

## The company

**Premium AEROTEC** was founded as an independent company on 1 January 2009 and is a wholly owned subsidiary of EADS N.V. EADS' Augsburg plant and Airbus' Nordenham and Varel plants have been integrated in Premium AEROTEC GmbH's business operations. The former Airbus parts manufacture in Bremen became an integral part of Premium AEROTEC on 1 January 2010, and is being run as part of the Nordenham plant. As of 31 December 2010, Premium AEROTEC took over the defence business activities of Aircraft Services Lemwerder (ASL).

In addition, Premium AEROTEC has launched production of aircraft components through its subsidiary S.C. Premium AEROTEC SRL Romania in December 2010. Therefore, a new factory has been set up in Ghimbav, Braşov County (Romania). The factory in Romania has been integrated into the Premium AEROTEC group alongside the German production sites in Augsburg, Bremen, Nordenham and Varel.

The company has more than 7,000 employees and generated revenues of 1.3 billion euros in 2010. In the medium term, the company plans to enter into industrial partnerships and participations. Premium AEROTEC's core business comprises the development and manufacture of metal and carbon fibre composite aircraft structures and the associated equipment and production systems.

The aim of Premium AEROTEC over the coming years is to further expand its position as the leading tier 1 supplier of civil and military aircraft structures. Even in its start-up phase, Premium AEROTEC has taken a leading position in the aerostructures business and is represented in all of the major civil and military aircraft programmes (Airbus A318-A321, A330/A340, A350 XWB, A380, Boeing 787, A400M, Eurofighter, Tornado and unmanned aerial vehicles, also known as UAVs). The company is the world's largest supplier of aircraft fuselage structures to Airbus, and is the only provider in its sector with many years of experience in both civil and military aircraft construction.

Premium AEROTEC is the largest aerostructures supplier for the new A350 XWB, whose fuselage will be made mainly of carbon fibre composite material. For this next-generation Airbus Premium AEROTEC supplies the front fuselage section (section 13/14) and the side shells of the rear fuselage section (section 16-18) as well as the floor structure and the aft pressure bulkhead in the rear fuselage section. Premium AEROTEC aims to become the leader in its industrial sector for the development and application of new and innovative materials, technologies and processes. From its infancy, the company already possessed a wealth of highly advanced and in some cases unique know-how, such as a technique developed in Nordenham for the laser welding of aircraft structures or the VAP® (Vacuum Assisted Process) technology, developed in Augsburg and patented by EADS, which is used to manufacture carbon fibre-reinforced plastic (CFRP) structures.

One of Premium AEROTEC's most important steps – in addition to the EASA approval as a recognised production and maintenance organisation, which it has already been granted – is the design organisation approval (DOA) by EASA.

Premium AEROTEC is headquartered in Augsburg, and the operational units are managed from Varel. The company also has its own development unit with its main facilities at its Augsburg site and development offices in Bremen and Hamburg.

In order to develop its position as a technological leader, the company plans to invest heavily in the ongoing training of its existing workforce to guarantee its ability to meet the constantly growing demands of the market and keep pace with technological progress. Premium AEROTEC's top priority is customer satisfaction. At the same time, meeting profitability targets throughout all of its organisational units lies at the heart of Premium AEROTEC's growth strategy, with which it aims to secure its position as a global leader in its sector. Premium AEROTEC is open to new programmes and new markets.

## **The plants**

The plants now belonging to Premium AEROTEC already established an excellent reputation in the past. For example, "Aerostructures made in Augsburg" has long become a brand name synonymous with quality throughout the entire sector. The laser welding technique for joining aircraft fuselage structures developed in Nordenham was awarded the German industry innovation prize in 2000. Several years later, Premium AEROTEC won the JEC Innovation Award 2009 for its industrial application of the VAP® process in making the A400M's upper cargo door.

### **Augsburg**

The Augsburg plant has already been involved in all of the major European aerospace programmes and has also made a significant contribution to the development of new concepts. With over 2,500 employees, the Augsburg plant has been one of the largest suppliers of large structural components for Airbus worldwide for many years. The central fuselage section of the Eurofighter "Typhoon" is also made in Augsburg.

The core competencies of the Augsburg plant include the production and assembly of fuselage components and structural components designed to withstand high fatigue for military and commercial programmes of all kinds as well as equipping such components. In addition to hybrid lightweight construction techniques, its portfolio covers the full range of modern technologies employed in the production of fibre-reinforced composite components, using prepregs, infiltration techniques (VAP®) and sandwich structures. The pressure bulkheads for the Boeing 787 ("Dreamliner") are also produced here, as will be those for the Airbus A350 XWB in future.

Premium AEROTEC is a technological leader in fibre-composite technology. The cargo door for the new A400M military transporter – to name just one outstanding example – was developed and is produced at the Augsburg plant. This geometrically complex structural component is located in a highly stressed area of the fuselage and therefore exposed to high physical loads. With dimensions of roughly 7m x 4m, the cargo door is the world's largest

aircraft component to be manufactured using VAP® technology. A composite structure of this size would not have been possible without the use of the novel, proprietary VAP® process, in which a matrix of carbon fibres is infiltrated with resin using a vacuum-assisted process. An advantage of this new technology is that a temperature controlled oven is sufficient for hardening the resin. Apart from the economic advantages, this patented technique also has the benefit of allowing shorter component production times in comparison to conventional processes. It also increases the flexibility of production.

Premium AEROTEC won the JEC Innovation Award 2009 for its use of this process. This technique also proved convincing to Boeing, and the 4.3m x 4.6m “black” pressure bulkheads for the B787 are also made in Augsburg using the VAP® technique. Premium AEROTEC recently built new workshops for the A350 XWB and other aircraft with fuselage structures made of carbon composites at its plants in Augsburg and Nordenham, and commissioned them in mid-2010. The side shells of section 16-18 of the new Airbus A350 XWB long-haul aircraft are produced in Augsburg.

## **Nordenham**

The Nordenham plant, with roughly 2,500 employees, specialises in the production of large sheet metal and stressed-skin structures, primarily for Airbus aircraft. State-of-the-art automated manufacturing technologies help to keep production costs to a minimum. A new hall, 208 metres long and 78 metres wide, and correspondingly high, has been specially built to manufacture the large fuselage shells for the double-deck Airbus A380.

The fuselage shell construction process in Nordenham ranges from large sheet metal production and surface protection (electroplating) to assembly. With the work packages for the new Airbus A350 XWB, the plant is now being upgraded to become a fuselage assembly plant. In future the new A350 production facilities in Nordenham will not only be used to manufacture fuselage structures from carbon fibre composites, but also for the assembly and delivery of fully integrated fuselage sections. The entire section 13/14 of the A350 XWB will be supplied by Nordenham.

Other major activities in Nordenham include profile forming, stretch forming large surface area metal structures and adhesive metal bonding for all Airbus models as well as laser welding of aircraft fuselage structures made of aluminium alloys. This novel manufacturing process was developed and is being used in serial production for the first time here in Nordenham.

Laser beam welding replaces conventional riveting in a number of areas of aircraft fuselage production. Skin fields for the fuselage sections of the Airbus models A318 and in particular the A380 are welded in Nordenham using the laser welding technique. The total weld seam length for the wide-body Airbus A380 amounts to 1,400 metres per aircraft. Laser welding technology is ten times faster than the comparable riveting process and helps to achieve significant weight savings.

Complex, discrete structural components for the Eurofighter are also manufactured in Nordenham.

The deep-drawing metalworking techniques employed in Nordenham have also attracted customers from outside the aircraft industry. For example, the aerodynamic nose cone of the "ICE 3" high-speed train and its new successor, the Siemens "Velaro", operated by Deutsche Bahn (DB) in Germany as well as the Netherlands Railways (NS), the Spanish national railway network (RENFE), the Chinese National Railways (CNR) since the 2008 Olympic Games and the Russian Railways (RZD) since the end of 2009, was manufactured at this plant.

### **Bremen**

An integral part of the Nordenham plant in terms of organisational structures, the Bremen-based Airbus parts manufacturing unit was taken over by Premium AEROTEC as of 1 January 2010. The plant's more than 300-strong permanent staff manufacture over three million aeronautically tested structural components every year, including roughly 30,000 different series production parts and 25,000 non-series-produced parts. The unit has also recently begun to manufacture complex clips made from thermoplastic material for the new Airbus A350 XWB long-haul aircraft.

### **Varel**

The Varel plant, with about 1,300 employees, specialises in the machining of aircraft parts and the development and design of production tools and is an expert in the assembly of A350 XWB doors frames made from titanium and the assembly of the Eurofighter's fuselage section 3/2b.

Flexible manufacturing systems (FMS) and powerful information processing systems are employed to achieve an optimum degree of automation on cutting processes. The plant is equipped to machine all highly-stressed integral structural milling parts made of aluminium, titanium or steel. One particularly demanding work package performed at the Varel parts manufacturing facility is the 5-axis high-performance cutting (HPC) of milled aluminium integral components. In this high-performance environment, aluminium fuselage frames measuring up to seven metres in length are milled.

Within Premium AEROTEC's manufacturing network, the sites in Varel and Augsburg are equipped with sophisticated high-performance milling machines, used for instance to produce titanium components for the frames of the A350 XWB's passenger cargo compartment doors as well as for the centre fuselage section of the Eurofighter as well as aluminium cutting for the production of civil and military structural components.

The Varel plant also manufactures cut aluminium parts for the Eurofighter (air intake shells and ducts). The first metal cut for the first major airframe component, which marked the start of production of the A400M military transporter, took place during a special ceremony in Varel on 26 January 2005.

The manufacture of production systems in Varel dates back more than 60 years. Today, the plant offers complete system solutions and production tools for all aircraft programmes and all process stages of aircraft construction,

from moulds for carbon fibre composites (fibre lay-up and hardening tools for CFRP components) to assembly lines and test rigs and even air transport equipment. Automation and flexibility, combined with strict adherence to the highest production standards, ensure precise and highly efficient results, even when manufacturing low-volume parts.

The Varel engineers have considerable experience in the construction of models for high-speed and low-speed wind tunnel testing. The models they build in different take-off and landing configurations (e.g. wing flap positions) are used to test aerodynamic behaviour during different flight phases in the wind tunnel.

### **Braşov / Romania**

In December 2010, Premium AEROTEC launched production of aircraft components in Ghimbav, Braşov County in Romania. The new manufacturing plant in Romania provides jobs for 300 qualified experts and will specialise in the production and assembly of metal structures for all of Airbus' series aircraft programmes (A320 family, A330/A340, A380). It will be seamlessly integrated into the process chain of Premium AEROTEC's German plants in Augsburg, Bremen, Nordenham and Varel.

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Communications and Public Affairs