

Tenova is a worldwide supplier of advanced technologies, products and services for the metal and mining industries providing innovative integrated solutions. Combined process automation and metallurgical know-how enhance the value delivered to the customers. Tenova is committed further to develop its technology in the areas that mostly impact the future of the industries it serves: quality of the products delivered by the customers, energy saving and environmental safeguard.

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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ASA Metals No2 Furnace Project

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

Background and Project Description

In 2003 Pyromet were awarded the contract for the design, construction and commission for an additional submerged arc AC furnace at ASA Metals at Steelpoort in Limpopo Province. This new 36 MW furnace has a 30% higher capacity than the existing furnace.

The first ASA Metals furnace was commissioned by Pyromet in August 1999. It included the first complete installation using the new Pyromet Electrode Column, which has achieved 99.7% availability for more than two years (0.3% downtime). The plant features an advanced and integrated plant automation and control system and was designed to eventually cater for up to four furnaces. The complete plant was designed and supplied by Pyromet, and has been highly efficient.

Early Start-up of Furnace

Furnace number 2 at ASA Metals was successfully switched into service during December 2003, almost 6 weeks ahead of the contract schedule. With this, ASA Metals increased their production capacity to 120,000 tpy of charge chrome, and the early start-up allowed them to achieve more than a month's extra production.

This was a remarkably successful project, characterised by good relations between Pyromet and our client, and by a strong desire from all parties to build an exceptional furnace plant.

ASA Metals selected Pyromet as the turnkey designer and supplier of their second furnace following the success that they have had since the start-up in 1999 of their first furnace plant, also designed and supplied by Pyromet. For this project a bigger 45 MVA capacity semi-closed furnace was selected, whereas furnace 1, also semi-closed, is rated at 33 MVA.

New Features

And while similar in many respects to furnace 1, the second furnace boasts several new features. These include:

- quick-release heat-shield seal joints on the electrodes the pressure ring is assembled in the bridge position.
- an all-new electrode seal design is employed
- the use of a freeze lining
- improved access to the mechanical equipment in the furnace building.

Other Plant Features

The turnkey project included the supply of the furnace and building, the bag filter, and all related equipment. The bag filter features an "intelligent" cleaning system.

Evaporative coolers are employed for the furnace cooling water, (where furnace 1 uses air-coolers), and an integrated clay gun and taphole drill assembly was installed.

Electrode Equipment

The furnace uses the Pyromet patented electrode column system. This system has achieved remarkable results in operation on other furnaces, including on furnace 1 at ASA Metals, with a high availability demonstrated in over four years of service. The electrodes for furnace 2 are 1,350mm diameter, and a new system to measure electrode tip positions and to detect electrode breakages has been installed.

The electrode smoke seal is designed with a water-cooled copper base to increase the life of the rope seal, and also features remote adjustment of the clamping force as the rope material wears in services.

Project & Construction Management

The challenges associated with an accelerated program were met by rigorous attention to the management and scheduling of project activities, and by fostering good relationships, commitment and cooperation between the project team, the client and the various sub-contractors.

Sub-contractors for this project included MAC Engineering for steel fabrication and erection, Peter Mellor for civil construction, Domento for mechanical erection, and RBF Technology, Conco and NIC for electrical and instrumentation supply and installation.

Project Information

Project name:	ASA Metals No. 2 Furnace Project
Client:	ASA Metals (Pty) Ltd
Site:	Dilokong, Steelpoort
Project description:	New furnace plant including furnace building civil and structural work, furnace equipment, cooling water, gas cleaning, dust handling, raw materials handling, and related plant auxiliaries.
Disciplines included:	Civil, structural, mechanical, electrical, instrumentation and control
Produces:	Charge chrome (ferrochrome)
Furnace capacity:	45 MVA
Production capacity:	70,000 tpy charge chrome
Project duration:	12 months
Project start:	January 2003
Commissioned:	December 2003 (6 weeks ahead of schedule)

Project Statistics

Concrete:	1,820 m ³
Steel structures:	980 tons
Cladding:	9,000 m ²
Electric cabling:	44 km
Piping:	6,710 m
Pyromet project team:	20 persons

