



Modular centric workholding systems for 5-axis machining

Flexibility, economy and speed

Triag International has launched the ZSM and ZSB centric workholding series for flexible clamping of wide-ranging workpieces during 5-axis machining. Their stock in trade: outstanding adjustability due to their modular design.

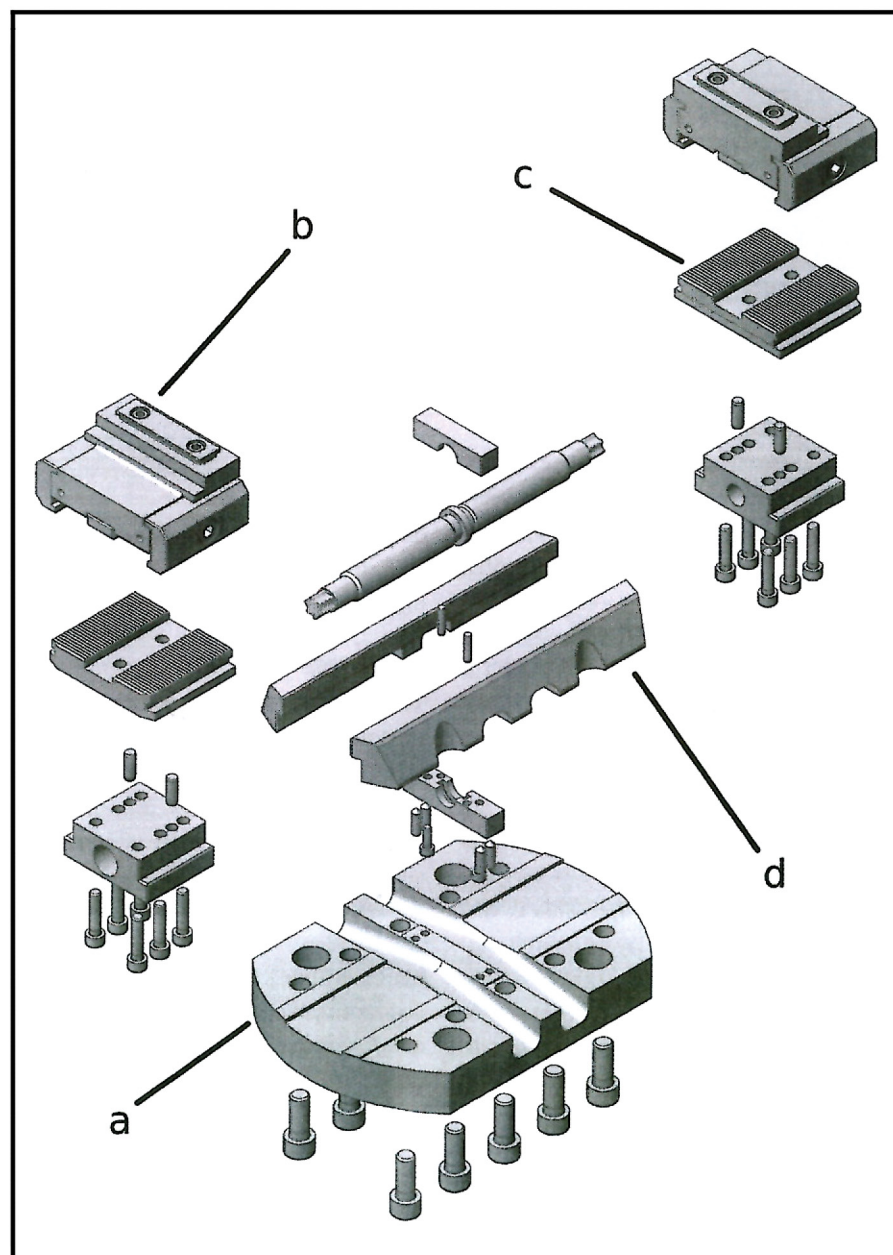
BY KONRAD MÜCKE

→ 5-axis machining is increasingly emerging as highly advantageous. On the one hand, it allows manufacturing firms to carry out complete machining in a single clamping operation and so achieve substantially greater accuracy coupled with shorter throughput times. On the other hand, increasingly complex workpiece geometries in fields such as medical technology, electronics and mechatronics can only be tackled by using 5-axis machining methods. The complexity of some of these components, with different angles, folds and bends in every conceivable direction, means that they cannot be economically produced using any other technology.

5-axis machining requires centric workholding

However, producers using 5-axis machining require specially designed workholding systems. These must guarantee that the clamped components are easily accessible from five sides. In addition, the workpieces must permit reliable, correctly positioned clamping irrespective of the blank's contours. Particularly vital is the need for the workpiece centre to agree precisely with the rotary and swivel axes (fourth and fifth NC axis).

To ensure that every component is correctly positioned in respect of the swivel axis movements, only centric workholding systems are suitable for 5-axis machining. However, every workpiece geometry imposes its own particular demands on the workholding system. This is why in



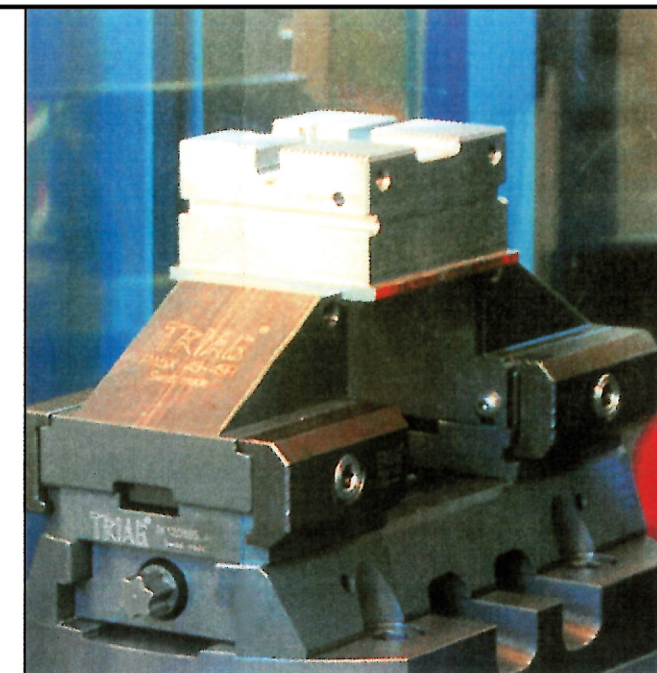
1 Outstanding centric clamping flexibility: The modular workholding system from Triag comprising base plate (a), drive and guiding element (d), base rail (c) and vice module (b)

the main, centric vices have always been produced as single-purpose systems. To ensure that these are economical both in terms of initial outlay and also application, they are generally designed as low-cost systems, with all the drawbacks of insufficient stability, poor accuracy and also the major disadvantage that producing companies have to procure and stock a wide selection of different centric vices. Even though a cohesive in-house logistical system then has to be set up and maintained for all of these variants, there is still a distinct lack of flexibility. Any newly introduced workpieces always involve the purchase of additional matching centric vices.

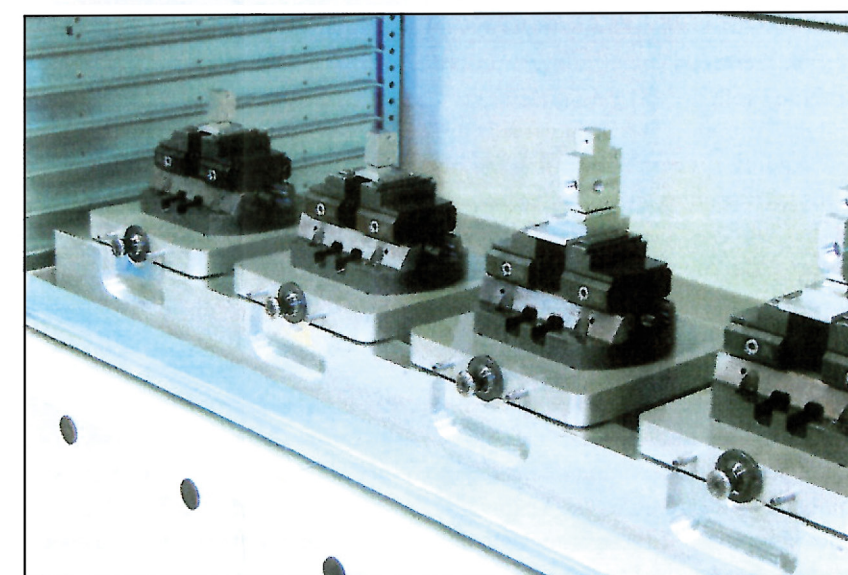
Modularity saves money and minimizes logistical outlay

»From our viewpoint, centric workholding concepts available to date are highly costly in the long term, and also wasteful in terms of material and capital resources,« says Beat Baumgartner, CEO of Triag International AG in Allenwinden. »A modular centric workholding concept offers a far more favourable solution. Many production engineers the world over are already familiar with our proven powerClamp system and appreciate its consistently modular design. Our aim was to transpose these benefits to the family of centric workholding systems.«

It was with this aim in mind that the designers in Allenwinden went to work on the concept for the latest centric workholding modules ZSB and ZSM. What has emerged is a system with a consistently modular structure. Using just a few modules, well over 200 different centric workholders can be configured. The system comprises the basic module (base plate), on which is screwed the drive and guide unit, two base rails with serrations and lateral clamps, as well as the workholding modules themselves. Due to the standardized quick-change interface on the base rails with clamps, all the clamping jaws from the existing powerClamp system from Triag can also be used with the ZSB and ZSM centric workholding system. This arrangement allows the implementation of wide-ranging and unusual vice modules – for instance with clamping jaw, chuck and vacuum table – which are otherwise impossible to realize on centric work-



2 Small in size, big in clamping performance: Despite its compact dimensions, the ZSM and ZSB centric workholding systems are able to clamp workpieces up to 160 mm in width



3 Economical: On zero point pallets, the modular structured centric workholders ensure short downtimes for complete 5-axis machining operations. Clamping jaws fitted with stamping inserts provide a clamping fixture with only a minimal blank machining allowance

holders. Depending on the clamping jaw arrangement, the modular structured centric workholders cover clamping ranges from zero to 80 mm (with stamping inserts from 10 to 90 mm) or from 80 to 160 mm.

Individual stamping inserts

The day-to-day practical application of the 5-axis technology increasingly involves the use of vice modules with stamping jaws. Baumgartner explains: »Here too, we offer a number of striking benefits compared to workholding systems offered by our competitors. At Triag, stamping jaws come with exchangeable stamping inserts.« In the standard version, the stamping jaws re-

quire only around three millimetres of the blank to be able to reliably clamp at forces of up to 1600 daN. Clamping takes place mechanically via the drive and guide unit with the aid of a Torx key, which reliably ensures that the required level of torque is transmitted.

Alongside the standard variants, Triag also offers stamping inserts to customer order. These inserts are optionally available in the form of unhardened blanks which the producing company can machine itself for the workpiece being clamped in each case. Due to this modular flexibility, individual insert configurations can be implemented, for instance with individual

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