



Properties of rolled aluminium jacks

Abstract

Since several years components made of aluminium are used for shoring. Adjustable aluminium props, which require a German technical approval based on the "Principles for the assessment of adjustable aluminium props (issue December 1995)", use rolled aluminium jacks up to 2 m length. As these elements are used with high axial forces effects of second order theory are of important influence. The knowledge of the jack's properties - especially it's bending stiffness - is important for the calculation of internal forces and for the safety of the structures.

The present research project examined the cross sectional area A and the moment of inertia I according to DIN 4421 as well as according to DIN EN 12811-1 for jacks of approved adjustable aluminium props. The aluminium jack of an other prop, which is assessed currently, was integrated into this evaluation. The results show differences up to 14 % (area) and 20 % (moment of inertia) respectively. By means of compression and bending tests performed on tubes from which the jacks were rolled to verify the applied techniques and with tests on the jacks themselves the actual differences should be pointed out.

The properties of the new aluminium jack evaluated from tests compared to the calculated properties show that the area A calculated according to DIN EN 12811-1 is in acceptable agreement while DIN 4421 overestimates A . The results are similar concerning the moment of inertia; the best correlation was found when the core diameter was used for calculation.