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**Documentation Sheet**

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**Abstract :**

This report details the mechanical design aspects of the 1:7.645 scale LCA high speed air intake model. The model is intended to generate intake data in the transonic range 0.7 < M < 1.3 by Aeronautical Development Agency.

The model has been designed for testing in the S2MA ONERA wind tunnel facilities. The 1:7.645 scale model is basically a composite model with metallic bulkheads/inserts and mainly consists of front fuselage, the wing, the canopy, interchangeable front duct modules, the rear portion of the CFRP duct, the main bulkhead, the heat exchanger duct, the sting, kulite rake, rear portion of the metallic duct including venturi, butterfly valve and diffuser. The kulite rake, the sting and the rear portion of the duct available with ONERA is made use of in the present model design. The steel bulkhead provides anchor support for the model in the tunnel through a flange mounted sting. The model has been designed to meet all the requirements of ONERA regarding model design and construction. For the design of the present model, the critical loads are scaled down from the load data of the 1:4.405 scale model. Structural analysis based on strength of materials approach has been carried out on the components of the model viz. forward fuselage, main bulkhead, air intake duct, and the splitter plate. FEM analysis has been carried out on the wing which is supposed to be the critical element of the model. The stress analysis shows that adequate margins of safety are available for all the components of the model.