

MORE
INNOVATION IN STEELMAKING

LINDARC™ EVO

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REAL TIME OFF-GAS ANALYSIS SYSTEM

The **LINDARC™** off-gas analysis technology, with lasers installed on the fix duct, just after the secondary gap, uses the technique of “Tunable Diode Laser Absorption Spectroscopy” (TDLAS) to obtain exact data of various gas species in the EAF off-gas system in real time. The **LINDARC™** is used to further optimize the EAF melting process, controlling fuel and oxygen post combustion by **Q-MELT**.

FEATURES



CO, CO₂, H₂O AND
OFF-GAS TEMPERATURE
MEASUREMENT



FAST RESPONSE TIME
(LESS THAN 2 SECONDS)



DYNAMIC WATER LEAK
DETECTION



FINGER TIPS
AUTO-CLEANING
SYSTEM



LASERS HEADS
AUTO-ALIGNMENT
SYSTEM

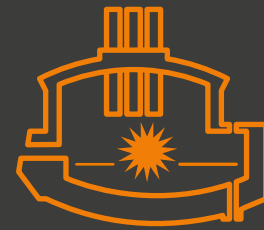
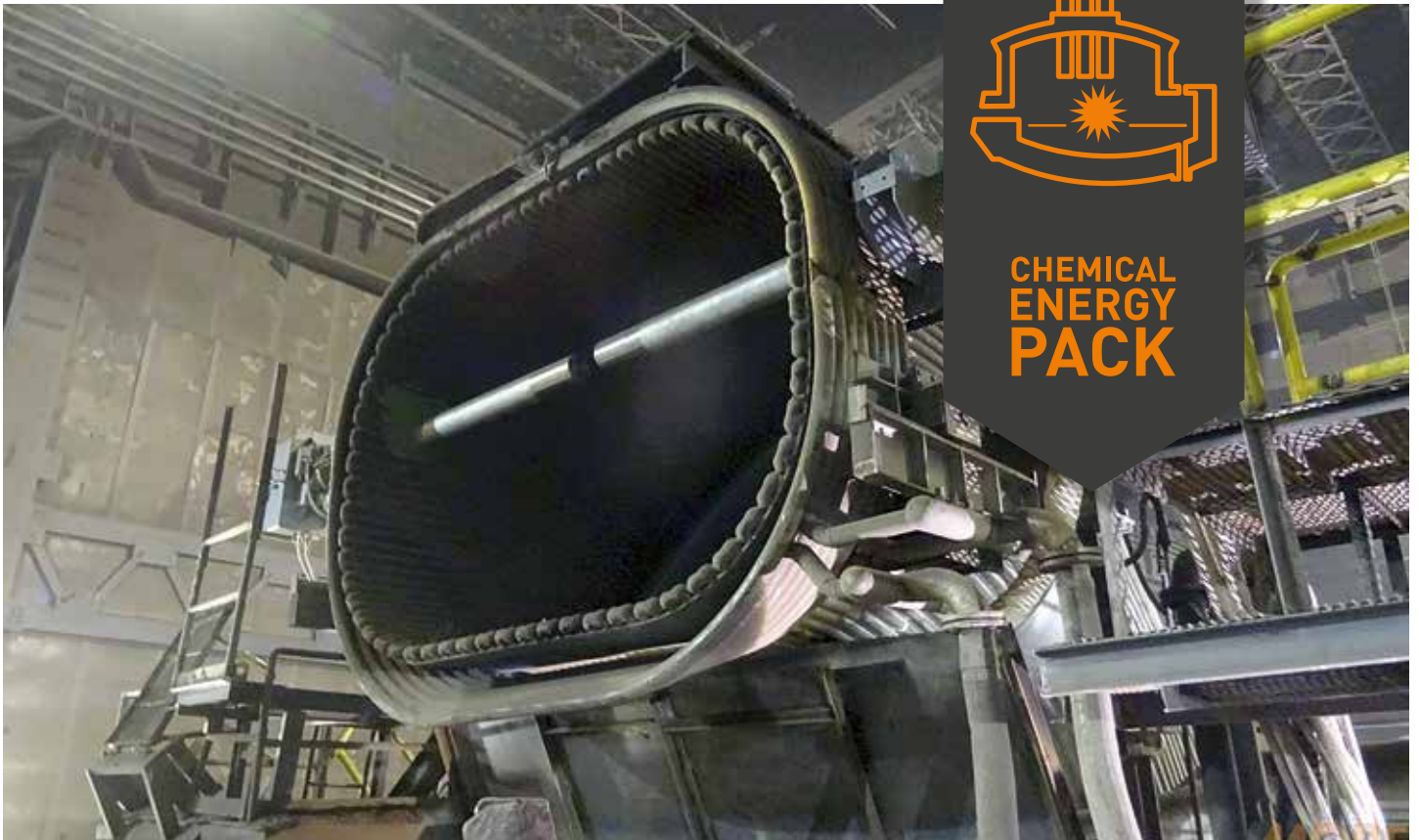


MULTIPLEX
OPTICAL FIBER
TRANSMISSION

MEASURED ELEMENTS

CO	2 ÷ 80%	In temperature range between 260° ÷ 1700° C [500 ÷ 3092° F]
OFF-GAS temp.	260° ÷ 1700° C	[500° ÷ 3092° F]
CO ₂	2 ÷ 80%	In temperature range between 260° ÷ 1700° C [500 ÷ 3092° F]
H ₂ O	0,5 ÷ 50%	In temperature range between 100° ÷ 1700° C [212 ÷ 3092° F]





CHEMICAL ENERGY PACK

SAFETY

- Real-time signal of H₂O will prevent explosions generated by water leaks.
- Real-time signal of CO will prevent explosions in the dust settling chamber or bag house.
- Possible set-up of gap / dumpers position.
- Real-time signal of CO will prevent excessive release of CO in the atmosphere.

SAVINGS

- Maximum yield of oxygen requirements.
- Low maintenance cost (no filters, no driers installed).
- Reduced electric energy requirements as CO is combusted in the EAF shell.

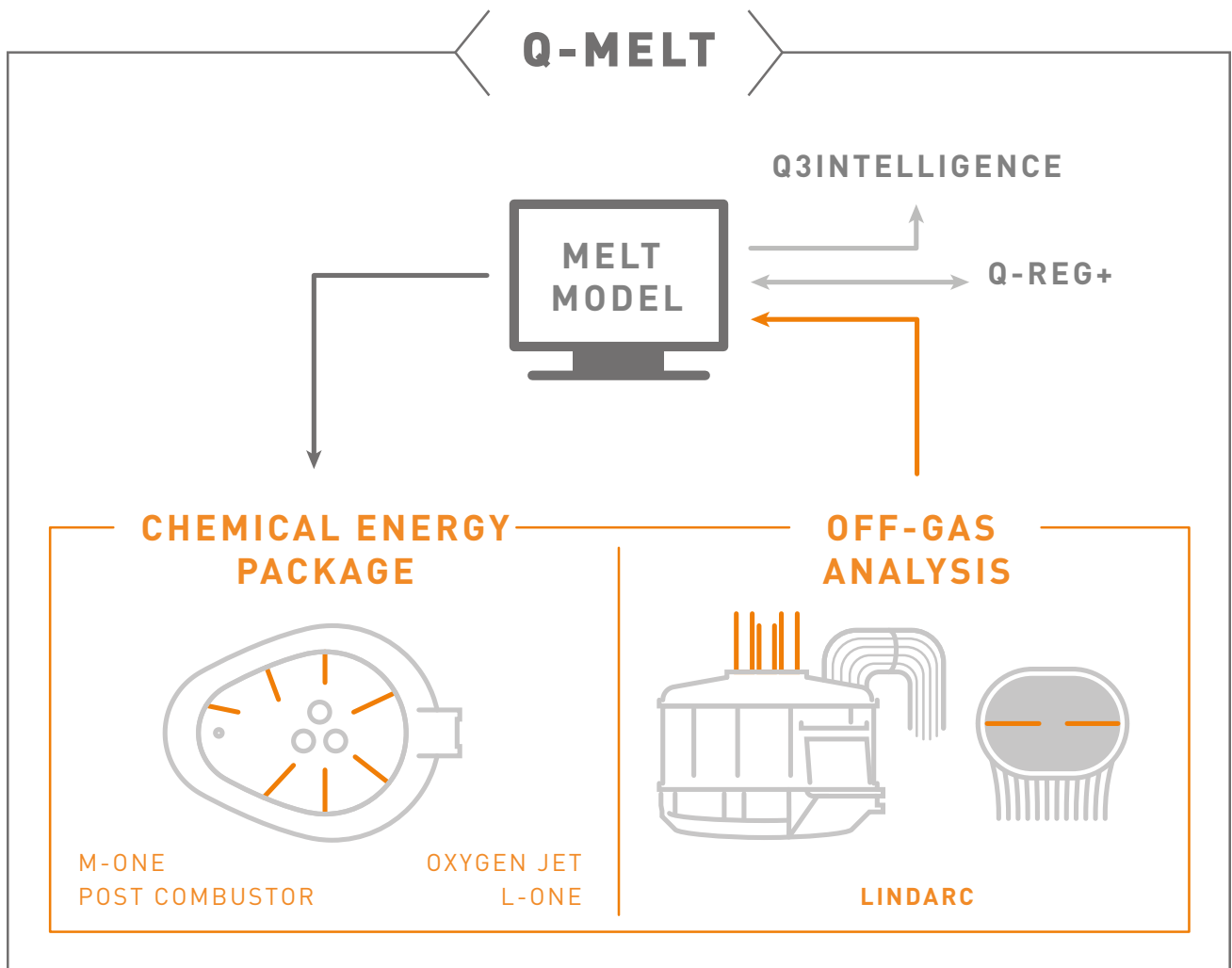
OPTIMIZATION

- High accuracy of CO, CO₂ and O₂ measured values.
- Fine tuning of burners settings (best ratio of CH₄ and O₂).
- High yield of CO combustion due to precise O₂ injection.
- High system functionality thanks to minimized maintenance design.
- Fast response time with real-time availability of measurement results (<2 sec.).
- All readings made on the real off-gas volume (no sampling, drying or filtering needed).
- Dynamic closed-loop control of burner and injection system by **Q-MELT**.

MORE

Q-MELT AUTOMATIC FURNACE

Data taken from the **LINDARC™** is transferred to an adaptive EAF process control the **Q-MELT**. **Q-MELT** purpose is to reach complete automatic control in each stage of the EAF melting process. It can adjust the electric power input, optimize the combustion process within the furnace shell, control slag steel metallurgy and every other operation needed during the EAF melting cycle.



FEATURES

- It implements a statistical approach to identify process deviations.
- It dynamically adjusts the oxygen injection to hit the final carbon % and steel temperature without over-oxidizing the heat.
- It integrates several process models to track the %C, temperature and O₂ content in the steel bath.
- It performs synchronization, normalization and qualitative analysis of all collected process data.
- It provides personalized reports and analysis tools for the main process parameters.
- It adjusts the electrical set-points dynamically to keep the EAF running in a stable manner.
- It keeps the highest active power until the end of the heat without creating severe stress to the panels.
- It integrates a dynamic foamy slag control that monitors slag conditions and adjusts electric arc and carbon/lime injection set-points.

DWLD - DYNAMIC WATER LEAKS DETECTOR

The **LINDARC™** includes a DWLD software to prevent any dangerous explosions generated by accidental water leaks that may occur during operations.

Using a specific algorithm, it is possible to calculate an expected water baseline level for every on-going heat. Any accidental water leakage that may occur will increase the water content above the dynamically/self-calculating baseline water level and it will generate a warning message for the operators.





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