



WHITE PAPER:

Wear protection for any surface?

How to increase the service life of your parts.

igus®

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You have to break eggs to make an omelette, as the saying goes. But there are many ways to protect component contact surfaces against abrasion and wear and to reduce friction: guides and joints are equipped with plain or roller bearings that ensure smooth operation, low friction, and protection. Larger contact surfaces such as guide plates and chutes are often either clad with wear strips and plates or made of particularly resistant materials. Each of these solutions has specific advantages and disadvantages.

Rolling bearings are structurally suitable only for applications in which rotating bodies must be supported. Plain bearings are more flexible in terms of geometry, but share a disadvantage with rolling bearings: they constitute an additional component.

But machines, devices, and their assemblies must continuously become more efficient in terms of cost, resources, and energy. Devices and machines are becoming lighter and more compact. Components increasingly have to fulfil several roles at once, and these roles do not always harmonise with each other.

Coatings made of high-performance materials can make a valuable contribution here. They can be applied directly to the surface of the components to be protected and reduce friction without requiring an additional component. This not only reduces costs, but also cuts weight, frees up valuable installation space, and simplifies manufacturing processes.



The terms "igus", "Apiro", "chainflex", "CFRIP", "conprotect", "CTD", "drygear", "drylin", "dry-tech", "dryspin", "easy chain", "e-chain", "e-chain systems", "e-ketten", "e-kettensysteme", "e-skin", "e-spool", "flizz", "ibow", "igear", "iglidur", "igubal", "kineKIT", "manus", "motion plastics", "pikchain", "plastics for longer life", "readychain", "readycable", "ReBeL", "speedigus", "triflex", "roboLink" and "xiros" are legally protected trademarks in the Federal Republic of Germany and, where applicable, also internationally.

iglidur® coating is a tribologically optimised polymer blend powder that can be applied to all electrically conductive surfaces using the electrostatic powder coating process. Like all iglidur® materials, iglidur® coating powders are tribologically optimised and thus offer excellent coefficients of friction and wear. They also protect frequently used surfaces from wear - without any additional components.

The foundation for iglidur® coatings is formed by thermoplastic base polymers, which are mixed with various fillers and solid lubricants and processed into an applicable powder. The proportions of these components in the finished formulation determine the properties of the subsequent coating and the requirements for the application process.

During the coating process, the powder is distributed evenly over the surface to be coated, forming a homogeneous layer. The resulting layer thickness can be influenced in the process. But component surface conductivity decreases as coating thickness increases, impairing powder adhesion. The maximum achievable coating thickness depends on the conductivity of the component to be coated, its geometry, and the nature of the powder. It is usually 60–120µm. Under favourable conditions, layer thicknesses of up to 500µm can be achieved.

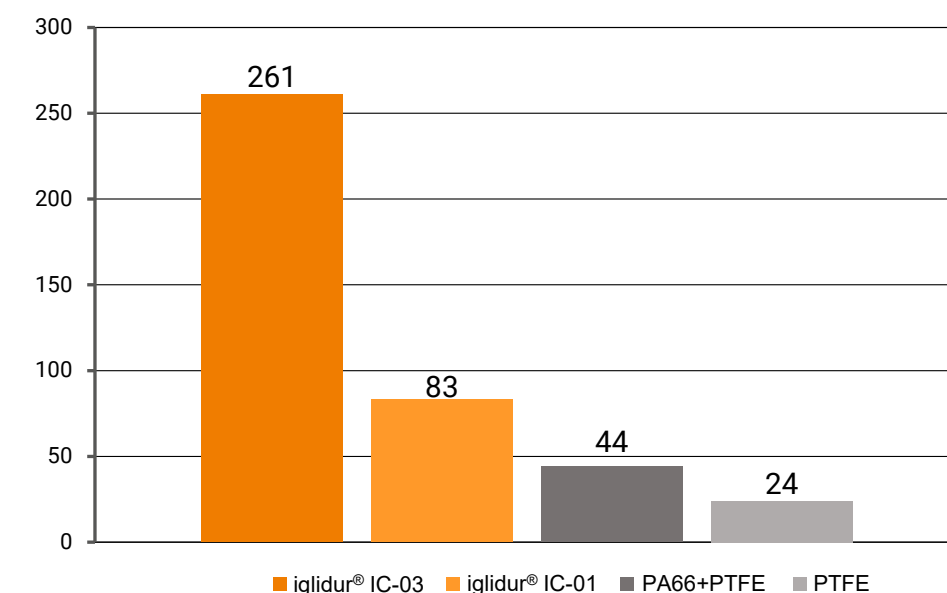


Powder coating of hanging components

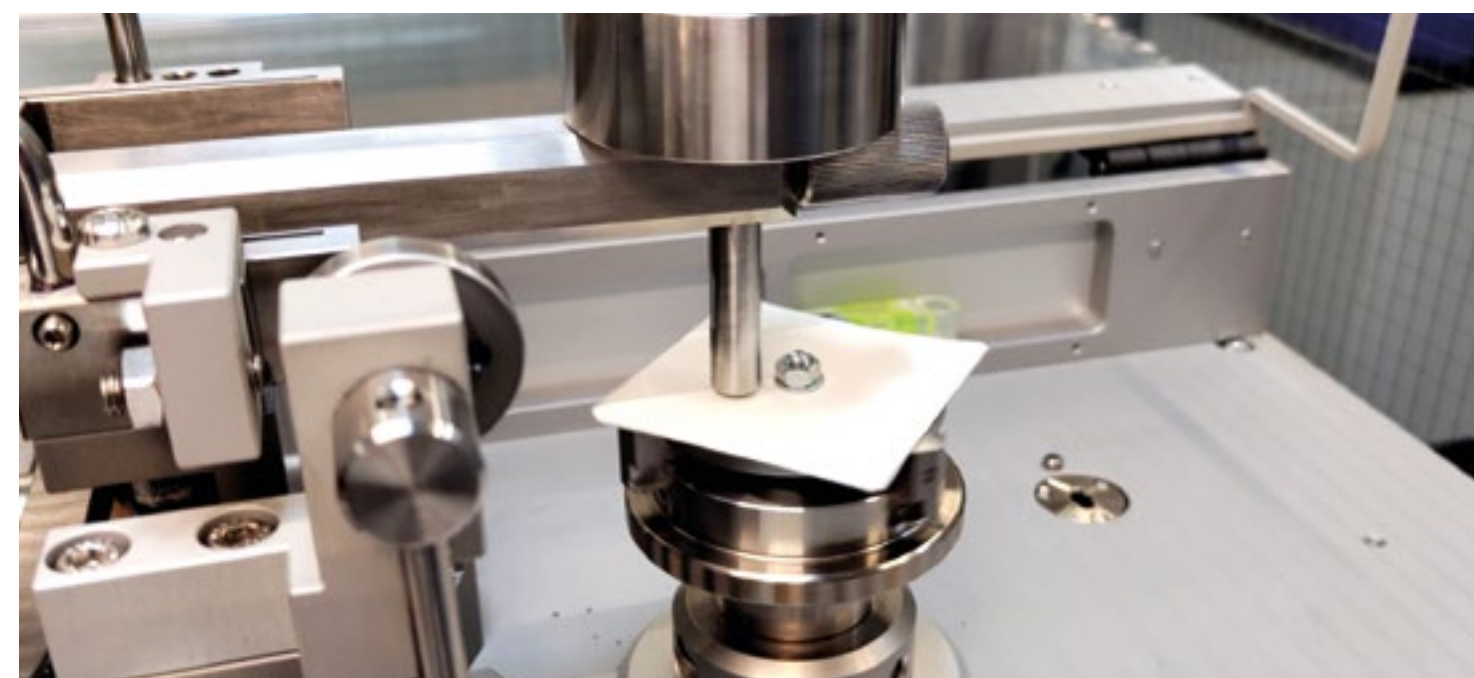
iglidur® coatings have been optimised for a wide range of applications. They differ primarily in temperature resistance, friction and wear properties, and colour. The exact material data can be found in our material data sheets.

Since data sheets are of limited value in narrowing the selection of materials and assessing service life in tribologically demanding environments, iglidur® plain bearing and coating materials are subjected to over 10,000 different application-oriented tests annually in order to analyse wear behaviour in a wide range of application scenarios. The data thus collected – enriched by our decades of experience – is incorporated into extensive databases.

The collected data forms the basis for the iglidur® expert systems and enable our application consultants to provide advice about even complex and particularly demanding projects directly on site and to make an optimal selection of materials in advance.



Service life [h]; short stroke 5mm; speed 0.1m/s;
load 1MPa; temperature 23°C; shaft 304 SS



Test rig for coatings in the igus® test laboratory

The iglidur® coating service – how it works

igidur® coating is available as a powder to be processed. If you already have a coating service provider or in-house processing capabilities, you can easily integrate iglidur® coating into your existing processes.

But igus® also offers the entire coating service upon request. Based on your requirements, you will receive an offer after your drawing and the required layer thickness have been checked. You can then have igus® coat your components.

What parts can be coated?

All conductive components of up to 1x1x3 metres can be coated. The parts must have at least one hole as a 'means to hang'. Holes can also be coated, with the achievable depth determined by the hole diameter. For diameters of up to 20mm, achievable depth is the same as diameter. (Example: hole with diameter of 10mm = 10mm coating depth). For more than 20mm, larger depths are also possible.

Partial coatings are also available. Surfaces that are not to be coated must be laminated or taped off before the coating process, and holes or threads must have plugs. This lamination process incurs additional costs. Devices can be manufactured for large quantities to simplify these processes, minimising additional costs.

Tips for self-coating

What should the pretreatment of the surface for iglidur® coating look like?

Generally, the substrate must be free of greases, oils, release and drawing agents, corrosion products, and other contaminants. Pretreatments, such as e.g. blasting, roughening, phosphating, descaling, etc., can improve adhesion.

At what temperatures and for how long does the coating need to cure?

Temperatures and exposure times depend on the material in question. The relevant information can be found in our processing instructions, which you can download free of charge from our website.

What containers is the coating powder available in?

The standard containers are bags of 1kg, 5kg, and 10kg and can be ordered conveniently and without a minimum order quantity in the igus® online shop or through conventional ordering channels.

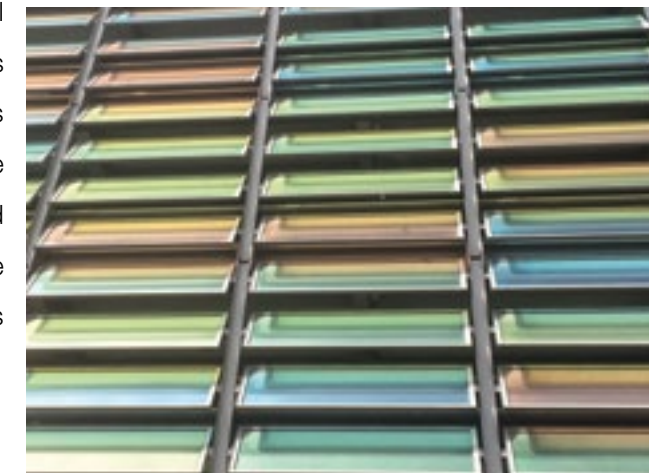
Can a test quantity be obtained in advance?

Yes, sample bags and sample quantities are also available. **Contact us!**

Practical application examples

Coated springs for Venetian blinds with iglidur® coating

For this application, springs were coated with an iglidur® material and used to guide Venetian blinds. The manufacturer's problem was that lubricants do not last as long as the blinds. So he tested springs with an iglidur® IC-02 coating. Although the springs touched the aluminium housing in the experiment, the coated spring outlasted the housing. Nor was there any noise from the springs during the test. The coating makes lubricants and additional components unnecessary.



Plates for pole mounting with iglidur® IC-02 coating

Until now, wear pads made of aluminium and a POM material have been used in this application to prevent wear in two metal components. This customer now relies on wear pads coated with iglidur® IC-02 high-performance polymers. To ensure that the coated plates withstand the extreme environmental conditions, they have been subjected to practical tests with sand, water, and high and low temperatures. The test results showed that the ambient conditions were no problem and that the metal components did not wear out.



Adjustable office chair armrest with iglidur® IC-02 coating

Our customer, a manufacturer of office chairs, used to use components made of a POM material for armrests. Because the friction of this material was too high, he opted for an alternative from igus®: overmoulded aluminium linear guides combined with sliding elements made of iglidur® J, which greatly reduced friction. The customer previously coated the aluminium channels with a clear PTFE paint, which not only was expensive, but also required a long lead time. So he tested our IC-02 coating powder, which further reduced friction and was even more cost-effective. The manufacturing process has thus taken a step forward: the components are now coated directly with IC-02, and no subsequent painting is required. The same customer coats the inside with IC-02 and then paints the outside for a better look.



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igus® is certified in accordance with ISO 9001:2015 and IATF 16949:2016 in the field of energy supply systems, cables and harnessing, as well as plastic bearings.

Do you have any questions on this topic?



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