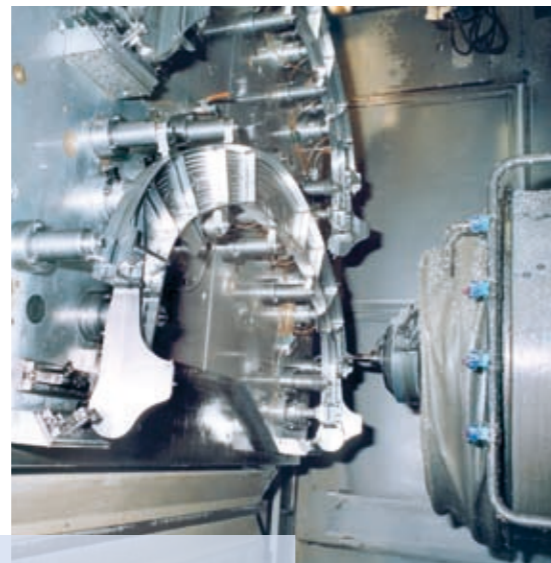


Seven in one fell swoop

Major order for DST from Korean aircraft constructor

Despite the economic situation DST has won one of its biggest orders ever against international competition. Korean aircraft constructor, KAI Korea Aerospace Industries Ltd. based in Sacheon City, has placed an order for seven ECOSPEED F high-performance machining centres, including a rail guided transport system, in a multi-million deal with the machine tool specialists from Mönchengladbach. The milling centres will be used to machine the wing ribs (which form the aerofoil shape of the wing) on the Airbus (A 350 XWB). ECOSPEED is the synonym for an exclusive DST concept. It uses the Sprint Z3 parallel kinematic machining head. This technology is the most productive and efficient solution for machining aircraft aluminum structural parts on the market today. All the machining centres are designed to machine workpiece sizes up to a maximum of 2,000 x 6,000 mm. A C-axis is incorporated for positioning of the angular drilling/milling head. With this, the machine can remove material at any dihedral angle between -130° and +130°. The drilling/milling head uses the tool interface as the main spindle and can be interchanged automatically. It means that with 5-sided machining, the ECOSPEED F offers more complex options than a conventional milling machine, with an interference contour between tool shaft and machining head of only 50 mm. The drive power at the high-performance spindle is 120 kW (100% DC), the maximum torque is 83 Nm and it reaches speeds of up to 30,000 rpm. With these values, combined with the Sprint Z3 parallel-kinematic machining head, the machining centre also achieves clearly higher feedrates than conventional machines. Each ECOSPEED F has a rack type tool magazine with 125 positions. A vacuum work-piece clamping system, video monitoring and Sinumerik 840 D control system complete the convenient fittings provided with each machining centre.

KAI Korea Aerospace Industries, the Korean aircraft constructor, has ordered seven ECOSPEED F machining centres from DST in order to obtain maximum cutting capacity in the machining of high-tensile aircraft aluminium.



The Sprint Z3 machining head with its interchangeable, driven angular head and 120 kW spindle that reaches speeds of 30,000 rpm, and 83 Nm of torque, achieves highest cutting capacities.

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DST will deliver the first ECOSPEED F to Korea in November 2009; the seventh is scheduled for delivery in January 2014. On completion, a rail guided transport system with three loading and unloading stations and 60 storage stations will link the seven machines. With this system, 60 pallets will be ensuring high-production manufacture as they alternate between set-up and machining.

DST invests in the future

It is precisely in times of crisis that it is important that we send out the right signals. Dörries Scharmann Technologie GmbH (DST) is therefore investing in its company and expanding the Bielefeld factory by adding an assembly hall for large machines. After just six months in construction, the modern manufacturing hall covering an area of 3,400 m² destined for the final assembly of large machine tools is now ready. From now on extremely large machines in the Dörries, Scharmann and Droop+Rein product ranges will undergo their final assembly process here. The new hall has a clearance height of 16 meters below the 80 ton crane. It means that DST is one of the few suppliers in the world able to implement a very wide variety of large machine concepts: gantry machining centers, large lathes, and boring mills - from a single source.

And DST's servicing concept is also unique. Besides the maintenance and spare parts service the most important part of the company's servicing concept is its comprehensive retrofitting service. In recent years the company Reifenhäuser EXTRUSION GmbH & Co. KG. in Troisdorf has been supplying the booming wind energy industry and has an enormous amount of machining expertise. Among the machine tools they use are two Dörries CONTUMAT VCE 2000 vertical lathes. A third new machine was supposed to cover the company's growing requirements. DST found an older Dörries vertical grinding machine in Belgium, converted it into a modern turning-machining center, and delivered it to Reifenhäuser in brand new condition after just one year. "With our positive experience of the two VCE 2000s and with the first retrofit, we were sure that DST would be supplying us with a machine in as-new condition. With the twelve month time saving, we have been able greatly to increase our order volume," said Production Manager Rolf Stockhausen, as he outlined some major advantages.



Knowledge and growth, market awareness and motivation

Medium-sized contract manufacturer of large components shows high potential for competitiveness and quality

The experts at MFT Maschinenbau and Fertigungs Technologie GmbH (MFT) based at Mechernich in Nordrhein-Westfalen are suppliers to as well as a customer of DST. The basis of this mutual and trusting co-operation is formed firstly from the excellent manufacturing skills of the professionals at Mechernich, and secondly, on their in-house knowledge of machine tools for medium-sized and large components. The experts from the Eifel region have proved this in the example of the Dörries CONTUMAT VCE 2800/250 MC vertical lathe. It is used to manufacture particularly challenging one-off orders, for example for customers in the machine tools and the energy systems industries. The "secret" of high precision for the machined parts is firstly the performance of the VCE 2800/250 MC, with deviations of less than 5 µm in concentricity and axial run-out, and secondly, its versatility: It allows different machining processes to be carried out in a single clamping.

Johann W. Mießler is managing director of MFT and a major shareholder. Having worked at the firm for 44 years (formerly the Dörries manufacturing plant) he is now in charge of the company as its managing director. He outlines the company's core business: "We concentrate on medium-sized and large parts to cover our customers' machine tool construction needs and their requirements for the production of wind energy transmissions. With our reliability, precision and dependable delivery we create and maintain a competitive advantage, and thus customer loyalty." Johan Mießler is well aware of the consequence of entering the growth market as a supplier of energy machines: "We want to get a foothold in this market, and need to be correspondingly equipped for it. It is a precarious situation if we constantly have to say no to enquiries due to a lack of capacity."

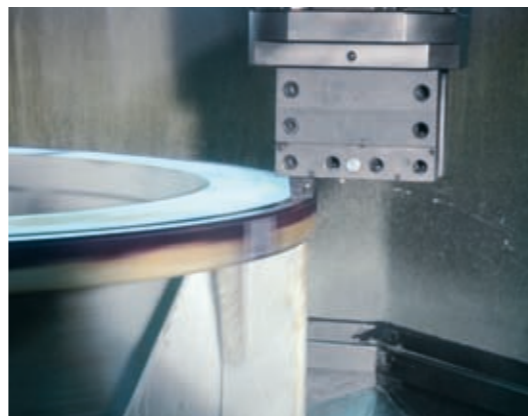
"At the moment we are being held back not so much by the order book situation as by the difficulty we have in obtaining suitably qualified machining specialists on the employment market," said Johan Mießler, explaining a significant aspect of the necessary expansion of capacity. One answer to this is MFT's above-average commitment to training. Fourteen upcoming machining specialists are currently receiving their training at the Mechernich plant. A job offer as a specialist skilled worker at MFT is almost guaranteed. On completion of their training in this demanding field the machining specialists follow a program of continuous professional development. "We train the young people alongside the experienced operators of our top-quality machine tools using state of the art technology. It means that we can meet our claim to be able to manufacture complex, complicated work pieces to the highest quality," continued the Technical Manager on the subject of the need specialist personnel.



Economic in batch size 1

In general the turned part specialists at MFT produce parts in batch size 1. In doing so they adopt a different view of productivity and cost efficiency than do suppliers producing in medium-sized to large series runs. It is not the set-up and other non-productive times, but rather the productive machining time that are crucial for economic production. The fact that the experts at Mechernich insist on "multiple machining in a single set-up" for their new vertical lathe is due first of all to the high level of precision required. Secondly, they want to be as flexible as possible in order to cover the wide range of extremely varied and customer-specific parts; in other words besides turning, they want to use the same machine for the drilling, milling and grinding processes too.

In 2006 when they decided to invest in a new, efficient vertical turning lathe, one thing was almost certain as regards the special and mutually interwoven business relationship with the supplier: "We have built the essential parts of our VCE machine ourselves, commissioned by our customer DST, and we know what the machine can do. So I am convinced that this is the best product for the job profile we need. Discussions with DST covered the precise design of the machine, and of course the price negotiations too," reported Johan Mießler.



The specifics

The experts at MFT are talking about large parts starting at diameters of 800 mm. "We mill and machine parts up to 12 meters long, with a cross-sectional area of 2.5 by 3 meters", explained Mießler. He continued: "But the particular thing here is that we also manufacture items in large sizes of several meters so accurately to dimensions that the deviation is only five thousandths, maximum two hundredths of a millimeter from the nominal dimension. With this rate of performance we are among the top ten in Germany."

A vertical lathe to meet the highest demands

VCE 2800/250 MC stands for a single column vertical turning lathe with a machining diameter of 2,800 mm and a turning height of 2,150 mm. It is based on a DST standard series and, with the addition of modules and components from the comprehensive modular component system, has been expanded into a universal multi-functional turning and machining center. The compact vibration-reducing base structure consists of grey cast iron; the components have been optimized using the Finite Element Method (FEM) and possess high static bending and torsional stiffness. That is the requirement for high chip removal rates. And the high damping level increases the achievable surface qualities as well as the tool service life. The horizontally divided machine base consists of a full-length stand with the columns placed on it. In relation to the center of the machine it is constructed thermosymmetrically. The intrinsically rigid construction absorbs all the machining forces. It means that the plinth is not subject to any special requirements.

The extra specials

It was the possibility of achieving greater flexibility and the opportunity of being able to handle even more demanding orders in the future that caused MFT to invest in some special extras. These started with raising the height of the base, the cross beam and the ram. A separate servo motor with backlash-free pretensioned drive drives the additional C-axis on the machine table. Together with the incremental rotary encoder in the center of the facing plate it ensures a high level of positioning accuracy when drilling and advancing for circular milling. The additional drilling and milling spindle incorporated into the ram provides up to 30 kW power. The machine also has an interchangeable grinding spindle. The cross-beam extends to the right-hand side of the machine. With the extended path, the support can easily reach the change position for the plate tool magazine. This is where HSK 100 tools and attachment units can be

Characteristic facts and figures about the VCE 2800/250 MC, Working range

Machining diameter	2,800 mm
Turning height	2,150 mm
X-axis horizontal axis cross-beam support	± 1,550 mm
Z-axis vertical path of ram	1,500 mm
Drive power, continuous load	100 kW
Torque at machining table, max.	40,400 Nm

interchanged automatically using the pick-up procedure. Another extra chosen by MFT was an attachment spindle which makes it possible to dip into slim work piece contours. The integral tool and work piece measurement units have likewise been extended. The manufacturing experts from Mechernich also place great store on specific solutions in the fields of cooling lubricant supply, cleaning and swarf disposal.

In addition to the standard operating station for the suspended pendulum DST also equipped the lathe with a station on the operating platform. The Siemens Sinumerik 840 D CNC control system has seen some extensions and additional programs. The experts at MFT make use of Siemens technology to program the drilling, turning and milling cycles, to store the measurement results and to organise data traffic. The software installed at MFT also includes the DST teleservice. This can be used to correct any machine stoppages directly by remote diagnosis.

The outlook and prospects

Johan Mießler and his staff put the Dörries CONTUMAT VCE 2800/250 MC into operation in September 2006. After almost two years in constant use in three-shift operation, they are able to report thoroughly positive experience.

"With our VCE 2800/250 MC we have obtained a solid base machine which, with an angled head, is able to provide almost universal options for drilling and milling. And if there is corresponding demand we will fit a universal head and then be able to implement drilling at an angle to the workpiece axis," continued the Managing Director.

The next thing was for DST to provide the induction and training for the operators. Since that time the machine has been operating reliably at high output in three-shift working. "A single workpiece will be in the machine for least 5 hours, some of them up to 20 hours. The blanks arrive to us as cast parts, mostly grey cast. They usually consist of steel, including alloyed and high-alloyed types, and less often of aluminium. And of course we are prepared for the trend towards titanium," said Mießler. He summed up: "We knew from the start what the VCE 2800/250 MC can do and we understood its value. With it we are at the peak of technology, and our expectations have been met. If we could have had enough staffing capacity, I would have bought two!"