TENOVA iRECOVERY® TECHNOLOGY

Saving Energy with Steam, for a Combination of Heat Recovery and Environmental Sustainability
Tenova is a worldwide partner for innovative, reliable and sustainable solutions in the metals and mining industries.

Building upon decades of experience, Tenova develops solutions that help mining and metals companies reduce costs, save energy, limit environmental impact and improve working conditions for their employees.

Tenova believes in on-the-job passion, and actively seek out professionals who truly love what they do. Their contributions to the business have helped make Tenova the industry-leading company it is today, and their passion is the driver behind the company business approach.

This approach can be summed up in four key pillars: Innovation, Reliability, Sustainability and Safety.
Recovery® technology is a heat recovery cooling system for different industrial furnaces, among others the electric arc furnaces (EAF), submerged arc furnaces (SAF), basic oxygen furnaces (BOF), walking beam furnaces and pusher type furnaces.

The difference between Recovery® technology and conventional cooling systems is that energy losses in the waste gas are now recovered as steam. 30% of the primary energy input of a typical EAF is lost in the off gas: Recovery® technology allows recovering 35-70% of these losses, bringing back 10-25% of the primary energy input.

The technology is based on the following process:

- Pressurized water at the boiling point is pumped towards the cooled waste gas duct. The pressure can be set in a wide range between 5-55 bar depending on the steam usage.
- The off gas heat is exploited by the process of evaporation, cooling down the waste gas in the same way as conventional cooling.
- A mix of steam and water is flowing back to the steam drum where steam gets spilled for different purposes.

Tenova i Recovery® is part of the iSteel technologies portfolio, the Tenova program for increasing the furnace process efficiency. Belong to the iSteel portfolio also:

- iEAF™, an innovative automation system, based on continuous, real time process measurements and online process models, developed for the dynamic control and optimization of the EAF.
- iBOF®, a breakthrough technology designed to reduce GHG emissions while improving yield, productivity and scrapmelting capability and cutting operating costs.
SAVING ENERGY WITH STEAM

Energy efficiency is a topic that gets more and more importance to all potential customers in the steel and non-ferrous metal industry. 25-30% of the energy input in industrial furnaces is lost in waste gas and cooling water. The Tenova i:Recovery® technology brings back up to 70% of the energy that would be lost. Hot cooling is a well established technology in use from many years for reheating furnaces and converters.

The combination of heat recovery system with sophisticated control technology and a wide range of tools for steam buffering, applied to electric arc furnaces and submerged arc furnaces is the innovation that Tenova is bringing into the market.

The heat recovery systems installed by Tenova have successfully demonstrated their ability to ‘re-generate’ energy from waste gas and reduce environmental impact, while assuring low operating costs for the customers.

MAIN BENEFITS

- Up to 70% off gas energy losses can be recovered.
- Reduced water consumption respect to open cooling towers.
- Reduced duct corrosion, pipes deposit and elimination of sulphuric acid condensation.
- Reduced thermal stress in the off-gas ducts and in the skids.
- Longer life time and less maintenance.
- High flexibility in the characteristics of produced steam (temperature and pressure).
- Applicable for nearly all kind of furnaces.

** Considering complete combustion of C
The mix of steam and water arrives at the steam drum where water and steam get separated.

The steam that is taken out from the steam drum can be used for a wide variety of purposes.

The feed water tank replaces the demand of steam consuming processes.

A Ruth steam buffer homogenizes the steam output during power-off time.
Water gets pumped at temperatures bar pressures between 150°C/5 bar and 270°C/55 bar.

An additional heat transfer surface and dust removal optimizes the off gas cooling duct (optional).