Experiment n°10

Determination of the critical Reynold’s number

# Objective

The aim of this experiment is to find the critical Reynold’s number in different pipes and see the effect on the fluid.

# Theories

The type of the flow is determined by the Reynold’s Number: ReD=

The transition between laminar and turbulent flow is for a Re beyond 2000

For a venturi tube, the basic theories is:

Bernoulli formula

Flow rate equality:

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# Description

The HD98B bench is used with the pipe n°2. This pipe is equipped with a venturi tube in transparent material in order to observe the flow inside the pipe and see the behaviour of this flow.

Two U-shaped manometers are available one filled with water (ρ=1000 kg/m3) the other one is filled with oil (ρ=900 kg/m3).

# Experiment

1. Check the opening of the exit valve;
2. Open the n°2 pipe;
3. Connect one of the two manometers;
4. Activate the pump;
5. Pick up the values of the manometer in the following table;

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Qv m3/s | h1 mm | h2 mm | Δh m | U m/s | Re | State of the fluid |

Conclude on the valour of the critical Reynold’s number in this pipe, conclude on the state of the fluid depending the Reynold’s number.