

Continuous Thermal Treatment Facility

TIMKEN
Where You Turn

The Timken Company's Continuous Thermal Treatment Facility is one of the world's most advanced quench-and-temper complexes. It produces both bar and tubular product with extremely uniform mechanical properties for applications demanding maximum strength in many different environments. This facility complements the capabilities of our Induction Thermal Treatment Facility (ITTF).

At Timken's CTF, great strides are taken to ensure the quality of its steel product. Variations in strength, toughness and hardness are greatly reduced – even compared to present high-quality limits – while advanced computer-controlled techniques oversee austenitizing, quenching and tempering. The result: bar and tube products with characteristics tailored to a wide range of customer specifications.

CTTF Process Features:

- *Advanced quench-and-temper techniques plus constant product rotation for maximum uniformity.*

- *Ability to customize properties to meet specific customer needs.*
- *Accurate, rapid heating for maximum production, optimum quenching and minimum cost.*
- *Maximum bar and tube straightness.*
- *Reduced OD distortion.*
- *Blend of computer/operator control for optimum product quality and uniformity.*
- *Quenching versatility of OD quench or The Timken Company's patented OD/ID Quench Process.*

Thermal Treatment Processes:

Austenitizing Furnace

This single-strand, roller-hearth furnace with heat recuperators and fiber installation for top fuel efficiency offers precise temperature control of $\pm 10^{\circ}\text{F}$ (5.5°C) and 23 computer-controlled temperature zones for rapid temperature adjustment and maximum production.

Quenching Process

Depending on product features and

desired mechanical properties, optimum quench cycle is selected for precise control of as-quenched properties with minimum distortion. OD-only quench is available for bars and thin-walled tubing. The Timken Company's patented OD/ID Quench Process is ideal for heavy-walled tubing.

Tempering Furnace

To impart toughness and relieve stresses, product undergoes a specialized heating process in tempering furnaces. It is heated in a fuel-efficient, double-row roller-hearth furnace by controlled-temperature circulating gases heated by 12 external combustion chambers. The result is rapid heating and precise control of final tempering temperature to $\pm 5^{\circ}\text{F}$ (2.8°C). Temperature and soak time are adjusted for individual product requirements.

Hot Straightening

Bars and tubes with superior straightness are produced by the computer-controlled, five-roll straightener. Product temperature is maintained to within 200°F (111°C) of tempering temperature during straightening, resulting in a product essentially free from residual stresses. After initial set-up, straightening can be completely automatic. An inherent advantage is the elimination of subsequent stress relieve processing.

Cutoff

After final cooling to below 300°F (149°C), samples can be cut from either or both ends of product for metallurgical testing. Once samples have been cut and length established, saw operation can be automatic.



Austenitizing/Tempering Furnace/Straightener at CTF Facility.

Product Capabilities

TUBES (Size Range)

OD: 2.375 to 12.000 inches
60.3 to 304.8 mm

Wall: up to 3.250 inches
up to 82.55 mm

Length: 10 to 42 feet
3 to 12.8 m

Weight: 3500 lb maximum
1600 kg

BARS (Size Range)

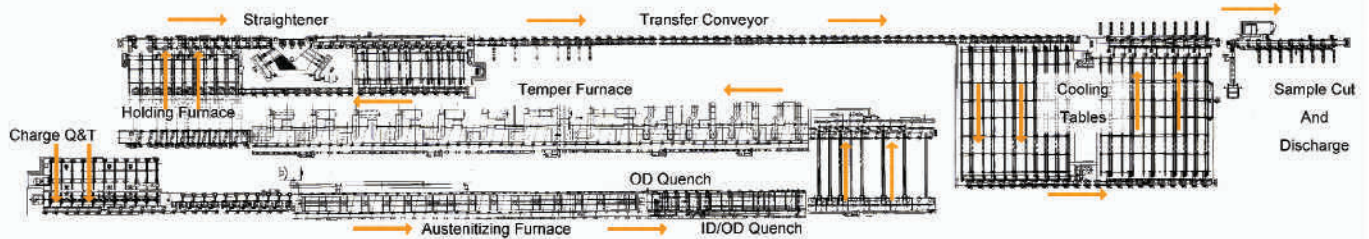
OD: 2.375 to 10.000 inches
60.3 to 254 mm

Length: 10 to 42 feet
3 to 12.8 m

Weight: 7000 lb maximum
3200 kg



Cooling Table at Continuous Thermal Treatment Facility



Process Chart of Continuous Thermal Treatment Facility

For thermal treated products that meet your demanding oil field, industrial and automotive applications, turn to The Timken Company. Customers can be sure they are receiving Timken quality because our experienced staff controls the entire process from melt through thermal treatment.

Timken is Where You Turn™ for innovation, quality and value-added options to help your products perform more efficiently and improve performance.

For more information on Timken® steel and other value-added services or products, call 866-284-6536, fax 330-471-7032 or visit our website at www.timken.com/products/alloysteel.

TIMKEN
Where You Turn

Bearings • Steel •
Precision Components • Lubrication •
Seals • Remanufacture and Repair •
Industrial Services

www.timken.com

Timken® is a registered trademark of
The Timken Company

© 2007 The Timken Company
Printed in U.S.A.
2.5M 07-07-29 Order No. 4127