

■ Application: Cleaning of CO-gas from a melting furnace



■ The Task

During the production of stainless steel in an electric arc furnace carbon monoxide is generated. Due to its high energy content the gas is used both for the preheating of material as well as in the energy network of the complete factory. In order to burn the gas effectively and to protect the burners from getting dirty, the dust emissions from the furnace have to be removed from the gas stream.

During the loading and unloading phase of the oven no carbon monoxide is produced. The cleaned air is exhausted to the atmosphere by disconnecting the CO-net from the clean gas stream.

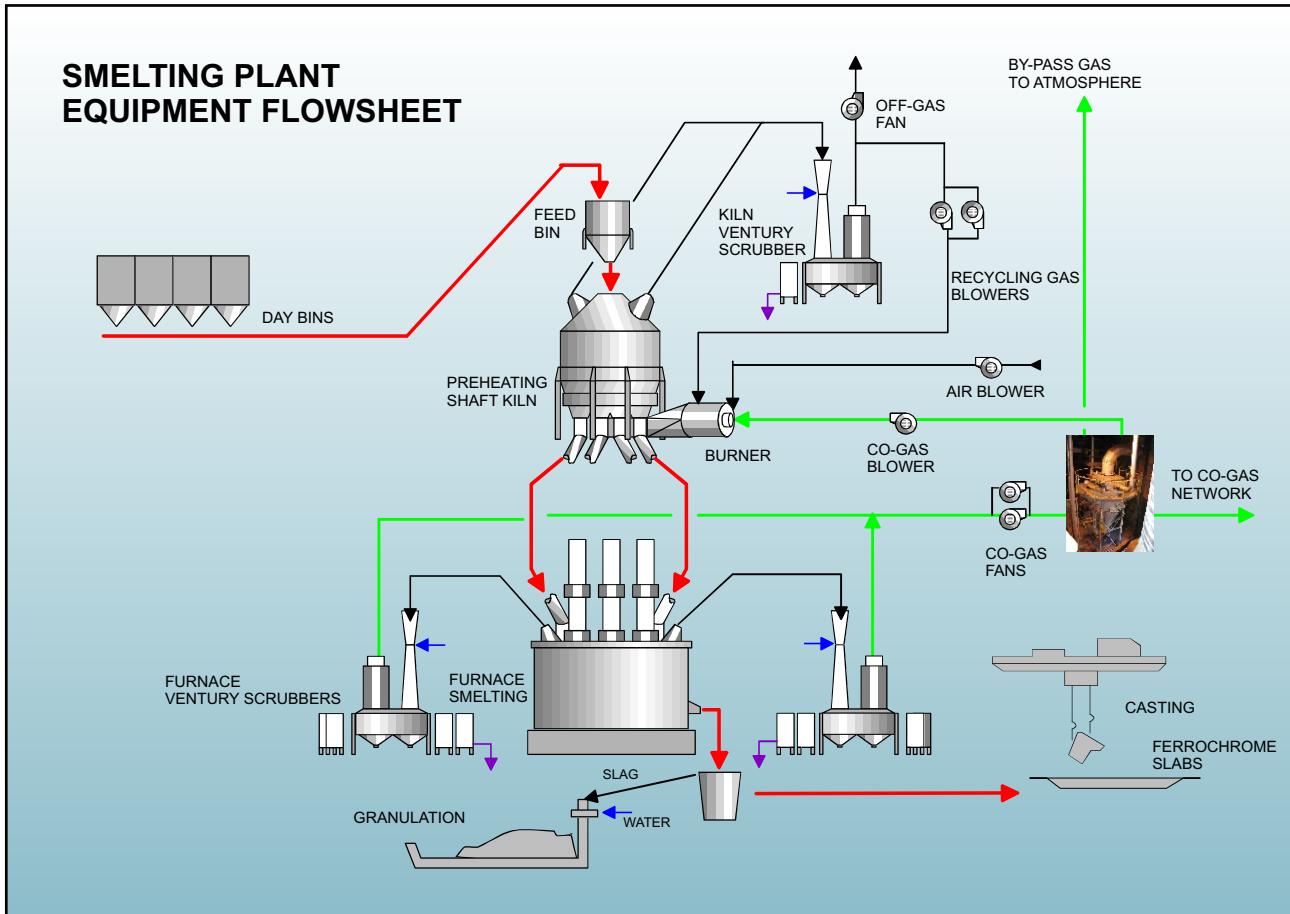
A mixture of CO and oxygen is explosive if the concentration of CO is between 12 and 75 %. This results in special needs for the phases of switching from air to CO-gas and vice versa.

■ The Solution

Herding® Filtration System for Cleaning of Carbon Monoxide:

- ⇒ Air volume starting from 20,000 m³/h
- ⇒ Filter unit design: gas-tight and explosion-resistant
- ⇒ Use of certified antistatic filter elements:
 - surface resistance < 10⁹ Ω
 - earth resistance < 10⁸ Ω
- ⇒ Compact rigid body with an average useful lifetime of more than 10 years guarantees optimum uptime of the complete production system
- ⇒ Pure surface filtration resulting in a constant pressure drop and thus in a constant air flow guarantee a reliable capturing of the carbon monoxide at the furnace
- ⇒ Consistency of < 1mg/m³, rated as HEPA filter grade R (EU 12) guarantees a constant high quality of the cleaned gas

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The Herding® Sinter Plate Filter Characteristics of the Process

- ⇒ Dust components:
SiO₂, MgO, K₂O, Zn, C, Na₂O, S, Al₂O₃, Cr, Fe, CaO
- ⇒ Dust concentration: 20 – 300 mg/Nm³
- ⇒ Moisture content: 2 – 30 g/Nm³
- ⇒ Gas components:
CO (70 – 95%), CO₂, H₂, H₂O, N₂, O₂
- ⇒ Explosion risk in presence of oxygen and carbon monoxide (limits: 12% < CO < 75%)
- ⇒ Ignition energy < 1mJ
- ⇒ Gas for jet-pulse cleaning of the filter elements: N₂
- ⇒ Temperatures in the filter unit: up to 50 °C

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