



The
**Future of
Steel**

BHUSHAN STEEL LTD.

HARDENED & TEMPERED STEEL STRIPS

Definition:

Carbon Steel strips produced by the continuous heat treatment process are known as the Hardened and Tempered steel strips. Steel strips produced through this process achieve unique spring and cutting properties.

Product Introduction:

Hardened and tempered steel strips produced using liquid metal quenching route has an excellent combination of hardness with ductility which otherwise is not possible to achieve by the conventional oil quench route. Therefore these strips find an exclusive use in the Wood working, Stone cutting, Automobile, Textile, Masonry and, Leather processing Industries, to name a few.

Continuous hardening and tempering line from world leader Ebner-Austria is capable to produce fine tempered marten site as well as bainitic microstructure to meet the stringent requirement of the product in the above mentioned industries.

Product Information/process:

Operations involved in producing the hardened and tempered steel strips are:

- Slitting to the required width
- Continuous Hardening & Tempering
- Edge profiling
- Surface Grinding or Polishing
- Color Tempering
- Inspection &
- Packing

Facilities Received From:

- Furnace : Ebner, Austria
- Mechanical Devices from Daehyun, Korea
- Edge trimming line: Jullus, Germany
- Grinding Machine: Breuer, Germany
- Polishing Machine: Breuer, Germany

Product attributes :

- Uniform hardness through out the length
- Excellent ductility
- Ability to perform under stressed conditions
- Excellent flatness
- Smooth uniform surface finish
- Fine Tempered Martensite or Bainitic microstructure

The process used to manufacture the product :

The process begins with heating the cold rolled strip indirectly under the controlled oxygen free atmosphere at 50 degree celcius or more above the austenising temperature. The heated strip is quenched in the molten metal bath and further cooled through the constant and controlled flow of air. The strips attains fully martensitic structure at this stage and is very hard and brittle. It further moves through the heated and pressurized leveling plates to achieve the desired flatness. The strip is than heated in the tempering furnace to attain the hardness as per the customer requirement, before it is finally cooled in the oxygen free atmosphere at the room temperature.

The hardened and tempered strip thus emerging out of the sealed processing unit is oxide layer free.



The
**Future of
Steel**

APPLICATIONS

1. Wood working Industry : Band Saw, Circular Saw, Hand Saw, Tennon Saw, Web Saw
2. Automotive Industry : Flat springs for Clutch Plates, Horn Diaphragm, Auto electric springs, Flapper valve plates, Shock absorber shims
3. Stone cutting Industry : Gang Saw blades, Circular Saw blades
4. Agricultural Equipments : Sickles, Ginning knives, Grass cutting blades
5. Masonry tools : Trowels, Plainer knives
6. Leather Industry : Splitting knives
7. Paper Industry : Doctor blades, Creasing knives
8. Textile Industry : Heald Frames, Drop pins

RAW MATERIAL SOURCES

Buderus - Germany

JFE - Japan

Posco - Korea

Acesita - Brazil

FACILITIES

● CONTINUOUS HARDENING & TEMPERING LINE, EBNER - AUSTRIA

SALIENT FEATURES

- MUFFLE WIDTH : 680mm
Provides sufficient space for Uniform Heating of Wider Width Material
- MUFFLE LENGTH : 14700mm
Length sufficient enough to process the Material at Higher Speed

Lead-Bismuth Quenching Media

- Provides Flexibility to produce either Martensitic or Bainitic Microstructure
- Reduces Internal Stresses during Transformation, Ensuring Flat Strip
- Improves Ductility of the Material
- Excellent Atmospheric Control
- With the controlled flow of oxygen along with nitrogen and hydrogen gas in the tempering and cooling zones of the furnace line, we can achieve online scale less blue, bronze and grey finish.
- Wide Processing range



● **CONTINUOUS STRIP GRINDING MACHINE, BREUER - GERMANY**

The Four Head Strip Grinding Machine from Breuer is for Grinding Strips employing different Grit Belts to impart the desired Bright Surface Smoothness



● **CONTINUOUS STRIP POLISHING MACHINE, BREUER - GERMANY**

The Four Head Strip Polishing Machine from Breuer is capable of polishing strips using different Grit Pastes to impart required surface finish specially to the Thinner Gauge Material



● **EDGE PROFILING LINE, JULIUS - GERMANY**

14 Station State of the Art machine is for providing Round, Square, Bevel and Sharp Edges to the Strips of 25 to 250mm Maximum width and 0.30 to 3.50mm Thickness by using suitably designed TUNGSTON CARBIDE tool bits.



● **COLOR TEMPERING LINE**

- Salt Bath Tank
- Water Rinsing Tanks
- Hot Air Dryer
- Hot Chamber

We can achieve Blue, Bronze and Grey colour on the strips surface

● **QUALITY CONTROL**

BSL's in-house quality control laboratory is fully equipped with the latest testing equipment.

Dedicated chemists ensure conformance to specifications on every coil and all test records are documented and maintained.

ULTRA MODERN LABORATORY EQUIPPED WITH

- Spectrometer from Thermo Arl SWITZERLAND
- Metallurgical Microscope from CARL ZEISS
- Digital Hardness Tester from MATSUZAWA JAPAN
- Computerized Tensile Testing Machine
- Rockwell and Vickers Hardness Testers



BHUSHAN STEEL LTD.

SPECIFICATIONS OF H&T STRIPS

Material	Plain high carbon and low alloy steel.
Strip Thickness	0.20 mm(min) to 3.5 mm (max)
Strip Width	50 mm (min) to 510 mm (max)
Hardness	38 RC (min) to 55 RC (max)
Surface Finish	Scaleless unpolished bright/ grey / blue, Polished Bright, Polished blue, and Polished Bronze.
Edge Condition	Round Edges, Square Edges, Dressed Edges, Beveled Edges or Combination of above.
Grade of Steel	AISI1062 , AISI 1074, AISI 1080, AISI 1095 2% Nickel Steel(SKS51), 50CrV4,75Cr1, 75 Ni8, CK75

SUPPLY CONDITIONS

IN COIL FORM :

Having Maximum Coil Weight 8 Kgs per mm of width

IN CUT TO LENGTH :

Minimum Length : 500mm
Maximum Length : 2500mm

Assurance

BSL has the experience, expertise and exposure to provide you the H&T steel strips as per the international standard.

We have adopted the philosophy to opt for the state of the art equipments available from the world market to produce H&T strips. From strip to strip, BSL engineers ensure that the finished goods will meet and exceed our customers' requirements and expectations.

Production Capacity

With Three high technology lines BSL with the existing plant configuration has the capacity to produce 12,000 Mt H&T strips annually.

PROCESS FLOW CHART

