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Tenova Pyromet is a leading company in the design and supply of high-capacity electric submerged-arc smelting furnaces and complete smelting plants for the production of ferroalloys, base metals, slag cleaning and alloy refining. Tenova Pyromet has a long and successful history in the ferroalloy industry and also designs and supplies equipment for material handling and pre-treatment, alloy conversion and refining, granulation of metal, matte and slag, furnace off-gas fume collection and treatment, treatment of hazardous dusts and wastes. The company has been certified to ISO 9001:2008 for "The Design and Supply of Smelting Technology and Equipment".



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Saldana Steel Pig Iron Granulation Plant

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TECHINT GROUP

TENOVA is a world-wide supplier of advanced technologies, product and services for the metal and mining industries.

Breakthrough Plant

Pyromet designed, installed and commissioned Southern Africa's first pig iron granulation plant at Saldanah Steel. The plant represents a significant breakthrough in the handling of molten pig iron.

The granulation plant converts molten iron from the Corex plant into solid granules, which permits the iron to be sorted in manageable form. The only emission resulting from the process is water vapour.

The iron granules are produced from excess iron produced in the Corex unit. The production of iron is the first stage in the process to produce hot rolled coil at Saldanah Steel.

Requirement for the Granulation Plant

The Corex and the Conarc are operated in balance, but the balance may be upset by problems in the operation of either of the units, resulting in the production of excess iron that needs to be stored before it can be processed in the Conarc. Prior to the installation of the granulation plant, the excess iron from the Corex plant was poured on to the ground (known as "plating") for future recovery. This plated iron needed to be broken into manageable sizes and stored before being fed back into the Conarc. This process caused environmental problems and delays in the operation of the Conarc.

Pyromet adapted Swedish Uddeholm Granshot™ technology to design the granulation plant after Saldanah Steel had identified its preference for this technology.

Process

Iron is produced in two facilities - Corex and Midrex. The Corex plant produces liquid iron and large quantities of gas which are utilized in the Midrex plant which produces direct reduction iron (DRI).

Saldanah Steel is the first steelmaking complex in the world where Corex and Midrex have been used in tandem to supply iron for the production of steel in an electric furnace.

The charge to the Conarc electric-arc furnaces is a mixture of the liquid iron from the Corex plant and the DRI from the Midrex plant. The Conarc performs the dual role of smelting and converting in a single unit

Process Description

The excess Corex iron is conveyed in an 85t ladle to the granulation plant. The ladle is positioned on a ladle tilter, and molten iron (at about 1315° C) is poured into a tundish that is placed over the granulation tank. An outlet nozzle in the middle of the tank is situated above a sprayhead.

The molten iron falls on to the sprayhead (a ceramic disc) and then forms droplets that fall into a water bath. The outer shell solidifies in flight and the inner core is quenched as it strikes the water furnace. Cooling water is supplied to the tank via an evaporative cooling plant.

Project Information

Project name:	Saldanha Granulation Project
Project Description:	Designed, installed and commissioned Southern Africa's first pig iron granulation plant
Client:	Iscor Ltd.
Site:	Saldanha Steel
Project description:	Pig iron granulation plant
Produces:	Pig iron granules, 3 – 40 mm
Plant capacity:	2 ton/minute
Plant cooling capacity:	54 MW
Project duration:	9 months
Project award:	January 2002
Commissioned:	September 2002

Project Statistics

Concrete:	1,080 m ³
Steel structures:	64 tons
Cladding:	1,020 m ³
Electric cabling:	7,000 m
Piping:	3,250 m
Pyromet project team:	10 persons
Project site team:	155 persons (at peak)

