Tutorial Session 8c Homework: Equivalent Stress

Mentor Guide Knowledge & Skills Questions

1.12 Define typical yield criteria for isotropic metals in a general 3D state of stress.

Numerical Quetsions

1) A thick pipe has inner and outer radii 10mm and 15mm respectively and is subject to an internal pressure of P. Show that the Mises stress on the inner and outer surfaces are respectively 3.12P and 1.39P.

2) This pipe is also subject to a bending moment of 100 Nm, in the sense which gives a positive stress at the top. If the pressure is P = 20 MPa, calculate the Mises stress on the inner and outer surfaces at both the top and the bottom of the pipe.

3) In Qu.2, is it a coincidence that the Mises stress at the top and bottom of the pipe are the same?

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