



MULPIC®

PLATE COOLING TECHNOLOGY KOBE STEEL LTD., KAKOGAWA WORKS, JAPAN

Project start: April 2013
FAC completion: June 2015

In April 2013, Primetals Technologies received an order to supply a new Plate Cooling System based on the MULPIC® Technology as part of a modernisation project for the KOBE Steel Ltd. is 4.7m wide Plate Mill at their Kakogawa works in Japan, with the aim to widen their product mix as well as improve the quality of their final products.

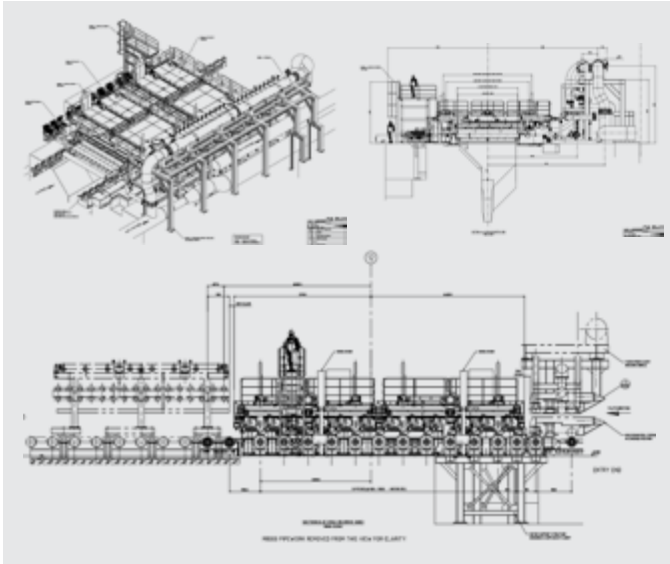
The scope of supply included two six metre MULPIC cooling banks, one with DQ capability with the associated Automation System to replace existing HC2 and MC1 Cooling Sections.

MULPIC® TECHNOLOGY SOLUTION

MULPIC® technology provides a single 'in-line' Plate Cooling System with the capacity to achieve the cooling rates and temperature drops required for Accelerated Cooling (ACC) and Direct Quench (DQ) cooling for a wide range of plate thicknesses.

MAIN BENEFITS

- Low capital investment cost for the modernization, by utilizing existing WTP with no requirement for an overhead tank.
- Increased product range due to MULPIC® high flow turn down ratio, cooling capacity and flexibility.
- Hybrid Cooling capability combining the new MULPIC Cooling Banks with the existing HC1, MC2 and LC Cooling sections.
- Improved product quality resulting from uniform and precise cooling.
- The robust design and ease of maintenance of the MULPIC means reduced down time and reduced requirement for frequent maintenance.
- A minimum of 1 year post-FAC Support Service included as standard for all new MULPIC® installations.



Mechanical configuration



KOBE Steel MULPIC – Non-Pipework side

SPECIFICATION

KOBE STEEL MULPIC - Plate Cooling System

Machine Length	12 m divided into 2 (6 m) Cooling Banks
No. of Headers per Cooling Bank	6 Top + 6 Bottom
Cooling Headers Width	4,700 mm
Cooled Plates Thickness Range	12 ~ 120 mm
Top Headers Height Adjustment	300 ~ 1,500 mm
Edge Masking Width Range	1,150 mm ~ 4,700 mm
Max. Flow	Bank A: 6,700 m ³ /hr Bank B: 3,048 m ³ /hr
Water Supply Pressure:	Bank A & ZSS (Spray Pumps): 7.0 bar (regulated to 5 bar) Bank B (Laminar Pumps): 3.0 bar (regulated to 2 bar)

TECHNICAL FEATURES

- Highly dynamic, fast & accurate flow control
- Header design, individual flow control – flexibility
- Length temperature uniformity - better quality
- Width temperature uniformity – better quality
- Adaptive, model-based cooling control

PERFORMANCE

- FCT Accuracy SD: 13°C (G.V.: 16°C).
- Length Temperature Uniformity SD: 15.0°C
- Width Temperature Uniformity SD: 10.0°C

Two (2) Cooling operation modes are available:

1. **MULPIC Cooling:** In this mode only MULPIC Cooling Banks are used and all setup calculations are done by the MULPIC Level 2 Model.
2. **Hybrid Cooling:** MULPIC Banks and existing cooling sections are used. Cooling control and all setup calculations are done by the customer existing Level 2 system.

Primetals Technologies Limited
A joint venture of Mitsubishi Heavy Industries and partners

Sheffield Business Park | Europa Link | Sheffield S9 1XU
primetals.com

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