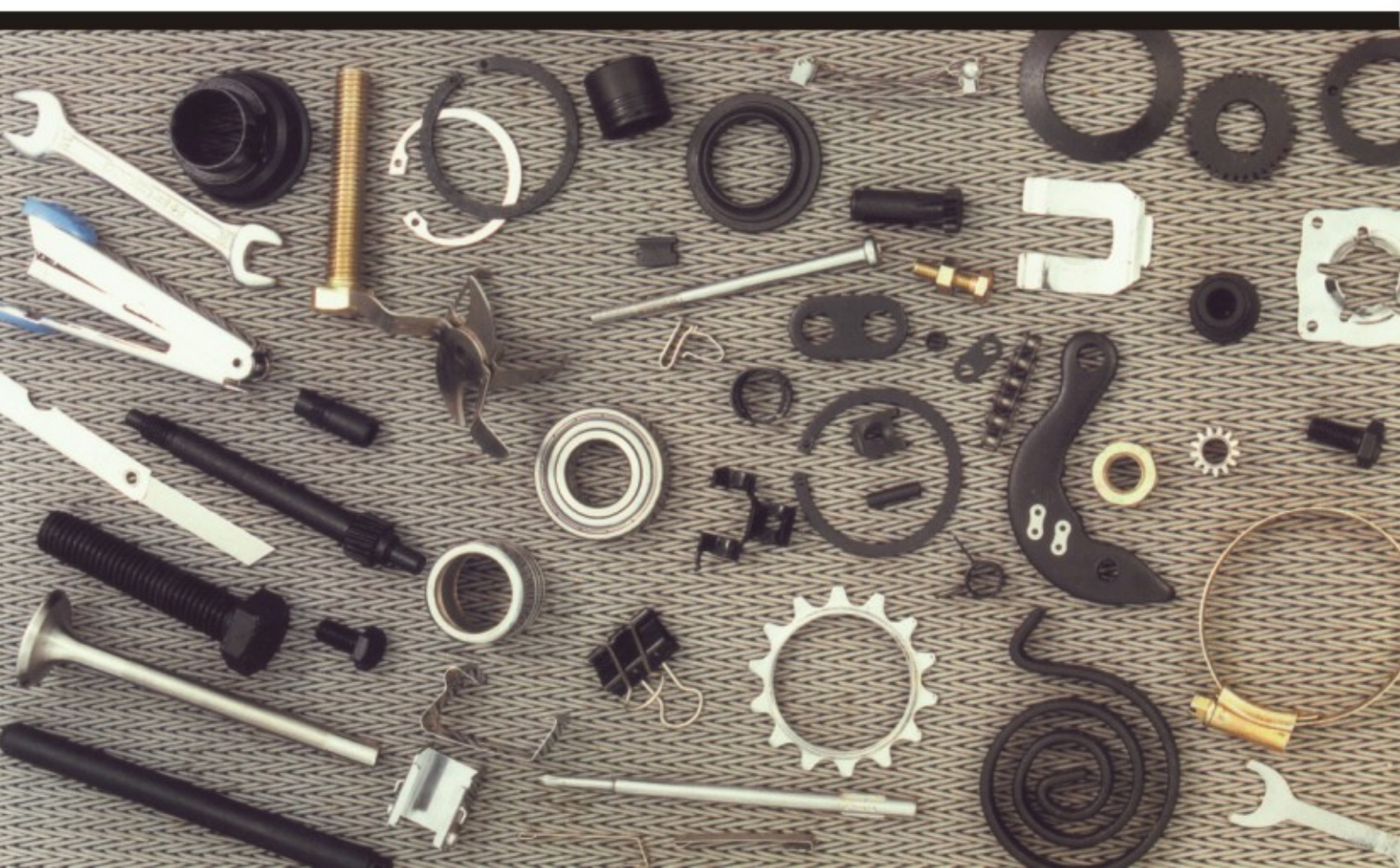




CONTINUOUS MESH BELT  
FURNACES FOR HEAT TREATMENT  
OF  
MASS PRODUCED COMPONENTS



# **CONTINUOUS HARDENING LINES**

10 Kg/Hr upto 3000 Kg/Hr heavy duty models

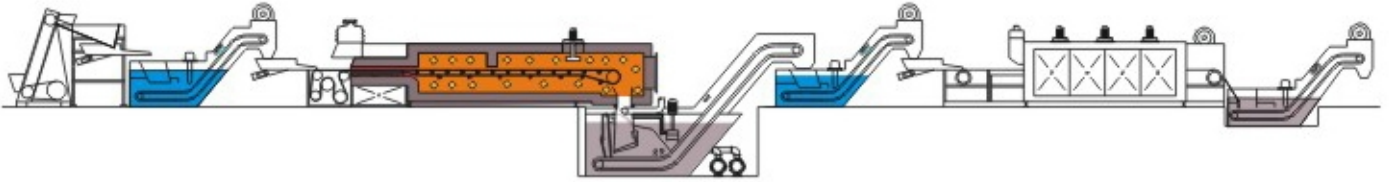
**For**  
**HARDENING &**  
**TEMPERING**  
**CARBURISING**  
**CARBONITRIDING**  
**SOLUTIONISING**  
**AUSTEMPERING**



**OF**  
**FASTENERS**  
**BEARINGS**  
**CHAINS**  
**AUTO PARTS**  
**BICYCLE PARTS**  
**LOCK PARTS**  
**SPRINGS**  
**CIRCLIPS**  
**CUTLERY**  
**HAND TOOLS**  
**KNIVES & BLADES**  
**NEEDLES**  
**SURGICAL TOOLS**  
**APPLIANCE PARTS**  
**PRESSED PARTS**  
**PEN & HAIR CLIPS**  
**AGRI TOOLS**  
**PRECISION PARTS**  
**& MANY OTHER COMPONENTS**



Consistency of quality is better obtained when components are continuously quenched, a few pieces at a time instead of in a batch at periodic intervals. Of the total tonnage of heat treated components the majority do not require fixturing and can tumble into a quench tank. The ideal plant for all such components in terms of quality, capital cost as well as operating cost is a continuous conveyerised heating and quenching system. Components spend less time at temperature and consume less energy compared to batch furnaces. Continuous quenching, a few components at a time, ensures a high degree of quality consistency in terms of hardness, case depth and physical properties. Such plants with conveyerised auxiliary equipment for loading, washing and tempering can be completely automated.

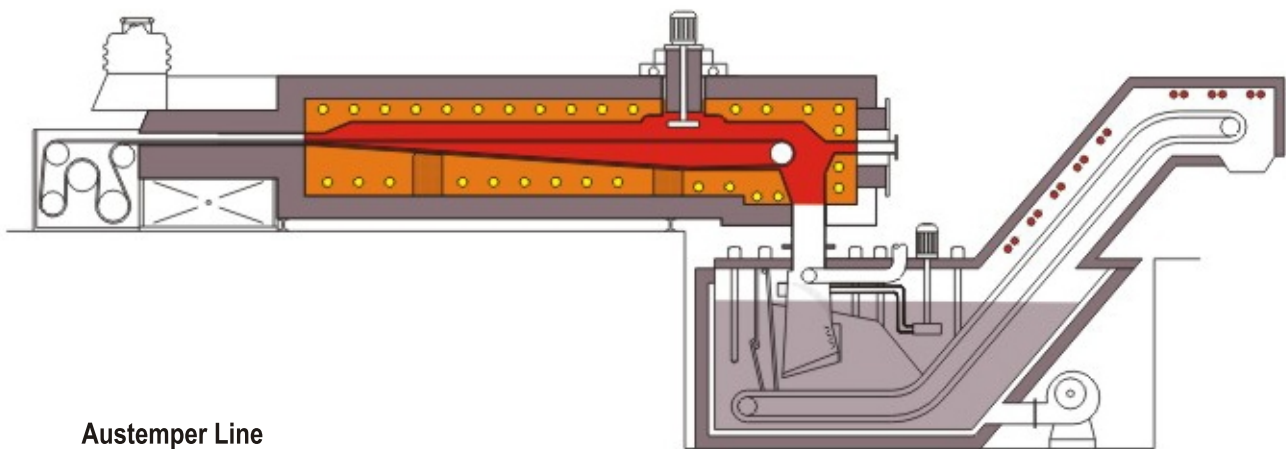


## Quench & Temper Line

# EQUIPMENT FEATURES AND OPTIONS

- ✔ **Auto loading** and **'soft' product handling** systems (several types) designed to prevent component damage with optional **in line weighing** system with closed loop control. Pick and place specials also available.
- ✔ **Pre-wash and Post quench wash** : Compact 3 stage (immersion, spray and dry) or multi-zone conveyor plants.
- ✔ **In line centrifuges** allow lubricant and quenchant recovery and reduce washing intensity, pollution & costs. Salt recovery system in wash plants for salt quenched components.
- ✔ **Vibratory metering spreaders** to convert batch input (e.g. Dump loading, centrifuging) to continuous uniform furnace belt loading and to control gaps between different types of products.
- ✔ **Hot belt return** design where the cold belt and components entering the furnace are preheated by conductive contact with the returning hot belt.
- ✔ The narrow **tunnel entry** vestibule allows extra time for preheating, reduces gas consumption and increases gas velocity which helps drive lubricant and water vapour out of the hot zone.
- ✔ **Gas tight shell & insulation** with low mass energy efficient materials and refractory bricks.
- ✔ The **muffle** option offered in small & medium furnaces (upto 200 kg/hr) allows quick start up & shut down and insulates the refractory and heat source from the furnace atmosphere.
- ✔ **Re-use of spent reactive atmosphere** to preheat components or to heat the wash medium.
- ✔ **Electrically heated** or **fuel fired** by radiant tubes housing electric heaters or recuperative burners. Exposed **side extraction elements** or direct chamber firing burners for furnaces with muffles.





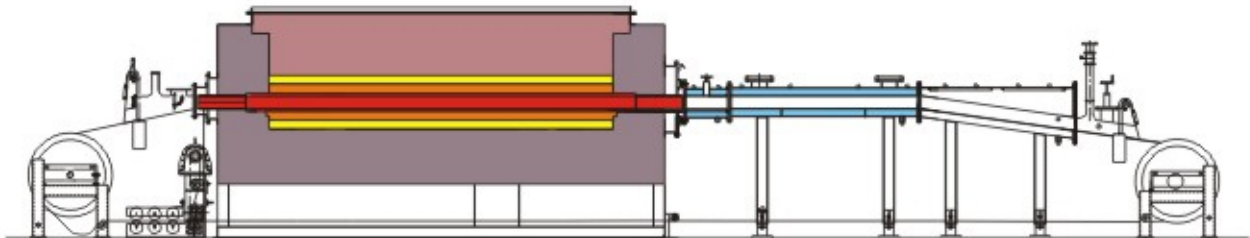
Austemper Line

- ✓ Atmosphere **circulation fans** in medium & large furnaces with/without muffles.
- ✓ **Alloy belt**, optional side raised and / or lateral ridges. Front end **variable speed drive** and **drift compensator**. Alloy return and belt support rollers or low friction skid design in furnaces with muffles.
- ✓ Closed loop **carbon potential control**, oxyprobe or infrared with remote connectivity.
- ✓ Quenchant **antisplash cascade** in chute and jet agitation at strategic locations
- ✓ **Quenching in oil, water or polymer**. Special tanks with track heaters for salt. Equipped with heating / cooling devices and auto temperature control, in line replaceable filters and vapour extraction system Variable rate jet agitation with anti-splash cascade in the quench chute. Plants available with multiple quenches.
- ✓ **Continuous tempering furnaces** designed for high efficiency convective heat transfer and temperature uniformity, electric or fuel fired, upto 650°C, suitable for air or protective atmosphere. Engineered for **rapid response** when changing process temperature. Equipped with forced air after cooling.
- ✓ Post tempering **corrosion resisting** soluble oil or black oxidizing conveyerised baths or oil spray centrifuges.
- ✓ **Endogas, exogas or PSA nitrogen plants**. **Special inbuilt reactors** for generation of endogas and dissociation of ammonia or methanol. Also nitrogen -methanol mixing and dosing systems.
- ✓ Several **process control options** from semiautomatic PLC Systems with all required safety interlocks to total auto **SCADA PC/ PLC** systems for plant supervision, control and documentation including barcode tracking. The system adjusts plant parameters to maximise production and quality based on geometry, weight and identification.



# MESH BELT FURNACES WITH INDIRECT COOLING

- ❑ **HARDENING** martensitic stainless steel components.
- ❑ **ANNEALING** of ferrous, non ferrous & stainless steel components.
- ❑ **NORMALISING** of castings & forgings.
- ❑ **CARBURISING** and annealing of machined steel components.
- ❑ **NITROCARBURISING** of finished machined carbon or alloy steel, stainless steel & iron components.
- ❑ **BRAZING** of ferrous, nonferrous & stainless steel assemblies.
- ❑ **SINTERING** of ferrous & nonferrous PM parts.
- ❑ **STEAM OXIDING** of ferrous wrought & PM parts.



## EQUIPMENT FEATURES AND OPTIONS

- ❑ Gas tight shell & efficient insulation.
- ❑ Metal alloy or ceramic muffle.
- ❑ Alloy fans in relevant furnaces.
- ❑ Low voltage side extraction heaters.
- ❑ Hump back or straight through.
- ❑ Multiple temperature control zones.
- ❑ Thyristorised and dual plane temperature control.



- ❑ Atmosphere zoning.
- ❑ Atmosphere gas impingement quenching or cooling.
- ❑ Non corrosive closed circuit cooling.
- ❑ On line atmosphere monitoring & control.
- ❑ Simple manual controls to software driven supervisory, control & documentation systems including bar code tracking.

**ALSO ATMOSPHERE GENERATORS FOR ENDO GAS, EXO GAS AND DISSOCIATORS FOR AMMONIA AND METHANOL, EITHER BUILT INTO THE FURNACE OR EXTERNAL UNITS**

FLUIDTHERM DOES NOT STOP SHORT AFTER SUPPLYING STATE OF THE ART FURNACES WITH AN INDUSTRY STANDARD WARRANTY. WE ALSO PROVIDE TOTAL SOLUTIONS AND PROCESS GUARANTEES.

WE OPERATE A VERSATILE HEAT TREATMENT PROCESS PROTOTYPING LABORATORY WHERE METALLURGISTS UNDERTAKE CLIENT SUPPORT ACTIVITIES LIKE SAMPLE PROCESSING FOR CHOICE OF PROCESS & PLANT, OPTIMISATION OF PROCESS PARAMETERS, TESTING CLIENT SUPPLIED PARTS, CUSTOM PROCESS DESIGNING, FAILURE ANALYSIS AND GENERALLY HELPING CLIENTS WITH THEIR HEAT TREATMENT NEEDS BEFORE AND LONG AFTER A SALE.



PROMPT AFTER SALES SERVICE BY EXPERIENCED & COMMITTED ENGINEERS, BACK UP METALLURGICAL & SUPPORT SERVICES AND A WIDE VARIETY OF SPARE PARTS IN INVENTORY. WHEN TROUBLE ARISES, FLUIDTHERM SHOOTS FIRST & TALKS LATER.

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