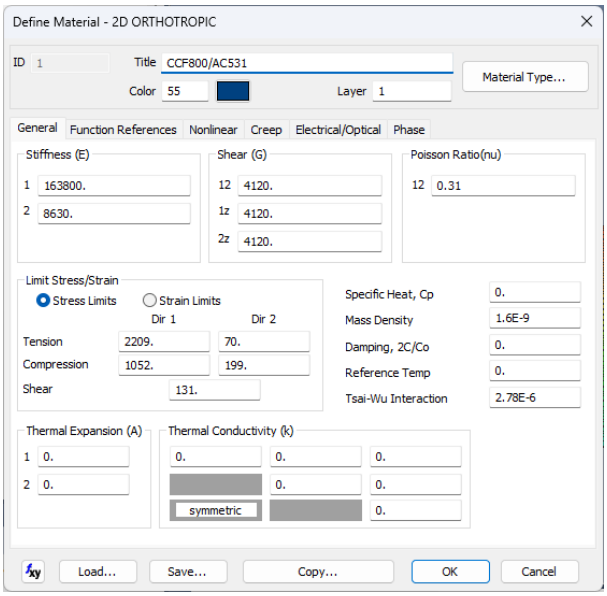
Aerobatic Wing

Honeycomb variant

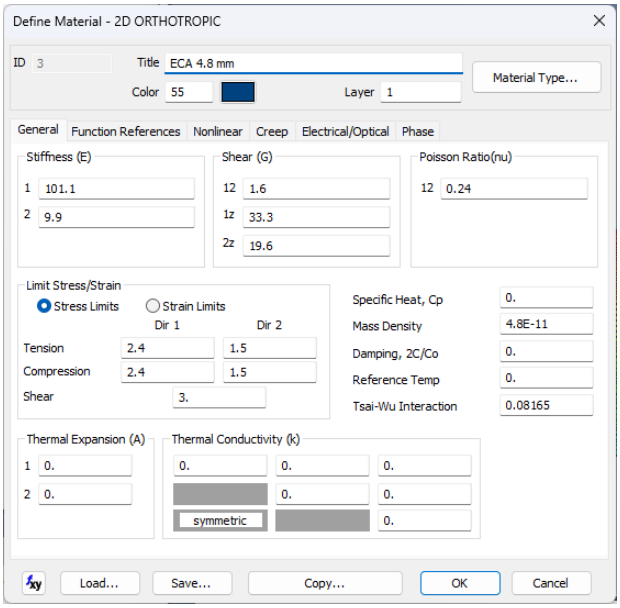
Material properties

Carbon fibre layups will be modelled using UD plies whose properties are as follows:



UD plies have thickness of 0,155 mm.

For the honeycomb material, aramid was chosen. Honeycomb properties are modelled using 2D Orthotropic material model. Shear modulus and strenghts were obtained using Ashbys approximations. Cell size is 4,8 mm, while honeycomb core height is 5 mm. Honeycomb core height was tested in manual iterative process where it was noticed that after increasing the height above 5 mm, the skin began to buckle.



To increase the stiffness of the Spar webs, foam material is inserted into the middle. Foam was modelled as an isotropic material, with properties that represent the weakest values from an orthotropic material model of the foam. Foam inserts for both the front and aft spar have thicknesses of 2 mm. Foam properties are given below: