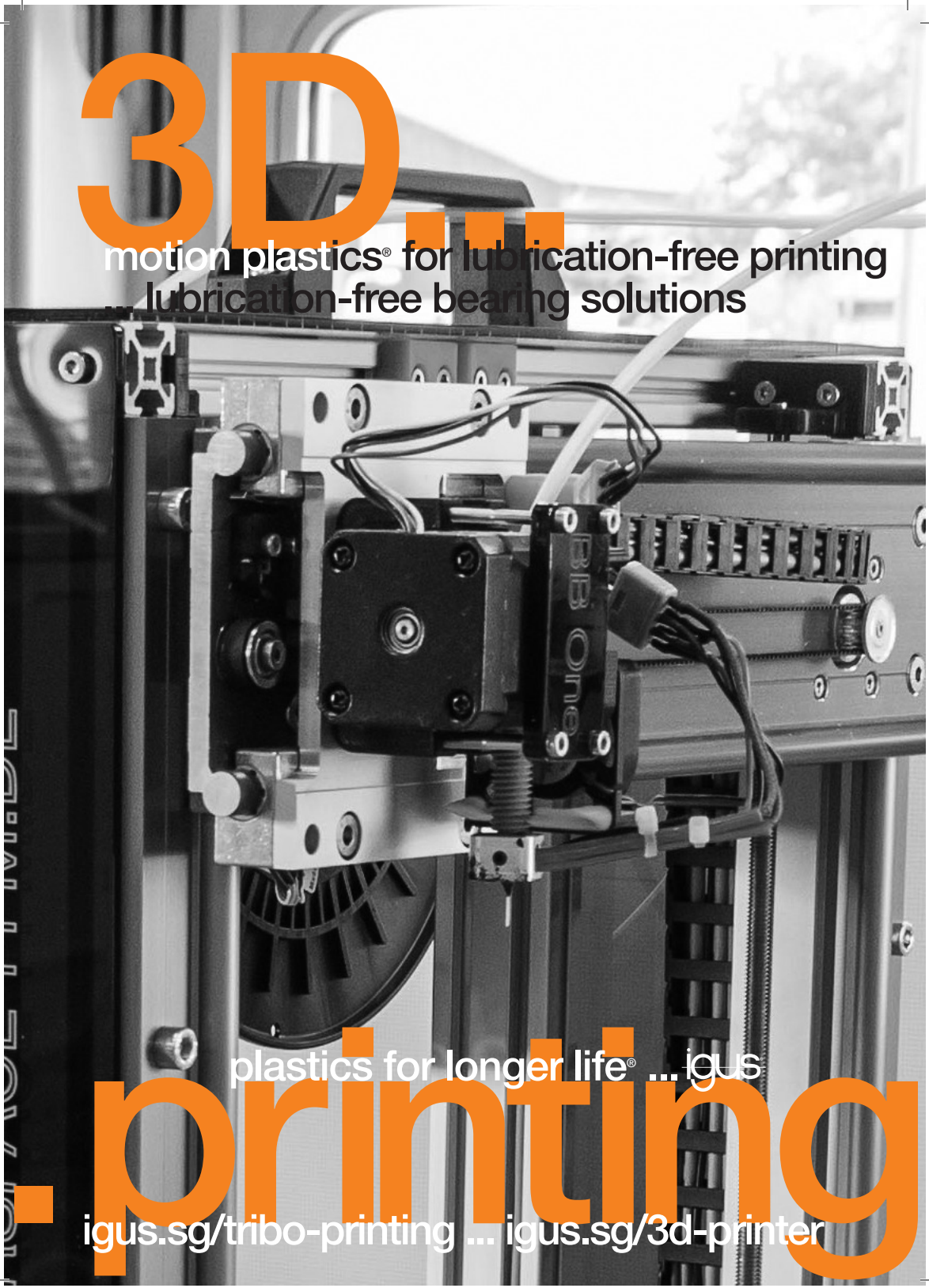

igus® solutions for 3D printing ...

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Luo Zhao Ming
Territory Manager
Bearing Products
Phone: +65 8798 1095
e-mail: zluo@igus.com.sg

Maximum 3D printing freedom thanks to the large igus® motion plastics® system – 100% lubrication-free from the bearing surface all the way to the printed product

▶ Lubrication-free printing

Extremely abrasion- and wear-resistant Tribo plastics for additive manufacturing via selective laser sintering (SLS) or the use of filament (FDM/FFF) allow you to use the printed bearing or to test the function of the part reliably and completely from the prototype or production batch onward.

▶ Lubrication-free bearings

Through the use of igus® high-quality plastics, 3D printers and scanners are maintenance-free and operate without lubrication. drylin® linear plain bearings are quiet because they do not use metal balls; dryspin® lead screw nuts adjust the print bed efficiently and precisely; igus® energy cable chains prevent cable malfunctions and extend machine operating times.

Whether they are individual components or systems such as fabricated energy chains® with cables and connectors or ready-to-install linear axes with a motor, igus® products provide the following benefits:

- Lubrication-free
- Silent operation and smooth gliding
- Resistance to dirt
- Long service life
- Corrosion resistance
- A wide array of variants and material types
- Delivery from stock at quantities as low as 1 item in as little as 24 h

Our online tools also enable you to reduce process costs.
Also visit our industry website

www.igus.sg/3d-print

www.igus.sg/tribo-printing

Draw inspiration from the ideas and solutions in this brochure.

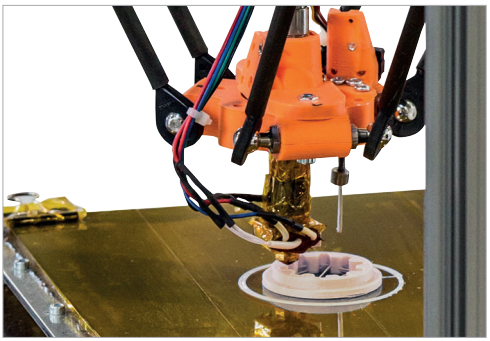
The print head layers the plastic fibres on the print table. Dry-running drylin® R linear bearings ensure accurate travel.

... innovative tribo plastics from igus®

Printed, injection-moulded, machined ...

Tribo parts, created easily according to your needs – Everything a question of quantity

With around 100 different materials for very different environments, igus® now offers the largest selection of tribo-enhanced plastics. igus® also offers the most common methods of processing these Tribo plastics such as 3D printing, extrusion or injection-moulding. As a result, the design engineer always has the right quantity of the right parts in each phase of his project development work.



3D printing / SLS

For prototypes and small quantities

made from tribo-filaments with the laser sintering method

Wear-resistant materials for 3D printing and the laser sintering method – Print parts yourself or have igus® print them for you.

- Up to 50-times more abrasion-resistant than normal 3D printing materials
- Various iglidur® materials available for FDM/FFF (filament) and SLS (powder)
- No tool costs; cost effective for as little as 1 piece

Milled/turned/routed

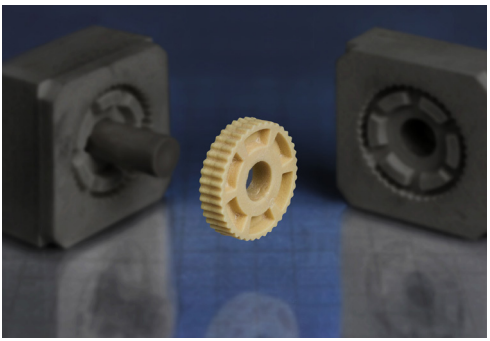
For small batches

made from iglidur® bar stock

For greater designing freedom: bar stock for doing it yourself or supplied immediately as your finished part.

- As round bar in Ø 10-100 mm
- As plate material in thickness 2-40 mm
- Lengths 100-1,000 mm

... for tribologically identical properties



Printed tools

For small batches
made from iglidur® granules

3D-printed injection mould tools. Bearing parts with a simple geometry can be made from most iglidur® materials.

- Customised parts delivered from 72 hrs
- Up to 80% more cost-effective than conventional injection mould tools
- For prototypes and small batch production

Injection moulding

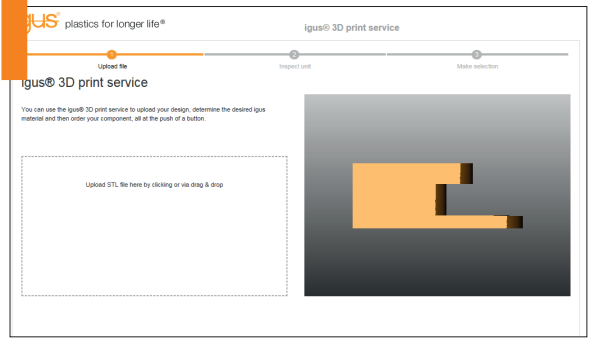
For serial production
made from iglidur® granules

Modern injection-moulding systems enable the low-cost, controlled manufacture of standard and special parts.

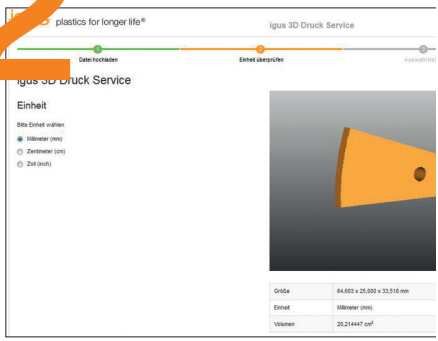
- Can be ordered and calculated online
- 100,000 products from stock

Individual wearing parts in 24 hrs...

1



2



Wearing parts from the 3D printing service: extremely fast and online

Printed parts extreme wear-resistant– as prototype or in small series. Simply upload your desired part, determine the price and order online (or ask for a quotation).

Thanks to the iglidur® 3D printing service, from now on 3 quick and easy steps will fetch home your customised component made of self-lubricating and abrasion-resistant iglidur® plastics.

1. Upload STL file
2. Inspect the component in the 360° viewing mode and select the dimensional unit
3. Select the Tribo material and order the component or ask for a quotation

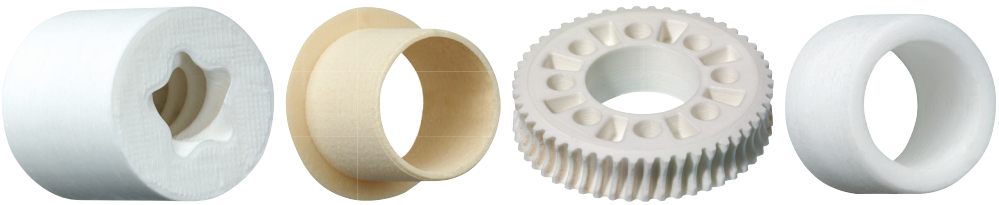
SLS can also be used to make wear resistant parts

The 3D printing service is being extended with the material iglidur® I3. Laser sintering (SLS) is used to make parts of this material. Even more bearing applications are therefore possible with 3D printed parts as strength and precision are considerably greater if this method is used.

- Wear-resistant and lubrication-free
- Good mechanical properties
- Detail accuracy with exact surfaces
- Delivered from 48 hrs

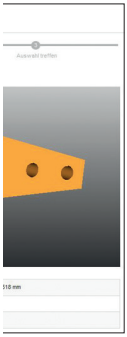
Test online now!

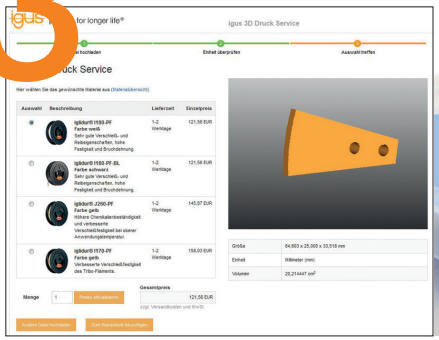
www.igus.sg/3dprintservice



... a quotation in 60 sec ...

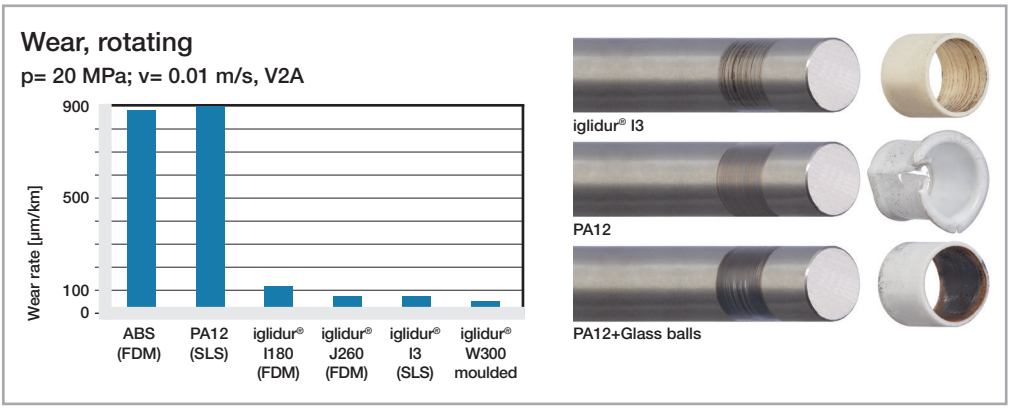
3





The precision of the printed parts in the case of the iglidur® tribo-filaments is ±0.2 mm (up to an edge length of 50 mm, above this ±0.4 %). In the case of parts made using the laser sintering process (iglidur® I3), the precision is ±0.1 mm (up to an edge length of 50 mm, above this ±0.2 %).

The space used for processing the iglidur® tribo-filaments measures 135x145x200 mm. In the case of laser sintering of iglidur® I3, the space used measures 200x200x300 mm. The following applies to both processes: larger parts may have to be made of several sections.



igus® tribo-filaments ...

3D printing with tribo-filaments
50 times more abrasion resistance than standard materials for maximum service life

Components made of igus® tribo-filament are up to 50 times more wear-resistant than standard materials for 3D printing and therefore have an extremely long service life. Due to their excellent tribological properties, they are suited for 3D printing of replacement parts for e.g. bearings, drive nuts, gears and other components. The igus® tribo-filaments can be processed on 3D printers that are based on the fused-deposition-modelling method (FDM/FFF) and that allow the nozzle temperature to be set as required.

"How do I assess myself and my 3D printer?"			
Ambient temperature of application	**Beginner** *"What can go wrong"*	**Advanced** *"Everything is usually ok"*	**Expert** *"I know what I am doing"*
-30 to +65 °C	iglidur® I150	iglidur® I150 iglidur® I180	iglidur® I180 iglidur® J260 iglidur® I170
-40 to +80 °C	iglidur® I180	iglidur® I180	iglidur® I180 iglidur® J260 iglidur® I170
-30 to +100 °C			iglidur® J260 iglidur® C210
-100 to +120 °C			iglidur® J260

Find and order the appropriate tribo-filament online

www.igus.sg/tribofilament

... for 3D printing

Material: iglidur® I150

Wearing parts printed the easy way

- High abrasion-resistance at low speeds
- Good mechanical properties
- The easiest to process tribo-filament (even without a heated print bed)
- Nozzle temperature: 240 - 250 °C

Material: iglidur® I180

Best combination of ability to be processed and service life

- High abrasion resistance
- Good mechanical properties
- Nozzle temperature: 250 - 260 °C
- Also in black (iglidur® I180-BL)

Material: iglidur® J260

Extremely long service life and excellent coefficients of friction

- Outstanding abrasion-resistance of tribo-filaments
- Application temperature from -100 °C to +120 °C
- High-quality processing
- Nozzle temperature: 260 - 270 °C

Material: iglidur® I170

Longer service life

- Improved abrasion-resistance
- High-quality processing
- Nozzle temperature: 240 - 260 °C

Material: iglidur® C210

Resistant to chemicals and highly abrasion-resistant during printing

- High chemical resistance
- High abrasion resistance
- High-quality processing
- Nozzle temperature: 260 - 270 °C

Printed as good as injection-moulded ...

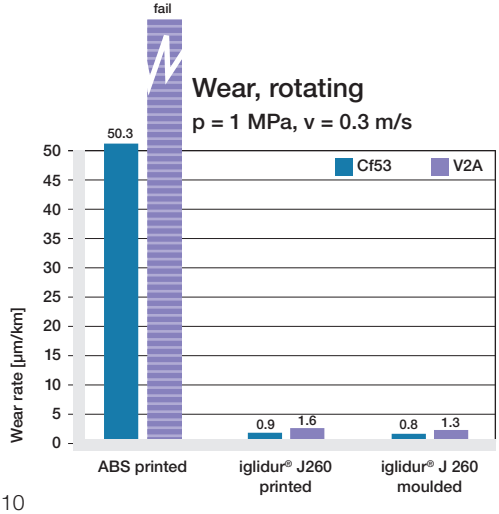
Tribo sensation: iglidur® J260 filament

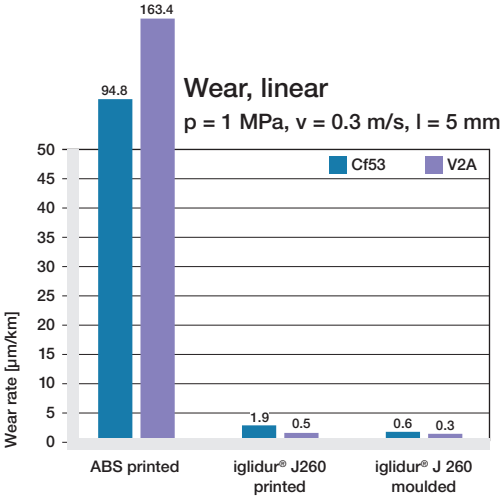
3D print filament impresses during tests with injection moulding quality

Our iglidur® J260 tribo-filament is more wear-resistant than standard print material

Our series of tests show: printed plain bearings from our latest filament iglidur® J260 are equally as wear resistant as our injection-moulded parts from the same material. The tests have also proven that iglidur® 3D print filaments have considerably lower coefficients of friction and are up to 50 times more abrasion-resistant than conventional 3D printing materials. This makes iglidur® tribo-filaments the only 3D printing materials to also offer impressive performance in moving applications. You can therefore directly install printed parts such as bearings, drive nuts or worm gears and use them as wearing parts – from the prototype phase to series production.

- Outstanding abrasion-resistance of tribo-filaments
- Application temperature from -100 °C to +120 °C
- High-quality processing
- Available as filament, bar stock or injection-moulded part – from the prototype of series production



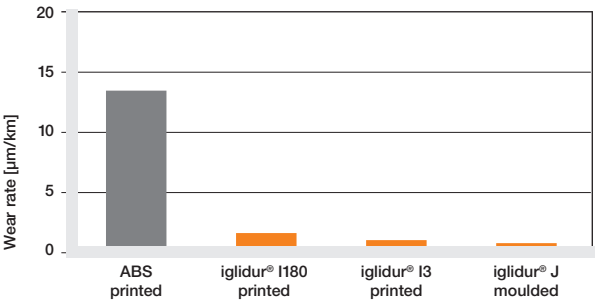


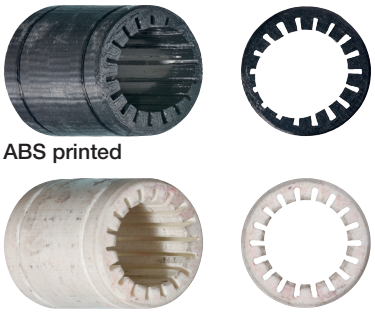
... tested thousands of times

Parts made of iglidur® tribo-filament with the 3D printing method or parts made of iglidur® I3 with the SLS method are much more wear-resistant than standard 3D materials.
The following tests also show that, "printed and injection-moulded", the 3D printed iglidur® bearings are comparable to conventionally made bearings in respect of wear-resistance.

Wear, linear

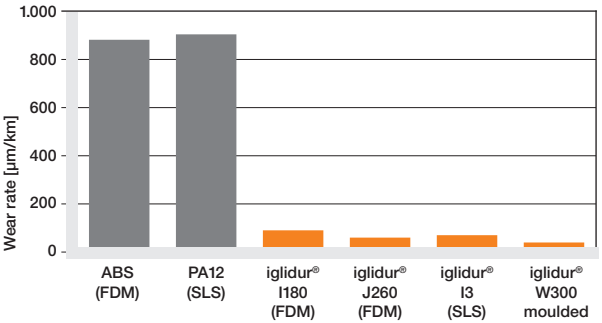
p = 0.11 MPa, v = 0.34 m/s, l = 370 mm





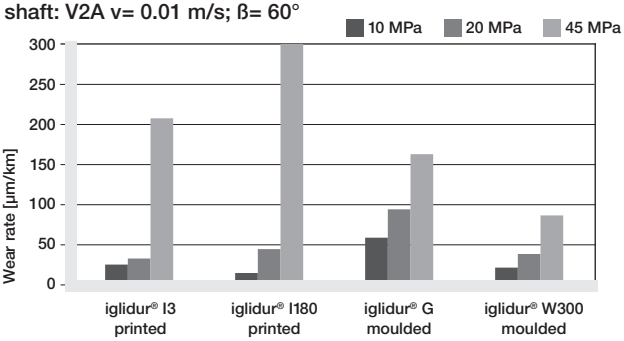
Wear, rotating

p = 20 MPa, v = 0.01 m/s, V2A



Wear, pivoting

shaft: V2A v= 0.01 m/s; ß= 60°



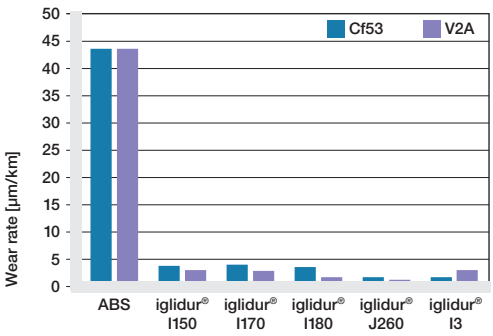
igus® tribo-filaments ...

Material properties		iglidur®				
General properties	**Unit**	**I150**	**I180**	**J260**	**I170**	**C210**
Density	g/cm³	1.30	1.21	1.35	1.21	1.4
Colour		white	white	yellow	yellow	purple
Max. moisture absorption at +23 °C and 50 %r.h.	% weight	0.3	0.3	0.2	0.5	0.3
Max. water absorption	% weight	0.7	0.9	0.4	1.6	0.7
Mechanical properties						
Flexural modulus	MPa	1,700	1,000	1,000	1,000	1,600
Flexural strength at +20 °C	MPa	54/41[1)]	46/33[1)]	41/13[1)]	33/17[1)]	38/30[1)]
Shore-D hardness		62	66	66	64	70
Physical and thermal properties						
Max. long-term application temperature	°C	+65	+80	+120	+75	+100
Max. short-term application temperature	°C	+75	+90	+140	+85	+180
Min. long-term application temperature	°C	–30	–40	–100	–40	–30
Electrical properties						
Specific volume resistance	Ωcm	> 10^{13}	> 10^{12}	> 10^{12}	> 10^{12}	> 10^{13}
Surface resistance	Ω	> 10^{12}	> 10^{11}	> 10^{10}	> 10^{11}	> 10^{12}

[1)] Printed flat/upright

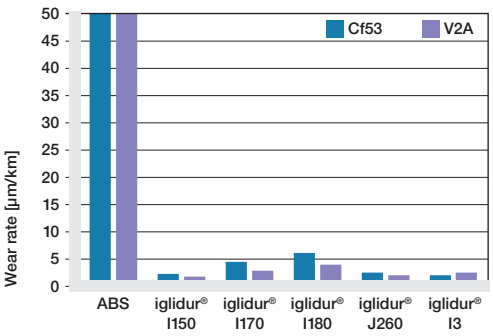
Wear, pivoting

p = 1 MPa, v = 0.01 m/s



Wear, short stroke

p = 1 MPa, v = 0.1 m/s



... Processing & accessories

Processing instructions

iglidur® tribo-filaments can be processed on any 3D printer that is equipped with a heated print bed on which temperatures are adjustable. The igus® adhesive film allows a good adhesion between the iglidur® tribo-filament and the print bed. Further recommended printing surfaces are "Buildtak" or "Blue-Tape" with glue applied "Pritt Power" stick.

- Good ventilation should be provided during processing
- When heated above +300 °C, hazardous fumes are produced

Complete processing instructions online: www.igus.sg/tribofilament

Example: Art. No. tribo-filaments
I150-PF-0175-0250
for 250 g spool with a diameter of 1.75 mm made of the iglidur® material I150

igus® print bed film for your print bed

Part No. adhesive film for print bed
PF-01-0203-0203 (203 x 203 mm)
PF-01-0254-0228 (254 x 228 mm)

Thanks to the film available from igus® for the print bed, there is very good adhesion between the iglidur® tribo-filament and the print bed.

- Useable up to approx. 20 times
- "Set" the degree of adhesion by means of print bed temperature
- 3D printer without heating bed? The combination of iglidur® with this print bed film also makes it possible to make wearing parts oneself with such 3D printers

Spool

iglidur® tribo-filaments weighing 250 g are wound onto a spool with an outer diameter of 105 mm, a width of 55 mm. It has an inner diameter of 55 mm. Test kits with 25 g filament are also available; this is not wound onto a spool.

Example: Art. No. Test kits
I150-PF-0175-0025
for 25 g of filament, loose with 1.75 mm diameter made of the iglidur® material I150

Filament thickness

The iglidur® tribo-filaments are available with 1.75 mm and 3 mm thickness. The 3 mm filaments can be used without problems in 3D printers that need a 2.85 mm filament.

3x more material

With the bigger spool size, each spool contains 750 g filament (300 m filament in 1.75 mm diameter or 90 m filament in 3 mm diameter).

For 3D printing via SLS ...

Tribo plastic for the laser sinter process

The material iglidur® I3, specially developed for laser sintering, proved to have an abrasion resistance at least 3 times greater than conventional materials for laser sintering during tribological tests in the igus® test laboratory. This means the degree of design freedom for wear resistant parts has been increased yet again.

- Wear resistant
- Good mechanical properties
- Detail accuracy with exact surfaces
- Can be processed using the standard parameter set
- Refresh rate: 75%

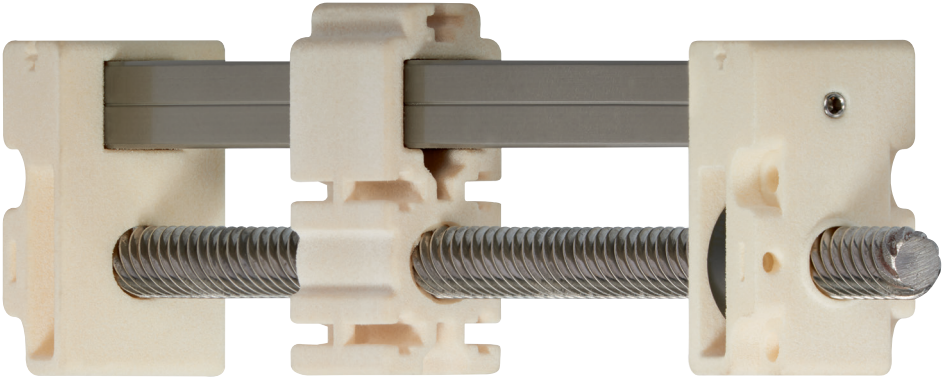
www.igus.sg/laser-sintering

Material properties		iglidur®
General properties	**Unit**	**I3**
Density	**g/cm³**	1.05
Colour		Yellow
Max. moisture absorption at +23 °C and 50 %r.h.	**% weight**	0.8
Max. water absorption	**% weight**	1.9
Mechanical properties		
Flexural modulus	**MPa**	1,400
Flexural strength at +20 °C	**MPa**	68/61[1)]
Shore-D hardness		70
Physical and thermal properties		
Max. long-term application temperature	**°C**	+80
Max. short-term application temperature	**°C**	+140
Min. long-term application temperature	**°C**	–40
Electrical properties		
Specific volume resistance	**Ωcm**	> 10^{12}
Surface resistance	**Ω**	> 10^{11}

[1)] Printed flat/upright

... designed in 3D

Lubrication-free and wear-resistant due to laser sintering with iglidur® I3

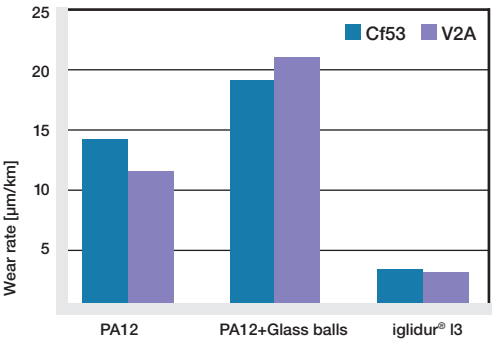


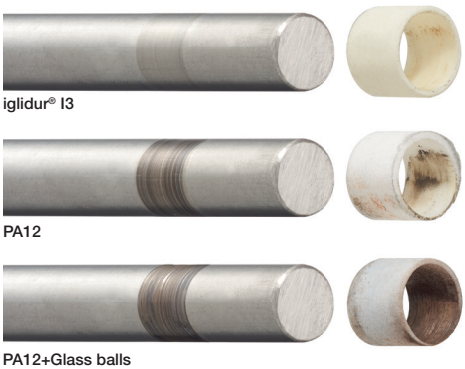
The first drylin® linear module made from iglidur® I3

With the SLTI3, igus® is taking a completely new approach to drive technology. This lead screw module was developed with the following goals: fast and very easy installation, the use of lubrication-free and wear-resistant high-performance polymers and greatest possible variability. Due to the reduced number of components, the lead screw module can be assembled in seconds. Consisting of wear-resistant iglidur® I3, the carriage is made with the laser sintering method. **Your wishes regarding lengths or fastening options or even regarding appearance can be implemented very quickly and printed overnight.** This is how YOUR drylin® linear module is created.

Wear, rotating

v = 0.3 m/s p = 1 MPa

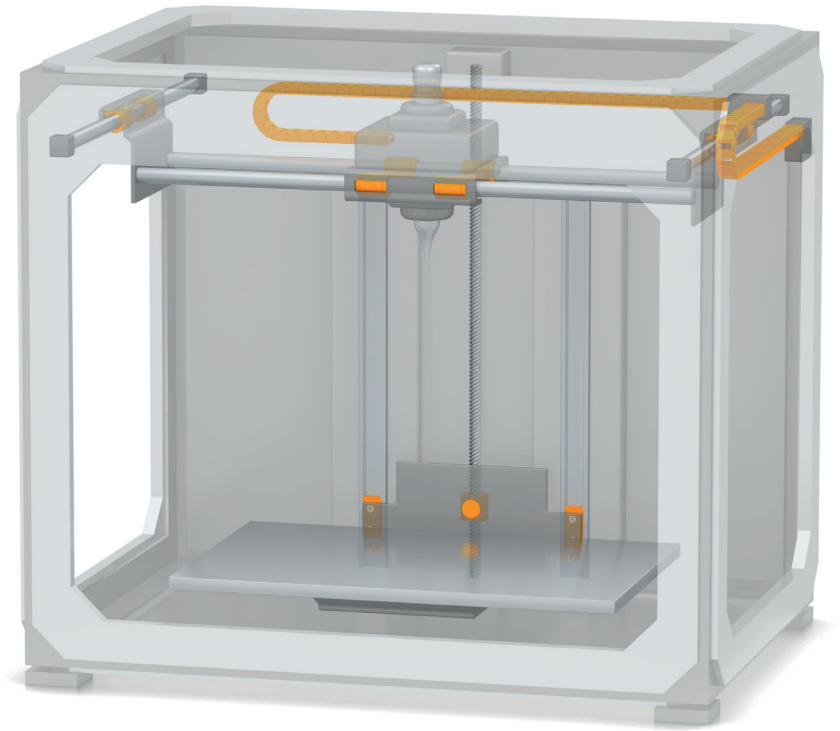




Test result: In this rotating wear test, the abrasion resistance of iglidur® I3 is higher than that of conventional SLS materials by a factor of 4. In addition, the shafts and bearings that are shown here and were used in the test make it clear that iglidur® I3 results in considerably less stress on the mating component, the service life of which is also increased as a result.

igus® solutions for 3D printers ...

Our diverse systems offer a large selection of suitable products for all moving applications in 3D printers: linear guides and energy chains® in flat installation heights, the smallest sizes and narrow bend radii. Our lubrication and maintenance-free 3D printing components allow you to improve your 3D technology while also reducing costs.



▶ Lubrication-free for life

No risk of contaminating printing components and printed products

▶ Silent operation and smooth gliding

Very quiet operation and perfectly harmonised polymer materials

▶ Lightweight, easy assembly and cost-effective

By the use of lubrication-free high-performance plastics in plain bearings and energy chains® and anodised aluminium in guide rails

▶ Long service life

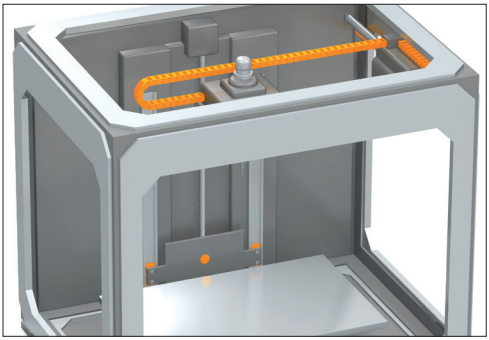
Prevent cable malfunctions with igus® energy chains® and flexible chainflex® cables that are compatible with energy chains®

▶ Variety of sizes and options

Suited for even the smallest installation spaces

▶ Available in 24hrs or today

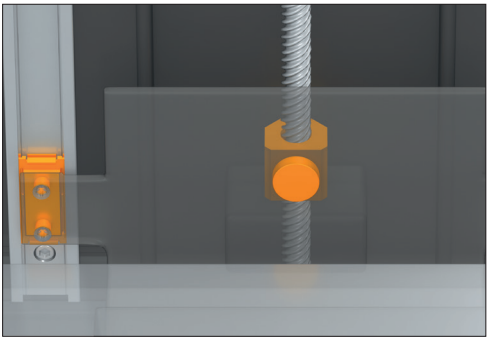
... quiet, smooth, lubrication-free



Cable guide for print head

igus® energy chains® and cables

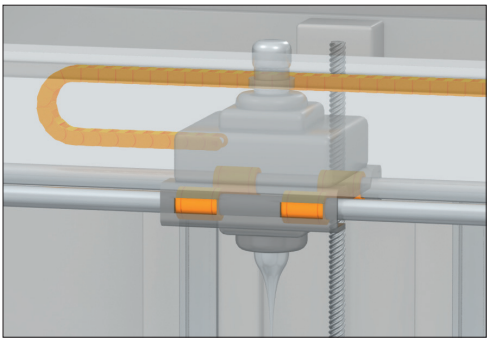
- Solutions for tight bending radii
- Low weight, high speed



Print table/bed lowering mechanism

drylin® lead screw drives

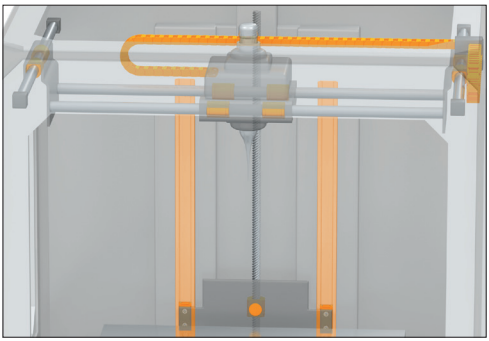
- Self-locking trapezoidal and metric threads



Linear movement of XY axis

drylin® R shaft guides

- Superior operating properties, long service life
- Wear resistant, and resistant to dirt



Height-adjustable Z axis

drylin® linear guides

- Linear modular system based on rails, linear bearings and carriages

drylin® R linear bearings with iglidur® J liner

- Closed, anodised aluminium adapter
- A perfect 1:1 replacement for recirculating ball bearings
- Available also as low-clearance version

www.igus.sg/RJUM

drylin® R solid polymer bearings

- Japan dimensions
- The lubrication-free alternative, including to former ball bearings in 3D printers
- Cost-effective
- Lightweight

www.igus.sg/RJ4JP

Lubrication free for 3D-printers ...

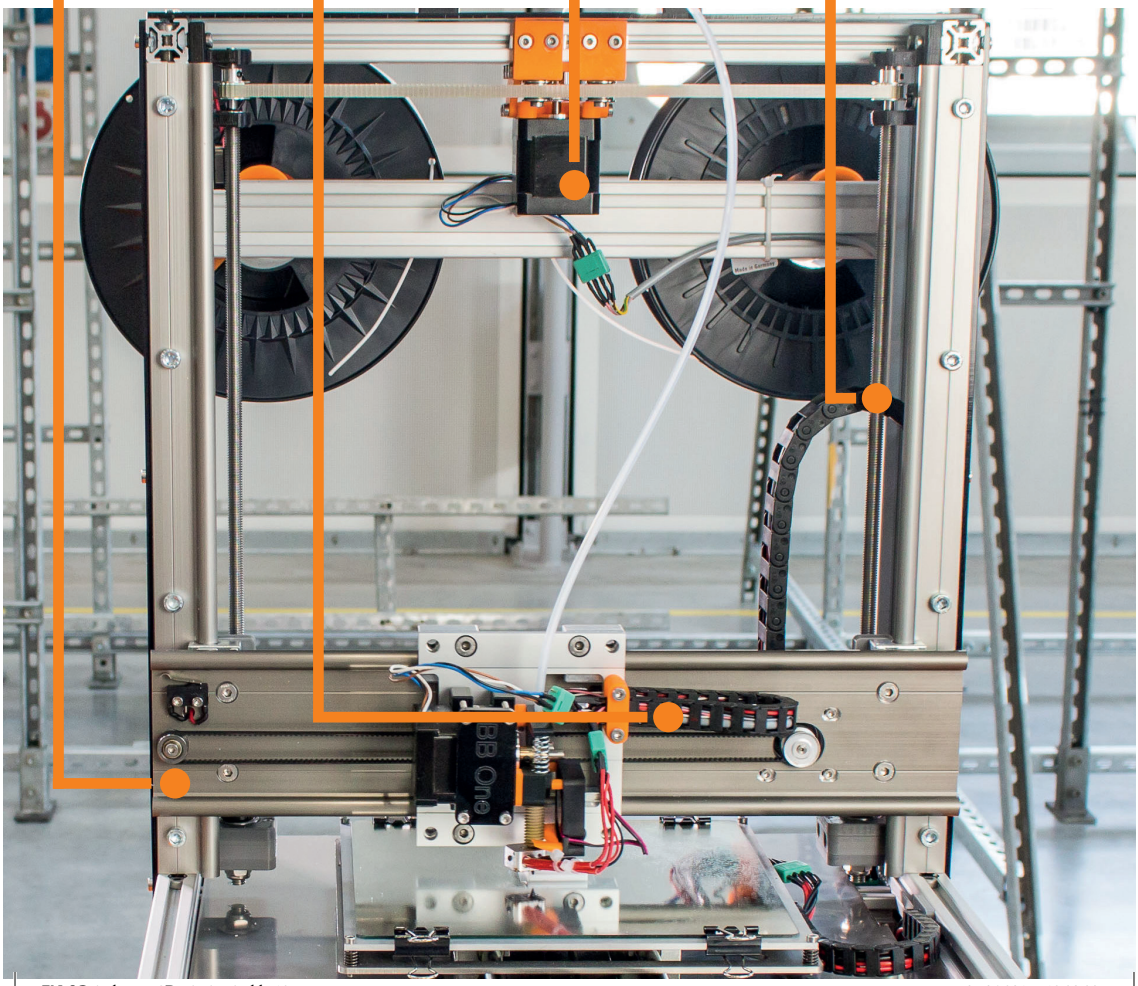
A complete system for new ideas. igus® offers you lubrication and maintenance-free components and ready-to-install system solutions – ideal for any installation space. Plain bearings, linear guides, energy chains® and suitable cables in many installation sizes and materials inspire creativity in design engineers. energy chains® fabricated with cables and plugs or ready-to-install linear axes with motors make assembly easier and reduce the risk of malfunction.

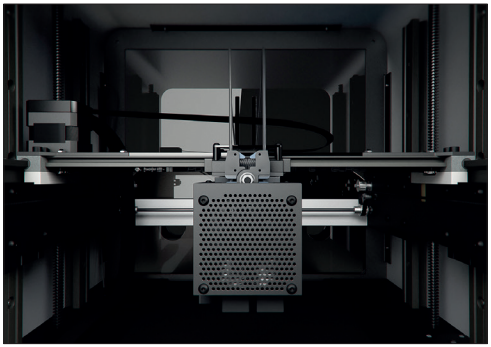
Quiet, light and clean
drylin® linear systems for round shafts and rail guides

Stable even when subjected to the narrowest bend radii
igus® e-chainsystems®

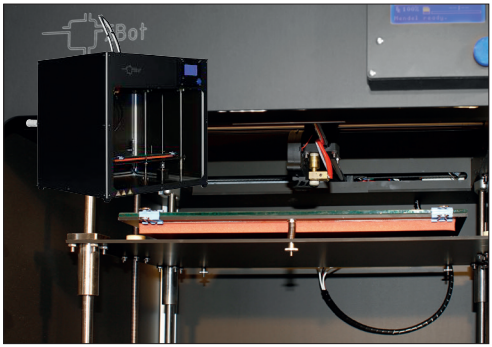
Strong, durable, ready-to-install: drylin® E step and DC motors
As a lead screw motor or with a drylin® linear axis

Efficient, durable, lubrication-free: drylin® lead screw nuts and lead screws
- High helix thread
- Trapezoidal thread
- Metric threads

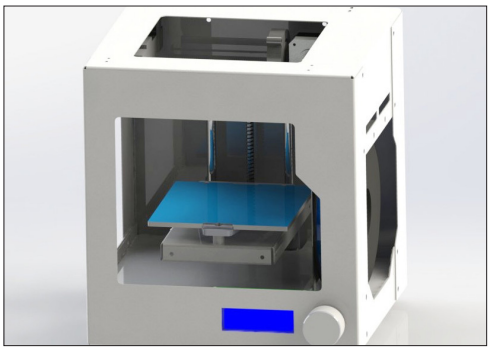




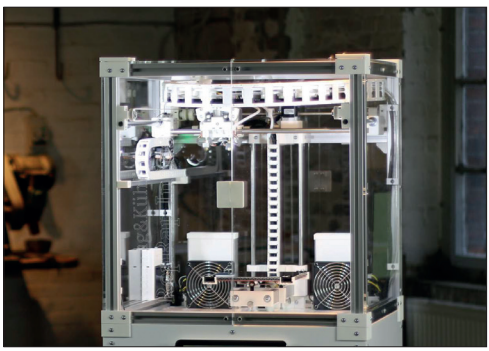
drylin® T & drylin® N linear guides, as well as drylin® lead screw units move in the 3D printer free of lubrication without any risk of contamination on the filament and the printed products. [Cobot]



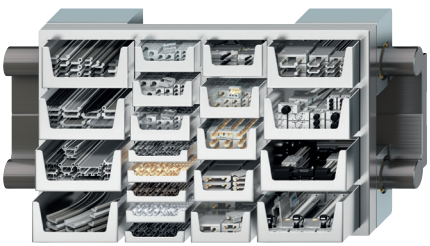
This 3D printer runs quietly and precisely. This is made possible by trapezoidal lead screw nuts and plain bearings from igus®, which are mounted on all axes of the printer. [Reprap Austria]



Precise printing: made feasible by a drylin® linear guide system from igus®, which enables precise and smooth movement of the print head. [edu3DP]



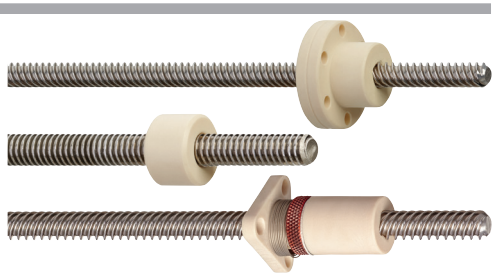
The use of maintenance-free drylin® linear bearings eliminates the regular greasing, and they move quietly and dampen the vibrations occurring during high accelerations while printing [Kühling & Kühling GbR]



drylin® W modular linear construction kit

- For maximum design freedom
- Modular, lubrication-free and strong
- Many rail geometries, bearing types, as pure linear guide or combined with drive and motor.

www.lineartoolkit.eu



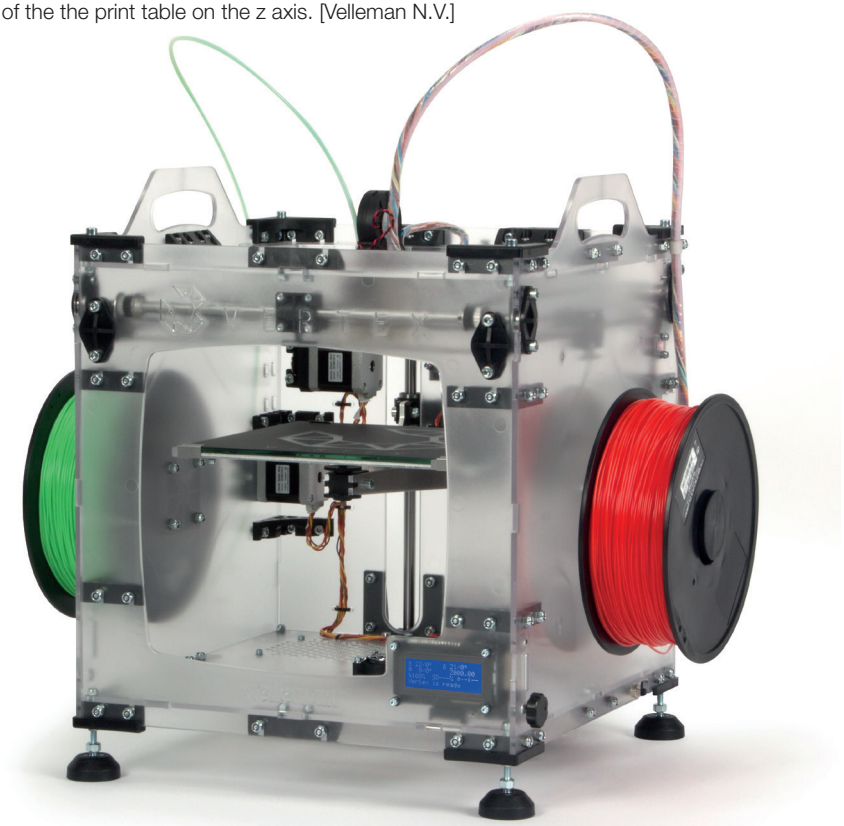
drylin® lead screw nuts and lead screws

- For height control in the case of motor-operated systems
- With a self-locking mechanism or high-speed dryspin® technology
- Lubrication-free, low noise, smooth running and efficient

www.igus.sg/dryspin

Efficient for 3D printers ...

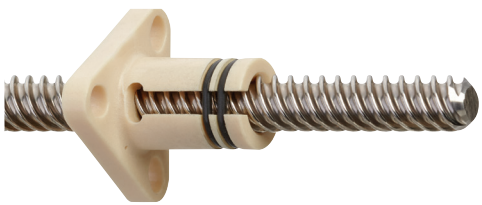
The VERTEX K8400 is a reliable open-source 3D printer kit from Velleman. Lubrication-free drylin® RJMP polymer bearings guide the print head precisely and drylin® trapezoidal threaded nuts and lead screws are responsible for movement of the the print table on the z axis. [Velleman N.V.]



drylin® W bearings with spring preload

- For manual movement without "stick-slip" effect
- Quiet and smooth movements
- Suitable for single and double rails

www.igus.sg/WJUM-P



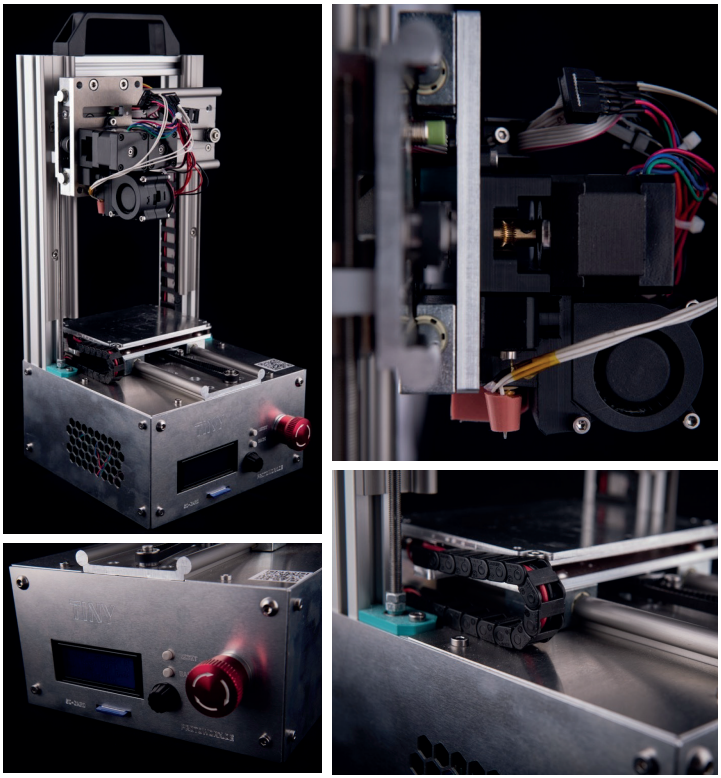
drylin® lead screw nut with pre-load

- Quite operation and low clearance
- Constant radial pre-loading
- Available for efficient dryspin® high helix thread and self-locking trapezoidal thread

www.igus.sg/dryspin

... guided lubrication-free

The TINY from Protoworx is a compact 3D printer, ideal for mobile use and reliable in continuous operation. The drylin® W linear system guides the x, y and z axes, a lubrication-free drylin® trapezoidal thread adjusts the height and an e-chain® E2 guides the cables. [Protoworx UG]

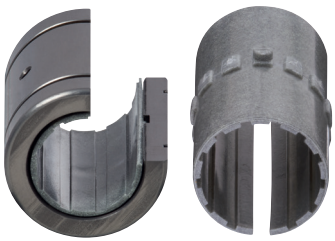


E2.1 micro e-chain® – snap-open outside

- Stronger, quieter, faster assembly*
- Available in 2 inner heights and many widths/radii
- Chain opener is included

www.igus.sg/E2.15

* compared to preceding versions



drylin® R linear bearings with iglidur® E7 liners

- Service life up to 8 times longer on steel and stainless steel shafts
- Precise, resistant and 100% lubrication-free.
- For drylin® linear bearings and housing with Ø10-60

www.igus.sg/drylinR

Lubrication-free in delta printers .

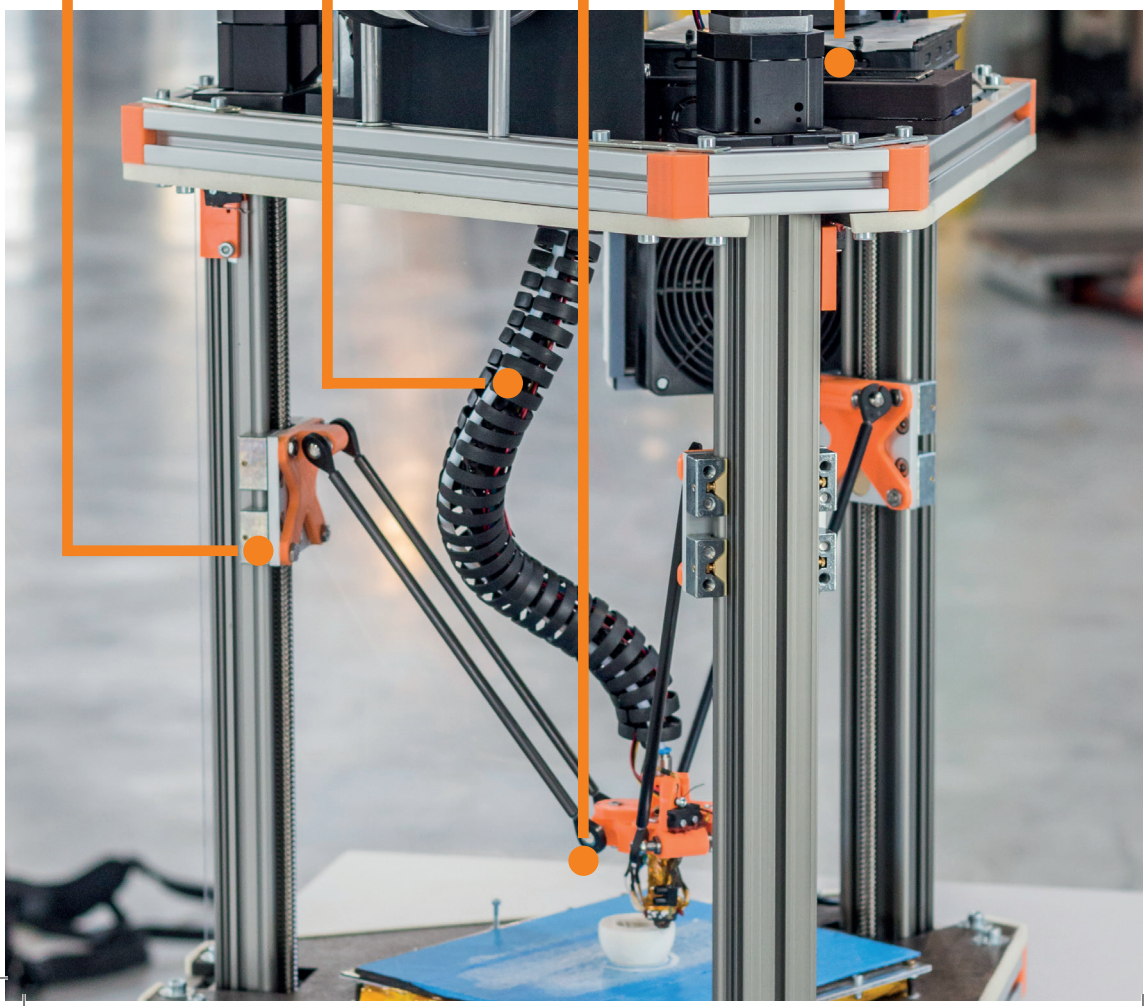
Durable construction with lightweight components, quiet operation based on the "sliding instead of rolling" principle, resistance to contamination thanks to the omission of lubricants. igus® offers a wide variety of solutions for delta attachments – reliable in guiding and connecting the print head – with a flat design for maximum pressure volume.

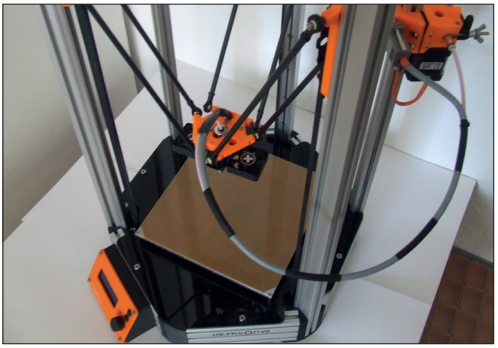
Low profile and precise
drylin® N low profile guides and drylin® W profile guides

Extremely flexible with little wear on cables
3D e-chain® triflex® R

Lightweight, durable and resistant
igubal® rod end bearings

Ready-to-install and tested
drylin® E linear axes with stepper motors





The drylin® N low profile guides and igubal® rod end bearings in this 3D printer kit are impressive due to the maintenance-free dry running with suitably matching printing results. [FabLab Karlsruhe e.V.]

This 3D printer prints reliably and precisely thanks to the lubrication and maintenance-free plastic components from igus®.
[GLOBAQ srl and New 3D Printing Life srl]

Objects up to 1 m high can be printed uniformly and precisely thanks to drylin® linear guides.

Precision printing even after extended use: igubal® spherical bearings and drylin® linear bearings in this 3D printer.

igubal® spherical bearings

- Angle-compensation
- Precise guidance of the print head
- Available with inside and outside threads and in many installation sizes and shapes of Ø 2-30 mm

www.igus.sg/igubal

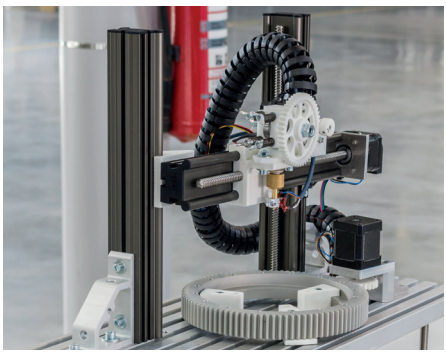
chainflex® cables – with guarantee

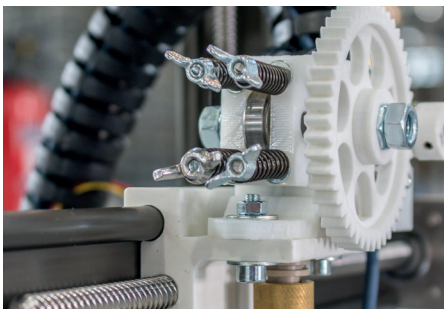
- Over 1,244 types from stock
- Smallest bend radii
- Abrasion-resistant jacket materials
- Halogen-free and/or flame-retardant

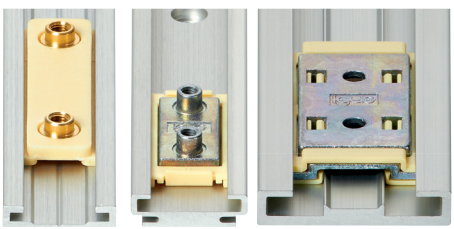
www.igus.sg/chainflex

Successful in delta printers ...

This compact and completely lubrication-free 3D printer kit is based on the hard-anodised drylin® W high profile for adjustment in the y and z directions. The torsion-resistant linear profile gives the printer the necessary stability without an additional frame structure, while providing a variety of connection options.The torsion-resistant linear profile gives the printer the necessary stability without an additional frame structure, while providing a variety of connection options. The direct drive via drylin® E lead screw motors is precise and saves space. Linear carriage including threaded nuts were printed from the iglidur® tribo-filament I180.







drylin® N low profile guide

- Extremely compact linear guide in 4 installation sizes for each installation area
- Low coefficients of friction, long service life
- Cost-effective

www.igus.sg/drylinN

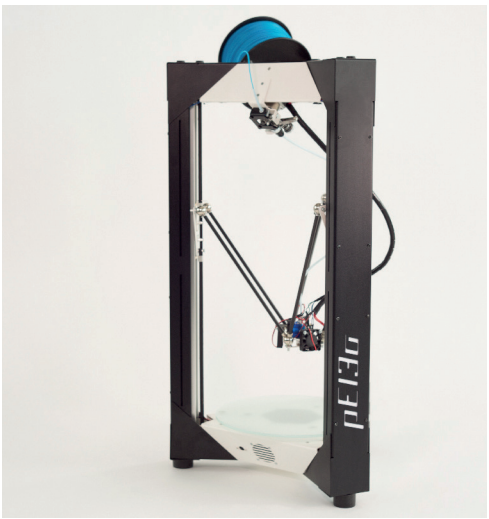
triflex® R e-chain®

- Thanks to the easy principle, filling and removal of cables is simple
- The rounded, elegant design has received an iF Design Award

www.igus.sg/triflexR

... long-lasting, lubrication-free

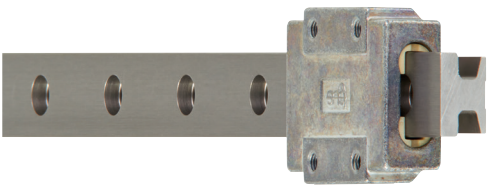
The LOV3 delta 3D printer from PEL3O has been designed for both commercial and private use. The goal here was to address the creative mind. The LOV3 design is close to perfection.
In order to achieve this goal, drylin® N linear guides were used. The 3D printer from PEL3O operates quickly and reliably with drylin® N and without the need for maintenance.
The most important decision criterion for drylin® N low-profile guide systems is the low installation height as this makes it possible to achieve a maximum load. Lightweight carriages can now be operated at higher speeds with quicker accelerations.
Thanks to drylin® self-lubrication, printer operation is maintenance-free. This means that operation is easier and there are almost no operational costs. The wear resistance of drylin® N guarantees that the LOV3 3D printer will have a long service life. [PEL3O]



iglidur® polymer plain bearings

- Guarantee low-noise movements
- Robust and wear-resistant, even when subjected to heavy loads and harsh environments
- Light weight and easy to install

www.igus.sg/iglidur



drylin® T low profile linear guide system

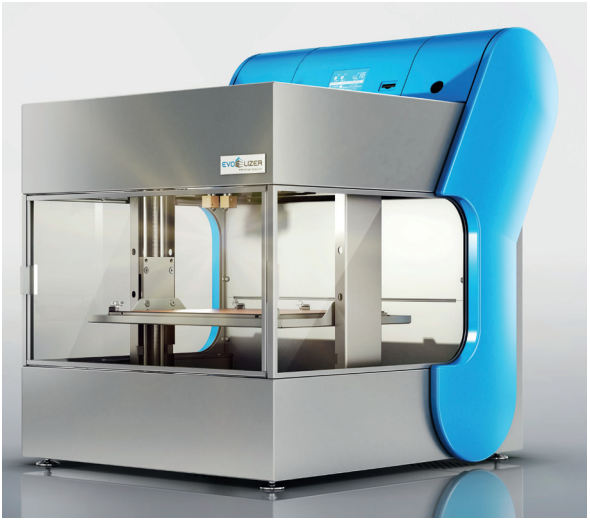
- Classic low profile guide in 4 installation sizes (7-15 mm)
- Compact design, robust carriage
- With clearance adjustment if requested

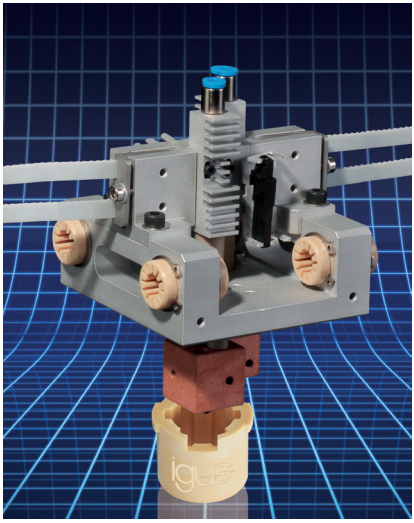
www.igus.sg/TK04

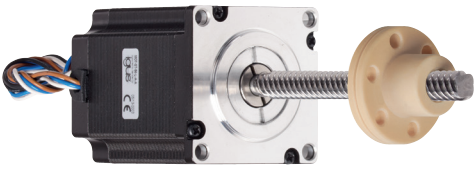
Everything from a single source ..

... system solutions for the 3D print industry

In addition, igus® energy chains® ensure that connection cables are supported during the computer-controlled print process. Due to their low-profile and tight bending radii, the micro-chain series are particularly suited for dynamic applications in any direction of movement on 3D printers. As is the case for linear plain bearings, micro-chain series also have a very low weight. The chainflex® control and motor cables guided in these are specifically designed for continuous motion applications, guaranteeing a long service life for 3D printers. Combined with motorised drylin® linear axis, which include motor flanges, couplings and drylin® E stepper and DC motors, igus® can supply a fully complete, ready-to-install operating unit from a single source. [EVO-tech GmbH]



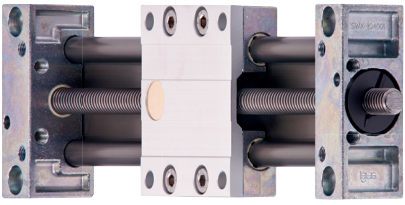




drylin® lead screw motors

- 7 lead screw types with pitches from 0.8 - 50 mm
- Maximum precision by centring the lead screw
- The lead screw can be attached on either side
- Space saving, versatile

www.igus.sg/leadscrewmotor



drylin® SLW linear modules

- With self-locking trapezoidal thread or fast, high helix thread
- For any installation space, for manual and electrical adjustment mechanisms with motor

www.igus.sg/drylinSLW

... ... printing in the XXL format

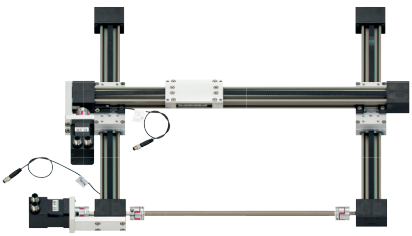
Canal house from the mobile 3D printer in XXL format

With the second generation of the "Kamer Maker 2.0", Actual can print larger elements with high precision and greater speed. The igus® gantry system was instrumental in this. Joe Platt, Head of Mechanical Engineering at Actual: "igus® gave us excellent support, and the gantry proved to be the best in practice." Among the projects undertaken by Actual at present is the "3D print Canal House", which is currently being built on a town canal in Amsterdam. In this case, a room gantry is used, in which the x- and y-axis have been implemented with drylin toothed belt units and the z-axis with drylin lead screw / nut systems. Ready to install gantries for one, two and three axes with actuators and sensors for position detection. [Actual]

drylin® ZLW toothed belt axes

- Ready-to-install linear axes with toothed belt drive and stepper motors
- Fast and quiet operation

www.igus.sg/drylinZLW



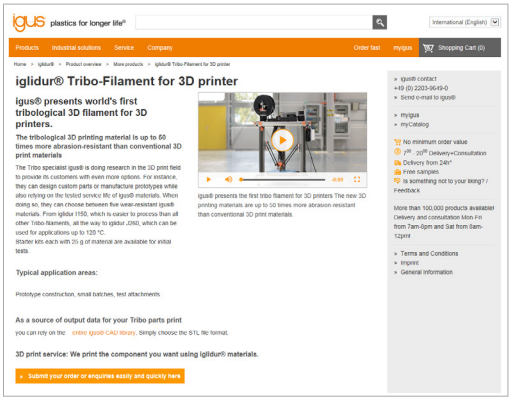
drylin® E linear robots

- Combination of drylin® linear axes (with motor) configured ready for installation
- For multi-dimensional movements, e.g. for pick&place or print head guidance
- Linear, flat and room linear robots are available

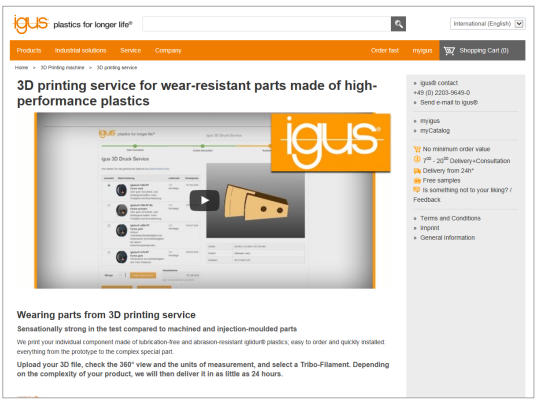
www.igus.sg/gantry

www.igus.sg/...

www.igus.sg/tribofilament



www.igus.sg/tribo-printing



www.igus.sg/3dprinter

www.igus.sg/drylinW

www.igus.sg/online

Reduce process costs ...
A selection of our useful online tools

Expert system for drylin® linear bearings
– system selection & lifetime calculation with CAD
www.igus.sg/drylin-expert

Configurator for the drylin® drive technology
www.igus.sg/quicklin

Lifetime calculator for drylin®
lead screw drives
www.igus.sg/screwdrivequick

Service life calculator for e-chains®
– unsupported and gliding applications
www.igus.sg/quickchain100

Product finder for short travels
– up to 13 m unsupported applications
www.igus.sg/quickchain13

Expert system for iglidur® plain bearings
– product selection and lifetime calculation
www.igus.sg/iglidur-expert

iglidur® 3D printing service
– material selection and price information
www.igus.sg/3dprintservice

Since 1987, 36 igus® products have been awarded by "iF Forum Design GmbH" in the "Industrial Design" category.

www.igus.sg/iF

igus® service for schools and universities supports students and instructors (the pioneers in the production of our prototypes).

www.igus.sg/yes

For all tasks – in all batch sizes

Different industries need different solutions. Ranging from mechanical engineering, automotive assembly, to the robotics industry - igus® offers customised solutions for specific applications.
igus® already has many years of experience and specialised resources in many industries.

www.igus.sg/industry

plastics for longer life® ...

igus® delivery service

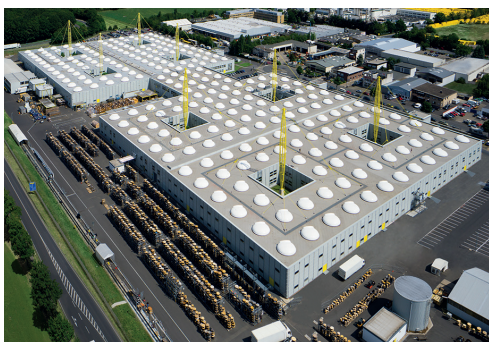
An orientation to innovations and service is one of the focal points of our corporate philosophy.
We have therefore put together an extensive package of services for you: no minimum order quantity, speedy delivery after 24 h, more than 100,000 products from stock. Order an iglidur® bearing or a pre-assembled standard portal from stock in 24 hours at no extra cost. Rapid delivery is guaranteed worldwide. Spare parts are delivered ex stock in the shortest possible time.

Modern injection moulding technology

The igus® GmbH quality policy is based on the objective of identifying and meeting customer needs, and of always being a professional partner and reliable supplier. igus® has always been committed to producing products of the best possible quality and consistently developing innovative solutions.

Global standards - igus® in your vicinity

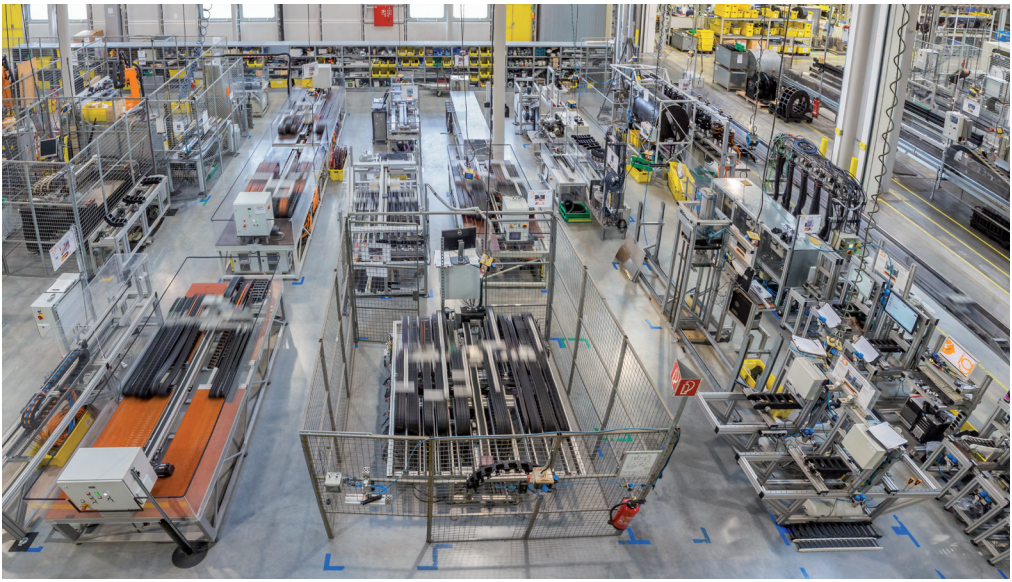
A large network of sales engineers is at your disposal in Germany and worldwide. We gladly provide consultation on your premises, supply assembly instructions and aids to installation sites, as well as measure installation spaces and any other requirements for your site.
There are 2,950 employees in Germany and 35 international subsidiaries, plus distributors in another 55 countries to guarantee a rapid delivery worldwide.



igus® motion plastics®

One vision has been driving us for 50 years – motion plastics®: moving parts made of plastic that cost less and last longer.
Our core technology consists of tribo-polymers – high-performance plastics, which we have optimised for friction and wear. The technology has made us into a world-wide leader for developing and manufacturing energy supply systems and plain bearings.

... tested and reliable

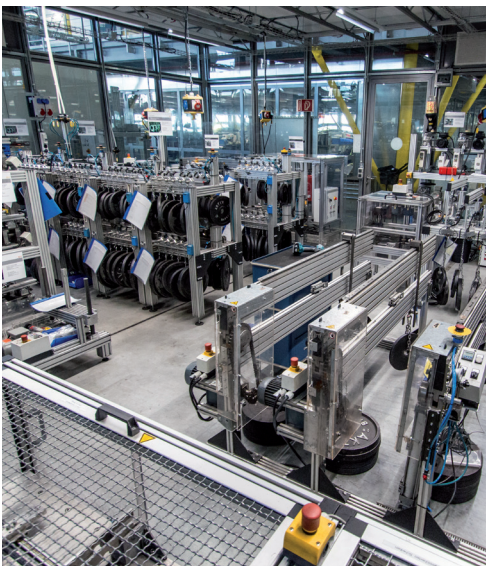


Better products for less – a key element is the industry's largest test lab. 2,750 m² lab, more than 15,000 tests and 2 billion test strokes per year

The igus® lab and field experience

Cutting costs while also guaranteeing maximum process reliability - only those who conduct intensive research and testing will successfully bridge this gap. The industry's largest test lab conducts more than two billion test cycles per year on a total of 107 test rigs. Our mechanical engineering components meet real world demands, because they have already passed the test before they ever leave the igus® warehouse.

www.igus.sg/test



Tribological testing in the plain bearing lab, igus® Cologne

/9001:2008 /16949:2009

igus® is certified in accordance with ISO 9001:2008 and ISO/TS 16949:2009 in the field of energy supply systems, cables and harnessing, as well as plastic plain bearings.

/newsletter

Free of charge! Discover more about the latest trends and innovations from the world of igus® motion plastics® world. Many exciting applications and videos, even from your industry.
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/contact

Your contact person for your industry and your country: www.igus.sg/contact

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