufacture.

As a manufacturer of high performance cast polyamides and plastic components, Licharz has been a competent partner for decision-makers and designers in mechanical engineering and drive technology for over 60 years. We advise you on the use of plastic components and work with you to develop customised solutions for your machines and systems.

Licharz is a third generation developer of formulations for cast polyamides and a leading manufacturer of semi-finished plastic products. Our focus is on the production of LiNNOTAM polyamide castings, a very strong, durable cast polyamide developed in-house. We are working with various partners to expand our range to include other engineering plastics, such as POM and PET.
We use machining processes to manufacture high performance plastic parts and components for various industries and markets from our extensive range of semi-finished products.

Contents

Materials and manufacturing processes

First-class materials and customised solutions for perfect components

Welcome to the world of high-precision plastic processing!
We are known around the world for our cost-effective manufacturing processes and excellent technical standards.
We only process high-quality materials and guarantee the precise machining of components that meet the most demanding quality requirements.

Materials

The most important engineering plastics

Polyamide (PA)
Polyacetal (POM)
Polyethylene terephthalate (PET)

These are used in a wide variety of material modifications for parts subject to sliding and wear.

Plastics for standard applications

A large number of other plastics are only partially suitable for use under sliding loads. Their properties make them the right construction material when special requirements, such as chemical resistance or lower costs, are needed.

These materials include:
Polyethylene (PE)
Polypropylene (PP)

High-temperature plastics

High-temperature plastics are another group of modern materials that are characterised in particular by high degrees of rigidity and strength at high temperatures. One disadvantage is the high price structure, which in some cases is up to 30 times higher than for engineering plastics.

High-temperature plastics include:
Polyvinylidenfluorid (PVDF)
Polytetrafluorethylen (PTFE)
Polyetheretherketon (PEEK)

Product overview

Product	Material
LiNNOTAM	PA 6 C
LiNNOTAM MoS	PA 6 C + MoS_2
LiNNOTAM HS	PA 6 heat stabilised
LiNNOTAM AST	PA 6 C anti-static
LiNNOTAM GLiDE	PA 6 C + oil
LiNNOTAM GLiDE Pro T	PA 6 C + solid lubricant
LiNNOTAM HiPERFORMANCE HPI	PA 6 C impact-modified
LiNNOTAM DRiVE 612 Fe	PA 6/12 C + steel core
LiNNOTAM DRiVE 1200 Fe	PA 12 C + steel core
LiNNOTAM HiPERFORMANCE 612	PA 6/12 C
LiNNOTAM HiPERFORMANCE 1200	PA 12 C
Polyamide 6	PA 6
Polyamide 66	PA 66
Polyamide 12	PA 12
Polyacetal copolymer	POM-C
Polyethylene terephthalate	PET
Polyethylene terephthalate + lubricant	PET-GL
Polytetrafluoroethylene	PTFE
Polyvinylidene fluoride	Polyvinylidene fluoride
Polyether ether ketone	PEEK

Material overview

Discover LiNNOTAM, Licharz's outstanding product line, which we have specially developed to meet the highest demands. Our cast polyamides are the ideal materials for precise and complex components. With LiNNOTAM, you benefit from simple and efficient processing, as well as from comprehensive diversity. We offer a wide range of shapes, casting weights, and dimensions, so that you can get your hands on the exact material that meets your specific requirements.

LiNNOTAM

LiNNOTAM is our brand name for high-quality cast polyamide 6 (PA 6 C). LiNNOTAM is a semi-crystalline, thermoplastic material produced by the anionic polymerisation of the raw material caprolactam. In the pressureless casting process, the monomer melt is polymerised into semi-finished products or moulded parts by means of a controlled chemical reaction. LiNNOTAM is the brand name for Licharz's especially high-performance cast polyamides. It impresses with its high strength, excellent wear resistance, and very good dimensional stability – ideal for use in components subject to high mechanical stress.

LiNNOTAM GLiDE

LiNNOTAM GLiDE is a highly crystalline modification of LiNNOTAM, that has been specially designed for use in sliding applications by adding lubricating additives and oil. Its excellent properties make LiNNOTAM GLiDE a coveted material for highly stressed components in mechanical and plant engineering. The lubricants and additives contained within the material ensure a lasting lubricating effect throughout its service life. Compared to standard quality, a 50 percent reduction in the coefficient of sliding friction can be achieved, resulting in less frictional heat and therefore considerably higher load capacity.

LiNNOTAM GLiDE Pro T

LiNNOTAM GLiDE Pro T is a further development of our tried-and-tested LiNNOTAM GLiDE, and the addition of solid lubricants and special additives makes it particularly suitable for sliding applications. It stands for maximum wear resistance and a long service life. The additives contained therein lubricate the material throughout its service life and reliably reduce the tendency to stick-slip. This results in a coefficient of sliding friction that is exceptionally low at 0,15 μ.

LiNNOTAM HiPERFORMANCE

LiNNOTAM HiPERFORMANCE is a group of high-performance polyamides made from the raw materials caprolactam and laurinlactam. Compared to pure LiNNOTAM, the materials LiNNOTAM HiPERFORMANCE HPI, LiNNOTAM HiPERFORMANCE 612 and LiNNOTAM HiPERFORMANCE 1200 have a higher impact and shock resistance and a lower tendency to absorb moisture – depending on the type – while retaining the same sliding and wear properties. The materials are also characterised by improved creep behaviour and greater elasticity. They are developed for applications where increased shock and vibration loads are expected, or where increased demands are placed on fatigue strength or elasticity.

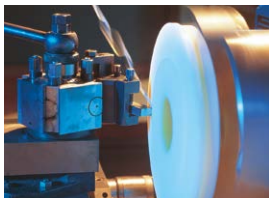
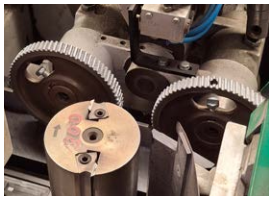
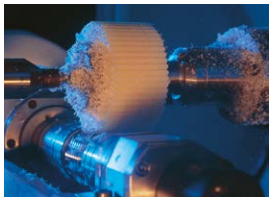
LiNNOTAM DRiVE

LiNNOTAM DRiVE was specially developed for drive technology and uses a knurled metal core coated with LiNNOTAM HiPERFORMANCE 612 or 1200. The cooling polymer shrinks onto the core after casting. This form- and force-fitting composite applies high forces to the metal axle and uses the advantages of plastic to ensure optimum power transmission: low noise, higher wear resistance, and higher impact strength on the outer casing.

Manufacturing processes

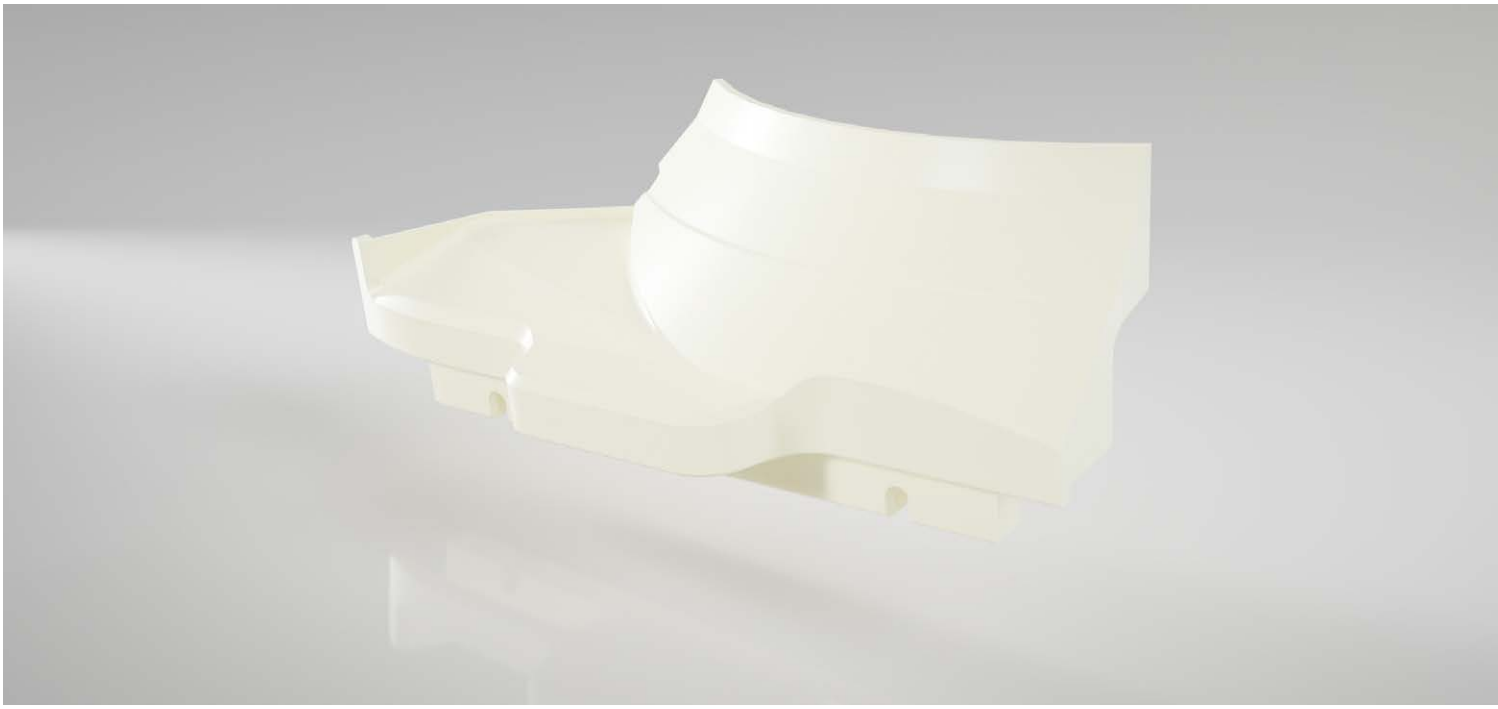
Precision in every format

Our machines offer a wide range of machining options in various dimensions, and we manufacture small and large-volume precision parts:

Cutting		**NC lathe**	Clamping range up to Ø 1.560 mm
		CNC lathe	up to Ø 650 mm
		CNC automatic lathes	Spindle bore up to Ø 100 mm
		Conventional automatic lathes	Spindle bore up to Ø 100 mm
Milling		**CNC milling machines**	Operating range up to 3,000 × 1,000 mm
		Profile milling	Spindle mounter and router machines
Planing		**Four-sided planer**	up to 125 mm thickness and 225 mm width
		Thickness planer	up to 230 mm thickness and 1,300 mm width
Sawing		**Panel saws**	up to 170 mm cutting thickness and 3,100 mm cutting length
		Band saws	up tp Ø 800 mm
Other machines		**Eight-axis CNC profiling machine**	Plate profiles up to 230 × 170mm
		Gear-cutting machines	Gear wheels from module 0.5 to Ø 1.500 mm

Mechanical engineering
Our plastic components make your machines even more efficient

Extremely lightweight and durable – structural components such as gear wheels, sprockets, grippers or guide elements made of engineering plastic are virtually unbeatable when it comes to building efficient machines. Take advantage of the superiority of engineering plastics to achieve higher performance, lower vibrations, and less wear.



Components for mechanical engineering

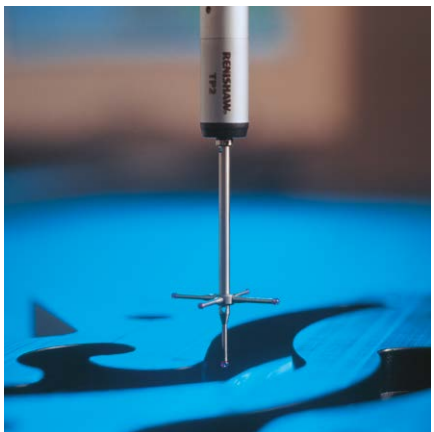
The industry demands ever faster and more efficient solutions from machine and plant manufacturers that are also cost-effective, safe, and sustainable. There is great potential for innovation in terms of materials: engineering plastics are often suitable as substitute materials for manufacturing a wide variety of components.

Numerous Licharz materials are suitable for components in general mechanical engineering:

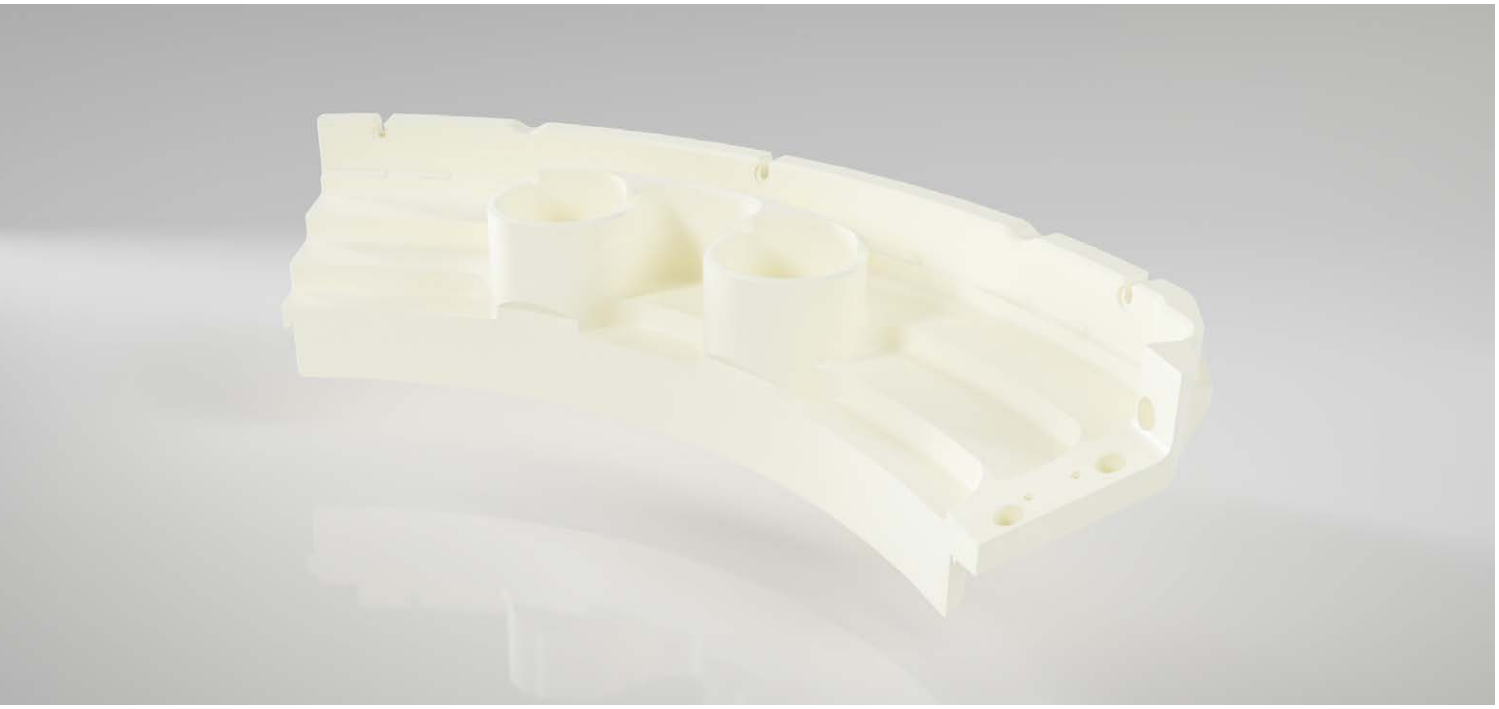
– LiNNOTAM
– LiNNOTAM GLiDE
– LiNNOTAM GLiDE Pro T
– LiNNOTAM HiPERFORMANCE
– LiNNOTAM DRiVE
– POM
– PET

Components made from LiNNOTAM and other engineering plastics for mechanical and plant engineering score highly thanks to their:

– Low weight
– High impact, pressure and shock resistance
– High load-bearing capacity
– Good recovery behaviour when deformed
– Good sliding and emergency running properties
– High wear resistance
– Good creep resistance
– High corrosion resistance (chemicals, environment, oils & greases)
– Good vibration and noise damping properties
– Low running noise



Mechanical engineering



Engineering plastics for a wide range of applications

We supply components such as gear wheels, rope pulleys, grippers, guide elements, castor, conveyor, guide and deflection rollers, pump impellers and housings, sprockets, conveyor stars, sliding bearings and plates, cam discs, insulators, valves, valve blocks and bodies, precision parts, seals, and parts for medical technology and medical device construction.

Areas of application:

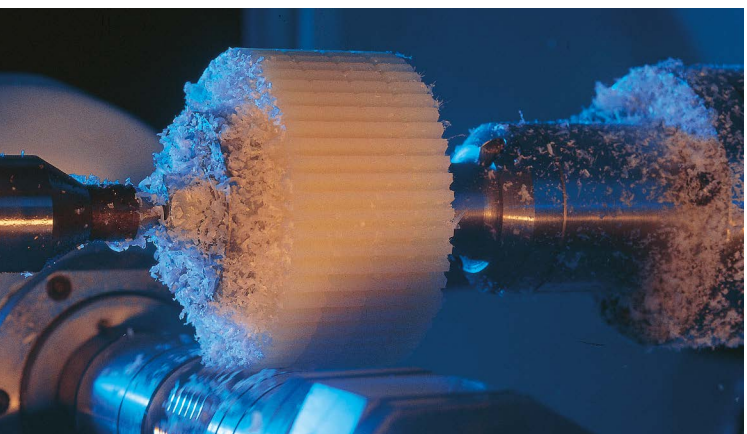
Machine/design elements, manufacturing and assembly technology, measurement and weighing technology, control and regulation technology, maintenance technology, automation technology, and general mechanical engineering.

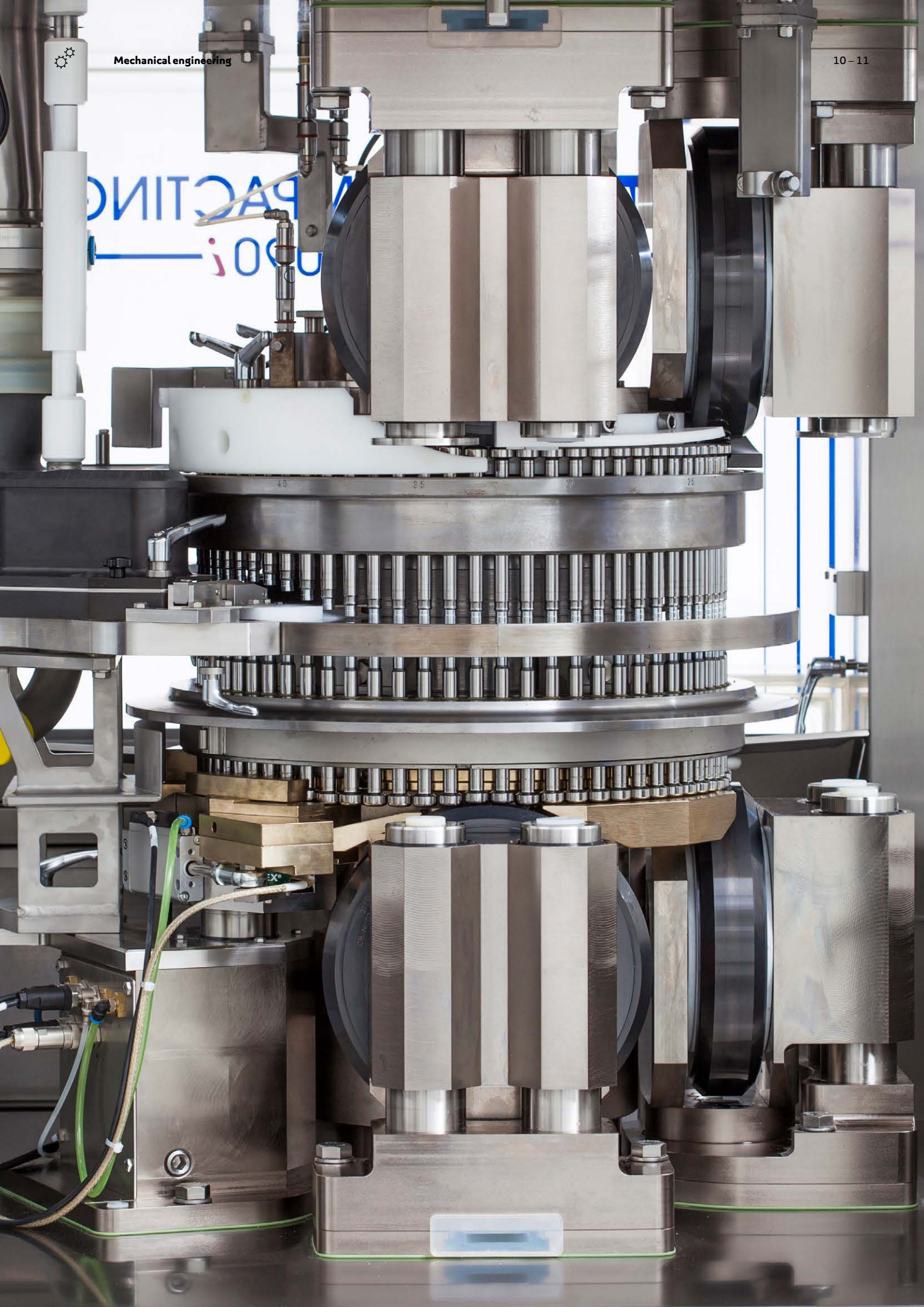
LiNNOTAM for all eventualities: With the products from the LiNNOTAM family, we offer a high performance range for particularly stressed parts, such as:

– Heavy-duty castor and guide rollers:
LiNNOTAM HiPERFORMANCE 1200,
LiNNOTAM HiPERFORMANCE 612

– Gear wheels, sprockets, driven rollers:
LiNNOTAM DRiVE 1200, LiNNOTAM DRiVE 612

– Sliding bearings, sliding plates, guides:
LiNNOTAM GLiDE, LiNNOTAM GLiDE Pro T





Conveyor technology
Engineering plastics – the driving force behind your intralogistics

Optimise your conveyor technology. Our sprockets, gear wheels, guide rails, and rope and roller pulleys made of engineering plastic offer high resistance to abrasion and chemicals. They reduce the overall weight, thereby reducing running noise and energy consumption. At the same time, they protect your plastic tracks.

Rope pulleys made from LiNNOTAM

LiNNOTAM rope pulleys are suitable for heavy loads and have proven their worth after years of use. Compared to steel rollers, they reduce surface pressure during rope travel tenfold – and the service life of your steel ropes is increased considerably as a result.

Another advantage: LiNNOTAM rope pulleys dampen or absorb vibrations from rope movement that can damage bearings, extending the service life of the drive train and bearing elements.

Areas of application:

Wherever low running noise, high wear resistance and maintenance-free operation are advantageous, e.g.: in storage and retrieval machines, hoists, gantry cranes, lifts, cable cars, rope hoists and similar applications.

LiNNOTAM rope pulleys score highly overall thanks to their:

– Low running noise
– Lightweight properties
– High wear resistance
– High corrosion resistance
– Maintenance-free operation
– Rope-wear elasticity

Conveyor technology

Rollers made from LiNNOTAM

Compared to steel rollers, rollers made from LiNNOTAM are highly wear and corrosion-resistant. They reduce surface pressure – and effectively protect the plastic track.

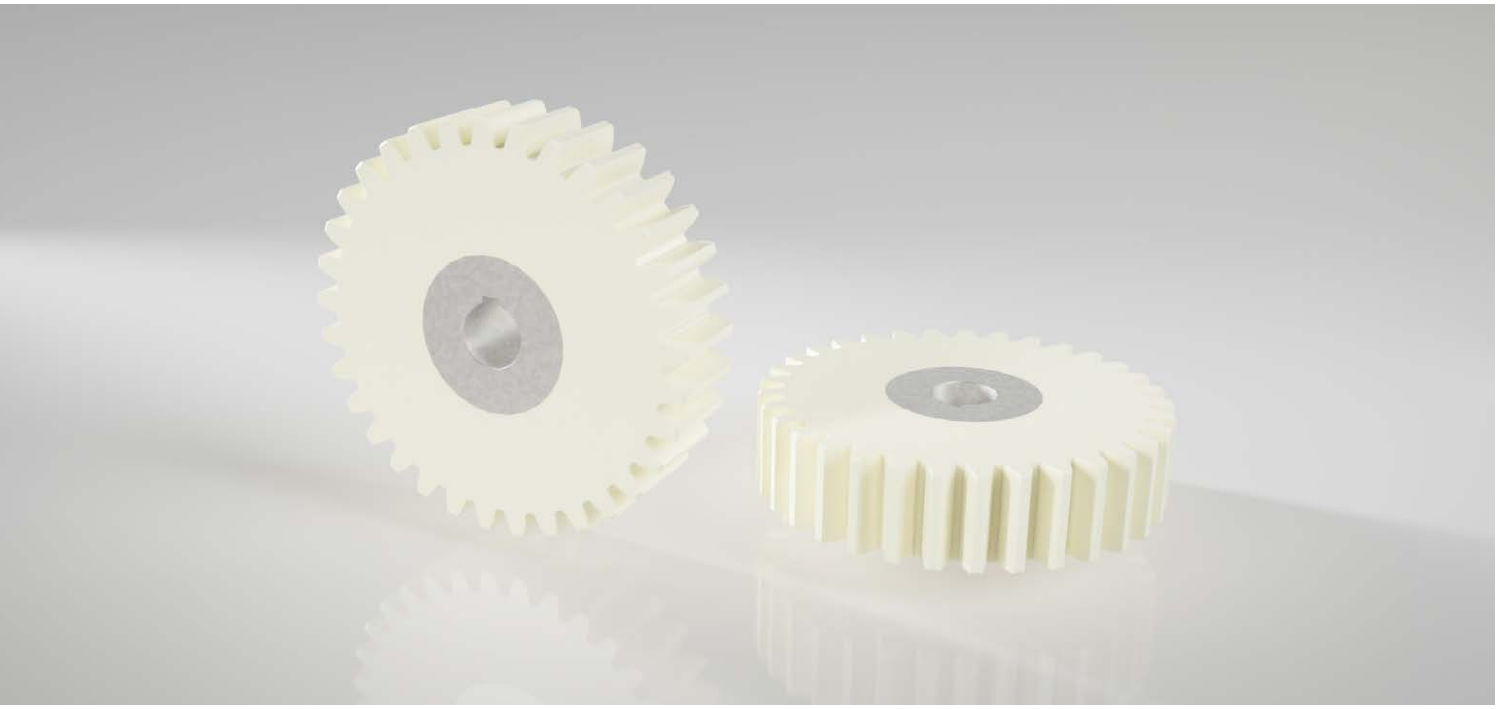
Another advantage: LiNNOTAM castors and guide rollers, with their material-specific elasticity, ensure that flattening caused by static loads is reliably and quickly reversed.

Areas of application:

Wherever smooth running and low weight are advantageous. Castor and guide rollers in transport trolleys, crane trolleys, crane runway systems, trolleys, storage and retrieval machines, and other transport and conveyor equipment.

Rollers made from LiNNOTAM score points overall thanks to their:

– Low weight
– High wear resistance
– Very quiet operation
– Protection of the plastic track
– Good vibration and noise damping properties
– Excellent corrosion resistance
– Long service life



Sprocket/gear wheels and guide rails

Sprocket/gear wheels and guide rails made from LiNNOTAM, LiNNOTAM GLiDE, LiNNOTAM HiPERFORMANCE 612 and LiNNOTAM DRiVE generally require little or no lubrication and offer maximum operational reliability even when running dry. They have particularly good damping properties and can therefore absorb vibrationson the output side that could damage bearings, significantly extending the service life of your entire drive train.

Another advantage: its excellent elasticity ensures rapid recovery after shock loading, prevents permanent deformation, and guarantees a long service life.

Areas of application:

Sliding and guide rails in packaging and filling systems, transport and conveyor systems, as chain guides, etc., gear wheels in machine, plant and gear construction. Sprockets in vertical conveyors, accumulation chain conveyors, trough chain conveyors, tube chain conveyors or bucket elevators.

Sprocket/gear wheels made from LiNNOTAM score highly overall thanks to their:

– Good dry and emergency running properties
– Low rolling noise with good vibration damping
– High wear resistance and long service life
– Excellent corrosion resistance
– Maintenance-free operation

Sliding and guide rails made from LiNNOTAM score points overall thanks to their:

– Good gliding properties
– Good dry and emergency running properties
– High wear resistance and low weight
– Corrosion resistance
– High strength and elasticity
– Virtually maintenance-free status after initial lubrication

Crane and lifting technology
Move heavy loads with ease

LiNNOTAM components set new standards in many areas of crane and lifting technology. They withstand even extreme conditions when used daily and continuously, and offer high resistance to physical stress and environmental influences. This leads to a significant reduction in energy consumption, less wear and tear, a lower dead weight, and increases the operational readiness and ease of maintenance of your systems.

Rope pulleys made from LiNNOTAM

LiNNOTAM rope pulleys are suitable for heavy loads and have proven their worth after years of use. Compared to steel rollers, they reduce surface pressure during rope travel by a factor of ten – and the service life of your steel ropes is increased considerably as a result.

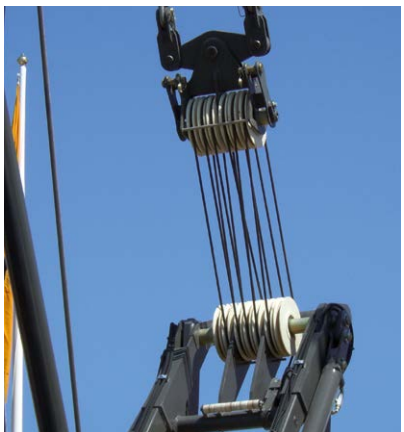
Another advantage: rope pulleys made of LiNNOTAM dampen or absorb vibrations from rope movement that can damage bearings, extending the service life of the drive train and bearing elements.

Areas of application:

Wherever low running noise, high wear resistance and maintenance- free operation are advantageous, e.g.: mobile cranes, lattice boom cranes, gantry cranes, drilling and pile-driving equipment, lifts, cable cars, cable pulls, stranding, wire drawing and winding machines, and similar applications.

LiNNOTAM rope pulleys score highly overall thanks to their:

– Low running noise
– Light weight
– High wear resistance
– High corrosion resistance
– Maintenance-free operation
– Rope-wear elasticity



Crane and lifting technology

Supporting elements/plates made from LiNNOTAM

Based on LiNNOTAM HiPERFORMANCE 612, we manufacture supporting elements such as crane support plates, that can withstand the highest loads. Compared to steel plates, they offer high resilience when deformed – and therefore remain usable for much longer.

Another advantage: LiNNOTAM supporting elements are easier to handle during use and installation thanks to their low weight. Thanks to the excellent elasticity of the material, they remain stable and secure even on surfaces with minor unevenness and edges. They are completely recyclable and resistant to fuels and lubricants.

Areas of application:

Mobile cranes, vehicle cranes, mobile concrete pumps, attachment cranes, aerial work platforms, mobile drilling and pile driving equipment, and similar applications.

Supporting elements made from LiNNOTAM score highly overall thanks to their:

– Good sliding and emergency running properties
– High wear resistance
– Good creep resistance
– High compressive strength
– High elasticity
– Durability

Sliding components/sliding plates

Sliding components and sliding plates made of LiNNOTAM, LiNNOTAM GLiDE or LiNNOTAM GLiDE Pro T have been tried and tested and are more durable than comparable elements made of metallic sliding materials. The lubricants embedded in the polymer matrix reduce the sliding friction coefficient by up to 50% – making your sliding plates extremely wear-resistant and easy to slide.

Another advantage: components made from LiNNOTAM GLiDE or LiNNOTAM GLiDE Pro T offer rapid recovery from shock loads. Compared to other thermoplastics, these materials are particularly strong and can withstand significantly higher loads. At the same time, however, they are elastic enough to function reliably at low temperatures or under sudden loads.

Areas of application:

Telescopic booms for mobile cranes, work platforms, telescopic handlers, vehicle-mounted cranes, adjustable attachments, lifting devices and similar applications.

LiNNOTAM sliding components score highly overall thanks to their:

– Good sliding and emergency running properties
– High wear resistance
– Good creep resistance
– High compressive strength
– High elasticity
– Durability

Lift technology
Greater efficiency for your vertical transport

Modern lift technology benefits greatly from using low-noise, low-friction, and freely dimensionable deflection rollers made from LiNNOTAM. This makes them the intelligent alternative to conventional, heavy, and maintenance-intensive metal solutions.

Deflection rollers made from LiNNOTAM

Deflection rollers made from LiNNOTAM HiPERFORMANCE E cast polyamide, which is specially tailored to the application, offer maximum safety and are ideal for use in lifts. Due to their low weight (approx. 1/7 of the weight of steel), deflection rollers made from LiNNOTAM HiPERFORMANCE E have a lower flywheel mass than those made from metallic materials and, as a result, a significantly reduced tendency to castor. Their low weight also makes them considerably easier to install.

Another advantage: the lift cables run over the rollers without much friction thanks to the plastic used. As a result, the rope lasts significantly longer. The rollers are very accurate in terms of concentricity and resistance to corrosion, but they also have another significant advantage: they are coloured yellow as standard and therefore do not need to be painted, which is both time-consuming and costly.

Areas of application:

Cable lifts

Deflection rollers made from LiNNOTAM HiPERFORMANCE E score points overall thanks to their:

– High level of security

– Lightweight

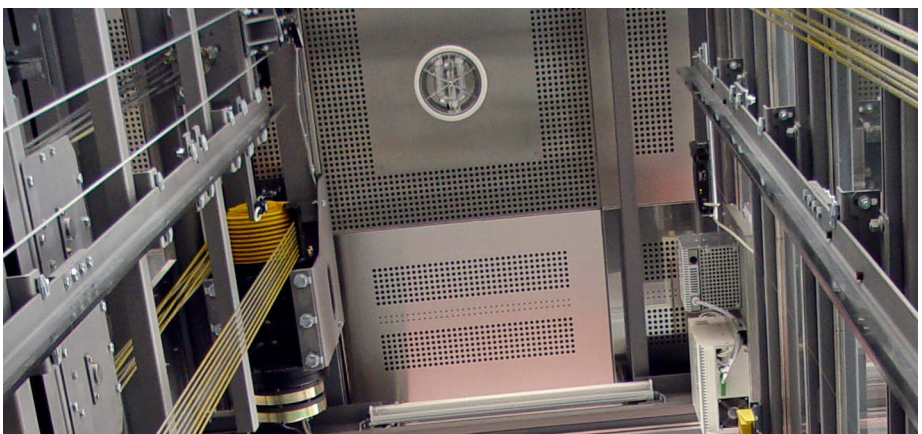
– Reduced tendency to castor

– High corrosion resistance

– Low running noise

– High concentricity

– Low-cost production



Lift technology

LiNNOTAM HiPERFORMANCE E+

Space and weight savings are crucial in lift construction. Small rope diameters and plastic-coated ropes with small deflection rollers are currently in vogue. However, plastic-coated ropes require design adjustments be made to the rollers. Noise and installation requirements can therefore be minimised.

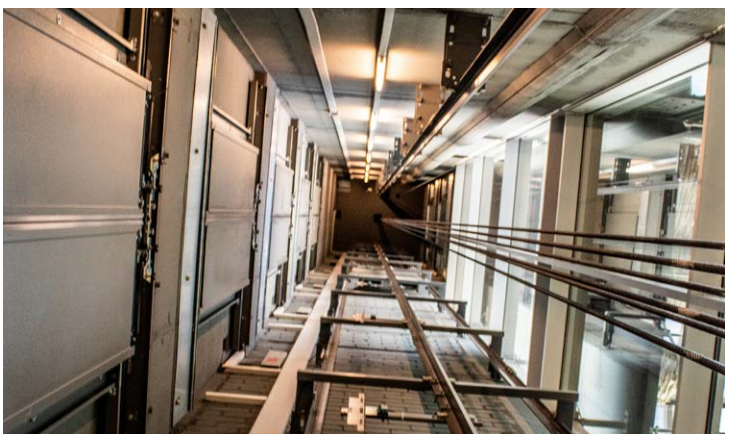
Our deflection rollers made from LiNNOTAM HiPERFORMANCE E+ are a cost-effective alternative. Here, a special material replaces the deflection roller's complex adjustment. Existing lift structures can be converted without additional effort. These rollers also offer minimal maintenance, high concentricity, corrosion resistance, and come in a standard light yellow colour.

Both LiNNOTAM HiPERFORMANCE E+ and LiNNOTAM HiPERFORMANCE E are highly resilient. Upon request, we will check the load capacity mathematically and in accordance with the relevant regulations.

Tests show that LiNNOTAM HiPERFORMANCE E+ significantly reduces the static friction coefficient of small-diameter plastic-coated ropes, which considerably extends the service life of the ropes.

Deflection rollers made from LiNNOTAM HiPERFORMANCE E+ impress with their:

– Reduced static friction values
– Low noise level
– Even rope tension
– Reduced assembly and adjustment requirements
– Adoption of existing role constructs
– No additional moving parts
– Wide range of dimensions
– Cost-effective production



Rollers for lift doors made from LiNNOTAM

In addition to the standard quality LiNNOTAM, the applications-pecific modified cast polyamides LiNNOTAM HiPERFORMANCE 612 and 1200 form the basis for these rollers. Rollers made from these materials have a very long service life, even under heavy loads. As the material has a permanently high strength, the rollers do not become brittle and no fatigue cracks the form. Good creep resistance ensures that the bearing is securely seated.

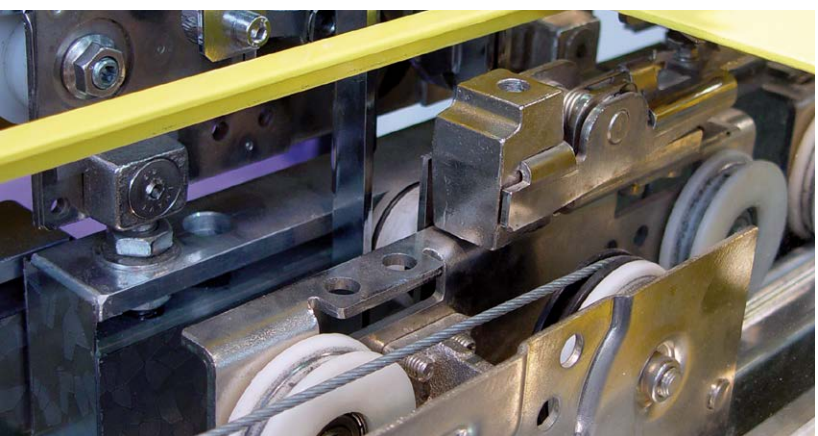
Another advantage: these castors produce very little running noise, as the plastic selected provides excellent damping, and high-quality bearings are used. Due to mechanical processing, the rollers are very accurate in terms of concentricity. Other positive characteristics include the excellent flattening effect, resistance to corrosion, abrasion resistance, and gentle effect on the plastic track.

Areas of application:

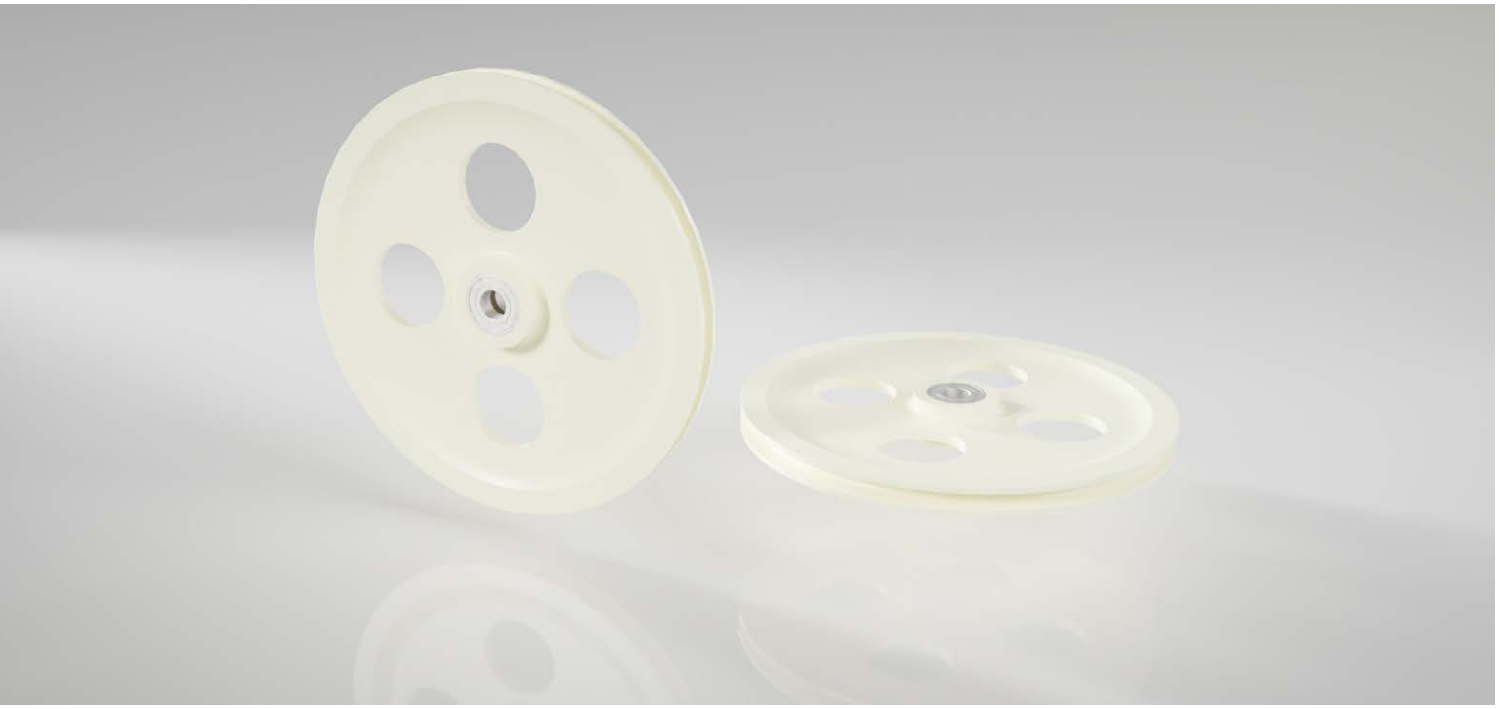
Lift doors

Rollers for lift doors made from LiNNOTAM score points thanks to their:

– High load-bearing capacity
– Low running noise
– Permanently high strength
– High concentricity
– Secure bearing seat
– High corrosion resistance
– Excellent flattening behaviour
– Good creep resistance
– Very long service life
– Low-cost production



Lift technology



Accessories for lift technology

Accessories for lift technology such as hand wheels, rope pulleys for speed limitation and measurement systems, and guide rollers made from LiNNOTAM are tried and tested and extremely durable. The individual parts are lightweight, resulting in a low flywheel mass and reduced tendency to castor. Balancing the parts is not necessary.

Another advantage: the accessories are resistant to corrosion. All parts come in yellow, eliminating the need for time-consuming and costly painting. The accessories are available as standard parts or are custom-made.

Areas of application:

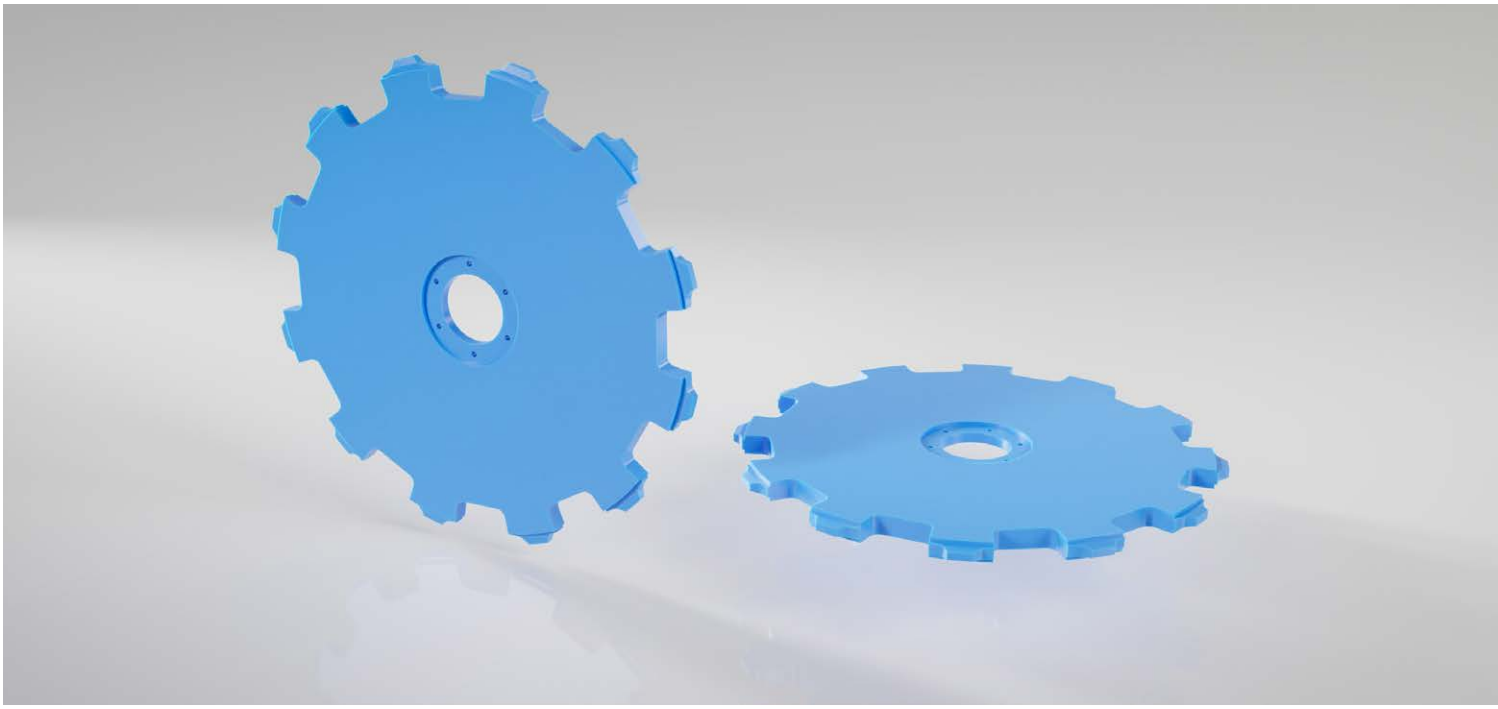
Lift drive, speed limiter, and speedometer.

Accessories such as hand wheels, rope pulleys for speed limitation and measurement systems, or guide rollers made from LiNNOTAM score points overall thanks to their:

– Low weight
– High load-bearing capacity
– Reduced tendency to castor
– Low flywheel mass
– Customisable mould
– High corrosion resistance
– No balancing required
– Low-cost production

FoodTec
Your path to effective food production

Improving production environments with the strictest hygiene regulations is a real challenge. You are taking a giant step towards safe food production on an industrial scale with grippers, guide elements, sprocket and gear wheels, and other components made from engineering plastic.



Components for FoodTec

Components for the food and beverage industry must be clean, safe, and durable above all else! We meet these expectations in the best possible way with our LiNNOTAM brand products.

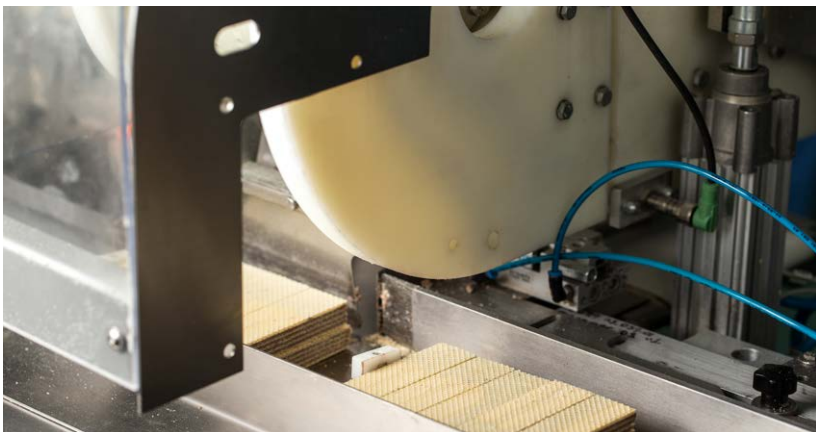
Components such as grippers, guide elements, castor, conveyor, guide and deflection rollers, cutting plates, as well as general construction parts and elements made from LiNNOTAM score highly in the food industry thanks to their:

– Lightweight properties
– Colour stability
– Low-cost production
– High corrosion resistance
– Chemical resistance (acids/alkalis)
– High wear resistance (abrasive materials)
– Long service life and dimensional stability
– Meet the requirements of the FDA and FG (EU 10/2011)

Whether it is for packaging machines, slaughtering equipment, transport or filling systems, bakery, dough and confectionery processing machines, meat, fish and poultry processing machines or cutting and portioning machines: we meet your highest standard requirements with components manufactured for you from LiNNOTAM and other plastics.

The following Licharz materials are particularly suitable for Food-Tec components:

– LiNNOTAM/LiNNOTAM GLiDE
– PET/PET-GL
– POM-C



FoodTec

Engineering plastics for the highest standards

Licharz offers you expertise – and not just in the manufacture of semi-finished products and components for the food and beverage industry.

We also offer a range of high-quality advanced services with a focus on:

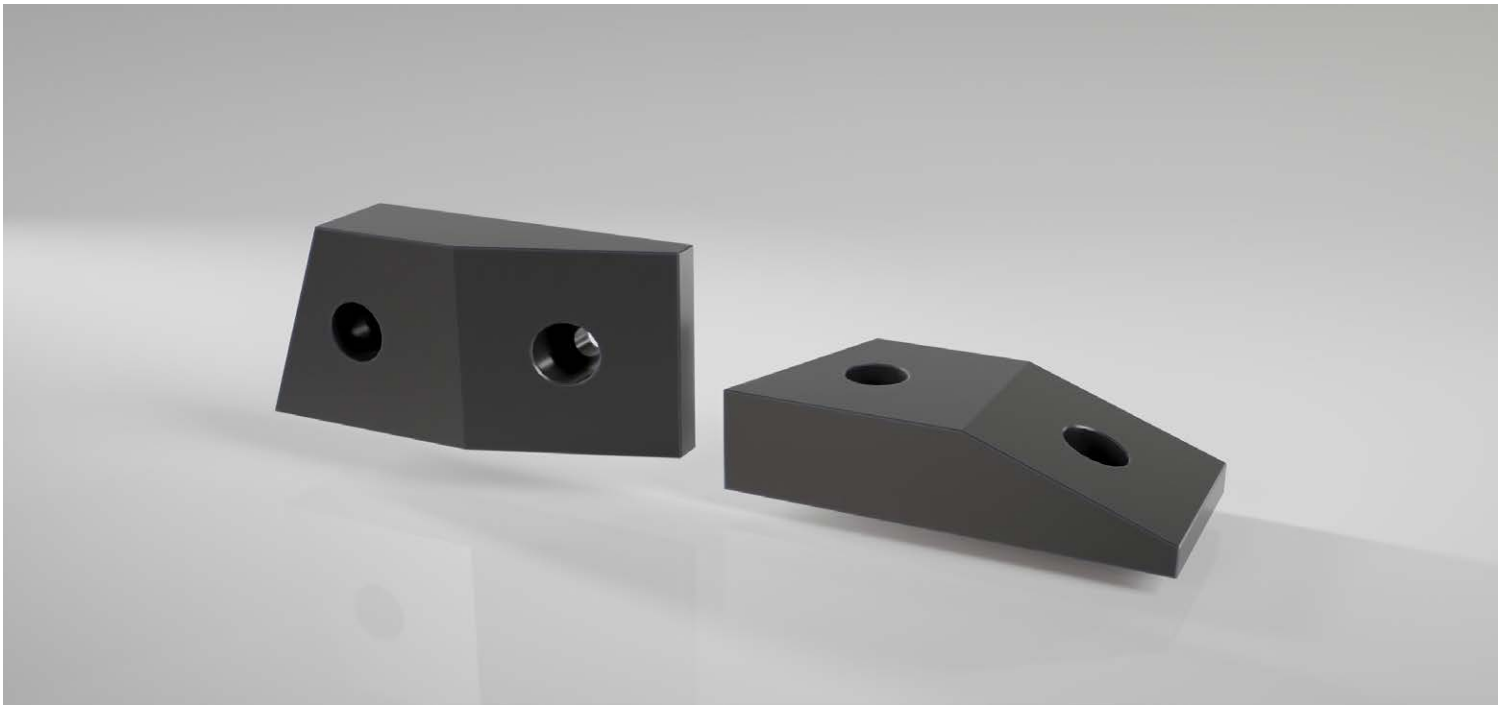
- **Advice** on all matters relating to food contact materials
- **Development** and production-related testing of materials in the factory's own laboratory to ensure high material quality.
- **Support** with design and material selection for your application

The colour blue:

We also supply blue-coloured plastic components for improved visual inspection and testing in food processing.

Rail transport
High-performance plastics in modern rail transport

Make rail transport safe and efficient. Whether it is for bridge plates, sliding plates, sliding bearings, rollers, buffer plates or in switch technology – our products offer solutions that meet the requirements of modern rail systems. The high degree of crystallinity also ensures excellent mechanical properties in almost any shape and component size.



LiNNOTAM HiPERFORMANCE 600 FR and 1200 FR

Our certified materials from LiNNOTAM HiPERFORMANCE FR are cast polyamides specially designed for rail transport that meet the material requirements of DIN EN 45545-2.

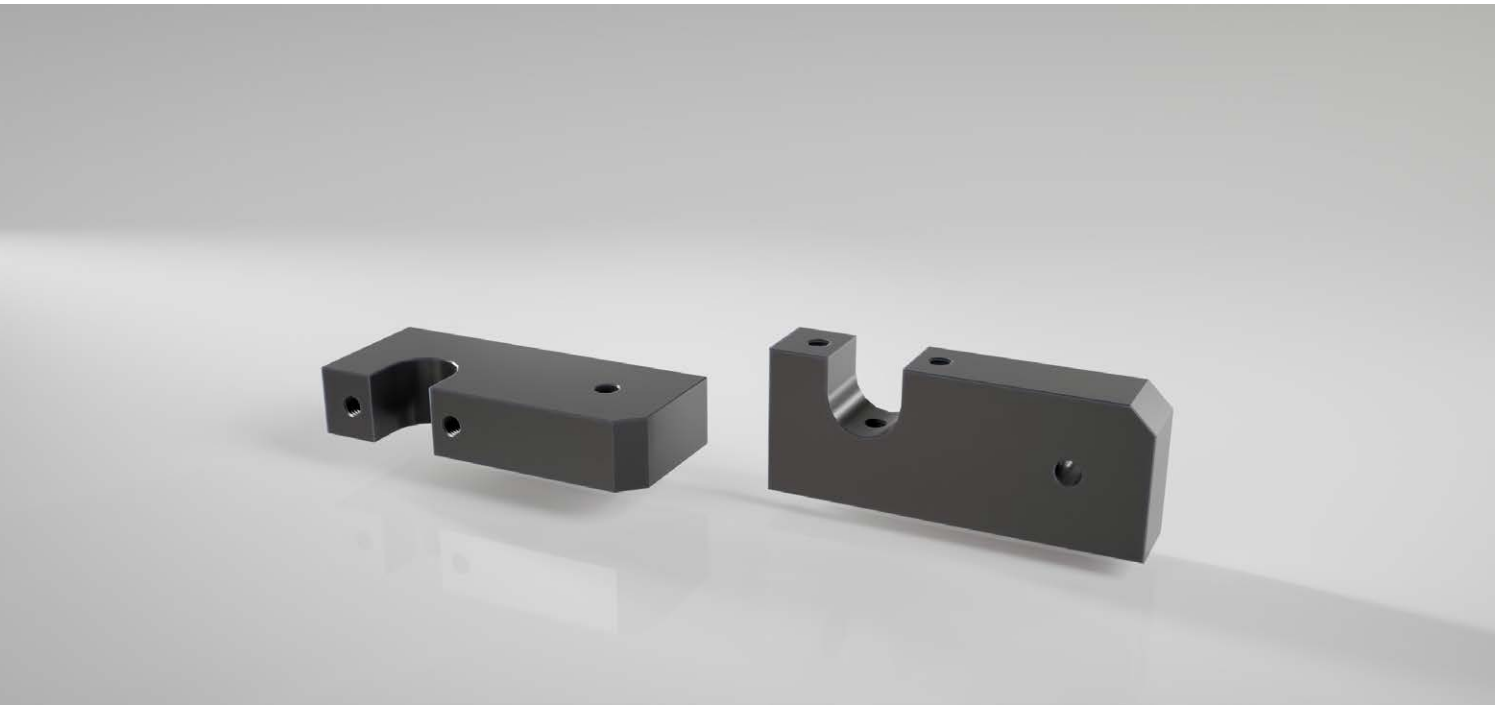
LiNNOTAM HiPERFORMANCE FR has the same excellent properties as our LiNNOTAM:

– Virtually free of internal tension
– High degree of crystallinity
– Can be manufactured as semi-finished products or moulded parts
– Can be moulded into almost any shape
– Can be manufactured in virtually unlimited casting weights and dimensions

Areas of application:

– Bridge plates, sliding plates and sliding bearings for transition systems
– Rollers for door systems
– Sealing strips and sealing plates
– Buffer plates
– Switch technology
– Fastening and clamping elements

Rail transport



DIN 45545-2 Standard for new and existing vehicles

Our materials comply with the European fire safety standard for rail vehicles EN 45545-2. LiNNOTAM HiPERFORMANCE 600 FR and 1200 FR can therefore be used in all new and existing vehicles.

By avoiding halogenated and inorganic flame retardants, LiNNOTAM HiPERFORMANCE 600 FR and 1200 FR are also harmless to your health and the environment.

Material	Cut dimensions in accordance with DIN EN 45545-2 (as amended)	
600 FR (black and natural)	Bars from 6 mm in length and diameter; plates from 6 mm in thickness	R10 (HL1/ HL2 /HL3) (DIN EN 45545-2)
		R8 (HL1) (DIN EN 45545-2)
1200 FR (natural)	Bars from 6 mm in length and diameter; plates from 6 mm in thickness	R10 (HL1/ HL2/ HL3) (DIN EN 45545-2)
		R8 (HL1) (DIN EN 45545-2)


160

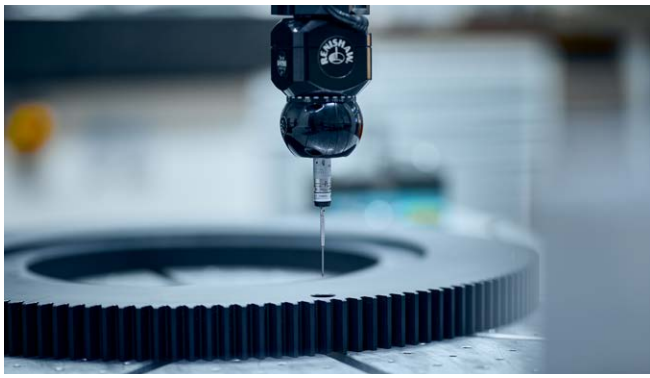
Physical material properties

Properties that make the difference

All key figures at a glance – compare various essential plastics directly. Get an idea of the performance of our products based on the practical properties of our materials and compare them with many standard values of common plastics.

Notes and conditions for the table

The information in the list is intended to provide an overview of the properties of our products and allow you to quickly compare materials. They reflect the current state of our knowledge and do not claim to be complete. Due to the strong dependence on environmental influences and processing, the values given are only to be understood as guidelines. They do not constitute a legally binding assurance regarding the properties of our products or their suitability for use in a specific application. All values mentioned were determined as average values from many individual measurements and refer to a temperature of 23 °C and 50% RH. For a specific application, we recommend proving suitability by means of a practical test.



The conditions under which the individual values, or their characteristics, were determined are indicated in the following list with the corresponding footnotes:

Characteristic value	Condition	Footnote
Impact strength DIN EN ISO 179	measured with pendulum impact tester 0.1 DIN 51 222	1
Creep stress DIN 53 444	Stress leading to 1% total elongation after 1,000 hours	2
Coefficient of sliding friction	hardened and ground against steel, P = 0.05 MPa, V = 0.6 m/s, t = 60 °C near the running surface	3
Linear coefficient of thermal expansion	for a temperature range from +23 °C to +60 °C	4
Temperature range	Empirical values determined on finished parts without load in heated air, depending on the type and form of heat exposure, short term = max. 1 h, long term = months	5
Dielectric constant IEC 250	at 10^6 Hz	6
Colours	POM-C natural = white PET natural = white PVDF natural = white to ivory (translucent) PE natural = white PP-H natural = white (translucent) PP-H grey ≈ RAL 7032 PVC grey ≈ RAL 7011 PEEK natural ≈ RAL 7032 PSU natural = honey yellow (translucent) PEI-natural = amber (translucent)	7
Units and abbreviations	o. B. = without snapping 1 MPa = 1 N/mm² 1 g/cm³ = 1,000 kg/m³ 1 kV/mm = 1 MV/m	without

					Mechanical values											
No.	Product	Material	Colour (standard)	Test specimen condition	Density DIN EN ISO 1183	Tensile stress DIN EN ISO 527	Elongation at break DIN EN ISO 527	Modulus of elasticity (tension) DIN EN ISO 527	Modulus of elasticity (bending) DIN EN ISO 178	Flexural strength DIN EN ISO 178	Impact resistance DIN EN ISO 179	Notch impact strength DIN EN ISO 179	Ball pressure hardness $H_{358/30}$ DIN EN ISO 2039-1	Creep stress 1% elongation DIN EN ISO 899-1	Coefficient of sliding friction against steel (dry running) [3]	Sliding wear against steel (dry running) [3]
					1 ρ g/cm³	2 σ_{zS} MPa	3 ε_{zR} %	4 E_t MPa	5 E_{B3} MPa	6 σ_{bB} MPa	7 a_{cU} kJ/m²	8 a_{cN} kJ/m²	9 H_K MPa	10 $\sigma_{1/1,000}$ MPa	11 μ –	12 V µm/km
1	LiNNOTAM	PA 6 C	natural/ black/ blue	dry/ humid	1.15	80/60	40/100	3,100/1,800	3,400/2,000	140/60	o. B.	> 4/> 15	160/125	> 7	0.36/0.42	0.10
2	LiNNOTAM MoS	PA 6 C + MoS_2	black	dry/ humid	1.15	85/60	40/100	3,200/1,850	3,300/2,000	130/50	o. B.	> 5/> 15	150/115	> 7	0.32/0.37	0.10
3	LiNNOTAM HS	PA 6 C-WS	black	dry/ humid	1.15	90/60	30/80	2,500/2,000	3,000/2,300	120/40	o. B.	> 4/> 12	170/130	> 7	0.36/0.42	0.10
4	LiNNOTAM GLiDE	PA 6 C + oil	natural/ black/ yellow/ green/red	dry/ humid	1.14	80/55	50/120	2,800/1,700	3,000/1,900	135/55	o. B.	> 5/> 15	150/100	> 7	0.15/0.20	0.03
5	LiNNOTAM GLiDE Pro T	PA 6 C + solid lubricant	grey/red/ green	dry/ humid	1.14	80/60	40/100	3,100/1,800	3,300/2,000	110/60	o. B.	> 4/> 15	160/125	> 7	0.15/0.23	0.03
6	LiNNOTAM DRiVE 600 Fe	PA 6 C + impact-modified	–	dry/ humid	1.15	90	20	2,800	2,500	160/130	o. B.	> 15	175	> 7	0.36/0.42	–
7	LiNNOTAM HiPERFORMANCE 612	PA 6/12 C	natural	dry/ humid	1.12	80/55	55/120	2,500/1,500	2,800/1,800	135/55	o. B.	> 12	140/100	> 15	0.36/0.42	0.12
8	LiNNOTAM HiPERFORMANCE 1200	PA 12 C	natural	dry	1.03	60/50	55/120	2,200/1,800	2,400	90	o. B.	> 15	100	> 11	0.4	–
9	LiNNOTAM HiPERFORMANCE HPI	PA 6 C + impact-modified	light yellow	dry/ humid	1.15	90/70	40/100	3,000/1,900	3,100/2,200	130/60	o. B./ –	> 8/ –	145/120	> 7	0.36/0.42	–
10	Polyamide 6	PA 6	natural/ black	dry/hu-mid	1.14	70/45	50/180	2,700/1,800	2,500/1,400	130/40	o. B.	> 3/o. B.	160/70	> 8	0.38/0.42	0.23
11	Polyamide 66	PA 66	natural/ black	dry/ humid	1.14	85/65	30/150	3,000/1,900	2,900/1,200	135/60	o. B.	> 3/> 15	170/100	> 8	0.35/0.42	0.1
12	Polyamide 66 + glass fibre	PA 66 GF 30	black	dry	1.35	160	3	11,000	–	–	50	6	240/200	40	0.45/0.5	–
13	Polyamide 12	PA 12	natural	dry	1.02	50	>200	1,800	1,500	60	o. B.	> 15	100	> 4	0.32	0.8
14	Polyacetal copolymer	POM-C	natural[7]/ black	dry	1.41	65	40	3,000	2,900	115	o. B.	> 10	150	13	0.32	8.9
15	Polyacetal copolymer glass fibre	POM-C GF 30	black	dry	1.59	125	3	9,300	9,000	150	30	5	210	40	0.50	–
16	Polyethylene terephthalate	PET	natural[7]/ black	dry	1.38	80	40	3,000	2,600	125	82	14	140	13	0.25	0.35
17	Polyethylene terephthalate + lubricant	PET-GL	light grey	dry	1.38	75	5	2,230	–	–	23	10	–	–	0.2	0.1
18	Polytetrafluoroethylene	PTFE	natural	dry	2.18	25	380	750	540	6	o. B.	16	30	1.5	0.08	21.0
19	Polyvinylidene fluoride	PVDF	natural[7]	dry	1.78	56	22	2,000	2,000	75	o. B.	> 15	120	3	0.3	–
20	Polyethylene 1000	PE-UHMW	natural[7]/ black/ green	dry	0.94	22	350	800	800	27	o. B.	o. B.	40	–	0.29	0.45
21	Polypropylene homopolymer	PP-H	natural[7]/ grey[7]	dry	0.91	32	70	1,400	1,400	45	o. B.	7	70	4	0.35	11.0
22	Polyvinyl chloride	PVC-U	grey[7]/ black/ red/white	dry	1.42	58	15	3,000	–	82	o. B.	4	130	–	0.6	56.0
23	Polyether ether ketone	PEEK	natural[7]/ black	dry	1.32	95	45	3,600	4,100	160	o. B.	7	230	–	0.34	–
24	Polyether ether ketone (modified)	PEEK-GL	black	dry	1.48	118	2	8,100	10,000	210	25	2.5	215	–	0.11	–
25	polysulfone	PSU	natural[7]	dry	1.24	75	>50	2,500	2,700	106	o. B.	4	150	22	0.4	–
26	polyetherimide	PEI	natural[7]	dry	1.27	105	>50	3,100	3,300	145	o. B.	–	165	–	–	–

All values stated were determined as average values from many individual measurements and refer to a temperature of 23 °C and 50% RH.

Thermal values							Electrical values								Other data
Melting temperature DIN EN ISO 3146	Thermal conductivity DIN 52 612	Specific heat capacity	linear expansion coefficient [4]	Temperature range (long term) [5]	Temperature range (short term) [5]	Fire behaviour in accordance with UL 94 IEC 60695	Dielectric constant [6] IEC 60250	Dielectric loss factor [6]	Specific contact resistance IEC 60093	Surface resistance IEC 60093	Dielectric strength IEC 60243	Creep resistance IEC 60112	Moisture absorption in NK DIN EN ISO 62	Water absorption DIN EN ISO 62	Special properties
13 T_m °C	14 λ W/(K·m)	15 c J/(g·K)	16 α 10^{-5}·K^{-1}	17 – °C	18 – °C	19 – –	20 ε_R –	21 tan δ –	22 ρ_D Ω·cm	23 R° Ω	24 E_d kV/mm	25 – –	26 w(H_2O) %	27 W_s %	
+220	0.23	1.7	7-8	-40 to +105	+170	HB	3.7	0.03	$10^{15}/10^{12}$	$10^{13}/10^{12}$	50/20	CTI 600	2.2	6.5	hard, pressure and abrasion-resistant, largest dimensions can be manufactured
+220	0.23	1.7	7-8	-40 to +105	+160	HB	3.7	0.03	$10^{15}/10^{12}$	$10^{13}/10^{12}$	50/20	CTI 600	2.2	6.5	like PA 6 C, but with increased crystallinity
+220	0.23	1.7	7-8	-40 to +105	+180	HB	3.7	0.03	$10^{15}/10^{12}$	$10^{13}/10^{12}$	50/20	CTI 600	2.2	7	same as PA 6 C, but heat ageing stabilised
+220	0.23	1.7	7-8	-40 to +105	+160	HB	3.7	0.03	$10^{15}/10^{12}$	$10^{13}/10^{12}$	50/20	CTI 600	1.8	5.5	high abrasion resistance, low sliding friction
+220	0.23	1.7	7-8	-40 to +105	+160	HB	3.7	0.03	$10^{15}/10^{12}$	$10^{13}/10^{12}$	50/20	CTI 600	2.2	6.5	low stick-slip, very low sliding friction
+225	0.23	1.7	7-8	-40 to +105	+160	HB	3.7	0.03	$10^{15}/10^{12}$	$10^{13}/10^{12}$	50/20	CTI 600	1.9	5.8	high impact and shock resistance, with steel core
+220	0.23	1.7	7-8	-40 to +105	+160	HB	3.7	0.03	10^{15}	10^{13}	50/20	KA 3c	1.9	5.8	like PA 6 C, but with high impact resistance
+190	0.23	1.7	10-11	-60 to +110	+150	HB	3.7	0.03	10^{15}	10^{13}	50/20	CTI 600	0.9	1.4	low water absorption, very good time stability
+225	0.23	1.7	7-8	-40 to +105	+160	HB	3.7/–	0.03/–	$10^{15}/10^{12}$	$10^{13}/10^{12}$	50/20	CTI 600	1.9	5.8	like PA 6 C, but with increased crystallinity and impact resistance
+218	0.23	1.7	8-9	-30 to +100	+140	HB	7.0	0.3	$10^{15}/10^{12}$	$10^{13}/10^{10}$	50/20	CTI 600	3.0	10.0	tough, good vibration dampening
+265	0.23	1.7	9-10	-30 to +100	+150	HB	5.0	0.2	$10^{15}/10^{12}$	$10^{12}/10^{10}$	50/20	CTI 600	2.5	9.0	high abrasion resistance (similar to PA 6 C)
+255	0.3	1.5	2-3	-30 to +120	+180	HB	3.7	0.02	$10^{14}/10^{13}$	$10^{13}/10^{12}$	60/30	CTI 475	1.5	5.5	high strength, low thermal expansion
+178	0.30	2.09	11-12	-70 to +70	+140	HB	3.1	0.03	2×10^{15}	10^{13}	30	CTI 600	0.8	1.5	tough, resistant to hydrolysis, low moisture absorption
+168	0.31	1.45	9-10	-30 to +100	+140	HB	3.9	0.003	10^{15}	10^{13}	20	CTI 600	0.2	0.8	high strength, impact resistant, low creep tendency
+168	0.40	1.21	3-4	-30 to +110	+140	HB	4.8	0.005	10^{15}	10^{13}	65	KA 3C/ KC > 600	0.17	0.6	high strength, low thermal expansion
+255	0.24	1.1	7-8	-20 to +100	+160	HB	3.6	0.008	10^{16}	10^{14}	50	CTI 600	0.25	0.5	tough, hard, low cold flow, dimensionally stable
+245	0.23	–	6-7	-20 to +110	+160	HB	3.6	0.008	10^{16}	10^{14}	–	CTI 600	0.2	0.5	like PET, aditional maximum wear resistance
+327	0.23	1	18-20	-200 to +260	+280	V-0	2.1	0.0005	10^{18}	10^{17}	40	CTI 600	0.01	< 0.01	high chemical resistance, low strength
+178	0.19	0.96	13	-40 to +140	+160	V-0	8.0	0.165	5×10^{14}	10^{13}	25	CTI 600	< 0.04	< 0.04	Resistance to UV, beta and gamma radiation, abrasion-resistant
+133	0.38	1.84	18	-260 to +50	+80	HB	3.0	0.0004	$> 10^{16}$	10^{14}	44	CM 600	0.01	< 0.01	like PE-HMW, but more abrasion-resistant, low coefficient of friction
+162	0.22	1.7	16	0 to +80	+100	HB	2.25	0.00033	$> 10^{16}$	10^{14}	52	CM 600	< 0.01	< 0.01	similar to PE-HD, but with higher heat resistance
–	0.156	1.05	8	0 to +50	+70	V-0	3.3	0.025	10^{16}	10^{13}	39	KA 3b	< 0.01	< 0.01	good chemical resistance, hard and brittle
+340	0.25	1.06	4-5	-40 to +250	+310	V-0	3.2	0.002	10^{16}	10^{16}	24	CTI 150	0.2	0.45	resistant to high temperatures and hydrolysis, dimensionally stable
+340	0.24	–	3	-40 to +250	+310	V-0	3.2	–	10^{5}	–	24.5	–	0.14	0.3	like PEEK, but with a higher PV value, better sliding properties
–	0.26	1	5-6	-40 to +160	+180	V-0	3.0	0.002	10^{17}	10^{17}	30	CTI 150	0.4	0.8	steam sterilisable, hydrolysis and radiation resistant
–	0.22	–	5-6	-40 to +170	+200	V-0	3.0	0.003	10^{18}	10^{17}	33	CTI 175	0.75	1.35	high strength and rigidity, high heat resistance

Chemical resistance
The reliable force against chemical influences

When it comes to the resistance of parts and components to chemical influences, engineering plastics can be superior to many metallic materials. The following table provides a broad overview of how strong and durable our plastics are in chemical and industrial environments.

Notes on using the list

The information on chemical resistance in the following list refers to tests in which the test specimens were exposed to the respective media without external stresses and loads. Added to this is our experience from the practical and, in some cases, long-standing use of synthetic materials in contact with the media. Due to the diversity of media, this list represents only an excerpt from the data available to us. If the medium you use is not included, we will be happy to provide you with information on the resistance of the plastics we supply upon request.

When applying the list, it should be noted that factors such as:

– Different degree of purity of the medium
– Deviating concentration of the medium
– Temperatures other than those specified
– Alternating temperatures
– Mechanical stress
– Part geometries, especially those that result in thin wall thicknesses or significant differences in wall thickness
– Tensions generated by processing
– Mixtures composed of different media
– Combinations of the above factors

may affect chemical resistance.

Despite being classified as 'conditionally resistant', a plastic component may be superior to a material consisting of metallic components and make more sense economically.

In the case of oxidising media, such as nitric acid and polar organic solvents, there is a risk of stress cracking in many thermoplastics, despite their chemical resistance to the medium. For the manufacture of parts that come into contact with such media, such a manufacturing process should therefore be selected that generates as little mechanical stress as possible in the workpiece. An alternative is to relieve the tension by tempering the semi-finished products before and during the manufacture of the product.

For mixtures of different media, resistance cannot usually be predicted, even if the plastic is resistant to the individual components of the mixture. We therefore recommend attempting storage with the appropriate mixed medium under the expected environmental conditions in this case. It should be noted that parts intended for use in areas where two or more media come into direct contact may also be subject to additional temperature stress due to the reaction heat generated.

Despite being classified as 'stable', contact with the medium may cause surface changes in some cases, such as matting or discolouration, and clouding in transparent plastics. However, despite this surface change, the resistance remains intact.

The information contained in the lists corresponds to our current state of knowledge and should be understood as a recommendation and guideline. For specific applications or in cases of doubt, we recommend testing the resistance by storing the product under the expected conditions of use.

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Concentration	Temperature °C	LiNNOTAM	LiNNOTAM HS	LiNNOTAM MoS	LiNNOTAM GLiDE	LiNNOTAM GLiDE Pro T	LiNNOTAM HiPERFORMANCE HPI	LiNNOTAM HiPERFORMANCE 612	LiNNOTAM HiPERFORMANCE 1200	PA 6 – polyamide 6	PA 66 – polyamide 66	PA 12 – polyamide 12	POM-C – polyacetal copolymer	PET – polyethylene terephthalate	PET-GL – polyethylene terephthalate/lubricant	PTFE – polytetrafluoroethylene	PVDF – polyvinylidene fluoride	PE-UHMW – polyethylene 1000	PP-H – polypropylene homopolymer	PVC-U – polyvinyl chloride un-plasticised	PEEK – polyether ether ketone	PEEK-GL – modified polyether ether ketone	PSU – polysulfone	PEI – polyetherimide
1 acetaldehyde	40	20	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	–	+	+	–	+	+	–	+
2 acetamide	50	20	+	+	+	+	+	+	+	+	+	+	+	+	/	/	+	–	+	+	/	+	+	/	+
3 acetone	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	O	O	+	–	+	+	–	+	+	–	–
4 acrylonitrile	UD	RT	+	+	+	+	+	+	+	+	+	+	+	/	/	/	+	+	+	+	/	+	+	–	/
5 allyl alcohol	UD	RT	O	O	O	O	O	O	O	O	O	O	O	/	+	+	+	/	+	+	–	+	+	O	/
6 aluminium chloride	10	RT	+	+	+	+	+	+	+	+	+	+	+	O	+	+	+	+	+	+	+	+	+	+	+
7 formic acid	2	RT	O	O	O	O	O	O	O	O	O	O	O	+	+	+	+	+	+	+	+	+	+	/	+
8 formic acid	UD	RT	S	S	S	S	S	S	S	O	S	S	O	–	O	O	+	+	+	+	+	O	O	–	/
9 ammonia	10	RT	+	+	+	+	+	+	+	+	+	+	+	+	–	–	+	+	+	+	+	O	O	–	–
10 ammonium hydroxide	30	RT	+	+	+	+	+	+	+	+	+	+	+	–	–	–	+	–	+	+	/	+	+	+	–
11 ammonium nitrate	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	–	–
12 aniline	UD	RT	–	–	–	–	–	–	–	O	–	–	O	O	+	+	+	+	+	O	–	+	+	–	/
13 antimony trichloride	10	RT	–	–	–	–	–	–	–	–	–	–	–	/	/	/	+	+	+	+	+	+	+	/	/
14 benzaldehyde	UD	RT	O	O	O	O	O	O	O	O	O	O	O	+	+	+	+	O	+	+	–	+	+	–	–
15 petrol (premium)	CA	40	+	+	+	+	+	+	+	+	+	+	+	+	/	/	+	+	O	O	–	+	+	O	–
16 benzene	UD	RT	+	+	+	+	+	+	+	+	+	+	+	O	+	+	+	+	O	O	–	+	+	–	–
17 benzoic acid	UD	RT	–	–	–	–	–	–	–	+	–	–	+	O	+	+	+	+	+	+	+	+	+	/	/
18 benzyl alcohol	UD	RT	O	O	O	O	O	O	O	O	O	O	O	+	+	+	+	+	+	+	/	+	+	O	–
19 bleaching lye (12.5% AC)	CA	RT	–	–	–	–	–	–	–	O	–	–	O	–	+	+	+	+	+	+	+	+	+	–	+
20 borax	AS	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	/	/	+	+	/	/
21 boric acid	10	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
22 hydrobromic acid	10	RT	–	–	–	–	–	–	–	–	–	–	–	–	O	–	+	+	+	+	+	+	+	+	/
23 hydrobromic acid	50	RT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	+	+	+	O	O	/	/
24 butanol	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	+
25 butyl acetate	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	/	/	+	+	–	O
26 calcium chloride	5	RT	+	+	+	+	+	+	+	+	+	+	+	O	+	+	+	+	+	+	+	+	+	O	+
27 calcium chloride in alcohol	20	RT	–	–	–	–	–	–	–	–	S	S	–	–	+	+	+	+	+	+	/	+	+	O	+
28 calcium hypochloride	SS	RT	–	–	–	–	–	–	–	–	–	–	–	–	O	O	+	+	+	+	+	+	+	/	/
29 chlorobenzene	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	O	–	+	+	S	–
30 chloroacetic acid	UD	RT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	+	+	/	+	+	/	/
31 chloroform	UD	RT	O	O	O	O	O	O	O	O	O	O	O	–	–	–	+	+	O	O	–	+	+	S	–
32 chromic acid	1	RT	O	O	O	O	O	O	O	O	O	O	O	O	+	+	+	+	+	+	+	+	+	O	+
33 chromic acid	50	RT	–	–	–	–	–	–	–	–	–	–	–	–	+	+	+	+	O	O	+	+	+	O	/
34 cyclohexane	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	/
35 cyclohexanol	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	–
36 cyclohexanone	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	–	–	+	O	+	+	+	+	+	S	/
37 dibutyl phthalate	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	O	/	/	+	+	+	O
38 dichloroethane	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	–	–	+	+	O	O	–	+	+	S	–
39 dichloroethylene	UD	RT	+	+	+	+	+	+	+	+	+	+	+	S	S	S	+	+	–	O	–	+	+	/	/
40 iron(II) chloride	SS	RT	–	–	–	–	–	–	–	–	–	–	–	O	/	/	+	+	+	+	+	+	+	–	+
41 iron(III) chloride	SS	RT	–	–	–	–	–	–	–	–	–	–	–	O	/	/	+	+	+	+	+	+	+	–	+
42 vinegar	CA	RT	–	–	–	–	–	–	–	+	–	–	+	+	+	+	+	O	+	+	+	+	+	/	/
43 acetic acid	5	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
44 acetic acid	10	RT	O	O	O	O	O	O	O	+	O	O	+	O	+	+	+	+	+	+	+	+	+	+	+
45 acetic acid	10	50	–	–	–	–	–	–	–	O	–	–	O	–	+	+	+	+	+	+	+	+	+	+	+
46 acetic acid	95	RT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	+	+	O	+	+	–	–
47 acetic acid	95	50	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	O	O	O	–	+	+	–	–
48 ethyl ether	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	O	–	+	+	O	+
49 hydrofluoric acid	AS	RT	S	S	S	–	S	S	S	S	S	S	S	–	–	–	+	+	+	+	+	S	S	–	O
50 formaldehyde	UD	RT	O	O	O	O	O	O	O	O	O	O	O	+	+	+	+	+	+	+	+	+	+	–	–

UD = undiluted
AS = aqueous solution
SS = saturated solution
CA = commercially available
RT = room temperature
\+ = stable
O = conditionally stable
– = not constant
S = soluble
/ = not tested

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Concentration	Temperature °C	LiNNOTAM	LiNNOTAM HS	LiNNOTAM MoS	LiNNOTAM GLiDE	LiNNOTAM GLiDE Pro T	LiNNOTAM HiPERFORMANCE HPI	LiNNOTAM HiPERFORMANCE 612	LiNNOTAM HiPERFORMANCE 1200	PA 6 – Polyamide 6	PA 66 – Polyamide 66	PA 12 – Polyamide 12	POM-C – polyacetal copolymer	PET – polyethylene terephthalate	PET-GL – polyethylene terephthalate/lubricant	PTFE – polytetrafluoroethylene	PVDF – polyvinylidene fluoride	PE-UHMW – polyethylene 1000	PP-H – polypropylene homopolymer	PVC-U – polyvinyl chloride unplasticised	PEEK – polyether ether ketone	PEEK-GL – modified polyether ether ketone	PSU – polysulfone	PEI – polyetherimide
51 glycerine	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	+
52 fuel oil	CA	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	/	+	+	+	+	+	+	+
53 heptane	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	+	+	+	O	+
54 hexane	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	+
55 isopropanol	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	O	O	+	+	+	+	+	+	+	O	/
56 potash lye	10	RT	+	+	+	+	+	+	+	+	+	+	+	+	–	–	+	+	+	+	+	+	+	O	+
57 potash lye	10	80	+	+	+	+	+	+	+	+	+	+	+	+	–	–	+	O	–	+	–	+	+	O	–
58 potash lye	50	RT	O	O	O	O	O	O	O	+	O	O	+	+	–	–	+	+	+	+	+	+	+	O	–
59 ketones (aliphatic)	UD	RT	O	O	O	O	O	O	O	O	O	O	O	+	–	–	+	/	+	/	/	+	+	/	/
60 methanol	50	RT	+	+	+	+	+	+	+	+	+	+	+	+	O	+	+	+	+	+	+	+	+	O	+
61 methanol	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	O	+	+	+	+	+	+	+	+	O	+
62 methylene chloride	UD	RT	–	–	–	–	–	–	–	O	–	–	O	–	–	–	+	+	O	O	S	+	+	S	S
63 mineral oil	CA	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
64 sodium hypochloride	10	RT	–	–	–	–	–	–	–	–	–	–	–	–	O	O	+	+	+	O	+	+	+	+	/
65 Caustic soda	10	RT	+	+	+	+	+	+	+	+	+	+	+	+	O	O	+	O	+	+	+	+	+	+	O
66 Caustic soda	10	80	–	–	–	–	–	–	–	–	–	–	–	+	–	–	+	O	O	+	O	+	+	+	–
67 Caustic soda	50	RT	O	O	O	O	O	O	O	O	O	O	O	+	–	–	+	O	+	+	+	+	+	+	–
68 Caustic soda	50	80	–	–	–	–	–	–	–	–	–	–	–	+	–	–	+	O	O	+	O	+	+	+	–
69 nitrobenzene	UD	RT	–	–	–	–	–	–	–	–	–	–	–	O	O	O	+	+	+	+	–	+	+	–	–
70 nitrotoluene	UD	RT	O	O	O	O	O	O	O	O	O	O	O	O	+	+	+	/	+	+	–	+	+	/	/
71 oxalic acid	10	RT	O	O	O	O	O	O	O	O	O	O	O	–	+	+	+	+	+	+	+	+	+	+	+
72 phenol	90	RT	S	S	S	S	S	S	S	S	S	S	S	–	–	–	+	+	+	+	O	+	+	–	–
73 phenol	UD	40	S	S	S	S	S	S	S	S	S	S	S	–	–	–	+	+	+	+	–	+	+	–	–
74 phenol	UD	60	S	S	S	S	S	S	S	S	S	S	S	–	–	–	+	O	–	–	–	+	+	–	–
75 phenol	UD	80	S	S	S	S	S	S	S	S	S	S	S	–	–	–	+	O	–	–	–	+	+	–	–
76 phosphoric acid	10	RT	–	–	–	–	–	–	–	–	–	–	–	+	+	+	+	+	+	+	+	+	+	+	+
77 phosphoric acid	25	RT	–	–	–	–	–	–	–	–	–	–	–	O	+	+	+	+	+	+	+	+	+	+	+
78 phosphoric acid	85	RT	S	S	S	S	S	S	S	S	S	S	S	–	+	+	+	+	+	+	+	+	+	O	–
79 propanol	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
80 Nitric acid	10	RT	–	–	–	–	–	–	–	–	–	–	–	–	+	+	+	+	+	+	+	+	+	+	+
81 Nitric acid	10	60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–	–	+	+	/	/
82 Nitric acid	50	RT	S	S	S	S	S	S	S	S	S	S	S	–	–	–	+	+	–	–	–	O	O	+	/
83 Nitric acid	80	RT	S	S	S	S	S	S	S	S	S	S	S	–	–	–	+	O	–	–	–	O	O	+	/
84 hydrochloric acid	10	RT	–	–	–	–	–	–	–	–	–	–	–	–	O	O	+	+	+	+	+	+	+	+	+
85 hydrochloric acid	20	RT	–	–	–	–	–	–	–	–	–	–	–	–	O	O	+	+	+	+	+	+	+	+	+
86 hydrochloric acid	30	RT	S	S	S	S	S	S	S	S	S	S	S	–	–	–	+	+	+	+	+	+	+	O	+
87 Sulphuric acid	40	RT	–	–	–	–	–	–	–	–	–	–	–	–	O	O	+	+	+	+	+	O	O	+	+
88 Sulphuric acid	40	60	–	–	–	–	–	–	–	–	–	–	–	–	O	O	+	+	+	+	O	–	–	O	O
89 Sulphuric acid	96	RT	S	S	S	S	S	S	S	S	S	S	S	–	–	–	+	+	O	O	+	S	S	S	–
90 Sulphuric acid	96	60	S	S	S	S	S	S	S	S	S	S	S	–	–	–	+	+	–	–	O	S	S	S	–
91 carbon tetrachloride	UD	RT	+	+	+	+	+	+	+	+	+	+	+	O	+	+	+	+	–	–	–	+	+	+	+
92 toluene	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	O	–	+	+	–	–
93 trichloroethylene	UD	RT	O	O	O	O	O	O	O	O	O	O	O	O	O	O	+	+	O	O	–	+	+	S	–
94 hydrogen peroxide	10	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
95 hydrogen peroxide	20	RT	–	–	–	–	–	–	–	O	–	–	O	+	+	+	+	+	+	+	+	+	+	+	+
96 hydrogen peroxide	30	RT	–	–	–	–	–	–	–	–	–	–	–	O	+	+	+	+	+	+	+	+	+	+	+
97 hydrogen peroxide	30	60	–	–	–	–	–	–	–	–	–	–	–	–	+	+	+	/	O	O	O	+	+	/	/
98 xylene	UD	RT	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	O	O	–	+	+	O	O
99 citric acid	10	RT	O	O	O	O	O	O	O	+	O	O	+	+	+	+	+	+	+	+	+	+	+	O	+
100 citric acid	10	50	O	O	O	O	O	O	O	O	O	O	O	–	+	+	+	+	+	+	+	+	+	O	+

UD = undiluted
AS = aqueous solution
SS = saturated solution
CA = commercially available
RT = room temperature
\+ = stable
O = conditionally stable
– = not constant
S = soluble
/ = not tested

We are developing a better future built on tried and tested foundations

Precision, quality and plastics expertise with vision

1962

Company founded in cooperation with an Italian manufacturer as a pure trading company for semi-finished plastic products.

1995

Opening of the site in England, initially as a work partnership with Licharz Germany.

2000

Opening of the trading location in France to internationalise market activities, initially under external management.

2005

Technical refinement of polyamide 6 to achieve the market-leading quality we enjoy today.

Future

2021

Successful takeover of the entire company by Dr. Otto Lose.

2022

Repositioning of corporate identity with successful repositioning of the Licharz brand.

2024

Installation of a PV system on Licharz's company premises. The new plant covers 20 per cent of the electricity demand.

2025

Licharz is awarded DIN EN ISO 50001 certification.

We continue to develop our engineering plastics, just as we continue to develop as a company. We are embarking into the future with new ideas, modern technology, and growing expertise. In doing so, we remain true to what defines us: reliability, precision, and customer focus. Because our goal is clear: creating solutions that impress not just today, but tomorrow too.

LICHARZ

Our locations

Germany

Licharz GmbH
Industriepark Nord 13
53567 Buchholz/Westerwald
Germany

T +49 2683 - 977-0
F +49 2683 - 977-111
info@licharz.com

www.licharz.com

France

Licharz Sarl.
Z.I. de Leveau – Entrée G
F-38200 Vienne
France

T +33 4 74 31 87 08
F +33 4 74 31 87 07
info@licharz.fr

www.licharz.fr

Great Britain

Licharz Ltd.
34 Lanchester Way
Royal Oak Industrial Estate
Daventry, NN11 8PH
Great Britain

T +44 1327 877 500
F +44 1327 877 333
sales@licharz.co.uk

www.licharz.co.uk

www.licharz.com