



The principle of Archimedes says that: "Every body submerged in a liquid experiences a vertical thrust and upward equal to the weight of the liquid dislodged".

With this equipment is intended to study and calculate the metacentric height of a floating body, which pretends to be a boat.

It is called *metacenter* to the point of intersection of the vertical axis of the boat or floating object, with the vertical drawn from the center of hull.

The *metacentric height* is the distance between the metacenter and the center of gravity of the floating body.

In the study of the equilibrium of a floating object, such as a boat, we can distinguish three cases, are the following: • Stable equilibrium: If the metacenter is above the center of gravity of the body, it will remain in balance.

• Unstable equilibrium: If the metacenter is under the center of gravity of the body, the deviation of the line of force from the weight of the floating object with respect to the thrust of the fluid in which it floats form a torque, and therefore the deviation tends to increase further.

• Neutral equilibrium: If the metacenter coincides with the center of gravity of the body, the metacentric height will be equal to zero.

With this equipment, calculations can be studied and performed in different situations, so that both Archimedes` principle and the stability of a floating object will be clearly understood.

The equipment is prepared to be able to change the position of the center of gravity of the floating object, having calibrated rules to control the position of the weights, as well as the angle of inclination of the barge directly.





The user manual clearly shows and with a large number of images, the entire process to be followed to operate the equipment.

EL-10.2:ALTURA-METACÉNTRICA Hanamos en depásito-volumétrico del banco hidráulto.y-colocamos la barcaze en el agua.de forma que no toque con ninguna de las paredes. 1 • En caso de que diagongamos de una bandajo con dimensiones : suficientes	FL-10.2/ALTURA-METACÉNTRICA 5. PRÁCTICAS-REALIZABLES 5. JPRINCIPIO-DE-AROU/MEDES	FL-10.2-ALTURA-IMETACÉNTRICA
podremos-también-realizar-la-práctica-en-ellaEn-este-caso-procederemos-del- siguiente-modor¶ o-Colecamovia-barcaza-dentro-de-la-bandeia-sin-anua.¶		Peso-totalq Altura-calculada¶ Altura-medida¶ Diferencia× *
o → Vertemos agua en-la-bandeja-hasta-que-la-barcaza-flote,-con-una-distancia- al-fondo-suficiente-como-para-que-la-barcaza-queda-inclinarse-sin-tocar-el-	"Todo- cuerpo- sumergido- en- un- líquido- experimenta- un- empuje- vertical- y- hacia-arriba-igual-al-peso-del-líquido-desalojado"¶	2,28× 32,9× 33× 0%× *
fondo.¶ Desplazamos- el· índice- del· contrapeso- hasta- ajustarlo- a- cero- con- la- escala-	Por-lo-tanto-para-que-un-cuerpo-flote,-su-peso-debe-de-ser-contrarrestado-por-el- empuje:¶	2,384× 34,4× 35× -2%× *
horizontal.§	$W = E$ (1) \overline{Y}	2,485× 35,9× 3/× -3%×
	L = ry = Lefty (2); De(1)γ(2) tenemorque:1 H= H/Lby .s.s.MÉTODO] . Colocames le barcaze sobre un liquido cualquiera,1 . Colocames de barcaze sobre un	Salto de págna
101	۹ ــــــــــــــــــــــــــــــــــــ	129

Together with the user manual, a completely resolved manual is given with the data to be obtained during the practice with the equipment. In this way, the teacher can easily check if the students are doing the job correctly.





The practical manual shows and explains all the theoretical foundations, as well as the mathematical formulas used for the realization of all the experimentation.





Optional Accessory: FL 10.3 - ADDITIONAL BODIES FOR STUDY OF METACENTRIC HEIGHT 2 Floating bodies with weights and scales for metacentric height calculation. Forms V and U.



• Study of the Principle of Archimedes.

object.

LEARNING OBJECTIVES

• Study and calculation of the methacentric height of a floating

FL 10.2 - METACENTRIC HEIGHT

TECHNICAL DATA

Barge:

- Outdoors dimensions 350 x 200 x 100 mm.
- Walls thickness 6 mm.

Weights:

- Horizontally movable counterweight 500 gr.
- Vertically movable weight by the mast 200 gr.
- * The weight of the weights is calibrated for each supplied equipment .

Other data:

- Maximum angular deviation 33°.
- Counterweight lineal deviation ±90mm.
- Barge total approximate weight 2.300 gr.
- Mast height 400 mm.

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