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## Buyer's Guide 2014-15

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# Micro-clamping market goes big as demand surges

Small workpieces are getting even smaller, a fact confronting suppliers of clamping systems. In principle, if it can be machined, it can be clamped. However, customer-specific solutions are often required to achieve the needed accuracy in run-out and clamping.

The world has become smaller, a shift measurable in the perceived closeness created by communications technology or in the world of processing.

Where the trend towards miniaturisation becomes a factor, those sectors and the production world must adapt. The application markets are not huge, but they are attractive.

## Micro-workholding: Living up to its potential?

Urs Canonica, marketing and press relations at Erowa in Büron, Switzerland, said: "In medical and micro-clamping

technology we see a truly great potential." A manufacturer like Erowa probably invests in this area because the watch industry is one of their biggest customers for micro-clamping.

Heinold Kostner, manager of product and portfolio management in clamping technology at Schunk in Lauffen, Germany, said that along with the watch and jewellery industries and the production of medical and dental devices, mould construction and the optics industry are also target groups. In all the relevant sectors, the number of applications with micro-machining has reportedly risen enormously.

## Suppliers move to meet rise in applications

Kostner cited the consequences for Schunk: "We are reacting to the increased demand with a special programme for micro-machining." The target is said to be the expansion of the standard program so that as many tasks as possible would be covered.

Erowa, with its Fine Tooling System (FTS), has a standard solution for small dimensions. Werner Meier, an Erowa product manager, sees the firm as thoroughly "armed for projects in the field of micro-clamping technology". However, the need for customer-specific solutions is growing. In fact, the company is developing a project group of its own for this. Because despite all the euphoria and prognoses, micro-clamping technology continues to be a niche market, according to manufacturers. Their evaluation ranged at best between "very interesting" and "extremely interesting".

## Downsizing of products shakes up market

Mario Baur, who works in marketing at Röhm in Sontheim, Germany, said "this market has become much more dynamic recently". Manufacturers attributed this largely to the fact that the switchover from manual production to automated processes is taking place on a large scale. One or two manufacturers are convinced that the niche business has an effect on the standard business as a whole. A point to note: micro-clamping solutions are hardly ever available off the shelf.

The smaller the workpiece, the larger the flow of information has to be between manufacturers of machines, tool and clamping equipment and end users. Erowa's Meier said, "Ultimately, this



*This chuck with eight jaws is suitable for processing deformation-sensitive workpieces, such as rings.*

Photo: Röhm

makes forceful demands on product development, making the matter interesting for us and resulting in progress for us and for our customers."

Clamping equipment to date has been of only limited use. Clamping accuracy is insufficient and the necessary run-out accuracy has not been achieved. Furthermore, very small, filigree workpieces demand clean, careful working, and limits have been reached in handling as well. Kostner said, "A frequent reason for changing to our precision clamping system is deficits in process security." In micro-applications, users are said to depend on high process stability from start to finish.

### Research hits smaller realms, leaving work for suppliers

University research has moved on from the micro to the nano area. Larger projects, certainly, are not expected. According to Baur, "Now it's up to the manufacturers with their development departments." Out of special solutions, series have developed, and building sets are being extended. Röhme, for example, has introduced a solution for the two-sided processing of a printed circuit board in one clamping. Baur said he expects a surge in development, especially for the combination of micro-clamping technology and automation. "Fast-change systems with high clamping repetition accuracies will play an important role."

Generally, manufacturers of clamping systems are taking orientation from complete processing. Rolf Glück, sales manager of reference systems at Hirschmann, Fluor-Winzeln, Germany, cited the critical factor: "In practice, the start-to-finish process chain has priority." Hirschmann applied the experience gathered from the alliance project Mikro Pro Ket and developed, with the  $\mu$ -Pris Fix integrative neutral point clamping system, a mini-clamping system for applications in small component processing. Here, the change-accuracy in the process, i.e., in the change from one machine to another, is quoted at better than  $1\mu\text{m}$ . This patented system is reportedly employed both for the cutting and non-cutting processing of workpieces as well as in measuring technology.

There is bound to be ongoing interest in further developments in this market. Since constantly smaller workpieces have to be processed, tool and clamping equip-



The Fine Tooling System is a clamping chuck for small dimensions.

ment manufacturers have followed the same path of miniaturisation. Erowa's Meier noted that "Ultra-small machines are conceivable, with very confined space inside."

### New materials and coatings expand clamping alternatives

Large amounts of development time and effort would have been saved if the dimensions of clamping devices could simply be made smaller. This is, to an extent, possible with conventional requirements. The processing of gold is another matter, not just because of the price of the working material. "The sometimes very aggressive cooling lubricants require a special construction," Baur explained. Available from Röhme are therefore versions with chemically nickel-plated elements – versions which are not needed in conventional machining.

Besides the different working materials used in micro or macro clamping technology, it is above all the processing of the miniature clamping elements which call for know-how of its own. Jaw guides, for example, are ground with high precision using special methods for perfect fitting. "With such clamping, our procedures are a touch different from those of conventional chucks," Baur explained. Developing a centric clamping system with jaws, for example, is a solu-



Mario Baur, responsible for marketing at Röhme: "The market for micro-clamping technology has become very much more dynamic recently."

tion that at first sight, and with practical experience with a 3-jaw chuck in mind, should not work. But it does, as practice proves, and with high accuracy. After all, the wedding rings which are processed in a clamping system of this kind have to hold for a lifetime.

This article originally appeared in our sister magazine MM Maschinenmarkt and was written by Bernhard Foitzik.