PRIMETALS TECHNOLOGIES

COREX® GAS BASED MIDREX® DR PLANT

JSW IN VIJAYANAGAR, TORANAGALLU, INDIA

JSW PROJECTS LTD., INDIA, ORDERS A COREX® EXPORT GAS-BASED MIDREX® DIRECT-REDUCTION PLANT

Efficient utilization of Corex® Export Gas for the production of additional iron

MAIN BENEFITS

- Safe and clean ironmaking based on Corex(R) Export Gas
- The realized concept provides maximum Corex(R) Export Gas utilization for DRI production
- Tail gas, DR bypass gas and DR off-gas is utilized at the downstream steel plant for heating purposes and for electric power generation
- Compared to cold DRI change, hot DRI transport system to the EAF allows for
  - Increased productivity determined to be 15% to 20%
  - Power savings of 130-150 kWh per ton of liquid steel
  - Electrode savings of 0.5-0.6 kg per ton of liquid steel

THE CUSTOMER

Name: JSW Projects Ltd.

Location: Vijayanagar, Toranagallu, Karnataka State, India

JSW Steel is India's biggest private steel producer with an installed steel production capacity of 14.3 mtpy, which is mainly produced at Torangallu with 11 mtpy. As a major player in the Indian steel industry, JSW was the first company to use Corex® technology to produce hot metal. JSW became known worldwide for its zero-effluent-discharge status.

THE CHALLENGE

A cooperation consisting of Primetals Technologies as the consortium leader, Linde AG and Midrex Technologies, Inc. received a contract from JSW Projects Ltd., a group-company of JSW Steel Ltd., for the engineering and supply of a Corex export gas-based Midrex® Direct-Reduction-plant to be erected at JSW Steel Ltd. in India. This new facility has a nominal production capacity of approximately 1.2 million tons of direct-reduced iron per year and includes a hot DRI transport system for the adjacent EAF plant. The order value is a low three digit million Euro figure. Successful start-up of the new facility was carried out in fall 2014.

THE SOLUTION

The Corex® export gas is cleaned, compressed and treated in a Pressure Swing Absorption System where the CO_2 is scrubbed out. Subsequently it is heated in two stages (indirectly via heat exchanger and directly by partial oxidation) to the desired reducing gas temperature. Then the gas is introduced into the descending burden through a series of bustle slots located in the reduction zone of the shaft furnace. The ascending reducing gas flowing in counter current to the descending iron oxide material, heats the burden, and reduces and carburizes the iron ore.

The DR furnace is operated a temperature of approximately 800°C. The temperature employed depends on the type of oxide feed material and amount of oxide coating material applied. The reaction period within the reduction zone is sufficient to reduce incoming iron oxide material to metallization levels of 91% or higher.

SCOPE OF SUPPLY

- Supply of key equipment
- Electrics
- Automation
- Supervision of erection, commissioning and start-up
- Training services

PLANT DATA

Reduction furnace inner diameter	7.15 m
Typical output (CDRI + HDRI)	1.2 mtpy
Nominal capacity	147 t/h
Typical metallization	92%-94%
Typical HDRI carbon content	1.3%

Primetals Technologies Austria GmbH
A joint venture of Mitsubishi Heavy Industries and partners

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