



*Empowering progress  
through Technology*

**MANUFACTURERS OF THERMOCOUPLES,  
THERMOWELLS AND RTD'S**



# History

**2014**

Founded with the vision of innovate, inspire and ignite change

**2016**

Entered the aluminum sector and provided supply to integrated aluminum industry.

**2018**

Entered the steel sector and started supplying Tata Steel through our channel partners.

**2019**

Ventured into the public sector, initiating the supply of thermocouples for bake oven furnaces to NALCO.

**Present**

Transitioned to a new facility and commenced exports to a prominent aluminum smelter in Oman.



# Products

## Thermocouple

J,K,N,T,E,R,S,B

Simplex/Duplex/Triplex

## Thermowell

Metallic, Ceramic, Carbide

Silicon Nitride, Tungsten Carbide

## RTD's

Pt 100, Pt 1000, Cu and Ni

Simplex/Duplex

## Instrument Cables

Thermocouple extension and  
compensating cables

# GLASS INDUSTRY



# GLASS INDUSTRY

Temperature sensors are used throughout the glass manufacturing process to monitor and control the temperature at critical stages. The right temperature sensor and placement can help ensure the quality of the glass, the efficiency of the production process, and the life of the refractory walls.

## Type of Glass Industries

- Container / Bottle Glass
- TV-Panel Glass
- Tubing / Lighting Glass
- Optical & Special Glass
- Float Glass
- Tableware Glass
- Fiber Glass



## THERMOCOUPLES FOR FURNACE AND REGENERATOR CROWN

The glass melting furnace features a melting chamber where solid batch materials are heated to produce molten glass. A critical component of this chamber is the crown, which is the highest point and experiences temperatures exceeding 1600°C

### Importance of Temperature Control

- **Service Life of the Crown:** Maintaining optimal temperatures can prolong the life of the crown's refractory material. Overheating can lead to premature erosion, while insufficient temperatures may reduce melting efficiency and increase fuel consumption.
- **Temperature Measurement:** Accurate temperature monitoring at various points (center, right, and left of the crown) is essential for maintaining optimal conditions.



# THERMOCOUPLES FOR FURNACE BOTTOM

Measuring the correct temperatures at the furnace bottom is crucial for prolonging the service life of bottom blocks, which are the most expensive components of a melting tank. Accurate temperature control directly influences the efficient operation of the glass furnace.

1. **Impact on Fuel Consumption:** Even a temperature variation of 2-3 degrees can significantly affect fuel consumption, making precise monitoring essential.
2. **Reliable Thermocouples:** Tempsens Thermocouples have successfully met the “whole campaign life” goal in various projects.
3. **Thermocouple Installation:**
  - **Glass Immersion Thermocouples:** Can be immersed through a hole, featuring hardened platinum/platinum alloy thimbles within ceramic protection tubes for durability.
  - **Alternative Protection:** If using a blind hole or thermocouple pocket, recrystallized alumina protection sheaths are recommended to ensure reliability.



# THERMOCOUPLES FOR DISTRIBUTOR AND FORE HEARTH

Temperature measurement and control in the distributor and fore-hearth are critical for achieving optimal glass processing.

- **Temperature Sensing System:** Utilizes pre-positioned temperature sensors, including simplex thimble thermocouples and tri-level/triplex thermocouples. These consist of bottom, middle, and top thermocouples to measure the vertical temperature profile of the molten glass at a fixed location.
- **Control System:** The output signals from the temperature sensors are fed to controllers, which regulate the operation of heat input and cooling devices. Accurate calibration of thermocouples and controllers is essential for reliable and repeatable performance.
- **Thermal Homogeneity:** Tri-Level Thermocouples are specifically designed to ensure thermal homogeneity of the glass exiting the fore-hearth. This uniformity is crucial for proper distribution of the gob in molds during forming processes.





# THERMOCOUPLES FOR DISTRIBUTOR AND FORE HEARTH

## Thermocouple Models for Glass Melting

- **Design:** Features a small thimble length.
  - **Economics:** Cost-effective and widely used globally.
  - **Performance:** Typically provides excellent service life.
  - **Disadvantage:** Vulnerable to platinum loss if the ceramic tube breaks, as it is in direct flame contact.
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- **Design:** Longer thimble length, extending from glass immersion to the roofing block.
  - **Flame Contact:** Designed to be entirely in flame, with no joint between the ceramic tube and platinum thimble exposed to the fore-hearth atmosphere.
  - **Popularity:** Preferred in heavy draw fore-hearths where glass draw rates are high.
  - **Customization:** All thermocouples are custom-built to meet specific customer requirements.



# THERMOCOUPLES FOR DISTRIBUTOR AND FORE HEARTH

In the distributor and fore-hearth rear and middle zones, many glass companies prefer using simplex small thimble thermocouples as an alternative to fiber optic pyrometers.

- **Temperature Measurement:** While pyrometers provide only the surface temperature of glass, simplex thermocouples allow customers to measure glass immersion temperatures, offering more precise control.
- **Common Usage:** These thermocouples are widely utilized across the container glass industry due to their reliability and accuracy.
- **Manufacturing Consistency:** We produce trilevel thermocouples for the conditioning zone and simplex thermocouples for the rear/middle zones from the same batch elements, ensuring high accuracy in relative temperature measurements.



## GLASS LEVEL PROBES FOR LEVEL CONTROL

Our glass level probes are designed for effective glass level control, featuring:

- **Construction:** Made with a platinum alloy probe, ensuring durability and accuracy. Protected with recrystallized alumina tubes on both the inside and outside.
- **Replacement for Traditional Probes:** These probes serve as a modern alternative to outdated water-cooled level probes, offering improved performance.
- **Customization:** Available with various hanger types tailored to customer specifications. Lengths and diameters can be customized to meet specific site requirements.
- **Service Life:** The probes are designed for a long service life, enhancing reliability in glass level measurement.



# BLANK MOULD THERMOCOUPLES

## Temperature Measurement at Blank Mould

Measuring the temperature at the Blank Mould is crucial for ensuring proper gob distribution and product quality in container glass manufacturing.

- **Thermocouple Types:** Most industries utilize K-Type or J-Type thermocouples for this purpose.
- **Cable Specifications:** These thermocouples are equipped with mineral-insulated, flexible high-temperature cables, enhancing their usability in various applications.
- **Size and Flexibility:** Available in smaller diameters (1.5 mm and 3 mm), the flexible design allows for easy adaptation to different mould sizes.
- **Continuous Monitoring:** These thermocouples facilitate continuous monitoring of mould temperature, ensuring optimal performance and quality control.



# SPOUT THERMOCOUPLES

In container glass industries, accurately measuring the temperature of the Spout Bowl is critical for quality control.

- **Construction:** Our Spout Bowl Thermocouples are made from noble metals with a platinum thimble, ensuring durability and precision.
- **Immersion Design:** The thermocouple is immersed through the side of the spout bowl, allowing users to obtain the correct temperature of molten glass just before cutting.
- **Customization:** Available in various lengths to meet specific application requirements.



# Thankyou.

Looking Forward to Working with you

**Unitech Therminstruments Pvt. Ltd.**

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