

First Fruits Of Rotherham Firm's input Into Airbus Super-Jumbo

Completion of the first full set of wing skins for the new Airbus A380 'super-jumbo' recently marks a significant landmark for Rotherham-based engineering con-

sultants Bennett Associates.

The A380 will be the world's largest passenger aircraft when it makes its first flight next year. It will carry 555 passengers

- 140 more than the biggest aircraft today - and will be nearly 80 metres long from nose to tail. The main wings, which measure 45 metres along the leading edge,

will be built at a new factory opened last month at Broughton, North Wales, before being transported to France where the complete aircraft are assembled.

The consultancy, based at Pleasley Road, Whiston, was responsible for the top wing skin production system at the new factory, which forms and handles panels of aluminium alloy from 5mm to 25mm thick, 23 metres to 33 metres long and up to 2.5 metres wide. The cost was £7.7 million. As well as designing the equipment, Bennetts also managed its manufacture and installation, completing the project on time and under budget.

Each complete wing skin is produced in four

sections, using a process known as creep forming that results in very accurately shaped panels with little alteration to their mechanical performance. 'Creep forming creates a finished skin with very little inherent stress, which allows the designer to minimise weight and achieve the required performance,' explained John Wadsworth, who managed the project for Bennetts.

The A380 creep forming tooling incorporates several innovative features. For example, it can be adjusted to fine-tune the skin shapes, which kept the transition from prototype to full production to a minimum. This feature also allowed the tooling to be manufac-

tured concurrently with the aerodynamic design process at Airbus, which greatly reduced the overall project lead-time from concept to production. Waiting for the wing design to be completed before starting to manufacture the tooling would have greatly extended the schedule.

Bennetts also carried out intensive testing with suppliers of all the manufacturing processes to ensure that profiles cut straight from the CAD production drawings could go directly to a final laser profile check without the need for full trial assembly or intermediate checks. This not only produced the secure supply routes required by the project but also

reduced lead-times and costs.

The aerodynamic configuration data for the wing panels produced by Airbus, using a specially developed predictive modelling application, had to be manipulated to allow it to be transferred into Bennett's Catia V5 CAD software. The company created its own computer programmes for this task.

As well as the creep forming tooling, Bennetts also designed and project-managed the installation of systems for checking and handling the panels before and after they are formed. Checking the form and edge profiles on the A380 wing skins takes just one hour, whereas much smaller

wing skins have previously taken a day to check.

'The facility, delivered to budget, is the first of its kind and was taken from initial concepts to a production-ready unit in under two years,' said Mr Wadsworth. 'This is a major achievement when taking into account that the completed final aerodynamic shape of the wing was being developed in parallel with the manufacture and installation of the tooling.'

Other projects in which Bennett Associates have been involved include the Channel Tunnel, the Falkirk Wheel, the Gateshead Millennium Bridge and the world's largest coal terminal in China.



Removing protective material from a completed A380 wing skin section after forming on the new production system designed by Bennett Associates