

Press release

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Application Deckel Maho, Pfronten

Mechanical clamping systems from RÖHM is the standard at Deckel Maho processing centers

Automatic, accurately, strong

Clamping cones with massive power in a minimum of space safely and precisely clamp workpiece pallets at Deckel Maho machines. Possible through a clever knack by RÖHM.

With the introduction of the spring-loaded clamping system Deckel Maho Pfronten has not just made their machining centres safer during the last five years but has also improved the precision during the linking of several machines. Pre-fitted pallets are clamped fast and safely with large pull in forces. Extreme accuracy in the axial run and radial run ensure that the system is now the standard at Deckel Maho. Since 2005 every new construction series is fitted with the spring-loaded clamping cones for pallet clamping, which were developed by RÖHM.

„In 98% of the orders our processing centres are supplied with the pallet clamping system of RÖHM“, explains Bernd Moder. This is no surprise for the design engineer at Deckel Maho in Pfronten, he is well aware of the advantages of the powerful clamping cone. With a force of up to 40 kN four of the spring loaded clamping cones each pull the respective pull stud of the workpiece pallets into the machine table for clamping. The pallets measure 400 x 400 mm in the smaller DMG machines such as for example with a horizontal processing centre of DMC 55H duoBlock®. They take on workpieces up to 500 kg. Workpieces of up to 3,000 kg and up to 1,400 mm can be clamped safely in larger machines such as for example the 5 axis machining centre DMC 160U duoBlock®.

Extremely accurate in radial- and axial run

Deckel Maho is able to promise extreme precision due to the powerful clamping systems by RÖHM. „During the radial run we achieve accuracies of 0.01 mm and during the axial run up to 0.015 mm. With the previous solution we were only able to achieve these values with a significantly greater effort“ confirms Moder. Back then they were purely hydraulic solutions. In 2005, due to safety reasons, Deckel Maho switched exclusively to spring-loaded systems with pullout locks, which still securely hold the workpiece pallet even in case of hydraulics failure.

Earlier clamping solutions with cones, which were inserted into the bore and clamped by a wedge bolt, sometimes led to obliquely inserted pallets. In the past the positioning via the pallet exchanger was not always possible in the desired repeat accuracy.

Moder remembers: „Especially in large workpieces with extreme weights of over 1,500 kg deflections could sometimes lead to a

Contact and information:

RÖHM GmbH
Frank Heiler
Heinrich-Röhm-Str. 50
D-89567 Sontheim a.d. Brenz
Tel. +49 (0)7325 / 16 -364
Fax +49 (0)7325 / 16 -510
f.heiler[at]roehm.biz
www.roehm.biz

DECKEL MAHO Pfronten GmbH
Bernd Moder
Tiroler Straße 85
87459 Pfronten
Tel. +49 (0)83 63 / 89-207
Fax +49 (0) 83 63 / 89-144
bernd.moder[at]deckelmaho-
pfronten.de
www.deckelmaho.de

slightly oblique positioning, which increased the wear and tear at the clamping system as well as the clutches of the clamping hydraulics.“ If several machines were linked to one manufacturing network, all machines and pallets had to be coordinated with each other. „The set-up effort for this was enormous“ so the engineer. The solution developed by RÖHM is completely different. The precise positioning is here taken over by the clamping system. Because the clamping cones virtually grip the pull studs of the pallet, pull them into the conical cylinders, calibrate and clamp them centrally, a possible oblique transfer of the pallet is not taken over during clamping. The pallet is always positioned horizontally and centric. This ensures great axial- and radial run values. With the extremely high pull in forces and exchange accuracy of the RÖHM solutions it was easy for Deckel Maho to make the clamping cones in both designs with 125 or 140 millimetre diameter the standard system in machining centres. One by one almost all DMC series are fitted this way since 2005.

Positioning workpiece pallets fast and precise

The development of the clamping system challenged the engineers of RÖHM in the past. Deckel Maho had stipulated the basic conditions. Interfaces to above and below were thus defined just like the disk, the pull studs and the construction space. „Particularly the very limited construction space was a challenge“ remembers Kurt Schmidt, Engineer at RÖHM.

„We ultimately had to accommodate the entire mechanics with the collet and the power operation mechanics in it“. The segment collet develops a force-enhancing effect, which is operated via simple coil springs. Compared with hydraulic clamping heads this increases the pulling force many times. The segment pulling collet mechanically locks and thus activates a pull-out safety without further elements. The hydraulic is thus only required during stand-still for the releasing of the lock. The bodies of the clamping cones are ribbed all round due to the application of coil springs. This additionally increases their stability.

The pallet change is very quick. Following the pivoting of the pre-set pallet the workpiece pallet is placed on the mounting tapers of the clamping heads with the pull studs at the bottom and pre-centred. The pull studs hereby push back the spring-loaded cover of the clamping heads.

The tension is immediately activated once the release pressure is switched off. The springs hereby move the tension bolts via the release taper. The segment pulling collet closes around the pull stud. This pulls the pallet over the pull stud onto the mounting taper and it is automatically centrally aligned and mechanically locked.

At the end of the process the effect of the spring load is increased several times due to respective bevel surfaces. With a patented gimmick the RÖHM engineers have achieved that the actual force of the springs is increased several times and are thus capable of asserting a pressure of up to 40 kN. This holds even large and heavy workpieces in the set up position at all times.

The space around the segment pulling collet and the mounting taper is cleaned during the clamping process in order to remove shavings.

This can occur with compressed air as well as with cooling lubricant. Respective bores and channels conduct the medium and ensure the quick removal of shavings. KSS is used for cleaning at Deckel Maho. The clamping position can be checked via the plant control and the result of the machine control can be processed.

Clamping system for transfer to linked machines

The clamping system by RÖHM now creates ultimate conditions for the linking of several processing centres into one manufacturing network. With a small refit the workpiece pallets can be precisely transferred between diverse Deckel Maho machines. Due to the accuracy of the axial and radial run the clamping systems contribute to an important step toward automation. Dieter Baz of RÖHM makes a final point: „Our clamping cones make an important contribution to the precise production of parts in a partially- or fully automated manufacturing network.“

www.roehm.biz

Bilderverzeichnis RöhM, Applikation Deckel Maho
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Bild Nr. 10-01 RM_DM-Spannkopf.jpg
Die Segment-Spannzange schließt sich um den Anzugsbolzen, zieht ihn automatisch auf den Aufnahmekegel und verriegelt mechanisch.

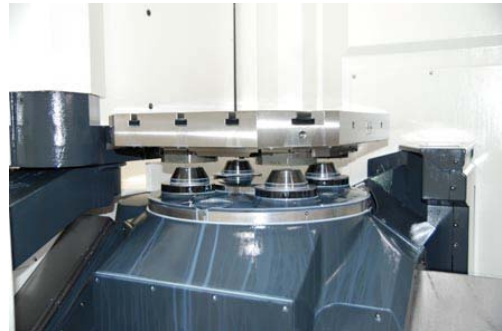


Bild Nr. 10-02 RM_DM-Spannkone.jpg
Durch die kraftvollen Palettenspannsysteme von RöhM erzielen BAZ von Deckel Maho große Präzision bei der Bearbeitung.

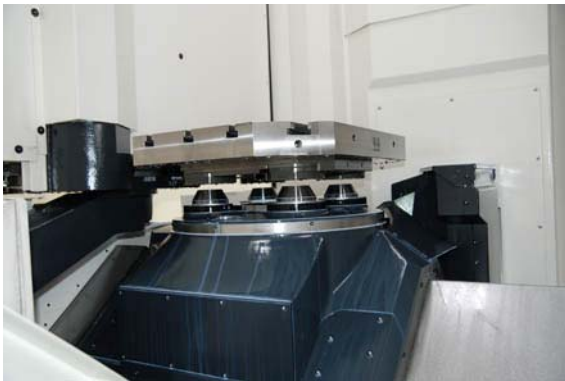


Bild Nr. 10-03 RM_DM-Spannkone2.jpg
Die Palette wird immer horizontal und zentrisch positioniert, weil die Spannkone sich die Anzugsbolzen der Palette regelrecht greifen und in die Kegel hineinziehen.



Bild Nr. 10-04 RM_DM-Spannkone3.jpg
Der Palettenwechsel geht sehr schnell vonstatten. Nach dem Einschwenken der vorgerüsteten Palette wird die Werkstückpalette mit den Anzugsbolzen an der Unterseite auf die Aufnahmekegel der Spannköpfe aufgesetzt und zentriert.



Bild Nr. 10-05 RM_DM-Zentrierung.jpg
Die Palette wird immer 3-achsig positioniert.
Das sorgt für guten Planlauf von 0,01 mm.



Bild Nr. 10-06 RM_DM-PaletteGross.jpg
Beim 5-Achsen-Bearbeitungszentrum
DMC 160U duoBlock® können Werkstücke bis
3.000 kg auf bis zu 1.400 mm Durchmesser
großen Paletten sicher gespannt werden.

((Firmeninfo RöhM GmbH))

Spezialist mit großer Innovationskraft

RöhM wurde 1909 gegründet und gilt als einer der bedeutendsten Spannzeughersteller der Welt mit einem umfangreichen Produktprogramm und eigener, leistungsfähiger Sonderfertigung. Rund 1.500 Mitarbeiter produzieren und vertreiben weltweit Spannzeuge vom kleinsten Bohrfutter über effiziente Werkzeugspannungen und packende Greiftechnik bis zur Hightech-Kraftspanneinrichtung. Darüber hinaus werden kundenspezifische Produkte für nahezu jede Spannsituation und Handhabungsaufgabe entwickelt und gefertigt. Das Unternehmen ist längst zum Global-Player geworden, der seine Aktivitäten insbesondere in Lateinamerika, Osteuropa und Asien weiter ausbaut. Ein kompetenter und leistungsfähiger Außendienst unterstützt von mehreren Produktmanagern sowie mehr als 40 Vertretungen weltweit ergänzen diese Entwicklung. Rund 50 Prozent der Produkte werden in mehr als 60 Länder exportiert. Neue Fertigungsstätten in der Slowakei und in Indien sowie ein Joint Venture in China stärken die internationale Ausrichtung des Unternehmens. 2008 wurde die Firmenleitung nach 99 Jahren an einen externen Geschäftsführer Dr.-Ing. Michael Fried, übergeben. Damit setzt die Familie RöhM den Gesellschafterbeschluss um, sich aus dem operativen Geschäft zurückzuziehen und die Geschicke des Traditionsunternehmens künftig als Gesellschafter und Mitglieder des Beirates mit zu gestalten.

((Firmeninfo DMG PFRONTEN))

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DMG ist als Hersteller von spanenden Werkzeugmaschinen in den -Technologien Drehen und Fräsen sowie Ultrasonic/Lasern weltweit führend und bietet innovative Maschinentechнологien, kompetente Serviceleistungen und bedarfsgerechte Softwareprodukte an. Ergänzt werden die Kernkompetenzen durch intelligente Lösungen im Zukunftsmarkt der regenerativen Energien. Mit zahlreichen anwenderorientierten Innovationen setzt DMG weltweit Trends. Die DECKEL MAHO Pfronten iGmbH ist ein wichtiges Lieferwerk im Konzernverbund der DMG AG.