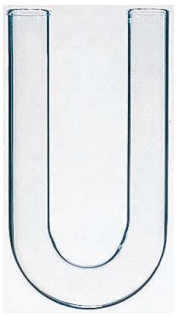
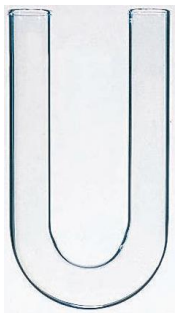
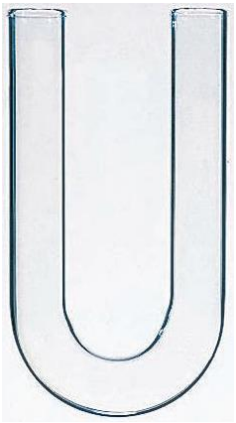
PRESSURE GAUGES: TWO LIQUID U-TUBE

● Pressure Gauges use height differences to calculate pressure → $\mathbf{P_{BOT} = P_{TOP} + \rho gh}$

(1) 1 liquid, 2 open**:** **(2)** 1 liquid, 1 vacuum**:** **(3)** Most common**:** 2 liquids, 2 sides open**:**

EXAMPLE**:** A U-tube **(**as above**)** has two long sides, both open at their ends**.** You first pour enough water so that the height of the water columns on both sides is 20 cm. You then pour enough of a particular oil **(**800 kg/m^3**)** on the right side so the column of oil above the water is 5 cm tall. Assuming the liquids don't mix**:**

(a) What is the gauge pressure at the water-oil interface?

(b) What is the difference in height (in cm) between top of water on the left, and the top of oil on the right**?**

PRACTICE: U-SHAPED TUBE / FIND DENSITY

PRACTICE**:** Water and oil are poured into a u-shape tube, as shown below. The column of oil, on the right side, is 25 cm tall, and the distance between the top of the two columns is 9 cm. Calculate the density of the oil**.**