

KEY WORDS: cylinders; deformation; engineering mechanics; loads (forces)

ABSTRACT: A thick-walled cylinder submitted to uniformly distributed internal and external pressures and to a uniformly distributed longitudinal load is considered. A graphical construction is established allowing the determination of whether the material does or does not remain elastic under this state of loads, or the selection of the value of one pressure with a view to maximizing another without the cylinder undergoing plastic deformation. Three different constructions are given corresponding to the use of the criteria of Von Mises, Tresca, and of a linearized form of the intrinsic curve of Mohr-Cauchot. Several remarks on the conditions and limits in the use of this method are included.

REFERENCE: Epain, Raymond, and Vodar, Boris, "Elastic Loading of High Pressure Cylinders," Journal of the Engineering Mechanics Division, ASCE, Vol. 90, No. EM5, Proc. Paper 4108, October, 1964, pp. 363-374.