



Machining

Tiny Parts Make the Smallest Runout Look Big

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It's easy for non-manufacturers to take miniaturization for granted, but those who have spent any time at all in a micromachining-focused shop know how challenging those parts can be. Tiny parts require even tinier part features, virtually all of which demand meeting tight tolerances with fragile, small-diameter tools. There's no room for error at this scale of machining – and the best way to reduce risks and achieve secure, repeatable processes is through the use of purpose-built toolholders designed for exceptionally low runout.

Of course, simply holding on to the tool is just the beginning. Micromachining applications typically take place in cramped machining envelopes, particularly in 5-axis and/or multi-tasking machines. Many of the industries in which micromachining is most common, particularly the medical and high-tech sectors, must also contend with challenging materials such as titanium or stainless steel.

All of these factors make micromachining into a major process optimization headache – at these scales, a small bit of runout is all that's necessary to break a tool, much less scrap a workpiece. Naturally, a rigid, high-speed machine tool and high-quality tooling are required for success, but neither can perform adequately with a substandard toolholder. For this reason, REGO-FIX offers a comprehensive range of products designed specifically for micromachining: the micRun® collet system.

Designed to be as easy to use as it is powerful, the micRun system delivers a total system runout of $\leq 0.0001\text{mm}$ ($3\ \mu\text{m}$) at 3xD for tools between 0.0394mm to 0.7874mm (1-20 mm) in diameter. These collets have been balanced for high RPM applications with a symmetrical, grooveless design made for quiet performance and exceptional vibration damping. The self-locking collet design and Hi-Q clamping nuts make tool insertion and removal possible without the use of an extractor, while the smooth, polished surface reduces noise at the same time that it prevents abrasive dust from settling.

To stay competitive, shops need to do more than meet the minimum requirements for micromachining, they need to maximize the value of their cutting tools and minimize costs. Luckily, eliminating runout is a great way to improve tool life and performance, and micRun holders can make a huge difference. In one *case study*, for example, a dental laboratory leveraged these holders to reduce runout from $10\ \mu\text{m}$ to $3\ \mu\text{m}$.

Shops can further simplify tool setup – and prevent damage to delicate small-diameter tools – with **TORCO-BLOCK**, a tool assembly assistant that makes overtorquing virtually impossible. Alternately, if they need even higher levels of vibration damping, transferable torque and rigidity, the **powRgrip®** system can clamp tools as small as 0.0079mm (0.2 mm) in diameter. Both of these

solutions become more useful as shops use more small-diameter tools, as the time saved in tool setup time adds up quickly.

Micromachining has made incredible things possible, from wireless earbuds and luxury watches to pacemakers and dental equipment. But to stay ahead of the competition, shops need to go beyond what's simply possible and achieve truly optimized machining – and effective toolholders like micRun make it easy for these shops to realize the benefits of tiny runout for their tiny parts. Find out how micRun can transform your micromachining operations ***here***.

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