Evaluation of the effect of compression of the holes of the cladding of aircrafts on strength

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The article analyzes the impact of the holes compression process in the riveted joint in the sheathing of aircraft on the strength. Optimal amount of compression at which the generated residual stress field leads to a significant reduction of stress at operating loads is determined. For this purpose, using ANSYS Workbench we created a parametric finite element model of an uniaxial loaded plate (plating) with central hole, i.e. compression spherical stamp. This model provides a comprehensive study of stress-strain state in the vicinity of the hole. Comparative calculations of the plate without any preliminary compression of the hole and with compression showed that at certain level of compression we can achieve reduction of maximum stresses. The work also shows the influence of the radius on the stamp.

Keywords: *stamping, elastoplastic material deformation, contact problem, stress strain state, residual stress, safety factor.*

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