

Optimization of contact stress distribution in interference fit

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Abstract

Assembly of shaft and hub by an interference fit is a classical connection with known advantages and disadvantages. The advantage being the level of possible torque transfer while the disadvantage is a possible fretting fatigue failure at the points of stress concentration. The pressure distribution in the contact is the source responsible for the fatigue failure. The distribution can be improved by design modification done directly on the contacting surfaces which however requires a very high production precision. Alternatively it is shown, how shape optimization of the hub side can improve the pressure distribution significantly.

Keywords: Interference fit, Contact, Optimization, Stress concentration.