



offgasDesign

Problem:

For a modern EAF process the control of IV hole off gas thermal losses and the consequent possibility of energy recovery coupled with the minimization of dioxin emission are conditions requested to off gas duct. Fume extraction efficiency and dust clogging avoidance have to be managed too.

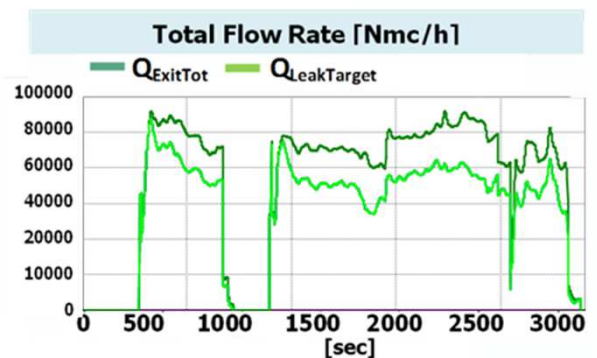
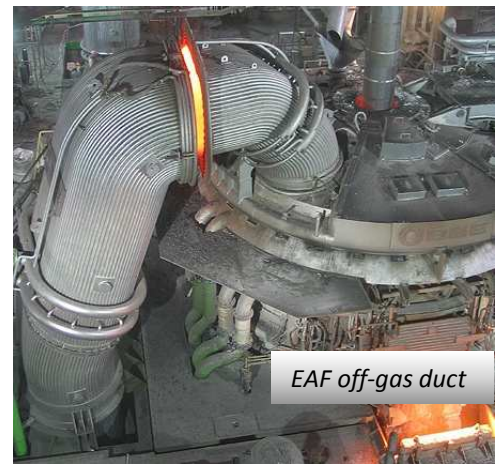
Solution:

The tool *offgasDesign* starts from on-line measurements of off-gas conditions at IV hole (temperature, composition and flow rate) and from the characteristic of the cooling sections, to evaluate the off gas conditions at the different sections of the duct.

The analysis based on *offgasDesign* offers the possibility to define the proper level of air leak at IV hole and, to optimize the use of methane in post combustion chamber (if available) in order to obtain controlled temperature and oxygen content.

Thanks to statistical analysis and correlation with process phases the *offgasDesign* gives also indications about duct zones of potential dioxins formation.

The coupling with the tool *iCSMelt*[®] can allow obtaining the whole process simulation and to estimate the effect on off gas conditions of EAF operating practice variation.



Benefits:

- To calculate and monitoring the chemical and sensible energy evolution in an existing off-gas duct during the EAF process phases
- Evaluation of thermal load of cooling device
- Investigation of possible off-gas duct improvement to control:
 - the off-gas temperature profile
 - the respect of conditions for dioxin emission minimization
 - the methane consumption in the PC chamber (if any)
 - the energy recoverable by off gas duct through steam, diathermic oil or electrical energy.

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Input

- *offgasDesign* runs in a stand alone PC and receives data from off-gas measurements or process simulation.
- Typical input includes:
 - off-gas duct geometry
 - IV hole gas conditions (composition, temperature, flow rate)
 - heat extraction technologies in the duct

Output

- Off-gas species and temperature evolution in the duct
- Heat extraction in the different zone of the duct
- CH₄ consumption in PCC chamber (if any) to maintain exit target temperature
- Estimation of energy recoverable as steam, diathermic oil or electrical energy
- Dioxins formation probability
- Correlation with process phases
- A wide range of statistical analysis

