



BME 332
Biomaterials and Biomechanics Lab

Lab 2
Hydrostatic Bench

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Purpose

- The Hydrostatic Bench enables the study of the main properties and the behavior of such liquids under hydrostatic conditions, with the aid of some accessories to make the different experiments.

Equipment Description

- The equipment consists of a metallic structure assembled on wheels with a panel at the top. In the lower part of the bench there is a tank where water is stored. Water is then sent to a methacrylate tank placed at the upper part of the bench and to other plastic deposit. Two hand-operated pumps are used for such distribution.

Equipment Description

The methacrylate tank is connected to two communicating tubes on the front panel, enabling to perform some practices; the other deposit placed on the horizontal surface of the bench is necessary for performing the rest of the practices. All water in excess is sent back to the storage tank by the drain.

Equipment Description

- The rest of the equipment consists of the following different elements and independent accessories:
 - Barometer (10)
 - Thermometer (3)
 - Ubbelohde capillary viscosimeter, 0.6-3 cp (0c)
 - Ubbelohde capillary viscosimeter, 2-10 cp (I)
 - Ubbelohde capillary viscosimeter, 10-50 cp (Ia)
 - Ubbelohde capillary viscosimeter, 60-300 cp (IIc)
 - 3 graduated cylinders
 - Accessory for demonstration of free surface in static conditions (7)

Equipment Description

- Bourdon manometers calibration (13)
- [?] Mercury manometers (9)
- [?] Accessory to determine the metacentric height (FME11)
- [?] Accessory for studying Archimedes' principle
- [?] Accessory for studying the hydrostatic pressure (FME08) (14)
- [?] Fluid level gauge calibrator (16)
- [?] Set of weights (5, 10, 20, 50, 100, 400, 1000, 2000, 5000 gr.)
- [?] Air pump
- [?] 2 water pumps (11 and 12)

Procedure

1. Fill the precipitate tube or cylinder with water in such a way that the hydrometer floats. Check that the submerged length corresponds to 1.00 in the graduated scale.
2. Fill the other three cylinders with the liquids to work with, and note down the scale mark for each one. This value in the scale indicates the specific gravity.
3. Note down the results obtained in the following graph, taking into account the values of the atmospheric pressure and temperature in the moment of performing the practice.

Procedure

1. Clean carefully both glasses.
2. Loosen slightly the screws and vertically place strips between the glasses (These can be just pieces of paper).
3. Tighten carefully the screws.
4. Place the two glasses in the support guides.
5. Submerge in water.
6. Observe that where the space is smaller the raising is higher, and where the space is wider the raising is lower.
7. Do the same thing with other strips of different thickness.