

Innovative integration of the steel industry with **HEAT DX**, a concept anyone could think of, but no one could achieve



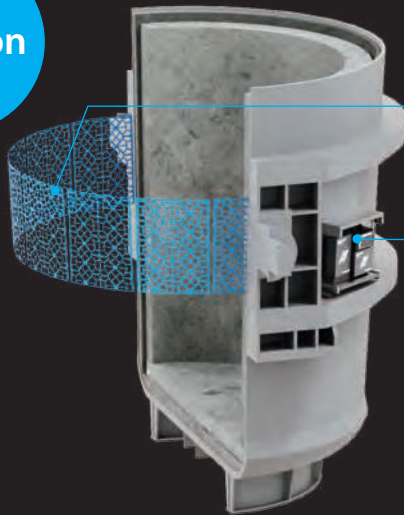
Innovation
in extreme environments

EXCEO

Innovative Provider of ESG/Carbon Neutral Solution

We extract real-time data from equipment and refractories used in extreme environments to optimize their usage and minimize operator access through stages of monitoring, analysis, and algorithm refinement.

Solution

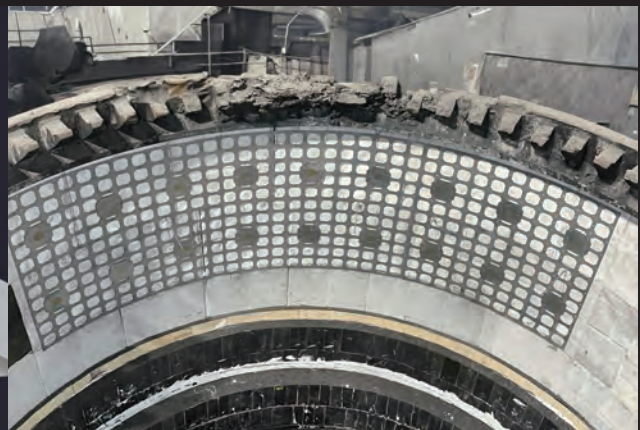
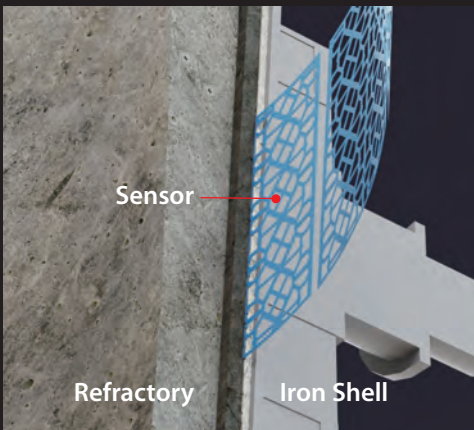


Surface Temp. sensor

- Surface Temperature measurement (Max Temp. 1,350°C)
- Sensor structure applicable to all equipment

Communication Module System

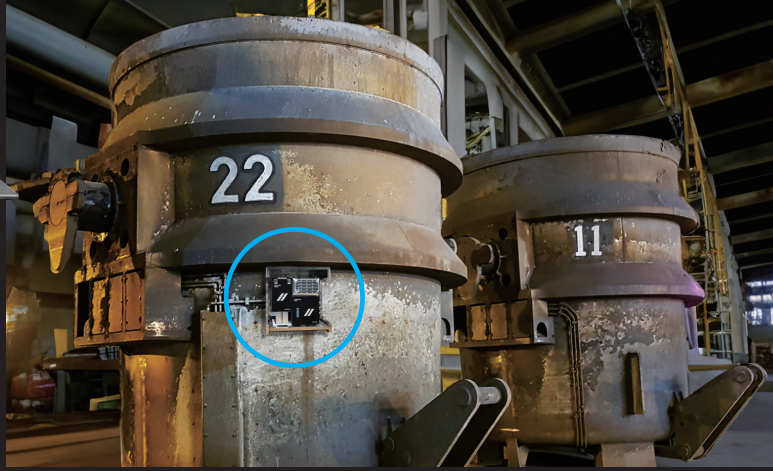
- Optimized communication system in extreme environment (Max Temp. 600°C)
- Explosion-proof / Thermoblock / Dust-proof / Low-power structure (minimum 2 month of continuous use)



Surface Temp. Sensor

- Key Features
 - Measuring Surface Temperature of Equipment (Max Temp. 1,350°C)
 - Installed between refractories and Iron shell
 - Sensor structure applicable to all equipment

- Data
 - Data extraction from inside the equipment (High data reliability)
 - Surface Temperature data of equipment
 - Temperature data at location/depth of refractory



Communication Module System

- Optimized communication system in extreme environment (Max Temp. 600°C)
- Real-time wireless communication (LoRa, Wi-fi, LTE, Bluetooth)
- Real-time Location tracking
- Explosion-proof / Thermoblock / Dust-proof / Low-power structure (minimum 2 month of continuous use)

Data & Benefit

Data	Real-time data measurement
	Surface Temperature data of equipment
	Temperature data at location / depth of refractory
	Real-time location tracking data (process)

Analysis	Data analysis and Deep learning
	Optimization of equipment usage, temperature optimization by steel grade / operation
	Process-specific temperature matching. Real-time prediction of molten metal temperature data

Improved productivity
10-20% Increase

- **Less stoppage and more work time in operations : By leakage prevention**
 - Securing more profitability by enabling more seamless operations
- Real-time prediction of molten metal temperature data
- Case : **10% increase of operation hours**

Cost reduction
10-20% Cost Saving

- **Energy saving (ESG / Carbon-Neutral)**
 - Optimization of equipment preheating and minimization of carbon emission
- **Cost reduction**
 - Optimizing refractory usage by predicting refractory lifetime
- Case : **10% cost savings achieved through refractory optimization**

Enhanced safety
Safety grade Improvement

- **Preventive Solution for Industrial Accidents**
 - No need for worker access for equipment status check during operation
 - **Prevention of safety accidents** such as explosions and molten metal leakage
- Case : **Improvement of Safety management grade**

EXCELLO is the leading innovator in HEAT DX

Data Service



Intelligent Real-time System

- **Real-time monitoring**
 - Surface temperatures of equipment
 - Refractory condition
 - Location of equipment
- **Optimization**
 - Operation guide temperature setting
 - Equipment usage & temperature
 - Process by steel grade & operation
- **Data analysis**
 - Prediction of molten metal temperature data
 - Real-time 360° heatmap
 - Data analysis report



Smart Ladle



Smart Tuyere Stock



Smart AOD

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EXCELLO

BUSINESS AREA

High-temperature/pressure industries such as Steel,
Incinerator, Power plant, petrochemical and Cement Industries

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