Consteel® Evolution: An Innovation with Solid Roots

Consteel® Evolution is a new generation of furnaces resulting from an intense, continuous research activity and the long-standing experience and engineering expertise Tenova developed in the steelmaking sector. This drive for innovation has produced the Consteel® Evolution system, the revolutionary technology of continuous scrap feeding and pre-heating.

The Consteel® system is the only industrial process that continuously pre-heats and feeds metallic charge (scrap, pig iron, etc.) to the EAF while simultaneously controlling gaseous emissions. Through the use of iRecovery® technology, the ideal complement to a Consteel® system, the waste gas residual energy can be recovered as steam, with an efficiency ranging from 35% to up to 70%.

Tenova MELT SHOPS is a leader in the design and supply of equipment for crude steel production. The Tenova Melt Shops heritage embraces historical brands such as Tagliaferri Electric Arc Furnaces and innovative technologies such as Consteel®, a continuous scrap feeding and pre-heating system, Goodfellow EFSOP®, an off-gas dynamic control tool, and iRecovery®, a virtual recovery system. Tenova Melt Shops projects range from completely new melt shops to the state-of-the-art technological upgrading and managing of existing production units. Tenova MELT SHOPS is building one of the largest electric arc furnace facilities in the world at its site in Vitoria, Spain. Additionally, Tenova MELT SHOPS is leading the development of Consteel® Evolution, which is the ultimate technology for the steel industry.

Tenova MELT SHOPS
Tenova MELT SHOPS holds several European patents and is a worldwide supplier of advanced technologies and services for the iron & steel and mining industries, providing customers with innovative solutions. Tenova provides clients with the most advanced and environmentally-friendly technologies, and is committed to reducing energy consumption and pollution in order to meet the needs of the steel and mining industries.

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The Consteel® Evolution system boosts productivity and improves energy efficiency with increased environmental impact. The key advancements of the latest Consteel® generation are the introduction of new solutions to increase the amount and efficiency of the chemical energy used in the process through high-efficiency burners and heat exchangers. The new design significantly increases the exchange surface, a different burner profile to improve heat treatment efficiency, and a new tunnel profile to increase the exchange surface. A different burner profile to improve the convective heat exchange, and a new tunnel increases the exchange surface, a different burner profile to improve the convective heat exchange.

A key characteristic of the latest Consteel® generation is the use of chemical energy to control the CFD analysis of the off-gas. The off-gas temperature and composition, with automatic control of the air/fuel ratio, result in a low thermal stress on the heaters and reduce the environmental impact of using the Consteel® Evolution in a downstream process.

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The burner is a key component, as it guarantees high efficiency and is responsible for maintaining the right gas conditions for feeding the process. The burner is responsible for ensuring the optimal use of the chemical energy used in the process, and for maintaining the right gas conditions for feeding the process.

In the new system, the use of chemical energy is controlled, monitored, by continuous measurement of the off-gas temperature and composition, with automatic control of the air/fuel ratio. The result is a more effective control of the burners and less environmental impact, ensuring the Consteel® Evolution system is a downstream efficiency system.

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