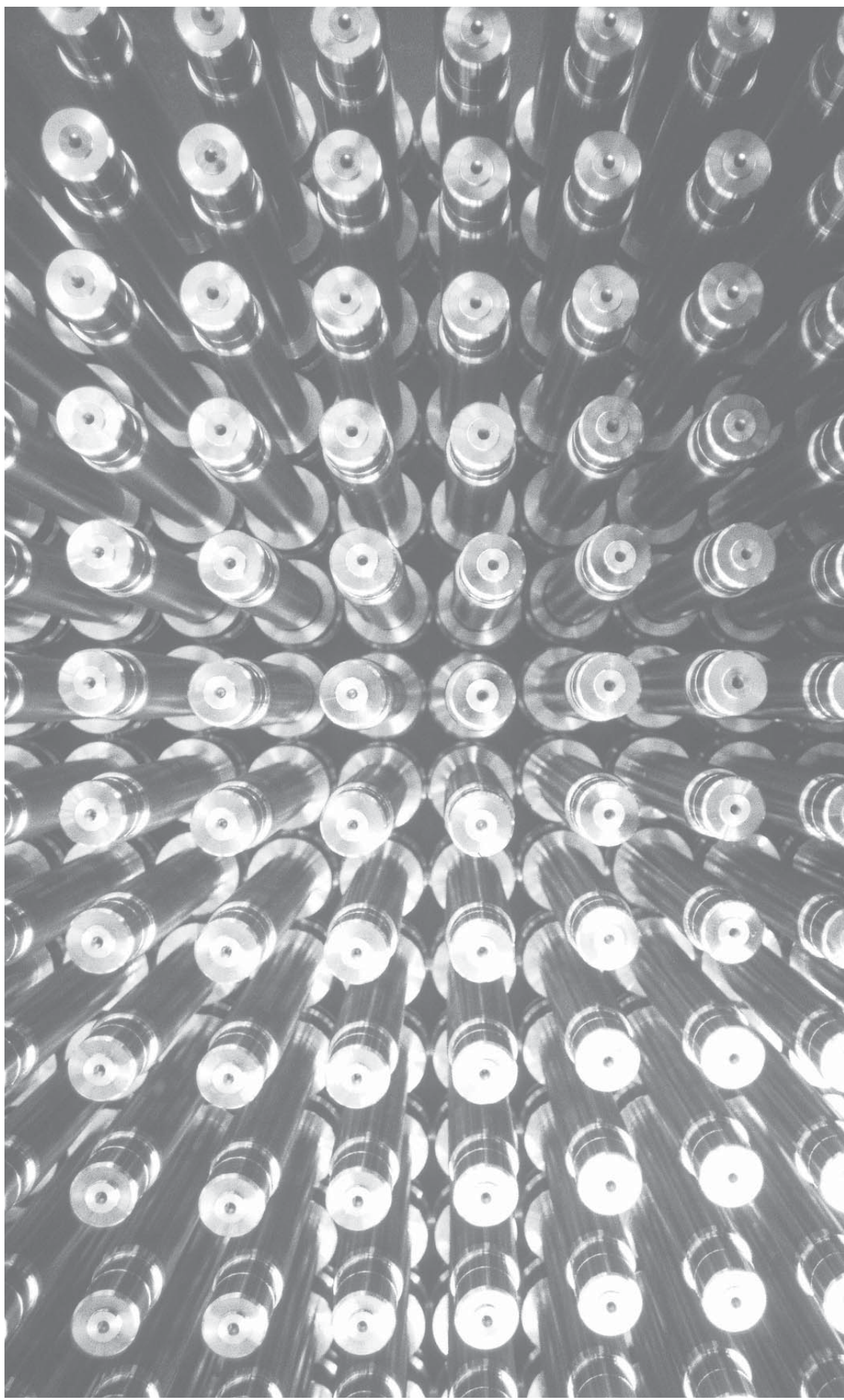


**Technological  
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# Technological advance<sup>2</sup>

## Turn-mill center with two motor milling spindles speeds up the machining of parts

**The rotational parts production at the site of Airbus Deutschland GmbH in Varel attaches importance to having the latest technology at all times. A turn-mill center G400 with two motor milling spindles of the Esslingen INDEX factory produces rotational parts for the Airbus wing division. The parts were formerly produced on several machining centers in several clampings; now just one clamping is needed. The entire process is completed in less than half the time.**

'I did have my doubts about wanting to turn and mill with a motor milling spindle. But with every new technology there's a certain amount of risk - and here the risk has paid off.' Werner Martens, Head of Rotational Parts Production and Sub-Assembly Installation at Airbus Deutschland GmbH in Varel, can very clearly say, after a good year of using the machine: Our expectations have been fulfilled in every respect.' The talk is of the new INDEX turn-mill center G400 with two motor milling spindles, probably a world first. This means that parts, which were formerly 'produced in a relatively time-consuming way on several machining centers in several clampings' can be completely machined today in one clamping. Werner Martens watches the market all the time and very intensively at that, for 'we must always have the latest technology because we are constantly forced to become ever faster

and better.' Keeping your sights on market and technology at all times is part of his everyday tasks in order 'to be able to judge where we are technologically speaking.' And in complete machining, the Airbus technology expert sums up, INDEX is currently simply ahead of the rest with its two milling spindles; there is nothing comparable at the present time.' Those who have the highest requirements like him are probably never entirely satisfied: 'We are not yet where we want to be.'

Despite his initial doubts, Martens opted for the G400 after he had seen it at a tool making fair, because 'for us, it is very important to have the latest machine technology at all times.' He links technological advances with the lifetime of a machine - around eight years - 'then the technology is out-of-date, and the break-even points must be after two years, otherwise it's not worthwhile purchasing a new one.' Airbus in Varel has rigorously pursued this technology philosophy over the last ten years, always with the goal of complete machining in one clamping. A good 20 per cent of the individual machining steps relate to turning, the rest is divided up among other techniques such as drilling, milling or gear milling. Rotational parts, like the ones produced here, are simply not available on the market. That is why a process needed to be push-started, according to the motto: Expand core competencies and purchase simple parts. Construction, work preparation and programming are of course fully involved in this strategy. Since January 2006, rotational parts (hinged parts, forks, hous-



*Blank of a torsion carrier*



*Complex rotational parts*

*Left:  
Rope pulley - completely milled in one clamping*



Successful project team: Werner Martens (center), Dieter Theßmann (right), Michael Czudaj (2. from left), Heinrich Hilbers (left) and two machine operators

ings, rope pulleys or torsion carriers made of aluminium, steel and titanium) from the wing division of the Airbus series A380 and A320 have been completely machined on the G400. At the time, the existing machine fleet was by no means out of date but the technology was 'obsolescent'. The increasing requirements could no longer be met with the available tool change times, machine speeds, torques and cutting data.

Werner Martens knows the market and speaks to all suppliers that 'operate in this sector' - and the concept proposed by INDEX convinced him, despite 'the certain risk that every new technology harbors in itself'. Not least, the innovative modular principle 'two motor milling spindles in one machine' was a decisive factor in the purchasing decision. The important criterion for parts manufacture 'costs per workpiece' had thus remained competitive and calculable.

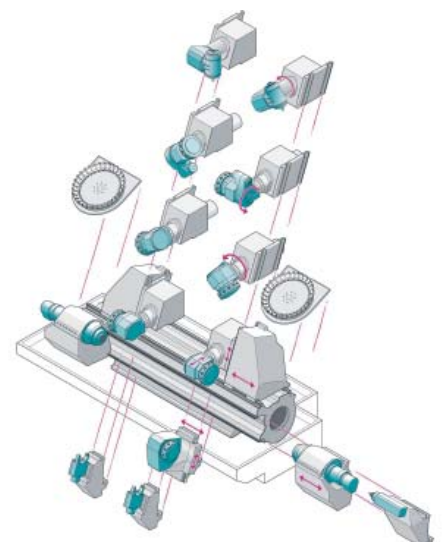
INDEX Head of Marketing and Field Service, Michael Czudaj, can only confirm this: 'We have undoubtedly struck lucky with this machine.' They are receiving a large quantity of interesting inquiries from diverse industry sectors and are thus gaining a feel via technical sales for where the value creation benefits lie and what the requirements in the complete machining sector are, he says. They can thus allocate very well where a machine with two motor milling spindles makes sense. It is thus possible to integrate such a machine made of standard components into series production, from existing technology and based on the business philosophy of the system



The G400 from INDEX is ideally suited for the complete machining of complicated parts, as the images document.

Left: Housing and forks from the Airbus wing division

Below: Torsion carrier - highly complex functional parts for the wing division of the Airbus family



The modular INDEX system kit permits the specific equipment of the G400 with forward-looking options

modules of INDEX. Czudaj; 'I am certain that Airbus has not yet exploited all the options of this machine.'

### **The right concept with all the options**

INDEX sales regional manager Dieter Theßmann had a vital part to play in the implementation of the project: 'We do of course know the parts manufactured here and the Airbus production philosophy. When Mr Martens made an inquiry to us, we already had a G250 with motor milling spindle. This meant that we were able to present the right concept relatively quickly.' And Airbus by no means left it at the standard machine. Werner Martens: 'We need machines that have all the options - if we don't need them today, we will undoubtedly need them tomorrow.' The people at Varel therefore ordered, among others, the option modules 'integrated measurement technology' and the genuine 'five-axis programming'.

This of course makes additional demands on the qualification of the programmers and machine operators as 'the five-axis machining can no longer be programmed by hand. We program and produce in the 3D world.' Programmer Heinrich Hilbers: 'The machine's options are also a challenge for us.'

Another technology module and INDEX USP to increase productivity, minimize down times, and shorten running in times in workshop operation is the 'Virtual Machine'. Dieter Theßmann: 'With that, you get executable programs on the machine.' And you are always 'close up to the process': The real machine is depicted precisely in the Virtual Machine, with all its disruption contours, tool changes, et cetera, i.e. the real NC data are processed in the 'Virtual world'.

The question of whether such a highly complex machine will not be too complicated for many users is one that Michael Czudaj does not want to leave unanswered. 'We should not forget that we have integrated the functions of two machines in one piece of equipment, which as far as we know is unique anywhere in the world. The tremendous opportunities of real five-axis machining and processing do of course necessitate that the user has a certain amount of experience and know-how.' Implementing production processes from a program technology perspective is a demanding process philosophy: 'I think that Airbus is already working today in the innovative border area of tomorrow.'

Summing up, Werner Martens states once again: 'This investment has clearly paid off. Compared to the earlier solution with several machining centers, our unit costs have been reduced to less than half.' And they had 'not yet reached the machine's limits' by any means with the results achieved. As a basic principle, however, this technology will prevail: 'If you want to work with the latest technology available today, you won't be able to do without this.'

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