

Comparison of results in application of different methods of deformation strengthening

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Abstract

In exact analyses of bodies in the elastic-plastic area, the behaviour of the material above critical stress values plays a key role. In addition, under cyclic stress, important phenomena to be taken into account are the various types (modifications) of strengthening and design (adaptation) of the material or structure. In this process, it is important to define several groups of characteristics. These include for instance initial area of plasticity or load which defines the interface between elastic and plastic deformation area. The characteristics also include the relevant law of plastic deformation which specifies the velocity direction of plastic deformation during plastic deformation. The strengthening condition is also important to determine position, size and shape of the subsequent loading area. The practical part of this article is dedicated to the comparison of results obtained in the analysis of stresses and deformations of particular structural elements in the elastic-plastic area by FEM using models of different types of deformation strengthening.

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