

Airbus to fly riblet-covered A320

Airbus is to flight-test an A320 with 80 per cent of its surface covered with drag-reducing riblets. The programme follows promising trials of the microscopically grooved adhesive film on an A300-600.

In a joint programme with Lufthansa and riblet film manufacturer 3M, Airbus applied six narrow strips of film to 12 areas of an A300.

The aircraft flew on scheduled Lufthansa African services, and one strip was removed from each area every three months. The aim was solely to investigate the product's resistance to routine wear and tear, rather than to explore aerodynamic benefits.

The aircraft was specifically operated to destinations with extreme temperature changes, and the film was applied to areas subject to particular wear factors, such as ultra-violet light on the roof, fluid contamination on the under-fuselage, and erosion on leading edges.

After a year on the 18-month programme, Airbus general



Riblets (below, shaded) could cut A320 drag (above, the first for Braniff)

manager research and technical, Dieter Schmitt, says that the chief problem was fluid contamination filling the grooves on the under-fuselage. Lufthansa used only routine cleaning techniques on the trial aircraft.

Airbus is not releasing exact details of the film design, but

previous experiments have suggested that airliner riblet grooves should be approximately 0.002in deep and wide.

In the new trials, Airbus will first fly one of the A320 development aircraft to establish a basic database, and then repeat the schedule with the aircraft covered in film.

The 3M film is self-adhesive but, Schmitt says: "For big surfaces it will not be simple to apply. We will have to invent a procedure."

He explains that, to be effective, the riblet grooves have to be aligned $\pm 10^\circ$ with the airflow in the lower boundary layer, which is why it is not practicable to use the film on some parts of the aircraft.

On the rear fuselage cone it is impossible to align the grooves with the flow, and on other areas the flow alters direction. Outside the 10° limit the effect becomes counter-productive, so the film cannot be used.

Schmitt is confident of achieving a 1 per cent fuel saving, and says as much as 2 per cent could be possible. He believes that, despite stable fuel prices, the low weight and cost of the film will make it attractive to operators. The Lufthansa trial suggested that a single application would have a life measured in years.

A key aspect of the trials will be structure inspectability with the film applied, says Airbus. □

Rediffusion joins MD-11

Rediffusion Simulation has sold its first full flight simulator for the McDonnell Douglas MD-11 airliner to Italian flag carrier Alitalia.

Also announcing the sale of a second Boeing 747-400 flight simulator to Cathay Pacific Airways, the UK company claims to have taken 55 per cent of the airliner simulator market so far this year.

In taking over the sales lead from CAE Electronics, Rediffusion has also broken the Canadian company's monopoly on the supply of MD-11 flight simulators—five so far, including one for McDonnell Douglas.

The £8 million Alitalia machine, complete with Rediffusion's SP-X 500/WIDE daylight panoramic visual system, will be installed at the Italian airline's training centre at Rome's Fiumicino Airport in 1991. Alitalia already operates two Rediffusion-built MD-82 simulators, and has a Cheyenne IIIA machine on order.

Hong Kong-based Cathay Pacific already operates a Rediffusion-built 747-400 flight simulator, and will install the second machine at its Kai-Tak Airport training centre in January 1991. Like the first, it will have SP-X 500/WIDE visual system. □

