

Contribution ID: 444

Type: Keynote Presentation

EAF waste gas cleaning through iRecovery® system and CataFlexTM

Tuesday 7 October 2025 14:30 (20 minutes)

Tenova and Topsoe have developed an innovative solution for waste gas cleaning in Electric Arc Furnace (EAF) operations by integrating Topsoe's CataFlex™ technology with Tenova's iRecovery® system. This solution improves waste gas cleaning performance, addressing critical pollutants such as carbon monoxide (CO), polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF), and nitrogen oxides (NOx). The iRecovery® system captures the thermal energy from EAF off-gases and converts it into steam for applications like vacuum production and power generation. The system recovers up to 75% of energy, reducing the environmental impact of steel production. The iRecovery® system, through natural circulation ensured by the evaporative system, provides the proper conditions for the catalytic filter bags to function effectively. By incorporating Topsoe's CataFlex[™] catalytic inner filter bags in series with iRecovery[®], the combined system ensures superior removal of harmful pollutants, achieving higher cleaning performance compared to previous solutions. CataFlex™ technology removes dust and multiple gaseous compounds in a single step. This integration allows for the reduction of CO, PCDD/PCDF emissions to levels below regulatory limits. CataFlex™ can, when used with a reducing agent like NH₃, reduce NOx emissions to operate compliant with regulatory emission limits. The technology converts dioxins and furans into harmless gaseous species and has shown removal efficiencies of >99% at industrial installations. The combination of CataFlex™ with an outer filter bag provides efficient dust removal, comparable to conventional fabric filters, with no significant increase in pressure drop. The lifetime of CataFlex™ matches conventional fabric filter bags, ensuring long-term performance without frequent replacements. One key advantage is the minimization of additional reagents such as activated carbon and calcium hydrate in the waste gas treatment process; this simplifies operation and enhances the potential for reusing the EAF dust. This partnership underscores the commitment of both Tenova and Topsoe to driving innovation and sustainability in industrial processes.

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Session Classification: Waste Processing & Byproduct Utilization

Track Classification: Environmental and energy aspects in iron and steelmaking