

Effect of Interference and Form Defect on the Cohesion of the Shrink-Fit Assembly

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Abstract : Due to its superior economics, shrink-fit assembly is one of the best mechanical assembly methods. There are simply two components, the axis and hub. It is used in many different industries, including the production of trains, cars, and airplanes. The outer radius of the inner cylinder must be greater than the inner radius of the outer cylinder for this operation; this difference is referred to as the "interference" between the two cylinders. There are three ways to accomplish this: heating the outer cylinder to cause it to expand; cooling the cylinder's inside to cause it to contract; and third, finishing the fitting under a press. At the intersection of the two matched parts, a contact pressure and friction force are generated. We consider interference and form defects in this article because they prevent the connection between the axis and the hub from having a perfect form surface and because we will be looking at how they affect the assembly. Numerical simulation is used to ascertain if interference and form defects have a beneficial or negative influence in the distribution of stresses, assembly resistance, and plasticity.

Keywords : shrink-fit, interference, form defect, plasticity, extraction force

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