



FURNACE TECHNOLOGIES PRODUCT PORTFOLIO

MODERNIZE YOUR HEAT TREATMENT PROCESS WITH ADVANCED EQUIPMENT FROM PRIMETALS TECHNOLOGIES

Primetals Technologies offers the answers you seek for your heat treatment processes and equipment. Based on the technologies of Drever Company and Flinn & Drefflein Engineering Company, combined with decades of expertise, innovation, and experience, our Furnace Technologies team offers solutions to keep you competitive throughout the life cycle of your equipment.

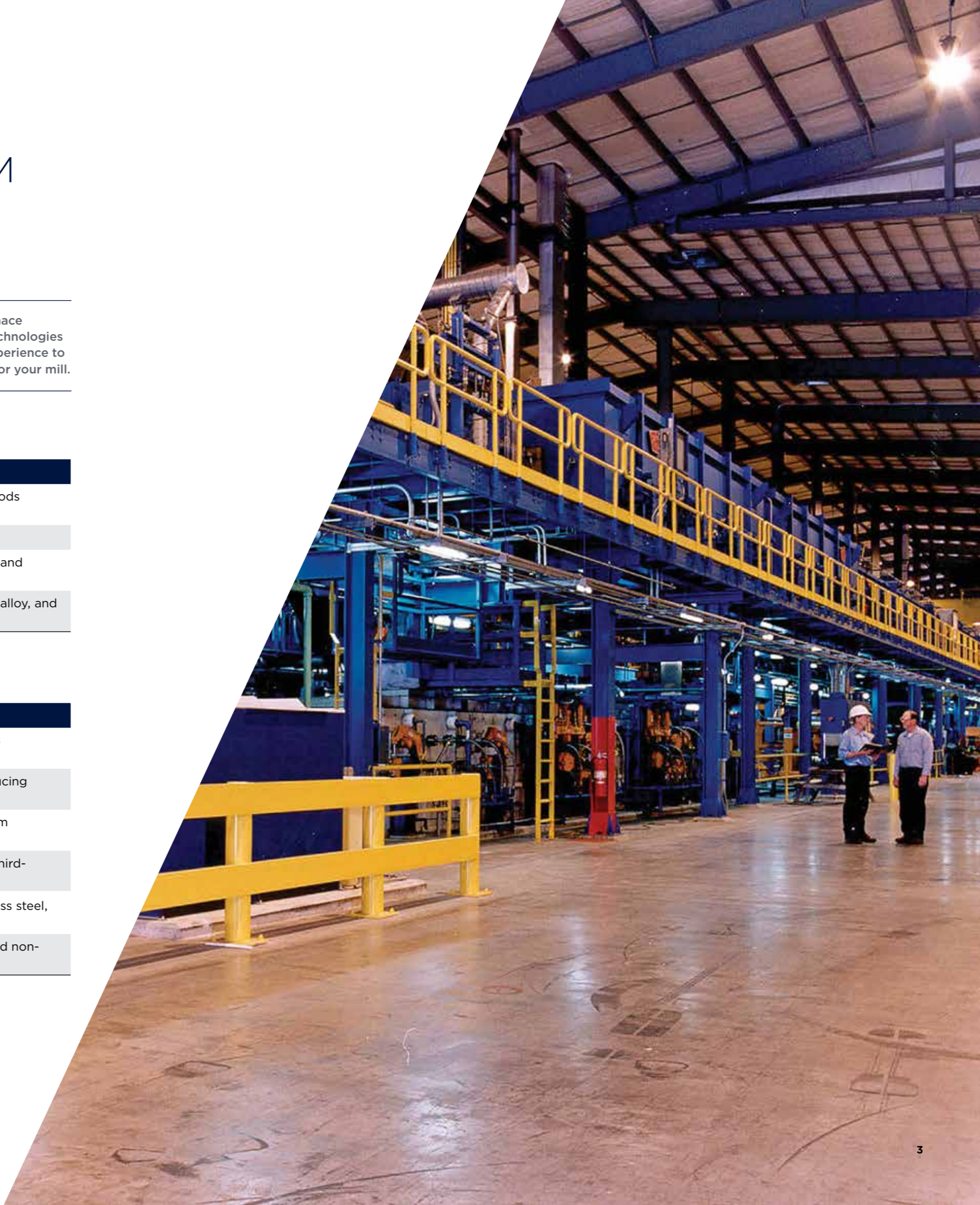
As the pioneers of key furnace technologies, Primetals Technologies has the knowledge and experience to provide the best solution for your mill.

FURNACE TECHNOLOGIES FOR HEAT TREATMENT

Product	Description
Tubular Quench and Temper Lines	Heat treatment equipment for the production of oil country tubular goods (OCTG), truck rail, and other long products
Car Bottom Furnaces	Furnaces for a broad range of metal products and processes
Lamination Lines	Roller hearth furnaces to anneal and surface treat materials for motors and transformers
Plate Heat Treating Equipment	Roller hearth furnaces and quenches for the heat treatment of carbon, alloy, and stainless steel plates, including normalizing, hardening, and tempering

FURNACE TECHNOLOGIES FOR FINAL PRODUCTS

Product	Description
Vertical Continuous Annealing Line (VCAL)	Vertical furnaces for the heat treatment of sheet and tin plate products
Horizontal Continuous Galvanizing Line (HCGL)	Horizontal, hot-dip coating furnace, and after-pot equipment for producing coated sheet products
Vertical Continuous Galvanizing Line (VCGL)	Vertical furnaces and after-pot tower equipment for producing premium galvanized and galvanneal sheet products
Continuous Galvanizing Line High Hydrogen Cooling	Upgrade your existing CGL furnace to increase capacity and produce third-generation advanced high strength steel (3G AHSS)
Annealing and Pickling Lines	Continuous furnaces for annealing and pickling process lines for stainless steel, silicon steel, and other special metal strip
Bright Annealing Line (BAL)	Furnaces for continuous bright annealing of stainless, special alloys, and non-ferrous foil and strip products





FURNACES FOR CAL AND CGL NEW DESIGN - FOR THE LATEST ADVANCED HIGH-STRENGTH STEELS

A LONG-TIME FURNACE SUPPLIER

For more than 40 years, Primetals Technologies has supplied vertical and horizontal furnaces to the steel industry, responding to requests for production capacity, thermal treatment cycle, greater energy savings and extended equipment lifetime.

TECHNICAL DATA

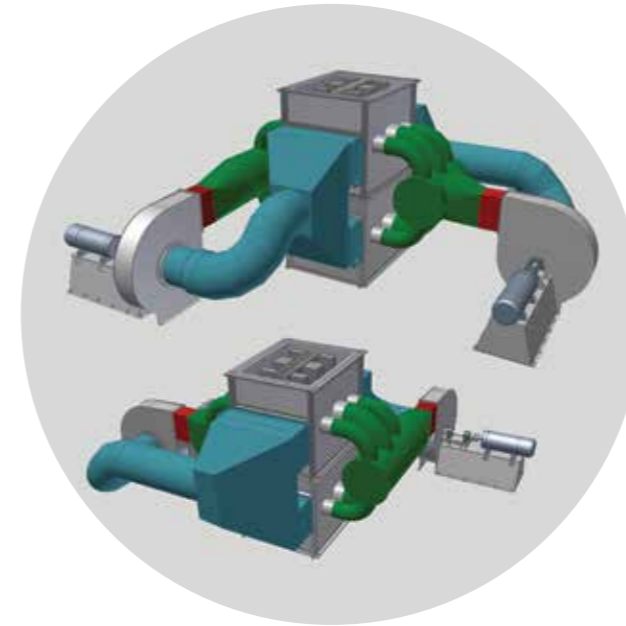
Thickness	0.2 to 6.0 mm
Typical max. width	1880 mm
Max. cooling, gas	120°C/s/mm
Max. cooling, water	> 1500°C/s/mm

LATEST REFERENCES

- AK Steel Dearborn CGL, USA
- JFE Steel CGL, Indonesia
- JFE Steel CGL, China
- Baosteel CAL/CGL, China

MAIN BENEFITS

- Vertical, horizontal or L-shape furnace types
- Flexibility to produce the most advanced steel grades in the automotive industry
- Solutions for AHSS such as direct flame impingement burners, heating strip to 950°C, and water / hydrogen quenching
- Atmosphere controls for improved wettability of higher alloy substrates
- Flexible exit section for complex thermal cycles
- Fully automated operation to minimize number of operators
- Accurate temperature control with advanced thermal models



CGL HIGH HYDROGEN COOLING UPGRADE EXISTING FURNACES FOR 3G AHSS STEELS

FASTER COOLING RATES

With a new cooling section, you can upgrade your continuous galvanizing line to increase capacity and produce more advanced high strength steels. High hydrogen cooling technology enables faster cooling rates and extends your product range to include third-generation advanced high strength steel.

TECHNICAL DATA

Thickness	0.2 to 6.0 mm
Typical max width	1825 mm
Max. cooling, gas	150°C/sec/mm

LATEST REFERENCES

- ArcelorMittal Cleveland CGL, USA
- CSN, Volta Redonda, Brazil
- AK Steel Dearborn CGL, USA

MAIN BENEFITS

- Patented high hydrogen cooling system achieves 150°C/sec/mm cooling rates
- Exit temperatures down to 150°C
- Patent-pending Tnozzle plenum design is more uniform across the width
- Operating costs reduced by minimizing power requirements and recycling hydrogen



PIPE QUENCH AND TEMPER LINE

OCTG - FOR THE MOST DEMANDING OIL COUNTRY TUBULAR GOODS

MOST PROVEN SOLUTION

Flinn & Dreffein technology, featuring the first and only proven OD/ID spray quench, combined with full automation, enables our quench and temper lines to provide industry-leading capabilities to meet the exact requirements demanded for offshore and horizontal drilling.

TECHNICAL DATA

Diameter	60 - 600 mm
Wall	≥ 30 mm
Normalizing	≥ 950°C
Tempering	500 - 750°C
Max. martensite	> 95%

LATEST REFERENCES

- Borusan Mannesman Pipe, USA
- Boomerang Tube, USA
- U. S. Steel (4 lines), USA
- TMK IPSCO (4 lines), USA

MAIN BENEFITS

- Produces straight pipes with more than 95% martensite
- Efficient, low-NOx combustion
- Uniform heating
- Able to meet the most challenging API and proprietary requirements
- Fully automatic end-to-end line operation requires fewer operators



PLATE HEAT TREATMENT LINES

COST EFFECTIVE - LOW OVERALL OWNERSHIP COSTS

CONSISTENT AND EFFICIENT

For the production of normalized as well as quenched and tempered plates, we combine the latest technologies with end-to-end automation to ensure consistent product quality, maximum production output, low operating costs and minimal maintenance expenditures.

TECHNICAL DATA

Thickness	4.5 - 200mm
Width	≤ 5000 mm
Normalizing	≤ 950°C
Tempering	250 - 750°C
Max. martensite	> 95%

LATEST REFERENCES

- AHMSA Normalizing Line, Mexico
- GRP Normalizing Line, Indonesia
- Baosteel Heat Treatment Line, China
- Bunge Quench & Temper Line, Australia

MAIN BENEFITS

- Atmosphere furnace minimizes roll pickup
- Long-life, low-maintenance silicon carbide radiant tube burners
- Roller pressure quench produces flat plate of > 95% martensite
- Fully automatic end-to-end line operation requires fewer operators

Primetals Technologies USA LLC

A joint venture of Mitsubishi Heavy Industries and partners

220 Commerce Drive, Suite 105
Fort Washington, PA 19034, USA
Phone: +1 (215) 947-7333

primetals.com

Brochure No.: T10-O-N586-L2-P-V5-EN

Printed in USA

© 2020 Primetals Technologies Ltd. All rights reserved

The information (including, e.g., figures and numbers) provided in this document contains merely general descriptions or characteristics of performance based on estimates and assumptions which have not been verified.

It is no representation, does not constitute and/or evidence a contract or an offer to enter into a contract to any extent and is not binding upon the parties. Any obligation to provide and/or demonstrate respective characteristics shall only exist if expressly agreed in the terms of the contract.

These estimates and assumptions have to be analyzed on a case-to-case basis and might change as a result of further product development.

Primetals Technologies excludes any liability whatsoever under or in connection with any provided information, estimates and assumptions. The provided information, estimates and assumptions shall be without prejudice to any possible future offer and/or contract.

Any use of information provided by Primetals Technologies to the recipient shall be subject to applicable confidentiality obligations and for the own convenience of and of the sole risk of the recipient.

Primetals is a trademark of Primetals Technologies Ltd.