

Abstract

The use of the interference fit (Shrink fit) assembly technique is increasing nowadays. However, design methodologies for such assemblies employ older models based on restrictive assumptions regarding the shape and surface quality of assembled parts. A finite element method software is frequently used to overcome this drawback. Such software allows an approach that is close to the physical reality of the parts (Complex form) of an assembly. However, surfaces are generally considered to be perfect cylinders with a constant tightening. The proposed approach allows both form defects and roughness to be introduced into the design, and thus, the manufacturing process is considered. Form defect is integrated directly into the mesh, whereas roughness is considered by a homogenized finite element of the interface. An application of the approach is presented to determine the specifications that consider the manufacturing process (Honing, grinding, and turning). This simple method can be easily applied in industrial design offices