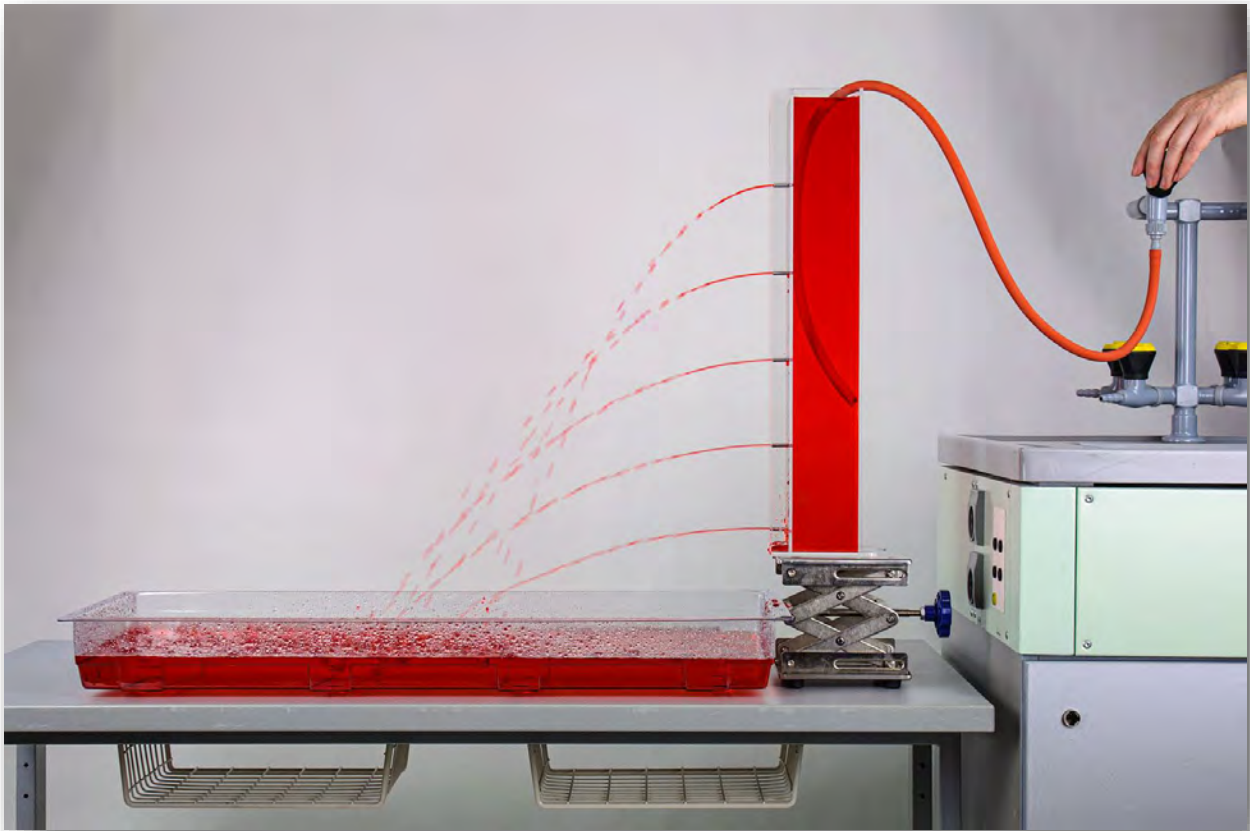


LATERAL PRESSURE AND FLOW VELOCITY - LEAKY VESSEL

MED 15.09



Material:

Item-no.	Qty.	Description
DM430-1A	1	Leaky vessel with 5 outflow tubes
C7235-2B	1	Lab-jack, 150x150 mm
DM682-1B	1	Water basin, long
C7445-7G	1	Hose, rubber, D=7/10 mm, L=100 cm
P7050-1A	1	Powder dye, red

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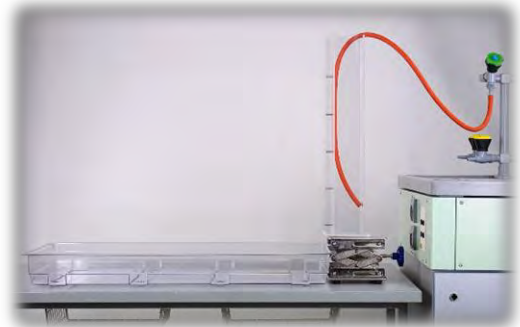
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Purpose:

Demonstration of the weight pressure of a liquid acting both laterally and downwards and the associated increase in outflow velocity with depth.

Preparation:

- Place the long water basin on a flat table top.
- The lab-jack is placed beside the water basin and raised to about 15 cm.
- Place the leaky vessel on the lab-jack, the outlets should point towards the water basin.
- The hose is connected to a water tap and the free end is hung in the leaky vessel.



Experiment:

The leaky vessel is filled with water.

If the water level in the leaky vessel is higher than 20 cm, some powder dye is sprinkled into the vessel. The colouring of the water makes the jets of water more visible to the students.

As soon as the leaky vessel is almost full, the inflow quantity is regulated at the tap so that the water level in the vessel remains as high as possible.

Now observe the throwing distance of the water jets.



Result:

The throwing distances are different.
The top jet is the shortest one; the bottom jet is the longest one.

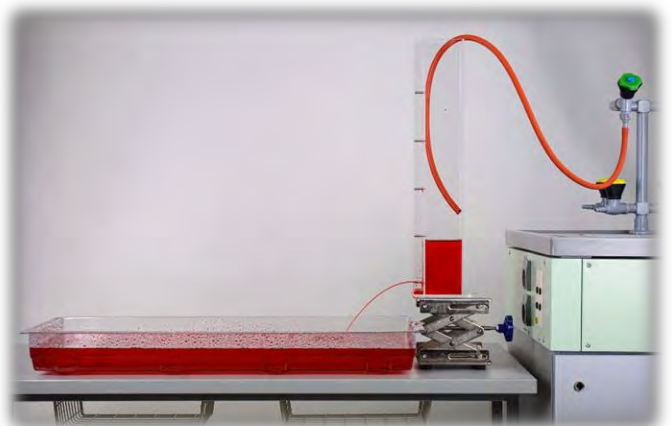
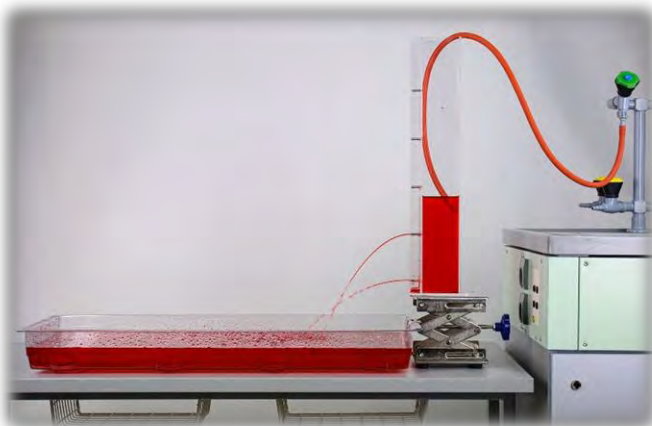
A longer throwing distance of the jet at the same fall height indicates a large outflow velocity.
This larger outflow velocity indicates a larger pressure.

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The water supply is stopped (turn off the tap).

We observe the water level in the outlet vessel and the throwing distance of the water jets.



If the water level in the vessel sinks, the throw distances also become smaller.

The higher the water column above the outlet opening, the greater the water pressure. The higher water pressure causes a greater outflow speed and thus also a greater throwing distance.

Notes:

The width of the vessel and therefore its volume has no effect on the increase in pressure - only the height (or depth) and the density are relevant.

Of course, the viscosity of the liquid is a major factor for outflow velocity.