Heraeus

Electro-Nite

ArMOR™

Clean Sampling System

ArMOR

The highest quality requires the most representative sample

Introduction

Modern steelmaking demands the highest levels of process control to improve efficiency while meeting ever increasing customer expectations. This starts with the highest quality, most representative steel sample.

Conventional immersion samples are subject to contamination by slag, constituents of the capping, steel to atmospheric reaction, and a proper depth of immersion is that can never be guaranteed. These intermittent and difficult to detect problems lead to non-representative samples, causing process delays or further issues downstream.

The ArMOR clean steel sampling system purges the sample chamber with argon gas, to keep the sample free of slag, cap constituents, and air entrapment. The same gas flow is used for depth detection, ensuring the sampler fills at the proper location, so only the highest quality, most representative steel is collected.

The intuitive interface, flexible sampler designs, and low cost system makes it a logical choice for all applications, from ladle stations to degassers to AODs along with caster molds and tundishes.

Intended Applications:

- Mold
- Tundish
- Ladle
- Degasser
- AOD
- Research
- Hand Poles
- Auto pole
- Combination poles

Features

- Easy to use, operator friendly
- Flexible and economical
- Open and Closed sampler design capable
- Economical immersion lance design
- Slag free, representative samples with the cleanest available surfaces
- Compatible with all Heraeus Electro-Nite molten metal sampler types
- Shortest possible immersion time
- Best solution from LMF to Caster for in-situ immersion molten metal sampler chemical analysis
- No preparation potential for samples
- Easily interfaces with manipulators

Benefits

- Cleanliness
- Gives the most representative sample
- Time Savings
- Getting a quality sample on the first attempt is critical to avoid slowing down the production process
- Time Stamp
- System outputs allow logging of sampling times
- Easy Operation
- Single button operation
- Automatically detects best depth for sample
- Economical
- Low cost system and consumables

Available Sample Molds

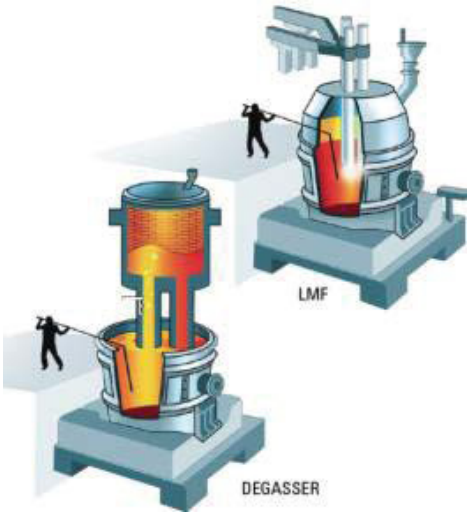
Double Thickness

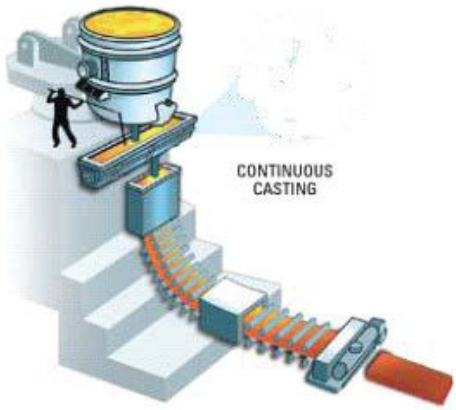
Reverse Fill

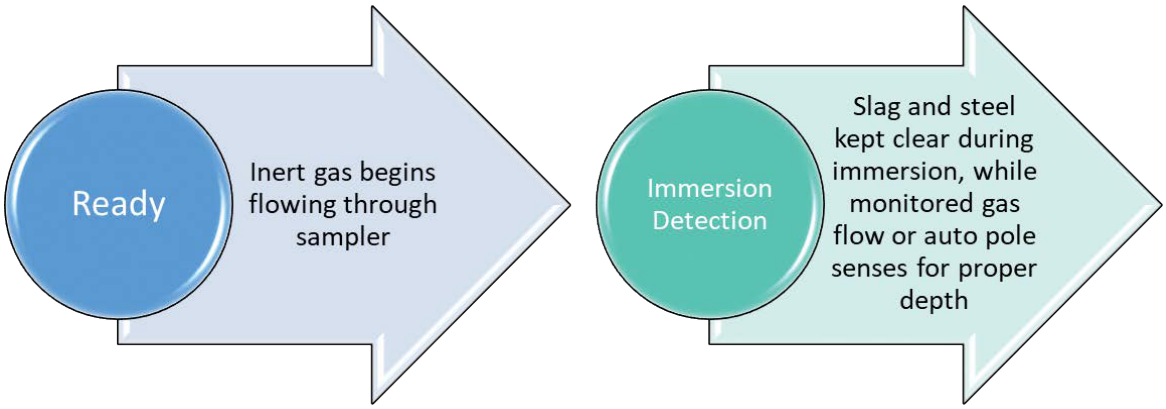
5Pin Star Mold

Single Thickness

Application Examples

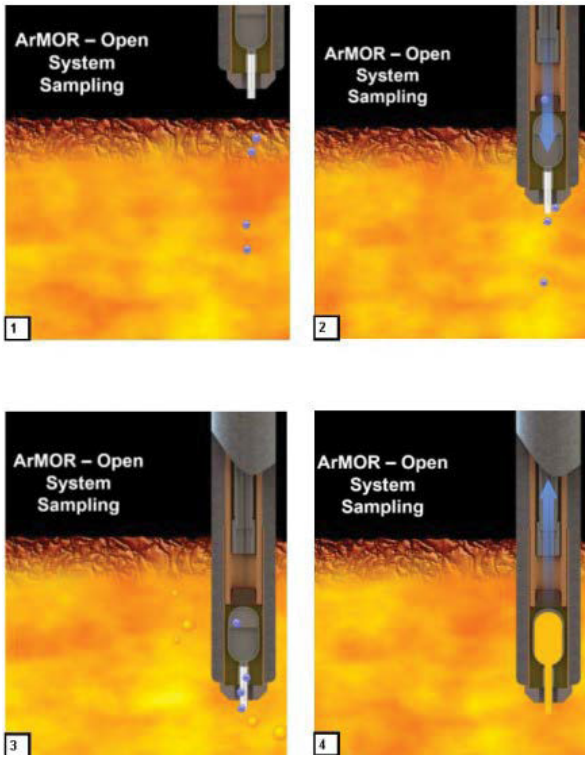






Open Mode Sampling

In many applications a sampler can be used without the metal or paper caps found in conventional immersion samplers. Because the ArMOR system is purging the sampler chamber and the front of the sampler with an inert gas, slag and steel and pushed away until a proper depth is reached. Eliminating the risk of contaminating the sample with cap constituents helps yield the most representative sample. Timing control of the purging ensures there is no contamination.



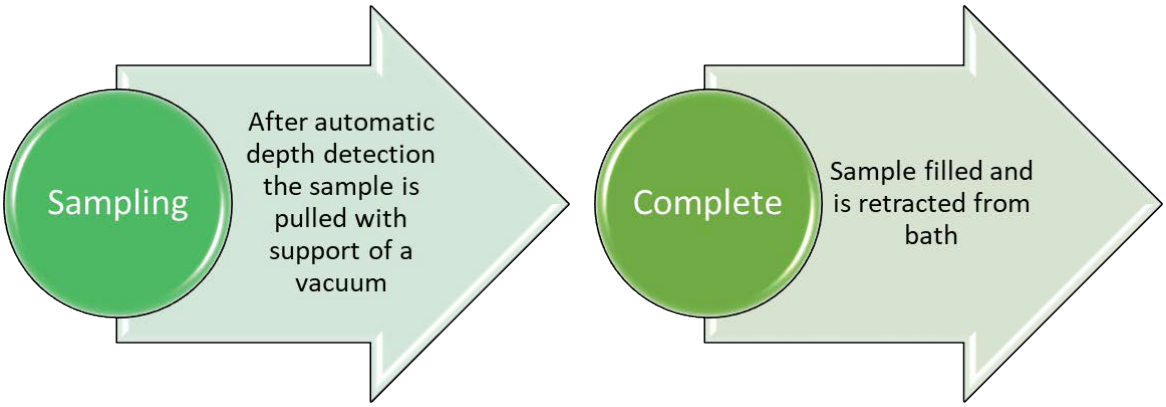
Open Mode Sampling Stages

Step 1
Gas is flowing before the sampler goes into the molten metal.

Step 2
Sampler goes into the molten metal, gas is flowing.

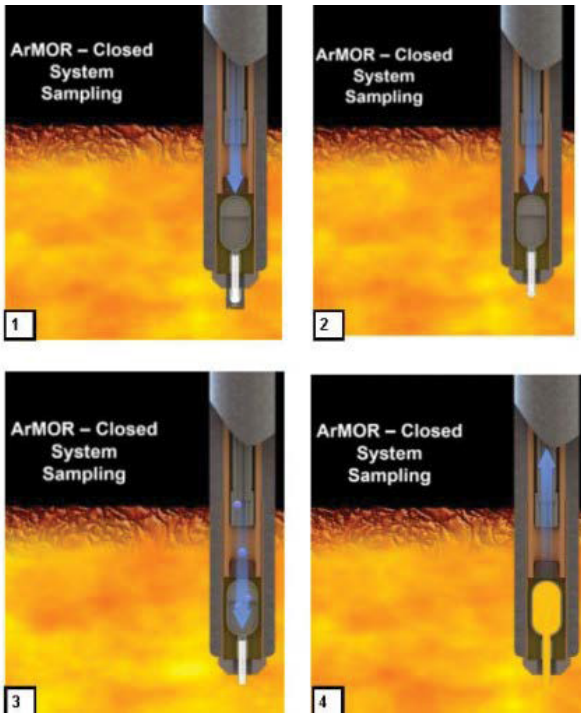
Step 3
Sampler has reached the minimum immersion depth.

Step 4
Start sampling sequence. Vent (or vacuum).
Sampler can be removed from molten metal.



Closed Mode Sampling

For applications such as the Caster Mold, which demand very low flow of gas and have very shallow immersions, ArMOR is also capable of utilizing samplers sealed by capping, metal or glass.



Closed Mode Sampling Stages

Step 1
A pressurized sampler is immersed into the molten metal.

Step 2
Caps begin to dissipate from the entry of the sample.

Step 3
Gas flows into the molten metal

Step 4
Start sampling sequence. Vent (or vacuum). Sampler can be removed from molten metal.

The System

The system is comprised of:

ArMOR – a simple to use instrument which controls the inert gas purging and sample collection

Lances and Hoses – economical hardware for sample collection

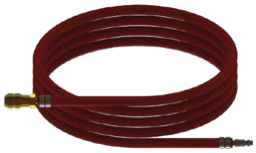
Quik-Spec Samplers – specially designed samplers to application needs

Typical Samplers

Caster - Open

Argon Supply Hose

System to Lance Hose



Caster - Closed

Sampling Poles

Ladle - Open

System Specifications

Power input	100-240VAC, 50/60Hz, 162W
Purge gas	Argon Ultra High Purity, Grade 5.0 (recommended) Dry and regulated, 7.6 bar (110 psi)
Operating Range	0°F – 120°F Vortex cooler optional
Housing, dimensions and weight	Height = 22” (558.8mm) Width = 18” (457.2mm) Depth = 7” (177.8mm) Clearance required below for system connections Weight approximately 55lbs
Outputs	Solid state relays for lights
Inputs	Relay controlled dedicated remote start module, external start via plant Level 1 PLC

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