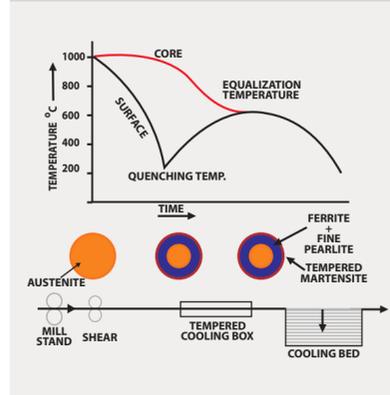


Production Process of

GPH TMT 500W Rebar: GPH TMT 500W bar is produced by fully automatic, computerized machines based on sophisticated and accurate advanced technology and design. The thoroughly tested billets are reheated under controlled temperature in automatic reheating furnace at 1100-1200°C and are subsequently rolled through a sequence of rolling stands progressively reducing to the required size.

With the help of rolling conveyor, the billets are made to pass through Roughing Stand. This begins the process of gradual size reduction of billets. Following Roughing Mill, the size is further reduced in Intermediate and Finishing Mills. This gradual reduction is an important factor to ensure finer grain structure of the bar. The rolling continues till the required size is achieved.

Schematic Presentation of GPH TMT Process



The bar after leaving the last rolling mill stand is fed to quenching box at a very high speed. In this section, a rapid and controlled water quenching is performed reducing the temperature of surface drastically from around 950°C to 600°C. Due to higher speed, only outer portion of bar gets quenched. The inner part remains hot only. The Case due to rapid quenching gets converted in Martensite form. The Microstructure is fine-grained Ferrite-Pearlite structure at the Core and Martensite at the Case. Then the bar is cut with automatic Flying Shear and fed into the cooling bed.

At cooling bed, the Core that is still hot transfers heat outside to the Case thereby tempering it. Due to this self-tempering, the Martensite Case becomes Tempered Martensite that has more strength and very high Corrosion Resistance Properties. Both quenching and self-tempering, lead to typical micro-structure of TMT bar i.e. Fine grained Ferrite-Pearlite structure at the Core (soft) and Tempered Martensite at the Case (hard). After this, Normalizing process starts where the bar cools down in atmospheric temperature and gradually attaining the same.

Once the bars are cooled, they are cut into desired length by means of cold shearing and tied into small bundles of 12 meters length. Later these bundles are stored in Finished Goods Yard according to their Grade, Size, Lot Number, and any other extinguishing factor for onward dispatch.

GPH Bars

have the best combination of strength, ductility & unparalleled quality consistency and form unbreakable and unshakeable bond with cement, and together they lend a strong foundation to your home. It is available through our dealers and our corporate & branch-offices assuring the right price and length at the point of purchase. This ensures a deep-rooted trust in the brand, which is its core value.

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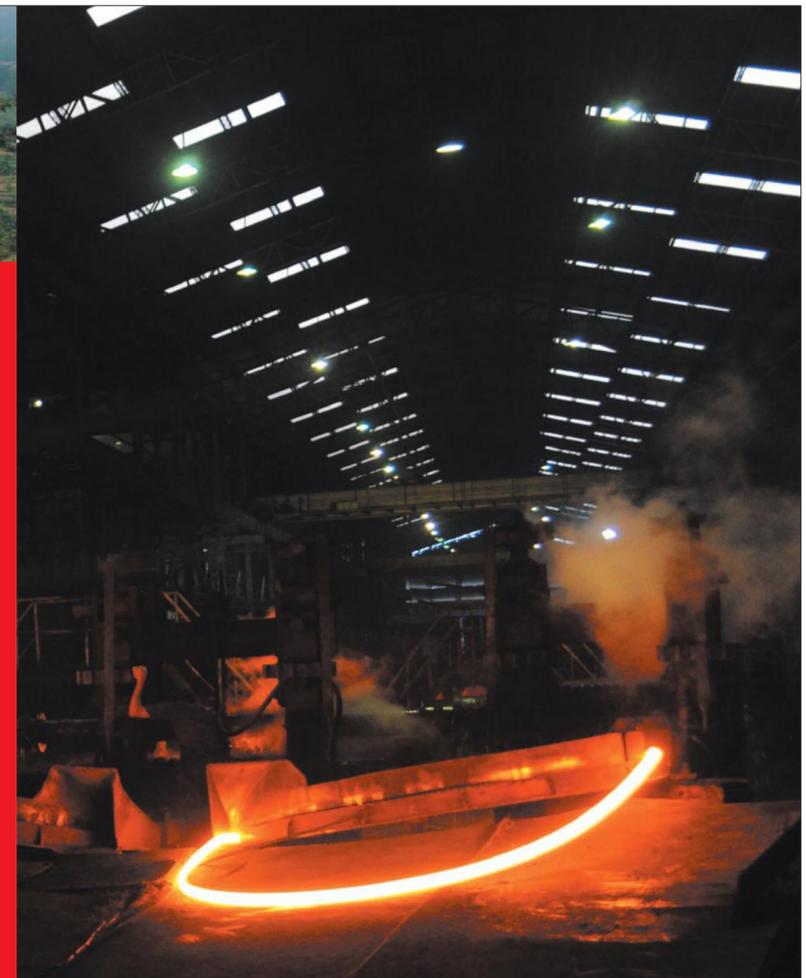
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AN ISO 9001-2008
CERTIFIED COMPANY

GPH ispat Ltd.
COMMITTED TO STRENGTH

**GOD FEARING
PLAIN LIVING
HIGH THINKING**

**“In the beginning,
God created man”**

and after thousand years of intelligence, precision, hard work and innovation, man created steel – one of the greatest inventions of all time. This super-strong, carbonized and alloyed form of iron is an element without which modern life is literally unimaginable. From skyscrapers and planes to syringes and forks, steel is an essential part of our everyday life.

GPH Ispat Ltd.,

one of the leaders of Bangladesh in manufacturing steel, promises a super strong future and economy for the country with its world-class products. Not only structural bar, but GPH Ispat Ltd. is also one of the producers of low & medium carbon and low alloy steel billets in Bangladesh, the main ingredients of manufacturing graded steel bar. As GPH is ensuring the highest quality products in Bangladesh as per various international and national standards, GPH steel billets and bars are getting exported to other countries after nourishing national demand. The introduction of GPH Ispat Ltd. has all the potentials to take Bangladesh quite a few steps forward to a stronger, brighter tomorrow.

mission

“to provide customers with excellent services and products resulting in constant improvement and innovation at the highest level of quality”

vision

“to enrich the steel sector of Bangladesh as a beacon of light for others and to help the country in upcoming infrastructural development”

Chemical Composition of GPH Rebar:

Name of Elements	Grade-wise percent constituents	
	GPH TMT 500W	GPH G60-400
Carbon(C)	0.15-0.25	0.20-0.35
Manganese (Mn)	0.75-0.90	1.00-1.65
Silicon (Si)	0.25 Max	0.25 Max
Sulfur(S)	0.05Max	0.05 Max
Phosphorus (P)	0.04 Max	0.05 Max
Copper(Cu)	0.20 Max	0.25 Max

All other tramp elements are kept near traces.

Mechanical Properties of GPH Rebar:

Grades of Steel	Yield Strength (min)	Tensile Strength (min)	Percent Elongation (min)
GPH TMT 500W	72,500 psi	83,375 psi	14%
	500 Mpa	575 Mpa	
GPH G 60-400	60,175 psi	90,045 psi	14%
	415 Mpa	620 Mpa	

Standard Specification of GPH TMT 500W Rebar:

- BDS ISO 6935-2:2006-Steel for the Re-enforcement of Concrete, Part-2 Ribbed bars (Bangladesh Standard).
- BS 4449:2005 + Amendment 2 2009-Specification for carbon steel bars for the reinforcement of concrete (British Standard).
- ASTM A706 / A706M - 09b-Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement (USA Standards).
- DIN 488-1-Steel rebar - reinforcing of concrete (German Standard).
- NF A 35-016-1 Reinforcing steel-weldable ribbed steel-Part 1: Bars and Coils (France Standard).
- AS/NZS 4671:2001-Australian/Newzeland Standard-Steel reinforcing materials (Australia-Newzeland Standard).
- JIS G 3112-Steel bars for concrete reinforcement (Japanese Standard).

Standard Specification of GPH G60-400 Rebar:

GPH Deformed Bars G 60-400 conforms to the following national and international standard specifications:

- ASTM A615 / A615M - 12
- BDS 1313:1990
- JIS G 3112(1987)
- IS 1786
- ISO 1335 & 4951
- BA 1963
- DIN 488 & 1045
- BS 4449:1998

Bar Size, Nominal Weights, Dimensions, etc of GPH TMT 500W & GPH G60-400 Rebar:

Bar nominal diameter	Nominal weight	Cross-sectional area	App. Lengths per M.Ton	
			Metre	Feet
mm	Kg/m	mm ²		
8	0.395	50.3	2,532	8,307
10	0.616	78.5	1,621	5,318
12	0.888	113.1	1,126	3,694
14	1.21	153.86	826	2,711
16	1.579	201.1	633	2,077
18	2.000	254.34	500	1,640
20	2.466	314.2	405	1,330
22	2.985	380.3	335	1,100
25	3.854	490.9	259	850
28	4.836	616	207	680
32	6.313	804.2	158	518

Normally available length: 12 meters.

Bend Test Requirements of GPH Rebar:

Bar Size	P in Diameter for 180° Bend Test	
	GPH G 60-400	GPH TMT 500W
8, 10, 12, 14, 16	3.5d	3d
18, 20, 22, 25	5d	4d
28, 32	7d	6d

Note: *d = nominal diameter of specimen
*Test bends 180 unless noted otherwise

Rolling tolerances on nominal mass:

All sizes +Not specified
-6.0%

Bend Test is performed as per ASTM Standards. The test is conducted for each lot of production frequently to confirm the bendability. The test is conducted by the 1000KN Universal Testing Machine (UTM) from Hungta Instrument Co. Ltd., Taiwan.



Features of GPH TMT 500W Rebar:

GPH TMT 500W bar can be described as new generation high-strength steel having superior properties such as fire resistance, corrosion resistance, weldability, strength, ductility and bendability meeting highest quality standards at international level.

- Fire Resistance:** Withstands temperatures up to 5000 degrees Celsius.
- Corrosion Resistance:** The TMT process gives the bar superior strength and good anti-corrosive properties.
- Earthquake Resistance:** The soft ferrite-pearlite core enables the bar to bear dynamic and seismic loading.
- Superior Malleability:** TMT bars are most preferred because of its flexible nature.
- Better Weldability:** They have fine welding features.
- Excellent Bonding Strength:** External ribs running across the entire length of TMT bar give superior bonding strength between the bar and the concrete.
- Cost-effective:** A high tensile strength and better elongation value gives great savings.

