

SEAMLESS ERW



Pipelines
for the
21st century.



MAHARASHTRA SEAMLESS LIMITED

(ERW Division)

An ISO 9001:2008 Company

Company Profile

Maharashtra Seamless Limited, the flagship company of the **D.P. Jindal Group**, is the largest manufacturer of Seamless Pipes & Tubes in India. The company, today is also manufacturing the largest diameter ERW pipes in the country. ERW pipe size range from 1/2" to 20" with wall thickness from 2 mm to 12.7 mm (black and galvanized). The state - of - the - art plant of Mannesman, Germany, is India's first, par excellence "Largest Outer Diameter" ERW pipe manufacturing plant having maximum welding speed of 33 meters per minute with an installed capacity of 1,50,000 MT per annum. **JINDAL STAR Mild ERW Steel Pipes** are serving the Oil and Gas Sector in Oil and Gas Tank Farms and also Cross Country Pipelines. These pipes are also utilized in petrochemical industries, refineries, water and sewage applications.

Group company **Jindal Pipes Limited**, is one of the most established, best and largest manufacturer of ERW, Black and Galvanized, Steel Pipes & Tubes. Maharashtra Seamless Limited and Jindal Pipes Limited, together, make **JINDAL STAR**, the largest selling ERW Pipes & Tubes brand in India with diverse manufacturing locations catering to requirements across the country. All manufacturing locations are ISO, API and BIS certified and manufacture products conforming to various Indian and International Standards.

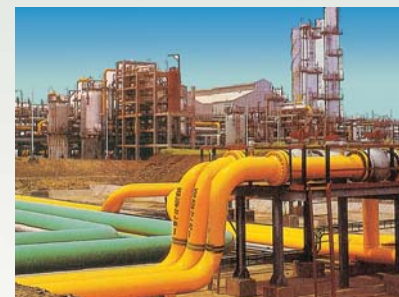
Product Applications

A wide range of application is found in almost every sector of activities viz:



Product Specification and Application

API 5L	Steel Pipe for Oil & Gas line
API 5CT	Steel casing pipe for Oil Wells
ASTM A53	Steel pipe for Water, Gas, Steam & Air lines
IS:3589	Steel pipes for Water, Gas & Sewage
IS:1978	Steel pipes for Oil & Gas line
IS:1979	Steel pipes for High pressure Oil & Gas line
IS:4270	Steel pipes for Water Well casing



System Specification

API Q1	Specification for Quality Programs for the Petroleum, Petro Chemical and Natural Gas Industry
ISO 9001	Quality Management Systems Requirements



Quality Policy

We are committed to

- Achieve customer satisfaction by offering quality products conforming to National/International Standards by implementing Quality System.
- Attain technological leadership through innovative measures and continuous developments.
- Attain high morale and ethical standards of employees through improved work practices and welfare schemes.
- Train and develop people at all levels on continuing basis.

D.P. Jindal
Chairman



ERW LINE PIPE CONFORMING TO API 5L, IS:1978, IS:1979



**WATER GAS & SEWAGE LINE CONFORMING TO IS:3589
WATER WELL CASING CONFORMING TO IS:4270**

DIMENSIONS AND WEIGHTS (kg/m) / (lb/ft)

W.T.		OUTSIDE DIAMETER Inch/mm																							
mm	Inch	Inch 6.5/8	8.5/8	10.3/4	12.3/4	14	16	16.5	16.3/4	18	18.5/8	20	20.7/8												
		mm 168.3	219.1	273.1	323.9	355.6	406.4	419.0	426.0	457.0	473.0	508.0	530.0												
		kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft										
3.20	0.125	13.03	8.69	17.04	11.36	-	-	-	-	-	-	-	-	-	-										
3.60	0.141	14.62	9.77	19.13	-	-	-	-	-	-	-	-	-	-	-										
4.00	0.156	16.21	10.79	21.22	14.12	26.54	17.67	-	-	-	-	-	-	-	-										
4.40	0.172	17.78	11.87	23.29	-	29.15	-	34.67	23.13	38.10	-	43.62	-	44.98	-	45.74	-	49.10	-	50.84	-	-	-	-	-
4.50	0.180	18.18	-	23.81	-	29.80	-	35.44	-	38.96	-	44.60	-	46.00	-	46.77	-	50.21	-	51.99	-	-	-	-	-
4.80	0.188	19.35	12.94	25.37	16.96	31.76	21.23	37.77	25.25	41.52	27.76	47.54	31.78	49.03	-	49.86	-	53.53	35.80	55.42	-	59.56	-	62.17	-
5.20	0.203	20.91	13.94	27.43	18.28	34.35	22.89	40.87	27.23	44.93	29.94	51.45	34.28	53.06	-	53.96	-	57.93	-	59.99	-	64.47	-	67.30	-
5.30	0.209	-	-	-	-	-	-	45.78	30.96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.40	0.210	21.69	-	28.45	-	35.64	-	42.41	-	46.63	-	53.40	-	55.08	-	56.01	-	60.13	-	62.27	-	66.93	-	69.86	-
5.60	0.219	22.47	15.00	29.48	19.68	36.94	24.65	43.96	29.34	48.33	32.26	55.35	36.95	57.09	-	58.05	-	62.34	41.63	64.54	-	69.38	46.31	72.42	-
6.00	0.236	24.01	-	31.53	-	39.52	-	47.04	-	51.73	-	59.24	-	61.11	-	62.14	-	66.73	-	69.10	-	74.27	-	77.53	-
6.30	0.248	25.17	-	33.06	-	41.45	-	49.34	-	54.26	-	62.16	-	64.11	-	65.20	-	70.20	-	72.50	-	77.94	-	81.36	-
6.40	0.250	25.55	17.04	33.57	22.38	42.09	28.06	50.11	33.41	55.11	36.75	63.13	42.09	65.12	-	66.22	-	71.12	47.44	73.64	-	79.16	52.78	82.64	-
7.00	0.277	27.84	-	36.61	24.72	45.93	-	54.70	-	60.17	-	68.94	-	71.12	-	72.33	-	77.68	-	80.44	-	86.48	-	90.28	-
7.10	0.280	28.22	18.99	-	-	46.57	31.23	55.47	37.46	61.02	41.21	69.91	47.22	72.12	-	73.34	-	78.77	53.23	81.57	-	87.70	59.23	91.55	-
7.80	0.307	-	-	-	-	51.03	34.27	-	-	-	-	-	-	79.10	-	80.44	-	-	-	89.48	-	-	-	100.44	-
7.90	0.312	31.25	21.06	41.14	27.73	-	-	61.56	41.48	67.74	45.65	77.63	52.32	80.09	-	81.45	-	87.49	58.99	90.61	-	97.43	65.66	101.71	-
8.00	0.315	31.62	-	41.60	-	52.30	-	62.32	-	68.57	-	78.59	-	81.08	-	82.46	-	88.58	-	91.73	-	98.64	-	102.98	-
8.20	0.322	32.37	-	42.65	28.58	53.56	-	63.84	-	70.25	-	80.52	-	83.07	-	84.48	-	90.75	-	93.99	-	101.06	-	105.51	-
8.40	0.330	-	-	-	-	65.35	43.81	-	-	-	-	-	-	85.05	-	86.50	-	-	-	96.24	-	-	-	108.05	-
8.70	0.344	34.24	23.10	45.14	30.45	56.72	38.27	67.62	45.62	74.42	50.22	85.32	57.57	88.03	-	89.53	-	96.18	64.93	99.61	-	107.12	72.28	111.84	-
9.00	0.354	35.35	-	46.63	-	58.61	-	69.89	-	76.92	-	88.20	-	90.99	-	92.55	-	99.43	-	102.98	-	110.75	-	115.63	-
9.30	0.365	-	-	-	-	60.50	40.52	-	-	-	-	-	-	93.96	-	95.56	-	-	-	106.34	-	-	-	119.42	-
9.50	0.375	37.20	25.05	49.10	33.07	61.75	-	73.65	49.61	81.08	54.62	92.98	62.64	95.93	-	97.57	-	104.84	70.65	108.58	-	116.78	78.67	121.94	-
10.00	0.394	39.04	-	51.56	-	64.88	-	77.40	-	85.22	-	97.75	-	100.86	-	102.58	-	110.23	-	114.17	-	122.80	-	128.23	-
10.30	0.405	40.13	-	53.03	-	66.75	-	79.65	53.57	87.70	59.00	100.61	67.68	103.81	-	105.59	-	113.46	76.36	117.52	-	126.41	85.04	132.00	-
10.50	0.413	40.86	-	54.02	-	67.99	-	81.15	-	89.36	-	102.51	-	105.77	-	107.58	-	115.61	-	119.75	-	128.82	-	134.51	-
11.00	0.432	42.67	28.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.10	0.438	43.02	-	56.94	38.33	71.72	48.28	85.62	57.65	94.30	63.50	108.20	72.86	111.65	-	113.57	-	122.05	82.23	126.43	-	136.01	91.59	142.03	-
11.30	0.445	43.75	-	57.90	-	72.95	-	87.10	-	95.94	-	110.10	-	113.61	-	115.56	-	124.20	-	128.65	-	138.41	-	144.54	-
11.50	0.453	44.47	-	58.87	-	74.19	-	88.59	-	97.58	-	111.99	-	115.56	-	117.55	-	126.34	-	130.87	-	140.80	-	147.04	-
11.90	0.469	45.90	-	60.80	-	76.65	-	91.56	-	100.86	67.84	115.77	77.87	119.46	-	121.52	-	130.62	87.89	135.31	-	145.58	97.92	152.04	-
12.00	0.472	46.25	-	61.28	-	77.26	-	92.30	-	101.68	-	116.71	-	120.43	-	122.51	-	131.68	-	136.42	-	146.78	-	153.29	-
12.50	0.492	48.03	-	63.68	-	80.33	-	95.99	-	105.76	-	121.42	-	125.30	-	127.46	-	137.02	-	141.95	-	152.74	-	159.52	-
12.70	0.500	48.73	32.74	64.64	43.43	81.55	54.79	97.46	65.48	107.39	72.16	123.30	82.85	127.25	-	129.44	-	139.15	93.54	144.16	-	155.12	104.23	162.00	-

NOTE: i) Size indicates weight lb/ft respective thickness conforms to API 5L, IS:1978 and IS:1979
ii) Above sizes conforms several other National and International Standards for Different Applications.

TOLERANCE ON OUTSIDE DIAMETER, WALL THICKNESS, WEIGHT AND LENGTH OF PIPE

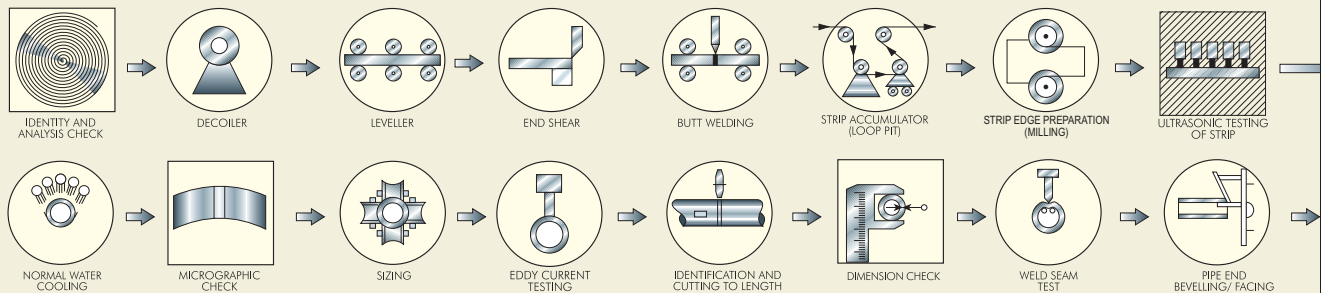
SPEC.	OUT SIDE DIAMETER		WALL THICKNESS	WEIGHT	LENGTH							
	PIPE BODY	PIPE END			NOMINAL ft mtr.	Avg. Min. ft mtr.	MINIMUM ft mtr.	MAXIMUM ft mtr.				
API 5L	< 2 3/8" (60.3 mm) OD : + 0.40mm, - 0.80mm ≥ 2 3/8" (60.3 mm) OD to ≤ 24" (610 mm) : ± 0.0075 D (but max. of ± 3.20 mm)	≤ 6 5/8" (168.3 mm): + 1.60 mm, - 0.40mm > 6 5/8" (168.3 mm) to ≤ 24" (610 mm) : ± 0.005 D (but max. of ± 1.6 mm)	≤ 5.0 mm WT : ± 0.5 mm > 5.0 mm WT to < 15.0 mm WT : ± 0.1 ≥ 15.0 mm WT : ± 1.5 mm	Single length of pipe + 10%, - 3.5% Carloads ≥ 20 Ton : - 1.75%	20	6	17.5	5.33	9	2.74	22.5	6.86
					40	12	35.0	10.67	14	4.27	45.0	13.72
IS: 1978	60.3 and above ± 1%	≤ 273.1 mm OD = + 1.60mm-0.40 mm 323.9 mm OD & larger pipe = + 2.40 mm - 0.80 mm	101.6 mm to 457.2 mm OD = + 15% - 12.5% 508 mm OD and above + 17.5% - 10.0%	Single length of pipe + 10%, - 3.5% Carloads: for min. 18,000 Kg-1.75%	-	6.0	-	5.3	-	2.70	-	-
IS: 1979	< 508.0 mm OD ± 0.75% ≥ 508.0 MM OD PIPE = ± 1.0%	≤ 273.1 mm OD pipe = + 1.60 mm - 0.40 mm 323.9 MM OD & LARGER PIPE = + 2.40 mm - 0.80 mm	≤ 457.0 mm OD pipe = + 15.0% - 12.5% ≥ 508.0 mm OD pipe = + 19.5% - 8.0%	Single length of pipe + 10% - 3.5% Carloads: for min. 18,144 Kg. - 1.75%	-	6.0	-	5.3	-	2.70	-	-
ASTM-A-53	Pipe 2" NPS and over = ± 1.0%	-	At any point - 12.5% (Max) T _m = T _n X 0.875 T _n = Nominal w.t T _m = Minimum w.t	± 10%	20	6.0	-	-	16	4.88	22	6.71
IS: 3589	Upto 508 mm OD = ± 0.75%	-	± 10%	-	-	6.0	-	-	-	4.00	-	7.0
IS: 4270	± 1.0%	-	upto 406.4 mm OD = + 15% - 12.5% over 406.4 mm OD = + 15% - 10%	+ 10% - 8%	-	6.0	-	-	-	4.0	-	7.0
API-5CT	4 - 1/2" and larger = + 1.0% - .5% of OD	5" and larger = + 1.0% - 0.016"	- 12.50%	Single length of pipe + 6.5%, - 3.5% Car loads: for min 40,000 lb or more - 1.75%	Range-1			Range-2		Range-3		
					ft/mtr	ft/mtr	ft/mtr	ft/mtr	ft/mtr	ft/mtr	ft/mtr	ft/mtr
					16/4.88	25/7.62	34/10.36	min.	min.	min.		
					ft/mtr	ft/mtr	ft/mtr	ft/mtr	ft/mtr	ft/mtr	ft/mtr	ft/mtr
					max.	max.	max.	max.	max.	max.	max.	max.

STEAM, WATER, GAS AND AIR LINE ERW PIPES CONFORMING TO ASTM A-53/API 5L

DIMENSIONS & WEIGHTS

NPS DESIG NATION	OUTSIDE DIAMETER		SCHEDULED WALL THICKNESS/ WEIGHT															
			10		20		30		STD		40		XS		60		80	
	Inch	mm	Inch (lb/ft)	mm (kg/m)	Inch (lb/ft)	mm (kg/m)	Inch (lb/ft)	mm (kg/m)	Inch (lb/ft)	mm (kg/m)	Inch (lb/ft)	mm (kg/m)	Inch (lb/ft)	mm (kg/m)	Inch (lb/ft)	mm (kg/m)	Inch (lb/ft)	mm (kg/m)
6	6.625	168.3	-	-	-	-	-	-	0.280 18.97	7.11 28.28	0.280 18.97	7.11 28.26	0.432 28.57	10.97 42.56	-	-	0.432 28.57	10.97 42.56
8	8.625	219.1	-	-	0.250 22.360	6.35 33.31	0.277 24.70	7.04 36.82	0.322 28.55	8.18 42.55	0.322 28.55	8.18 42.55	0.500 43.39	12.70 64.64	0.406 35.64	10.31 53.08	0.500 43.39	12.70 64.64
10	10.750	273.0	-	-	0.250 28.04	6.35 41.75	0.307 34.24	7.80 51.01	0.365 40.48	9.27 60.29	0.365 40.48	9.27 60.29	0.500 54.74	12.70 81.52	0.500 54.74	12.70 81.52	-	-
12	12.750	323.8	-	-	0.250 33.38	6.35 49.71	0.330 43.81	8.38 65.18	0.375 49.58	9.52 73.78	0.406 53.52	10.31 79.70	0.500 65.42	12.70 97.43	-	-	-	-
14	14.000	355.6	0.250 36.71	6.35 54.69	0.312 45.61	7.92 67.90	0.375 54.57	9.52 81.25	0.375 54.57	9.52 81.25	0.438 63.44	11.13 94.55	0.500 72.09	12.70 107.39	-	-	-	-
16	16.000	406.4	0.250 42.05	6.35 62.64	0.312 52.27	7.92 77.83	0.375 62.58	9.52 93.17	0.375 93.17	9.52 93.17	0.500 82.77	12.70 123.30	0.500 82.77	12.70 123.30	-	-	-	-
18	18.000	457.0	0.250 47.39	6.35 70.60	0.312 58.94	7.92 87.75	0.438 82.15	11.13 122.43	0.375 70.59	9.52 105.10	-	-	0.500 93.45	12.70 139.20	-	-	-	-
20	20.000	508.0	0.250 52.73	6.35 78.55	0.375 78.60	9.52 117.02	0.500 104.13	12.70 155.12	0.375 78.60	9.52 117.02	-	-	0.500 104.13	12.70 155.12	-	-	-	-

MANUFACTURING AND TESTING FLOW DIAGRAM OF H.F.I WELDED PIPE



ERW CASING PIPES CONFORMING TO API 5C T

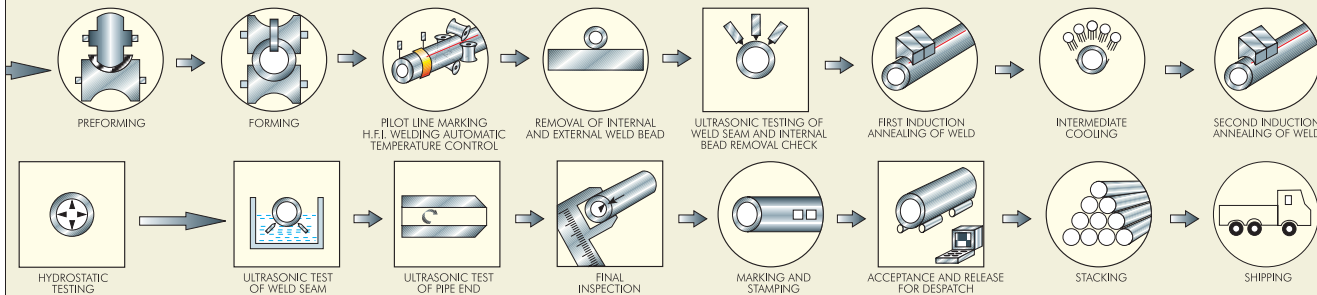
DIMENSIONS & WEIGHTS (kg/m)/(lb/ft)

DESIGNATION		OUTSIDE DIAMETER (D)		WALL THICKNESS		INSIDE DIAMETER		PLAIN-END WEIGHT	
Inch	lb/ft	Inch	mm	Inch	mm	Inch	mm	lb/ft	kg/m
6-5/8	20.00	6.625	168.30	0.288	7.30	6.049	153.64	19.51	29.00
6-5/8	24.00	6.625	168.30	0.352	8.90	5.921	150.40	23.60	35.10
6-5/8	28.00	6.625	168.30	0.417	10.60	5.791	147.10	27.67	41.20
6-5/8	32.00	6.625	168.30	0.475	12.10	5.675	144.15	31.23	46.48
7.00	17.00	7.00	177.80	0.231	5.90	6.538	166.06	16.72	24.90
7.00	20.00	7.00	177.80	0.272	6.90	6.456	163.98	19.56	29.10
7.00	23.00	7.00	177.80	0.317	8.05	6.366	161.70	22.65	33.70
7.00	26.00	7.00	177.80	0.362	9.20	6.276	159.41	25.69	38.20
7.00	29.00	7.00	177.80	0.408	10.40	6.184	157.07	28.75	42.80
7.00	32.00	7.00	177.80	0.453	11.50	6.094	154.79	31.70	47.20
7.00	35.00	7.00	177.80	0.498	12.70	6.004	152.50	34.61	51.50
8-5/8	24.00	8.625	219.10	0.264	6.70	8.097	205.66	23.60	35.10
8-5/8	28.00	8.625	219.10	0.304	7.70	8.017	203.63	27.04	40.24
8-5/8	32.00	8.625	219.10	0.352	8.90	7.921	201.19	31.13	46.33
8-5/8	36.00	8.625	219.10	0.400	10.20	7.825	198.75	35.17	52.34
8-5/8	40.00	8.625	219.10	0.452	11.50	7.725	196.21	39.33	58.53
8-5/8	44.00	8.625	219.10	0.500	12.70	7.625	193.67	43.43	64.63
9-5/8	32.30	9.625	244.50	0.312	7.90	9.001	228.62	31.06	46.20
9-5/8	36.00	9.625	244.50	0.352	8.90	8.921	226.59	34.89	51.90
9-5/8	40.00	9.625	244.50	0.395	10.00	8.835	224.41	38.97	58.00
9-5/8	43.50	9.625	244.50	0.435	11.00	8.755	222.38	42.73	63.60
9-5/8	47.00	9.625	244.50	0.472	12.00	8.681	220.50	46.18	68.70
10-3/4	32.75	10.75	273.10	0.279	7.10	10.192	258.87	31.23	46.48
10-3/4	40.50	10.75	273.10	0.350	8.90	10.050	255.27	38.91	57.90
10-3/4	45.50	10.75	273.10	0.400	10.20	9.950	252.73	44.26	65.87
10-3/4	51.00	10.75	273.10	0.450	11.50	9.850	250.19	49.55	73.74
10-3/4	55.50	10.75	273.10	0.495	12.60	9.760	247.90	54.26	80.75
13-3/8	48.00	13.375	339.70	0.330	8.40	12.715	322.96	46.02	68.50
13-3/8	54.50	13.375	339.70	0.380	9.70	12.615	320.42	52.79	78.60
13-3/8	61.00	13.375	339.70	0.430	10.90	12.515	317.88	59.50	88.55
13-3/8	68.00	13.375	339.70	0.480	12.20	12.415	315.34	66.17	98.50
16	65.00	16.000	406.40	0.375	9.50	15.250	387.34	62.64	93.22
16	75.00	16.000	406.40	0.438	11.10	15.124	384.15	72.86	108.40
16	84.00	16.000	406.40	0.495	12.60	15.010	381.25	82.05	122.10
18-5/8	87.50	18.625	473.07	0.435	11.10	17.755	450.98	84.59	125.90
20	94.00	20.000	508.00	0.438	11.10	19.124	485.75	91.59	136.30
20	106.50	20.000	508.00	0.500	12.70	19.000	482.60	104.23	155.10

BLACK & GALVANIZED STEEL TUBES CONFORMING TO IS:1239(I) EQUIVALENT TO BS:1387

SERIES			LIGHT					MEDIUM					HEAVY				
NOMINAL BORE		O.D.	OUTSIDE DIA.		WALL THICK.	WEIGHT		OUTSIDE DIA.		WALL THICK.	WEIGHT		OUTSIDE DIA.		WALL THICK.	WEIGHT	
Inch	mm	mm	(Min.) mm	(Max.) mm	mm	P/E kg/m	S/S kg/m	(Min.) mm	(Max.) mm	mm	P/E kg/m	S/S kg/m	(Min.) mm	(Max.) mm	mm	P/E kg/m	S/S kg/m
1/2	15	21.3	21.0	21.4	2.0	0.947	0.956	21.0	21.8	2.6	1.22	1.22	21.0	21.8	3.2	1.44	1.45
3/4	20	26.9	26.4	26.9	2.3	1.38	1.39	26.5	27.3	2.6	1.56	1.57	26.5	27.3	3.2	1.87	1.88
1	25	33.7	33.2	33.8	2.6	1.98	2.00	33.3	34.2	3.2	2.41	2.43	33.3	34.2	4.0	2.93	2.95
1-1/4	32	42.2	41.9	42.5	2.6	2.54	2.57	42.0	42.9	3.2	3.10	3.13	42.0	42.9	4.0	3.79	3.82
1-1/2	40	48.3	47.8	48.4	2.9	3.23	3.27	47.9	48.8	3.2	3.56	3.60	47.9	48.8	4.0	4.37	4.41
2	50	60.3	59.6	60.2	2.9	4.08	4.15	59.7	60.8	3.6	5.03	5.10	59.7	60.8	4.5	6.19	6.26
2-1/2	65	76.1	75.2	76.0	3.2	5.71	5.83	75.3	76.6	3.6	6.42	6.54	75.3	76.6	4.5	7.93	8.05
3	80	88.9	87.9	88.7	3.2	6.72	6.89	88.0	89.5	4.0	8.36	8.53	88.0	89.5	4.8	9.90	10.10
4	100	114.3	113.0	113.9	3.6	9.75	10.00	113.1	115.0	4.5	12.20	12.50	113.1	115.0	5.4	14.50	14.80
5	125	139.7	-	-	4.5	15.00	-	138.5	140.8	4.8	15.90	16.40	138.5	140.8	5.4	17.90	18.40
6	150	165.1	-	-	4.5	17.80	-	163.9	166.5	4.8	18.90	19.50	163.9	166.5	5.4	21.30	21.90

S HIGH FREQUENCY INDUCTION WELDED/ELECTRIC RESISTANCE WELDED



CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES



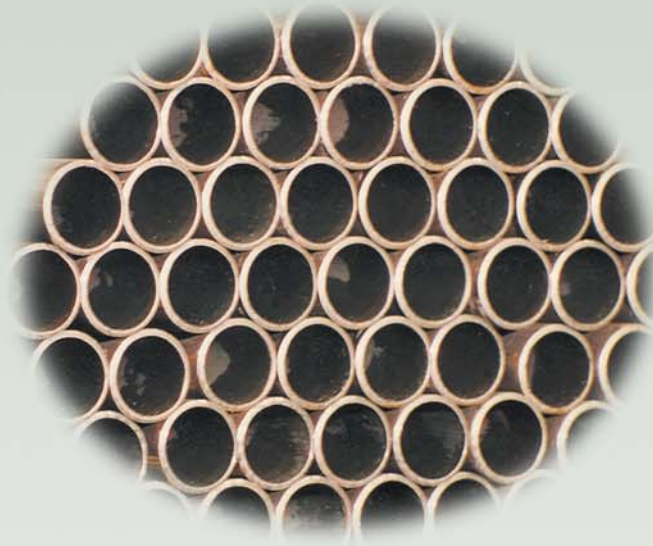
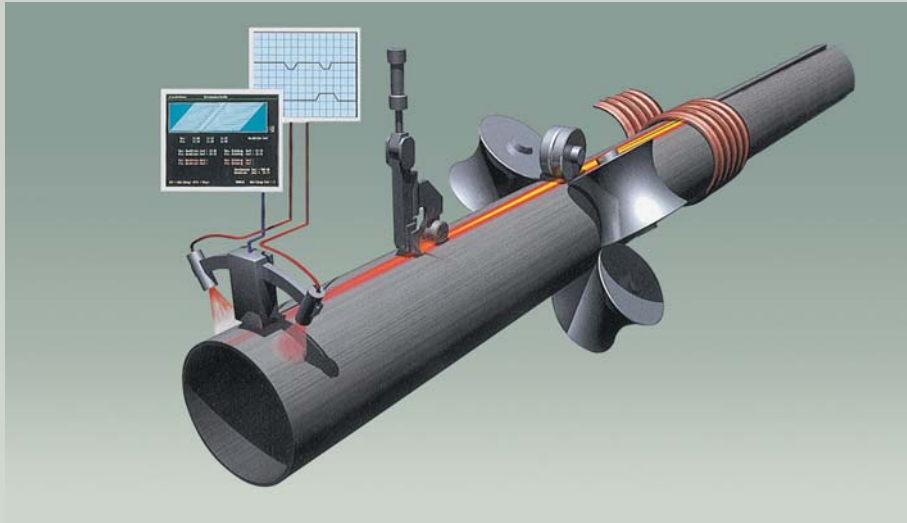
Specification	Grade	CHEMICAL COMPOSITION % (Max.)										MECHANICAL PROPERTIES								Impact Energy J ft/lb min.	Hydrostatic Test Pressure			
		C	Mn	P	S	Si	V	Nb	Ti	C.E.		YIELD STRENGTH				TENSILE STRENGTH						% Elongation e		
										PCM	IIV	Min.		Max.		Min.		Max.						
												PSI	MPa	PSI	MPa	PSI	MPa	PSI	MPa					
API 5L	L210 or A	0.22	0.90	0.030	0.030	-	-	-	-	-	-	-	30500	210	-	-	48600	335	-	-	U.S Customary Unit e = 625,000 A ^{0.2} / U ^{0.9}	-	U.S Customary Unit, P = 2ST / D	
PSL-1	L245 or B	0.26	1.20	0.030	0.030	-	-	-	-	-	-	-	35500	245	-	-	60200	415	-	-	S.I Unit e = 1940 A ^{0.2} / U ^{0.9}	-	S.I Unit P = 2000 ST/D	
	L290 or X-42	0.26	1.30	0.030	0.030	-	-	-	-	-	-	-	42100	290	-	-	60200	415	-	-	S = Fibre Stress in PSI (MPa) = 60% of Min. Y.S for all sizes for Grade A & B = 60% of Min.Y.S for all sizes < 5/16" for Gr. X-42 & above. = 75% of Min. Y.S for size > 5/16" & < 8 5/8" for Gr. X-42 & above. = 85% of Min. Y.S for size > 8 5/8" & < 20" for Gr. X-42 & above. = 90% of Min. Y.S for size > 20" for Gr. X-42 & above.			
	L320 or X-46	0.26	1.40	0.030	0.030	-	-	-	-	-	-	-	46400	320	-	-	63100	435	-	-	Legend : e = specified min. elongation A= Tensile test piece cross sectional area. U= Specified min. tensile strength.	-	Std. Test pressure limited to 2970 PSI (20500 kpa) for Gr. X-42 & above. Alternate test pressure limited to 7260 PSI (50000 kpa) for size < 16" & 3630 PSI (25000 kpa) for size > 16" for Gr. X-42 & above	
	L360 or X-52	0.26	1.40	0.030	0.030	-	-	-	-	-	-	-	52200	360	-	-	66700	460	-	-		-		
	L390 or X-56	0.26	1.40	0.030	0.030	-	-	-	-	-	-	-	56600	390	-	-	71100	490	-	-		-		
	L415 or X-60	0.26	1.40	0.030	0.030	-	-	-	-	-	-	-	60200	415	-	-	75400	520	-	-		-		
	L450 or X-65	0.26	1.45	0.030	0.030	-	-	-	-	-	-	-	65300	450	-	-	77600	535	-	-		-		
	L485 or X-70	0.26	1.65	0.030	0.030	-	-	-	-	-	-	-	70300	485	-	-	82700	570	-	-		-		
API 5L	L245M or BM	0.22	1.20	0.025	0.015	0.45	0.050	0.050	0.040	0.25	0.43	35500	245	65300	450	60200	415	110200	760	-	-	27 (20)		
PSL-2	L290M or X42M	0.22	1.30	0.025	0.015	0.45	0.050	0.050	0.040	0.25	0.43	42100	290	71800	495	60200	415	110200	760	-	-	27 (20)		
	L320M or X46M	0.22	1.30	0.025	0.015	0.45	0.050	0.050	0.040	0.25	0.43	46400	320	76100	525	63100	435	110200	760	-	-	27 (20)		
	L360M or X52M	0.22	1.40	0.025	0.015	0.45	-	-	-	0.25	0.43	52200	360	76900	530	66700	460	110200	760	-	-	27 (20)		
	L390M or X56M	0.22	1.40	0.025	0.015	0.45	-	-	-	0.25	0.43	56600	390	79000	545	71100	490	110200	760	-	-	27 (20)		
	L415M or X60M	0.12	1.60	0.025	0.015	0.45	-	-	-	0.25	0.43	60200	415	81900	565	75400	520	110200	760	-	-	27 (20)		
	L450M or X65M	0.12	1.60	0.025	0.015	0.45	-	-	-	0.25	0.43	65300	450	87000	600	77600	535	110200	760	-	-	27 (20)		
	L485M or X70M	0.12	1.70	0.025	0.015	0.45	-	-	-	0.25	0.43	70300	485	92100	635	82700	570	110200	760	-	-	27 (20)		
	IS:1978	YST - 210	0.22	0.90	0.040	0.050	-	-	-	-	-	-	-	210	-	-	-	330	-	-	-	e = 1942.57 A ^{0.2} / U ^{0.9}	-	for Std. Pressure, 155 for ALT pressure; S for YST 240 = 145 for Standard Pressure, 181 for ALT pressure,
	YST - 240	0.27	1.15	0.040	0.050	-	-	-	-	-	-	-	240	-	-	-	410	-	-	-		-		
IS:1979	YST - 290	0.28	1.25	0.040	0.050	-	-	-	-	-	-	-	290	-	-	-	410	-	-	-	e = 1942.57 A ^{0.2} / U ^{0.9}	-	P = 2000 S T/D or 20700 KPA whichever is smaller where S= Fibre stress in MPA equal to % of SMYS for various sizes as below :	
	YST - 320	0.30	1.35	0.040	0.050	-	-	-	-	-	-	-	320	-	-	-	430	-	-	-		-	Size 114.3 mm OD or less = 60% 168.32 to 219.1 mm OD = 75% 273.0 to 457.2 mm OD = 85% 508 mm OD and large = 90%	
	YST - 360	0.30	1.35	0.040	0.050	-	-	-	-	-	-	-	360	-	-	-	450*/500**	-	-	-		-	P = 2 ST / D or 2800 PSI (19.3 MPa) whichever is smaller S = 0.60 times min. specified Y.S PSI (Kpa) P = 2ST / D shall not exceed 5 MPa S = Stress which shall be taken 60% of min. specified Y.S	
	YST - 390	0.26	1.35	0.040	0.050	-	-	-	-	-	-	-	390	-	-	-	490*/520**	-	-	-		-		
	YST - 410	0.26	1.35	0.040	0.050	-	-	-	-	-	-	-	410	-	-	-	520*/540**	-	-	-		-		
	YST - 450	0.26	1.40	0.040	0.050	-	-	-	-	-	-	-	450	-	-	-	530*/550**	-	-	-		-		
	YST - 480	0.23	1.60	0.040	0.050	-	-	-	-	-	-	-	480	-	-	-	565	-	-	-		-		
<p>* Applicable for pipes with < 508 mm OD and any wall thickness, and pipe with 508 mm and larger, and wall thickness > 9.5 mm</p> <p>** Applicable for pipes with 508 mm OD and larger wall thickness < 9.5 mm</p>																								
ASTM	A	0.25	0.95	0.050	0.045	-	-	-	-	-	-	-	30000	205	-	-	48000	330	-	-	e = 625,000 A ^{0.2} / U ^{0.9}	-		
A- 53	B	0.30	1.20	0.050	0.045	-	-	-	-	-	-	-	35000	240	-	-	60000	415	-	-		-		
IS:3589	Fe 330	0.16	1.20	0.040	0.040	-	-	-	-	-	-	-	195	-	-	-	330	-	-	-	G.L = 5.65√area	20		
	Fe 410	0.20	1.30	0.040	0.040	-	-	-	-	-	-	-	235	-	-	-	410	-	-	-		18		
	Fe 450	0.25	1.20	0.040	0.040	-	-	-	-	-	-	-	275	-	-	-	450	-	-	-		15		
IS:4270	Fe 410	-	-	0.040	0.040	-	-	-	-	-	-	-	235	-	-	-	410	-	-	-	G.L = 5.65√area	15		
	Fe 450	-	-	0.040	0.040	-	-	-	-	-	-	-	275	-	-	-	415	-	-	-		13		
API 5CT	H 40	-	-	0.030	0.030	-	-	-	-	-	-	-	40000	276	80000	552	60000	414	-	-	e = 625,000 A ^{0.2} / U ^{0.9}	20L/16T	P = 2 (f x yp x T) / D	
	J-55	-	-	0.030	0.030	-	-	-	-	-	-	-	55000	379	80000	552	75000	517	-	-		27L/20T	f = a Factor, 0.8 for < 9 5/8" & 0.6 for > 9 5/8"	

NOTE : Refer current edition of Relevant specification for Dimensions and Properties data

* Specifications are subject to change without any prior notice

A = Specimen cross-sectional area
U = Specified Min. T.S.
D = Specified Outside Diameter.

P = Test pressure PSI (MPa)
T = Specified wall thickness



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