

# TECHTALK DESIGN ADVICE SERIES

## THE SCIENCE BEHIND TRIBOPLASTIC BEARINGS



During my recent travels, I revisited a customer who, just a few years before, was set against using plastic bearings. He knew he could save a lot of money by making the switch, but couldn't be convinced that plastic—a material that

most people equate with a disposable commodity like a plastic fork or spoon—would actually work. Instead of walking away defeated, I offered to test our bearings on his product in our test lab, at no cost to him. A win-win situation: the customer would either be right about predicting the plastic bearings would fail or if they did work, he'd save a lot of money out of the deal.

I assured him he'd be singing the praises of plastic bearings by the end of the testing cycle, but needless to say he was a non-believer and thought I was drinking the igus® Kool-Aid. However, we delivered: the customer's motor actually broke before our plastic bearings incurred any wear. And to the customer's delight, he didn't tie up any resources to make this discovery.

This encounter got me thinking about how many of our customers start out with an anti-plastic outlook. More often than not, we've been conditioned to associate plastics with cheap. The brain conjures up images of throwaway items, such as plastic bags, cups or toys, or if you're a design engineer, perhaps images of mass-produced bearings by your local, run-of-the-mill injection molder. However, there is an enormous difference between bearings from most injection molders and the types of plastic bearings developed by igus®. igus®'



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triboplastics are tribologically optimized material compounds and the basis of all our products and systems.

Using a layer of lubricant to reduce surface contact during tribological interaction (whenever one material slides over another) typically minimizes wear. In contrast, igus' plastics inherently contain solid lubricant as microscopic particles released in tiny amounts during movement. All igus® products, as a result, don't require any lubrication, which virtually eliminates maintenance.



More than 100 plastic compounds have been developed by igus® and each is comprised of three parts:

1. Base polymers, which are responsible for the resistance to wear.
2. Reinforcing fibers and filaments, which make the bearings ideal for high forces and edge loads.
3. Solid lubricants, which are blended into each material.

igus® is continually developing new polymer blends for every application scenario and conducts more than 5,000 tests in its laboratory every year. Unlike most bearing manufacturers, igus® consistently focuses on high-performance plastics only, yet is able to injection mold them at a low cost. The industries they are used in are vast and include agricultural, medical, automotive, packaging, marine, aerospace and so many more. Thanks to more recent tribological developments, we now also offer special materials optimized for use in chemically charged and high-temperature environments.

In addition, igus® compiles its test results into a comprehensive database. After each polymer blend is tested, the results are added into the data pool for a unique lifetime calculation program: The Expert System, which allows you to enter your application's maximum loads, speeds, temperatures, and shaft and housing materials in order to calculate the best plastic bearing and its expected lifetime. I frequently meet customers who tell me they love using The Expert System because it saves them time and money and - because the recommendations are based on real-world results - they also get peace of mind from knowing exactly how long the bearings will last, which is priceless.

## Useful Links

[Learn more: iglide® plastic bushings](#)

[Expert System: bearing lifetime calculation program](#)

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