



IS 3104: Part 1: 1982 - Density Hydrometers: Part I Requirements

The **Density Hydrometer** is an essential instrument used to measure the **density of liquids**. Comprising a **glass stem and bulb**, this tool is calibrated with a scale that provides instant readings of **density** based on the level at which the hydrometer floats in the liquid. Widely used in **research, laboratories**, and industries such as **chemicals, pharmaceuticals**. The **Density Hydrometer** plays a critical role in ensuring quality control, product consistency, and regulatory compliance by offering reliable and accurate measurements for liquid analysis.

The **Indian Standard IS 3104 Part 1: 1982**, established by the Bureau of Indian Standards (BIS), outlines the specific requirements for **density hydrometers**. This Part I primarily focuses on the essential **design and material requirements**, ensuring hydrometers deliver accurate and reliable measurements. It covers **eight series of hydrometers** comprising **five main series** and **three special sub-series**. The **five main series** cover hydrometers that measure the **density in the range of 600 to 2000 kg/m³ (0.6 to 2.0 g/ml)**. These hydrometers are graduated to indicate density at 20°C, and are appropriate for use in liquids of low, medium and high surface tension. The **three special sub-series** are designed for liquids with low surface tension. These hydrometers are graduated to indicate density at either 20 or 15°C, and have smaller tolerances. Their density measurement range is limited **600 to 1100 kg/m³ (0.6 to 1.1 g/ml)**. This standard specifies the reference temperature for density hydrometers, which is 20°C for most hydrometers. The reference temperature for the **L50SP, M50SP, and S50SP sub-series** is either 20°C or 15°C.

Key parameters covered include the **construction of the hydrometer**, materials used for the **bulb and stem**, **scale accuracy**, and **overall calibration methods** to meet standardized performance. The standard also outlines the procedures for **calibration** and **testing** to ensure compliance with specified norms. The specification emphasizes safety and durability, aiming to achieve consistent readings under varying environmental conditions.

The standard mandates that each **Density Hydrometer** is marked with **BIS certification**, ensuring it meets **Indian standards**. This includes clear labeling of the **manufacturer's details** and the **density range**, giving consumers confidence in the product's quality. To prevent damage during shipping, hydrometers are **securely packaged** in **cushioned cartons**, ensuring they arrive **ready for use**.

In conclusion, **IS 3104: Part 1: 1982** ensures that **density hydrometers** are of **high quality**, meet precise measurement standards, and are reliable in various industrial applications, thereby helping consumers choose instruments that meet their needs for accuracy, durability, and ease of use.