



SRMB TMT BAR BROCHURE

GENERAL & TECHNICAL INFORMATION

WHAT IS TMT

(THERMO-MECHANICAL TREATED) BARS?

Thermo-Mechanically Treated Bars (TMT Bars), are Extra High Strength Reinforcing bars which replaced any form of cold twisting, the technology of yesteryears. In this process, the steel TMT bars receive a short, intensive cooling as they pass through the specially designed Tempcore Water Cooling System after the last Rolling Mill Stand. The sudden quenching converts the surface layer of the steel bar to a hardened structure.

This phase of intensive cooling by the Tempcore System is followed by further cooling in atmosphere, so that the temperature between the core (which is steel hot) and the cooled surface layer is equalized, and the surface layer gets tempered by the heat from the core. The resulting structure is a tempered martensite zone at the periphery and a fine grain ferrite pearlite structure in the central zone.

PRODUCT RANGE

- **TMT BARS / De- formed Bar**

(Grade Fe-415/ 500/ 550 & Fe-415D, Fe500D, Fe 550D, Fe 600) - 8 mm - 50 mm dia.

- **AZAR BARS - Zinga Coated TMT BARS / De- formed Bars**

(Grade Fe-415/ 500/ 550 & Fe-415D, Fe500D, Fe 550D, Fe 600) - 8 mm - 50 mm dia.

- **TMT / De- formed Bars Corrosion Resistance Bars**

(Grade Fe-415/ 500/ 550 & Fe-415D, Fe500D, Fe 550D, Fe 600) - 8 mm - 50 mm dia.

PRODUCT BENEFITS



SUPERIOR STRENGTH

The different grades of SRMB TMT BARS are stronger than the conventional bars.



IMPROVED ELONGATION

Greater strength with higher elongation is one of the unique features of SRMB TMT Bars.



HIGH LOAD RESISTANT

The high fatigue-resistant property of SRMB TMT BARS helps in the dynamic loading on account of the high strength of the surface layer.



CORROSION RESISTANT

SRMB TMT Bars help prevent corrosion and enhance the life of the structures.



INCREASED DUCTILITY

The increased elasticity gives the bars a fantastic bending ability during construction.



SUPERIOR WELD-ABILITY

SRMB TMT Bars, because they have low carbon equivalent content, can be used for butt / lap and other weld joints without reduction in strength at the weld joints.

SRMB TMT BAR

TECHNICAL DESCRIPTION BREAKDOWN

Fe 415 grade

Fe 415 grade was the first innovation in TMT series which replaced conventional CTD bars with much better yield strength ductility and elongation. The journey of modern day construction steel started with the introduction of Fe-415 grade TMT bars .

Features of Fe 415 grade TMT Bars are as follows:

MECHANICAL PROPERTIES			CHEMICAL PROPERTIES			
0.2% Proof Stress / YS (N/mm ²) Max.	Tensile Strength (N/mm ²) Min	Elongation %	C (%)	S (%)	P (%)	S & P (%)
415.0	485.0	14.5	0.30	0.060	0.060	0.110

Section Meta Chart

The Standard section weight and difference with 'SRMB Srijan Private Ltd TMT is enumerated in the table below:

Benefits of Using SRMB's Srijan Pvt Ltd TMT Bars

Size mm Dia	Section Wt. gms./MT	Tolerance in Weight	
		ISI	SRMB TMT
8	395	± 7%	(-) 3%
10	617	± 7%	(-) 3%
12	888	± 5%	(-) 2%
16	1580	± 5%	(-) 2%
20	2470	± 3%	(-) 1%
25	3850	± 3%	(-) 1%

N.B.: These are indicative results of general standard lots of "SRMB TMT". There may be variance as per customer requirements are applicable standard.

Fe-415 D

The D variety of TMT bars were introduced by BIS in their latest armament in the year 2008. This category of TMT Bars demonstrate higher tensile strength and ductility on and above normal grade TMT bars. The D variety TMT bars are manufactured through special category of billets and critically controlled thermal treatment during manufacturing process. The best part of the D variety TMT bars is these are the ideal product for earthquake resistance and totally free of mechanical fatigue.

Features of Fe 415 grade TMT Bars are as follows:

MECHANICAL PROPERTIES			CHEMICAL PROPERTIES			
0.2% Proof Stress / YS (N/mm ²) Max.	Tensile Strength (N/mm ²) Min	Elongation %	C (%)	S (%)	P (%)	S & P (%)
415.0	500.0	18.0	0.25	0.045	0.045	0.085

Fe 500 Grade

Fe 500 grade TMT Bars were introduced as an one step up technological marvel over conventional fe 415 grade product . The superior tensile strength in Fe 500 TMT bars resulted in approximately 17% lesser consumption in steel in construction.

Features of Fe 500 grade TMT Bars are as follows:

MECHANICAL PROPERTIES			CHEMICAL PROPERTIES			
0.2% Proof Stress / YS (N/mm ²) Max.	Tensile Strength (N/mm ²) Min	Elongation %	C (%)	S (%)	P (%)	S & P (%)
500.0	545.0	12.0	0.30	0.055	0.055	0.105

Fe-500 D

Features of Fe 500 D grade TMT Bars are as follows:

MECHANICAL PROPERTIES			CHEMICAL PROPERTIES			
0.2% Proof Stress / YS (N/mm ²) Max.	Tensile Strength (N/mm ²) Min	Elongation %	C (%)	S (%)	P (%)	S & P (%)
500.0	565.0	16.0	0.25	0.040	0.040	0.075

Fe 500 Grade

Fe 550 grade & Fe 600 grade TMT Bars were introduced to further increase the technical excellence of TMT bars and propensity of consumption of steel in construction projects drastically got reduced due to much higher tensile strength and load bearing capabilities of these technologically superior grade of TMT bars. Gradually the structural engineer fraternity is inclining towards these high end TMT Bars.

Features of Fe 550 & Fe 600 grade TMT Bars are as follows:

Fe 500 Grade

MECHANICAL PROPERTIES			CHEMICAL PROPERTIES			
0.2% Proof Stress / YS (N/mm ²) Max.	Tensile Strength (N/mm ²) Min	Elongation %	C (%)	S (%)	P (%)	S & P (%)
550.0	585.0	10.0	0.30	0.055	0.050	0.100

Fe 500 Grade

MECHANICAL PROPERTIES			CHEMICAL PROPERTIES			
0.2% Proof Stress / YS (N/mm ²) Max.	Tensile Strength (N/mm ²) Min	Elongation %	C (%)	S (%)	P (%)	S & P (%)
550.0	600.0	14.5	0.25	0.040	0.040	0.075

Fe 500 Grade

MECHANICAL PROPERTIES			CHEMICAL PROPERTIES			
0.2% Proof Stress / YS (N/mm ²) Max.	Tensile Strength (N/mm ²) Min	Elongation %	C (%)	S (%)	P (%)	S & P (%)
600.0	660.0	10.0	0.30	0.040	0.040	0.075

SRMB CRS TMT BAR

SRMB CRS TMT Bar is produced by adding alloying elements like Cr, Cu, Ni, Mo and P, either individually or in combination, to improve allied product properties. In the Electric Furnace, corrosion resistant elements like phosphorus, copper/chromium are added to the molten steel, while carbon and sulphur is reduced further through refining and deslagging. The microalloyed molten steel are then casted into billets and rolled in a controlled quenching and tempering process to impart the desired corrosion resistant properties to the end product.

ADVANTAGES OF SRMB CRS BAR

- Longer life due to superior corrosion resistant
- High yield strength coupled with superior ductility and bendability
- No additional precaution required in material handling and transportation
- No extra operations required during fabrication
- Easy to weld
- Can be sent and re-bent using very small mandrel

WHAT ARE THE AREAS OF USE OF CRS TMT?

- Highly humid and moist areas
- Marine atmosphere
- Bridges, dams, roofing prone to seepage of water
- Back water areas

Deterioration of reinforced concrete by corrosion of the carbon steel reinforcing bars (Rebars) is a worldwide problem. The corrosion product (rust) occupies a greater volume than the original steel bar and this creates a pressure which causes cracking and subsequent bleeding of the surrounding concrete.

Corrosion of carbon steel rebars is greatly accelerated when chlorides are present in the concrete (coupled with requisite moisture and oxygen levels to sustain the corrosion reactions). This situation gets aggravated in constructions at the coastal areas due to inherent extra salinity in its surroundings.

However, there is increasing interest in the use of reinforcing materials that have inherently good corrosion resistance, thus minimizing the need for maintenance and monitoring of the structure. Faced with the problems of costly repair / replacement of important structures, the governing authorities are increasingly demanding a greater emphasis on Life Cycle Costs for new construction projects, as opposed to considering only the initial capital costs.

Billets manufactured from steel containing desired quantities of Copper and Chromium / Copper and Phosphorus having inherent corrosion-resistant properties are used for hot-rolling of CRS TMT rebars. The bars then undergo controlled quenching and tempering to impart the desired corrosion-resistant properties to the end product.

CHEMICAL COMPOSITION OF SRMB CRS BAR

CHEMICAL COMPOSITION OF CRS MATERIAL (Cu / P Grade)		CHEMICAL COMPOSITION OF CRS MATERIAL (Cu / Cr Grade)	
Elements	Composition	Elements	Composition
% C	0.15 (MAX.)	% C	0.15 (MAX.)
% Mn	0.50 (MIN.)	% Mn	0.50 (MIN.)
% Cu	0.30 (MIN.)	% Cu + Cr	0.40 (MIN.)
% P	0.120 (MAX.)	% P	0.120 (MAX.)
% Cr	Not Required		
REMARKS	Ref. : IS:1786/2008, Clause no. 4.2, note 3	REMARKS	Ref. : IS:1786/2008, Clause no. 4.2, note 3

PHYSICAL PROPERTIES OF SRMB CRS BARS

Grades	Yield Strength (N/mm2) Min	Tensile Strength, (N/mm2) Min	Elongation (%) Min
Fe - 415	415	10% more than actual 0.2 percent proof stress/Yield Stress but not less than 485 N/mm2	14.5
Fe - 415 D	415	12 % more than actual 0.2 percent proof stress/Yield Stress but not less than 500 N/mm2	18.0
Fe - 500	500	8 % more than actual 0.2 percent proof stress/Yield Stress but not less than 545 N/mm2	12.0
Fe - 500 D	500	10% more than actual 0.2 percent proof stress/Yield Stress but not less than 565 N/mm2	16.0
Fe - 550	550	6% more than actual 0.2 percent proof stress/Yield Stress but not less than 585 N/mm2	10.0
Fe - 550 D	550	8% more than actual 0.2 percent proof stress/Yield Stress but not less than 600 N/mm2	14.5
Fe - 600	600	6% more than actual 0.2 percent proof stress/Yield Stress but not less than 660 N/mm2	10.5



An ISO 9001, ISO 14001 & OHSAS 18001 Company

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