

ITP 308: Homework 8

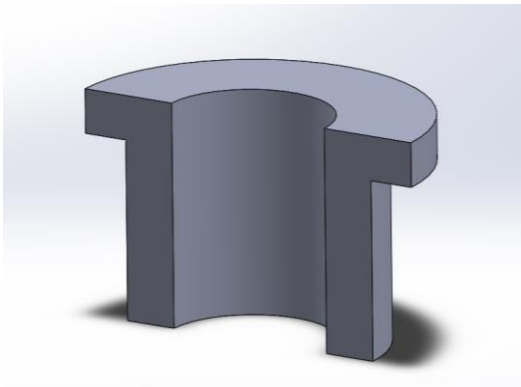
Due: March 31, 2021 11:59PM

Setup

You have been hired by Pressure Vessel Inc. as an entry level product designer. You are tasked with creating a pressure vessel (a vessel that holds compressed gas) that meets certain requirements. Your design is your own, your material selection is your own, but you must stick to the following requirement list.

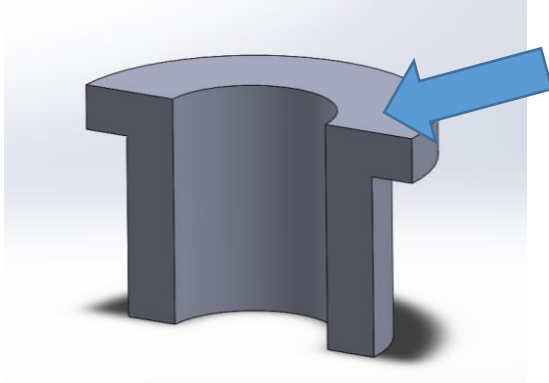
Requirements

1. Your pressure vessel may not exceed a physical dimension size of 30 linear inches (the sum of the length, width, and height) of an imaginary box that bounds the entire vessel. If we were to put your vessel in a box that fits it snugly on all sides, the box should not exceed 30 linear inches.
2. Your pressure vessel material may only come from the following material categories:
 - a. Steel
 - b. Iron
 - c. Aluminum Alloys
 - d. Copper Alloys
3. Your pressure vessel must be able to withstand a pressure of 2,000 psi with a minimum Factor of Safety of 3. If your vessel cannot withstand a pressure of 2,000 psi, or has a minimum Factor of Safety less than 3, you will lose points.
4. Your pressure vessel must have a fill port. The fill port will hold a valve that allows the vessel to be filled with pressurized gas. The fill port must be a circular port with an inner diameter of 0.75" with a minimum depth of 1". This port must stick out of the pressure vessel. See the picture below:



Note: You do not need a flared top like the one in the drawing. Also, the port must connect to your pressure vessel, and must also withstand the 2,000psi pressure limit.

5. You must show, through Simulation, that your vessel can withstand the 2,000psi limit, and that the minimum FOS is 3. In your simulation, the only fixed geometry should be the outer lip of the fill port (the surface the blue arrow is pointing to).



Deliverables:

Save your part file as:

username_pressurevessel.sldprt

Compress the file into a ZIP folder named:

username_HW8.zip

Submit it through Blackboard by the due date

Rubric:

Item	Points
Material selection is one of the predefined materials	4
Part fits within size constraints	8
Has simulation analysis	8
Factor of Safety is 3 or higher at 2000psi	8
Has proper fill port	4
Total	32