



Mechanics of Materials II: Thin-Walled Pressure Vessels and Torsion

Dr. Wayne Whiteman Senior Academic Professional and Director of the Office of Student Services Woodruff School of Mechanical Engineering



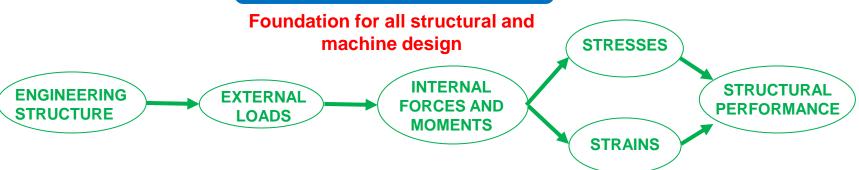


Module 3 Learning Outcome

 Develop an expression for longitudinal stress for a thin-walled pressure vessel in terms of the pressure and the dimensions of the vessel

Mechanics of Materials







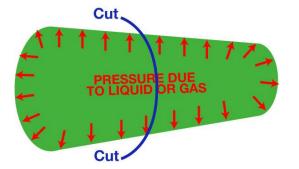


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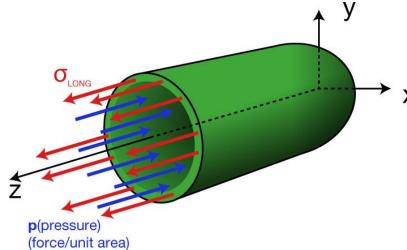
Thin-Walled Pressure Vessels

Let's again look at a section cut





We will neglect the weight of the contents and the weight of the structure itself. These forces are generally many orders of magnitude less than the forces due to the internal pressure and the forces from the resulting stresses in the cross-section.

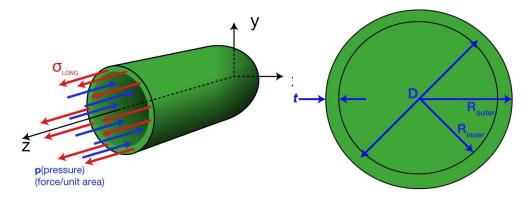


Mechanics of Materials Georgia Tech Foundation for all structural and machine design **STRESSES INTERNAL STRUCTURAL ENGINEERING EXTERNAL FORCES AND PERFORMANCE** STRUCTURE **LOADS MOMENTS STRAINS** PRESSURE DUE TO LIQUID OR GAS

(force/unit area)

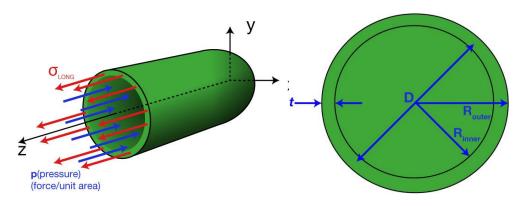
Thin-Walled Pressure Vessels





Thin-Walled Pressure Vessels





Longitudinal Stress:

$$\sigma_{LONG} = \frac{pD}{4t}$$