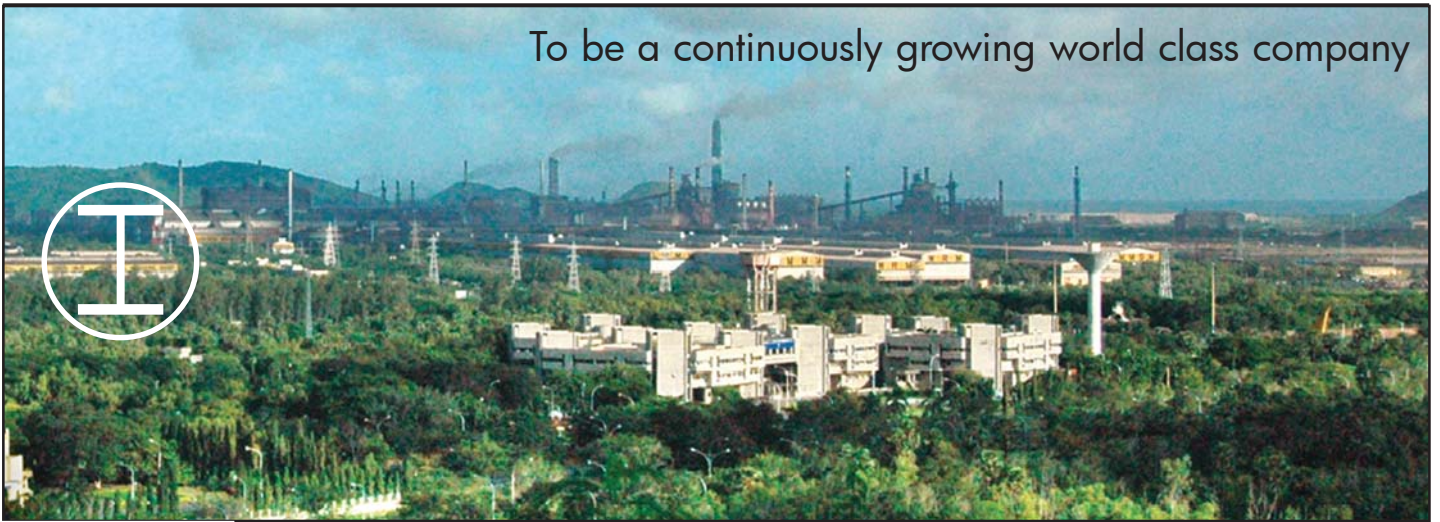


To be a continuously growing world class company



Rashtriya Ispat Nigam Limited, the corporate entity of Visakhapatnam Steel Plant is the only shore based integrated steel plant in the country.

Visakhapatnam Steel Plant popularly known as VIZAG STEEL has been a symbol of innovativeness and excellence right from its nascent stage and is consistently producing well above 3.5 Mtpy.

Basically a long product manufacturer, VIZAG STEEL pioneered several technological trends in the Indian Steel Industry, be it the 7 Mtr. tall Coke Oven Batteries, 3200 Cum. Blast Furnaces, 100% Continuous Casting, Tempcore and Stelmor thermal treatment processes.

VIZAG STEELs deep commitment to Customer delight, Quality, Health, Safety and Environment is reiterated by being the first integrated steel plant in the Country to be certified for ISO 9001:2000, ISO 14001 and OHSAS 18001 Standards.

Total automation, timely up-gradation and seamless integration of facilities and processes enable VIZAG STEEL to produce a wide range of grades in diverse shapes like the TMT Bars, Wire rod Coils, Angles, Channels, Beams, Rounds, Squares and Billets to exacting National and International standards meeting the stringent demands of the discerning customers.

The eternal waves of the Bay of Bengal have become an intrinsic part of VIZAG STEELs culture to face the challenges of change through its technical know how to produce tailor made special steels to suit the Automobiles, Engineering, Wire drawing and Railway sectors.

Twenty four Branch Sales Offices and Stockyards spread across the length and breadth of the country ensure the availability of VIZAG STEEL to customers at their doorstep. With a fully computerized Marketing network, VIZAG STEEL attains a high level synergy in meeting the rising and ever changing needs of the customer.

Complemented by a young and vibrant workforce with a passion to excel and powered by creativity, VIZAG STEEL is the most sought after steel maker in the Nation, and all set to conquer new horizons.

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Infrastructure Indian and Beyond



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WIRE RODS

5.5, 6, 6.5, 7, *7.5, 8, *9, 10, *11, 12, 12.7, *13, 14 mm

ROUNDS

16, *16.5, *17.5, 18, 20, **20.64, 22, 25, 28, 32, 33.5, 34, 36, 38, 40, 42, 45, 46.5, 48, 50, 53, 56, 60, 63, 65, 71, 75, 77, 80 mm

REINFORCEMENT BARS

8, 10, 12 mm in straightened or coil form
 16, *18, 20, *22, 25, 28, 32, 36 mm in straight lengths

ANGLES

*50 x 50 x 5/6 mm
 *60 x 60 x 5/6 mm
 *65 x 65 x 6 mm
 75 x 75 x 6/8 mm
 90 x 90 x 6/8 mm
 100 x 100 x 8/10 mm
 110 x 110 x 8/10 mm

CHANNELS

MC *40 x 32 x 5.0 mm
 MC *75 x 40 x 4.8 mm
 MC 100 x 50 x 5.0 mm
 MC 125 x 65 x 5.3 mm
 MC 150 x 75 x 5.7 mm

BLOOMS

245 x 245 mm --- 5.5 --- 6.08 mts
 315 x 245 mm --- 6.0 --- 6.40 mts

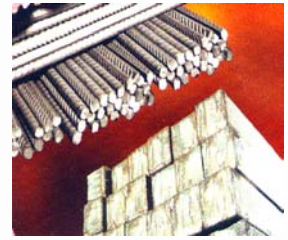
GRADES

BLOOMS : Mild Steel/Low, Medium & High Carbon Steel, Forging Quality
BILLETS : Mild Steel, Low, Medium & High Carbon, Spring Steel, High Mn & Forging Quality Steels.
ROUNDS : Mild Steel, Low, Medium Carbon, Bright Bar & Forging Quality
REBARS : Thermo Mechanically Treated (TMT) bars of different yield strengths.
STRUCTURALS : Structural Steel and High Tensile Steel.
WIRE RODS : Low Carbon, Wire drawing, Bright Bar, Electrode Quality, Cold Heading Quality, Tyre-bead and other High Carbon Grades.

* Not regular rolled ** Only 55 Si7 grade spring steel rounds for "ERC" application.
 ○ All the above materials can be supplied conforming to various international specifications also.



Bundle Weights
4.5 tonnes to 10 tonnes (max)



Bundle Weights
4.5 tonnes to 10 tonnes (max)



Compacted, Coil
Weight 1.2 MT approx



Nested and Interlocked

BEAMS

IPE - BEAMS *180 x 91 x 5.3 mm
HE - BEAMS *120 x 114 x 5.0 mm
ISMB BEAMS 125 x 70 x 5.0 mm
 150 x 75 x 5.0 mm
 175 x 85 x 5.8 mm

BILLETS

125	x	125 mm	---	8.0	---	10.4 mts
90	x	90 mm	---	6.0	---	12.0 mts
75	x	75 mm	---	6.0	---	12.0 mts
65	x	65 mm	---	6.0	---	12.0 mts



Produced by STELMOR controlled-cooling process from fully killed steel.

Diameter Range (mm) :

5.5 6 6.5 7 *7.5 8 *9 10 *11 12 12.7 *13 14

Specifications :

Grade	Conforming to
Wire drawing	: IS : 7887 GR.3 & GR.5 - 1992 ASTM A 510 M (SAE 1008 / 1010 / 1012 / 1015 / 1018)
Construction / Structural	: IS 2062 E250A - 2006

Wire rods are manufactured in special steel grades also for various applications like Coldheading. Tyre-bead, Cable armouring, Electrodes, Pre-stressed Concrete wire etc.,

Tolerance as per

IS : 7887 - 1992

IS : 1852 - 1985

Special Features :

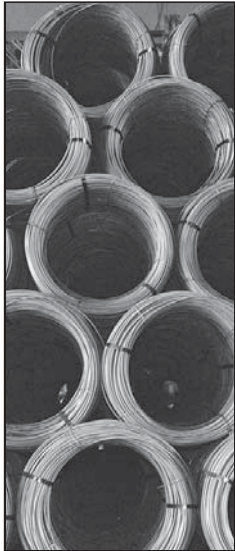
- Stelmor cooling process ensures uniform grain size, and desired metallurgical and mechanical properties.
- Tungsten carbide rings in pre-finishing and finishing Morgan blocks ensure excellent surface finish and rigid dimensional tolerance.
- High pressure compactors with automatic tying retain tight and proper coil shape.

Packing : Bare, tied coils of approx. 1.2 metric tonnes weight,
Coil OD 1250 mm max., ID 725 mm max., height 1400 mm max.

Invoicing : As per actual weight.

Quantity & Shipment : On mutually agreed terms.

*Not regularly rolled



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VIZAG TMT RE-BARS



Produced from fully killed steel :

Size (mm)	Sectional Wt. (Range) Kg/m
8	0.363 to 0.426
10	0.567 to 0.666
12	0.835 to 0.941
16	1.501 to 1.659
18	1.940 to 2.060
20	2.396 to 2.544

Size (mm)	Sectional Wt. (Range) Kg/m
22	2.891 to 3.069
25	3.735 to 3.966
28	4.685 to 4.975
32	6.121 to 6.499
36	7.750 to 8.230

Specifications :

Grade : Conforming to
 Constructional : IS : 1786 - 1985

Standard	Grade	Remarks	Yield Strength (N / mm ²) min	UTS (N / mm ²)min	% Elongation min
IS : 1786-1985	Fe 415	-	415	485	14.5
IS : 1786-1985	Fe 500	-	500	545	12
IS : 1786-1985	Fe 550	-	550	585	8
Re-bars with corrosion resistant elements	CRM	Cu+Cr+P = 0.75% min	415	485	14.5
	HSCRM	Cu+Cr+P = 0.75% min	500	545	12

Note : Sizes 8,10 and 12 mm are not regularly rolled in Fe 550 Grades

Tolerance as per
 IS : 1786 - 1985

Length : 12 meters in general, can also be supplied
 in 9 meters on mutual agreement

Special Features :

- . Low carbon content and made from fully killed steel.
- . Higher yield strength, Ultimate tensile strength and higher percentage elongation when compared to cold twisted bars of same grade.
- . Easy bendability, weldability and excellent ductility ensures economy and safety of use.
- . In-built ability to resist loss of strength at higher temperature.
- . Require less energy for bending and re-bending along with superior reverse bending properties.
- . Can be butt welded or lap-welded.
- . Use of Fe-500 grade results in saving more than 15% in steel consumption when compared to cold twisted bars.
- . Higher corrosion resistance and seismic resistance compared to CTD.
- . Ideally suited for any type of concrete structure.

Packing : Bare, in strapped bundles / piles weighing 7 to 8 metric tonnes approximately.
 Invoicing : As per actual weight.
 Quantity & Shipment : On mutually agreed terms

31R, 31D, 31E, 31F
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 317, 318, 319, 320
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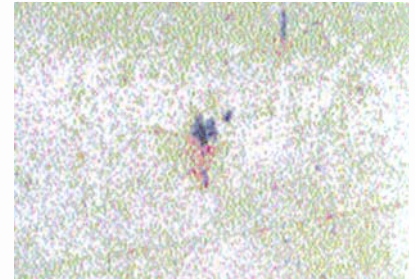
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The added Advantages

...of Vizag TMT over others in the market.

The only plant to adapt this technology (QST) for production of rebars from the design stage. Hence, the total extent of the superior technology could be harnessed. 120 metres length of the cooling bed available for self tempering which no other mill in India can match is the testimony for this.

These bars are made from virgin steel in Blast Furnace - Basic Oxygen Furnace - Continuous Casting route. Steel is fully killed made from best Quality Raw Materials. Rolling is done in the state of the art Rolling Mills with latest technologies. Not even a single ton of Rebar is produced by conversion.



Very clean steel with distinctly low tramp element contents. Typical Inclusion rating as per IS:4163-1982

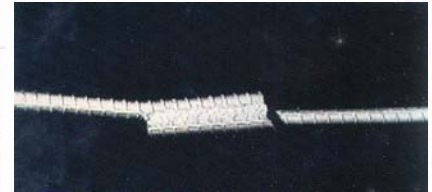
A	B	C	D (Thin Series)
0.5	0.5	0.5	1.0

Can be butt welded or lap welded

The low carbon content and low carbon equivalent of VIZAG TMT reinforcement bars ensure excellent weldability even while using any of the welding processes such as arc welding, flash butt welding, gas shielded semi automatic welding, gas pressure welding and resistance welding etc. Welding of these bars does not require pre-heating or post heating. VIZAG TMT bars indicate good welding properties in case of butt welds, cross welds and lap welds. Tensile tests carried out on these reinforcing bars after butt welds, cross welds and lap welds have shown no failure at the weld joints. Normal electrodes with matching strength can be used for welding.

In the welding of steel, the tendency to produce hard and brittle heat affected zones is maximum when the cooling rates of the weld and the carbon content are high. In

addition, in those welding processes, where molten metal filler is used, such as in manual metal arc welding, hydrogen pick up may occur leading to hydrogen induced cracking in the heat affected zone. In case of welding reinforcement bars, hard brittle welds of low ductility and heat affected zone can occur in susceptible steels due to fast cooling rates. VIZAG TMT bars have got very low susceptibility to both heat affected zone brittleness and hydrogen induced cracking due to their low carbon content. These bars when welded show no loss of strength at the load carrying joints.





Higher fatigue strength

Fatigue test carried out on VIZAG TMT bars (by subjecting to alternate tensile stressing) has shown that the fatigue strength of the bars is equal to the reinforcement bars produced by other methods. The fatigue test was also carried out on bent and angled bars encased in concrete. The results were obtained by using constant amplitude loading of 200 MPa with a maximum stress equal to 0.7 X Yield Strength. The fatigue strength of these bars meets the requirements given in various International Standards.

ADDITIONAL COST SAVING BY USING TMT BARS WITH WELDED LAP JOINTS

For a dia = 20 mm
 $f_y = 415 \text{ N/mm}^2$ and $f_{ck} = 20 \text{ N/mm}^2$ grade of concrete

Type of lap	Lap length reqd.	Material requirement	Cost	% cost saving per joint of a single bar
Conventional Joint	50 X dia (average) = 1000 mm	2.47 Kg of bar @ Rs. 28,000/- per Tonne	Rs. 69-00	51.2 %
For welding	6.3 dia = 126mm	0.31 Kg of bar @ Rs.28,000/- Per Tonne 2.5 Electrodes of 4mm dia and 450 long and other expenses	Rs. 8.68 Rs.25.00 Rs. 33.68	

Recommended welding length For VIZAG TMT 415 = 6.3 X dia
 VIZAG TMT 500 = 7.0 X dia
 VIZAG TMT 550 = 7.5 X dia

IS 2751 - 1979 - Welding Code

* Indicative market price, which will change from time to time

Economy and Savings in Steel

The use of High strength Fe 500 VIZAG-TMT rebars has numerous advantages over normal Fe 415 rebars. It leads to savings in steel in terms of weight and there by cost.

Section	Example	Grade of Concrete	Grade of Steel	Quantity in Kgs	% Saving in Wt, over normal 415
Doubly Reinforced Beam (5m Long)	300mm X 500mm M lim=234.5 KNM SF lim=187.5 KN d'/d = 0.1	15	Normal 415	115	
		15	VIZAG TMT 500	99	14
		15	VIZAG TMT 550	93	19.13
		20	Normal 415	104	-
		20	VIZAG TMT 500	89	14.5
		20	VIZAG TMT 550	83	20.2
Doubly Reinforced Beam (6m Long)	300mm X 600mm M lim=507 KNM SF lim=337.5 KN d'/d = 0.075	15	Normal 415	260	
		15	VIZAG TMT 500	218	16
		15	VIZAG TMT 550	204	21.5
		20	Normal 415	245	
		20	VIZAG TMT 500	207	15.5
		20	VIZAG TMT 550	198	20

Produced from fully killed steel :

Size (mm)	Sectional Wt. (Range) Kg/m
8	0.363 to 0.426
10	0.567 to 0.666
12	0.835 to 0.941
16	1.501 to 1.659
18	1.940 to 2.060
20	2.396 to 2.544

Size (mm)	Sectional Wt. (Range) Kg/m
22	2.891 to 3.069
25	3.735 to 3.966
28	4.685 to 4.975
32	6.121 to 6.499
36	7.750 to 8.230

	Yield Strength (N/mm ²)	UTS (N/mm ²)	UTS / YS	Elongation (%)
IS : 1786-1985 Fe 415	415	485	1.17	14.5
VIZAG TMT (Typical)	478	572	1.20	24.0
IS : 1786-1985 Fe500	500	545	1.09	12.0
VIZAG TMT (Typical)	550	648	1.18	22.0
IS : 1786-1985 Fe550	550	585	1.06	8.0
VIZAG TMT (Typical)	611	707	1.16	20.0

Comparison of Fe 500 with International Standards

	Grade	UTS N/mm ²	YS	% Elongation
ASTMA 615	75	690	520	6-7
JISG 3112	SD 490	620	490-625	12-13
BS4449	500	525-675	500	12
DIN-488	BST-500	550	-----	8
New Zealand	500N	650	-----	5
Australia	500N	-----	-----	---
IS 1786-1985	Fe 500	545	500	12
VIZAG TMT (Typical) Fe 500		648	550	22

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PLAIN ROUNDS



Produced from fully killed steel :

Size(mm)	Nominal Wt. (Kg/m)	Size(mm)	Nominal Wt. (Kg/m)
16	1.58	40	09.85
* 16.5	1.68	42	10.88
* 17.5	1.89	45	12.50
18	2.00	46.5	13.33
20	2.47	48	14.21
20.64	2.63	50	15.40
22	2.98	53	17.32
25	3.85	56	19.30
28	4.83	60	22.20
32	6.31	63	24.50
33.5	6.92	65	26.00
34	7.13	71	31.09
36	7.99	75	34.70
38	8.91	77	36.57
		80	39.47

Specifications :

Grade

Conforming to

Structural	: IS 2062 E250A - 2006
Forging / Bright Bar	} 20C 15, 27C 15, SAE 1524S, SAE 1524CR CK-45, EN8, EN8A, EN8D, EN9, SAE 1049, 35C8 SAE 1524, EN15B, 37C15, A105, 40Cr4 etc.
Medium Carbon, High Mn Steel	
Spring Steel	
Case Hardening Steels	: 20MnCr5, 16MnCr5

Special Features :

- Bundling and automatic tying / strapping of the rounds ensure minimum damage during handling and transport.
- Tension free rolling in the Light and Medium Merchant Mill ensures close dimensional tolerances.
- 38 mm and below are rolled in Light and Medium Merchant Mill and other rounds are rolled in Medium Merchant and Structural Mill.

Packing : Bare, in strapped bundles weighing 4 to 5 T upto 36 φ & 8 to 9 T for above 36 φ approximately.

Invoicing : As per actual weight.

Quantity & Shipment : On mutually agreed terms

3118, 3118, 3118, 3118
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VIZAG UKKU STRUCTURALS



Rolled from fully killed steel.

Size (mm) & Nominal Weight :

ANGLES	Nominal Wt. (Kg/m)	CHANNELS	Nominal Wt. (Kg/m)	BEAMS	Nominal Wt. (Kg/m)
*50 x 50 x 5/6	3.8/4.5	*MC 40 x 32 x 5	4.82	*IPE 180 x 91 x 5.3	18.80
*60 x 60 x 5/6	4.5/5.4			*HE 120 x 114 x 5	19.90
*65 x 65 x 6	5.8	*MC 75 x 40 x 4.8	7.14		
75 x 75 x 6	6.8			ISMB	
75 x 75 x 8	8.9	MC 100 x 50 x 5	9.56	125 x 70 x 5	13.30
90 x 90 x 6	8.2			150 x 75 x 5	15.00
90 x 90 x 8	10.8	MC 125 x 65 x 5.3	13.10	175 x 85 x 5.8	19.60
100 x 100 x 8	12.1				
100 x 100 x 10	14.9	MC 150 x 75 x 5.7	16.80		
110 x 110 x 8	13.4				
110 x 110 x 10	16.6				

Sectional properties as per :

For Angles : IS : 808 - 1989
 For Channels : IS : 808 - 1989 / IS : 3954 - 1991
 For Beams : DIN : 1025 - 1994 / IS : 12778 - 1989 / IS : 808 - 1989

Tolerance as per :

For Angles : IS : 1852 - 1985
 For Channels : IS : 1852 - 1985 / IS : 3954 - 1991
 For Beams : DIN : 1025 - 1994 / IS : 12779 - 1989 / IS : 1852 - 1985

Grades as per :

For Angles : IS : 2062 : E250 A - 2006
 For Channels : IS : 2062 : E250 A - 2006
 For Beams : IS : 2062 : E250 A - 2006

Special Features :

- Piling and automatic tying of the structurals ensure minimum damage during handling and transport.
- Tension free rolling ensures closer tolerances and negative sectional weight.
- Universal beam rolled in Medium Merchant & Structural Mill is the most economical section which has got better sectional properties, has a simple symmetrical cross section providing more flexibility to designer, fabricator and erector. This section can result in saving of 15% Steel.

Packing : Bare, in strapped bundles / piles weighing 8.3 metric tonnes approximately.
 Invoicing : As per actual weight.
 Quantity & Shipment : On mutually agreed terms.

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PRODUCT : WIRE ROD COILS

Grade	Designation	Chemical Composition					Mechanical Properties		
		C%	MN %	P% (MAX)	S% (MAX)	Si %	UTS %	ELONG %	%RA
VSP	HC50	0.46-0.50	0.50-0.80	0.035	0.035	0.15-0.35	80-90	16	40
VSP	HC55	0.51-0.55	0.50-0.80	0.035	0.035	0.15-0.35	85-95	15	35
VSP	HC60	0.56-0.60	0.50-0.80	0.035	0.035	0.15-0.35	90-100	15	35
VSP	HC65	0.61-0.65	0.50-0.80	0.035	0.035	0.15-0.35	95-105	13	30
VSP	HC70	0.66-0.70	0.50-0.80	0.035	0.035	0.15-0.35	100-110	13	30
VSP	HC75	0.71-0.75	0.50-0.80	0.035	0.035	0.15-0.35	105-115	12	25
VSP	HC80	0.76-0.80	0.50-0.80	0.035	0.035	0.15-0.35	110-120	12	25
VSP	HC85	0.81-0.85	0.50-0.80	0.035	0.035	0.15-0.35	115-125	12	25
VSP	PC 115	0.73-0.85	0.50-0.80	0.035	0.035	0.15-0.35	115 MIN	12	25*
VSP	VIZAGTBQ	0.68-0.72	0.50-0.80	0.035	0.035	0.15-0.35	100-110	13	30

*%Cr.0.15-0.25

Sizes : 5.5/6.0/6.5/7.0/8.0/10.0/12.0/12.7/14.0 mm

Coil Weight : 1.2 mt approx

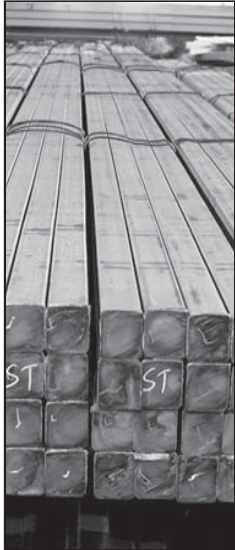
Remarks : For 7 - 9mm UTS is 5 Kgf/mm² lower and for 10 - 13 mm UTS is 10 Kgf/mm² lower

PRODUCT : MMSM ROUNDS & BILLETS

Grade	Designation	Chemical Composition							B%
		C %	MN %	P% (MAX)	S% (MAX)	Si%	Al%(MIN)	Cr%	
ASTM	SAE 1008	0.10 MAX	0.30-0.50	0.04	0.04	0.15-0.35	0.02	-	
ASTM	SAE 1020	0.18-0.23	0.30-0.60	0.04	0.04	0.15-0.35	0.02	-	
ASTM	SAE 1022	0.18-0.23	0.70-1.00	0.04	0.04	0.15-0.35	0.02	-	
VSP	SAE 1023S	0.20-0.25	0.70-1.00	0.04	0.04	0.15-0.35	0.02	-	
VSP	SAE 1025S	0.21-0.30	0.40-0.65	0.04	0.04	0.15-0.35	0.02	-	
VSP	SAE 1029S.	0.26-0.30	0.70-0.90	0.04	0.04	0.15-0.35	0.02	-	
ASTM	SAE 1030	0.28-0.34	0.60-0.90	0.04	0.05	0.15-0.35	0.02	-	
ASTM	SAE 1049	0.46-0.50	0.60-0.90	0.04	0.04	0.15-0.35	0.02	-	
BS 970	EN8	0.35-0.45	0.60-1.00	0.04	0.04	0.05-0.35	0.02	-	
BS 970	EN8D	0.40-0.45	0.70-0.90	0.04	0.04	0.05-0.35	0.02	-	
BS 970	EN9	0.50-0.60	0.60-0.80	0.04	0.04	0.05-0.35	0.02	-	
VSP	SAE 1524S	0.16-0.21	1.35-1.65	0.04	0.04	0.15-0.35	0.02	-	
VSP	SAE 1524Cr	0.23-0.28	1.35-1.65	0.04	0.04	0.15-0.35	0.02	0.20-0.30	
VSP	55Si7	0.50-0.60	0.80-1.00	0.04	0.04	1.50-2.00	-	-	
VSP	60Si7	0.55-0.65	0.80-1.00	0.04	0.04	1.50-2.00	-	-	
VSP	65Si7	0.60-0.70	0.80-1.00	0.04	0.04	1.50-2.00	-	-	
ASTM	A 105	0.20-0.25	0.85-1.15	0.035	0.035	0.15-0.35	0.02	-	
JIS G 4801	SUP9	0.52-0.60	0.65-0.95	0.035	0.035	0.15-0.35	-	0.65-0.95	
DIN	40CR4	0.35-0.40	0.60-0.90	0.035	0.035	0.15-0.35	0.02	0.90-1.20	
DIN	41CR4	0.36-0.44	0.60-0.90	0.035	0.035	0.15-0.35	0.02	0.90-1.20	
BS 970	EN15	0.30-0.40	1.30-1.70	0.05	0.05	0.05-0.35	0.02	-	
BS 970	EN15B	0.35-0.40	1.10-1.30	0.04	0.04	0.05-0.35	0.02	-	
VSP	20C15	0.16-0.24	1.30-1.70	0.035	0.035	0.10-0.35	0.02 (Min)	-	
ASTM A510	SAE 1018	0.15-0.20	0.60-0.90	0.04	0.04	0.15-0.35	0.02 (Min)	-	
VSP	27C15	0.22-0.32	1.3-1.7	0.035	0.035	0.15-0.35	0.02 (Min)	-	
BS 970	EN32B	0.10-0.18	0.60-1.00	0.05	0.05	0.15-0.35	0.02	-	
DIN-17210	20MNCr5	0.17-0.22	1.10-1.40	0.035	0.035	0.15-0.40	0.02	1.0-1.30	
DIN-17210	16MNCr5	0.14-0.19	1.00-1.30	0.035	0.035	0.15-0.40	0.02	0.80-1.1	
JIS G 4801	SUP11A	0.56-0.64	0.70-1.00	0.035	0.035	0.15-0.35	-	0.70-1.00	0.0005-0.003
VSP	35C8	0.35-0.40	0.60-0.90	0.04	0.04	0.15-0.35	0.02	-	
VSP	CK-45	0.42-0.50	0.50-0.80	0.035	0.035	0.15-0.35	0.02 (Min)	-	
VSP	EN8A	0.33-0.38	0.70-0.90	0.04	0.04	0.15-0.35	0.02 (Min)	-	
VSP	VIZAG TIT	0.17-0.22	1.20-1.60	0.04	0.04	0.15-0.35	0.015 (Min)	-	0.03 (Min)
Size									
Billets		: 75 x 75 mm; 65 x 65 mm; 90 x 90 mm				Length : 6 - 12 mts			
Rounds		: 40, 42, 45, 46.5, 48, 50, 53, 56, 60, 63, 65, 71, 75, 77, 80 mm							

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PRODUCT : WIRE ROD COILS

Chemical Composition

Grade	Designation	C %	MN %	P% (MAX)	S% (MAX)	Si %	Al % (MIN)	Cr%	B %
ASTM A510	SAE 1008	0.10MAX	0.30-0.50	0.04	0.04	0.15-0.35	0.02	-	-
ASTM A510	SAE 1010	0.08-0.13	0.30-0.60	0.04	0.04	0.15-0.35	0.02	-	-
VSP	SAE 1010W	0.08-0.12	0.70-0.90	0.04	0.04	0.30 MAX	0.02	-	-
ASTM A510	SAE 1012	0.10-0.15	0.30-0.60	0.04	0.04	0.15-0.35	0.02	-	-
ASTM A510	SAE 1015	0.13-0.18	0.30-0.60	0.04	0.04	0.15-0.35	0.02	-	-
ASTM A510	SAE 1016	0.13-0.18	0.60-0.90	0.04	0.04	0.15-0.30	0.02	-	-
ASTM A510	SAE 1018	0.15-0.20	0.60-0.90	0.04	0.04	0.15-0.30	0.02	-	-
IS 2879	EW-NR	0.10 MAX	0.38-0.62	0.025	0.025	0.03 MAX	0.012 MAX	-	-
VSP	EQ-NR	0.10 MAX	0.38-0.62	0.03	0.03	0.03 MAX	-	-	-
VSP	CAQ	0.07 MAX	0.5 MAX	0.035	0.035	0.05 MAX	-	-	-
BS 970	EN8D	0.40-0.45	0.70-0.90	0.04	0.04	0.05-0.35	-	-	-
BS 970	EN8	0.35-0.45	0.60-1.00	0.04	0.04	0.05-0.35	-	-	-
BS 970	EN32B	0.10-0.18	0.60-1.00	0.05	0.05	0.15-0.35	0.02 (Min)	-	-
VSP	EN8A	0.33-0.38	0.70-0.90	0.04	0.04	0.15-0.35	0.02 (Min)	-	-

PRODUCT : LMMM ROUNDS & BILLETS

Grade	Designation	Chemical Composition							
		C %	MN %	P% (MAX)	S% (MAX)	Si%	Al% (MIN)	Cr%	B%
ASTM	SAE 1010	0.08-0.13	0.30-0.60	0.04	0.04	0.15-0.35	0.02	-	-
VSP	SAE 1012S	0.10-0.15	0.30-0.60	0.04	0.04	0.15 max	0.02	-	-
ASTM	SAE 1020	0.18-0.23	0.30-0.60	0.04	0.04	0.15-0.35	0.02	-	-
VSP	SAE 1023S	0.20-0.25	0.60-1.00	0.04	0.04	0.15-0.35	0.02	-	-
VSP	SAE 1029S	0.26-0.30	0.70-0.90	0.04	0.04	0.15-0.35	0.02	-	-
ASTM	SAE 1030	0.28-0.34	0.60-0.90	0.04	0.04	0.15-0.35	0.02	-	-
BS 970	EN8	0.35-0.45	0.60-1.00	0.04	0.04	0.05-0.35	0.02	-	-
BS 970	EN8D	0.40-0.45	0.70-0.90	0.04	0.04	0.05-0.35	0.02	-	-
BS 970	EN9	0.50-0.60	0.50-0.80	0.04	0.04	0.05-0.35	0.02	-	-
ASTM	SAE 1049	0.46-0.50	0.60-0.90	0.04	0.04	0.15-0.35	0.02	-	-
ASTM	SAE 1541	0.36-0.44	1.35-1.65	0.04	0.04	0.15-0.35	0.02	-	-
VSP	SAE 1524S	0.16-0.21	1.35-1.65	0.04	0.04	0.15-0.35	0.02	-	-
VSP	SAE 1524Cr	0.23-0.28	1.35-1.65	0.04	0.04	0.15-0.35	0.02	0.20-0.30	-
VSP	37C15	0.32-0.42	1.30-1.70	0.035	0.035	0.15-0.35	0.02	-	-
BS970	EN32B	0.10-0.18	0.60-1.00	0.05	0.05	0.15-0.35	0.02 (Min)	-	-
VSP	27C15	0.22-0.32	1.30-1.70	0.035	0.035	0.15-0.35	0.02 (Min)	-	-
ASTM A510	SAE1018	0.15-0.20	0.60-0.90	0.04	0.04	0.15-0.35	0.02 (Min)	-	-
ASTM	A105	0.20-0.25	0.85-1.15	0.035	0.035	0.15-0.35	0.02	-	-
DIN-17210	20MnCr5	0.17-0.22	1.10-1.40	0.035	0.035	0.15-0.35	0.02	1.00-1.30	-
DIN	40CR4	0.35-0.40	0.60-0.90	0.035	0.035	0.15-0.35	0.02	0.90-1.20	-
DIN	41CR4	0.36-0.44	0.60-0.90	0.035	0.035	0.15-0.35	0.02	0.90-1.20	-
VSP	55Si7	0.50-0.60	0.80-1.00	0.04	0.04	1.50-2.00	-	-	-
VSP	60Si7	0.55-0.65	0.80-1.00	0.04	0.04	1.50-2.00	-	-	-
VSP	65Si7	0.60-0.70	0.80-1.00	0.04	0.04	1.50-2.00	-	-	-
BS 970	EN43D	0.60-0.65	0.40-0.60	0.04	0.015-0.035	0.15-0.35	-	-	-
VSP	35C8	0.35-0.40	0.60-0.90	0.04	0.04	0.15-0.35	0.02	-	-
VSP	SAE 1010S	0.08-0.12	0.30-0.60	0.04	0.04	0.10	0.02	-	-
VSP	CK-45	0.42-0.50	0.50-0.80	0.035	0.035	0.15-0.35	0.02 (Min)	-	-
VSP	EN8A	0.33-0.38	0.70-0.90	0.04	0.04	0.15-0.35	0.02 (Min)	-	-

Sizes

Billets : 125 x 125 mm

Length : 8 - 10.4 mts

Rounds : 16, 18, 20, 22, 25, 28, 32, 33.5, 34, 36, 38 mm

Length : 6 - 12 mts

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AMMONIUM SULPHATE

Nitrogen by weight	% min	:	20.6
Moisture by weight	% max	:	1.00
Free acidity	% max	:	0.04

CRUDE COAL TAR

Specific gravity at 20 °C	:	1.16 - 1.20
Moisture % max	:	6.00
* Viscosity (E deg) at 93 °C	:	1.70 - 5.00
* Residue on distillation (above 360 °C) % min	:	53
* Toluene insoluble % max	:	14
* Quinolene insoluble % max	:	5

COAL TAR FUEL / PITCH CREOSOTE MIXTURE (PCM)

* Moisture % max	:	4.00
* Viscosity (E deg) at 93 °C	:	2 - 8

HOT PRESSED NAPHTHALENE

Colour	:	White or Light Brown
Crystallisation point	:	78.50 °C
* Ash (by weight) max	:	0.20
* Toluene insoluble % max	:	0.20
* Moisture % max	:	0.50

DRAINED NAPHTHALENE OIL

Specific gravity at 20 °C (max)	:	1.02
Moisture % max	:	4.00
Naphthalene %	:	30 - 50

PHENOL FRACTIONS

Specific gravity at 20 °C	:	0.99 - 1.00
* Distillation 0 - 210 °C	:	95%
Phenol %	:	20 - 30
Naphthalene % max	:	30
Moisture % max	:	4.00

LIGHT SOLVENT OIL (LSO)

Specific gravity at 15 °C	:	0.850 min	
* Distillation range	upto 125 °C ml	:	5 max
	upto 170 °C ml	:	90 min
* Residue on evaporation	mg / 100 ml	:	10
* H ₂ S & mercaptans		:	Negative

(* These parameters will be included in the Test Certificate on agreement with the customers)

COKE FRACTIONS :

BF Coke (25-80 mm), Nut Coke (10 - 25 mm), Coke Breeze, Coke Dust.

MEDIUM HARD PITCH

Softening Point (R & B) °C	Coking Value (Conradson) %	Toluene insoluble %	Quinolene insoluble %	Ash Content %
95 - 115	48 min	25 min	12 max	0.3 max




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BENZENE

Relative density 15.6/15.6 °C	:	0.879 - 0.886
* Distillation range 1-96 %	:	0.60 °C (including 80.1 °C)
* Residue on evaporation mg/100ml	:	5
* Total sulphur ppm max	:	2.00
* H ₂ S & Mercaptans	:	Negative
* Crystallisation point °C min	:	5.30
* Non-aromatics ppm max	:	500
Purity (by GLC method) min %	:	99.93

TOLUENE

Specific gravity at 15 / 15 °C	:	0.870 - 0.874
* Distillation range 1 - 96 %	:	0.60 °C (including 110.6 °C)
* Residue on evaporation mg/100ml	:	5.00
H ₂ S & Mercaptans	:	Negative
Purity (by GLC method) min %	:	99.2

COAL TAR WASH OIL

Specific gravity at 38 °C	:	1.04 - 1.08
Moisture %	:	4.00 max
* Distillation	upto 230 °C %	10.00 max
	230 - 300 °C %	85.00 max
	above 300 °C %	5.00 max
Naphthalene %	:	15.00 max

ANTHRACENE OIL

Specific gravity at 20 °C	:	1.12 max
Moisture %	:	3.00 max
* Distillation upto 300 °C %	:	20.00 max

SOL-110 (NON AROMATICS)

Specific gravity at 15 °C	:	0.84 min
* Distillation range 1-95 %	:	55-110 °C

HEAVY CRUDE BENZOL

Specific gravity	:	0.92 - 1.10
Moisture	:	5 % max
Naphthalene	:	20 - 25 %

B.F. SLAG

Specification :	CaO : 30 - 38%,	SiO ₂ : 30 - 40%,	Al ₂ O ₃ : 15 - 22%
	MgO : 8 - 11%,	FeO : 5 % Max,	Mn : 2 % Max

GASES

Liquid Oxygen, Liquid Nitrogen, Argon Gas and Liquid Argon



WIRE RODS

MEDIUM / LOW CARBON

Specifications	Grade / Chemistry	Remarks
ASTM A510-00	SAE 1008 (Si-0.30% Max)	UTS: 430 N/ mm ² Max
ASTM A510-00	SAE 1010 (Si-0.30% Max)	UTS: 450 N/ mm ² Max.
ASTM A510-00	SAE 1012 (Si-0.30% Max)	UTS: 470 N/ mm ² Max.
ASTM A510-00	SAE 1015 (Si-0.30% Max)	UTS: 510 N/ mm ² Max.
Electrode Quality	C- 0.10% Max; S,P & Si-0.03% each Max; Mn-0.35-0.62% & Al-0.02-0.05%	

HIGH CARBON

Grade	C%	Mn%	S & P%	Si%	MECHANICAL PROPERTIES				
					UTS (Kgf/mm ²)			% EL	% RA
					5.5, 6 & 6.5 mm	7, 8 & 9 mm	10, 11 & 12 mm		
HC 50	0.46 - 0.50	0.50 - 0.80	0.04 Max	0.15-0.35	80 - 90	75 - 85	70 - 80	16	40
HC 55	0.51 - 0.55	0.50 - 0.80	0.04 Max	0.15-0.35	85 - 95	80 - 90	75 - 85	15	35
HC 60	0.56 - 0.60	0.50 - 0.80	0.04 Max	0.15-0.35	90 - 100	85 - 95	80 - 90	15	35
HC 65	0.61 - 0.65	0.50 - 0.80	0.04 Max	0.15-0.35	95 - 105	90 - 100	85 - 95	13	30
HC 70	0.66 - 0.70	0.50 - 0.80	0.04 Max	0.15-0.35	100 - 110	95 - 105	90 - 100	13	30
HC 75	0.71 - 0.75	0.50 - 0.80	0.04 Max	0.15-0.35	105 - 115	100 - 110	95 - 105	12	25
HC 80	0.76 - 0.80	0.50 - 0.80	0.04 Max	0.15-0.35	110 - 120	105 - 115	100 - 110	12	25
HC 85	0.81 - 0.85	0.50 - 0.80	0.04 Max	0.15-0.35	115 - 125	110 - 120	105 - 115	12	25

Note : Coil Dimensions (mm) : ID - 725 (Min), OD - 1250 (Max); Height - 1400 (Max);
Weight : 1.2 MT (approx);

Sizes (mm) - 5.5, 6.0, 6.5, 7.0, 8.0, 10.0 & 12.0; Order Qty per size : 1000 MT (Min)

Order / Quotes for lower percentage of 5.5 mm size will be preferred;

Offers with lower Si content also can be considered depending on Al content permissible.

HOT ROLLED REBARS

Specification	Grade	Size (mm)	Remarks
JIS G 3112	SD 35	16, 20, 25 & " "	In★straight lengths 12 m + 0.1 allowable short length 2%
JIS G 3112	SD 35	8, 10, 12	In coils of dimensions as for Wire Rod Coils

Note : "★" Sizes (mm) 18, 28 & 32 can also be supplied subject to economic quantity of orders.
Rib pattern on rebars will be as per VSP's design.

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OTHER SECTIONS

EQUAL ANGLES

Size (mm)	Sec. Wt. (Kg/M)
100 x 100 x 8 / 10	12.10 / 14.90, + 5% - 3%
90 x 90 x 6 / 8	8.20 / 10.80, + 5% - 3%
75 x 75 x 6 / 8	6.80 / 8.90, + 5% - 3%
65 x 65 x 6	5.80 + 5% - 3%

BEAMS

Size (mm)	Thickness of Web (mm)	Sec. Wt (Kg / M)
180 x 91	5.3 ± 0.7	18.80 ± 4%
120 x 114	5.0 ± 0.7	19.90 ± 4%

Flange Thickness : 8.0 mm ± 1.0 mm for both

CHANNELS

Size (mm)	Sec. Wt. (Kg/M)
150 x 75 x 5.7	16.8 ± 2.5%
125 x 65 x 5.3	13.1 ± 2.5%
100 x 50 x 5.0	9.56 ± 2.5%
75 x 40 x 4.8	7.14 ± 2.5%

BILLETS

Size (mm)	Length	Chemistry
125 x 125	10 m ± 0.4	See note below IS : 2830 (C : 0.12-0.23% Si : 0.40% Max; Mn: 0.3-1.5% S & P : 0.05 % Max)
75 x 75	6 m ± 0.1	
65 x 65	6 m ± 0.1	

PIG IRON

C	Mn	Si	P	S
3.5 - 4.5%	1% Max	1.25% Max	0.12% Max	0.05 Max

Basic grade steel making pig iron, pigs are of two notches upto 45 kg in weight. Chips/Broken Pieces below 25 mm not exceeding 5%; dust, dirt and moisture exceeding 0.5% deductible from draft survey weight.

SLAG

Specification : CaO : 30 - 38%,	SiO ₂ : 30 - 40%,	Al ₂ O ₃ : 15 - 22%
MgO : 8 - 11%,	FeO : 5 % Max,	MnO : 2% Max

Note : Chemistry for Billets : C : 0.14 - 0.20% ; Mn : 0.5-0.9% ; S/P : 0.05% Max ; Si : 0.35% Max or SAE 1015 ; or other chemistry to be agreed.

ROUNDS

Size (mm)	16, 20, 25, 28, 32, 33.5, 34, 36, 40, 42, 45, 46.5, 50, 53, 56, 60, 65, 71 & 80
Specifications	EN8, EN8D, EN9, SAE 1045, SAE 1020 & IS : 2062 - 2006

Note : Chemistry (other than Billets) JIS G 3101 SS 400 or IS : 2062-2006;
Bundle wt. : 5MT (Max); Length : 12 ± 0.1m (for 6 ± 0.1 m ends would be gas cut);
Allowable short length upto 2%

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