

igus develops a two-component injection-moulded plain bearing for high mechanical loads

Injection-moulded iglidur Q3E plain bearing ensures lubrication-free maximum load capacity performance in efficient high-volume production

New to the agricultural and construction machinery industry: with the new iglidur Q3E plain bearing, igus has - for the first time - managed to manufacture heavy-duty bearings made of two layers of high-performance plastic using a cost-effective injection-moulding process. Plastic-based, multi-layer structures previously required the winding process, which is more expensive for high volumes.

If an excavator moves hundreds of kilograms of sand, enormous loads act on the bucket's bearing points. So far, igus has primarily used igutex-series plain bearings to handle this. The bearings are made of different materials and manufactured in a winding process. Integrated solid lubricants ensure low-friction dry operation. The outer layer provides enormous strength. "We have now succeeded in implementing a multi-layer structure using the injection-moulding process, combining materials with complementary specifications," says Uwe Sund, Product Manager iglidur Heavy-Duty Bearings. The result was the iglidur Q3E series. "The new technology enables us to mass-produce multi-component heavy-duty bearings using very cost-effective injection moulding."

The challenge: inject and fuse two materials in one operation

The new iglidur Q3E series is the result of intensive cooperation between igus material development and the specialists from our in-house tool making. "While developing iglidur Q3E, our goal was to implement a multi-part structure similar to the igutex series - with iglidur Q3 high-performance plastic for a tribologically optimised core and a strongly reinforced polymer for a mechanically high-strength shell," says Sund. The biggest challenge was to process the two different materials in the injection-moulding process so that two components become one. This combines the advantages of the two materials. "We are able

to do this with the multi-component injection-moulding process with correspondingly complex, sophisticated injection-moulding tools."

Robust load-bearing capacity with convincing sliding properties

Heavy-duty applications normally require bearings made of metal or fibre composite bushings, for example in construction and agricultural machinery. To reduce costs, the plain bearings made of iglidur Q3E are used as their maximum dynamic surface pressure is 75MPa. "This means that we can cover many heavy-duty applications with iglidur Q3E," says Sund. The decisive advantage is that the plain bearings require no lubricating grease. Microscopic solid lubricants are integrated into the polymer of the inner layer and released gradually over the bearing's service life. "Construction and agricultural machinery maintenance are two areas where lubricating the bearing points is one of the most time-consuming tasks," says Sund. "By switching to iglidur Q3E or igutex, users can reduce maintenance costs and extend machine service life. Neglecting lubrication for classic metal bearings is a frequent cause of expensive damage to shafts and plain bearings."

Caption:



Picture PM4423-1

Hard shell and wear-resistant core: the new cost-effective iglidur Q3E plain bearing supports heavy loads without lubrication. (Source: igus GmbH)

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igus® GmbH develops and produces motion plastics®. These lubrication-free, high-performance polymers improve technology and reduce costs wherever things move. igus® is the world's market leader in energy supply systems, highly flexible cables, plain and linear bearings as well as lead screw technology made of tribo-polymers. The family-run company based in Cologne, Germany, is represented in 31 countries and employs 4,600 people around the world. In 2022, igus® generated a turnover of €1.15 billion. Research in the industry's largest test laboratories constantly yields innovations and more reliability for users. igus® has 243,000 parts available from stock, and service life can be predicted online. In recent years, the company has expanded by creating internal start-ups in such areas as ball bearings, robot gearboxes, 3D printing, the RBTX platform for Low Cost Robotics and smart plastics for Industry 4.0. Among the most important environmental investments are the "change" platform for recycling technical plastics and partial ownership of a company that produces oil from plastic waste.

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