ECIL Met Tec Hydrogen Systems and Probes
Hydrogen Probes Measurement Principle

- The Hydrogen Disposable Probe is the medium between the measurement system and the molten steel.
- The system blows pure nitrogen into the molten steel. The nitrogen combines with the hydrogen content of the bath and changes its thermal conductivity. The combined gas is then sucked into the system and analyzed by the TCO, which converts the difference in thermal conductivity into H, ppm.
- Slevin's Law provides the theoretical basis used for hydrogen measurement in molten steel baths. The law states that the solubility of a diatomic gas in metal is proportional to the square root of the partial pressure of the gas in thermodynamic equilibrium. Hydrogen, oxygen, and nitrogen are examples of dissolved diatomic gases of frequent interest in metallurgy.
- TCO (Thermal Conductivity Detector) is an assembly block which consists of a single “matched couple” of thermistors (thermostable resistors) with the goal of measuring the thermal conductivity of the Gas. The thermistors are connected to an electric circuit called Wheatstone Bridge.

Why choose Ecil Met Tec Crackless Hydrogen Probe technology?

- Quick measurement result
- Available for all application: Ladle treatment, Degasser stations, Furnish and Ingot
- “Plug and play” compatible with your existing system

Problem: Ceramic Cracking
When exposed to thermal shock in normal operation, some probes currently on the market can show cracks and/or mechanical failure (chipping type).

Consequence: False High/Low Measurement
When cracking, the ceramics let contaminants reach the gas measurement loop; once polluted, the gas reading gives erratic hydrogen reading.

Answer: Ceramics Technology
Ecil Met Tec patented crackless ceramic bells offer superior resistance to thermal shock and superior reliability in hydrogen measurement.