

## **igus e-chain stays at the highest cleanroom class even after 60 million double strokes**

**e-skin flat energy chain: igus proves abrasion resistance with the first industry test of its kind**

**Cleanroom-compatible energy chains from the e-skin flat series still qualify for the highest cleanroom class even after 1.5 years of continuous use and 60 million double strokes. A test, unprecedented in the industry, led to this result. It was carried out in a cleanroom laboratory set up by motion plastics specialist igus in cooperation with the Fraunhofer Institute for Manufacturing Engineering and Automation (IPA).**

Dusting the living room can be annoying. You scarcely have time to enjoy the spotless surfaces before the first specks of dust begin to collect again. Manufacturers of displays and semiconductors have the same problem - but with more serious consequences. Any tiny particle, even one invisible to the naked eye, can damage electronic components. Therefore, the strictest cleanroom class - ISO Class 1 according to DIN 14644-1 - must contain no more than ten 0.1-micrometre (0.0001-millimetre) particles per cubic meter of ambient air. To achieve this level of purity, all suppliers of cleanroom production system components must meet the strictest requirements. To this end, igus has developed the e-skin flat, a flat cable guidance system made of abrasion-optimised high-performance plastic that ensures reliable, particle-free guidance of power and data cables in moving production systems and is thus suitable for ISO Class 1.

### **Unique test setup: e-chain runs for 1.5 years in a dirty and dusty environment**

"The e-skin flat cleanroom energy chain is ideal for robots and other automation systems in electronics production in such areas as semiconductors and display production," says Andreas Hermey, Development Manager for e-chain systems at igus. "It is so abrasion-resistant that contamination by airborne particles is no longer an issue." Until now, however, the intensity of the high-performance plastic's particle abrasion after long, intensive use has been unclear. To determine its details, igus launched a test setup that is unique in the industry so

far. Part one of the experiment was conducted in igus's own laboratory. The energy chain moved in an environment with normal levels of dust and dirt for around 1.5 years, during which it performed 60 million double strokes.

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Part two of the experiment took place in the cleanroom laboratory in Cologne, conducted by igus in cooperation with the Fraunhofer Institute for Manufacturing Engineering and Automation (IPA), igus's development and certification partner for more than 17 years. The heart of the setup was three so-called laminar flow boxes equipped with high-performance filters that enable tests in uncontaminated air. The worn-out e-chain was in motion there for over 100 minutes. Sensors detected particle concentration in the surrounding air. "Even after 60 million double strokes, our e-skin flat e-chain still qualified for the highest cleanroom class," says Hermey. "This finding offers cleanroom production facility operators additional confidence."

### **Modular concept for flexible filling**

The e-skin flat features not only extreme abrasion resistance, but also a modular design. If a profile into which cables have been fitted is defective, the user can just change that module. Many other solutions available on the market would require the entire system to be replaced. The module connection also allows individual profiles to be interlinked. The cable guidance system thus grows in line with requirements and ensures investment security. In combination with the specially harmonised chainflex CFCLEAN stranded structure, the complete system offers an especially high level of reliability. The complete system also has globally recognised certification from the well-known US Underwriters Laboratories (UL) organisation. Finally, the cable guidance systems are 9dB(A) quieter and cost 20% less than standard ribbon cables.

**Caption:**



**Picture PM6822-1**

A unique industry test shows that the modular igus e-skin flat remains at the highest cleanroom class even after 1.5 years of continuous use and 60 million double strokes. (Source: igus GmbH)

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## **ABOUT IGUS:**

igus GmbH develops and produces motion plastics. These lubrication-free, high-performance polymers improve technology and reduce costs wherever things move. In energy supplies, highly flexible cables, plain and linear bearings as well as lead screw technology made of tribo-polymers, igus is the worldwide market leader. The family-run company based in Cologne, Germany, is represented in 31 countries and employs 4,900 people across the globe. In 2021, igus generated a turnover of €961 million. Research in the industry's largest test laboratories constantly yields innovations and more security for users. 234,000 articles are available from stock and the service life can be calculated online. In recent years, the company has expanded by creating internal startups, e.g. for ball bearings, robot drives, 3D printing, the RBTX platform for Lean Robotics and intelligent "smart plastics" for Industry 4.0. Among the most important environmental investments are the "change" programme – recycling of used e-chains - and the participation in an enterprise that produces oil from plastic waste.

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", "tribofilament", "triflex", "robotink", "xirodur", and "xiros" are protected by trademark laws in the Federal Republic of Germany and internationally, where applicable.