

Density Determination of Solids

7 Tips and Tricks

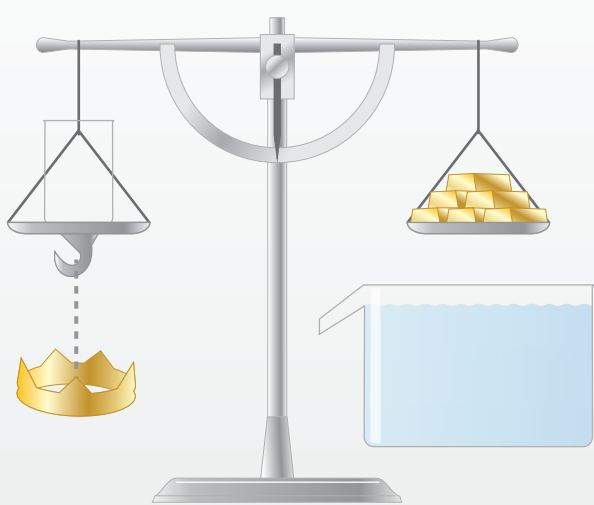
Use your balance and a density kit to determine the density of a solid sample with the help of Archimedes' principle: Perform one weighing in air and one in liquid, then let your METTLER TOLEDO balance do the rest.

Our 7 tips and tricks support you in using the right tools and creating suitable conditions to measure density correctly and accurately.



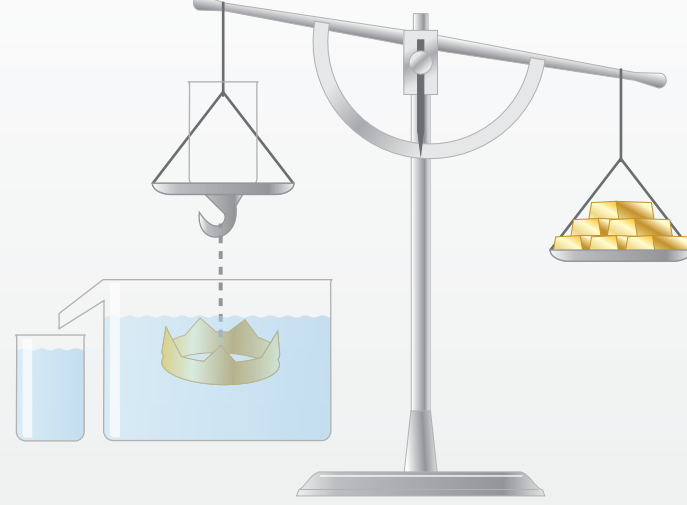
Good to Know

A. Mass Determination



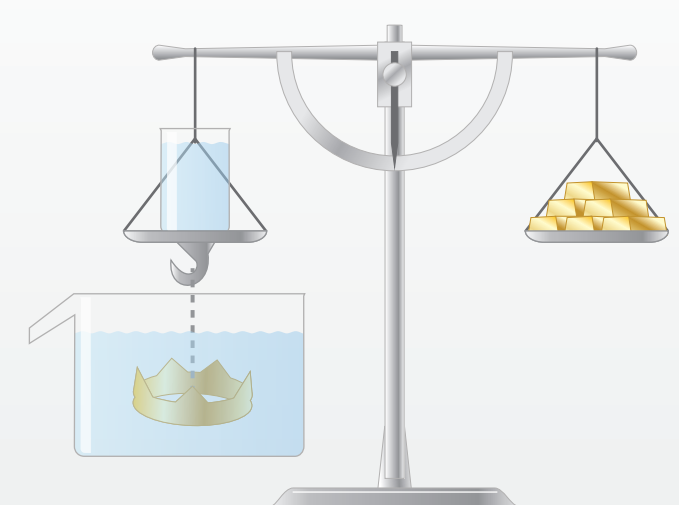
$$M_{\text{Crown}} = M_{\text{Gold}}$$

B. Volume Determination



$$V_{\text{Crown}} = V_{\text{Water Displaced}}$$

C. Density Determination



$$\rho_{\text{Crown}} = \frac{M_{\text{Crown}}}{V_{\text{Crown}}} = \frac{M_{\text{Crown in Air}}}{M_{\text{Crown in Air}} - M_{\text{Crown in Water}}}$$

"Any object totally or partially immersed in a fluid is buoyed up by a force equal to the weight of the fluid displaced by the object."
— Archimedes of Syracuse, 250 BC

01 Use the Right Liquid

Use a suitable liquid with a known density, such as deionized or freshly distilled water, that will not affect the sample. To help avoid air bubbles, you may add less than 0.1% of a wetting agent.



02 Challenging Sample?

Not every sample is well-suited for density applications: Different materials in one sample or a cavity inside the sample can falsify the results.



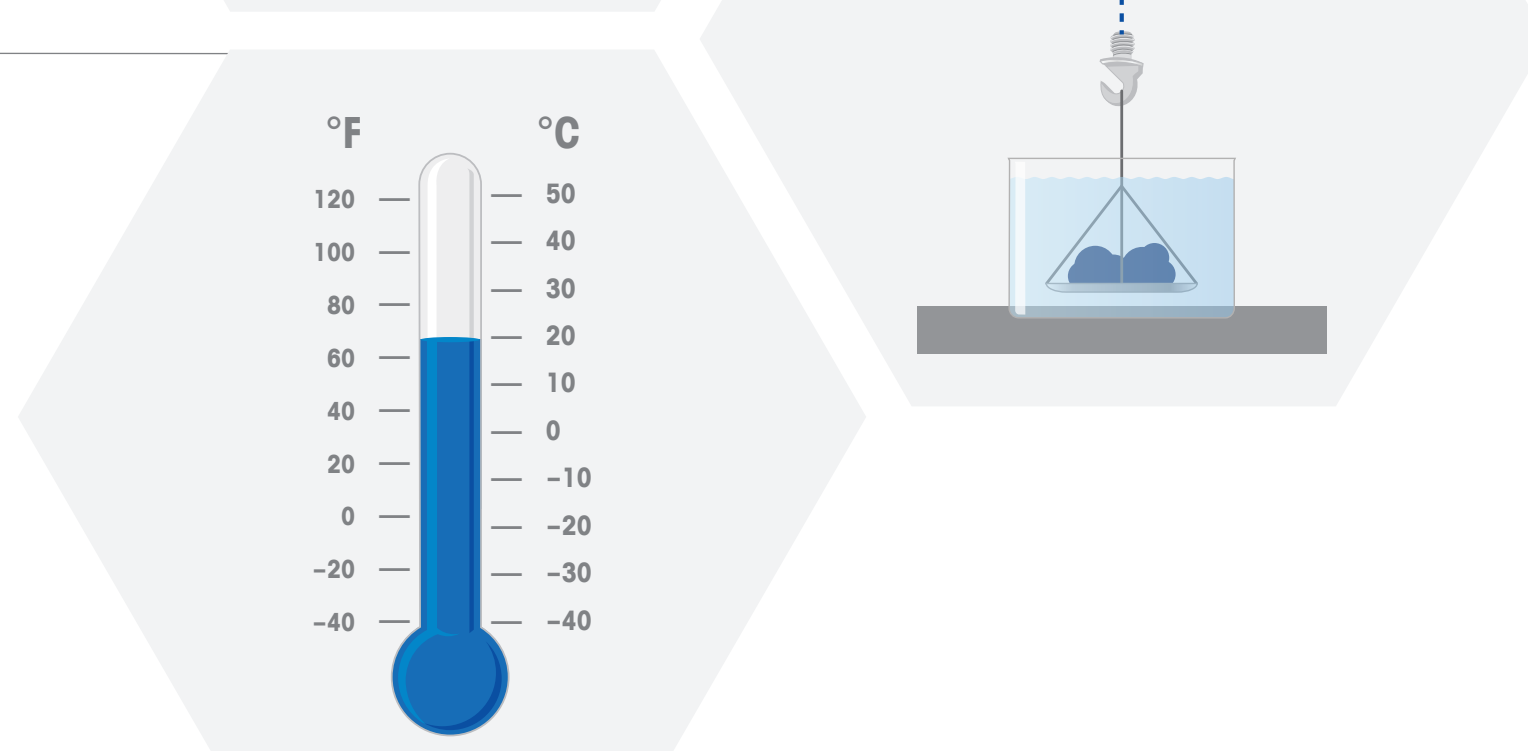
03 Avoid Bubbles

Remove air bubbles with a fine brush to avoid their buoyancy effect. A bubble with a 1 mm diameter can cause a buoyancy of up to 0.5 mg.



04 Maintain a Constant Temperature

Keep the temperature stable within ± 0.5 °C. Temperature changes can affect density on an order of magnitude from 0.1 to 1% per °C.



Use the Right Tools

05

Use gloves or forceps to handle the sample. Touching the sample with bare hands may deposit skin acid on the surface and can affect mass by up to +50 µg.

Collect and Calculate Results Efficiently

06

Manual transcription of data and calculations is time-consuming and error-prone. METTLER TOLEDO solutions ensure efficient, secure data management.

Handle Bulky Samples Easily

07

Measure the density of bulky samples with the help of an optional, dedicated hook mounted below the balance.



www.mt.com/labtec-density-solids

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