

عنوان مقاله:

Stress Analysis in Fixturing of Flexible Workpieces during Riveting Process

محل انتشار:

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خلاصه مقاله:

Fixtures are mainly constructed from locating and clamping systems. Locating system applies kinematic constraints to workpiece in order to locate it at the deterministic location (form closure) while the clamping system plays the role of force applying agent to keep the preserved position and orientation (force closure). Stress values and distribution are considered as one of the important parameters for determination of the appropriate loci of the workpiece. In the present study, FE analysis has been conducted using Abaqus software for determination of stresses on the flexible workpiece fabricated from Al7075-t6 alloy while it is fixtured on its deterministic location. For this purpose, specific locating and clamping systems have been designed for fixturing of sheet metal workpiece with considering the forces applied by the riveting process. The air intake module of an airplane has been selected as the case study because of its needs for high inner and outer profiles accuracy. The selected workpiece was first cut into two parts whose fixturing systems were specially designed for the riveting process. The FEA analysis was conducted on the workpiece using different locating and clamping schemes and forces and the appropriate fixturing plan were selected based on the stress distribution and values. Finally, the suitability of the final locating and clamping plans and their corresponding forces were evaluated and confirmed by the fixturing principles.

کلمات کلیدی:

Aerospace industry, Aluminum 7075-t6, Jig and fixture, Riveting, Stress distribution

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