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ELASTO-PLASTIC DEFORMATIONS OF CYLINDER WALLS  
UNDER ELEVATED PRESSURES

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Based on the examination of the conditions which determine the limits of the region of elastic deformation or which lead to the rupture of cylinders with thick walls, we have observed a little-known phenomenon which is to date quite imperfectly described : the influence on these conditions of the relative thickness of the walls.

In effect, independently of various verifications which had not yet been made, or which required confirmation, we have noticed the existence of a certain critical relative value for the relationship between the internal and external diameters of the cylinders.

The reasons for this result have been investigated by means of some very precise experiments, in which one measures, at both the interior and the exterior, the deformation of sample cylinders having the ratios of external to internal diameter of 1.5 and 2.

This work has centered primarily around the determination of the dimensional effect of the wall thickness on the interior of the limit of elastic deformation as well as those of rupture.

In summation, one sees in all the cylinders an inelastic behavior appearing for pressures below the elastic limit at the interior, and this behavior varies with wall thickness. Some hypotheses are proposed to explain these observations.

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