

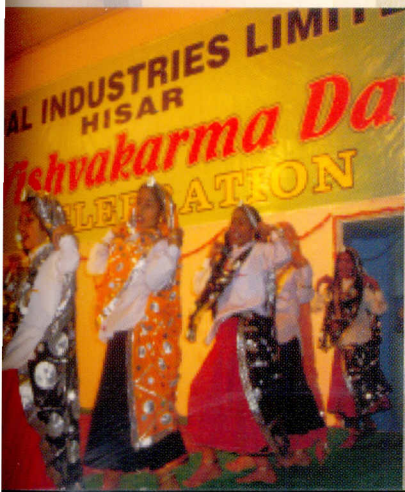
An Introduction

Jindal Industries Limited (JIL), Hisar incorporated in early sixties, is a leading manufacturer in India for Galvanised Steel Pipes, Black Steel Pipes and Hollow sections. Founded in the early 60's by the group of Jindals and their partners, the unit has steadily grown to become a premium brand in galvanised Steel Pipes industry. Jindal HISSAR, products have earned the reputation of impeccable quality and total reliability. The name has become synonyms with the 'BEST' in Steel Tubes.

Jindal Industries Limited manufactures pipes using state-of-the-art manufacturing facilities in range ½"(15mm NB) to 12"(300mm NB) for use in water transportation, Oil and gas Transportation, Chemical Industry, Agro based industries, Power sector, Fire Fighting application etc. with a capacity to produce about 200,000 Tonnes per annum. The unit is equipped with modern machinery including 8 rolling mills, 4 Galvanizing plants, threading & finishing equipment. It has full back up power generation facility. It is fully automated to ensure premium quality and a high degree of dependability.

Jindal Industries Limited has earned a commendable reputation for reliability and quality due to its adherence to uncompromising standards of quality. The objective is to delight customers at reasonable prices. All pipes have to pass through a series of tests during the various stages of production at our in-house testing laboratory. Jindal Industries Limited has adopted the total quality management approach. Its systems conform to ISO Standards viz ISO 9001, ISO 14001 and OHSAS 18001.

The pipes are engraved with ISI Mark and Trade Mark 'Jindal' with the device of the Map of India in oval shape and word 'HISSAR' underneath. Keeping in mind the profile of the end users particularly house holders and farmers, Company has taken the onus of ensuring quality better than the requirements. Pipes are normally manufactured to closer tolerances and care is further taken enroute to exceed user's expectations.



Quality Credentials

The Jindal Industries has been awarded the prestigious ISO 9001 certificate by British Standards Institution (BSI) certifying the Quality Management System of the Company. This certificate is valid for manufacture & supply of ERW black & galvanized steel pipes. Other Certifications awarded by BSI are ISO14001:2004 for Environment & OHSAS 18001:1999 for Health & Safety. Jindal Industry is the only steel tube manufacturer to have the integrated management system.



Inspection Agencies

- TCS - Tata Projects Limited
- Directorate General of Supplies & Disposals
- PDIL
- CEIL
- NTPC
- Engineers India Ltd.
- SGS INDIA LIMITED
- RITES
- DNV
- DMRC
- Bureau Veritas
- QSS

Product Range

- Galvanised Pipes
 - Jindal HISSAR-ACL Pipes
 - Black Pipes
 - Rectangle & Squares
 - Line Pipes
- ½" to 12" various national & international standards
 - ½" to 2" for concealed piping
 - ½" to 12" various national & international standards
 - From 25mm x 25mm to 150mm x 150mm
 - From 80mm to 300mm API Pipes



GRADES

CONFORMING TO STRINGENT SPECIFICATIONS

a INDIAN STANDARDS

- i) IS: 1239 – For ordinary use in water, gas & air, lines.
- ii) IS: 3589 – Grade 330 & 410 for water, gas & sewerage purposes.
- iii) IS: 4270 – Steel Tubes for water wells (casing pipes)
- iv) IS: 1161 – Grade YST210 and 240 for structural purposes
- v) IS: 3601 – Steel tubes for mechanical & general engineering purposes.
- vi) IS: 9295 – For Idlers & Conveyors
- vii) IS: 1978 – Grade YST 210 & 240 for use in oil and natural gas industries.

B INTERNATIONAL STANDARDS

1. British

- i) BS: 1387 – For ordinary use in water gas lines
- ii) BS: 1775 – For mechanical, structural & general engineering purposes
- iii) BS: 1139 – Tubes for metal scaffolding
- iv) BS: 534 – For water, gas and sewerage
- v) BS: 6363 – Structural tubes round, square & rectangular shape

2. American

- i) ASTM A 53 – For ordinary use in water, steam, gas & air, lines.
- ii) ASTM A 120 – For ordinary use in agriculture & air, lines.
- iii) ASTM A 500 – Structural tubes round, square & rectangular shape
- iii) API 5L – For oil & gas conveying at high pressure

3. European

- i) En: 10224 – For use in water, gas and air flow
- ii) En: 10255 – For water, gas & air flow

4. Japanese

- i) JIS G: 3452 – For use in water, gas & air flow

EQUIPMENT DETAILS

1. Slitting Units
2. ERW pipe mills
3. Galvanizing lines
4. Threading machines
5. Hydro testing machines
6. Eddy current Testing
7. Annealing
8. Power Plant

Applications

Concealed piping
 Fire Fighting System
 Power Projects
 Construction, Scaffolding
 Cold Storage
 Water Lines
 Agriculture and Irrigation
 General Engineering Tubes
 Structural Purposes
 Oil and Gas Transportation

TECHNICAL SPECIFICATIONS OF PIPES CONFORMING TO ASTM A-53 GR. A&B

NPS Designator	DN Designator	Outside Diameter		Shedule No	Wall Thickness		Mass of plain end pipe		Test Pressure		Pieces/bundle
		Inch	mm		inch	mm	kg/mtr	lb/ft	Grade A	Grade B	
									Mpa	Mpa	
½	15	0.840	21.3	40	0.109	2.77	1.27	0.85	4.8	4.8	120
¾	20	1.050	26.7	40	0.113	2.87	1.69	1.13	4.8	4.8	84
1	25	1.315	33.4	40	0.133	3.38	2.50	1.68	4.8	4.8	60
1 ¼	32	1.660	42.2	40	0.140	3.56	3.39	2.27	8.3	9	42
1 ½	40	1.900	48.3	40	0.145	3.68	4.05	2.72	8.3	9	36
2	50	2.375	60.3	40	0.154	3.91	5.44	3.66	15.9	17.2	26
2 ½	65	2.875	73.0	40	0.203	5.16	8.63	5.80	17.2	17.2	18
3	80	3.500	88.9	40	0.216	5.49	11.29	7.58	15.3	17.2	14
3 ½	90	4.000	101.6	40	0.226	5.74	13.57	9.12	14.0	16.3	12
4	100	4.500	114.3	40	0.237	6.02	16.07	10.80	13.1	15.2	10
5	125	5.563	141.3	40	0.258	6.55	21.77	14.63	11.5	13.4	7
6	150	6.625	168.3	40	0.280	7.11	28.26	18.99	10.5	12.3	7
8	200	8.625	219.1	40	0.322	8.18	42.55	28.58	9.2	10.8	-
10	250	10.750	273.0	20	0.250	6.35	41.75	28.06	5.8	6.8	-
10	250	10.750	273.0	40	0.365	9.27	60.29	40.52	8.4	9.9	-
12	300	12.750	323.8	20	0.250	6.35	49.71	33.41	4.9	5.7	-
12	300	12.750	323.8	30	0.330	8.38	65.18	43.81	6.4	7.5	-
12	300	12.750	323.8	STD	0.375	9.52	73.78	49.61	7.3	8.5	-
12	300	12.750	323.8	40	0.406	10.31	79.70	53.57	7.9	9.2	-

Tolerances

Outside Diameter Pipe Size upto & including DN 40 +/-0.4 mm
 Pipe Size DN 50 or larger +/- 1%
 Thickness -12.5% (max)
 Weight +/- 10%

Mechanical Properties

	Grade A	Grade B
Yield Strength	205 Mpa (Min)	240 Mpa (Min)
Tensile Strength	330 Mpa (Min)	415 Mpa (Min)
Elongation	As per ASTM A-53	

Chemical Properties (Max %)

	Carbon	Manganese	Phosphorus	Sulphur	Copper	Nickel	Chromium	Molybdenum	Vanadium
Grade A	0.25	0.95	0.05	0.045	0.5	0.4	0.4	0.15	0.08
Grade B	0.3	1.2	0.05	0.045	0.5	0.4	0.4	0.15	0.08

Galvanizing (As per ASTM A-90)

Minimum 0.490 Kg/Mtr (70 microns approx)
 Average 0.550 Kg/Mtr (79 microns approx)

TECHNICAL SPECIFICATIONS OF PIPES CONFORMING TO BS EN 10255/DIN EN 10255

Table 2 - Dimensions, Diameter Tolerance and Mass per unit length

Specified Outside Diameter ^a	Thread Size ^a	Outside Diameter		H			M		
		Max.	Min.	Heavy Series		Medium Series			
				Wall Thickness	Mass per unit length of bare tube		Wall Thickness	Mass per unit length of bare tube	
					T	Plain End		Threaded & Socketed	T
(mm)		(mm)	(mm)	(mm)	(kg/m)	(kg/m)	(mm)	(kg/m)	(kg/m)
21.3	½	21.8	21.0	3.2	1.44	1.45	2.6	1.21	1.22
26.9	¾	27.3	26.5	3.2	1.87	1.88	2.6	1.56	1.57
33.7	1	34.2	33.3	4.0	2.93	2.95	3.2	2.41	2.43
42.4	1 ¼	42.9	42.0	4.0	3.79	3.82	3.2	3.10	3.13
48.3	1 ½	48.8	47.9	4.0	4.37	4.41	3.2	3.56	3.60
60.3	2	60.8	59.7	4.5	6.19	6.26	3.6	5.03	5.10
76.1	2 ½	76.6	75.3	4.5	7.93	8.05	3.6	6.42	6.54
88.9	3	89.5	88.0	5.0	10.3	10.5	4.0	8.36	8.53
114.3	4	115.0	113.1	5.4	14.5	14.8	4.5	12.2	12.5
139.7	5	140.8	138.5	5.4	17.9	18.4	5.0	16.6	17.1
165.1	6	166.5	163.9	5.4	21.3	21.9	5.0	19.8	20.4

Table B.1 - Dimensions, Diameter Tolerance and Mass per unit length of tubes Type L

Specified Outside Diameter ^a	Designation of thread ^a	Outside diameter		Wall thickness	Mass per unit length of bare tube	
		Max.	Min.		Plain end	Threaded & Socketed
D	R	(mm)	(mm)	(mm)	(kg/m)	(kg/m)
21.3	1/2	21.7	21.0	2.3	1.08	1.09
26.9	3/4	27.1	26.4	2.3	1.40	1.41
33.7	1	34.0	33.2	2.9	2.20	2.22
42.4	1 1/4	42.7	41.9	2.9	2.82	2.85
48.3	1 1/2	48.6	47.8	2.9	3.25	3.29
60.3	2	60.7	59.6	3.2	4.51	4.58
76.1	2 1/2	76.0	75.2	3.2	5.75	5.87
88.9	3	88.7	87.9	3.2	6.76	6.93
101.6	3 1/2	101.2	100.3	3.6	8.70	8.88
114.3	4	113.9	113.0	3.6	9.83	10.1
139.7	5	140.8	138.5	4.5	15.0	15.5
165.1	6	166.5	163.9	4.5	17.8	18.4

Tolerance

Outside Diameter as per above table

Thickness : +/- 10% for medium, heavy & L series
+10%, -8% for L1 & L2 series

Weight +/-7.5% for bundles of 10 tons or more for medium, heavy & L series
-8%, +10% for L1 & L2 series for individual pipes

Chemical Properties

Carbon	0.20% Max
Manganese	1.40% Max
Phosphorus	0.035% Max
Sulphur	0.030 Max

Mechanical Properties

Yield strength	195N/sqmm (minimum)
Tensile strength	320 to 520N / sqmm
% elongation	20% minimum

Bend Test

For tubes upto & including 60.30 mm OD
(Black Tube) Bending angle 90 degree
Bending radius 3D approx

Flattening Test

For Tubes above 60.30 mm OD
1. Flatten upto 75% of tube dia for weld test Weld at 12 of 3 O'clock (alternatively)
2. Flatten upto 60% of tube dia for raw material test

Leak Tightness Test

100% Hydrotesting at 50 bar

Galvanizing Test

1. Zinc coating : 55 microns minimum
2. Adhesion test (up to 60.3 mm OD)

Threading

As per EN 10226-1&2

Table B.2 - Dimensions, Diameter Tolerance and Mass per Unit Length of Tubes Type L1

Specified outside Diameter ^a	Designation of Thread ^a	Outside Diameter		Wall Thickness	Mass per unit length of bare tube	
		Max.	Min		Plain end	Threaded & Socketed
D	R	(mm)	(mm)	(mm)	(kg/m)	(kg/m)
21.3	1/2	21.7	21.0	2.3	1.08	1.09
26.9	3/4	27.1	26.4	2.3	1.39	1.40
33.7	1	34.0	33.2	2.9	2.20	2.22
42.4	1 1/4	42.7	41.9	2.9	2.82	2.85
48.3	1 1/2	48.6	47.8	2.9	3.24	3.28
60.3	2	60.7	59.6	3.2	4.49	4.56
76.1	2 1/2	76.3	75.2	3.2	5.73	5.85
88.9	3	89.4	87.9	3.6	7.55	7.72
114.3	4	114.9	113.0	4.0	10.8	11.10

Table B.3 - Dimensions, Diameter Tolerance and Mass per Unit Length of Tubes Type L2

Specified outside Diameter ^a	Designation of Thread ^a	Outside Diameter		Wall Bare Tube	Mass per Unit Length of	
		Max.	Min		Plain end	Threaded & Socketed
D	R	(mm)	(mm)	(mm)	(kg/m)	(kg/m)
21.3	1/2	21.4	21.0	2.0	0.947	0.956
26.9	3/4	26.9	26.4	2.3	1.38	1.39
33.7	1	33.8	33.2	2.6	1.98	2.00
42.4	1 1/4	42.5	41.9	2.6	2.54	2.57
48.3	1 1/2	48.4	47.8	2.9	3.23	3.27
60.3	2	60.2	59.6	2.9	4.08	4.15
76.1	2 1/2	76.0	75.2	3.2	5.71	5.83
88.9	3	88.7	87.9	3.2	6.72	6.89
114.3	4	113.9	113.0	3.6	9.75	10.00

Manufacturing Process

The process utilises the latest technology and modern equipments for producing high quality ERW Pipes

1. Slit Preparations

HR Coils are slitted to predetermined widths for each size of pipe and thickness. Slitted coil is uncoiled at the entry of ERW mill and the ends are sheared and welded one after another to make it single endless strip.

2. Forming

Slitted coils are initially formed into U shape and then into a cylindrical shape with open edges using a series of forming rolls.

3. Welding

The open edges are heated to the required temperature through high frequency low voltage high current and press welded by forge rolls making perfect and strong butt weld without filler materials.

4. Debeading

Weld flash on top and inside (if needed) is trimmed out through carbide tools.

5. Seam Annealing

Whenever required, welding portion and heat affected zone is put to normalising with medium frequency normaliser and then cooled down in air cooling bed.

6. Sizing & Cutting

After water quenching, slight reduction is applied to pipes with sizing rolls to give them desired accurate outside diameter.

Pipes are cut to required lengths by flying cut off disc/saw cutter.

7. Facing and Bevelling

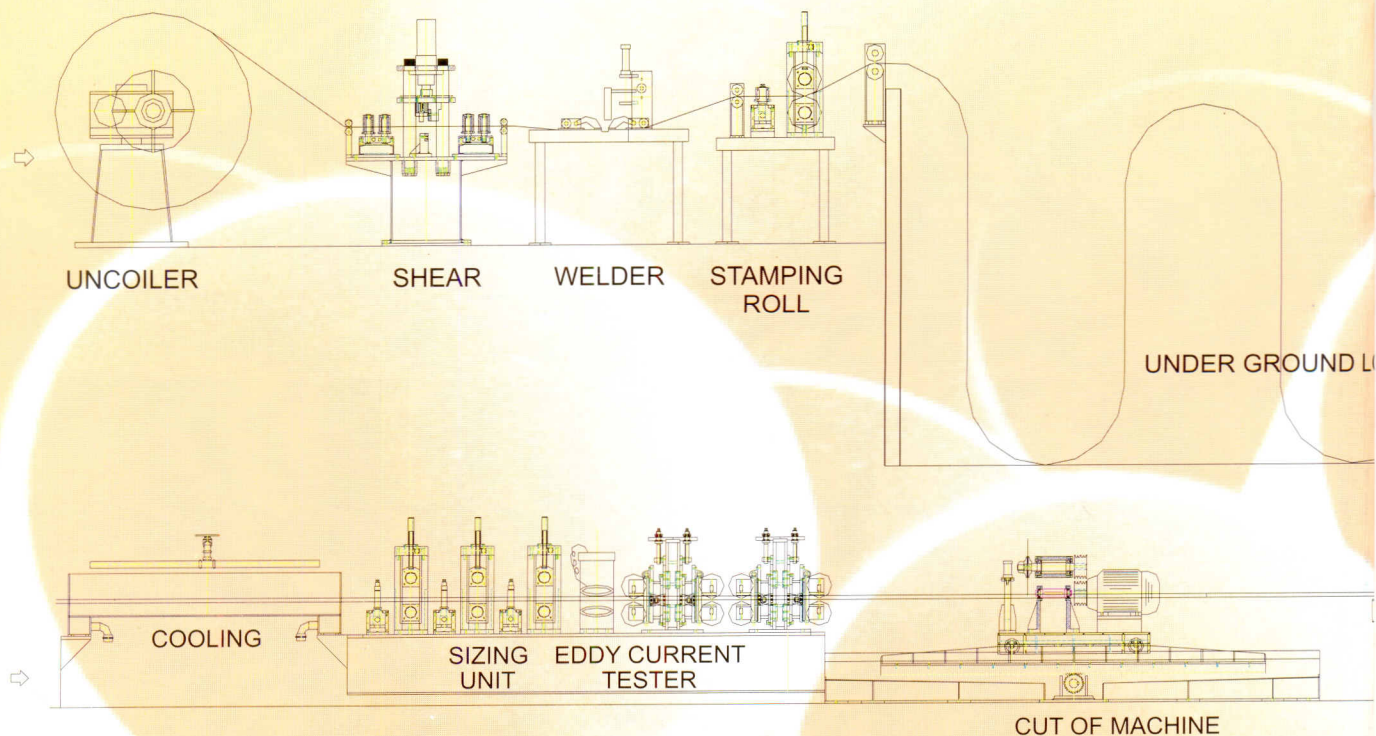
The pipe ends are faced and bevelled by the end facer.

All the processes are continuous with auto arrangements. These plain ended tubes go for further processing as per the customer need like galvanizing, threading, black varnishing etc.

8. Packing

Finished pipes are bundled in desired number of pieces as per customer's requirement and packed properly to ensure freshness till delivery.

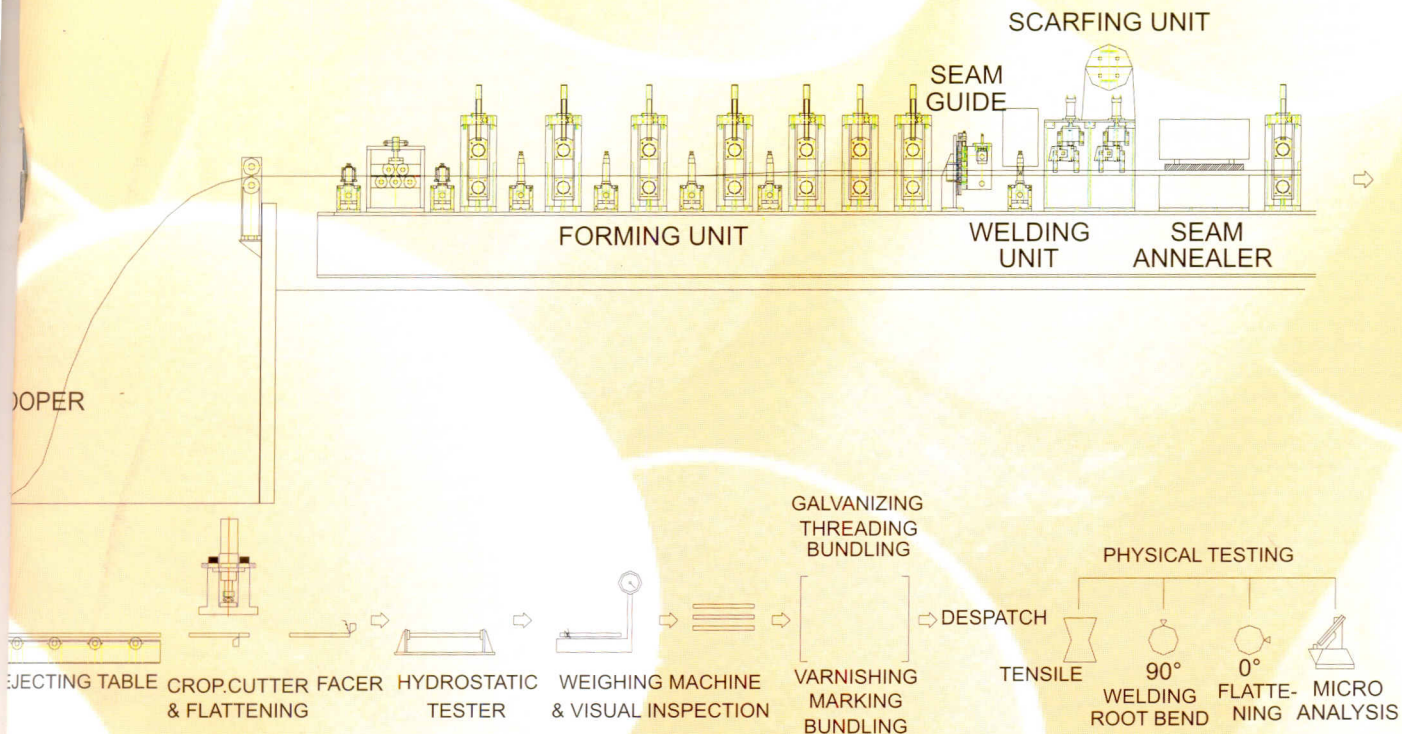
Manufacturing Process...



Galvanized and Black Pipes for Water, Gas and Air

Conforming to IS-1239 (Part-1) 2004/BS-1387/IS-1161 (Structural Tubes)

N.B.	Series	Mean Outside Diameter (MM)	Wall Thickness		Nominal Weight Galvanized & Black Tubes				Sockets		Tolerances
					Plain End		Screwed & Socketed				
			MM	SWG	kg/m	Mtrs/Tone	kg/m	Mtrs/Tone	OD in MM	Length MM	
15	Light	21.20	2.00	14	0.95	1056	0.95	1046	27.00	37.00	a) THICKNESS 1. Galvanized $\pm 5\%$ 2. Black $\pm 8\%$ * Better than ISI b) WEIGHT 1. Single Tube (Light Series) + 10% -8% 2. Single Tube (Med. & Heavy Tube) $\pm 10\%$ 3. For quantities per load of 10 tonnes minimum (Light Series) + 7.5% -5% 4. For quantities per load of 10 tonnes minimum (Medium & Heavy) $\pm 7.5\%$ c) LENGTH 1. Normal - 6m $\pm 0.02/0.03$ Meter 2. Random length - 4 to 7 Meters or as specified by the customer 1. Each Pipe is tested for leak proof test 2. End Condition : a) Screwed & Socketed b) Screwed without Socket c) Plain End
	Medium	21.40	2.60	12	1.21	826	1.22	820			
	Heavy	21.40	3.20	10	1.44	694	1.45	690			
20	Light	26.65	2.30	13	1.38	725	1.39	719	32.50	39.00	
	Medium	26.90	2.60	12	1.56	641	1.57	637			
	Heavy	26.90	3.20	10	1.87	535	1.88	532			
25	Light	33.50	2.60	12	1.98	505	2.00	500	39.50	46.00	
	Medium	33.75	3.20	10	2.41	415	2.43	412			
	Heavy	33.75	4.00	8	2.93	341	2.95	339			
32	Light	42.20	2.60	12	2.54	394	2.57	389	49.00	51.00	
	Medium	42.45	3.20	10	3.10	323	3.13	319			
	Heavy	42.45	4.00	8	3.79	264	3.82	262			
40	Light	48.10	2.90	11	3.23	310	3.27	306	56.00	51.00	
	Medium	48.35	3.20	10	3.56	281	3.60	278			
	Heavy	48.35	4.00	8	4.37	229	4.41	227			
50	Light	59.90	2.90	11	4.08	245	4.15	241	68.00	60.00	
	Medium	60.25	3.60	9	5.03	199	5.10	196			
	Heavy	60.25	4.50	7	6.19	162	6.26	160			
65	Light	75.60	3.20	10	5.71	175	5.83	172	84.00	69.00	
	Medium	75.95	3.60	9	6.42	156	6.54	153			
	Heavy	75.95	4.50	7	7.93	126	8.05	124			
80	Light	88.30	3.20	10	6.72	149	6.89	145	98.00	75.00	
	Medium	88.75	4.00	8	8.36	120	8.53	117			
	Heavy	88.75	4.80	6	9.90	101	10.10	99			
100	Light	113.45	3.60	9	9.75	103	10.00	100	124.00	87.00	
	Medium	114.05	4.50	7	12.20	82	12.50	80			
	Heavy	114.05	5.40	5	14.50	69	14.80	68			
125	Medium	139.65	4.80	6	15.90	63	16.40	61	151.00	96.00	
	Heavy	139.65	5.40	5	17.90	56	18.40	54			
150	Medium	165.20	4.80	6	18.90	53	19.50	51	178.00	96.00	
	Heavy	165.20	5.40	5	21.30	47	21.90	46			
150	Heavy	168.30	6.30		25.20	40					
200	Medium	219.10	5.40		29.50	34					
	Heavy	219.10	5.90		31.00	33					
250	Heavy	273.00	5.90		38.90	26					
300	Heavy	323.90	6.30		49.30	20					



TECHNICAL SPECIFICATIONS OF PIPES CONFORMING TO DIN:2440									
Nominal Size	Outside Diameter		Wall Thickness	Mass of Tube		Pipe Thread		Sockets	
				Plain End	Socketed	Thread	No of thread in 25.4 mm	Min. Outside Diameter (mm)	Min. Length (mm)
DN	Min (mm)	Max (mm)	mm	Kg/m	Kg/m	Diameter			
15	21.0	21.8	2.65	1.22	1.23	20.955	14	26.4	34
20	26.5	27.3	2.65	1.58	1.59	26.441	14	31.8	36
25	33.3	34.2	3.25	2.44	2.46	33.249	11	39.5	43
32	42.0	42.9	3.25	3.14	3.17	41.910	11	48.3	48
40	47.9	48.8	3.25	3.61	3.65	47.803	11	54.5	48
50	59.7	60.8	3.65	5.10	5.17	59.614	11	66.3	56
65	75.3	76.6	3.65	6.51	6.63	75.184	11	82.0	65
80	88.0	89.5	4.05	8.47	8.64	87.884	11	95.0	71
100	113.1	115	4.50	12.10	12.40	113.030	11	122.0	83
125	138.5	140.8	4.85	16.20	16.70	138.430	11	147.0	92
150	163.9	166.5	4.85	19.20	19.80	163.830	11	174.0	92

TECHNICAL SPECIFICATIONS OF PIPES CONFORMING TO DIN:2441									
Nominal Size	Outside Diameter		Wall Thickness	Mass of Tube		Pipe Thread		Sockets	
				Plain End	Socketed	Thread	No of thread in 25.4 mm	Min. Outside Diameter (mm)	Min. Length (mm)
DN	Min (mm)	Max (mm)	mm	Kg/m	Kg/m	Diameter			
15	21.0	21.8	3.25	1.45	1.46	20.955	14	26.4	34
20	26.5	27.3	3.25	1.90	1.91	26.441	14	31.8	36
25	33.3	34.2	4.05	2.97	2.99	33.249	11	39.5	43
32	42.0	42.9	4.05	3.84	3.87	41.910	11	48.3	48
40	47.9	48.8	4.05	4.43	4.47	47.803	11	54.5	48
50	59.7	60.8	4.50	6.17	6.24	59.614	11	66.3	56
65	75.3	76.6	4.50	7.90	8.02	75.184	11	82.0	65
80	88.0	89.5	4.85	10.10	10.30	87.884	11	95.0	71
100	113.1	115.0	5.40	14.40	14.70	113.030	11	122.0	83
125	138.5	140.8	5.40	17.80	18.30	138.430	11	147.0	92
150	163.9	166.5	5.40	21.20	21.80	163.830	11	174.0	92

Tolerances

Outside Diameter As per above table

Wall Thickness -12.5%

Weight

Single Tube	For lot of 10 Tons
+/-10%	+/-7.5%

Testing

Leak Tightness Test 100% Hydrostatic testing at 50 bar

Bend Test	For tubes upto & including DN 25	For tubes above DN 25 & upto DN 50
Bending angle	90°	Bending angle 90°
Bending radius	3 times to the OD of Tube	Bending radius 3.5 times to the OD of Tube
Weld Position	12 O' clock & 3 O' clock	Weld position 12 O' clock & 3 O' clock

Flattening Test

For tubes DN 65 & above

Flatten upto 2/3 of tube dia without crack in weld; Weld position - 12'O clock & 3' O clock.

Galvanizing

Zinc Coating = 400 g/sq m (Minimum)

Zinc layer thickness = 56 microns

Mechanical properties

Yield Strength 185 N/sq.mm (Minimum)

Tensile Strength 310 to 540 N/Sq.mm for wall thickness less than 3 mm

290 to 510 N/sq.mm for wall thickness ≥ 3mm

% Elongation

Thickness	≥ 2 & < 3 mm	≥ 3 & ≤ 40 mm
% Elong	14	18

Raw Material:- As per ST 33.2 conforming to DIN 17100.

TECHNICAL SPECIFICATIONS OF PIPES CONFORMING TO API 5L

Size	Outside Diameter		Wall Thickness		Mass of plain end pipe		Standard Test Pressure							
							Grade A	Grade B	Grade X42	Grade X46	Grade X52	Grade X56	Grade X60	
							Mpa	Mpa	Mpa	Mpa	Mpa	Mpa	Mpa	
3 1/2	88.9	3.500	2.1	0.083	4.50	3.03	5.9	6.8	8.2	9.0	10.2	10.9	11.7	
			2.8	0.109	5.95	3.95	7.8	9.1	11.0	12.0	13.6	14.6	15.6	
			3.2	0.125	6.76	4.51	8.9	10.4	12.5	13.7	15.5	16.7	17.9	
			3.6	0.141	7.57	5.06	10.1	11.7	14.1	15.4	17.4	18.8	20.1	
			4.0	0.156	8.37	5.58	11.2	13.0	15.7	17.1	19.4	20.7	20.7	
			4.4	0.172	9.17	6.12	12.3	14.3	17.2	18.8	20.7	20.7	20.7	
			4.8	0.188	9.95	6.66	13.4	15.6	18.8	20.5	20.7	20.7	20.7	
			5.5	0.216	11.31	7.58	15.4	17.2	20.7	20.7	20.7	20.7	20.7	
			2.1	0.083	5.81	3.92	4.6	5.3	6.4	7.0	7.9	8.5	9.1	
			3.2	0.125	8.77	5.85	7.0	8.1	9.7	10.6	12.1	13.0	13.9	
4 1/2	114.3	4.500	3.6	0.141	9.83	6.57	7.8	9.1	11.0	12.0	13.6	14.6	15.6	
			4.0	0.156	10.88	7.24	8.7	10.1	12.2	13.3	15.1	16.2	17.4	
			4.4	0.172	11.92	7.96	9.6	11.1	13.4	14.6	16.6	17.8	19.1	
			4.8	0.188	12.96	8.67	10.4	12.1	14.6	16.0	18.1	19.5	20.7	
			5.2	0.203	13.99	9.32	11.3	13.2	15.8	17.3	19.6	20.7	20.7	
			5.6	0.219	15.01	10.02	12.2	14.2	17.0	18.6	20.7	20.7	20.7	
			6.0	0.237	16.02	10.80	13.0	15.2	18.3	20.0	20.7	20.7	20.7	
			6.4	0.250	17.03	11.36	13.9	16.2	19.5	20.7	20.7	20.7	20.7	
			2.1	0.083	8.61	5.80	3.1	3.6	5.4	5.9	6.7	7.2	7.7	
			2.8	0.109	11.43	7.59	4.1	4.8	7.2	7.9	9.0	9.6	10.3	
3.2	0.125	13.03	8.69	4.7	5.5	8.3	9.0	10.2	11.0	11.8				
3.6	0.141	14.62	9.77	5.3	6.2	9.3	10.2	11.5	12.4	13.3				
4.0	0.156	16.21	10.79	5.9	6.9	10.3	11.3	12.8	13.8	14.8				
4.4	0.172	17.78	11.87	6.5	7.6	11.4	12.4	14.1	15.1	16.2				
4.8	0.188	19.35	12.94	7.1	8.2	12.4	13.6	15.4	16.5	17.7				
5.2	0.203	20.91	13.94	7.7	8.9	13.4	14.7	16.6	17.9	19.2				
5.6	0.219	22.47	15.00	8.3	9.6	14.5	15.8	17.9	19.3	20.7				
6.4	0.25	25.55	17.04	9.4	11.0	16.5	18.1	20.5	20.7	20.7				
7.1	0.28	28.22	18.99	10.5	12.2	18.4	20.1	20.7	20.7	20.7				
6 5/8	168.3	6.625	3.2	0.125	17.04	11.36	3.6	4.2	6.4	6.9	7.9	8.5	9.1	
			4.0	0.156	21.22	14.12	4.5	5.3	7.9	8.7	9.8	10.6	11.3	
			4.8	0.188	25.37	16.96	5.4	6.3	9.5	10.4	11.8	12.7	13.6	
			5.2	0.203	27.43	18.28	5.9	6.9	10.3	11.3	12.8	13.7	14.7	
			5.6	0.219	29.48	19.68	6.3	7.4	11.1	12.2	13.8	14.8	15.9	
			6.4	0.250	33.57	22.38	7.3	8.4	12.7	13.9	15.7	16.9	18.1	
			7.0	0.277	36.61	24.72	7.9	9.2	13.9	15.2	17.2	18.5	19.8	
			7.9	0.312	41.14	27.73	9.0	10.4	15.7	17.1	19.4	20.7	20.7	
			8.2	0.322	42.65	28.58	9.3	10.8	16.3	17.8	20.2	20.7	20.7	
			8.7	0.344	45.14	30.45	9.9	11.5	17.3	18.9	20.7	20.7	20.7	
8 5/8	219.1	8.625	9.5	0.375	49.10	33.07	10.8	12.5	18.9	20.6	20.7	20.7	20.7	
			4.0	0.156	26.54	17.67	3.6	4.2	7.2	7.9	8.9	9.6	10.3	
			4.8	0.188	31.76	21.23	4.4	5.1	8.7	9.5	10.7	11.5	12.4	
			5.2	0.203	34.35	22.89	4.7	5.5	9.4	10.3	11.6	12.5	13.4	
			5.6	0.219	36.94	24.65	5.1	5.9	10.1	11.1	12.5	13.5	14.4	
			6.4	0.250	42.09	28.06	5.8	6.8	11.6	12.6	14.3	15.4	16.5	
			7.1	0.279	46.57	31.23	6.5	7.5	12.8	14.0	15.9	17.1	18.3	
			7.8	0.307	51.03	34.27	7.1	8.3	14.1	15.4	17.4	18.7	20.1	
			8.7	0.344	56.72	38.27	7.9	9.2	15.7	17.2	19.4	20.7	20.7	
			9.3	0.365	60.50	40.52	8.5	9.8	16.8	18.4	20.7	20.7	20.7	
10 3/4	273.1	10.750	4.4	0.172	34.67	23.13	3.4	3.9	6.7	7.3	8.3	8.9	9.6	
			4.8	0.188	37.77	25.25	3.7	4.3	7.3	8.0	9.0	9.7	10.4	
			5.2	0.203	40.87	27.23	4.0	4.6	7.9	8.7	9.8	10.5	11.3	
			5.6	0.219	43.96	29.34	4.3	5.0	8.5	9.3	10.6	11.3	12.2	
			6.4	0.250	50.11	33.41	4.9	5.7	9.7	10.6	12.1	13.0	13.9	
			7.1	0.281	55.47	37.46	5.4	6.3	10.8	11.8	13.4	14.4	15.4	
			7.9	0.312	61.56	41.48	6.1	7.1	12.0	13.1	14.9	16.0	17.2	
			8.4	0.330	65.35	43.81	6.4	7.5	12.8	14.0	15.8	17.0	18.3	
			8.7	0.344	67.62	45.62	6.7	7.8	13.2	14.5	16.4	17.6	18.9	
			9.5	0.375	73.65	49.61	7.3	8.5	14.5	15.8	17.9	19.2	20.6	
10.3	0.406	79.65	53.57	7.9	9.2	15.7	17.1	19.4	20.7	20.7				

Tolerances

Outside Diameter	Pipe Body	+/- 0.75%	
	Pipe Ends	Pipe Size ≤ 10.750"	+ 1.6 mm, -0.4 mm
Thickness		Pipe Size > 10.750" & ≤ 20"	+ 2.4 mm, -0.8 mm
		Weight	+ 10%, -3.5%

Mechanical Properties

	Grade A	Grade B	Grade X42	Grade X46	Grade X52	Grade X56	Grade X60
PSL 1	MPa	Mpa	Mpa	Mpa	Mpa	Mpa	Mpa
Yield Strength (Min)	207	241	290	317	359	386	414
Tensile Strength (Min)	331	414	414	434	455	490	517
Elongation	As Per API 5L						

	Grade B	Grade X42	Grade X46	Grade X52	Grade X56	Grade X60	Grade X65
PSL 2	Mpa	Mpa	Mpa	Mpa	Mpa	Mpa	Mpa
Yield Strength (Min)	241-448	290-496	317-524	359-531	386-544	414-565	448-600
Tensile Strength (Min)	414-758	414-758	434-758	455-758	490-758	517-758	531-758
Elongation	As Per API 5L						

Chemical Properties (Max %)

PSL-1	C	Mn	P	S	Ti	V+Nb	V+Nb+Ti
Grade A	0.22	0.9	0.03	0.03	-	-	-
Grade B	0.26	1.2	0.03	0.03	0.04	0.03	0.15
Grade X42	0.26	1.3	0.03	0.03	0.04	-	0.15
Grade X46	0.26	1.4	0.03	0.03	0.04	-	0.15
Grade X52	0.26	1.4	0.03	0.03	0.04	-	0.15
Grade X56	0.26	1.4	0.03	0.03	0.04	-	0.15
Grade X60	0.26	1.4	0.03	0.03	0.04	-	0.15

PSL-2	C	Mn	P	S	Ti	V+Nb+Ti
Grade B	0.22	1.20	0.025	0.015	0.04	0.15
Grade X42	0.22	1.30	0.025	0.015	0.04	0.15
Grade X46	0.22	1.40	0.025	0.015	0.04	0.15
Grade X52	0.22	1.40	0.025	0.015	0.04	0.15
Grade X56	0.22	1.40	0.025	0.015	0.04	0.15
Grade X60	0.22	1.40	0.025	0.015	0.04	0.15
Grade X65	0.22	1.45	0.025	0.015	0.06	0.15

TECHNICAL SPECIFICATIONS OF PIPES CONFORMING TO ISO:65-1981 (E)

DN	OD	Light Series 1					Light Series 2				
		Outside Diameter		Wall Thickness (mm)	Mass Plain End (Kg/mtr)	Mass Screwed & Socketed (kg/mtr)	Outside Diameter		Wall Thickness (mm)	Mass Plain End (Kg/mtr)	Mass Screwed & Socketed (kg/mtr)
		Min (mm)	Max (mm)				Min (mm)	Max (mm)			
15	21.30	21.00	21.70	2.30	1.08	1.09	21.00	21.40	2.00	0.947	0.956
20	26.90	26.40	27.10	2.30	1.39	1.40	26.40	26.90	2.30	1.380	1.390
25	33.70	33.20	34.00	2.90	2.20	2.22	33.20	33.80	2.60	1.980	2.000
32	42.40	41.90	42.70	2.90	2.82	2.85	41.90	42.50	2.60	2.540	2.570
40	48.30	47.80	48.60	2.90	3.24	3.28	47.80	48.40	2.90	3.230	3.270
50	60.30	59.60	60.70	3.20	4.49	4.56	59.60	60.20	2.90	4.080	4.150
65	76.10	75.20	76.30	3.20	5.73	5.85	75.20	76.00	3.20	5.710	5.830
80	88.90	87.90	89.40	3.60	7.55	7.72	87.90	88.70	3.20	6.720	6.890
100	114.30	113.00	114.90	4.00	10.80	11.10	113.00	113.90	3.60	9.750	10.000

Tolerances

Outside Diameter as per above table

Thickness

Light Series 1		Light Series 2	
+ not limited	-12.5%	+ not limited	-8%

Weight

Light Series 1		Light Series 2	
Single tube	10 tonn Load	Single tube	10 tonn Load
+/-10%	+/-7.5%	+10%	+/- 5%
		-8%	

Mechanical Properties

Tensile Strength 320 to 520 N/sq mm

% Elongation 15% Min

Chemical Properties

Phosphorous 0.06% Max

Sulphur 0.06% Max

Leak Tightness Test

100% Hydro testing at a pressure of 50 bar

Sections/Closed Structurals (RHS/SHS) Conforming to IS 4923

(Also as per ASTM A500 & BS 6363 can also be supplied)

Section	Thickness	Sec. Area	Weight	Moment of Inertia		Radius of Gyration		Elastic Modulus	
				Lxx (cm) ⁴	lyy (cm) ⁴	xrxx (cm)	yyy (cm)	Zxx (cm) ³	Zyy (cm) ³
DxB (mm)	T (mm)	A (sq.cm.)	W (kg./m)	Lxx (cm) ⁴	lyy (cm) ⁴	xrxx (cm)	yyy (cm)	Zxx (cm) ³	Zyy (cm) ³
25x25	3.2	2.53	1.98	1.89	1.89	0.86	0.86	1.51	1.51
38x38	3.2	4.19	3.29	8.18	8.18	1.4	1.4	4.3	4.3
	4	5.03	3.95	9.26	9.26	1.36	1.36	4.87	4.87
50x50	3.6	6.28	4.93	21.42	21.42	1.85	1.85	8.66	8.66
	4.5	7.58	5.95	24.64	24.64	1.8	1.8	9.96	9.96
72.0x72.0	3.2	8.54	6.71	66.32	66.32	2.79	2.79	18.42	18.42
91.5x91.5	4.5	15.14	11.88	187.57	187.57	3.52	3.52	41	41
	5.4	17.85	14.01	215.68	215.68	3.48	3.48	47.14	47.14
50x25	3.2	4.13	3.24	11.63	3.8	1.68	0.96	4.65	3.04
66x33	2.9	5.19	4.07	27.33	9.12	2.29	1.33	8.28	5.53
	3.6	6.28	4.93	31.87	10.52	2.25	1.29	9.66	6.37
	4.5	7.58	5.95	36.64	11.93	2.2	1.25	11.1	7.23
96x48	3.2	8.54	6.70	98.61	33.28	3.4	1.97	20.54	13.87
	4	10.47	8.22	117.55	39.32	3.55	1.94	24.49	16.30
	4.8	12.31	9.66	134.35	44.55	3.3	1.9	27.99	18.56
122x61.0	3.6	12.32	9.67	232.61	78.83	4.34	2.35	38.13	25.84

**Steel Pipes for Water,
Gas and Sewerage Purposes**
Conforming to IS : 3589/EN-10224
(Grade ERW 330 and 410)

N.B Size MM	Outside Diameter MM	Wall Thickness MM	Weight (Plain End)	
			Kg/m	Mtr/MT
150	168.3	3.2	13.0	77
		4.5	18.2	55
		6.3	25.2	40
		7.1	28.2	35
200	219.1	3.6	19.1	52
		4.5	23.8	42
		5.2	27.4	36
		6.3	33.1	30
		7.1	37.1	27
		8	41.6	24
250	273	3.6	23.9	42
		4	26.5	38
		4.3	28.5	35
		5	33.0	30
		5.6	36.9	27
		6.3	41.4	24
		7.1	46.6	21
		8	52.3	19
		8.4	54.8	18
		9.5	61.7	16
300	323.9	5	39.3	25
		5.6	44.0	23
		6.4	50.1	20
		7.1	55.5	18
		8.4	65.4	15
		9.5	73.7	14

**Steel Tubes for Water Wells
(Casing Pipes)**
Conforming to IS : 4270
(Grade FE 410)

Size N.B. mm	Outside Diameter mm	Wall Thickness mm	Weight (Plain End)	
			Kg/m	Mtr/MT
100	114.3	5.4	14.5	69
125	141.3	5.4	18.1	55
		7.1	23.5	43
150	168.3	5.4	21.6	46
		7.1	28.2	35
175	193.7	6.4	29.6	34
		8	36.6	27
200	219.1	6.4	33.6	30
		8	41.6	24
225	244.5	7.1	41.6	24
		9	52.3	19
250	273.1	8	52.3	19
		10	64.9	15
300	323.9	8	62.3	16
		10	77.4	13

Tolerances IS : 3589

a	Outside Diameter	± 0.75%
b	Thickness	± 10%
c	Weight	± 7.5%

Quality - a prerequisite

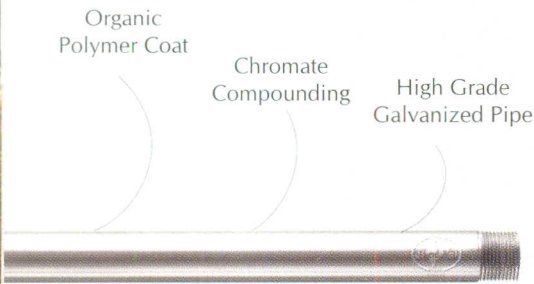
Sr. No.	Machine	Purpose
1.	Universal Testing Machines	For material testing (mechanical properties).
2.	Non Destructive Test	
a.	Eddy Current Testing Machine	For on line flaw detection on welds.
3	Hydro Testing Machine	
4.	Vickers Micro Hardness Tester	For checking micro hardness on weld, heat affected zone and material
5.	Digital Ultrasonic Thickness Gauge	For checking thickness & pipes.
6.	Mandrills and Fixtures	For welding root bent test.
8.	Hydraulic Press	For flattening and weld ductility test.
9.	Bending Machine	For pipe bend test.

For Concealed / Underground Pipeline (The only galvanised pipe particularly for buried lines)

Jindal HISSAR ACL Special Triple Coated ERW Pipe comes with 100% corrosion resistance technology. The corrosion resistance technology & process of Pipe manufacturing is well established & known to manufacturers across the world. But what makes JINDAL HISSAR - ACL special is the ability to combine the two functions, pipe making & coating, with a high degree of success. JINDAL HISSAR - ACL is Triple Coated by using the three sequential process i.e. Galvanizing, Conversion Coating & Organic Polymer application. Developed to provide a smooth, attractive, corrosion-resistant finish, JINDAL HISSAR - ACL have become an ideal choice for interior application. JINDAL HISSAR - ACL is 100% corrosion resistant and 100% leak proof or 100% peace of mind



Cross - section of 'ACL'



PROTECTIVE COATING

- Galvanizing (Zinc Coating) - With High Grade Purity Zinc
- Conversion Coating (for passivation film) - Conversion coating cover Galvanised surface formed due to chemical reaction & this film becomes an integral part of the superficial layer of zinc coating. This film passivates the highly reactive zinc surface & retards formation of white rust.
- Clear Organic Polymer application - Applied as a third coat of final finish on the exterior surface. This layer acts as barrier & inhibits the corrosion of the products.

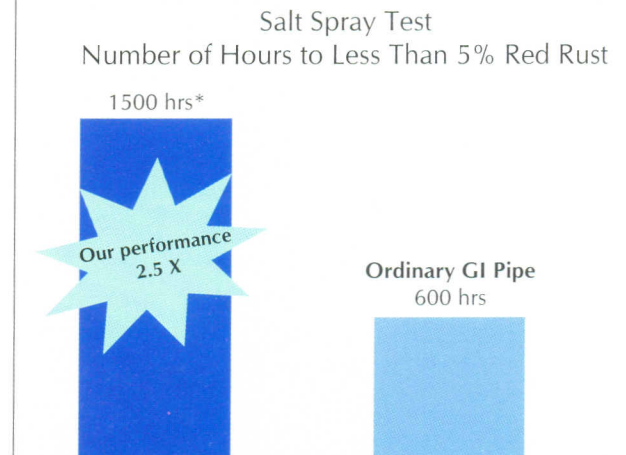
JINDAL HISSAR - ACL for Concealed Piping Patent 1956/DEL/2006 pending

Advantages of Coatings

Tubing exhibits strong corrosion resistance towards the following

- Salt (found in water, cement and bricks)
- Common household chemicals
- Fertilizers
- Insecticides
- Bleach
- Detergents
- Sulfuric acid
- Hydrochloric acid
- Sodium Hydroxide
- Microbiological attack & weathering

Corrosion Resistance



Technical Specifications for JINDAL - ACL Pipes

Conforming to IS:1239(Part-1) - 2004/ASTM-A-53 Specifications

N.B.	Series	Mean Outside Diameter (MM)	Wall Thickness		Nominal Weight Galvanized & Black Tubes			
					Plain End		Screwed & Socketed	
			MM	SWG	kg/m	Mtrs/Tone	kg/m	Mtrs/Tone
15	Light	21.20	2.00	14	0.95	1056	0.95	1046
	Medium	21.40	2.60	12	1.21	826	1.22	820
	Heavy	21.40	3.20	10	1.44	694	1.45	690
20	Light	26.65	2.30	13	1.38	725	1.39	719
	Medium	26.90	2.60	12	1.56	641	1.57	637
	Heavy	26.90	3.20	10	1.87	535	1.88	532
25	Light	33.50	2.60	12	1.98	505	2.00	500
	Medium	33.75	3.20	10	2.41	415	2.43	412
	Heavy	33.75	4.00	8	2.93	341	2.95	339
32	Light	42.20	2.60	12	2.54	394	2.57	389
	Medium	42.45	3.20	10	3.10	323	3.13	319
	Heavy	42.45	4.00	8	3.79	264	3.82	262
40	Light	48.10	2.90	11	3.23	310	3.27	306
	Medium	48.35	3.20	10	3.56	281	3.60	278
	Heavy	48.35	4.00	8	4.37	229	4.41	227
50	Light	59.90	2.90	11	4.08	245	4.15	241
	Medium	60.25	3.60	9	5.03	199	5.10	196
	Heavy	60.25	4.50	7	6.19	162	6.26	160

Product Type	ERW Welded Galvanized Pipe	Product Category	Pipes for water Gas & Air for buried concealed or underground pipes
Length	6.00 Mtrs	Specification	IS:1239(part-1)
Wall Thickness	As per specs As per order	Steel Grade	YST 210 C-0.12% Max, Mn-0.60 Max, S & P-0.04Max, C.E.-0.24 Max
Delivery Condition	Galvanised & transparent Polymer coated	Usage	Recommended for buried, concealed or underground pipes (cold water)

Mechanical Properties	
UTS Min	330 N/MM ²
Yiel Strength Min	210 N/MM ²
Bend Test	As per IS 2329
% Elongation Min	20

