Danobat

DEVELOPS CUSTOM GRINDERS FOR LARGE PART MACHINING

The Spanish machine tool manufacturer Danobat has been developing two highly versatile grinding machines for Grupos Diferenciales. These grinders will make it possible to turn, grind and measure large parts using a highly-efficient process.

Grupos Diferenciales, which specializes in producing high-tech gears for mechanical transmissions used in the automotive, maritime transport, railway and aeronautics industries, performs technologically-advanced tasks using difficult-to-machine materials with close tolerances.

There was a need to find a flexible, adaptable solution that could be highly customized, making it possible to finish the parts in a single set-up.

After evaluating different solutions existing in the market, Grupos Diferenciales decided to entrust Danobat with the development of two new pieces of equipment that allow the company to produce large parts compliant with stringent quality standards.

The main challenge consisted of producing optimum quality parts in a standardized manner.

The team of mechatronics engineers at Danobat designed and developed both horizontal and vertical grinders for Grupos Diferenciales. They are highly versatile and capable of turning, measuring and grinding parts of different sizes. The equipment has enhanced the tolerance and roughness of machined parts.

The VG-1000/700 vertical grinder is equipped with a multi-position head for hard turning and grinding of parts, as well as a measuring arm that makes it possible to verify whether the manufactured components meet the standards and provide optimal quality.

This grinding machine has a high stiffness, designed specifically for the stability and vibration elimination requirements in hard turning processes.

Danobat's customized gear grinding machines make it possible for Grupos Diferenciales to to turn, grind and measure large parts.

The measuring tool integrated in the machine is able to measure internal and external diameters, faces and cones with repeatability of less than 1 micron, thereby ensuring the dimensional geometry of the parts in less than 5 microns.

Danobat's experts designed this highly customized machine so that it could be adaptable to the already existing clamping tools. Therefore, the system has a main magnetic clamping system intended for manufacturing medium- to large-

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sized diameters and a self-centering jaw chuck for batches of smaller parts.

One of the needs to be addressed by Grupos Diferenciales was the versatility and flexibility of the equipment. This is why Danobat included an automatic tool changer in the grinder that makes it possible to select the most appropriate tool for each type of part to be manufactured on each occasion.

To complete the tasks commissioned, Danobat also developed a horizontal grinder, the HG-72-2000-B12, capable of machining parts with a length of up to 2,000 mm, a diameter of 640 mm and a weight of 1.5 tonnes.

One of its main features is that it is equipped with a head that includes three grinding wheels, making it possible to machine external diameters, faces and threads. This head (which rotates around its vertical axis and reaches every point on the part) is powered by a 45 kW motor that reaches peripheral speeds of up to 45 m/s, with grinding wheels that have a maximum diameter of 610 mm.

Thanks to these features, the device is able to respond to all grinding needs, including parts with Ra 0.1, in a single set-up and with guaranteed geometric quality.

The inclusion of the Danobat MDM-300 multi-diameter measuring device, which runs in parallel with the machining process, is advantageous since it prevents subsequent measurements and enables single-stage grinding. This will ensure that the part meets all the requirements established in the design.

The Danobat MDM has a repeatability of ±1.5 microns, making it possible to measure a wide range of diameters. Once the grinding process has ended (but before removing the part), post-process verification may be performed.

Moreover, the machine includes a filtration unit, making it possible to filter up to 15 microns. This contributes significantly to the quality of the end product.

In order to meet the specific demands of Grupos Diferenciales, Danobat has closely cooperated with them with the aim of developing a solution that is fully adapted to the needs and requirements set out by the company. Likewise, Danobat is in constant contact with the company to give the proper advice and service needed to take care of this equipment.

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Mitsubishi Heavy Industries

INTRODUCES SUPER GEAR SKIVING MACHINE

The opening of the JIMTOF machine tool show in Tokyo, Japan marked the debut of MHIMTC's new MSS300 super skiving gear machine. This new machine was developed to maximize the advantage of MHI's new three-tier skiving tool released in 2016.

The new MSS300 is designed specifically for the high-speed manufacturing of automotive internal ring gears. With a maximum outside diameter of 300 mm, the MSS300 brings flexible, high volume internal gear skiving to internal gear manufacturing.

In addition to internal gear cutting, the MSS300 is also capable of cutting parts with restrictive geometries, such as stacked pinion gears. Many applications that would have been shaped or manufactured in two parts previously can now be cut with the super skiving process.

The all-new machine features an ultra-rigid, powerful (33 kW) tool spindle capable of 6,000 rpm and ±30 degrees of helix angle. The direct drive work table offers 3,000 rpm with high torque and stable synchronization. The six-axis Fanuc 31i CNC controller utilizes graphic data entry screens for quick part setup.

For high speed operation, a ring loader is integrated into the machine design and is available as an option. The MSS300 is easily interfaced to robotic, gantry type, basket or conveyer automation.

Although the machine is designed to get the most productivity from MHI's newest super skiving tools, conventional pinion-type skiving tools are completely compatible and are utilized for certain applications. MHI's new super skiving tools typically produce three to five times more parts than conventional skiving tools.

Deliveries of the new MSS300 will begin in the second quarter of 2017. The MSS300, along with the innovative super skiving tools from MHI have established a new benchmark in productivity and process quality.

For more information:
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Koepfer America

CNC GEAR HOBBING MACHINE OFFERS COMPACT FOOTPRINT

The Monnier + Zahner ("MZ") 500 D-drive gear hobbing machine offers CNC technology in a compact footprint for top-quality fine- and ultra-fine pitch gear manufacturing. Introduced by Koepfer America at IMTS 2016, the 500 D-drive is the latest in precision machine design from the Swiss company, MZ.

The machine features two identical direct-drive work spindles on the headstock and tailstock. This configuration allows driving the workpiece with less tailstock pressure, which results in minimized machine distortion and increased part quality and cutting performance. The double drive system also provides precise concentricity of the workholding and better drive performance for workpieces that are difficult to clamp.

With CNC hob shifting (up to 1.181" or 30 mm), a 12,000 rpm hob spindle, and capability for mounting bore- or shank-type hobs, a wide variety of components can be manufactured on the 500 D-drive. Furthermore, the machine offers options for Wahli automatic loading and unloading systems. Existing Wahli workholding can also be used. In the end, this is a high-production, high-quality, high-flexibility solution for cutting fine- and ultra-fine pitch gears.

The 500 D-drive is rated at 1.575" (40 mm) diameter at 40 DP (0.6 m_n) with a maximum workpiece length of 1.969" (50 mm) and maximum hobbing length of 1.181" (30 mm). This range ensures an optimal gear hobbing solution for instrumentation, medical products, robotics and more.

For more information:
Koepfer America, LLC
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koepferamerica.com

LMT Tools

CARBIDELINE-H HOB DESIGNED FOR LARGE LOT SIZES

The large family of carbide hobs from LMT Fette now has a name: CarbideLine. It comprises the CarbideLine-S solid carbide tools, the CarbideLine-H hybrid carbide tools and the multi-part gear cutting CarbideLine-I indexable carbide tools. All CarbideLine tools, just like the established PM-HSS and SpeedCore hobs, excel through maximum productivity in their specific fields of application.

CarbideLine-H tools are a new addition to the product range of LMT Tools and were presented to a trade audience for the first time at the AMB in Stuttgart. They cover the module range 5 to 12 and are designed for rough machining and finishing large lot sizes, where the tool costs of using solid carbide milling cutters are too high and the gear cutting quality is too low with indexable inserts.

CarbideLine-H tools are also highly suitable for machining high-strength materials up to 1,400 N/sq. mm and enable a gear quality up to quality grade AAA. Its preferred area of application is for gears for commercial vehicles, general mechanical engineering and energy technology. In one specific application it was possible to reduce the gearing costs per wheel by 20 percent with the CarbideLine-H compared with an indexable insert system.

CarbideLine-H tools can — like CarbideLine-S tools — be reconditioned up to 20 times at LMT service centers after they have exhausted their tool life and thus make a significant contribution towards reducing the life cycle cost.

For more information:
LMT USA Inc.
Phone: (847) 693-3270
www.lmt-tools.com

Röhm Products of America

EXTERNAL CLAMPING CHUCK PROVIDES GEAR SURFACE FACE GRINDING

Röhm Products of America now offers a powered external clamping chuck for gear surface face grinding. The KZF-S collet chuck is especially well suited for clamping gears/workpieces that have an external plane or gear teeth geometries accessible from the outside. Additionally, the chuck allows face and ID diameters to be turned or ground concentric to outer gear pitch diameters.

The compact KZF-S chuck provides high clamping forces, optimal workpiece stability and maximum axial accuracy achieved via axial draw-in of the workpiece against a rigid work

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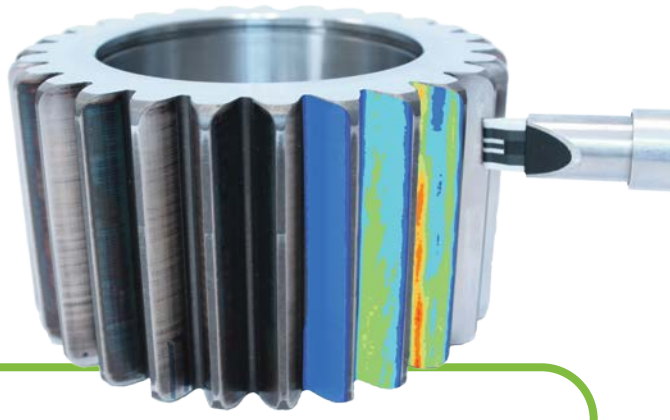

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stop. The chuck maintains its centrifugal force for a smooth rotation of less than 0.01 mm.

KZF-S chucks have modular designs that feature case-hardened components for maximum versatility and low maintenance. The workholding system features a grommet for the integration of air or coolant and a sealed lubrication channel to eliminate chip penetration.

Available in three sizes, the KZF-S chucks accommodate diameters ranging from 30 mm to 180 mm. A simple bayonet connector enables users to quickly retrofit clamping sleeves to different diameters, and an intermediate adaptor with adjustment screws enables DIN55026 or optional A5-A8 mounting.

For more information:
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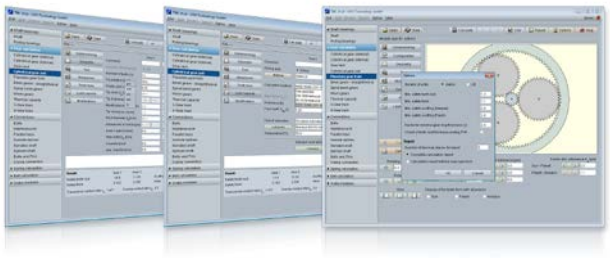
GWJ Technology

ANNOUNCES UPDATED VERSION OF TBK 2014 SOFTWARE



GWJ Technology is pleased to announce the latest release of *TBK 2014,* the calculation software for gear manufacturing and mechanical engineering.

The new and updated version V31 comes with some interesting features. The calculation modules "Cylindrical Gears" and "Planetary Geartrains" allow the users to use the DIN 58405 standard for fine mechanics as well as ISO 1328 and ANSI/AGMA 2015 in addition to the DIN 3961 standard for gear allowances. Both modules now support not only DIN 3990 and ISO 6336, but also ANSI/AGMA 2101-D04 in order to determine the load capacity. Profile modifications, for example tip relief, are taken into consideration, in particular for scuffing. Furthermore, the cylindrical gear pair module allows users to define the number of tooth meshes. This can then be considered in the calculation of the load spectrum, too.

A new input option for the center distance was also added to the dimensioning function dialog. The calculation module for planetary geartrains also features a new dimensioning function. In addition, the number of teeth of the planets can be automatically determined or defined individually.

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Liebherr

GEAR SHAPING MACHINE OFFERS SHORT SETUP TIMES AND FLEXIBILITY

Liebherr-Verzahntechnik GmbH has expanded its machine portfolio for small workpieces with the small-footprint (Platform 1) LS 180 F shaping machine equipped with an electronically operated, movable cutter head slide. The machine can shape smaller gears in different axial positions with only short set-up times. The machine is likely to be of interest for job shops, especially with aerospace work. The LS 180 F is also highly productive, capable of up to 1,500 double strokes per minute, processing workpieces up to 180 mm diameter, maximum module 5 mm.

Shaping continues to be the gear manufacturing process of choice for gears to be part of transmissions with minimum available space, for example, cluster gears with limited cutter overrun which can be machined in one clamping in the new Liebherr machine, avoiding additional set-ups.

Previously, only larger machines could accommodate such flexible applications; smaller shaping machines did not feature the necessary movable cutter head slide. The new LS 180 F now enables Liebherr to provide the right size of machine with a lot of features for small workpieces, too.

The new cutter head design also enables workpieces with both internal and external gear teeth to be machined in the same clamping operation. To accomplish this, the machine is equipped with a twin-track cam as standard. The LS 180 F continues to be available with a mechanical helical guide. The new version is also compatible with older versions, meaning that existing helical guides and removal cams can be used with the LS 180 F.

"One actual application is, for example, a component used to adjust aircraft landing flaps," says Dr. Andreas Mehr from the grinding and shaping technology development and application team at Liebherr-Verzahntechnik GmbH. "Every component features three gears that have to be positioned quite accurately to each other. That is why it is absolutely necessary to machine the entire gear tooth machining procedure in one clamping." But there are also potential customers for the LS 180 F in pump manufacturing

as well as in the motorbike and tractor industry. "This machine is extremely versatile," Dr. Mehr emphasizes. "Given its high stroke rate of 1,500 double strokes per minute, this machine can produce small quantities very cost-effectively."

The LS 180 F enables Liebherr to combine the small footprint of the Platform 1 with applications that were previously only feasible using larger machines. The LS 180 (without vertical cutter head slide) will be redesigned and an LS 180 E (with electronic helical guide and movable cutter head slide) will be designed from scratch this year.

"Ultimately we will then be able to offer the same maximum flexibility in the smallest machine class as we have only been able to do with larger machines to date," says Dr. Hansjörg Geiser, head of gear cutting machinery development and design engineering at Liebherr-Verzahntechnik GmbH in Kempten (Germany), in summary.

For more information:
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Index

DEVELOPS NEW GENERATION OF G200 TURN-MILL CENTERS

Index has developed a new generation of its successful turn-mill center G200, a compact machine offering significantly higher performance — potentially up to 30 percent greater productivity — in the same footprint as the earlier generation. The redesign of the machine resulted in an increase of the maximum turning length to 660 mm, a higher performance milling spindle, and expanded live tool complement as well as the XPanel with i4.0 readiness. The result is a machine that is geared to the needs of the market, offering flexibility and high-speed machining of both bar stock and chuck parts complete in one setup.

The machine bed is arranged vertically, making the machine stand higher, but extending in the work area, thus permitting second lower tool carrier to increase the productivity of the machine. Reducing cycle times by 30 percent compared to the first G200 generation is well within the bounds of possibility with appropriate workpieces, according to Index.

The fluid-cooled main and counter spindles are designed identically and feature a bar capacity of 65 mm (chuck diameter max. 165 mm). Their motorized spindles allow productive turning machining with a power of 31.5/32 kW (100%/40% duty cycle), a torque of 125/170 Nm and a maximum speed of 6,000 rpm.

The G200 has three tool carriers so tools can be assigned to almost any machining type on the main and counter spindles independently. This means great flexibility for the programmer in organizing the machining steps.

Due to the large work area, it is even possible to work with three turrets simultaneously on the main spindle or counter spindle, without them interfering with each other. One example: the lower right turret with an angular tool can machine the inside of a workpiece clamped in the main spindle, while the other lower turret and the upper tool carrier machine the outside. The same is also possible on the counter spindle. This increases the possibilities to use three cutting edges simultaneously, in some cases even four tools.

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