Green solutions for by-product utilization

Examples for utilization of by-products from gas cleaning



ESTEP 2024 Annual Event

Paul Trunner



European Steel Technology Platform

20 years together





FOR GREEN STEEL 3rd INTERNATIONAL CONFERENCE meets

A CIRCULAR ECONOMY DRIVEN BY THE EUROPEAN STEEL





General focus topics of metals business





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Customer demands in terms of sustainibility



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Combined MEROS and Scrubber Process with focus on high SOx concentrations







Combined MEROS and Scrubber Process with focus on high SOx concentrations





Sinter Plant - JFE Steel Fukuyama, Japan

Gas flow:	802,000 Nm³/h
Additive:	Soda based gas cleaning
SO ₂ removal:	>97%
Dioxin emission:	≤0.1 ng TEQ/Nm³
Clean gas dust content:	<5mg/Nm ³



By-Product Leaching

Challenge

- Large quantities of by-product dust, loaded with heavy metals, organic and other harmful components from dry dedusting systems
- •Special treatment & high disposal costs to hazardous landfill.
- Circular economy guideline demands recycling of raw materials as far as feasible.

Solution

- Primetals Technologies Leaching system for raw material recovery and utilization from dry dedusting systems
- Tailor-made treatment system which allows recovery of raw materials up to 90 % and concentrating the harmful components in a small remaining fraction.
- Fulfilling BAT requirements
- Tailormade design & compact layout based on modular system



Leaching





By-Product Leaching - Typical process flow diagrams



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BY-PRODUCT LEACHING

for dry dedusting plants



MEROS sinter waste gas cleaning Leaching effluent concepts





Other examples for valorization of By-products

- Zinc extraction process (ZEP)
 - Recovery of zinc fraction from EAF dust
 - Separation of metallic and mineral fraction of dust
- Selective waste disposal (2 Silos)
 - Best practice: selective separation of dust from stainless steel production
 - Dust stream controlled by Level 2 signal
 - Reuse of high quality dust
- Briquetting
 - Cold briquetting of fines from residuals
 - Internal or external use of briquetts
- Granulation of liquid slag
 - Hot slag granulated in rotating cup
 - Utilize energy, minizmize dust emission, valuable product





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Cold Briquetting of Fines (Dust, Sludge, Scale)



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Zinc extraction process (ZEP) The complete dust-recycling solution for the recovery of zinc and iron

- Patented zero waste process with 4 output products
- Halogen contamination is removed in the 1. step \rightarrow higher ZnO quality (no washing) \rightarrow usage in primary zinc industry
- Recovered iron/metal can be directly reused in steelmaking as scrap substitute \rightarrow Lower CO₂ emissions







