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**To:** Team A  
**From:** Engineering Management  
**Subject:** Orifice characteristics

We often use orifice meters to measure liquid flow rate, and would like to verify the accuracy of such measurements. Therefore, our lab has installed a test facility equipped with several circular and rectangular orifices, and instruments to measure flow rate and pressure drop.

Our first objective is to see whether or not our test facility can provide results for circular orifices similar to those found in the literature. Therefore, please determine the extent to which you can reproduce the results shown in Perry's Handbook (7<sup>th</sup> Edition) Fig. 10-19, page 10-15. Use downstream pipe tap locations at approximately 0.5, 1, and 2 pipe diameters downstream, and the upstream tap at approximately 1 pipe diameter upstream. Note that our orifices are sharp-edged, however.

We are also considering the use of rectangular orifices. In this case, we ask that you determine whether or not the discharge coefficient depends on the orientation of the rectangular slit (four possible installed positions) relative to each downstream tap location. Can you see significant differences with respect to slit orientation?