

Milling

## Meet the Mini Mills

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The trend for near-net-shape production and 3D printing is helping to drive demand for extremely small end mills. Far from a niche product, such mills can be found in countless applications.

Imagine an end mill as thin as a light-weight fishing line or the cotton thread you use to repair clothes. What possible uses could it have?

Far more than you might expect, according to Massimo Paletta and Ruud Zanders, two Seco experts in the field of micro machining. Seco's range of miniature solid carbide end mills and ballnose cutters can be found in just about every industry and are used to produce products we all use every day.

"Our range includes end mills from 3 millimeters in diameter right down to 0.2 millimeters," explains Massimo, who is an application engineer. "You can find them in use in the mold and die industry, being used to create electrical components, and in dental and medical applications. When you sit in a car, the electrical connectors, the circuit boards and parts in the engine and steering systems have probably been made using miniature end mills. We sell to every market segment."



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Ruud, who is Product Manager for Solid Milling, explains that Seco's JM500 series ranges are made from micrograin tungsten carbide that is precisely ground. "The toughness of the carbide combined with the properties of the SIRA or aluminum chromium nitride coating make these tools ideal for use with ISO S, P and M materials," he says.

Seco's miniature end mills also have numerous application areas – such as creating molds for toy soldiers and components for watches and jewelry.

Ruud explains the one thing users in all sectors face are challenges around machining on such a small scale. With the smallest Seco end mill just 0.2 millimeters, high-magnification microscopes are needed to check the results of milling. The depth of cut can be as little as 0.005 millimeters, and chips are often just 0.01 millimeter or smaller.

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Ruud Zanders

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Under such circumstances, it’s essential that the end mill is reliable and delivers optimum performance. “A lot of manufacturers in the mold and die sector are running their machines unmanned overnight,” he says. “If there’s a problem at the beginning of the process, that time will be wasted. Our new range of miniature end mills [is] very reliable and there’s now a much higher chance that you will get a high-quality workpiece.”

Massimo says the future for miniature end mills is bright. “There’s a growing trend for 3D printing and powder metallurgy parts being manufactured very close to the final shape,” he says. “In the future, there will be less of a focus on roughing and more of a focus on finishing, and miniature end mills will be a part of this.”

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