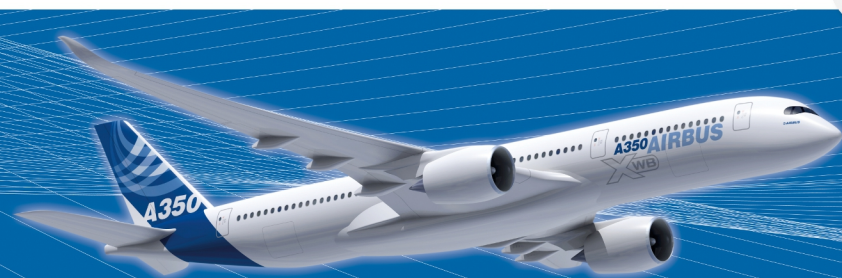


EXTENDED NON-DESTRUCTIVE TESTING OF COMPOSITE BONDS

Optimum bonding solutions for light-weight aircraft structures



ABOUT ENCOMB

As a medium-scale European project funded within the 7th Framework Programme, ENCOMB brings together leading experts in aeronautics research and development from nine European countries. Driven by central challenges within the aeronautics industry, ENCOMB aims at providing advanced non-destructive testing methods for reliable quality assurance of adhesive bonding of CFRP structural components.

Coordinated within the Fraunhofer Society, this research-based project covers a broad expertise with regard to material and surface characterisation. For information on our publications, upcoming events and available results visit our webpage www.encomb.eu

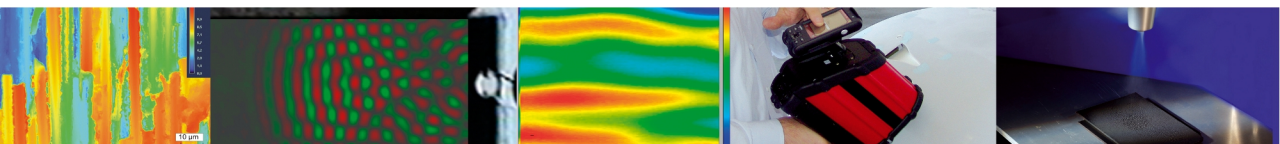
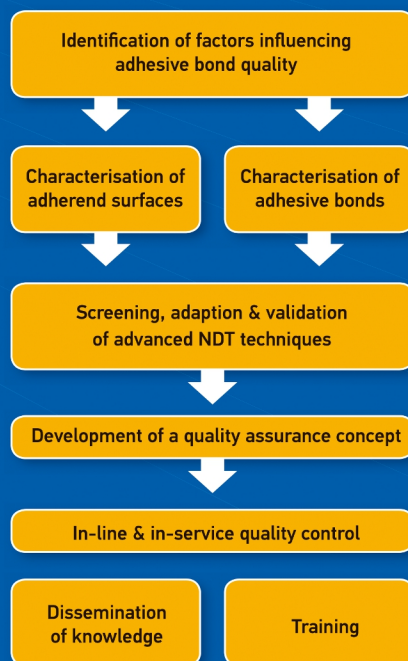
OUR GOALS

Even though composite materials are already used in the manufacturing of structural components in the aeronautics industry, a consequent light-weight design of CFRP primary structures is limited due to a lack of adequate quality assurance procedures for adhesive bonding – which is the optimum technique for joining CFRP light-weight structures. The strength of the adhesive joint depends on the operational loads during aircraft operation, defects in the joint area and the physico-chemical properties of the interphase region. Operational loads are considered in the structural design while defects can be detected by means of conventional NDT. The physico-chemical properties of the interphase region are mainly affected by the state of adherend surfaces, e.g. the degree of contamination and activation after surface pre-treatment.

Therefore, one objective of the ENCOMB project is the development and adaptation of methods for the characterisation of adherend surfaces before application of the adhesive. The development of techniques for evaluating the bonded components is the second challenging goal of the project. This new field of testing is defined as Extended NDT (ENDT).

The successful implementation of a reliable quality assurance concept within manufacturing and in-service environments will provide the basis for increased use of light-weight composite materials for highly integrated aircraft structures, thus minimising rivet-based assembly. The expected weight savings for the fuselage airframe are up to 15 percent. The resulting reduction of fuel consumption and hence reduced aircraft operational costs and CO₂ emissions will present a major step towards the greening of air transportation.

WHAT WE DO



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WHO WE ARE



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