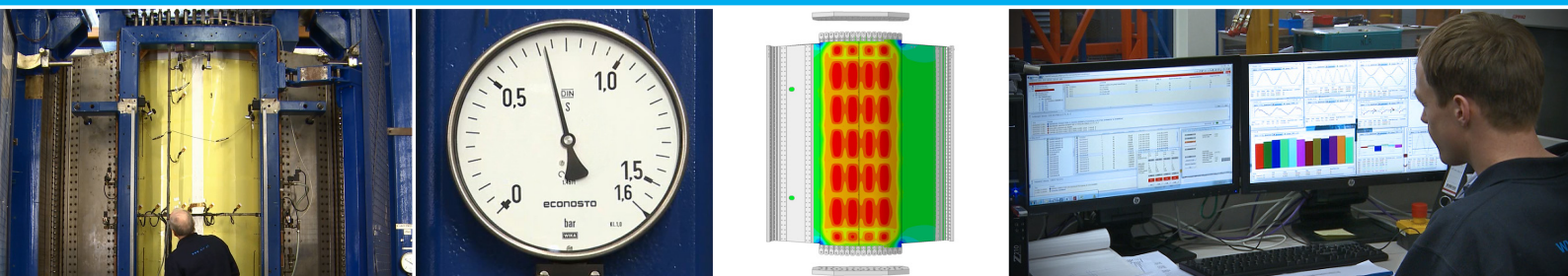





Curved Fuselage Panel Testing Facility



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“FUSELAGE DESIGN VALIDATION BY TESTING OF CURVED PANELS”

Fuselage skins of most aircraft are subjected to the combined loading of cabin pressure and fuselage bending. It is therefore highly desirable that curved fuselage panel test articles are tested under those biaxial loading conditions.

The fuselage panel test facility at NLR offers the possibility to subject fuselage skin sections to those biaxial loading conditions during static residual strength tests and fatigue tests.

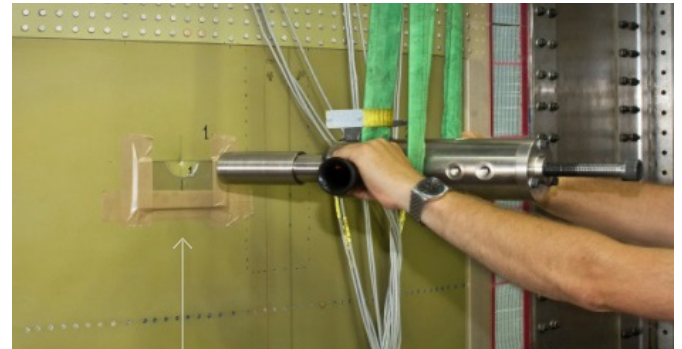
By testing curved panel sections instead of a full scale fuselage or barrel section, lead time and cost can be reduced.

"REAL-TIME MONITORING"

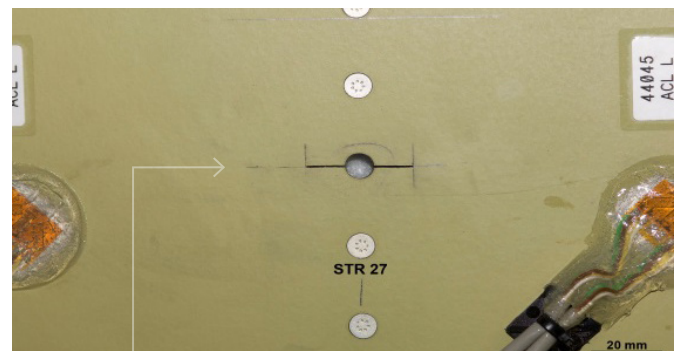
Specification NLR curved fuselage panel facility

The generic fuselage panel test facility at the NLR is flexible in panel diameter, width and length. An unique features of the facility is the unidirectional glass fiber sheets, which introduce the membrane loads very evenly and does not add local stiffens in axial direction. Another advantage is the possibility to visualize remotely real time test data generated during a test.

A recognised customer advantage is the wide variety of specialists and equipment available at the NLR, from control and measurement systems to loading actuators and sensors, to measure all kinds of parameters. NLR can take care of every step in aerospace full scale and component testing, including the transition from the requirements to the test definition, the test setup design and manufacturing, the definition of the load spectrum using the in-house developed computer programme CLASS, relevant testing techniques for static, fatigue, damage tolerance and environmental testing and interpretation of the results.



Inducing an impact



Applying damage

Aircraft	Fuselage diameter [mm]	Type of test	Type of loading	Goal
JAXA investigation	2880	Static + Fatigue	Constant amplitude	Natural crack growth in lap-joint
Airbus 380	5640	Static + Fatigue	Constant amplitude	Investigation of orbital joint and longitudinal joint at stringer
ANSA	3950	Fatigue + Damage Tolerance	Flight simulation spectrum	Fatigue crack growth + demonstrate bonded repair patch
Shorts Global Express	2693	Fatigue + Damage Tolerance + Residual strength	Flight simulation spectrum	Demonstrate technological feasibility of Glare side-wall fuselage panels
Alenia ATR 42	2865	Residual strength	Static + Constant amplitude	Verification of residual strength models with and without multi-site damage (MSD)
Airbus A300	5640	Residual strength	Static	Verification of residual strength models with and without multi-site damage (MSD)
Fokker 100	3300	Static + Fatigue	Flight simulation spectrum	Demonstrate feasibility of Glare and glare stringers and evaluate structural health monitoring systems