



Mechanics of Materials II:

Thin-Walled Pressure Vessels and Torsion

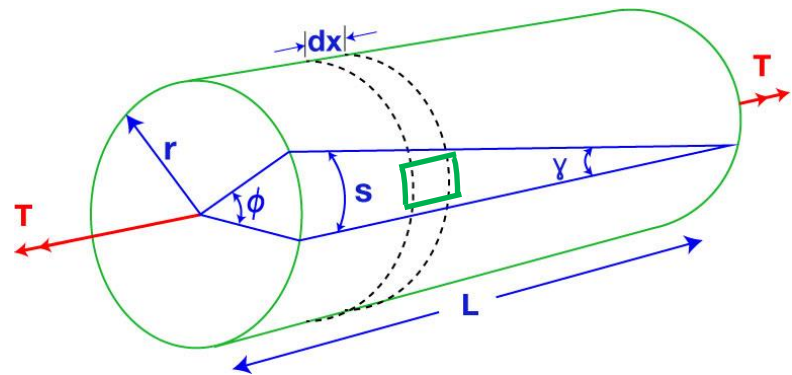
Dr. Wayne Whiteman

Senior Academic Professional and Director of the Office of Student Services
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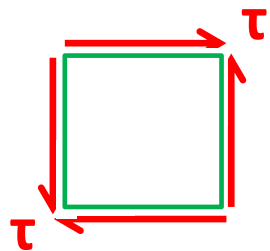
Module 19 Learning Outcome

- Investigate stresses on inclined planes for the case of pure shear due to torsion

Circular Bar Torsion

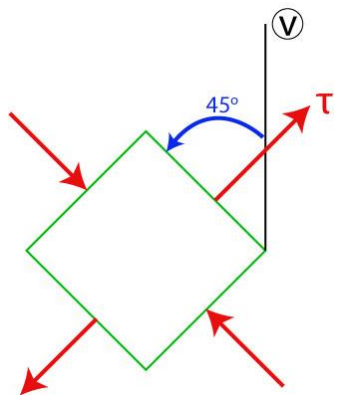
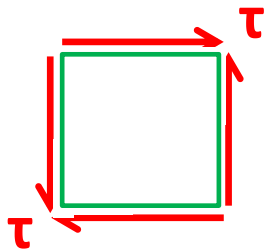


2D Pure Shear

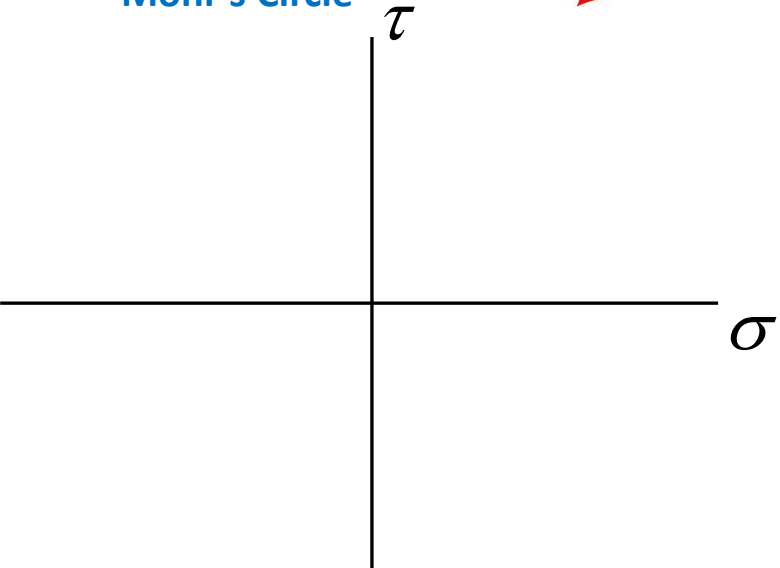


Circular Bar Torsion

2D Pure Shear

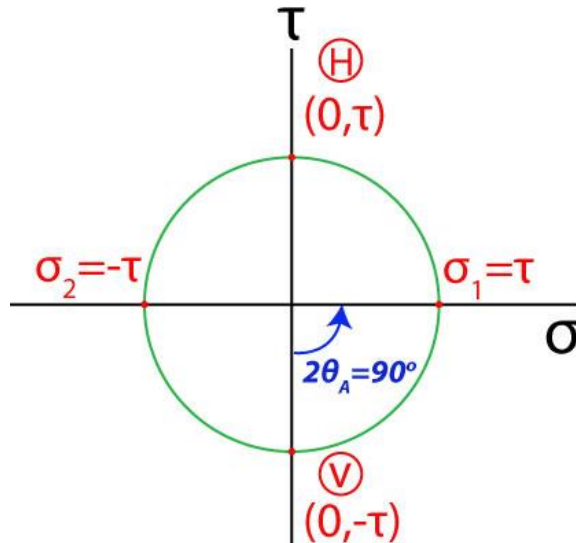
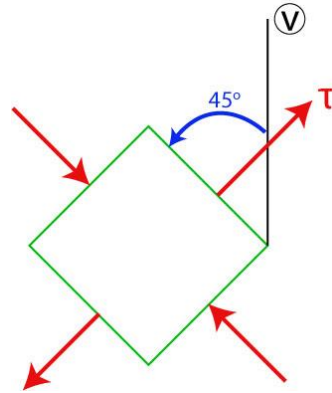
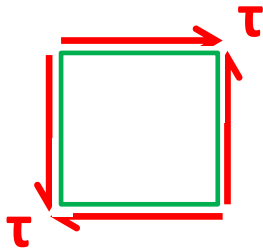


Mohr's Circle



Circular Bar Torsion

2D Pure Shear



Chalk is strong in compression and weak in tension.

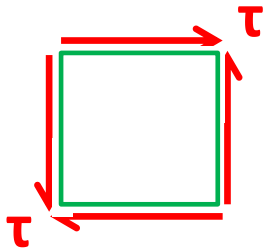
Maximum tensile stresses occur on a plane at an angle of 45° .

Therefore, chalk should break on 45° helical surface.

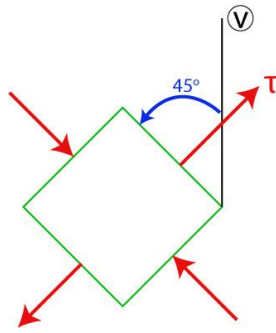
This is typical for any brittle material subject to torsion.

Circular Bar Torsion

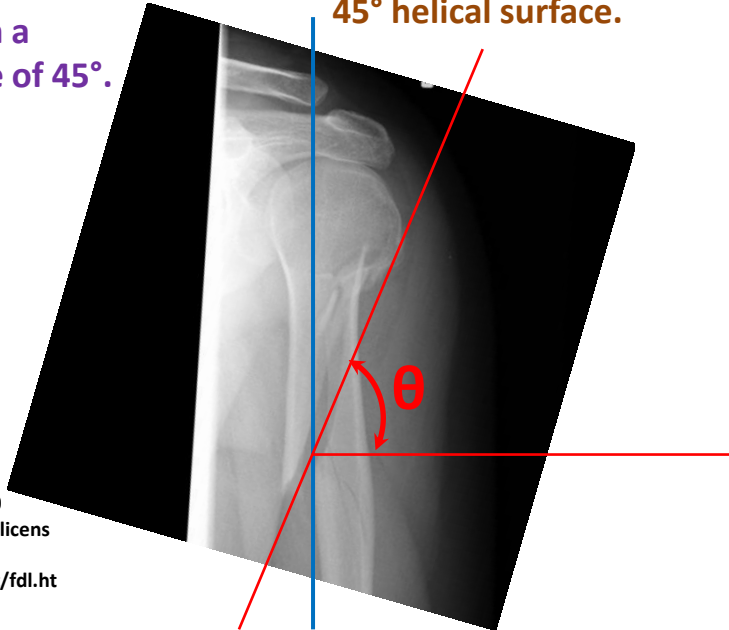
2D Pure Shear



Maximum tensile stresses occur on a plane at an angle of 45° .



Therefore, should break on 45° helical surface.



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