Experiment n°9

Experimental determination of the power of the pump

# Objective

The goal of this experiment is to create a formula in order to predict the power delivered by the pump

# Theories

This are the basic theories one head losses:

-linear head losses (major losses):

Darcy-Weisbach formula: ξ regular head lose coefficient

-Laminar flow:

-Turbulent flow in a smooth pipe: (Blasius fromula)

-Turbulent flow in a rough pipe: (Colebrook formula)

- Singular head losses (minor losses): K singular head losse coefficient

The Bernoulli formula will be used here:

With ΔPpump, pressure given by the pump, here,

Qv flow rate in m3/s, Ppump used in W

# Description

The HD98B Hydraulic Bench will be used with all of its pipes

Two U-shaped manometers will be used one filled with water, the other one filled with oil

Central manometers will be used (they are graduated in water column 1McE=9800Pa)

# Experiment

1. Check the opening of the exit valve
2. Open one of the pipe;
3. Connect the manometers to the bench
4. Measure the head losses
5. Determine the power of the pump
6. Repeat this protocol for different pipes
7. Conclude on the power of the pump and its characteristic