

Every gramme counts Teamwork in Northern Germany

“Complete vacuum clamping area measures 4100mmx13000mm. Total surface is divided in 36 individually operated areas. This means parts of different sizes can be clamped effectively giving a high degree of flexibility,” Bodo Winowsky, sales manager at Witte Bleckede explains.

A total of 50 hydraulic and 11 mechanical clamping units ensure part positioning along the sides. “To stop a part moving sideways we used hydraulic clamping on three sides and mechanical clamps on the fourth because hoses necessary for hydraulic clamping would have limited access and disturbed operators on that side,” says Guenther Kuck.

Guenther Kuck and Bodo Winowsky are both very happy with their combi-

ned project. “We have known Witte for years and we already use a lot of their vacuum products. As far as custom fixturing and solving problems is concern-



Part after milling

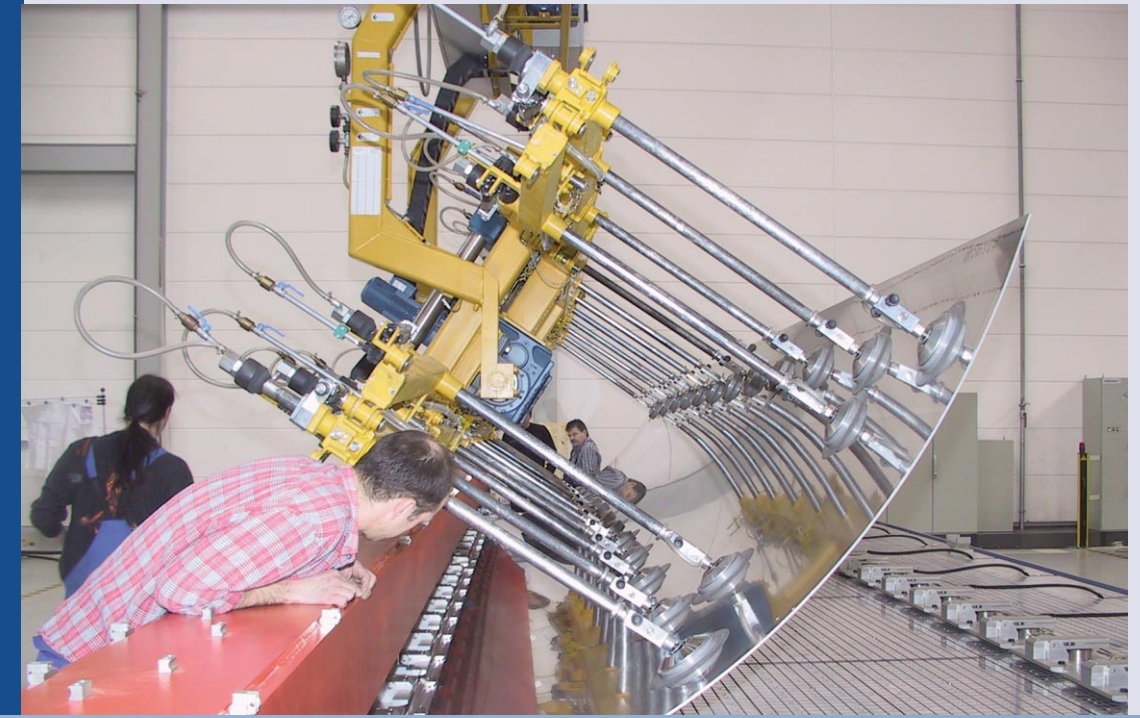
ned this Bleckede company is the perfect partner,” says Guenther Kuck , Bodo Winowsky adds “We welcome complicated clamping challenges.

In this case we made a small sample fixture to check clamping process and

asses small problems as early as possible in order to avoid them on the real thing.” Another advantage of the company from Bleckede, which develops and manufactures different kinds of clamping systems is their long experience working for aircraft industry. For more than 30 years Witte has machined high precision aluminium aircraft parts and knows the ins and outs of quality requirements..

Mr. Toenjes (Manager Plant Planning) is also satisfied with the project, „Our operators have accepted the system well and it is working almost constantly on three shifts.

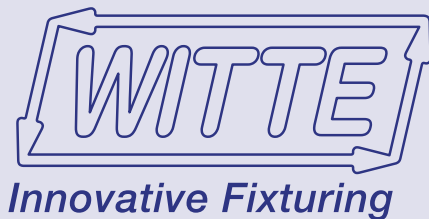
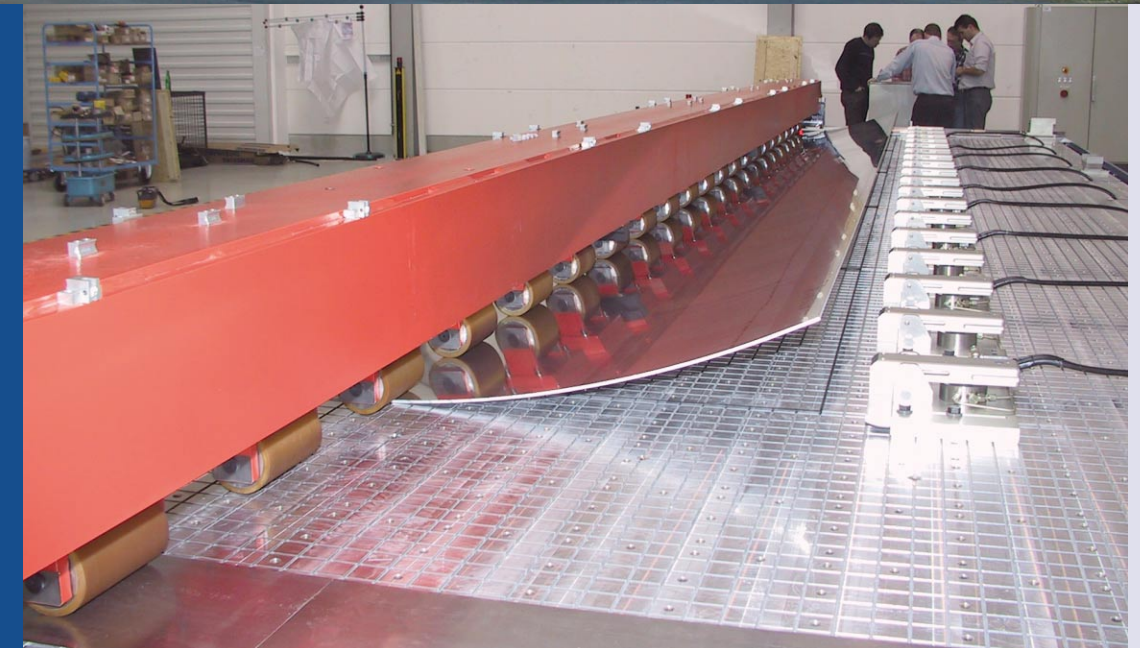
Airbus part is transported to clamping fixture using crane and then positioned against stops on one long side.



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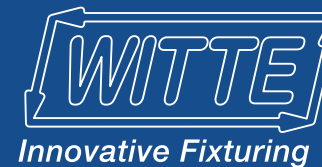


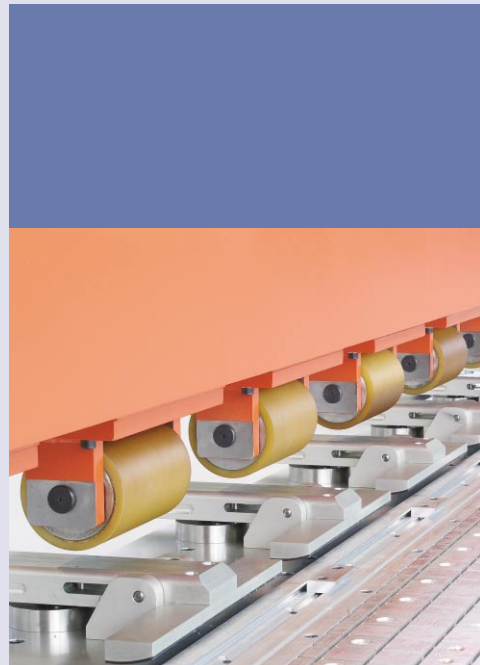
14m long roller bar moves across part and presses it flat. Hydraulic clamps are ready to fix part in position along starting edge.



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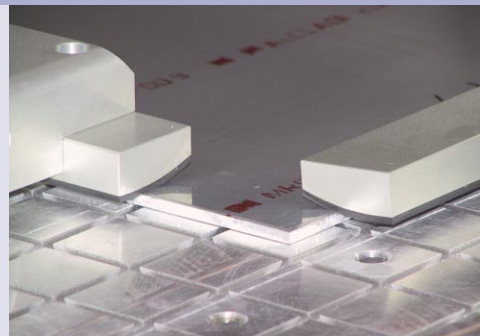
Manufacturing of fuselage parts for different Airbus projects is carried out in Nordenham. Typically in the aircraft industry weight is an important factor and in almost all areas weightsaving has been exploited to the extreme. In order to enable manufacture of lightest possible fuselage parts without any loss of quality Witte Bleckede and Airbus Nordenham have developed a special fixture for clamping pre-formed aluminium sheets during machining



Roller bar in start position.

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Detail of fixed part.



A cylindrical Airbus fuselage segment consists of several single metal sheets. The parts, measuring up to 10,500x2,700mm, run through several work processes for example rolling before they reach their final cylindrical form.

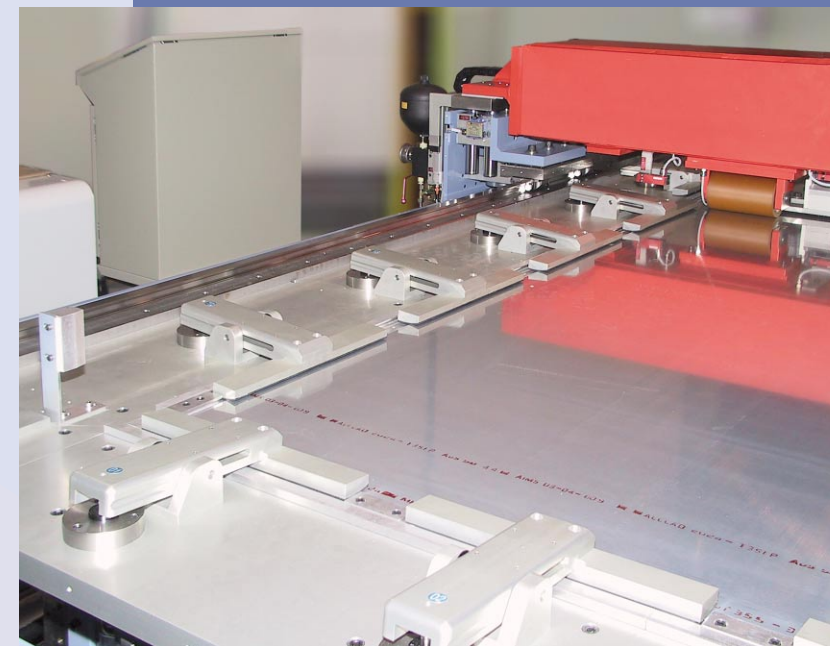
After the rolling process weight reducing pockets are machined into those parts of sheets which are statically under less stress. If pockets were machined beforehand they would not come up to quality standards.

Usual material to form pockets has mostly been removed by chemical milling. For economical and environmental reasons Airbus Nordenham wanted to leave outwith chemical processes and presented this challenge to Witte

Bleckede with the aim of finding a solution with them regarding positioning, clamping and machining of pre-formed parts.

“We want to start with machining of preformed parts”, says Guenther Kuck Plant Planning Dept. at Airbus. “Our fundamental idea: External forces should temporarily flatten the preformed parts into their original shape and they should be machined in that position. That seemed the most economical solution, anything else would have cost too much time and money.”

A custom-built fixture was developed to press down these parts and hold them during machining using vacuum and clamping elements. After machining sheets are released and go back to their former contour. Fixture design incorporated mechani



Clamps secure flattened Airbus part

cal, hydraulic and vacuum clamping elements.

Press – roll – clamp

First of all sheet metal parts are lifted with a crane and vacuum cross bar onto clamping fixture and positioned using stops on one long side.

Hydraulic clamps are activated along length and clamp part along positioned edge. On the same long side a 14m long bar equipped with special rubber rollers starts to move and presses parts down flat. It is guided by linear guiding elements and servomotors

positioned on both side edges of clamping surface. Hydraulic and mechanical clamps along the sides are activated step by step according to flattening process. All clamping elements are monitored by sensors and shown on a display.

While roller bar is moving the sheet metal is pressed onto clamping surface. At the same time corresponding vacuum areas are activated from underneath clamping section by section until whole area is secure. Pressure difference switches control each activated vacuum area.

After part has been pressed flat and is completely clamped a visual check of position and operating vacuum takes place. The bar goes back in its start position and milling can start. A milling cutter dia. 30/50 is used to remove up to 3mm on i.e. a 5mm thick sheet.▶