Accepted Manuscript

Closed-Form Solutions for the Load-Carrying Capacity of Annular Plates

Mehrdaad Ghorashi

PII: S0020-7403(17)33046-1
DOI: 10.1016/j.ijmecsci.2017.12.046
Reference: MS 4110

To appear in: *International Journal of Mechanical Sciences*

Received date: 26 October 2017
Revised date: 15 December 2017
Accepted date: 29 December 2017

Please cite this article as: Mehrdaad Ghorashi , Closed-Form Solutions for the Load-Carrying Capacity of Annular Plates, *International Journal of Mechanical Sciences* (2018), doi: 10.1016/j.ijmecsci.2017.12.046

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Closed-Form Solutions for the Load-Carrying Capacity of Annular Plates

Mehrdaad Ghorashi
Department of Engineering
University of Southern Maine
37 College Ave., Gorham, ME 04038, USA
mehrdaad.ghorashi@maine.edu

Abstract

This paper presents new closed-form solutions for the load-carrying capacity of annular plates subjected to uniform pressure and central uniformly distributed line load (or ring load). The plate is clamped at its outer edge and it is free at the inner circumference. It is assumed that the static failure of the material used for manufacturing the plate can be modeled by the Tresca (or the maximum shear stress) yield criterion. Using both the upper- and the lower-bound methods of limit analysis the load-carrying capacity of the plate is calculated. Furthermore, distributions of the radial and the tangential bending moments per unit length of the plate are presented. The obtained results are verified with the literature where such findings are available.

Keywords: limit analysis, rotationally symmetric loading, annular plate, load-carrying capacity, plastic collapse, Tresca yield criterion

ACCEPTED MANUSCRIPT

Download English Version:

https://daneshyari.com/en/article/7173909

Download Persian Version:

https://daneshyari.com/article/7173909

Daneshyari.com