



BLAST FURNACE NO.1 & NO.2
DRAGON STEEL CORPORATION,
TAICHUNG, TAIWAN

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Blow-in of No.1 blast furnace took place on 27th February 2010 and No.2 blast furnace on 6th March 2013

PROJECT HIGHLIGHTS

- Modern working practices
- Low fuel consumption
- Environmentally acceptable controls
- Flat casthouse floor
- High efficiency stoves with waste heat recovery system
- High rate coal injection system
- Furnace design for low maintenance cost with commonality of spares between furnaces
- Utilization of repeat engineering and key equipment supply

THE CHALLENGE

In June 2006 Dragon Steel Corporation, building on the successful relationship developed through the No.4 blast furnace project at China Steel, placed a contract with Primetals Technologies to design and supply a 2.5 Mtpa blast furnace for the first phase of their new integrated steelworks complex at Taichung, Taiwan.

Prior to the start up of the first phase a second contract was placed to continue the on-going development of the site with the addition of a second blast furnace to increase the total installed iron capacity to 5.0 Mtpa.

Installation and commissioning of blast furnace No.2 was required to proceed in parallel with the operation of blast furnace No.1 but without impact on the production requirements.

OUR SOLUTION

The Primetals Technologies solution ensured efficient use of the available space whilst minimizing any additional engineering by substantially mirroring the phase 1 plant.

The very good relationships built during phase 1 with the new plant operating and maintenance teams allowed the detailed planning and implementation of necessary utility tie-ins to progress without problem.

This close cooperation with the client ensured major equipment could be made live and commissioned without any unscheduled impact on the functioning phase 1 production plants.

The phase 2 plant incorporated extensions to the operating blower and PCI plants which were undertaken using a modular format so that in future operations there was full interchangeability between blast furnaces.

SCOPE OF SUPPLY

- As part of phase 1 Primetals Technologies delivered the basic and detail engineering for blast furnace No.1 plus all the equipment excluding civils and lagging. This included the blast furnace and cooling systems plus ancillary equipment including 2 blowers, hot blast stoves, stockhouse, coal grinding and injection, casthouse, gas cleaning, gasholder and top gas recovery turbine.
- As part of phase 2 a similar scope was supplied but with minimized engineering to incorporate the mirrored blast furnace No.2. The majority of the ancillary plant was the same as phase 1 but the common areas of the blower house and coal grinding unit included for just a single extension to support the new capacity requirements
- Both phases included for construction and commissioning supervision
- Performance guarantees for key production and operating parameters

ACHIEVED RESULTS

Blast furnace No.1 started operation in February 2010 and No.2 started in March 2013 - both dates met the agreed contract dates of the customer.

Both furnaces continue to maintain performance over the longer term with blast furnace No.2 exceeding the design figure of 2.5 Mt of hot metal within the first year, just as blast furnace No.1 exceeded 10 Mt within 4 years.

Both furnaces have reached production levels in excess of 8,200 tHM/d and continue to meet the key production and operating parameters.



Dragon Steel Corporation, Taichung Blast Furnace No.1 and No.2

NEW BLAST FURNACE

- Modern free-standing design with advanced instrumentation monitoring to enable high performance operation
- Furnace profile, utilizing Primetals Technologies' successful global experience with copper and cast iron staves, designed to meet the needs for a long campaign life
- Carbon hearth with deep sump and ceramic pad for long life

BLAST SYSTEM

- Blower house incorporating 3 off electrical axial blowers, each of 100% capacity for a single blast furnace and with interchangeability so as to provide a common standby
- 3 external combustion chamber stoves providing hot blast temperatures of 1,250 °C
- Waste heat recovery to enable efficient balancing of plant needs and to minimize fuel enrichment costs

PROCESS GAS SYSTEM

- Dustcatcher
- Triple-cone wet scrubber with inclined external demister to ensure the best conditioning of the process gas
- Top gas recovery turbine
- Gasholder

PCI

- Common grinding system with 3 streams feeding 2 product silos for maximum availability
- Individual injection systems capable of up to 180 kg/tHM

FURNACE CHARGING

- An in-line stockhouse capable of providing for a range of burden mixes with up to 30% pellets
- Single main charge belt conveyor feeding a parallel hopper top with 50% overcharge capacity

CASTHOUSE

- Flat-floor casthouse for optimum ease of operation
- 3 tapholes incorporating Primetals Technologies hydraulic taphole equipment

FURNACE DESIGN PARAMETERS

Average production	7,143 t/d
Peak production	7,857 t/d
Furnace hearth diameter	12.0 m
Furnace working volume	2,799 m ³
Furnace inner volume	3,274 m ³
Top gas operating pressure	2.50 bar g
Blast pressure at furnace	4.20 bar g
Normal productivity on inner volume	2.18 tHM/d/m ³
Normal productivity on hearth area	63.2 tHM/d/m ²
Number of tuyeres	32 off
Number of tapholes	3 off

Primetals Technologies

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