LN2 Measuring Stick

🔬 Description

An **LN2 Measuring Stick** is a specialized instrument designed to measure the **level** or **quantity** of **liquid nitrogen** (LN2) in storage tanks, cryogenic containers, or transport vessels. Liquid nitrogen, which is stored at extremely low temperatures (around **-196°C** or **-321°F**), is commonly used in medical, industrial, and scientific applications, including **cryogenics**, **preservation**, and **freezing**.

📐 Specifications

- **Material:** Made from **stainless steel** or **aluminium**, both of which are **corrosion-resistant** and can handle **extreme cold** without becoming brittle.
- **Length:** Typically ranges from **30 cm to 1 meter**, depending on the size of the container being measured.
- **Insulation:** The handle is often **insulated** with a **protective grip** or **cover** to prevent the user from coming into contact with extremely cold temperatures.
- **Graduated Scale:** Some sticks are **graduated**, showing **liquid nitrogen level** in **percentage** or **litre** scale. Others might simply give a **visual indication** of the LN2 level.

📏 Sizes

- **Small (30 cm - 50 cm):** For **smaller containers** such as **cryovials** or **small cryogenic tanks**.
- **Medium (60 cm - 80 cm):** Used for **medium-sized tanks** or **vessels**.
- **Large (1 meter):** Designed for **larger cryogenic storage tanks** used in **industrial or laboratory applications**.

🔲 Shapes

- **Straight Stick:** The most common form of the LN2 measuring stick, typically **long and cylindrical**, with a flat or **pointed tip** for immersion in the liquid nitrogen.
- **Flexible or Coil Design:** Some measuring sticks are designed with a **flexible coil** to reach **difficult-to-access areas** or for **flexibility in use**.

🧰 Types

- **Basic Liquid Nitrogen Stick:** The standard measuring stick, which uses a **simple thermal probe** to determine the **level** of the liquid nitrogen.
- **Digital LN2 Measuring Stick:** A more **advanced model** with a **digital display** to give a **precise reading** of the LN2 level and temperature.
- **Ultrasonic Liquid Nitrogen Measuring Stick:** A more **advanced version** that uses **ultrasonic waves** to measure the **liquid nitrogen height** without physically contacting the liquid.

⚙️ Material

- **Stainless Steel:** Offers **durability**, **resistance to low temperatures**, and is **easy to clean**.
- **Aluminium:** Lightweight but still resistant to **cryogenic temperatures**.
- **Thermal Insulation Coating:** The handle is often **coated** with thermal insulation (e.g., **rubber or foam**) to keep it **safe** for handling and prevent cold burns.

📂 Category

- **Cryogenic Instruments**
- **Temperature Measurement Tools**
- **Storage Tank Accessories**
- **Laboratory Equipment**

🔷 Product Form

- **Reusable:** LN2 measuring sticks are typically **reusable**, making them ideal for frequent use in laboratory or industrial settings.
- **Disposable (Rare):** In some cases, disposable **single-use** LN2 measuring sticks may be available for specialized applications

⚖️ Usage

- **Monitoring Liquid Nitrogen Levels:** The primary purpose is to measure the **amount** of **liquid nitrogen** in **cryogenic storage tanks**, ensuring that levels are maintained for **storage or preservation**.
- **Cryopreservation:** Often used in **biological and medical settings**, such as **cell preservation**, **sperm storage**, or **tissue freezing**.
- **Industrial Applications:** Used in industries where **liquid nitrogen** is used as a coolant or in **freezing** processes.
- **Laboratory and Research:** Used in **scientific labs** to monitor the **nitrogen levels** in containers during **experiments** or **material preservation**.

✅ Advantages

- **Accurate Readings:** Provides a reliable and precise way to measure the **liquid nitrogen level** in storage tanks.
- **Durable:** Made from materials that can withstand **extreme cold** and **harsh conditions**, such as **stainless steel**.
- **Easy to Use:** Typically a **simple design**, making it easy to use with minimal **training**.
- **Prevents Overflows:** By regularly checking the levels, users can avoid **overflows** or **low nitrogen levels**, which could compromise the **integrity** of stored materials.

❌ Disadvantages

- **Fragility (Glass or Thin Designs):** Some models, especially **glass or thin-walled designs**, can be **easily broken** if dropped or mishandled.
- **Temperature Sensitivity:** The measuring stick itself can become **extremely cold**, posing a **risk of frostbite** if handled improperly.
- **Limited to Cryogenic Containers:** Primarily designed for **cryogenic tanks**, making it unsuitable for use in **regular liquid containers**.

⚠️ Precautions

- **Wear Protective Gear:** Always wear **insulated gloves** and **safety goggles** when handling the **LN2 measuring stick** to avoid **cold burns** or **frostbite**.
- **Handle with Care:** Be cautious when inserting the measuring stick into **liquid nitrogen**; ensure that it doesn't hit the tank walls forcefully, which may cause damage or breakage.
- **Storage:** Store the stick in a **dry, insulated area** after use to maintain its **longevity** and to prevent condensation from forming inside the stick.

🔢 HS/HSN Code

- **HS Code:** 9027 (Instruments and apparatus for physical or chemical analysis)
- **HSN Code:** 9027.90 (For measuring instruments, including liquid nitrogen level indicators)

👐 Handling

- **Proper Handling:** When using, always ensure that the stick is **immersed slowly** into the **liquid nitrogen** to avoid **sudden temperature changes**.
- **Use Insulated Gloves:** To avoid **cold burns**, always handle the stick by its **insulated handle** or with **protective gloves**.
- **Avoid Dropping: Glass** versions of the measuring stick can easily **shatter** if dropped in extremely cold conditions.

🧼 Sterilization Details

- **Cleaning:** After use, **rinse** the LN2 stick with **warm water** and let it air dry.
- **Sterilization:** Use an **autoclave** or **chemical sterilization** for regular cleaning, especially in medical or laboratory environments.
- **Avoid Freezing:** Do not store in **extremely cold** environments when not in use, as this could cause the internal materials to **crack** or **break**.

🩺 Veterinary Application

- **Veterinary Cryopreservation:** Used in **veterinary practices** for **sperm storage**, **embryo preservation**, and other **biological material storage** in **liquid nitrogen**.
- **Animal Research:** Used to monitor **liquid nitrogen levels** in **cryopreservation tanks** for **animals** used in **research** and **breeding**.

👨‍⚕️ Human Application

- **Medical Cryopreservation:** Used in **medical labs** and **fertility clinics** for **sperm**, **egg**, and **embryo storage** in **liquid nitrogen**.
- **Tissue Preservation:** Often used to monitor **liquid nitrogen levels** during the **preservation** of **human tissues** or **stem cells**.

💬 FAQs

Q1: What is a Liquid Nitrogen (LN2) measuring stick?
A: It's a **specialized instrument** used to measure the **liquid nitrogen level** inside cryogenic tanks, ensuring proper **storage** and **preservation** conditions for biological or industrial materials.

Q2: How does a liquid nitrogen measuring stick work?
A: It works by detecting the **temperature difference** between the liquid and gas phases of nitrogen, which correlates to the **specific gravity** or **level** of the liquid nitrogen.

Q3: Can I use a digital LN2 measuring stick for accurate readings?
A: Yes, **digital models** provide precise, easy-to-read measurements of the **liquid nitrogen level**, often with a **digital display** for enhanced accuracy.

Q4: How do I handle the LN2 measuring stick safely?
A: Always wear **insulated gloves**, avoid direct contact with **liquid nitrogen**, and handle the measuring stick **gently** to avoid freezing or breakage.