

RINGSPANN®

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February

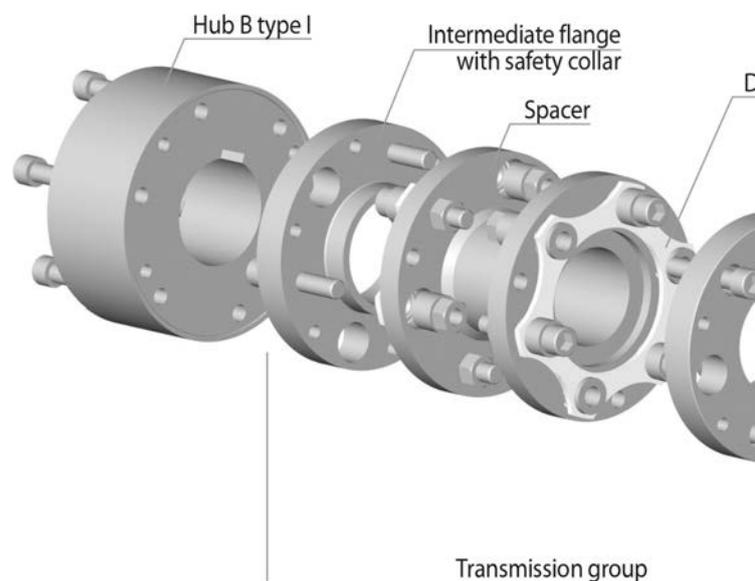
Also API compliant and balanced

RINGSPANN's product offensive in the field of shaft couplings, which has been ongoing for two years, has led to the inclusion of numerous new coupling types in the supplier's portfolio. Among designers and developers in industrial drive technology, the group of disc couplings is particularly currently enjoying an increase in demand. The company is taking this as an opportunity to define the correct selection and design of these non-switchable, torsionally stiff shaft couplings as a key issue at this year's Hannover Messe.

With a range of 22 shaft coupling series covering nominal torques from 2.0 to 1,299,500 Nm and almost all technically relevant types, RINGSPANN currently offers a highly attractive selection of solutions for compensating axial, radial and angular misalignments in industrial drive technology. The company thus provides designers and engineers of plant manufacturers with a great deal of freedom for the realisation of rigid, torsionally stiff or elastic connections between shafts, gears, motors and machines. With the disc couplings in the RINGSPANN portfolio currently enjoying increasing popularity, the company has decided to focus on the correct selection and exact design of this type of shaft coupling as part of its presentation at Hannover Messe 2020 (Hall 5, Stand D32/1). "In our discussions with customers, we discover time and time again that there are a number of uncertainties regarding the optimum application of disc couplings. Based on our decades of project experience and our design competence, we can provide users with important decision criteria and clarify many unresolved questions" says Martin Schneweis, the responsible product manager for shaft couplings at RINGSPANN.

Torsionally stiff and wear-free

The disc couplings of the three series RDL ... DSx in the RINGSPANN product range are torsionally stiff and wear-free shaft couplings. They require no lubrication, convince thanks to their low dead weight and are suitable for uniform and alternating torque loads, as well as for rough operation with bumpy and jerky loads. Their construction is designed for backlash free torque transmission. RINGSPANN offers these shaft couplings in three versions: With a single disc pack (RDL ... DSO), with a double disc pack (RDL ... DSZ) and with a double disc pack (RDL ... DSA) in the special design according to the specifications of the API 610 standard (ISO 13709). The API 610 and the associated API 671 (EN ISO 10441) standard of the American Petroleum Institute result in numerous technical changes for the demanding application of disc couplings in the international oil, petrochemical and natural gas industry compared to the standard design. "For all manufacturers and suppliers of plants and units used for the extraction, production, refining and further processing of crude oil, gas and chemicals, the use of API-compliant shaft couplings is therefore indispensable and competitively relevant", emphasizes product manager Martin Schneweis.





Service factor highly relevant

In addition to the industry-specific criterion of API conformity, there are a number of technical and constructional aspects for the selection and design of disc couplings with overarching significance for all areas of application. Because irrespective of whether such a shaft coupling is to be used in a pump drive, in a blower system, in a packaging plant, in a printing machine or in test bench technology: Correctly determining the nominal torques and the operating speeds is just as fundamentally important as considering the shaft diameter or the shaft misalignment. "Another key decision is selecting the appropriate service factor. With the service factor, torque peaks which may occur during the practical operation of the clutch but which cannot be calculated precisely in advance are taken into account when selecting disc couplings. Selecting a suitable service factor therefore has a key influence on the reliability and price of a disc coupling", explains Martin Schneweis.

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Going beyond the standard

Beyond the technical and physical aspects, there are always some aspects of product quality and finishing to consider when selecting the suitable shaft coupling. For example, RINGSPANN disc couplings – unlike many others on the market – have a surface phosphate coating as standard, which gives them a high level of corrosion protection. In addition, the couplings are balanced to grade G6.3 in accordance with DIN 1940 as standard. This means they support smooth, vibration-free shaft concentricity. "Often enough, it is precisely this quality factor that goes unnoticed when selecting disc couplings, which subsequently leads to concentricity problems and excessive noise emissions in the application – and often to premature coupling failure or even damage to other units of the drive system", stresses RINGSPANN manager Martin Schneweis.

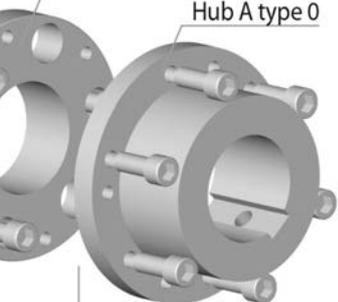
The current RINGSPANN portfolio of shaft couplings includes a wide range of flange, flexible and cone clamping couplings, as well as gear couplings, grid couplings, pin and bush couplings, jaw couplings and of course disc couplings. In addition to other aspects of coupling design, RINGSPANN will be presenting an overview of its expanded coupling range at this year's Hannover Messe in Hall 5, Stand D32/1 with numerous exhibits. If you would like to get an overview of the current RINGSPANN range of shaft couplings before the trade fair, however, you can download the current product catalogue at www.ringspann.com.



disc pack

Intermediate flange
with safety collar

Hub A type 0



The classic is now online

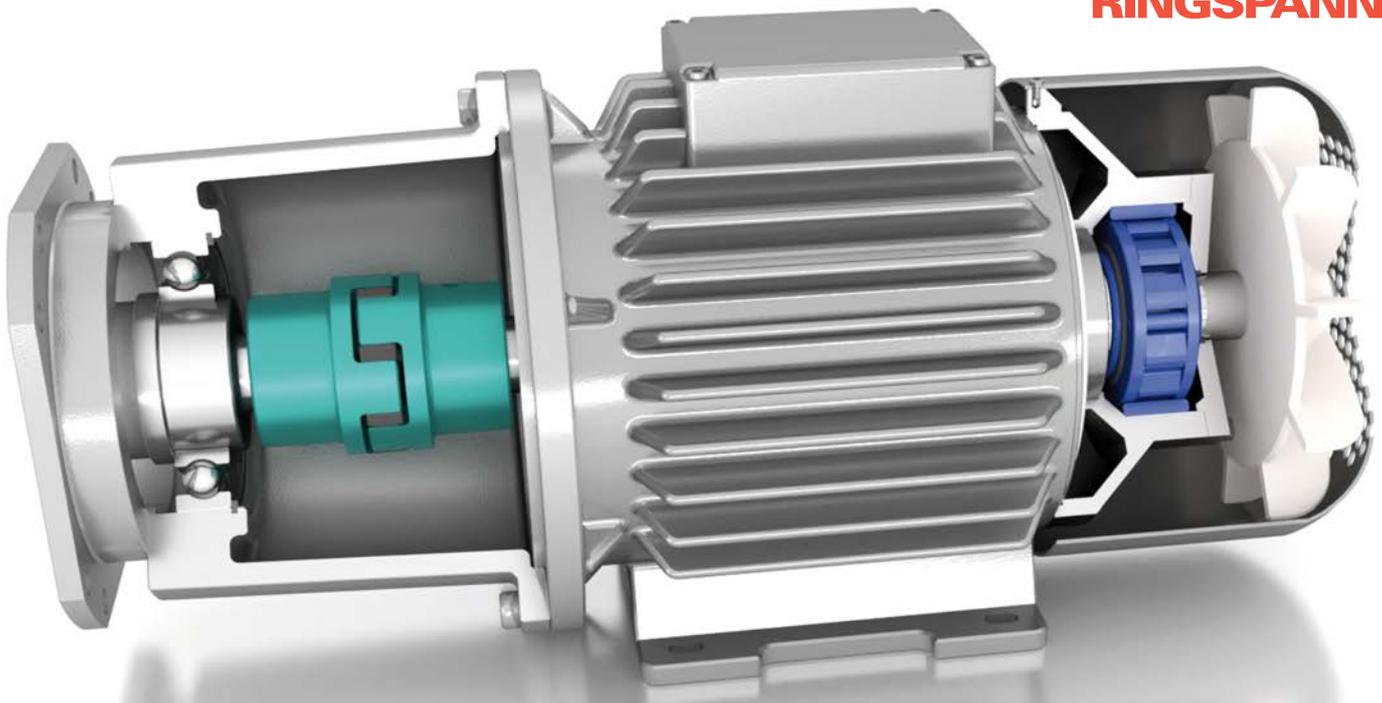
RINGSPANN's FXM-series integrated freewheels have long since become a staple of drive trains in international machine and plant construction. Equipped with the now legendary sprag lift-off type X, they impress with maximum torques of up to 1,230,000 Nm, low lift-off speeds and wear-free continuous operation. The entire FXM series currently comprises more than 40 standard sizes and can now be ordered directly in the company's online shop. In addition, the price structure has been optimised, which is of particular benefit to small series customers. The freewheel classic is currently arousing the interest of numerous e-mobility manufacturers and is part of the RINGSPANN product range at this year's Hannover Messe.

The integrated freewheels from the FXM series are a central focus of this year's RINGSPANN appearance at Hannover Messe (Hall 5, Stand D32/1). They are among the classics of freewheel technology and have been setting the international standard in terms of quality and performance since their market launch in 1971. RINGSPANN is now offering this best-seller in its wide range of freewheel products in its online shop. Furthermore, the price structure of the FXM series has been completely revised as part of its integration into the online order assortment. "This results in attractive economies of scale in pricing, which particularly benefits all those buyers and sourcing managers who often only want or need to order smaller quantities – for example to cover their spare parts requirements", explains Thomas Heubach, head of the freewheels division at RINGSPANN. All sizes with standard bores are available at short notice and customer-specific special designs can be quickly implemented thanks to the modular design of the integrated freewheels. Design and development engineers can find technical data sheets and installation instructions for all FXMs in the company's online shop – and above all: the respective 3D CAD models in various file formats and levels of detail for free download.

Deployable as a return stop and coupling

The integrated freewheels from RINGSPANN's FXM series are universally usable machine elements that can be used as backstops and overrunning clutches and cover a very wide range of applications in machine and plant construction. They do not have their own bearing support, are prepared for front-sided screw assembly, and have race diameters from 31 to 750 mm. Depending on the variant, they generate torques ranging from 110 Nm to 1,230,000 Nm. These performance figures enable them to cover, for example, an enormously wide range of gear applications in light, medium and heavy machine construction. FXM freewheels are, for example, used as backstops between the shafts of spur gearboxes in conveyor belt drives or as overrunning clutches in the gearbox units of bucket elevators, where they automatically engage and disengage the main and creep drives. "The FXM series has been continuously developed over the years and adapted to new areas of application time and again. It's one of the reasons why RINGSPANN engineering has a very high level of





design competence for this incredibly versatile freewheel type. For example, our FXMs are currently under discussion for various e-mobility applications. This will be a topic of discussion at this year's Hannover Messe", says division manager Thomas Heubach.

Compact design and quality in detail

Among the most important design features of the FXM freewheels are their compact design, their guide elements for the cage rings and sprags that are milled with the highest precision, and the excellent functionality of the type-X sprags acting inside them – a pioneering development of RINGSPANN engineering. Thanks to the generally low lift-off speeds for the sprags, a well thought-out overall design and

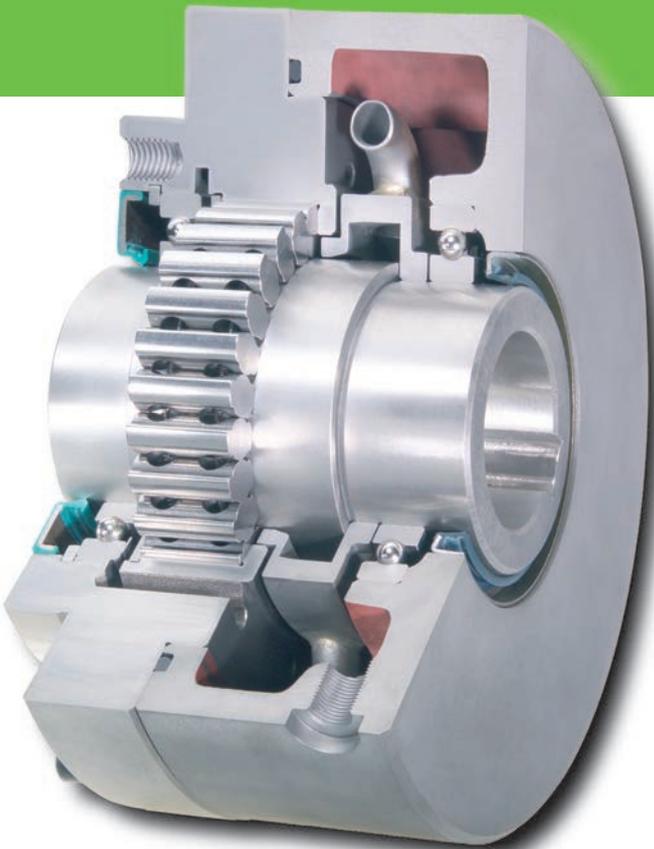
the high manufacturing quality of their components, these freewheels not only achieve the highest torques but also prove to be wear-free marathon runners. "As low-maintenance fire-and-forget solutions, our FXMs have been proven over many years in numerous long-term applications in mechanical and automotive engineering", reports Thomas Heubach.

In addition, there are two other important factors that underline the universal character of these RINGSPANN integrated freewheels. Firstly, the exceptional X-geometry of their sprags allows the FXMs to be used with friction-reducing solid lubricants (e.g. molybdenum sulphide). And secondly, the FXMs do their job even with larger runout deviations! They are therefore very well suited for use in plain bearing applications, for example.

Today, the RINGSPANN Group manufactures in production plants on three continents. These integrated freewheels are thus not only a real example of the company's market leadership on global freewheels markets, but also represent RINGSPANN's development into an international one-stop supplier of high-quality components for industrial drive engineering.



The functional link in hybrid drives



When manufacturers of mobile cranes, construction machinery or heavy transporters develop their engines, RINGSPANN's freewheels are often involved. These special vehicles are often driven by powerful hybrid systems consisting of diesel and electric motors. The overrunning clutches from the FK_h series, for example, are responsible for the division of labour between the two. The reason for this is that without complex control technology, this hydrodynamic clutch solution allows both high differences in speed between the engines to be achieved and different engines of the same drive train to be alternately engaged and disengaged.

Hybrid drive solutions are becoming increasingly popular in the off-highway and heavy-duty sectors of international vehicle construction. Today they are being used in mobile cranes and heavy-duty transporters as well as in many earth-moving, road construction and construction site vehicles. Typically, these hybrid engines combine modern diesel engines with powerful (asynchronous) electric motors so that the wheels of the mobile machines can be driven either by one of the units or by both in a duet. Now, however, the user must be able to rely on this work-sharing interaction between the combustion engine and the e-drive functioning reliably and efficiently over a long period of time. Many designers of hybrid drives therefore use overrunning clutches from RINGSPANN. The freewheels of the FK_h series have particularly proven themselves as dynamic mediators between the rotating forces of the systems. "These ready-to-install complete freewheels for front-side bolted assembly often prove to be the ideal solution for the safe and simple management of high speeds in hybrid engines with a spatially optimised design. This is primarily due to their hydrodynamic sprag lift-off, which is ideally suited for changing between freewheeling and driving operation in multi-motor drives where the speeds are the same in both operating modes", says Thomas Heubach, head of the freewheels division at RINGSPANN.

Coupling and uncoupling without an external impulse

The overrunning clutches of the FK_h series from RINGSPANN are low-maintenance components with ball bearings that can be used to engage and disengage the various engines of hybrid drive systems. This type of freewheel can be used as a compact clutch between electric motors and combustion engines in joint (or parallel) drive trains. The clutch is engaged with torque transmission in driving mode of the freewheel, while disengagement with torque interruption is carried out in freewheeling operation. Both of these operations can be

carried out without any addition control or regulating technology, because the functionality of an FK_h overrunning clutch is based solely on mechanical and hydrodynamic principles. The freewheels are always installed between the two drive sources of the hybrid system in such a way that the drive in driving mode is carried out via the inner ring, while the outer freewheel ring overruns in freewheeling operation.

Oil flow instead of centrifugal force

The hydrodynamic principle is the great strength of this freewheel series from RINGSPANN and makes it so attractive for use in fast-rotating multi-motor engines. In contrast to freewheels where the sprags lift off solely due to the centrifugal forces acting during rotation, the sprag lift-off in hydrodynamic overrunning clutches is achieved by an oil flow. "For this reason, in an FK_h freewheel, the speed in driving operation can be as high as the freewheeling speed in freewheeling operation", stresses division manager Thomas Heubach, and explains what this means in practice: "This results in an almost unlimited service life of the sprags, which float on an oil film

in overrunning operation and are thus separated from the inner raceway. The maintenance expenditure is minimal and is limited to an occasional oil change. These systems are therefore also extremely reliable and far superior to others in which no mechanical centrifugal lift-off can be used."

RINGSPANN supplies the overrunning clutches of the FK_h series in six standard sizes, filled with oil and ready for installation, for nominal torques up to 14,000 Nm and with bores ranging from 35 mm to 95 mm. Sizes FK_h 94 ATR and FK_h 106 ATR are currently in healthy demand among manufacturers of hybrid engines for mobile cranes, construction machinery and heavy transporters. Division manager Thomas Heubach is also of the opinion "that hybrid drive technology still possesses great development potential in automotive engineering and is a growing future market for hydrodynamic overrunning clutches. Particularly because it allows solutions to be realised that do not require any electronics at all and is therefore very easy to maintain."

The entire freewheels range can be found in the company's online shop at www.ringspann.com. <<

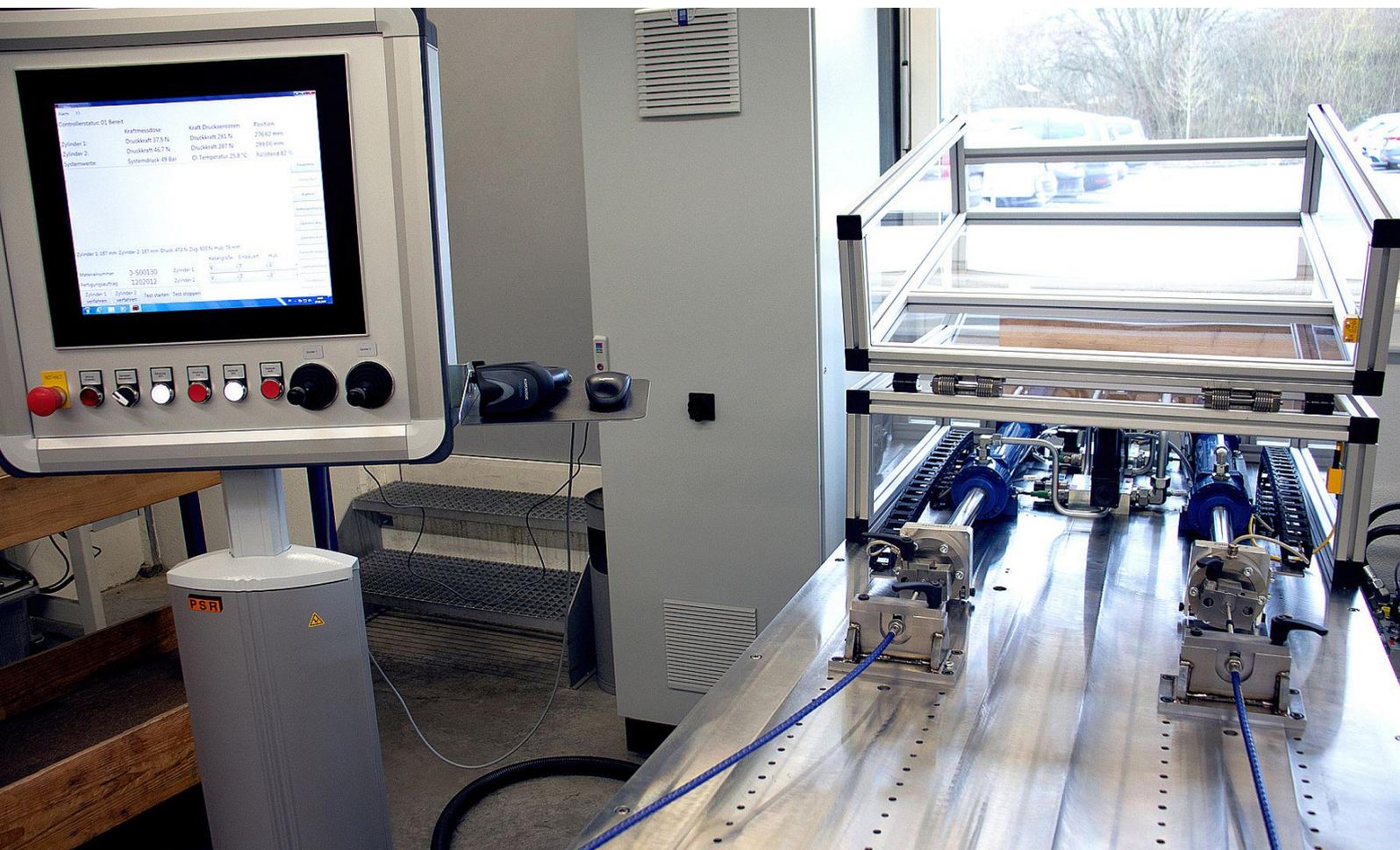


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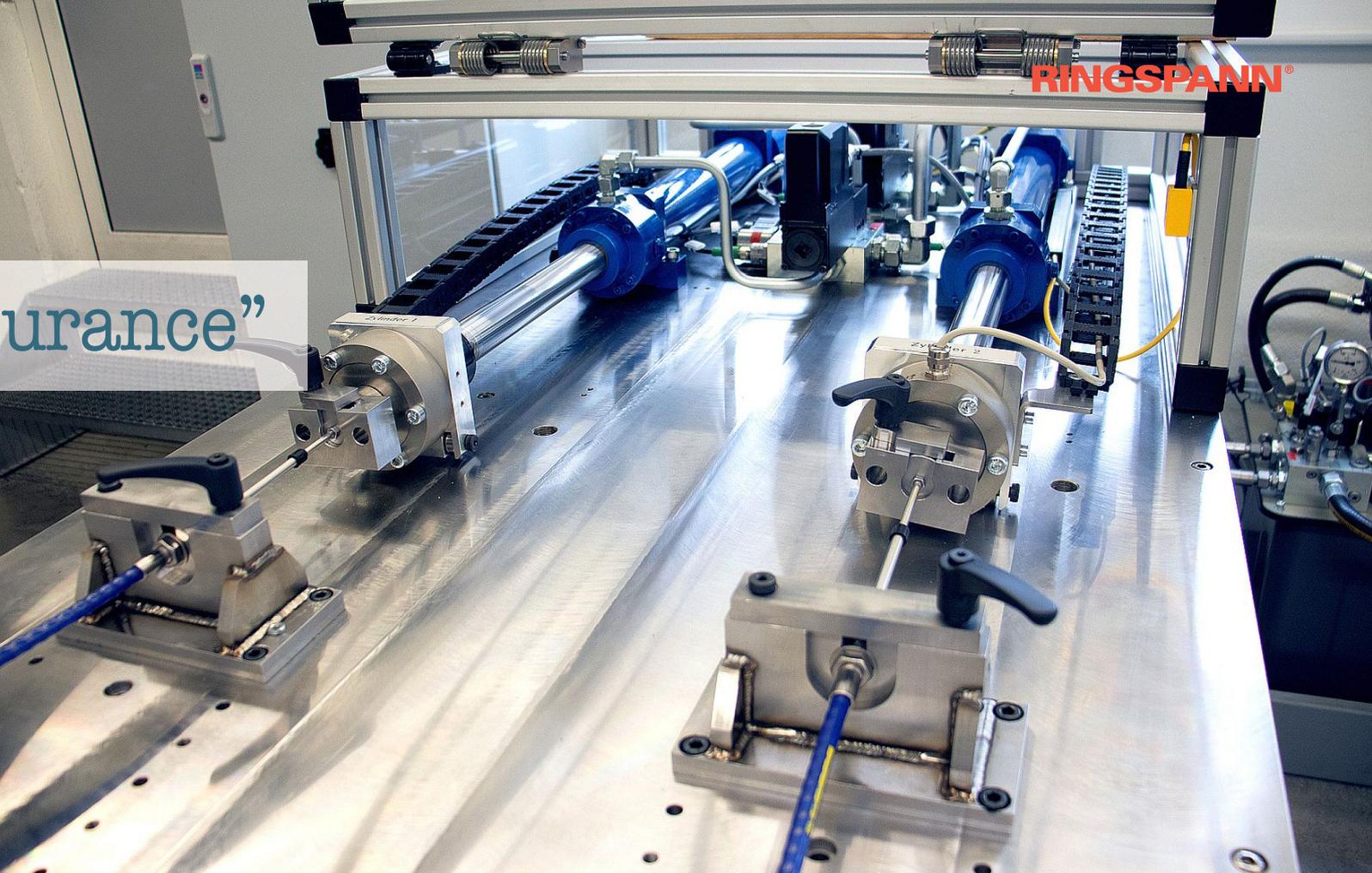
“Many new possibilities for quality assurance”

With the commissioning of a new test bench just a few days ago, RINGSPANN RCS has considerably expanded the possibilities for further development and quality assurance of its push-pull cable systems. The facility is equipped with a digital control system, two synchronously operating hydraulic cylinders and a mobile terminal. It offers numerous options for different test scenarios and comprehensive evaluations. The German remote control specialist is thus gaining a considerable competitive advantage internationally.

RINGSPANN RCS's new digital test bench is a powerful and intelligent system that provides the company's engineers with a large arsenal of options for the quality assurance and further development of their remote control systems. "All test benches for push-pull cables and Bowden cables known to us to date possess neither the high performance nor the flexibility of control that our new duplex system offers. In addition, this is a system solution designed exclusively for our company, and numerous quite demanding test scenarios that go far beyond the conventional have been taken into account in its realisation. This was a real challenge in the technical implementation of the test bench, but the result speaks for itself", emphasises Christian Kny, managing director of RINGSPANN RCS. The new test bench from the Oberursel-based manufacturer of remote control systems has a large



urance”



working platform with two parallel test lines. Two precisely controllable hydraulic cylinders ensure the desired kinematics and dynamics within the test scenarios. These two cylinders are equipped with 20 kN load cells and draw their power from the test bench's own 150 bar unit.

Wide range of test scenarios

The new remote control test bench from RINGSPANN RCS is easy to operate using a mobile terminal with a colour monitor. The digital control system offers both the company's quality managers and development engineers a great deal of freedom in the execution of numerous different test scenarios, as well as partially and fully autonomous test sequences. It can be used not only for standard tests, but also for special force tests, friction measurements, cycle tests and backlash measurements, as well as routines for evaluating elastic elongation and much more. "In addition to testing individual kinematic and dynamic performance parameters, we can also use the new facility to carry out demanding long-term test series and complex multiple-factor analyses in which several different requirements are alternately tested. It can also be used for benchmarking projects", says managing director Christian Kny. For RINGSPANN RCS, the new test bench is therefore not only a valuable tool for internal quality audits, but also an important source of inspiration for the further technical development of push-pull cable systems. In order to ensure that no results are lost in all this, that all test

scenarios are fully documented and that the data can flow directly into the evaluations, the test bench control system stores all results securely on network servers and records them in protocols.

Test bench creates a competitive advantage

With the new duplex test bench, which RINGSPANN RCS' engineering department actively helped to implement, the company based in Oberursel should have a clear competitive advantage within its industry. That is because the verifiable testing of cable systems and verification of the performance data is playing an increasingly important role today, both in the development of new high-quality push-pull cables and in the implementation of specific customer requirements, as well as in the qualitative improvement processes. Taking into account the highest quality requirements, the new system is also available for project-oriented test orders from customers and interested parties – including the evaluation and documentation of all parameters. Last but not least, the company's product developers can use the duplex test bench to demonstrate – and prove – technical correlations and quality features that were previously difficult to communicate to users. Managing director Christian Kny is therefore certain "that the results and findings that we achieve with the help of our duplex test bench will prove to be a strong argument in the decision-making processes of our customers in the future." <<

Produkte > Präzisions-Spannzeuge > Präzisions-Spanndorne > Kegelbüchsen-Flanschdorne > Kegelbüchsen-Flanschdorne BKDF

Kegelbüchsen-Flanschdorne BKDF



- Datenblatt BKDF
- 3D CAD-Modell
- Einbau- und Betriebsanleitung BKDF
- Katalog Präzisions-Spannzeuge

Kegelbüchsen-Flanschdorne als Komplett-Spannzeug

Eigenschaften

- Für Spanndurchmesser von 11,9 mm bis 132 mm
- Hohe Rundlaufgenauigkeit $\leq 0,01$ mm
- Zulässige Werkstücktoleranz bis IT15
- Plananzug gegen außenliegende Anlagefläche oder außenliegenden kundenseltigen Anlagering
- Für dünnwandige oder massive Werkstücke
- Handspannung optional möglich

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Werktags von 08:00 bis 18:00 Uhr

Artikel auswählen:

Bezeichnung	Spannbereich [mm]	Materialnummer	Lieferzeit*	Für Kunden in Deutschland Preis/Stück in € bei Abnahme ab		
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The precision clamping fixtures from RINGSPANN are now available to be ordered directly from the company's online shop. Manufacturers of cylindrical components for the automotive, mechanical engineering, aerospace and fluid technology industries particularly stand to benefit. They can now choose from numerous standard series with complete clamping chucks and clamping mandrels for external and internal clamping. All binding prices and delivery times can be viewed and the order can be placed with the click of a button.

The clamping chucks and clamping mandrels from RINGSPANN are suitable for almost all turning, milling and grinding processes, as well as testing and balancing processes where increased demands on accuracy are the overriding factors. They are therefore most at home in the machining and pro-

duction of demanding cylindrical workpieces, such as those required in gear manufacturing and fluid technology. One of their major areas of application is gearing technology. As a result, manufacturers and suppliers of high-quality precision components such as gear wheels, spur wheels, planetary carriers and pump wheels will gain from the completed expansion of RINGSPANN's online shop. They can now select and order precision clamping tools from all the company's standard series online. In concrete terms, this means that users have direct access to a wide range of clamping chucks and clamping mandrels in numerous different designs and variants – including prices.

Ready-to-use complete solutions

RINGSPANN's new online shop expansion includes all flange chucks and flange mandrels in bonded disc pack, taper collet, taper sleeve and flat element designs with their different external and internal clamping principles. In the case of mandrels, the new online shop range also includes the innovative,

online

high-precision disc actuated clamping mandrel from RINGSPANN and a particularly slim centre mandrel. All precision clamping fixtures have one thing in common: they are ready-to-use complete solutions with a high concentricity accuracy that are always optimally matched to their application.

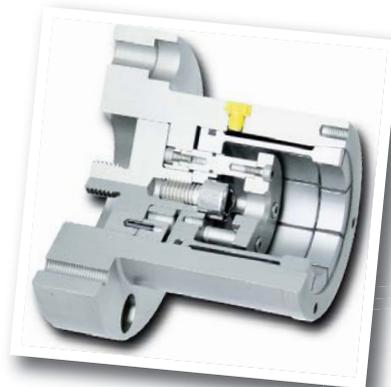
Depending on the design and clamping principle, RINGSPANN's clamping chucks and clamping mandrels focus on different areas of application. For example, you can find flange chucks for the machining of both thin-walled and solid workpieces (e.g. series LAFF / BKFF), or flange chucks which are characterised by long insertion depths (HKFF series) or very short clamping lengths (KFFF series). It's a similar situation with the rough differentiation of RINGSPANN flange mandrels. Other basic selection criteria for the user are the required clamping diameter (7.0 mm to 560 mm), the required concentricity (≤ 0.020 mm to ≤ 0.005 mm) and the permissible workpiece tolerance (IT 7 to IT 13). The company's online shop offers a comprehensive overview and a high degree of transparency, enabling you to quickly and accurately select the appropriate clamping tool. This includes being instantly able to see as a customer how you can benefit from the graduated price scale through multiple orders.

CAD models and the next step

Not only does the online shop offer the user the option of being able to order quickly, it also grants access to a treasure trove of key information on the individual clamping fixtures. Especially interesting for designers and maintenance staff here are – in addition to the detailed product descriptions – the data sheet and installation instructions downloads, as well as the 3D CAD data models in all relevant formats.

RINGSPANN is relentlessly driving forward the expansion and detailing of its online shop in all product groups. The next step in the field of precision clamping fixtures is also already underway: integrating the entire range of clamping elements for flange chucks and flange mandrels – i.e. bonded disc packs, taper sleeves, taper collets, expanding sleeves and thrust rings. Once these expansion measures have been implemented, users will also be able to select and order all their exchange and spare parts for RINGSPANN clamping fixtures online. It will simplify and speed up all activities related to the repair and subsequent optimisation of flange chucks and flange mandrels.

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Advancing into extreme performance



RINGSPANN is driving forward the expansion of its industrial brake portfolio with a great deal of creativity and a laser focus on the requirements of its customers in the mechanical and plant engineering industry. One of the most recent measures in this context is the addition of three particularly large brake calipers for the realisation of high-performance disc brakes in emergency stop and extreme applications. Among others, this stands to benefit manufacturers of drive systems for heavy-duty and mining technology, as well as power plant construction and offshore technology.

RINGSPANN's current product range expansion in the field of industrial disc brakes particularly appeals to all designers, system manufacturers and vehicle manufacturers who tend to get very big wheels turning when it comes to developing their drive systems. And that is down to the fact that, with clamping forces ranging up to 560,000 N, the newly added

HS/HW 145, HS/HW 165 and HS/HW 215 brake caliper series are entering the upper echelons of heavy engineering. This means that they enable, for example, the realisation of emergency stop systems for bulk material conveyor systems in the mining industry, for the driven cable winches of marine and offshore technology, or for use in heavy-duty construction machines, wind power plants, large-scale test benches and many other mammoth and extreme applications. In these areas, they are often used – in addition to many solo appearances – in batteries with several disc brakes.

Two become five

The new brake calipers from RINGSPANN are all representatives of the spring activated and hydraulically released design. They are available as fixed caliper and floating caliper models as well as in versions for parallel and right-angled mounting or installation – always viewed in relation to the position of the brake disc. “Based on the HS/HW 075 and HS/HW 120 series offered so far, we are now able to offer plant manufacturers a number of additional brake caliper variants for the design of industrial disc brakes in significantly higher performance classes”, says Franz Eisele, who heads RINGSPANN's brakes and clutches division. The company's current selection in the segment of spring activated and hydraulically released brake calipers now extends to five series in various dimensions and with clamping forces ranging from 1,500 to 560,000 N.

Lots of individual freedom

In addition to selecting the appropriate series, RINGSPANN offers customers numerous options to individually optimise the HS/HW high-performance brake calipers. For example, several types of friction linings are available for different requirements; among others, special sintered linings are available for applications with high circumferential speeds, where increased thermal load on the brakes is part of normal operation. In addition, the three new brake calipers are available in a marine and a cryogenic version, which considerably increases the range of application for these brakes. “In addition,

ranges



Franz Eisele
 Head of Division
 Brakes and Couplings
 at RINGSPANN GmbH

Planning and investment security

The availability of all technically relevant components at its European locations enables RINGSPANN to guarantee a high degree of availability of its industrial brakes. All wear and spare parts are available on call and the integration of brake assembly in just-in-time scenarios is also possible. On the basis of its in-house test rig technology, RINGSPANN can also offer its customers a high level of planning and investment security. In addition to installation descriptions and operating instructions, the scope of delivery also includes technical documentation and the test reports and protocols required for quality assurance. <<

plant engineers or system integrators will also receive a suitable console for all HS/HW brake calipers from us, which may considerably simplify and accelerate parallel or right-angled installation or mounting on site”, adds divisional manager Franz Eisele.

Since the company defines itself as a one-stop supplier, it also has the appropriate hydraulic power units, an electric friction block wear detection system and various sensor systems for querying operating modes in its portfolio. It also stocks raw parts for brake discs with diameters of up to 1,000 mm. This means RINGSPANN can supply the user with all the components needed to create a complete high-performance disc brake. What’s more, the company’s extensive selection of industrial brakes also makes it possible to combine the brakes of the HS/HW series in a package solution with spring activated/electrohydraulically released RINGSPANN brake calipers. In some applications this makes sense, since both spring activated brake types complement each other very well.



August

Lightweight solution for thin-walled di

Whenever rotationally symmetrical die-cast components with thin walls have to be machined in the production of modern automotive transmissions, the demands on the clamping technology increase considerably. This is because the clamping systems used for this purpose must exhibit a high degree of concentricity, must not deform the workpiece under any circumstances and should ensure optimum chip removal. RINGSPANN has therefore developed a clamping trio specifically for external and internal machining as well as for the balancing and crack detection of sensitive aluminium gear pots, which has quickly established itself as a semi-standard in large series production.

Even clamping systems can have a career. An extremely vivid example of this are the three clamping systems that RINGSPANN has recently realised for the production of lightweight components for modern 8HP generation automatic car transmissions. Within the space of just a few months, this innovative triple clamping fixture for external and internal machining, as well as for the balancing and crack detection of die-cast aluminium transmission pots, has become a permanent fixture in a large number of large series production lines. "Today, it is used not only in Germany but also overseas," reports Volker Schlautmann, head of RINGSPANN's clamping fixtures/ Shaft-Hub-Connections customer team.

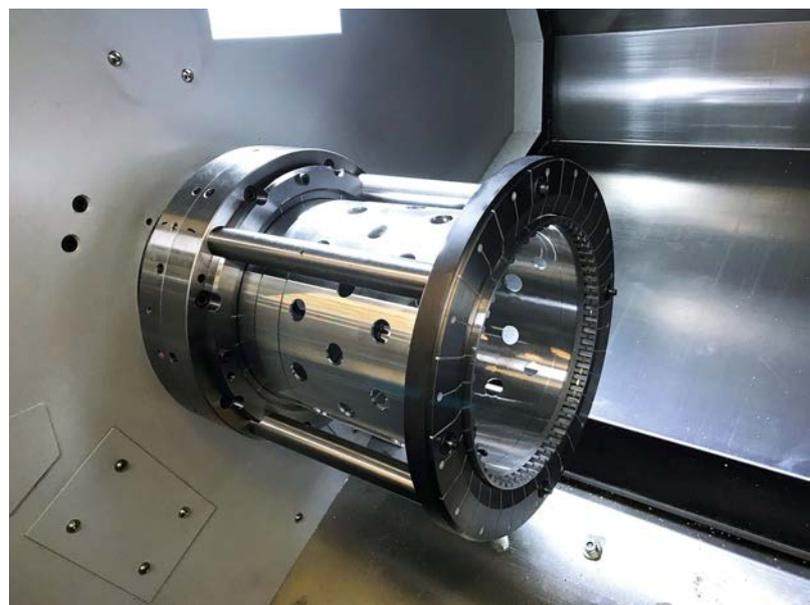
Also suitable for small machines

The design and functionality of these clamping fixtures are optimally tailored to the high quality and efficiency demands in gear manufacturing. Above all, this means: They ensure that the thin-walled aluminium components are held with as little distortion as possible, they meet the high demands on precision and concentricity in all machining process stages, and they support reliable chip removal during turning (inside and outside). In addition, all three clamping devices convince with what is principally a rather simple design and a low dead weight. Volker Schlautmann is therefore keen to stress: "After minimal training by our team, the user is quickly able to per-

form the maintenance themselves, and thanks to their lightweight construction, our clamping devices can also easily be used on smaller processing machines with lower spindle loads". The RINGSPANN trio thus directly contributes towards both reducing the total investment for a production line and lowering unit costs.

Secure and low-distortion clamping

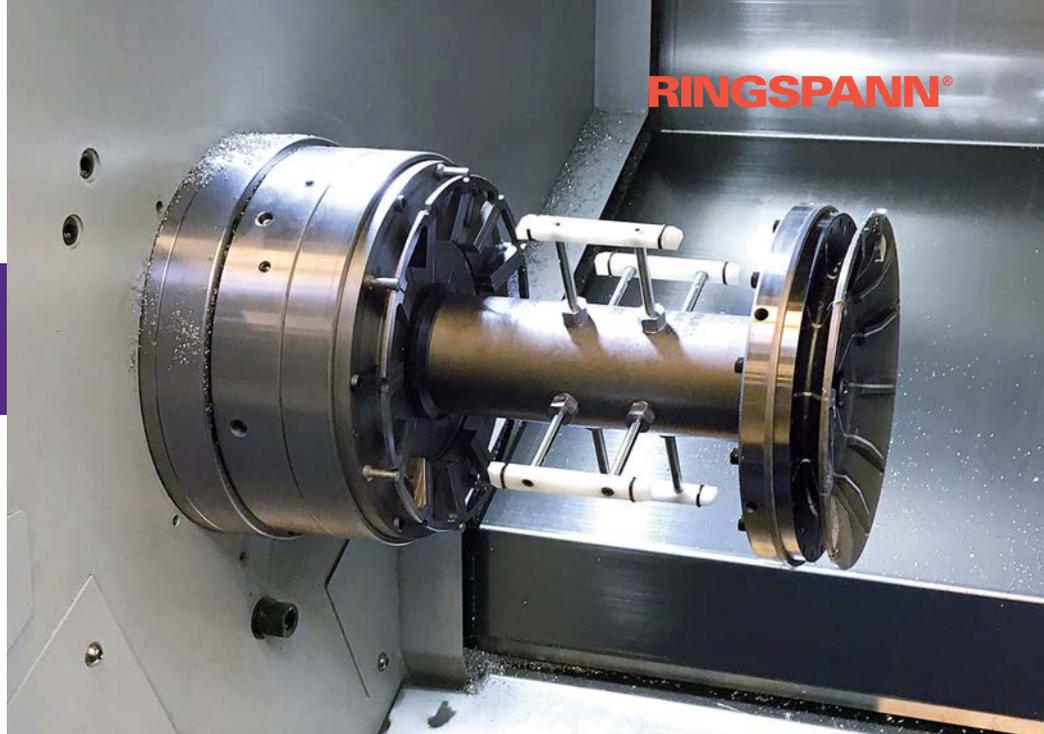
The two clamping fixtures for machining the cast aluminium blanks are, on the one hand, a pneumatically and mechanically actuated double diaphragm mandrel (external turning) and, on the other hand, a pneumatically and mechanically operated flat chuck-clamping chuck combination (internal turning). The clamping fixture for the two subsequent process steps of balancing and crack detection, on the other hand, is a mechanically operated double taper collect clamping mandrel. What all three systems have in common is that they clamp the cylindrical workpiece at the upper and lower edge - i.e. at both ends. The frictional connection is achieved with two independently acting, circularly arranged clamping elements. They ensure that the gear pot, whose wall thickness is reduced from a little more than 4.0 mm to just 2.2 mm during turning, always rests securely and - above all - with minimal distortion in the clamping. Additional vibration dampers also prevent the rotating gear pot from vibrating during the machining of its surfaces, which are interrupted by numerous holes. In combination with the open design of RINGSPANN's clamping systems, these bores facilitate the smooth removal of the fine aluminium chips.



e-cast parts



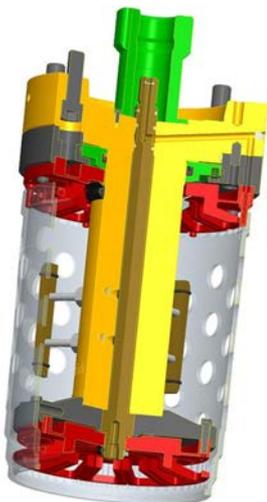
Volker Schlautmann
*Head of Customer Team
 Clamping Fixtures and
 Shaft-Hub-Connections*



Designed for long service life

All three RINGSPANN clamping systems for the machining and quality assurance of die-cast aluminium gear pots have a concentricity accuracy of $\leq 40 \mu\text{m}$ and are designed for very long tool life. They are currently proving their worth in several large series projects with batch sizes in the multi-million range and are being used in both European and US production lines. Their customer-oriented and product-specific design and configuration once again underlines the high level of competence of RINGSPANN engineers in the field of clamping systems for use in the large-scale production of gear manufacturing, fluid power and gearing technology. "Whenever round, cylindrical and rotationally symmetrical

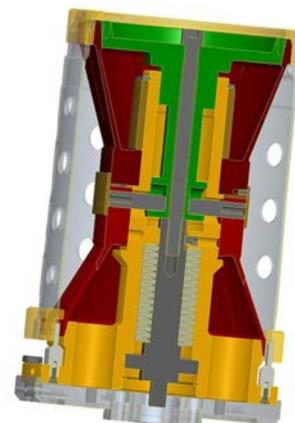
workpieces need to be machined with minimum tolerances, our clamping technology expertise is the right choice. Thanks to our more than 75 years of experience in this field, we are able to create high-quality clamping systems that reliably fulfil their task over a long period of time, even for completely new clamping situations or special conditions - such as in the case of the thin-walled die-cast parts described above. And if our wide range of standard precision clamping fixtures should not cover the task at hand, we set ourselves the goal of developing a new standard clamping fixture based on a special solution," says RINGSPANN expert Volker Schlautmann. <<



OP10



OP20



Balancing & Crack Test

August

The kinematic darling of designers

The ready-to-install complete freewheels from RINGSPANN's premium FB and FBF series are true universalists and cover a wide range of applications. They can be used in drive trains in machinery and plant construction as backstops and for overrunning and indexing functions. Since they are also available for a very large torque range and in four different sprag variants, they convince as extremely versatile drive elements. They can be ordered directly from RINGSPANN's online shop in versions with or without mounting flange.

If there were a versatility tournament in industrial drive technology, the freewheels of RINGSPANN's premium FB/FBF series would regularly land at the top of the winners' podium. That is because these complete freewheels provided by the manufacturer ready for installation are not only available in several sprag configurations for different performance demands, but also for an enormous torque range from 45 to 160,000 Nm. This opens up a wide field for designers and developers in mechanical engineering and plant construction to realise innovative and efficient solutions for backstops as well as overrunning and indexing kinematics in drive trains. They can also choose between basic versions with or without mounting flange. All FB/FBF freewheels can be selected and ordered directly from the RINGSPANN online shop. A number of variants with standard bores (max. 300 mm) are available at short notice.

Chrome steel with wear protection

RINGSPANN's FB/FBF series complete freewheels are essentially sealed sprag freewheels with ball bearings, which are filled with oil at the factory and supplied ready for installation. Depending on the individual application, the designer can then choose between four performance categories with regards to the sprag configuration. The standard version and the RIDUVIT® design already cover a wide range of applications. Both are suitable for backstop and overrunning appli-

cations with maximum idling speeds of 4,800 min⁻¹ (inner ring) and 5,500 min⁻¹ (outer ring). As indexing freewheels, they can handle medium (standard) to high (RIDUVIT®) indexing cycles. The chromium steel sprags of the RIDUVIT® variant are also characterised by a special surface with hard metal-like wear resistance. "This high-performance functional coating is based on important tribological findings and gives the RIDUVIT® freewheels a significantly increased service life," says Thomas Heubach, head of the freewheels division at RINGSPANN.

Decision between X or Z

The other variants of the freewheels FB/FBF are more specifically designed, which differ in the design of the sprag lift-off and are predestined for the realisation of particularly demanding backstop and overrunning applications. Here, the design engineer can choose between complete freewheels with the so-called sprag lift-off X or sprag lift-off Z. Both versions were developed for high freewheeling speeds in long-term operation, where no wear on the sprags arises beyond the lift-off speed. The sprags' shapes and bearing arrangements, which have been thought out down to the finest detail, exhibit an innovative sophistication. "In these two disciplines of freewheel design, we possess internationally recognised expertise thanks to decades of in-house development work", emphasises Thomas Heubach.

With the complete freewheels FB/FBF with sprag lift-off X, the sprags supported in a cage connected with the inner ring, rotate with the inner ring in freewheeling operation. Since this is caused by centrifugal force without any contact to the outer ring, the freewheel with sprag lift-off X can rotate almost wear-free in applications with a fast rotating inner ring. Similarly, type-Z sprags rotate in freewheeling operation without contact with the outer ring - which is why the FB/FBF freewheels with this type of sprag lift-off prove to be the ideal solution for long-term applications with a fast rotating outer ring. "The first two questions that the design engineer must therefore answer when choosing between X and Z are therefore: What is the mounting position? In which direction of rotation should the FB/FBF turn freely and in which direction should it lock or drive?", explains Thomas Heubach.



Two relatives with shaft couplings

The complete freewheels of RINGSPANN's premium FB/FBF series are currently used in almost all sectors and niches of international mechanical engineering and plant construction. Whether in the drive systems of trimming shears for wide-belt rolling mills, meat processing machines, shredders, mail sorting systems or leisure rides such as rollercoasters – in countless applications they serve as extremely reliable and durable backstops, overrunning clutches or clutches.

Two close relatives of the FB family are tailor-made for applications with overrunning functions, where two shafts have to be connected with offset. These are the complete freewheels FBE and FBL, which RINGSPANN offers as ready-to-use assemblies with flexible and torsionally rigid shaft couplings from its portfolio. "The customer thus receives combined solutions from two functional components, whereby the shaft couplings can be flexibly docked onto the freewheel depending on the desired direction of rotation", explains Thomas Heubach. The flexible FBE solution is designed for smaller shaft displacements - for example between a main drive and an angular gear - and the torsionally rigid FBL design can accommodate large radial and angular misalignments without constraining forces acting on adjacent bearings. A typical installation situation for this is, for example, the positioning between the main motor and the creep drive of a conveyor belt system. Both system solutions consisting of an overrunning clutch and a shaft coupling are available in three variants: Standard, RIDUVIT® and with sprag lift-off Z.

At home in all sectors and niches

In addition to a large selection of FB and FBF freewheels available at short notice, RINGSPANN can also produce special designs on request, for example for unusual bore dimensions or rare flanged connections. Depending on requirements and quantities, the RINGSPANN Group can draw on the capacities of production plants on three continents. "Both the FB/FBF complete freewheels and the FBE/FBL combined solutions are real examples of our market leadership on the worldwide freewheel market and our positioning as an international one-stop supplier of high-quality components for industrial drive technology," underlines division manager Thomas Heubach. <<



October

Sometimes it has to be something more

RINGSPANN offers stainless steel and nickel-coated Shaft-Hub-Connections especially for use in drive trains with increased corrosion protection requirements. Typical applications include gears and pumps in machines and plants in the food processing, pharmaceutical, chemical, packaging and bottling industries. Find out which Shrink Discs and clamping elements from the company's portfolio are the first choice here - and what customisation options RINGSPANN offers in terms of corrosion protection.

RINGSPANN has in its recent past integrated many more Shaft-Hub-Connections into its one-stop offer for drive technology and has raised the performance level of several series on the basis of an improved frictional connection calculation method. In addition, various external and internal clamping solutions that meet particularly high corrosion protection requirements have now found their way into the portfolio. These in-

clude in particular the stainless steel series RLK 603 K (Shrink Discs) and the nickel-plated series RLK 110 K (Cone Clamping Elements). The main users of these corrosion-resistant Shaft-Hub-Connections from RINGSPANN include, in particular, machine and plant manufacturers in food technology, pharmaceutical and medical technology, chemical and process technology as well as packaging, filling and fluid technology. "Furthermore, manufacturers of agricultural and construction machinery also use these extremely durable components to create weatherproof and wear-resistant drive trains," says Marvin Raquet, product manager for RINGSPANN's Shaft-Hub-Connections.

High quality stainless steels

From a functional point of view, all RINGSPANN Shrink Discs and clamping





elements are basically ready-to-install, largely standardised and frictionally connected Shaft-Hub-Connections for the transmission of torques and axial forces. The corrosion-resistant stainless steel type RLK 603 K Shrink Discs are designed as a three-part assembly, which allows hollow shafts or hubs with outer diameters of 24 mm to 175 mm to be clamped from the outside onto rotating shafts without backlash. They are suitable for transmittable torques ranging from 170 Nm to 23,000 Nm and are adjusted and fixed with clamping screws.

One concrete food technology application example for such a stainless steel Shrink Disc is the backlash-free attachment of a stirring hook to the drive gear of a hygiene-sensitive screening unit for conditioning baking agents, which can be aligned in the direction of rotation. According to Marvin Raquet, "the design of the complete Shrink Disc in stainless steel - including all screws - in this case allows the realisation of a very maintenance-friendly and easy-to-clean drive solution". The stainless steel Shrink Discs type RLK 603 K are also a good choice for many process engineering applications because of their resistance to a number of chemicals. As an alternative to this, RINGSPANN offers three-part Shrink Discs in the RLK 603 S series, which can optionally be designed with chemically nickel-plated surfaces.

Nickel-plated surfaces

The Cone Clamping Elements in the RLK 110 K series are nickel-plated as standard. With the help of these internal clamping connections, hubs can be fixed on rotating shafts with diameters from 19 mm to 60 mm. Depending on the variant, torques between 190 Nm and 2,800 Nm can be transmitted.

Thanks to their radially flat height, these clamping elements from RINGSPANN are particularly suitable for use with hubs of smaller outer diameters. Their high corrosion resistance in accordance with DIN 50021 is achieved by a nickel coating, which in the standard version has a layer thickness of 35 µm. Product manager Marvin Raquet stresses in this context: "The nickel coating gives the RLK 110 K a high corrosion resistance per se, which is why this clamping element covers a wide range of applications in the food industry. However, since we can scale the thickness of the coating, the degree of corrosion protection can be individually adapted to the customer's requirements. If, for example, a lower level of corrosion protection is sufficient and the cost framework is tight, we can also realise considerably thinner layer thicknesses".

A typical case for the use of a nickel-plated RLK 110 K is the backlash-free mounting of an eccentric wheel on the drive shaft of a food packaging machine. "In addition to nickel plating, we also offer our customers the option of designing these Cone Clamping Elements in various stainless steels," adds Marvin Raquet.

Demand is growing

The corrosion-resistant Shaft-Hub-Connections from RINGSPANN are currently experiencing growing demand. The company's technicians see a triggering impulse for this in the increasing hygiene and quality demands that users in medical technology, the pharmaceutical industry and food processing place on machine and plant manufacturers. In addition, the increasing automation in these industries is increasing the demand for corrosion-resistant components for the realisation of drive technology assemblies. <<

December

Mechanical solution for safe operation

Venous flow clamps are a traditional and proven solution for accurate and safe blood flow regulation during surgical procedures. They allow easy adjustment of the blood flow rate with the aid of a handy rotary actuator, which is operated via a flexible and extremely smooth-running power transmission cable. The German firm RINGSPANN RCS is one of the leading manufacturers of these types of custom-made pull and push-pull cables for use in medical technology.

The mechanical cable systems from RINGSPANN RCS are extremely high quality control elements that are designed for a long service life and boast excellent gliding properties. As intrinsically safe and maintenance-free remote control systems,

they prove their worth wherever forces have to be transmitted between locally separated and stationary components, but where it must always be possible to manually influence the connection between input and output force by means of a flexible control element. The cable systems from RINGSPANN RCS have proven to be extremely reliable control elements – thanks in particular to their length-preserving properties – even when the cables are installed with winding installation paths and with high precision requirements. But these are not the only reasons why many medical technology device and equipment manufacturers are opting for the German company's pull cables and push-pull cables. "At least as important as the high quality of our remote control systems is the fact that we are able to create tailor-made cable systems for our customers that are precisely tailored to the conditions of their applications", emphasises Alexander Balloussa, sales representative of RINGSPANN RCS.



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Between rotary actuator and flow clamp

Alexander Balloussa cites a current project as an illustrative example for the realisation of application-specific solutions for medical technology: the development and production of a high-quality pull cable for use in a venous flow clamp to regulate the flow of blood during surgical procedures. "In this case, our power transmission cable serves as a mechanical remote system and establishes the connection between a rotary actuator in the hand of the surgeon – or his assistant – and the flow clamp", explains the sales representative. Blood flow regulation is one of the indispensable fundamental tasks of many operating theatres and the technology used for this not only needs to be very easy to handle, but above all it must be absolutely reliable and fail-safe. The smooth running and functional safety of the RINGSPANN RCS pull cable are therefore two key quality features for the mechanical remote control system of the blood flow regulation unit. According to the customer, it also needed to be extremely stable, maintenance-free and easy to clean.

Sophisticated solution in detail

Based on its large selection of standard cables and the impressive number of customer solutions already implemented, RINGSPANN RCS has created a ready-to-install pull cable (type 278-U-04/04) with a stainless steel pull rod and a stainless steel connecting nipple (stainless steel 1.4305) for attachment to the clamp for the manufacturer of the venous blood flow regulator. The force is transmitted via a thin stainless steel cable, which runs in a core with a high-quality plastic sheathing. As Alexander Balloussa says, "the coated inner core in the material pairing with the flexible inner tube in which the core glides with minimal friction is one of the most important decision criteria for customers. This is because the use of special gliding plastics allows the annoying stick-slip effect to be 'constructed' out of the cable design to enable almost jerk-free and highly precise adjustment movements in practical application." For these reasons, the cable system from RINGSPANN RCS is as convincing a solution for medical technology as it is in precision mechanics and aerospace engineering.

Bi-directional cable system helps people to walk

The cable system for the mechanical remote control system of the venous blood flow clamp is just one example of many medical technology solutions already successfully implemented by RINGSPANN RCS. While this is a control element for the transmission of traction forces, elsewhere manufacturers place their trust in the company's bi-directional push-pull cables. One example of this is the development of a customer-specific push-pull cable (type 283-V) for use in a kinematically complex orthosis for people with walking difficulties. Here, the RINGSPANN RCS cable system is one of the constructional components of the power transmission system, which enables the disabled person to activate their remaining walking capability via the movement of their upper body. "This demanding orthopaedic application from human medicine places the highest demands on the functional safety and control precision of the push-pull cable. It also illustrates that our flexible development and production structures enable us to realise even small batch sizes for very special applications," says Alexander Balloussa. <<



Alexander Balloussa
Sales Representative
of RINGSPANN RCS

December

Greater loading clearance and longer c

Expanding the technical potential of the RINGSPANN clamping disc has always gotten RINGSPANN's innovative juices flowing. Based on the functional principle of this flat tapered spring steel ring, the company regularly presents new clamping technology solutions that further advance the machining of cylindrical gear components for the automotive and mechanical engineering industries, as well as for aerospace and fluid technology. And it's time again: For the first time the company presents new 15° clamping discs for its flange chucks and flange mandrels in the clamping disc design. What makes them so special are their excellent true running accuracies of just 10 microns!

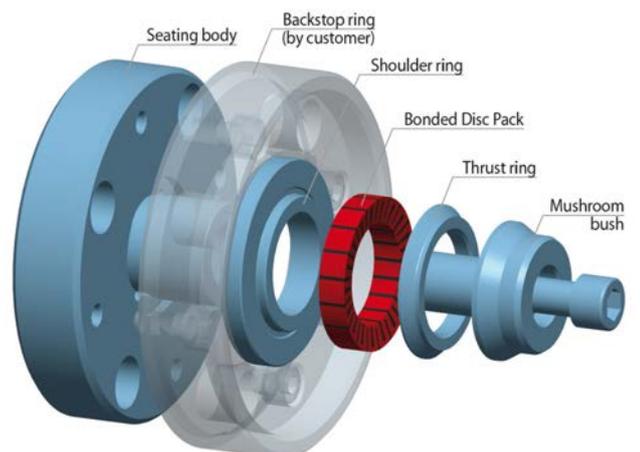
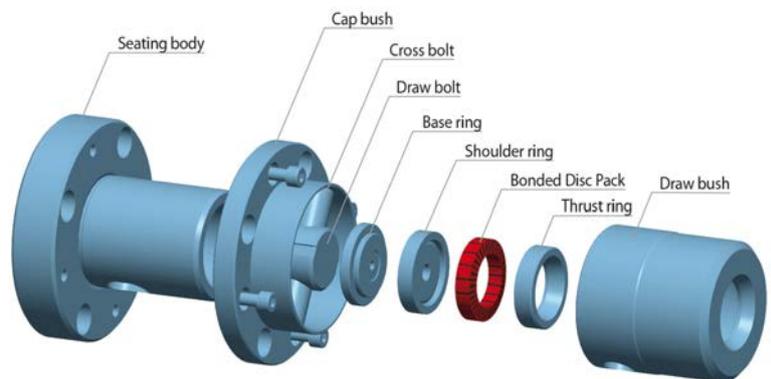
The LAFF series flange chucks and LBDF series flange mandrels from RINGSPANN rank among the precision clamping fixtures that have been setting the tone in metal-cutting machining for many years. Wherever cylindrical workpieces have to be centred and internally or externally clamped in the automotive industry, in aircraft technology or in the manufacture of pumps and gears, these chucks guarantee excellent results. The functional - and name-giving - heart of these flange chucks and mandrels are their RINGSPANN clamping discs. They are combined into ring-shaped and pre-stressed packages between 4.0 and 20 mm wide, depending on the number of discs. Their size follows the clamping diameter required for machining the workpiece. This ranges up to 170 mm for chucks and 200 mm for mandrels.

More comfort when loading

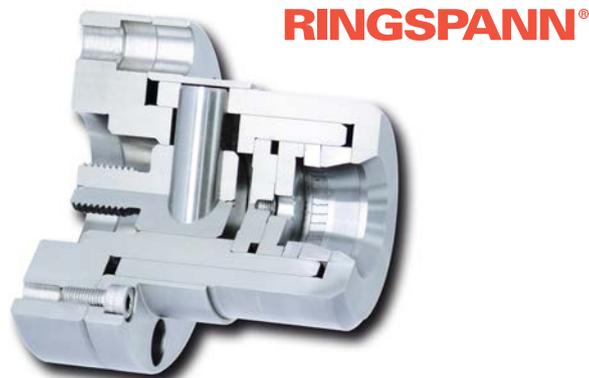
A key quality feature with a decisive influence on the precision achievable during milling, turning, drilling, grinding or balancing is the true running accuracy of the clamping discs used in the LAFF flange chucks and LBDF flange mandrels. Until now, the standard setter has been clamping discs with a taper angle of 9°, because they alone achieved a true run-



Volker Schlautmann
Head of Customer Team
Clamping Fixtures and
Shaft-Hub-Connections



operating life



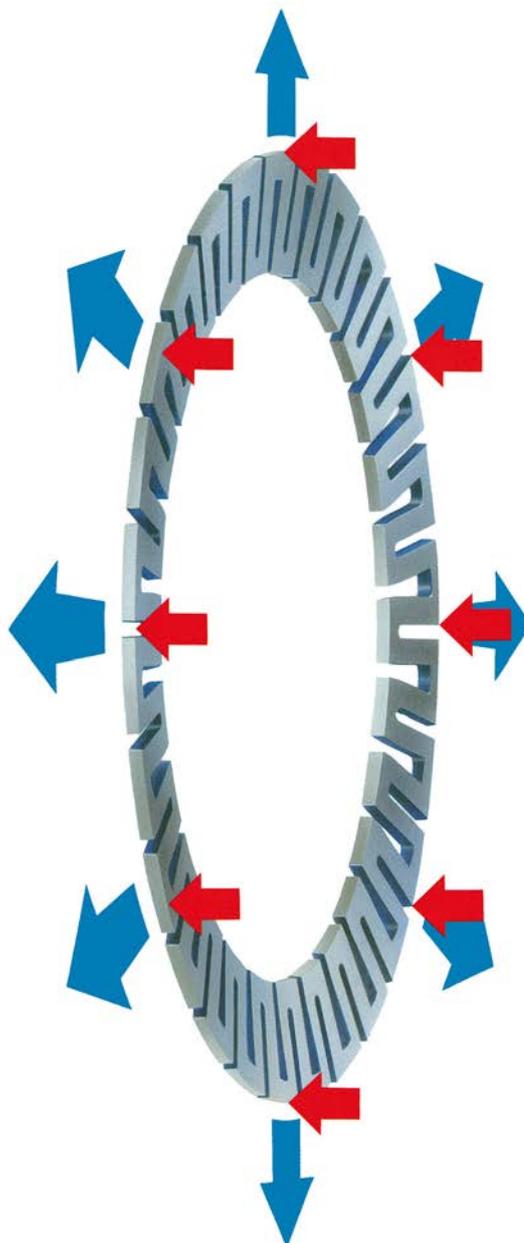
ning accuracy of $\leq 10 \mu\text{m}$. A few months ago, however, the RINGSPANN engineers set themselves the goal, as part of a medium-term development project, of developing further clamping discs with an improved true running accuracy, which would provide the user with two crucial advantages without compromising on accuracy: On the one hand, the aim was to enable significantly larger diameter changes so that a much more comfortable loading clearance is available; on the other hand, the clamping discs should have a considerably longer service life thanks to greater wear reserves.

"As a result of our development work, we can now offer suppliers and mechanical engineers two new series of clamping discs or bonded disc packs with taper angles of 15° whose true running accuracy is also $\leq 10 \mu\text{m}$ – with an expanding rate that is about four times greater," reports Volker Schlautmann, head of the customer team for Clamping Fixtures / Shaft-Hub-Connections at RINGSPANN. Up to that point, the 15° clamping discs had achieved true running accuracies of just $\leq 30 \mu\text{m}$. The considerable improvement in the true running properties was made possible by the internal switch to a different production technique. A new production method is the key to this change, which now enables the 15° clamping discs to be precision-ground on both surfaces – as has long been the standard with RINGSPANN's 9° clamping discs.

Gentle clamping of sensitive workpieces

Equipped with the new true running-optimised 15° clamping discs, the new LHFF flange chucks and the new LIDF flange mandrels are now predestined for machining tasks with very high demands on machining accuracy. At the same time, they provide users with a high-precision solution for centring, aligning and clamping cylindrical workpieces whose inner and outer surfaces have already been pre-machined – in other words, components for which value creation is already well advanced! Thanks to the precisely circular expansion of the flat tapered clamping discs, the torque is always transmitted to the workpiece with an all-round uniform pressure force. "This homogeneous 360° clamping protects the surfaces of the component and makes our LHFF flange chucks and LIDF flange mandrels - especially because of the increased true

running accuracy of their new 15° clamping discs – well suited for machining thin-walled, deformation-sensitive precision components", stresses customer team leader Volker Schlautmann. The permissible workpiece tolerance of these clamping tools ranges up to IT13, and for most sizes even up to IT14. <<



Advertising motifs

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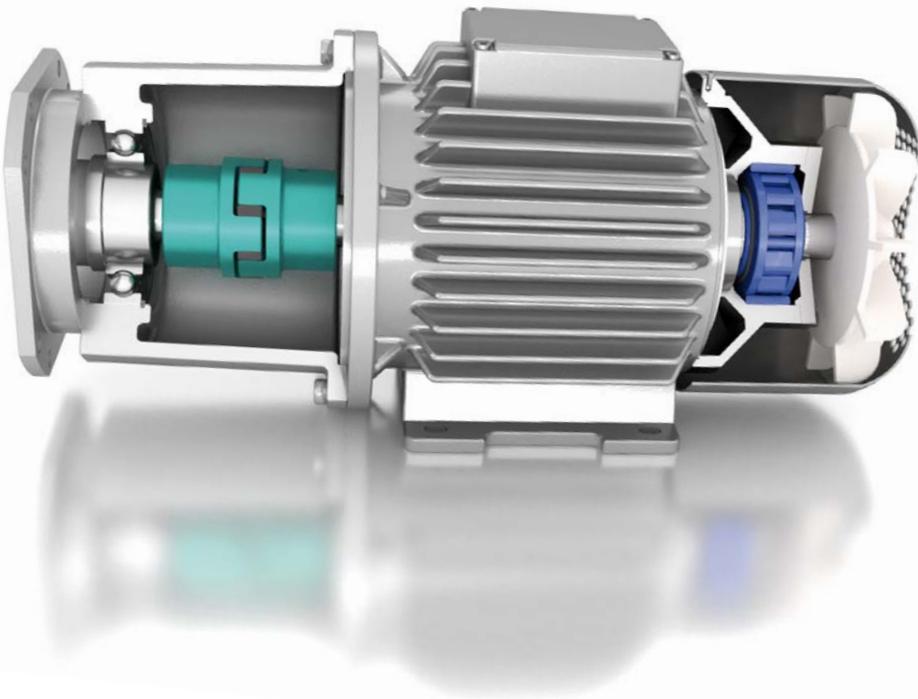
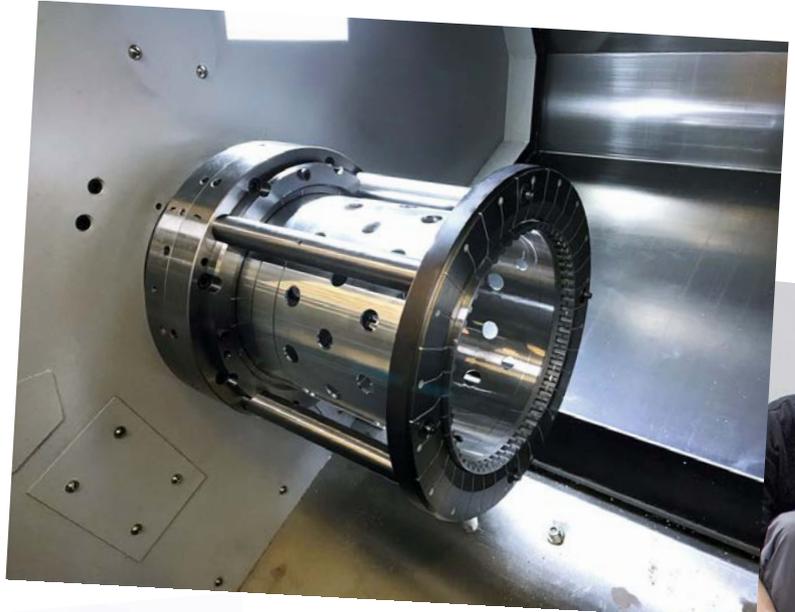
• Cone Clamping Elements

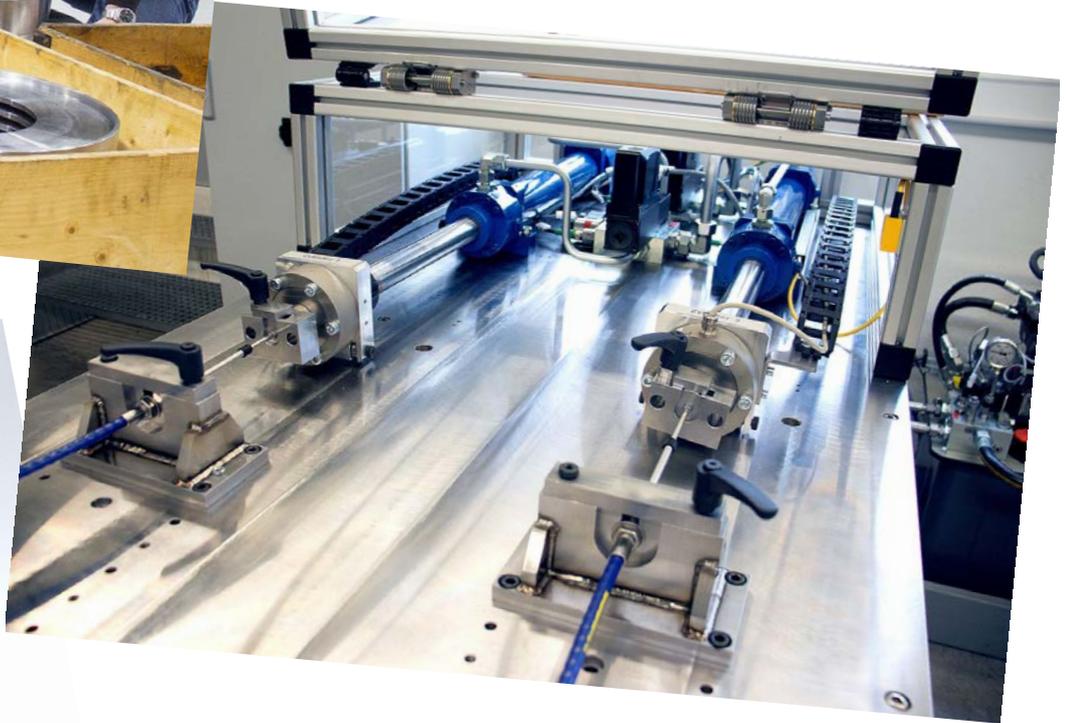


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