

## MEASURING THICKNESS USING MAGNETIC MEANS

Main Technological Area → Measurements tools and methods

Keyword → hollow body | magnetic force | thickness | non-ferromagnetic

Method for detecting the thickness of the walls of hollow manufactured articles having cross sections of any shape, such as for example pipes, air intakes for engines, hollow shafts for boats, etc. made of non-ferromagnetic materials, such as for example carbon fiber composites, aluminum, wood, etc.

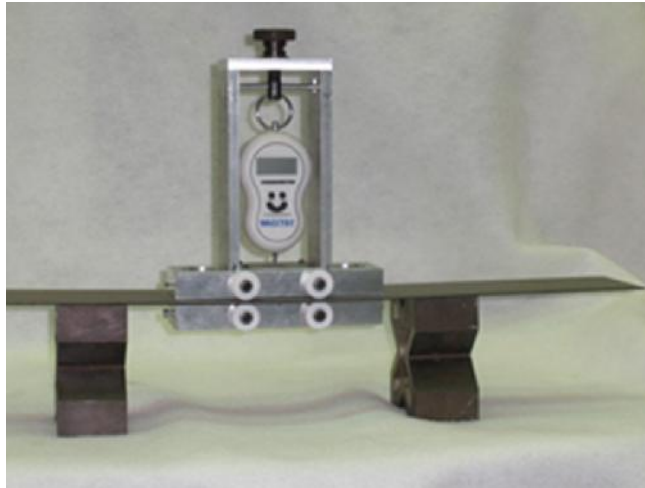


Figure 1 - Measuring device applied to the two opposing surfaces of a wall

### TECHNICAL SPECIFICATIONS

The method involves applying two magnets on the two surfaces that delimit the thickness to be measured. The magnetic force required to separate these two magnets, is related to the distance that separates them and that coincides with the thickness to be measured, all other conditions being equal (material to be measured, material, shape and size of the magnets, ...). Thus, the instrument must be calibrated with a curve plotted by executing a procedure on a reference specimen; the following Figure 2 is a diagram showing the thickness of the wall as a function of magnetic force required to remove the two magnets applied on opposite sides of the wall.

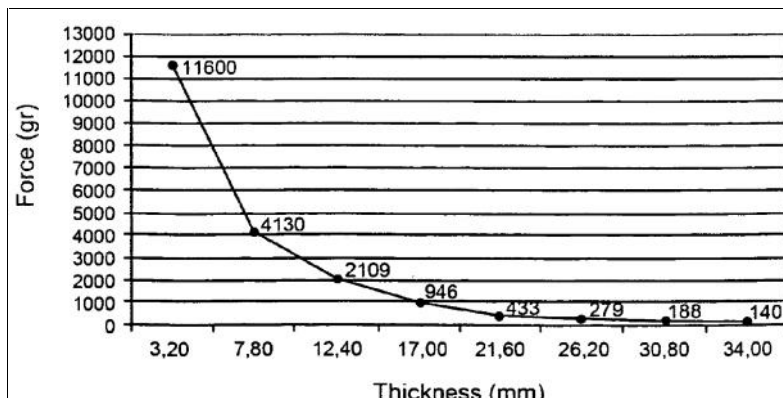


Figure 2 – Thickness of the wall as a function of the magnetic force

### INNOVATION/ADVANTAGES

For composite materials, in particular for hollow structures, the procedure is more efficient and precise than the methods in use (Ultrasounds, Induced Foucault Currents, etc.) because it is not influenced by the roughness of the hollow inner wall which is not workable.



FIELDS OF APPLICATION

**Metrology** | Measurements tool for hollow structures

PATENT INFORMATION

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**IPC Codes** – G01B 7/10

**Active worldwide applications**

EPO - EP2453201B1; **filing date:** 07/11/2011; **grant date:** 03/07/2013  
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