

ІСТІЛ (Iron & Steel Industry Ltd.) є передовою технологією виробником трубної сталі. Продукти ІСТІЛ, виготовлені на наших виробничих об'єктах здійснюються в суворій відповідності з докладними технічними та якісних характеристик, які виробляються в наших сучасних млинів технології труб. Компанія була схвалена і / або інших організацій, перерахованих.

Сьогодні бренд ІСТІЛ є синонімом якості, надійності і сервісу до максимального значення стандартів і має досвід роботи в багатьох секторах ринку.

ІСТІЛ млин має передові технології та обладнання для виробництва труб з вуглецевої сталі, в тому числі наших об'єктів в Україні і OEM-заводів.



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## INTRODUCTION

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ISTIL (Iron and Steel Industry Ltd.) is a modern technology steel pipe producer.

ISTIL products produced at our manufacturing facilities are manufactured in strict accordance with the detailed technical and quality specifications that are produced at our modern technology pipe plants. The company has been approved and / or listed by third party organizations.

Today, ISTIL brand is synonymous with quality, reliability and service to the very highest

standards and has industry experience in many market sectors.

ISTIL mills has advanced technology and equipments for producing carbon steel pipes including our facilities in Ukraine, Czech Republic, Russia, Poland and Azerbaijan and OEM factories.

In addition to our products, the pipe lines now became one of our main products including seamless and welded pipes that may used in boilers, electric power, chemical, petrochemical, pharmaceutical, heating and oil & gas lines.

ur production range for seamless pipes from 1/2" to 24"-as standard manufacturing with wall thickness according to SCH.30, Sch.40, Sch.80 and Sch. 160. We are specialized in manufacturing big size diameters for welded and Spiral STD pipes.

The manufacturing process according to GB, ASTM, API5L, API 5CT, DIN and JIS.

The product approved and delivered to many projects in different countries and regions in the world. We are covering quality assurance systems in our products according to the requirements of ISO 9001:2000 (TUV)

For some seamless sizes and welded pipes, we are utilizing global sourcing processes from different countries including our facilities in Ukraine. All manufacturing facilities are regularly audited by the British Standards Institute (BSI) and European PED (Pressure Equipment Directive) standards and approvals. We can also provide if required "Certificates of Test from Third Party". ISTIL products produced at our manufacturing facilities are manufactured in strict accordance with the detailed technical and quality specifications that are produced by our technical and QA departments.

Our manufacturing facilities are supervised by technologically export and experienced people and high level quality standards are adhered to, using the sophisticated inspection facilities available in house which include Hydro testing NDT using electro magnetic induction, ultrasonic & eddy current testing and laboratory testing of microstructure, tensility, impact hardness etc.

The Plants equipped with latest plant and machinery capable of producing wide range of seamless pipes and tubes both in HOT FINISED and COLD DRAWN/COLD PILGERED CONDITION.

Major quality accreditations of API 5L, API 5CT, API 5DP, Quality systems, Environment Management and occupational Health and safety management systems.

Major international client approvals: products are on approved list of various and international end-user Oil and Gas companies for their exploration and transportation programs. Our list of clients include Global Service, petroleum Development company-Oman, Statoil-USA, Kuwait, Oil company - Kuwait, Exxon Mobil-USA, Joint Operations - Kuwait.

International Exposure: Exporting close to 40% of its turnover to international markets in Middle East and North Africa, Canada, Mexico, Columbia, Brazil, Poland, Kuwait, Vietnam, East Africa and now in Egypt.

ISTIL manufacturing the largest diameter ERW Pipes with wall thickness ranging as special manufacturing - (Black and Galvanized). Having maximum welding speed of 33 meters per minute.

ISTIL ERW Steel Pipes are serving the Oil and Gas Sector, petrochemical industries, refineries, water and sewage applications.





### Line Pipe

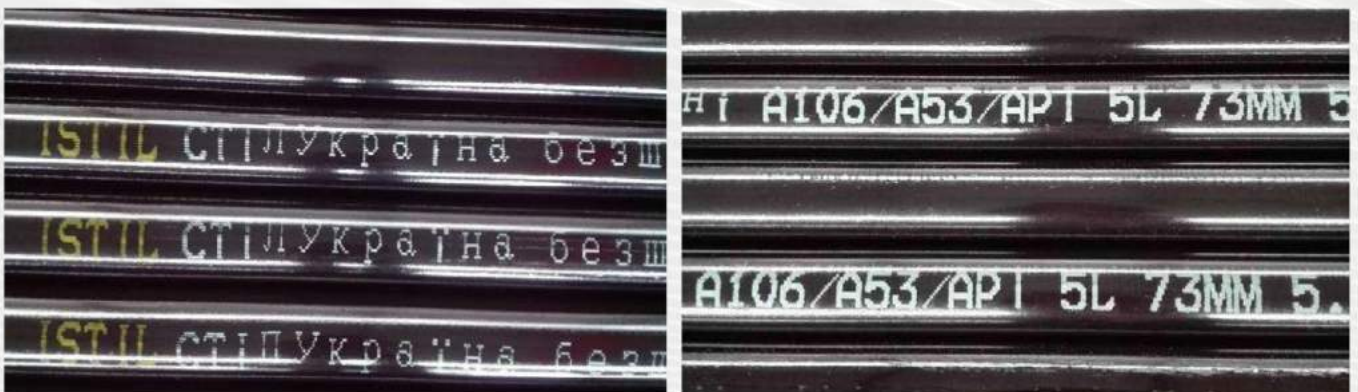
Line pipe is manufactured from high-strength carbon steel, and is made to strict engineering and metallurgical specifications developed by the American Petroleum Institute (API).

One particular standard, API Specification 5L, defines requirements for pipe made to transport natural gas, oil and water. This specification includes standards for the dimensional, physical, mechanical, and chemical properties of the carbon steel. Several pipe mills in North America and around the world manufacture API 5L line pipe for the natural gas industry. Pipe mills produce two types of line pipe: seamless and welded.

Seamless pipe is formed from a cylindrical bar of steel that is heated to a very high temperature and then is pierced with a probe to create the hole through the cylinder. Rollers size the cylinder to produce the proper diameter and wall thickness. This technique is used to make small diameter pipe, from 0.5 inches to 24 inches in diameter.

Most pipe produced for interstate natural gas pipelines is the welded variety, because interstate systems require larger diameter pipe. Pipe mills manufacture line pipe by forming a steel plate or coil into a cylindrical shape, and closing the seam using a welding process. The mill evaluates the quality of the weld seam using ultrasonic and/or radiological inspection methods and pressure tests each joint of pipe to levels significantly higher than the eventual operating pressure of the pipeline.

The pipe is further tested to ensure that it meets all requirements of steel chemistry, strength and toughness, and dimensional characteristics. Mills that produce line pipe to API specifications meet the most stringent criteria for steel making and pipe production technologies to ensure safe, reliable pipeline service. The gas pipeline industry maintains the manufacturing and test records of the pipe for the life of the pipeline.



## Pipeline Size and Design

The size of interstate pipelines varies, but in most cases a mainline, the principal pipeline that delivers natural gas, ranges from 16 to 48 inches in diameter.

Other smaller pipelines called laterals deliver gas to the mainline or take gas from the mainline and range from six to 16 inches in diameter.

The volume of gas to be delivered and the pressure at which the pipeline will be operated determines the pipeline's ultimate diameter. In order to meet customer delivery requirements most interstate gas pipelines operate at a pressure of at least 600 pounds per square inch (psi), but typically at about 1,000 psi.

The thickness of the pipeline is determined by the maximum operating pressure (MAOP), and is based on published industry standards and federal regulations. The pipeline incorporates a design safety factor, prescribed by U.S. Department of Transportation (DOT) regulations, that is related to the type of construction and population density along the pipeline route.

## SMLS (Seamless Carbon Steel Pipe)

Application: Low Pressure Fluid (water,oil,gas and other liquid) transmission General structure, Mechanical components, Pressured boiler etc.

## ERW (Electric Resistance Welded Carbon Steel Pipe)

ERW Steel Pipe-Electric Resistance Welded Steel Pipe is made of hot-rolled steel coils/sheets that have been put in a process know as cold roll forming. The obvious advantage of ERW steel pipe compared to seamless steel pipe is the uniform wall thickness. According to API standard or GB/T9711.1 standard, both ends of the steel pipe are beveled and length can be fixed as required.

## LSAW (Longitudinal Submerged-Arc Welded Carbon Steel Pipe)

LSAW steel pipe refers to Longitudinal Submerged-Arc Welded Steel Pipe, which is made of hot-rolled steel plate or coils. LSAW steel pipe always goes to the big-sized welded pipe, which can't be manufactured by electric resistance welding technique.

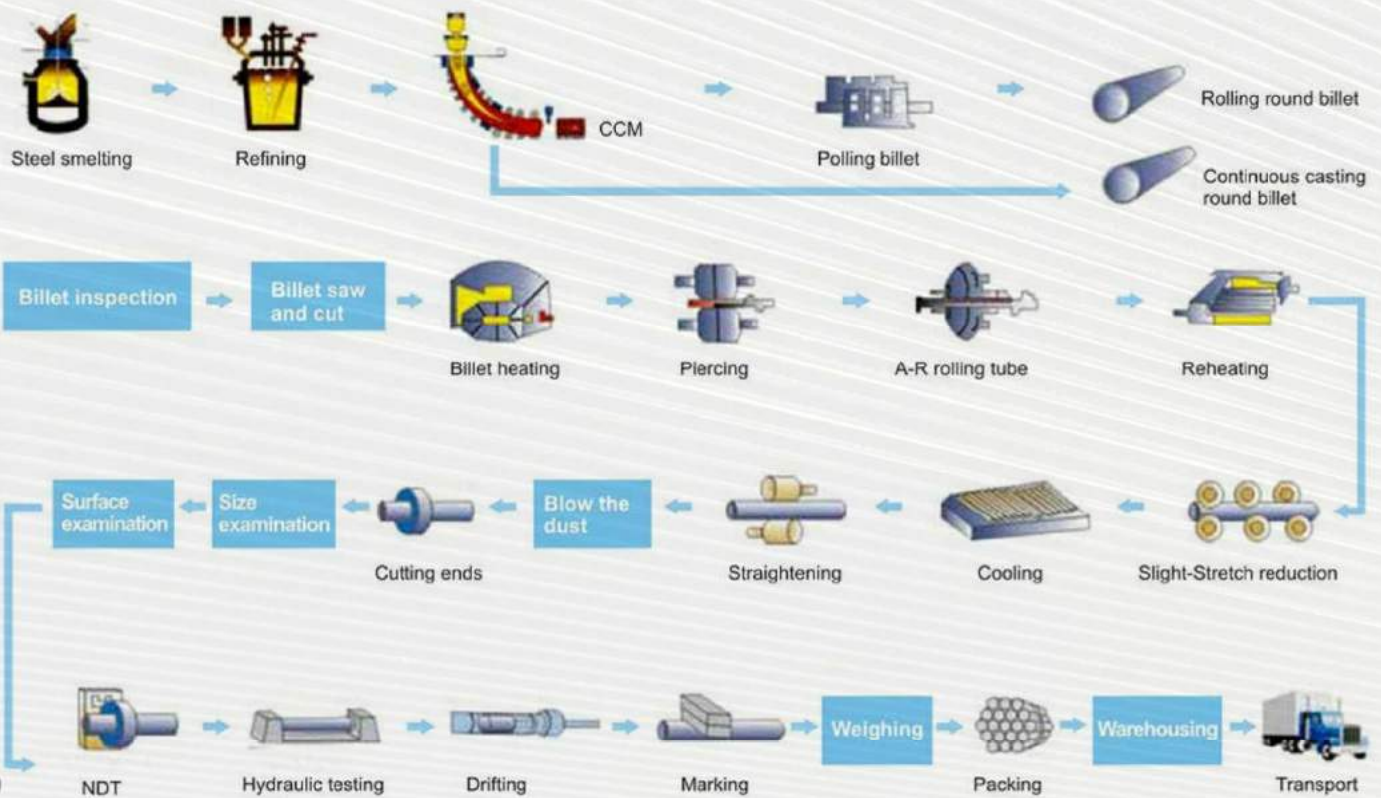
## SSAW (Spiral Submerged- Arc Welded Carbon Steel Pipe)

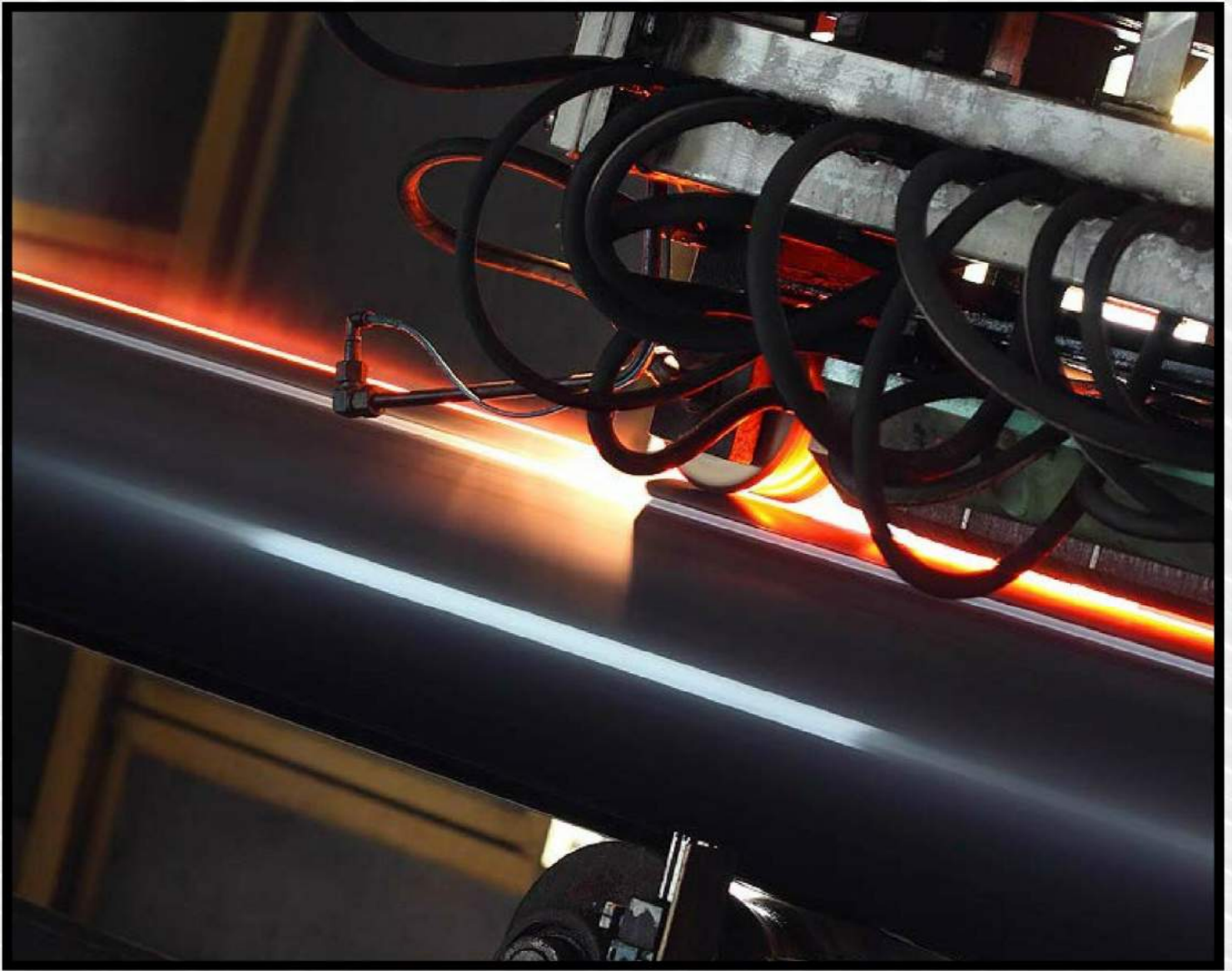
The raw material of the same width can be processed in difference molding angles to manufacture steel pipes in various diameters. The Spiral Steel Pipe shaping method ensures that the pipe will be round and straight in shape without any straightening procedure.





## SMLS steel pipes production Process flow chart







Size and Weight of Seamless Roll Steel Pipe

ASME B36.10M-1996

Nominal Diameter		Outside Diameter		(STD) (XS) (XXS)	Sch.no	Wall Thickness		Nominal Weight	
NPS	DN	in	mm			in	mm	lb/ft	kg/m
1/8	...	0.405	10.3	STD	40	0.068	1.73	0.24	0.37
1/8	...	0.405	10.3	XS	80	0.095	2.41	0.31	0.47
1/4	...	0.540	13.7	STD	40	0.088	2.24	0.42	0.63
1/4	...	0.540	13.7	XS	80	0.119	3.02	0.54	0.80
3/8	10	0.675	17.1	STD	40	0.091	2.31	0.57	0.84
3/8	10	0.675	17.1	XS	80	0.126	3.20	0.74	1.10
1/2	15	0.840	21.3	STD	40	0.109	2.77	0.85	1.27
1/2	15	0.840	21.3	XS	80	0.147	3.73	1.09	1.62
1/2	15	0.840	21.3	...	160	0.188	4.78	1.31	1.95
3/4	20	1.050	26.7	STD	40	0.113	2.87	1.13	1.69
3/4	20	1.050	26.7	XS	80	0.154	3.91	1.47	2.20
3/4	20	1.050	26.7	...	160	0.219	5.56	1.94	2.90
1	25	1.315	33.4	STD	40	0.133	3.38	1.68	2.50
1	25	1.315	33.4	XS	80	0.179	4.55	2.17	3.24
1	25	1.315	33.4	...	160	0.250	6.35	2.84	4.24
1 1/4	32	1.660	42.2	STD	40	0.140	3.56	2.27	3.39
1 1/4	32	1.660	42.2	XS	80	0.191	4.85	3.00	4.47
1 1/4	32	1.660	42.2	...	160	0.250	6.35	3.76	5.61
1 1/2	40	1.900	48.3	STD	40	0.145	3.68	2.72	4.05
1 1/2	40	1.900	48.3	XS	80	0.200	5.08	3.63	5.41
1 1/2	40	1.900	48.3	...	160	0.281	7.14	4.86	7.25
2	50	2.375	60.3	STD	40	0.154	3.91	3.65	5.44
2	50	2.375	60.3	XS	80	0.218	5.54	5.02	7.48
2	50	2.375	60.3	...	160	0.344	8.74	7.46	11.11
2 1/2	65	2.875	73.0	STD	40	0.203	5.16	5.79	8.63
2 1/2	65	2.875	73.0	XS	80	0.276	7.01	7.66	11.41
2 1/2	65	2.875	73.0	...	160	0.375	9.35	10.01	14.92
3	80	3.500	88.9	STD	40	0.216	5.49	7.58	11.29
3	80	3.500	88.9	XS	80	0.300	7.62	10.25	15.27
3	80	3.500	88.9	...	160	0.438	11.13	14.32	21.35
3 1/2	...	4.00	101.6	STD	40	0.226	5.74	9.11	13.57
3 1/2	...	4.00	101.6	XS	80	0.318	8.08	12.50	18.63
4	100	4.500	114.3	STD	40	0.237	6.02	10.79	16.07
4	100	4.500	114.3	XS	80	0.337	8.56	14.98	22.32
4	100	4.500	114.3	...	120	0.438	11.13	19.00	28.32
4	100	4.500	114.3	...	160	0.531	13.49	22.51	33.54
5	125	5.563	141.3	STD	40	0.258	6.55	14.62	21.77
5	125	5.563	141.3	XS	80	0.375	9.53	20.78	30.97
5	125	5.563	141.3	...	120	0.500	12.70	27.04	40.28
5	125	5.563	141.3	...	160	0.625	15.88	32.96	49.11
6	150	6.625	168.3	STD	40	0.280	7.11	18.97	28.26
6	150	6.625	168.3	XS	80	0.432	10.97	28.57	42.56
6	150	6.625	168.3	...	120	0.562	14.27	36.39	54.20
6	150	6.625	168.3	...	160	0.719	18.26	45.35	67.56
8	200	8.625	219.1	STD	40	0.322	8.18	28.55	42.55
8	200	8.625	219.1	XS	80	0.500	12.70	43.39	64.64
8	200	8.625	219.1	...	120	0.719	18.26	60.71	90.44
8	200	8.625	219.1	...	160	0.906	23.01	74.69	111.27
10	250	10.750	273.0	...	20	0.250	6.35	28.04	41.77
10	250	10.750	273.0	STD	40	0.365	9.27	40.48	60.31
10	250	10.750	273.0	...	80	0.594	15.09	64.43	96.01
10	250	10.750	273.0	...	120	0.844	21.44	89.29	133.06
10	250	10.750	273.0	...	160	1.125	28.58	115.64	172.33
12	300	12.750	323.8	...	20	0.250	6.35	33.38	49.73
12	300	12.750	323.8	...	40	0.406	10.31	53.52	79.73
12	300	12.750	323.8	...	80	0.688	17.48	88.63	132.08
12	300	12.750	323.8	XXS	120	1.000	25.40	125.49	186.97
12	300	12.750	323.8	...	160	1.312	33.32	160.27	238.76

Nominal Diameter		Outside Diameter		(STD) (XS) (XXS)	Sch.no	Wall Thickness		Nominal Weight	
NPS	DN	in	mm			in	mm	lb/ft	kg/m
14	350	14.000	355.6	...	10	0.250	6.35	36.71	54.69
14	350	14.000	355.6	...	20	0.312	7.92	45.61	67.90
14	350	14.000	355.6	STD	30	0.375	9.53	54.57	81.33
14	350	14.000	355.6	...	40	0.438	11.13	63.44	94.55
14	350	14.000	355.6	...	60	0.594	15.09	85.05	126.71
14	350	14.000	355.6	...	80	0.750	19.05	106.13	158.10
14	350	14.000	355.6	...	120	1.094	27.79	150.79	224.65
14	350	14.000	355.6	...	160	1.406	35.71	189.11	281.70
16	400	16.000	406.4	...	20	0.312	7.92	52.27	77.83
16	400	16.000	406.4	STD	30	0.375	9.53	62.58	93.27
16	400	16.000	406.4	XS	40	0.500	12.70	82.77	123.30
16	400	16.000	406.4	...	60	0.656	16.66	107.50	160.12
16	400	16.000	406.4	...	80	0.844	21.44	136.61	203.53
18	450	18.000	457	...	20	0.312	7.92	58.94	87.71
18	450	18.000	457	...	30	0.438	11.13	82.15	122.38
18	450	18.000	457	...	40	0.562	14.27	104.67	155.80
18	450	18.000	457	...	60	0.750	19.05	138.17	205.74
18	450	18.000	457	...	80	0.938	23.83	170.92	254.55
18	450	18.000	457	...	100	1.156	29.36	207.96	309.62
20	500	20.000	508	STD	20	0.375	9.53	78.60	117.15
20	500	20.000	508	XS	30	0.500	12.70	104.13	155.12
20	500	20.000	508	...	40	0.594	15.09	123.11	183.42
20	500	20.000	508	...	60	0.812	20.62	166.40	247.83
20	500	20.000	508	...	80	1.031	26.19	208.87	311.17
22	550	22.000	559	STD	20	0.375	9.53	86.61	129.13
22	550	22.000	559	XS	30	0.500	12.70	114.81	171.09
22	550	22.000	559	...	60	0.875	22.23	197.41	294.25
22	550	22.000	559	...	80	1.125	28.58	250.81	373.83
22	550	22.000	559	...	100	1.375	34.93	302.88	451.42
24	600	24.000	610	STD	20	0.375	9.53	94.62	141.12
24	600	24.000	610	...	30	0.562	14.27	140.68	209.64
24	600	24.000	610	...	40	0.688	17.48	171.29	255.41
24	600	24.000	610	...	60	0.969	24.61	238.35	355.26
24	600	24.000	610	...	80	1.219	30.96	296.58	442.08
26	650	26.000	660	STD	...	0.375	9.53	102.63	152.87
26	650	26.000	660	...	...	0.406	10.31	110.98	165.18
26	650	26.000	660	XS	20	0.500	12.70	136.17	202.72
26	650	26.000	660	...	...	0.562	14.27	152.68	227.23
28	700	28.000	711	STD	...	0.375	9.53	110.64	164.85
28	700	28.000	711	...	...	0.406	10.31	119.65	178.15
28	700	28.000	711	XS	20	0.500	12.70	146.85	218.69
28	700	28.000	711	...	...	0.562	14.27	164.69	245.18
28	700	28.000	711	...	30	0.625	15.88	182.73	271.21
30	750	30.000	762	STD	...	0.375	9.53	118.65	176.84
30	750	30.000	762	...	...	0.406	10.31	128.32	191.11
30	750	30.000	762	XS	20	0.500	12.70	157.53	234.67
30	750	30.000	762	...	...	0.562	14.27	176.69	263.12
30	750	30.000	762	...	30	0.625	15.88	196.08	292.18
32	800	32.000	813	...	10	0.311	7.92	105.66	157.28
32	800	32.000	813	...	20	0.5	12.70	168.32	250.55
32	800	32.000	813	...	30	0.311	15.88	209.57	311.95
32	800	32.000	813	STD	...	0.375	9.53	126.74	188.66
32	800	32.000	813	...	40	0.688	17.48	230.23	342.70



## TUBING AND CASING PIPE

### ● STANDARD:

API SPEC 5CT, API SPEC 5B, ISO 11960

Tubing is used to extracting petroleum and natural gas from a well.

Casing serves as walls of well.



Item		Tolerance
Outside Diameter	Pipe Body	$D \leq 101.60\text{mm} \pm 0.79\text{mm}$
	Coupling	$D \geq 114.30\text{mm} + 1.0\%D - 5\%D$
Wall Thickness		$\pm 1\%D$
Weight	Single Lengths	$0, -12.5\%$
	Carload Lots	$+6.5\% - 3.5\%$

### ⊙ Mechanical Properties

Grade	Yield Strength				Tensile strength		Hardness		Allcvable Hardness Variation
	min		max		min		max		
	Psi	Mpa	Psi	Mpa	Psi	Mpa	Hrc	Bhn	
J55	55,000	379	80,000	552	75,000	517	-	-	-
K55	55,000	379	80,000	552	95,000	655	-	-	-
N80	80,000	552	80,000	758	100,000	689	-	-	-

### ⊙ Chemical Composition(%)

Grade	Chemical Composition%									
	C	Si	Mn	P	S	Cr	Ni	Cu	V	Als
J55/K55	0.34-	0.20-	1.25-	≤	≤	≤	≤	≤		≤
(37Mn5)	0.39	0.35	1.50	0.020	0.015	0.15	0.20	0.20		0.020
N80	0.34-	0.25-	1.45-	≤	≤	≤	≤	≤		≤
(36Mn2V)	0.38	0.40	1.70	0.020	0.015	0.15	0.20	0.20	0.11-0.16	0.020



⊙ Length

	(Range 1)	(Range 2)	(Range 3)
Tubing	6.10-7.32m	8.53-9.75m	11.58-12.80m
Casing	4.88-7.62m	7.62-10.36m	10.36-14.63m
Pup Joint	0.5m-6.0m(2FEET-20FEET)		

Size Designation	Weight Designation		OD		WT		Type Of End Finish					
							Steel Grade					
							N	U	in	mm	in	mm
1.900"	2.4	-	1.9	48.26	0.125	3.18	PI	-	-	-	-	-
	2.75	2.9	1.9	48.26	0.145	3.68	PNUI	PNUI	PNUI	PNUI	PNUI	-
	3.65	-	1.9	48.26	0.2	5.08	PU	PU	PU	PU	PU	PU
2 3/8"	4	-	2.375	60.32	0.167	4.24	PN	PN	PN	PN	PN	-
	4	4.7	2.375	60.32	0.19	4.83	PNU	PNU	PNU	PNU	PNU	-
	5.8	5.95	2.375	60.32	0.254	6.45	-	PNU	PNU	PNU	PNU	PNU
	6.6	-	2.375	60.32	0.259	7.49	-	P	-	P	P	PNU
2 7/8"	7.35	7.45	2.375	60.32	0.336	8.53	-	PU	-	PU	PU	-
	6.4	6.5	2.875	73.02	0.217	5.51	PNU	PNU	PNU	PNU	PNU	-
	7.8	7.9	2.875	73.02	0.276	7.01	-	PNU	PNU	PNU	PNU	PNU
	8.6	8.7	2.875	73.02	0.308	7.82	-	PNU	PNU	PNU	PNU	PNU
	9.35	9.45	2.875	73.02	0.34	8.64	-	PU	-	PU	PU	PNU
	10.5	-	2.875	73.02	0.392	9.96	-	P	-	P	P	-
3 1/2"	11.5	-	2.875	73.02	0.44	11.18	-	P	-	P	P	-
	7.7	-	3.5	88.9	0.216	5.49	PN	PN	PN	PN	PN	-
	9.2	9.3	3.5	88.9	0.254	6.45	PNU	PNU	PNU	PNU	PNU	-
	10.2	-	3.5	88.9	0.289	7.34	PN	PN	PN	PN	PN	PNU
	12.7	12.95	3.5	88.9	0.375	9.52	-	PNU	PNU	PNU	PNU	-
	14.3	-	3.5	88.9	0.43	10.92	-	P	-	P	P	PNU
	15.5	-	3.5	88.9	0.476	12.09	-	P	-	P	P	-
4"	17	-	3.5	88.9	0.53	13.46	-	P	-	P	P	-
	9.5	-	4	101.6	0.226	5.74	PN	PN	PN	PN	PN	-
	10.7	11	4	101.6	0.262	6.65	PU	PU	PU	PU	PU	-
4 1/2"	12.6	12.75	4.5	114.3	0.271	6.88	PNU	PNU	PNU	PNU	PNU	-
	15.2	-	4.5	114.3	0.337	8.56	-	P	-	P	P	-
	17	-	4.5	114.3	0.38	9.65	-	P	-	P	P	-
	18.9	-	4.5	114.3	0.43	10.92	-	P	-	P	P	-
	21.5	-	4.5	114.3	0.5	12.7	-	P	-	P	P	-
	23.7	-	4.5	114.3	0.56	14.22	-	P	-	P	P	-
	26.1	-	4.5	114.3	0.63	16	-	P	-	P	P	-

Note :P--Plain End; N--Non External Upset; U--External Upset; T&C--Threading & Coupling ; I--Integral Connector

Available Size Of Casing Pipe

Size Designation	Weight Designation	OD		WT		Type Of End Finish							
		in	mm	in	mm	Steel Grade							
						J55 K55	L80-1	N80	C90	C95	T95	P110	M65
4 1/2"	9.5	4.5	114.3	0.205	5.21	PS	-	-	-	-	-	-	-
	10.5	4.5	114.3	0.224	5.69	PSB	-	-	-	-	-	-	-
	11.6	4.5	114.3	0.25	6.35	PSLB	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	13.5	4.5	114.3	0.29	7.37	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	15.1	4.5	114.3	0.337	8.56	-	-	-	-	-	-	PLB	-
5"	11.5	5	127	0.22	5.59	PS	-	-	-	-	-	-	-
	13	5	127	0.253	7.52	PSLB	-	-	-	-	-	-	-
	15	5	127	0.296	9.19	PSLB	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	18	5	127	0.362	9.19	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	21.4	5	127	0.437	11.1	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	23.2	5	127	0.478	12.14	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	24.1	5	127	0.5	12.7	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
5 1/2"	14	5.5	139.7	0.244	6.2	PS	-	-	-	-	-	-	-
	15.5	5.5	139.7	0.275	6.98	PSLB	-	-	-	-	-	-	-
	17	5.5	139.7	0.304	7.72	PSLB	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	20	5.5	139.7	0.361	9.17	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	23	5.5	139.7	0.415	10.54	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	26.8	5.5	139.7	0.5	12.7	-	-	-	P	-	P	P	P
	29.7	5.5	139.7	0.562	14.27	-	-	-	P	-	P	P	P
	32.6	5.5	139.7	0.625	15.88	-	-	-	P	-	P	P	P
	35.3	5.5	139.7	0.687	17.45	-	-	-	P	-	P	P	P
	38	5.5	139.7	0.75	19.05	-	-	-	P	-	P	P	P
	40.5	5.5	139.7	0.812	20.62	-	-	-	P	-	P	P	P
6 5/8"	43.1	5.5	139.7	0.875	22.22	-	-	-	P	-	P	P	P
	20	6.625	168.28	0.288	7.32	PSLB	-	-	-	-	-	-	-
	24	6.625	168.28	0.352	8.94	PSLB	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	28	6.625	168.28	0.417	10.59	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	32	6.625	168.28	0.475	12.06	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
7"	20	7	177.8	0.272	6.91	PS	-	-	-	-	-	-	PS
	23	7	177.8	0.317	8.05	PSLB	PLB	PLB	PLB	PLB	-	-	PLB
	26	7	177.8	0.362	9.19	PSLB	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	29	7	177.8	0.408	10.36	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	32	7	177.8	0.453	11.51	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	35	7	177.8	0.498	12.65	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	38	7	177.8	0.54	13.72	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
7 5/8"	26.4	7.625	193.68	0.328	8.33	PSLB	PLB	PLB	PLB	PLB	PLB	PLB	-
	29.7	7.625	193.68	0.375	9.52	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	33.7	7.625	193.68	0.43	10.92	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	39	7.625	193.68	0.5	12.7	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	42.8	7.625	193.68	0.562	14.27	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	45.3	7.625	193.68	0.595	15.11	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	47.1	7.625	193.68	0.625	15.88	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB

ote: P--Plain End; S--Short round thread; L--Long round thread; B--Buttress thread.

Size Designation	Weight Designation	OD		WT		Type Of End Finish							
		in	mm	in	mm	Steel Grade							
						J55 K55	L80-1	N80	C90	C95	T95	P110	M65
8 5/8"	24	8.625	219.08	0.264	6.71	PS	-	-	-	-	-	-	-
	28	8.625	219.08	0.304	7.72	-	-	-	-	-	-	-	-
	32	8.625	219.08	0.352	8.94	PSLB	-	-	-	-	-	-	-
	36	8.625	219.08	0.4	10.16	PSLB	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	40	8.625	219.08	0.45	11.43	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	44	8.625	219.08	0.5	12.7	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	49	8.625	219.08	0.557	14.15	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
9 5/8"	32.3	9.625	244.48	0.312	7.92	-	-	-	-	-	-	-	-
	36	9.625	244.48	0.352	8.94	PSLB	-	-	-	-	-	-	PSLB
	40	9.625	244.48	0.395	10.03	PSLB	PLB	PLB	PLB	PLB	PLB	-	PSLB
	43.5	9.625	244.48	0.435	11.05	-	PLB	PLB	PLB	PLB	PLB	PLB	-
	47	9.625	244.48	0.472	11.99	-	PLB	PLB	PLB	PLB	PLB	PLB	-
	53.5	9.625	244.48	0.545	13.84	-	PLB	PLB	PLB	PLB	PLB	PLB	-
	58.4	9.625	244.48	0.595	15.11	-	PLB	PLB	PLB	PLB	PLB	PLB	-
	59.4	9.625	244.48	0.609	15.47	-	-	-	P	-	P	-	-
	64.9	9.625	244.48	0.672	17.07	-	-	-	P	-	P	-	-
	70.3	9.625	244.48	0.734	18.64	-	-	-	P	-	P	-	-
	75.6	9.625	244.48	0.797	20.24	-	-	-	P	-	P	-	-
	32.75	10.75	273.05	0.279	7.09	-	-	-	-	-	-	-	-
	10 3/4"	40.5	10.75	273.05	0.35	8.89	PSB	-	-	-	-	-	-
45.5		10.75	273.05	0.4	10.16	PSB	-	-	-	-	-	-	PSB
51		10.75	273.05	0.45	11.43	PSB	PSB	PSB	PSB	PSB	PSB	PSB	PSB
55.5		10.75	273.05	0.495	12.57	-	PSB	PSB	PSB	PSB	PSB	PSB	PSB
60.7		10.75	273.05	0.545	13.34	-	-	-	PSB	-	PSB	PSB	-
65.7		10.75	273.05	0.595	15.11	-	-	-	PSB	-	PSB	PSB	-
73.2		10.75	273.05	0.672	17.07	-	-	-	P	-	P	-	-
79.2		10.75	273.05	0.734	18.64	-	-	-	P	-	P	-	-
11 3/4"	85.3	10.75	273.05	0.797	20.24	-	-	-	P	-	P	-	-
	42	11.75	298.45	0.333	8.46	-	-	-	-	-	-	-	-
	47	11.75	298.45	0.375	9.53	PSB	-	-	-	-	-	-	PSB
	54	11.75	298.45	0.435	11.05	PSB	-	-	-	-	-	-	PSB
	60	11.75	298.45	0.489	12.42	PSB	PSB	PSB	PSB	PSB	PSB	PSB	PSB
	65	11.75	298.45	0.534	13.56	-	P	P	P	P	P	P	-
	71	11.75	298.45	0.582	14.78	-	P	P	P	P	P	P	-
	48	13.375	339.72	0.33	8.38	-	-	-	-	-	-	-	-
13 3/8"	54.5	13.375	339.72	0.38	9.65	PSB	-	-	-	-	-	-	PSB
	61	13.375	339.72	0.43	10.92	PSB	-	-	-	-	-	-	PSB
	68	13.375	339.72	0.48	12.19	PSB	PSB	PSB	PSB	PSB	PSB	PSB	PSB
	72	13.375	339.72	0.514	13.06	-	PSB	PSB	PSB	PSB	PSB	PSB	PSB

Note :P--Plain End; S--Short round thread; L--Long round thread; B--Buttress thread

## BOILER TUBE

### ● STANDARD:

DIN17175, SA192, SA210/213.....National Standard

For manufacturing heating-pipelines, containers, steaming pipelines of low or medium pressure boilers ( $p \leq 450$ , work pressure  $\leq 5.88$  Mpa)

SRE Range: From 19mm on to 610mm on Wall Thickness from 2mm to 65mm WT



Standard	Grade	(MPa) Tensile Strength	Yield point not less than	Elongation not less than	Impact not less than	Hanchess not less than	
DIN17175	St35.8	360-480	235( $t \leq 16$ mm) 225( $t > 16$ mm)	25	—	—	
	St45.8	410-530	255( $t \leq 16$ mm) 245( $t > 16$ mm)	21	—	—	
	15Mo3	450-600	270	22	—	—	
	13CrMo44	440-590	290	22	—	—	
	10CrMo910	450-600	280	20	—	—	
	14MoV83	460-610	320	20	55	—	
	12Cr1MoV	470-640	255	21	41	—	
GB17175	20G	410-550	245	纵24 横22	纵40 横27	—	
	25MnG	485-640	275	纵20 横18	纵40 横27	—	
	15mOG	450-600	270	纵22 横20	纵40 横27	—	
	20MoG	415-665	220	纵22 横20	纵40 横27	—	
	12CrMoG	410-560	205	纵21 横19	纵40 横27	—	
	12Cr2MoG	450-600	280	纵22 横20	纵40 横27	—	
	12Cr1MoVG	470-640	255	纵21 横19	纵40 横27	—	
	12Cr2MoWVTIB	540-735	345	18	纵40 横27	—	
	10Cr9Mo1VNb	$\geq 585$	415	20	40	—	
	1Cr18Ni9	$\geq 520$	206	35	—	—	
	1Cr19Ni11Nb	$\geq 520$	206	35	—	—	
	ASTMA 108M ASME SA-108	A 106B/SA-106B	$\geq 415$	240	30	—	—
	ASTMA 192M ASME SA-192M	A 108C/SA-106C	$\geq 485$	275	30	—	—
	A 192/SA-192	$\geq 325$	180	35	—	77HRB(137HBW)	
ASTMA 209M ASME SA-209M	A 209T1/SA-209T1	$\geq 380$	205	—	—	80HRB(146HBW)	
	A 209T1b/SA-209T1b	$\geq 385$	195	—	—	77HRB(137HBW)	
	A 209T1a/SA-209T1a	$\geq 415$	220	—	—	81HRB(153HBW)	
ASTMA 210M ASME SA-210M	A 210A1/SA-210A1	$\geq 415$	255	—	—	79HRB(143HBW)	
	A 210C/SA-210C	$\geq 485$	275	—	—	89HRB(179HBW)	
	A 213T2/SA-213T2	$\geq 415$	205	—	—	85HRB(163HBW)	
	A 213T11/SA-213T11	$\geq 415$	205	—	—	85HRB(163HBW)	
	A 213T22/SA-213T22	$\geq 415$	205	—	—	85HRB(163HBW)	
	A 213T23/SA-213T23	$\geq 510$	400	20	—	97HRB(220HBW)	
	A 213T24/SA-213T24	$\geq 585$	415	20	—	25HRB(250HBW)	
	A 213T91/SA-213T91	$\geq 585$	415	20	—	25HRB(250HBW)	
	A 213T911/SA-213T911	$\geq 620$	440	20	—	25HRB(250HBW)	
ASTMA 213M ASME SA-213M	A 213T92/SA-213T92	$\geq 620$	440	20	—	25HRB(250HBW)	
	A 213T122/SA-213T122	$\geq 620$	400	20	—	25HRB(250HBW)	
	TP304H	$\geq 515$	205	35	—	90HRB(192HBW)	
	TP318H	$\geq 515$	205	35	—	90HRB(192HBW)	
	TP321H	$\geq 515$	205	35	—	90HRB(192HBW)	
	TP347H	$\geq 515$	205	35	—	90HRB(192HBW)	
	S30432	$\geq 590$	235	35	—	95HRB(219HBW)	
	TP310HCbN	$\geq 655$	295	30	—	100HRB(256HBW)	

● Chemical Composition(%)

Grade		C	Si	Mn	S	P	Cr	Mo	V	Ti	B	W	Ni	Al	Nb	N	Others
Standard	Steel Grade				Max												
GB5310	12Cr2MoWVTB	0.08-0.05	0.45-0.75	0.45-0.65	0.015	0.025	1.60-2.10	0.50-0.65	0.28-0.42	0.03-0.18	0.002-0.008	0.30-0.55	—	—	—	—	—
	10Cr9Mo1VNON	0.08-0.12	0.20-0.50	0.30-0.60	0.010	0.020	8.00-9.50	0.35-1.05	0.18-0.25	—	—	—	≤0.040	≤0.040	0.06-0.10	0.03-0.07	—
	07Cr19Ni10	0.04-0.10	≤0.75	≤2.00	0.015	0.035	17.00-20.00	—	8.00-11.00	—	—	—	—	—	—	—	—
	07Cr13Ni11No	0.04-0.10	≤0.75	≤2.00	0.15	0.03	17.00-19.00	—	—	—	—	—	9.00-13.00	—	3C-1.10	—	—
ASTM A 106M	A 106B SA-106B	≤0.30	≥0.10	0.20-1.06	0.020	0.025	—	—	—	—	—	—	—	—	—	—	—
ASME SA-106	A 106C SA-106C	≤0.35	≥0.10	0.20-1.06	0.020	0.025	—	—	—	—	—	—	—	—	—	—	—
ASTM A 192M	A 192 SA-192	0.06-0.13	≤0.25	0.27-0.63	0.020	0.025	—	—	—	—	—	—	—	—	—	—	—
ASTM A 209M	A 209T1 SA-209T1	0.10-0.20	0.10-0.50	0.30-0.60	0.020	0.025	—	—	—	—	—	—	—	—	—	—	—
	A 209T1b SA-209T1b	≤0.14	0.10-0.50	0.30-0.60	0.020	0.025	—	—	—	—	—	—	—	—	—	—	—
	A 209T1a SA-209T1a	0.15-0.25	0.10-0.50	0.30-0.60	0.020	0.025	—	—	—	—	—	—	—	—	—	—	—
ASTM A 210M	A 210A1 SA-210A1	≤0.27	≥0.10	≤0.93	0.020	0.025	—	—	—	—	—	—	—	—	—	—	—
ASME SA-210M	A 210C SA-210C	≤0.35	≥0.10	0.20-1.06	0.020	0.025	—	—	—	—	—	—	—	—	—	—	—
ASTM A 213M	A 213T2 SA-213T2	0.10-0.20	0.10-0.30	0.30-0.61	0.020	0.025	0.50-0.61	0.44-0.65	—	—	—	—	—	—	—	—	—
	A 213T11 SA-213T11	0.05-0.15	0.50-1.00	0.30-0.60	0.020	0.025	1.00-1.50	0.44-0.65	—	—	—	—	—	—	—	—	—
	A 213T12 SA-213T12	≤0.15	≤0.50	0.30-0.61	0.020	0.025	0.30-1.25	0.44-0.65	—	—	—	—	—	—	—	—	—
	A 213T22 SA-213T22	0.05-0.15	≤0.50	0.30-0.60	0.020	0.025	1.90-2.60	0.37-1.13	—	—	—	—	—	—	—	—	—
	A 213T23 SA-213T23	0.04-0.10	≤0.50	0.10-0.60	0.010	0.025	1.90-2.60	0.05-0.30	0.20-0.30	0.005-0.06	0.005-0.006	1.45-1.75	—	≤0.03	0.02-0.08	≤0.03	Ti/N ≥3.5

## WELDED PIPE

Standard	ERW Pipe	SSAW Pipe	LSAW Pipe	Hollow Sections	Galvanized Pipe
API	5L, 5CT	5L	5L(psl-1/psl-2),2B	—	—
GB	9711.1 9711.2	9711.1 9711.2	9711.1 9711.2	6728	3091
ASTM	ASTMA53	ASTMA53	A671,A672	ASTMA500	ASTMA53
BS	—	—	—	—	1387

## Welded Steel Pipe

Welded steel pipe is bent round, square shape with a steel or steel plate and then welded into the other, the surface of the pipe joints. Welded steel pipe is used in blank or strip.

### Classification of welded steel pipe

According to weld shape, welded steel pipe can be divided into straight welded pipe and spiral welded pipe. Among them, the straight welded pipe: the production process is simple, high efficiency, low cost, rapid development. Spiral welded pipe: Longitudinal strength is generally higher than that, can narrow the billet production of large diameter pipe, you can also use the same width of the billet production of different pipe diameters. However, with the same length of straight pipe seam, compared weld length of 30 to 100%, and lower production rate. Therefore, most of the use of smaller diameter straight seam welding pipe, large diameter spiral welded pipe are mostly used.

By the application, welded steel pipe can be divided into general-use pipe, galvanized pipe, oxygen pipe, wire pipe, metric pipe, roller pipe, deep well pump tube, automotive tube, transformer tube, welding thin-walled tube, welding shaped tube and spiral welded pipe.

Pipe material and its use of several different varieties divided into the following:

GB/T3091-1993 (low-pressure fluid Galvanized welded steel pipes). Mainly used for conveying water, gas, air, oil and hot water or steam heating and other general low pressure fluid control and other purposes. The representative material Q235A grade steel.

GB/T3092-1993 (low-pressure fluid Galvanized welded steel pipes). Mainly used for conveying water, gas, air, oil and heating hot water or low pressure steam and other fluids, and other general purpose control. The representative material as: Q235A grade steel.

GB/T14291-1992 (mining fluid welded steel pipe). Mainly used for mine air pressure, drainage, gas discharge axis with straight seam welded steel pipe. The representative material Q235A, B grade steel.

GB/T14980-1994 (large diameter low pressure liquid delivery welded steel pipe). Mainly used for conveying water, sewage, gas, air, low pressure steam heating fluid, and other uses. The representative material Q235A grade steel.

GB/T12770-1991 (mechanical structure with stainless steel welded pipe). Mainly used for machinery, automobiles, bicycles, furniture, decorative hotels and restaurants and other mechanical components and structural parts. The representative material 0Cr13, 1Cr17, 00Cr19Ni11, 1Cr18Ni9, 0Cr18Ni11Nb and so on. GB/T12771-1991 (fluid transport stainless steel welded pipe). Mainly used for conveying low pressure corrosive media. Representative material for the 0Cr13, 0Cr19Ni9, 00Cr19Ni11, 00Cr17, 0Cr18Ni11Nb, 0017Cr17Ni14Mo2 and so on.

## ERW

*The use of ERW:*

*ERW is used for transporting oil gas and other vapour-liquid objects and can meet the requirements of high and low pressure. besides, widely used in aviation, aerospace, energy, electronics, automobiles, light industry as well as various industry departments. So far, It occupy a decisive position in the field of transporting tube all over the world.*

## SSAW

*Spiral welded steel pipe(SSAW) is mainly used in oil and gas transmission pipeline, and its specification is expressed as outside diameter \* wall thickness. according to the external structure, it is classified single welding and double welding. Technically, the welded steel pipe should ensure that hydrostatic test, weld tensile strength and the cold bending property can comply with the regulations.*

## LSAW

*The use of LSAW:*

*LSAW has large diameter and wall thickness, resistance to high pressure, resistance to low temperature and strong corrosion characteristics. When constructing high strength and toughness, high quality oil and gas pipeline over long distances, what is required is mostly large caliber straight double submerged arc welding joints. According to the API standard provisions, LSAW is the only designated for tube type when passing through the cold region, submarine, the urban population dense area of 2 kinds, 1 region in the large oil and gas pipeline.*



## ERW PIPE

- ⊙ **OD:** 48.3--457.2mm
- ⊙ **WT:** 4--16mm
- ⊙ **Length:** 5.8--18m
- ⊙ **Standard:** API 5L/5CT, EN10217, EN10219, ASTM A53, ASTM A252
- ⊙ **Steel grade:** GR.A/B, X42, X46, X52, X56, X60, X65, X70. GR.2, GR.3. Q235B, Q345B, etc.
- ⊙ **Pipes' ends:** plain or bevelled
- ⊙ **Pipes' end protective:** plastic or iron caps
- ⊙ **Mill's inspection:** 100%NDT (UT)
- ⊙ **Third inspection part:** SGS, BV, Lloyd's or others
- ⊙ **Marking:** according to API standard or customer's requirement
- ⊙ **Usage:** oil & gas transmission, building construction, water conveying, steel structure, shipbuilding.....
- ⊙ **Package:** small sizes in bundled packed by steel strips , and big sizes in loose

OD		WT			WEIGHT	
INCH	MM	SCH	MM	IN	KG/M	LB/INCH
1 1/2"	48.3	STD-40	3.68	0.145	4.09	2.75
1 1/2"	48.3	XS-80	5.08	0.2	5.47	3.68
2"	60.3	STD-40	3.91	0.154	5.49	3.69
2"	60.3	XS-80	5.54	0.218	7.56	5.08
2 1/2"	73	STD-40	5.16	0.203	8.72	5.86
2 1/2"	73	XS-80	7.01	0.276	11.52	7.74
3"	88.9	STD-40	5.49	0.216	11.41	7.67
3"	88.9	XS-80	7.52	0.3	15.43	10.37
3 1/2"	101.6	STD-40	5.74	0.226	13.71	9.21
3 1/2"	101.6	XS-80	8.08	0.318	18.83	12.65
4"	114.3	STD-40	6.02	0.237	16.24	10.91
4"	114.3	XS-80	8.56	0.337	22.55	15.15
5"	141.3	STD-40	6.55	0.258	21.99	14.78
5"	141.3	XS-80	9.53	0.375	31.28	21.02
6"	168.3	STD-40	7.11	0.28	28.55	19.19
6"	168.3	XS-80	10.97	0.432	42.99	28.89
8"	219.1	STD-40	8.18	0.322	42.98	28.88
8"	219.1	XS-80	12.7	0.5	65.3	43.88
10"	273	STD-40	9.27	0.365	60.9	40.92
10"	273	80	15.09	0.594	96.95	65.15
12"	323.8	STD	9.53	0.375	74.61	50.13
12"	323.8	40	10.31	0.406	80.51	54.1
12"	323.8	XS	12.7	0.5	98.42	66.14
12"	323.8	80	17.48	0.588	133.38	89.63
14"	355.6	40	11.13	0.438	95.51	64.18
14"	355.6	XS	12.7	0.5	108.48	72.9
14"	355.6	80	19.05	0.75	159.71	107.32
16"	406.4	XS-40	12.7	0.5	124.55	83.69
18"	457	STD	9.53	0.375	106.23	71.38
18"	457	40	14.27	0.562	157.38	105.75
18"	457	80	23.03	0.938	257.13	172.78
20"	508	40	15.09	0.594	185.28	124.5
20"	508	80	26.19	1.031	314.33	211.22



## SSAW PIPE

- ⊙ **OD:** 219.2--3000mm
- ⊙ **WT:** 6--24mm
- ⊙ **Length:** 5.8--18m
- ⊙ **Standard:** API 5CT, API 5L, EN10217, EN10219, ASTM A252, ASTM A53
- ⊙ **Steel grade:** GR.A/B, X42, X46, X52, X56, X60, X65, X70
- ⊙ **Pipes' ends:** plain or bevelled
- ⊙ **Pipes' end protective:** plastic or iron caps
- ⊙ **Mill's inspection:** 100%NDT (X-ray)
- ⊙ **Third inspection part:** SGS, BV, Lloyd's or others
- ⊙ **Marking:** according to API standard or customer's requirement
- ⊙ **Usage:** oil & gas transmission, building construction, water conveying, steel structure, shipbuilding.....

### ● Available Sizes

OD		WT			WEIGHT	
INCH	MM	SCH	MM	IN	KG/M	LB/INCH
8"	219.1		4.78	0.188	25.52	17.15
8"	219.1		5.16	0.203	27.5	18.48
8"	219.1		5.56	0.219	29.58	19.88
8"	219.1	20	6.35	0.25	33.65	22.61
8"	219.1	30	7.04	0.277	37.19	24.99
8"	219.1		7.92	0.312	41.66	28
8"	219.1	STD-40	8.18	0.322	42.98	28.88
8"	219.1		8.74	0.344	45.8	30.78
8"	219.1		9.53	0.375	49.75	33.43
8"	219.1	60	10.31	0.406	53.62	36.03
8"	219.1		11.13	0.438	57.66	38.75
8"	219.1	XS-80	12.7	0.5	65.3	43.88
8"	219.1		14.27	0.562	72.81	48.93
8"	219.1	100	15.09	0.594	76.69	51.53
8"	219.1		15.88	0.625	80.31	54.02
10"	273		4.78	0.188	31.94	21.46
10"	273		5.16	0.203	34.43	23.14
10"	273		5.56	0.219	37.04	24.89
10"	273	20	6.35	0.25	42.18	28.34
10"	273		7.09	0.279	46.97	31.56
10"	273	30	7.8	0.307	51.53	34.63
10"	273		8.74	0.344	57.34	38.66
10"	273	STD-40	9.27	0.365	60.9	40.92
10"	273		11.13	0.438	72.61	48.79
10"	273	XS-60	12.7	0.5	82.35	55.34
10"	273		14.27	0.562	91.92	61.8

OD		WT			WEIGHT	
INCH	MM	SCH	MM	IN	KG/M	LB/INCH
10"	273	80	15.09	0.594	96.95	65.15
12"	323.8	20	6.35	0.25	50.22	33.75
12"	323.8		7.14	0.281	56.32	37.85
12"	323.8		7.92	0.312	62.32	41.88
12"	323.8	30	8.38	0.33	65.85	44.23
12"	323.8		8.74	0.344	68.6	46.1
12"	323.8	STD	9.53	0.375	74.61	50.13
12"	323.8	40	10.31	0.406	80.51	54.1
12"	323.8		11.13	0.438	86.69	58.25
12"	323.8	XS	12.7	0.5	98.42	66.14
12"	323.8	60	14.27	0.562	110.03	73.94
12"	323.8		15.88	0.625	121.81	81.85
14"	355.6	10	6.35	0.25	55.25	37.13
14"	355.6	20	7.92	0.312	68.6	46.1
14"	355.6		8.74	0.344	75.52	50.75
14"	355.6	STD-30	9.53	0.375	82.16	55.21
14"	355.6		10.31	0.406	88.68	59.59
14"	355.6	40	11.13	0.438	95.51	64.18
14"	355.6	XS	12.7	0.5	108.48	72.9
14"	355.6		14.27	0.562	121.33	81.53
14"	355.6	60	15.09	0.594	128	86.01
16"	406.4	10	6.35	0.25	63.28	42.52
16"	406.4		7.14	0.281	71.01	47.72
16"	406.4	20	7.92	0.312	78.62	52.83
16"	406.4		8.74	0.344	86.58	58.18
16"	406.4	STD-30	9.53	0.357	94.21	63.31
16"	406.4		10.31	0.406	101.72	68.36
16"	406.4		11.13	0.438	109.59	73.64
16"	406.4	XS-40	12.7	0.5	124.55	83.69
16"	406.4		14.27	0.562	139.39	93.67
18"	457	20	7.92	0.312	88.6	59.54
18"	457		8.74	0.344	97.59	65.58
18"	457	STD	9.53	0.375	106.23	71.38
18"	457		10.31	0.406	114.72	77.09
18"	457	30	11.13	0.438	123.6	83.07
18"	457	XS	12.7	0.5	140.562	94.45
18"	457	40	14.27	0.562	157.38	105.75
20"	508		8.74	0.344	108.7	73.04
20"	508	STD-20	9.53	0.375	118.33	79.51
20"	508		10.31	0.405	127.82	85.89
20"	508		11.13	0.438	137.76	92.57

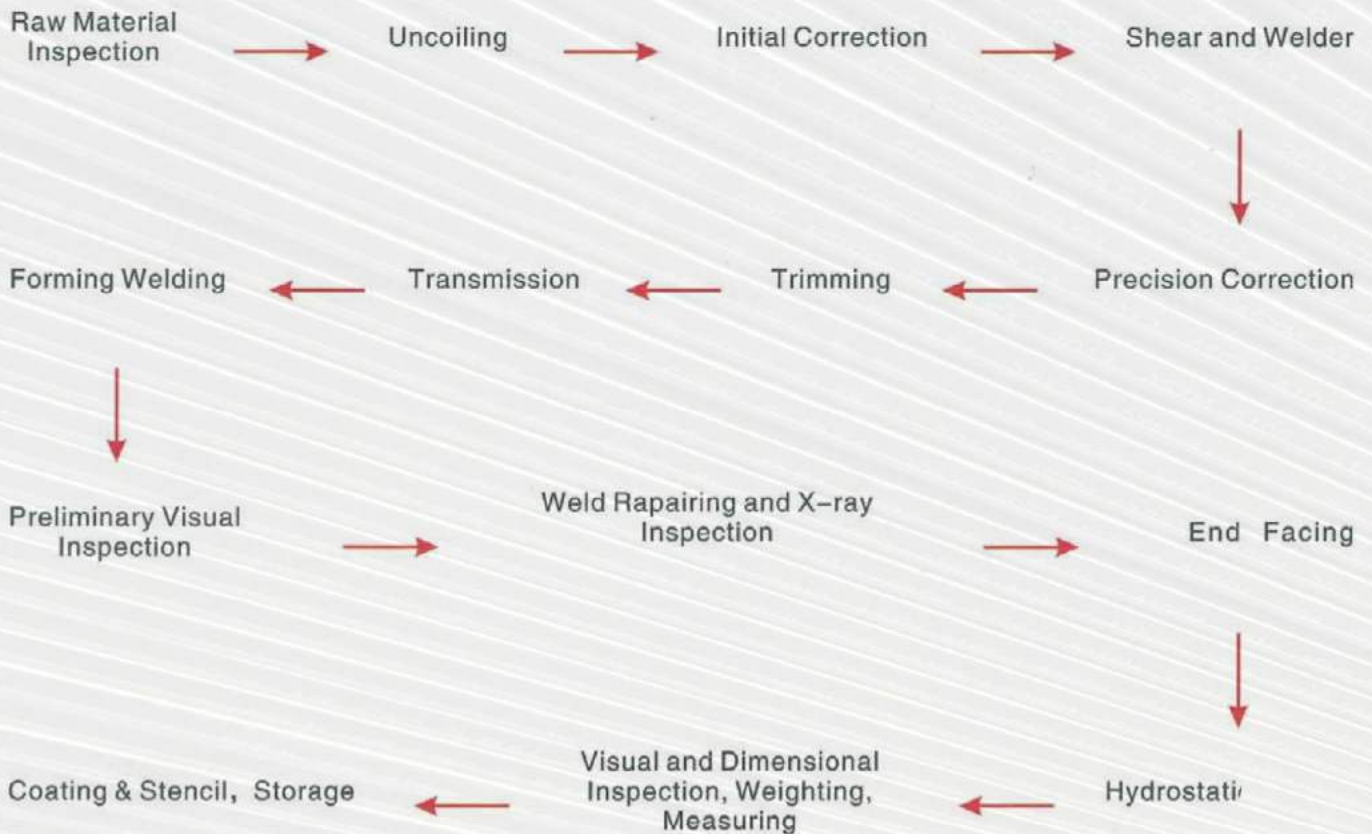


OD		WT			WEIGHT	
INCH	MM	SCH	MM	IN	KG/M	LB/INCH
20"	508	XS-30	12.7	0.5	156.7	105.3
20"	508		14.27	0.562	175.51	117.94
20"	508	40	15.09	0.594	185.28	124.5
22"	559		8.74	0.344	119.8	80.5
22"	559	STD-20	9.53	0.375	130.44	87.65
22"	559	XS-30	12.7	0.5	172.83	116.14
26"	660	STD	9.53	0.375	154.42	103.77
26"	660	XS-20	12.7	0.5	204.78	137.61
28"	711	STD	9.53	0.375	166.52	118.9
28"	711	XS-20	12.7	0.5	220.91	148.44
30"	762	STD	9.53	0.375	178.63	120.03
30"	762	XS-20	12.7	0.5	237.05	159.29
32"	813	STD	9.53	0.375	190.74	128.17
32"	813	XS-20	12.7	0.5	253.18	170.13
34"	864	STD	9.53	0.375	202.84	136.3
34"	864	XS-20	12.7	0.5	269.31	180.97
36"	914	STD	9.53	0.375	214.71	144.28
36"	914	XS-20	12.7	0.5	285.13	191.6
38"	965	STD	9.53	0.375	226.82	152.42
38"	965	XS	12.7	0.5	301.27	202.44
40"	1016	STD	9.53	0.375	238.93	160.55
40"	1016	XS	12.7	0.5	317.4	213.28
42"	1067	STD	9.53	0.375	251.04	168.69
42"	1067	XS	12.7	0.5	333.54	224.13
44"	1118	STD	9.53	0.375	263.14	176.82
44"	1118	XS	12.7	0.5	349.67	234.92
46"	1168	STD	9.53	0.375	275.01	184.8
46"	1168	XS	12.7	0.5	365.49	245.59
48"	1219	STD	9.53	0.375	287.12	192.93
48"	1219	XS	12.7	0.5	381.62	256.43
52"	1321		9.53	0.375	311.33	209.2
52"	1321		12.7	0.5	413.89	278.12
56"	1422		9.53	0.375	335.31	225.32
56"	1422		12.7	0.5	445.84	299.59
60"	1524		9.53	0.375	359.52	241.5
60"	1524		12.7	0.5	478.11	321.27
64"	1626		9.53	0.375	383.74	257.86
64"	1626		12.7	0.5	510.38	342.96
68"	1727		12.7	0.5	542.33	364.43
72"	1829		12.7	0.5	574.6	386.11
76"	1930		=12.7	0.5	606.55	407.58
80"	2032		14.27	0.562	717.23	481.95



ISTIL has 4 sets of double-sided submerged arc welding steel pipe producing lines which are the most advanced ones domestically. The double-sided submerged arc welding processing boasts not only high deposition rate, but also deep penetration ability, good quality and appearance of welding line and high density. All these can meet the requirements of welding line.

### SSAW Pipes Manufacturing Process



# LSAW PIPE

WT	OD	18	20	22	24	28	30	32	34	36	38	40	42	44	48	50	52	56	in
		457.2	508	558.8	609.6	711.2	762	812.8	863.6	914.4	965.2	1016	1066.8	1117.6	1219.2	1270	1320.8	1422.4	mm
0.312	7.92	87.75	97.67	107.59	117.51	137.36	147.28	157.20	167.12	177.04	186.96	196.89	206.81	216.73	236.57	246.49	256.41	276.26	API5L Gr.B- X80
0.375	9.53	105.21	117.15	129.08	141.02	164.90	176.84	188.78	200.71	212.65	224.59	236.53	248.47	260.41	284.28	296.22	308.16	332.04	
0.438	11.13	122.43	136.37	150.32	164.26	192.15	206.09	220.03	233.97	247.92	261.86	275.80	289.75	303.69	331.57	345.52	359.46	387.35	
0.500	12.70	139.21	155.12	171.03	186.94	218.76	234.67	250.58	266.49	282.40	298.31	314.22	330.13	346.03	377.85	393.76	409.67	441.49	
0.562	14.27	155.87	173.74	191.62	209.50	245.25	263.12	281.00	298.88	316.75	334.63	352.51	370.38	388.26	424.01	441.89	459.77	495.52	
0.594	15.09	164.52	183.42	202.33	221.23	259.04	277.94	296.84	315.75	334.65	353.55	372.46	391.36	410.27	448.07	466.98	485.88	523.69	
0.625	15.86	172.82	192.71	212.61	232.50	272.29	292.18	312.07	331.97	351.86	371.75	391.65	411.54	431.43	471.22	491.11	511.01	550.79	
0.688	17.48		211.44	233.34	255.24	299.03	320.93	342.83	364.73	386.62	408.52	430.42	452.32	474.21	518.01	539.91	561.80	605.60	
0.750	19.05		229.70	253.56	277.42	325.15	349.02	372.88	396.75	420.61	444.48	468.34	492.20	516.07	563.80	587.66	611.53	659.26	
0.812	20.62		247.83	273.66	299.49	351.15	376.98	402.81	428.65	454.48	480.31	506.14	531.97	557.80	609.46	635.30	661.13	712.79	
0.875	22.23		266.30	294.14	321.99	377.69	405.54	433.38	461.23	489.08	516.93	544.78	572.62	600.47	656.17	684.02	711.87	767.56	
0.969	24.61		293.36	324.19	355.02	416.68	447.51	478.34	509.17	540.00	570.83	601.66	632.49	663.32	724.98	755.81	786.64	848.29	
1.000	25.40		302.28	334.10	365.92	429.56	461.38	493.20	525.02	556.84	588.66	620.48	652.30	684.11	747.75	779.57	811.39	875.03	
1.094	27.79				398.72	468.34	503.16	537.97	572.78	607.60	642.41	677.22	712.04	746.85	816.47	851.29	886.10	955.73	
1.219	30.96				441.78	519.35	558.13	596.91	635.70	674.48	713.27	752.05	790.84	829.62	907.19	945.97	984.76	1062.33	
1.500	38.10					632.41	680.14	727.87	775.60	823.32	871.05	918.78	966.51	1014.24	1109.70	1157.43	1205.16	1300.61	
1.625	41.28						733.67	785.38	837.09	888.81	940.52	992.23	1043.94	1095.66	1199.08	1250.79	1302.51	1405.93	
1.750	44.45							842.22	897.90	953.58	1009.27	1064.95	1120.64	1176.32	1287.69	1343.37	1399.05	1510.42	
1.781	45.24							856.30	912.98	969.65	1026.32	1083.00	1139.67	1196.34	1309.69	1366.36	1423.04	1536.39	
1.812	46.02								985.48	1043.13	1100.78	1158.44	1216.09	1331.39	1389.04	1446.69	1561.99		
1.875	47.63										1077.74	1137.40	1197.07	1256.74	1376.07	1435.74	1495.41	1614.74	
2.00	50.80											1209.13	1272.77	1336.41	1463.69	1527.33	1590.96	1718.24	
in	mm	Single seam																Single seam or double seams	

### 1、 Product specification:

O.D.:  $\Phi 457.2 \sim \Phi 1422.4\text{mm}$  (16-56in) Length: 3~12.3m

W.T.: 8~50mm (apply to simple carbon steel, Low carbon alloy steel); 8-26.4mm (0.315-1.04in) (apply to X70 and above.)

Product standards: ISO3183、API Spec 5LPSL2、API Spec 2B、GB/T9711 etc.

Annual output: 150000 tons

### 2、 Application:

The pipes are mainly used as long distance transportation pipeline for oil, gas, liquid coal etc. on land and offshore. And also can be applied as construction pipes on offshore platform, power station, petrochemistry and city construction etc.

### 3、 Characteristics:

- ◆ The pipe internal stress is very small and uniformly distributed after the full-length expansion. The corrosion and cracking of the pipe owing to stress can be effectively prevented. The application of welding on site is very easy because of the high dimension precision;
- ◆ The inside and outside welding are performed after the tack welding, so the welding process is very stable with good weld quality;
- ◆ The NDT is easy to perform on the weld during production and field operation as well;
- ◆ The length of the weld is shorter than that of the non-longitudinal seam pipe, so the probability of defects occurrence is very low;
- ◆ The coverage of the pipe specification is very wide. The pipe can be either in large diameter with thick wall or in small diameter with thick wall.

## GALVANIZED PIPE

### HIGH-FREQUENCY WELDED

Outer Diameter: 1/2" to 66"

Wall thickness: 0.6mm-16mm

Length: Max. 6-12 meters

Standard: GB, ANSI, ASME, ASTM, JIS, DIN, BS, EN

Steel Grade: Q195/Q215/Q235/Q345/10#/20#/ASTMA106 GRB

Zinc content: 170-550g Per M<sup>2</sup>



Type	Galvanized steel pipe/ hot dipped galvanized steel pipe/GI pipe
Thickness	0.6-16 mm
Outer diameter	19-457mm
Length	Max 16meters
Standard	BS, ASTM , ASME , EN , DIN ,GB, JIS
Material	Q195 , Q215 , Q235 , Q345
Application	Petroleum, power, gas metallurgy, papermaking, chemical, medical equipment, aviation, boiler heat, exchanger, shipbuilding, construction, etc.
Package	Standard exporting package
Delivery time	10-15 days after your deposit
Quality	Superior quality

# ASTM A53

## Standard Spec. for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

### 1. Scope

1.1 This specification covers seamless and welded black and hot-dipped galvanized steel pipe in NPS 1/8 to NPS 26 [DN 6 to DN 650] (Note 1), inclusive, with nominal wall thickness (Note 2) as given in Table X2.2 and Table X2.3. It shall be permissible to furnish pipe having other dimensions provided that such pipe complies with all other requirements of this specification. Supplementary requirements of an optional nature are provided and shall apply only when specified by the purchaser.

Note 1. The dimensionless designators NPS (nominal pipe size) [DN (diameter nominal)] have been substituted in this specification for such traditional terms as "nominal diameter," "size," and "nominal size."

Note 2. The term nominal wall thickness has been assigned for the purpose of convenient designation, existing in name only, and is used to distinguish it from the actual wall thickness, which may vary over or under the nominal wall thickness.

### 2. Referenced Documents

*A90/A90M Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings*

*A370 Test Methods and Definitions for Mechanical Testing of Steel Products*

*A530/A530M Specification for General Requirements for Specialized Carbon and Alloy Steel Pipe*

*A700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Shipment*

*A751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products*

*A865 Specification for Threaded Couplings, Steel, Black or Zinc-Coated (Galvanized) Welded or Seamless, for Use in Steel Pipe Joints*

*B6 Specification for Zinc*

*E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications*

*E213 Practice for Ultrasonic Testing of Metal Pipe and Tubing*

*E273 Practice for Ultrasonic Examination of the Weld Zone of Welded Pipe and Tubing*

*E309 Practice for Eddy-Current Examination of Steel Tubular Products Using Magnetic Saturation*

*E570 Practice for Flux Leakage Examination of Ferromagnetic Steel Tubular Products*

*E1806 Practice for Sampling Steel and Iron for Determination of Chemical Composition*

### Chemical Requirements ASTM A53

	C	Mn	P	S	Cu (1)	Ni (1)	Cr (1)	Mo (1)	V (1)
Type S (seamless pipe)									
Grade A	0.25	0.95	0.05	0.045	0.40	0.40	0.40	0.15	0.08
Grade B	0.30	1.20	0.05	0.045	0.40	0.40	0.40	0.15	0.08
Type E (electric-resistance-welded)									
Grade A	0.25	0.95	0.05	0.045	0.40	0.40	0.40	0.15	0.08
Grade B	0.30	1.20	0.05	0.045	0.40	0.40	0.40	0.15	0.08
Type F (furnace-welded pipe)									
Grade A	0.30	1.20	0.05	0.045	0.40	0.40	0.40	0.15	0.08

(1) The total composition for these five elements shall not exceed 1.00%.

## Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service

### 1. Scope

1.1 This specification covers seamless carbon steel pipe for high-temperature service (Note 1) in NPS 1/8 to NPS 48 [DN 6 to DN 1200] (Note 2) inclusive, with nominal (average) wall thickness as given in ASME B36.10. It shall be permissible to furnish pipe having other dimensions provided such pipe complies with all other requirements of this specification. Pipe ordered under this specification shall be suitable for bending, flanging, and similar forming operations, and for welding. When the steel is to be welded, it is presupposed that a welding procedure suitable to the grade of steel and intended use or service will be utilized.

*Note 1:* It is suggested, consideration be given to possible graphitization.

*Note 2:* The dimensionless designator NPS (nominal pipe size) [DN (diameter nominal)] has been substituted in this standard for such traditional terms as "nominal diameter", "size", and "nominal size".

1.2 Supplementary requirements of an optional nature are provided for seamless pipe intended for use in applications where a superior grade of pipe is required. These supplementary requirements call for additional tests to be made and when desired shall be so stated in the order.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents. Therefore, each system is to be used independently of the other.

1.4 The following precautionary caveat pertains only to the test method portion, Sections 11, 12, and 13 of this specification: This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

### 2. Referenced Documents

*A530/A530M Specification for General Requirements for Specialized Carbon and Alloy Steel Pipe*

*E213 Practice for Ultrasonic Examination of Metal Pipe and Tubing*

*E309 Practice for Eddy-Current Examination of Steel Tubular Products Using Magnetic Saturation*

*E381 Method of Macroetch Testing Steel Bars, Billets, Blooms, and Forgings*

*E570 Practice for Flux Leakage Examination of Ferromagnetic Steel Tubular Products*

*MIL-STD-129 Marking for Shipment and Storage*

*MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage*

*ASME B36.10 Welded and Seamless Wrought Steel Pipe*

*Fed. Std. No. 123 Marking for Shipments (Civil Agencies)*

*Fed. Std. No. 183 Continuous Identification Marking of Iron and Steel Products*

*SSPC-SP6 Surface Preparation Specification No*

## Chemical Requirements ASTM A106

	Grade A	Grade B	Grade C
Carbon,max	0.25 (1)	0.30 (2)	0.35 (2)
Manganese	0.27-0.93	0.29-1.06	0.29-1.06
Phosphorus,max	0.035	0.035	0.035
Sulfur,max	0.035	0.035	0.035
Silicon,min	0.10	0.10	0.10
Chrome,max (3)	0.40	0.40	0.40
Copper,max (3)	0.40	0.40	0.40
Molybdenum,max (3)	0.15	0.15	0.15
Nickel,max (3)	0.40	0.40	0.40
Vanadium,max (3)	0.08	0.08	0.08

(1) For each reduction of 0.01% below the specified carbon maximum, an increase of 0.06% manganese above the specified maximum will be permitted up to a maximum of 1.35%.

(2) Unless otherwise specified by the purchaser, for each reduction of 0.01% below the specified carbon maximum, an increase of 0.06% manganese above the specified maximum will be permitted up to a maximum of 1.65%.

(3) These five elements combined shall not exceed 1%.

## About the American Society for Testing and Materials

### ASTM A530

#### Standard Spec for general requirements for specialized Carbon and Alloy Steel Pipe

##### 1. Scope

1.1 This specification covers a group of requirements which, with the exceptions of Section 5.3, Section 13, Section 20, and Section 21, are mandatory requirements to the ASTM pipe product specifications noted below unless the product specification specifies different requirements, in which case the requirement of the product specification shall prevail.

1.2 Sections 5.3 or 20 are mandatory if the product specification has a requirement for product analysis or flattening tests.

1.3 Section 21 is mandatory if the product specification has a hydrostatic test requirement without defining the test parameters.

1.4 Section 13 is for information only.

1.5 In case of conflict between a requirement of the product specification and a requirement of this general requirement specification, only the requirement of the product specification need be satisfied.

Title of Specification	ASTM Designation
Seamless Carbon Steel Pipe for High-Temperature Service	A 106
Metal-Arc-Welded Steel Pipe for Use With High-Pressure Transmission Systems	A 381
Centrifugally Cast Ferritic Alloy Steel Pipe for High-Temperature Service	A 426
Centrifugally Cast Austenitic Steel Pipe for High-Temperature Service	A 451
Seamless Carbon Steel Pipe for Atmospheric and Lower Temperatures	A 524
Centrifugally Cast Iron-Chromium-Nickel High-Alloy Tubing for Pressure Application at High Temperatures	A 608
Centrifugally Cast Carbon Steel Pipe for High-Temperature Service	A 660
Electric-Fusion-Welded Steel Pipe for Atmospheric and Lower Temperatures	A 671
Electric-Fusion-Welded Steel Pipe for High-Pressure Service at Moderate Temperatures	A 672
Carbon and Alloy Steel Pipe, Electric-Fusion-Welded for High-Pressure Service at High Temperatures	A 691
Centrifugally Cast Ferritic/Austenitic Stainless Steel Pipe for Corrosive Environments	A 872

1.6 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the specification. The inch-pound units shall apply unless the "M" designation (SI) of the product specification is specified in the order.

*Note 1:* The dimensionless designator NPS (nominal pipe size) has been substituted in this standard for such traditional terms as "nominal diameter", "size", and "nominal size".

## 2. Referenced Documents

*A370 Test Methods and Definitions for Mechanical Testing of Steel Products*

*A450/A450M Specification for General Requirements for Carbon, Ferritic Alloy, and Austenitic Alloy Steel Tubes*

*A700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Domestic Shipment*

*A751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products*

*A941 Terminology Relating to Steel, Stainless Steel, Related Alloys, and Ferroalloys*

*D3951 Practice for Commercial Packaging*

*E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications*

*MIL-STD-163 Steel Mill Products Preparation for Shipment and Storage*

*MIL-STD-271 Nondestructive Testing Requirements for Metals*

*MIL-STD-792 Identification Marking Requirements for Special Purpose Components*

*B36.10 Welded and Seamless Wrought Steel Pipe*

*B36.19 Stainless Steel Pipe*

*Fed. Std. No. 183 Continuous Identification Marking of Iron and Steel Products*

*SSPC-SP6 Surface Preparation Specification No. 6 Commercial Blast Cleaning*

Source: ASTM





## **SPECIFICATIONS FOR STEEL PIPE**

Published pipe standards serve three functions.

1. They dictate manufacturing and testing requirements and prescribed methods of measuring the required mechanical and physical properties.
2. Without specifications, it would be difficult for the pipe buyer to establish a common ground of understanding with the producer as to product requirements.
3. When the pipe producer marks a specification on this product they warrant that the pipe is made from prime quality steel and meets all the requirements of the specification.

Standard pipe is manufactured and tested as prescribed by ASTM (formerly American Society for Testing Materials), an international, non-profit technical and Scientific organization formed for "the consensus development of standards on characteristics and performance of materials, products, systems and services." The society operates through more than 127 main technical committees. These committees function under regulations that ensure balanced representation among producers, users and general interest groups. The published standards, therefore, represent the consensus viewpoint of all involved. Line pipe and Oil Country products are manufactured and tested as prescribed by the American Petroleum Institute (API). The API operates similarly to the ASTM except that producers, consumers, and associations with primary interests in oil or gas are involved.

### **GRADE**

Grade refers to divisions within different types of seamless and ERW pipe and designates mechanical properties such as minimum yield and tensile strengths. Grade B has higher tensile and yield strength than Grade A. It is manufactured to higher carbon content steel. Grade A, being a softer steel, is easier to bend and is recommended for use in close coiling and cold bending. Grade B has higher stress values and is better suited for machining operations. Grade C, which is available in ASTM-106, has higher tensile and yield strength than Grades A & B.

### **DIMENSIONS**

Many changes have been made to ASTM specifications over the years. One of the more recent has been to make the specifications fit with metric, and more correctly, with the measurements of pipe and the related fittings.

To change the pipe outside diameter (OD) and wall thickness, simply multiply the SI dimensions by the appropriate factor to convert to metric. However, an inch is not a real inch. Nowhere on pipe 12" and smaller is there a corresponding measurement because this size has no real numerical value.

To solve this problem and still retain the intent of the size designation, the inch mark was removed from the column showing the size, and the term NPS was added as were the following words: The dimensionless designator NPS (nominal pipe size) has been substituted in this standard for such traditional terms as "nominal diameter," "size," and "nominal size." They are now stated as NPS 1, NPS 2, NPS 6, NPS 12, NPS 14, etc.

### **WARNING**

Most pipe specifications are restricted by tolerances for outside diameter, wall thickness, and weight. Pipe must meet all three criteria or material could be rejected. Please refer to the applicable specifications.

# DIGEST OF COMMON - PIPE SPECIFICATIONS

Specification and Size Range Where Indicated	Scope	Type	Grades	Chemistry																																																																																																																					
A-120 (has been withdrawn) NPS 1/8 - 16	Blk & Galv Welded & SMLS pipe for ordinary use - not intended for close coiling bending or high temperature service	CW ERW SMLS	None Specified	None Specified																																																																																																																					
A-53 NPS 1/8 - 26	Blk & Galv Welded & SMLS pipe suitable for welding and forming operations CW not intended for flanging. Grade B not intended for close coiling or severe cold forming. Pipe required for close coiling should be specified on order.	CW - Type F  ERW - Type E  SMLS - Type S	CW - Type F  ERW & SMLS Grade A & B	<p style="text-align: center;"><b>Composition, max %</b></p> <table border="1"> <thead> <tr> <th></th> <th>C</th> <th>Mn</th> <th>P</th> <th>S</th> </tr> </thead> <tbody> <tr> <td colspan="5" style="text-align: center;"><b>Type S (seamless pipe)</b></td> </tr> <tr> <td colspan="5">Open-health, electric-furnace or basic-oxygen:</td> </tr> <tr> <td>Grade A</td> <td>0.25</td> <td>.095</td> <td>0.05</td> <td>0.045</td> </tr> <tr> <td>Grade B</td> <td>0.30</td> <td>1.20</td> <td>0.05</td> <td>0.045</td> </tr> <tr> <td colspan="5" style="text-align: center;"><b>Type E (electric resistance welded)</b></td> </tr> <tr> <td colspan="5">Open-health, electric-furnace or basic-oxygen:</td> </tr> <tr> <td>Grade A</td> <td>0.25</td> <td>.095</td> <td>0.05</td> <td>0.045</td> </tr> <tr> <td>Grade B</td> <td>0.30</td> <td>1.20</td> <td>0.05</td> <td>0.045</td> </tr> <tr> <td colspan="5" style="text-align: center;"><b>Type F (furnace welded pipe)</b></td> </tr> <tr> <td colspan="5">Open-health, electric-furnace or basic-oxygen:</td> </tr> <tr> <td></td> <td>0.30</td> <td>1.20</td> <td>0.05</td> <td>0.045</td> </tr> </tbody> </table> <p style="text-align: center;">Ladle and Check Limits</p>		C	Mn	P	S	<b>Type S (seamless pipe)</b>					Open-health, electric-furnace or basic-oxygen:					Grade A	0.25	.095	0.05	0.045	Grade B	0.30	1.20	0.05	0.045	<b>Type E (electric resistance welded)</b>					Open-health, electric-furnace or basic-oxygen:					Grade A	0.25	.095	0.05	0.045	Grade B	0.30	1.20	0.05	0.045	<b>Type F (furnace welded pipe)</b>					Open-health, electric-furnace or basic-oxygen:						0.30	1.20	0.05	0.045																																																									
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A-106 NPS 1/8 - 26	SMLS for high temperature service. Suitable for bending, flanging, and similar forming operations.	SMLS Only	Grades A, B & C	<p style="text-align: center;"><b>Composition, max %</b></p> <table border="1"> <thead> <tr> <th>Element*</th> <th>Grade A</th> <th>Grade B</th> <th>Grade C</th> </tr> </thead> <tbody> <tr> <td>Chrome</td> <td>0.40</td> <td>0.40</td> <td>0.40</td> </tr> <tr> <td>Copper</td> <td>0.40</td> <td>0.40</td> <td>0.40</td> </tr> <tr> <td>Molybdenum</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> </tr> <tr> <td>Nickel</td> <td>0.40</td> <td>0.40</td> <td>0.40</td> </tr> <tr> <td>Vanadium</td> <td>0.08</td> <td>0.08</td> <td>0.08</td> </tr> </tbody> </table> <p>*These five elements combined shall not exceed 1%.</p>	Element*	Grade A	Grade B	Grade C	Chrome	0.40	0.40	0.40	Copper	0.40	0.40	0.40	Molybdenum	0.15	0.15	0.15	Nickel	0.40	0.40	0.40	Vanadium	0.08	0.08	0.08																																																																																													
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A-135 NPS 2-30	Electric resistance welded for conveying fluid, gas or vapor.	ERW Only	Grades A & B	<p style="text-align: center;"><b>% max</b></p> <table border="1"> <thead> <tr> <th>Element</th> <th>Grade A</th> <th>Grade B</th> </tr> </thead> <tbody> <tr> <td>Carbon</td> <td>0.25</td> <td>0.30</td> </tr> <tr> <td>Manganese</td> <td>0.95</td> <td>1.20</td> </tr> <tr> <td>Phosphorus</td> <td>0.035</td> <td>0.035</td> </tr> <tr> <td>Sulfur</td> <td>0.035</td> <td>0.035</td> </tr> </tbody> </table> <p style="text-align: center;">Ladle and check limits</p>	Element	Grade A	Grade B	Carbon	0.25	0.30	Manganese	0.95	1.20	Phosphorus	0.035	0.035	Sulfur	0.035	0.035																																																																																																						
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A-252 NPS 6 - 24	ERW or SMLS for Pipe Piles	ERW SMLS DSAW	Grades 1, 2, 3	<p style="text-align: center;">All grades .05 Max. % Phos.</p> <p style="text-align: center;">Ladle &amp; check limits</p>																																																																																																																					
A-333	SMLS & Welded Carbon & Alloy Steel pipe for low temperature service	SMLS ERW	1, 3, 4, 6, 7, 8, 9	<p style="text-align: center;"><b>% max</b></p> <table border="1"> <thead> <tr> <th>GR</th> <th>C</th> <th>MN</th> <th>P</th> <th>S</th> <th>Si</th> <th>Ni</th> <th>CR</th> <th>CU</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>.30</td> <td>.40-1.05</td> <td>.025</td> <td>.025</td> <td>.18-.37</td> <td>0.18-0.82</td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>.19</td> <td>.31-.64</td> <td>.025</td> <td>.025</td> <td>.08-.17</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>.12</td> <td>.50-1.05</td> <td>.025</td> <td>.025</td> <td>.08-.17</td> <td>.47-.98</td> <td>.44-1.01</td> <td>.40-.75</td> </tr> <tr> <td>6</td> <td>.30</td> <td>.29-1.06</td> <td>.025</td> <td>.025</td> <td>.10min</td> <td></td> <td></td> <td></td> </tr> <tr> <td>7</td> <td>.10</td> <td>.90 max.</td> <td>.025</td> <td>.025</td> <td>.13-.32</td> <td>2.03-2.57</td> <td></td> <td></td> </tr> <tr> <td>8</td> <td>.13</td> <td>.90 max.</td> <td>.025</td> <td>.025</td> <td>.13-.18</td> <td>8.40-9.60</td> <td></td> <td></td> </tr> <tr> <td>9</td> <td>.20</td> <td>.40-.75</td> <td>.025</td> <td>.025</td> <td></td> <td>1.80-2.24</td> <td>.75-1.25</td> <td></td> </tr> <tr> <td>10</td> <td>.20</td> <td>1.15-1.50</td> <td>.035</td> <td>.018</td> <td>.10-.38</td> <td>.25 max.</td> <td>.15 max.</td> <td>.06 max.</td> </tr> <tr> <td>11</td> <td>.10</td> <td>0.90 max.</td> <td>.025</td> <td>.025</td> <td>0.36 max.</td> <td>35.0-37.0</td> <td>.50 max.</td> <td></td> </tr> </tbody> </table>	GR	C	MN	P	S	Si	Ni	CR	CU	1	.30	.40-1.05	.025	.025	.18-.37	0.18-0.82			3	.19	.31-.64	.025	.025	.08-.17				4	.12	.50-1.05	.025	.025	.08-.17	.47-.98	.44-1.01	.40-.75	6	.30	.29-1.06	.025	.025	.10min				7	.10	.90 max.	.025	.025	.13-.32	2.03-2.57			8	.13	.90 max.	.025	.025	.13-.18	8.40-9.60			9	.20	.40-.75	.025	.025		1.80-2.24	.75-1.25		10	.20	1.15-1.50	.035	.018	.10-.38	.25 max.	.15 max.	.06 max.	11	.10	0.90 max.	.025	.025	0.36 max.	35.0-37.0	.50 max.																												
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A-335 NPS 1/8 - 26	SMLS Alloy Steel Pipe for high temperature service	SMLS Only	P1, P2, P5, P5b, P5c, P9, P11, P12, P15, P21, P22, P91	<table border="1"> <thead> <tr> <th>Grade</th> <th>UNS Des.</th> <th>C</th> <th>Mg</th> <th>P</th> <th>S</th> <th>Si</th> <th>Cr</th> <th>Mo</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>K11522</td> <td>.10-20</td> <td>.30-80</td> <td>.025</td> <td>.025</td> <td>10-50</td> <td></td> <td>.44-.66</td> </tr> <tr> <td>P2</td> <td>K11547</td> <td>.10-20</td> <td>.30-61</td> <td>.025</td> <td>.025</td> <td>10-30</td> <td>5-81</td> <td>.44-.66</td> </tr> <tr> <td>P5</td> <td>K41545</td> <td>.15max</td> <td>.30-80</td> <td>.025</td> <td>.025</td> <td>50max</td> <td>4-6</td> <td>.45-.66</td> </tr> <tr> <td>P5b</td> <td>K51545</td> <td>.15max</td> <td>.30-80</td> <td>.025</td> <td>.025</td> <td>1.00-2.00</td> <td>4-6</td> <td>.45-.66</td> </tr> <tr> <td>P5c</td> <td>K41246</td> <td>.12max</td> <td>.30-80</td> <td>.025</td> <td>.025</td> <td>50max</td> <td>4-6</td> <td>.45-.66</td> </tr> <tr> <td>P9</td> <td>S50400</td> <td>.15max</td> <td>.30-80</td> <td>.025</td> <td>.025</td> <td>25-100</td> <td>8-10</td> <td>.801.10</td> </tr> <tr> <td>P11</td> <td>K11507</td> <td>.05-15</td> <td>.30-80</td> <td>.025</td> <td>.025</td> <td>50-100</td> <td>1-15</td> <td>.44-.66</td> </tr> <tr> <td>P12</td> <td>K11582</td> <td>.05-15</td> <td>.30-80</td> <td>.025</td> <td>.025</td> <td>50max</td> <td>.80-1.25</td> <td>.44-.66</td> </tr> <tr> <td>P15</td> <td>K11578</td> <td>.05-15</td> <td>.30-80</td> <td>.025</td> <td>.025</td> <td>1.15-1.85</td> <td></td> <td>.44-.66</td> </tr> <tr> <td>P21</td> <td>K31545</td> <td>.05-15</td> <td>.30-80</td> <td>.025</td> <td>.025</td> <td>50max</td> <td>2.65-3.35</td> <td>.801.06</td> </tr> <tr> <td>P22</td> <td>K2190</td> <td>.05-15</td> <td>.30-80</td> <td>.025</td> <td>.025</td> <td>50max</td> <td>1.9-2.5</td> <td>.871.13</td> </tr> <tr> <td>P91</td> <td>K91980</td> <td>.08-12</td> <td>.30-80</td> <td>.020</td> <td>.010</td> <td>20-50</td> <td>8-9.5</td> <td>.851.05</td> </tr> </tbody> </table> <p>a. New designation established in accordance with Practice E-527 and SAE J1086, Practice for Numbering Metals and Alloys (UNS).</p> <p>b. Grade P5c shall have a titanium content of not less than 4 times the carbon content and not more than 0.70% or a</p>	Grade	UNS Des.	C	Mg	P	S	Si	Cr	Mo	P1	K11522	.10-20	.30-80	.025	.025	10-50		.44-.66	P2	K11547	.10-20	.30-61	.025	.025	10-30	5-81	.44-.66	P5	K41545	.15max	.30-80	.025	.025	50max	4-6	.45-.66	P5b	K51545	.15max	.30-80	.025	.025	1.00-2.00	4-6	.45-.66	P5c	K41246	.12max	.30-80	.025	.025	50max	4-6	.45-.66	P9	S50400	.15max	.30-80	.025	.025	25-100	8-10	.801.10	P11	K11507	.05-15	.30-80	.025	.025	50-100	1-15	.44-.66	P12	K11582	.05-15	.30-80	.025	.025	50max	.80-1.25	.44-.66	P15	K11578	.05-15	.30-80	.025	.025	1.15-1.85		.44-.66	P21	K31545	.05-15	.30-80	.025	.025	50max	2.65-3.35	.801.06	P22	K2190	.05-15	.30-80	.025	.025	50max	1.9-2.5	.871.13	P91	K91980	.08-12	.30-80	.020	.010	20-50	8-9.5	.851.05
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P15	K11578	.05-15	.30-80	.025	.025	1.15-1.85		.44-.66																																																																																																																	
P21	K31545	.05-15	.30-80	.025	.025	50max	2.65-3.35	.801.06																																																																																																																	
P22	K2190	.05-15	.30-80	.025	.025	50max	1.9-2.5	.871.13																																																																																																																	
P91	K91980	.08-12	.30-80	.020	.010	20-50	8-9.5	.851.05																																																																																																																	
A-501  Square & Rectangular 1" - 10"  Round 1" - 24"	Hot Formed Welded & SMLS Round, Square & Rectangular Tubing	SMLS Welded	None Specified	<p style="text-align: center;"><b>Composition %</b></p> <table border="1"> <thead> <tr> <th>Element</th> <th>Heat Analysis</th> <th>Product Analysis</th> </tr> </thead> <tbody> <tr> <td>Carbon, max.</td> <td>0.26</td> <td>0.30</td> </tr> <tr> <td>Phosphorus, max.</td> <td>0.035</td> <td>0.045</td> </tr> <tr> <td>Sulfur, max.</td> <td>0.035</td> <td>0.045</td> </tr> <tr> <td>Copper, min.*</td> <td>0.20</td> <td>0.18</td> </tr> </tbody> </table> <p>*When copper steel is specified</p>	Element	Heat Analysis	Product Analysis	Carbon, max.	0.26	0.30	Phosphorus, max.	0.035	0.045	Sulfur, max.	0.035	0.045	Copper, min.*	0.20	0.18																																																																																																						
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A-587 NPS 1/2" - 10"	EW Pipe for process lines suitable for severe forming involving flanging and close bending	ERW Only	None Specified	<table border="1"> <thead> <tr> <th colspan="4">% MAX.</th> <th colspan="2">% MIN.</th> </tr> <tr> <th>C</th> <th>MN</th> <th>P</th> <th>S</th> <th>AL</th> <th></th> </tr> </thead> <tbody> <tr> <td>.15</td> <td>.27-.63</td> <td>.035</td> <td>.035</td> <td>.02-11</td> <td></td> </tr> </tbody> </table>	% MAX.				% MIN.		C	MN	P	S	AL		.15	.27-.63	.035	.035	.02-11																																																																																																				
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# DIGEST OF COMMON - PIPE SPECIFICATIONS

Specification and Size Range Where Indicated	Tensiles	Hydrostatic	Tests Bend	Flattening	Wall Tolerance	OD Tolerance																																	
A-120 (has been withdrawn) NPS 1/8 - 16	None Specified	yes	None Specified	None Specified	Min. wall shall not be more than 12.5% under nominal wall	1/2" - 1-1/2" + 1/64" -1/32" 2" & over- +/- 1% of OD																																	
A-53 NPS 1/8 - 26	<table border="1"> <thead> <tr> <th colspan="3">MIN. P.S.I.</th> </tr> <tr> <th>Grade</th> <th>Yield</th> <th>Tensile</th> </tr> </thead> <tbody> <tr> <td>C W</td> <td>25,000</td> <td>45,000</td> </tr> <tr> <td>GR-A</td> <td>30,000</td> <td>48,000</td> </tr> <tr> <td>GR-B</td> <td>35,000</td> <td>60,000</td> </tr> </tbody> </table>	MIN. P.S.I.			Grade	Yield	Tensile	C W	25,000	45,000	GR-A	30,000	48,000	GR-B	35,000	60,000	yes	yes - 2" & under Std. & XHY 90° to 12 times nom. diameter. Close coiling 180° to 8 times nom. dia.	yes - over 2" nom. XHY & lighter. CW 90° to 75% ODv	Min. wall shall not be more than 12.5% under nominal wall	1/2" - 1-1/2" + 1/64" -1/32" 2" & over- +/- 1% of OD																		
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A-106 NPS 1/8 - 26	<table border="1"> <thead> <tr> <th colspan="3">MIN. P.S.I.</th> </tr> <tr> <th>Grade</th> <th>Yield</th> <th>Tensile</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>30,000</td> <td>48,000</td> </tr> <tr> <td>B</td> <td>35,000</td> <td>60,000</td> </tr> <tr> <td>C</td> <td>40,000</td> <td>70,000</td> </tr> </tbody> </table>	MIN. P.S.I.			Grade	Yield	Tensile	A	30,000	48,000	B	35,000	60,000	C	40,000	70,000	yes	Not req'd over 2" diameter. 90° to 12 times dia. Close coiling 180° to 8 times diameter	yes - over 2" dia.	Min. wall shall not be more than 12.5% under nominal wall	1/8" - 1-1/2" + 1/64" -1/32" 2" - 4" +/- 1/32" 5" - 8" + 1/16" -1/32" 10" - 18" + 3/32" -1/32" 18" & over- 1/8" -1/32"																		
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A-135 NPS 2-30	<table border="1"> <thead> <tr> <th colspan="3">MIN. P.S.I.</th> </tr> <tr> <th>Grade</th> <th>Yield</th> <th>Tensile</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>30,000</td> <td>48,000</td> </tr> <tr> <td>B</td> <td>35,000</td> <td>60,000</td> </tr> </tbody> </table>	MIN. P.S.I.			Grade	Yield	Tensile	A	30,000	48,000	B	35,000	60,000	yes	None Specified	yes - for all sizes to 2/3 OD	Min. wall shall not be more than 12.5% under nominal wall	For all sizes +/- 1% of OD																					
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A-252 NPS 6 - 24	<table border="1"> <thead> <tr> <th colspan="3">MIN. P.S.I.</th> </tr> <tr> <th>Grade</th> <th>Yield</th> <th>Tensile</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>30,000</td> <td>50,000</td> </tr> <tr> <td>2</td> <td>35,000</td> <td>60,000</td> </tr> <tr> <td>3</td> <td>40,000</td> <td>66,000</td> </tr> </tbody> </table>	MIN. P.S.I.			Grade	Yield	Tensile	1	30,000	50,000	2	35,000	60,000	3	40,000	66,000	None Specified	None Specified	None Specified	Min. wall shall not be more than 12.5% under nominal wall. Surface defects no more than 25% deep	+/- 1% of OD																		
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A-335 NPS 1/8 - 26	<table border="1"> <thead> <tr> <th colspan="3">MIN. P.S.I.</th> </tr> <tr> <th>Grade</th> <th>Yield</th> <th>Tensile</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>30,000</td> <td>55,000</td> </tr> <tr> <td>P2</td> <td>30,000</td> <td>55,000</td> </tr> <tr> <td>P-91</td> <td>60,000</td> <td>85,000</td> </tr> <tr> <td>All</td> <td></td> <td></td> </tr> <tr> <td>Others</td> <td>30,000</td> <td>60,000</td> </tr> </tbody> </table>	MIN. P.S.I.			Grade	Yield	Tensile	P1	30,000	55,000	P2	30,000	55,000	P-91	60,000	85,000	All			Others	30,000	60,000	yes	yes	yes	Min. wall shall not be more than 12.5% under nominal wall	1/8" - 1-1/2" + 1/64" -1/32" 2" - 4" +/- 1/32" 4" - 8" + 1/16" - 1/32" 10" - 18" + 3/32" - 1/32" 20" - 26" + 1/8" -1/32"												
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A-589 Type 1 NPS 6-16	<table border="1"> <thead> <tr> <th colspan="3">MIN. P.S.I.</th> </tr> <tr> <th>Grade</th> <th>Yield</th> <th>Tensile</th> </tr> </thead> <tbody> <tr> <td>C W</td> <td>25,000</td> <td>45,000</td> </tr> <tr> <td>A</td> <td>30,000</td> <td>48,000</td> </tr> <tr> <td>B</td> <td>35,000</td> <td>60,000</td> </tr> </tbody> </table>	MIN. P.S.I.			Grade	Yield	Tensile	C W	25,000	45,000	A	30,000	48,000	B	35,000	60,000	yes	None Specified	None Specified	Min. wall shall not be more than 12.5% nominal wall	1-1/2" & under + 1/64" - 1/32" 2" & over +/- 1% of OD																		
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## DIGEST OF COMMON - PIPE SPECIFICATIONS (cont.)

Specification and Size Range Where Indicated	Scope	Type	Grades	Chemistry																																																																																			
Type II NPS 1-12	Type II Water well reamed and drifted	Type II SMLS, ERW or CW	Type II A or CW	<table border="1"> <thead> <tr> <th colspan="2">% MAX.</th> </tr> <tr> <th>P</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>.050</td> <td>.060</td> </tr> </tbody> </table>	% MAX.		P	S	.050	.060																																																																													
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Type III NPS 1-2	Type III Driven well pipe	Type III SMLS, ERW or CW	Type III A or CW																																																																																				
Type IV NPS 3-8	Type IV Water well casing	Type IV SMLS, ERW or CW	Type IV A or CW																																																																																				
API 5L	Welded and SMLS Line pipe	CW, ERW, SMLS DSAW	CW Grade 25 DSAW ERW & SMLS Grades A & B	<table border="1"> <thead> <tr> <th colspan="5">Ladle % Max</th> </tr> <tr> <th>GR</th> <th>C</th> <th>MN</th> <th>P</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>A-25</td> <td>.21</td> <td>.60</td> <td>.08</td> <td>.06</td> </tr> <tr> <td>SMLS</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>A</td> <td>.22</td> <td>.90</td> <td>.04</td> <td>.05</td> </tr> <tr> <td>B</td> <td>.27</td> <td>1.15</td> <td>.04</td> <td>.05</td> </tr> <tr> <td>ERW</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>A</td> <td>.21</td> <td>.90</td> <td>.04</td> <td>.05</td> </tr> <tr> <td>B</td> <td>.26</td> <td>1.15</td> <td>.04</td> <td>.05</td> </tr> </tbody> </table>	Ladle % Max					GR	C	MN	P	S	A-25	.21	.60	.08	.06	SMLS					A	.22	.90	.04	.05	B	.27	1.15	.04	.05	ERW					A	.21	.90	.04	.05	B	.26	1.15	.04	.05																																						
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API 5LX	Welded and SMLS High test line pipe	ERW & SMLS DSAW	X-42 X-46 X-52 X-60 X-65 X-70 X-80	<table border="1"> <thead> <tr> <th colspan="6">Ladle % Max % Min</th> </tr> <tr> <th>GR</th> <th>C</th> <th>MN</th> <th>P</th> <th>S</th> <th>CB</th> <th>V</th> </tr> </thead> <tbody> <tr> <td>SMLS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X-42</td> <td>.29</td> <td>1.25</td> <td>.04</td> <td>.05</td> <td></td> <td></td> </tr> <tr> <td>X-46</td> <td>.31</td> <td>1.35</td> <td>.04</td> <td>.05</td> <td></td> <td></td> </tr> <tr> <td>X-52</td> <td>.31</td> <td>1.35</td> <td>.04</td> <td>.05</td> <td></td> <td></td> </tr> <tr> <td>X-60</td> <td>.26</td> <td>1.35</td> <td>.04</td> <td>.05</td> <td></td> <td>.02</td> </tr> <tr> <td>ERW</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X-42</td> <td>.28</td> <td>1.25</td> <td>.04</td> <td>.05</td> <td></td> <td></td> </tr> <tr> <td>X-46</td> <td>.30</td> <td>1.35</td> <td>.04</td> <td>.05</td> <td></td> <td></td> </tr> <tr> <td>X-52</td> <td>.30</td> <td>1.35</td> <td>.04</td> <td>.05</td> <td></td> <td></td> </tr> <tr> <td>X-60</td> <td>.26</td> <td>1.35</td> <td>.04</td> <td>.05</td> <td></td> <td>.005</td> </tr> </tbody> </table>	Ladle % Max % Min						GR	C	MN	P	S	CB	V	SMLS							X-42	.29	1.25	.04	.05			X-46	.31	1.35	.04	.05			X-52	.31	1.35	.04	.05			X-60	.26	1.35	.04	.05		.02	ERW							X-42	.28	1.25	.04	.05			X-46	.30	1.35	.04	.05			X-52	.30	1.35	.04	.05			X-60	.26	1.35	.04	.05		.005
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Federal WWP-406	Comparable to A-120 (has been withdrawn)																																																																																						
Federal WWP-404	Comparable to A-53																																																																																						

## ASTM & API SPECIFICATIONS WITH COMPARABLE ANSI DESIGNATIONS

ASTM OR API DESIGNATIONS	ANSI DESIGNATIONS		TITLE
	CURRENT	REPLACED	
ASTM A-53	B-125.1	B-36.1	Welded & Seamless pipe
ASTM A-106	B-125.30	B-36.3	Seamless carbon steel pipe for high temperature service
ASTM A-120*	B-125-2	B-36.20	Black & galvanized and seamless steel pipe for ordinary uses
ASTM A-134	B-125.55	B-36.4	Electric-fusion (Arc) welded steel plate pipe (sizes 16" & over)
ASTM A-135	B-125.3	B-36.5	Electric resistance welded pipe
ASTM A-139	B-125.31	B-36.9	Electric-fusion (Arc) welded steel plate pipe (sizes 4" & over)
ASTM A-155	B-125.4	B-36.11	Electric fusion welded steel pipe for high temperature service
ASTM A-211	B-125.56	B-36.16	"Insert discontinued 1994"
ASTM A-312	B-125.16	B-36.26	Seamless and welded austenitic stainless steel pipe
ASTM A-333	B-125.17	B-36.40	Seamless and welded steel pipe for low temperature service
ASTM A-335	B-124.24	B-36.42	Seamless ferritic alloy steel pipe for high temperature service

\* has been withdrawn

## DIGEST OF COMMON - PIPE SPECIFICATIONS

Specification and Size Range Where Indicated	Tensiles			Hydrostatic	Tests Bend	Flattening	Wall Tolerance	OD Tolerance
Type II NPS 1-12	MIN. P.S.I.			yes	None Specified	None Specified	Min. wall shall not be more than 12.5% under nominal wall	1-1/2" & under + 1/64" - 1/32" 2" & over +/- 1% of OD
	Grade	Yield	Tensile					
	C W	25,000	45,000					
	A	30,000	48,000					
Type III NPS 1-2	MIN. P.S.I.			yes	yes-for A-25 pipe 2-3/8 & smaller	yes	2-7/8" & smaller + 20% - 12.5%	1,900 & under + .016" - .031"
	Grade	Yield	Tensile					
	A-25	25,000	45,000					
	A	30,000	48,000					
Type IV NPS 3-8							3-1/2" OD + 18% - 12.5%	2-38" - 4" OD +/- 1%
API 5L							20" & larger + 17.5% - 10%	
API 5LX	MIN. P.S.I.			yes	None Specified	yes - for ERW	+ 15% - 12.5%	+/- .75%
	Grade	Yield	Tensile					
	X-42	42,000	60,000					
	X-46	46,000	63,000					
	X-52	52,000	66,000					
X-60	60,000	75,000						
Federal WWP-406	Comparable to A-120							
Federal WWP-404	Comparable to A-53							

## ASTM & API SPECIFICATIONS WITH COMPARABLE ANSI DESIGNATIONS

ASTM A-358	B-125.57	B-36.47	Electric fusion welded austenitic chromium-nickel alloy steel pipe for high temperature service
ASTM A-369	B-125.77	B-36.48	Carbon & ferritic alloy steel forged and bored pipe for high temperature service
ASTM A-376	B-125-25	B-36.43	Seamless austenitic steel pipe for high temperature temperature central station service
ASTM A-381	B-125.25	B-36.49	Metal arc welded steel pipe for high pressure transmission systems
ASTM A-405	B-125.26	B-36.44	Seamless ferritic alloy steel pipe specially heat treated for high temperature service
ASTM A-523	G-62.5		Plain end seamless & ERW steel pipe for high pressure pipe type cable circuits
ASTM A-524	B-125.37	B-36.56	Seamless C.S. pipe for process piping
ASTM A-530	B-125.20	B-36.57	General requirements for specialized carbon and alloy steel pipe
API 5L			Line pipe
API 5LX			High test line pipe
API 5LS			Spiral weld line pipe

## FEDERAL

**WWP-404c** is similar to ASTM A-53 except that Government inspection and continuous identification marking of electric weld and seamless is mandatory. It covers black and galvanized welded and seamless pipe for flanging, bending, and coiling and for use with fresh water, oil, steam, air, and gas on shore plus a limited number of shipboard uses. Sizes 1/8 inch through 24 inch. WWP-406c is a federal specification comparable to ASTM A-120 (withdrawn 1988). Mills can certify that A-120 pipe in a distributor's stock meets all the requirements of WWP-406c.

## A.W.W.A.

**C-200** covers black welded and seamless pipe intended for the conveyance of water in sizes 6 inch and larger. Specification prescribes hydrostatic test pressures for sizes of pipe covered. Tensile, flattening, and bending tests are required.

## ASME

**B31.1 Code for pressure piping.** Prescribes minimum requirements for design, manufacture, test, and installations of power piping systems for steam generating plants, central heating plants, and industrial plants.

**B31.2 Fuel Gas Piping.**

**B31.3 Petroleum Refinery Piping.**

**B31.4 Liquid Petroleum Transportation Piping Systems.**

**B31.5 Refrigeration Piping.**

**B31.7 Nuclear Power Piping**

**B31.8 Gas Transmission and Distributing Piping Systems.** Covers design, fabrication, installation, inspection, testing, and the safety aspects of operation and maintenance of gas transmission and distribution systems.

## ANSI (ASME)

**B36.10 American Standard for Wrought-Steel and Wrought-Iron pipe.** Designates dimensions, weights, and schedule numbers for welded and seamless pipe. Schedules 10 through Schedules Double Extra Heavy (DXH/XXH).

**B36.19 American Standard for Stainless Steel Pipe.** Designates dimensions, weights, and schedule numbers for welded and seamless Stainless Steel Pipe, Schedules 5 through Schedules 80.

## A.A.R.

**M-111** covers black and galvanized welded and seamless pipe intended for coiling, bending, flanging, and other special purposes; and is suitable for welding. Purpose for which pipe is intended should be stated on orders. M-111 is comparable in most requirements to ASTM A-53.

**M-130** covers black and galvanized welded and seamless pipe for ordinary uses in steam, water, gas, and air lines. Sizes 1/8 inch through 12 inch. Pipe to this specification is not intended for close coiling, bending, or high temperature service. M-130 is comparable in most requirements to ASTM A-120.

ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

Pipe Size (in)	Diameter (in)		Nominal Thickness (in)	Transverse Areas (in <sup>2</sup> )			Length of Pipe (per sq. foot of)		Volume (ft <sup>3</sup> /ft)	Weight	
	External	Internal		External	Internal	Steel	External Surface (ft)	Internal Surface (ft)		lb/ft	kg/m
1/8	0.41	0.27	0.07	0.13	0.06	0.07	9.43	14.2	0.0004	0.24	0.36
1/4	0.54	0.36	0.09	0.23	0.1	0.13	7.07	10.49	0.0007	0.42	0.63
3/8	0.68	0.49	0.09	0.36	0.19	0.17	5.66	7.75	0.0013	0.57	0.84
1/2	0.84	0.62	0.11	0.55	0.3	0.25	4.55	6.14	0.0021	0.85	1.26
3/4	1.05	0.82	0.11	0.87	0.53	0.33	3.64	4.64	0.0037	1.13	1.68
1	1.32	1.05	0.13	1.36	0.86	0.49	2.9	3.64	0.006	1.68	2.5
1 1/4	1.66	1.38	0.14	2.16	1.5	0.67	2.3	2.77	0.0104	2.27	3.38
1 1/2	1.9	1.61	0.15	2.84	2.04	0.8	2.01	2.37	0.0141	2.72	4.04
2	2.38	2.07	0.15	4.43	3.36	1.08	1.61	1.85	0.0233	3.65	5.43
2 1/2	2.88	2.47	0.2	6.49	4.79	1.7	1.33	1.55	0.0333	5.79	8.62
3	3.5	3.07	0.22	9.62	7.39	2.23	1.09	1.25	0.0513	7.58	11.27
3 1/2	4	3.55	0.23	12.56	9.89	2.68	0.95	1.08	0.0687	9.11	13.56
4	4.5	4.03	0.24	15.9	12.73	3.17	0.85	0.95	0.0884	10.79	16.06
5	5.56	5.05	0.26	24.3	20	4.3	0.69	0.76	0.1389	14.61	21.74
6	6.63	6.07	0.28	34.47	28.89	5.58	0.58	0.63	0.2006	18.97	28.23
8	8.63	7.98	0.32	58.42	50.02	8.4	0.44	0.48	0.3552	28.55	42.49
10	10.75	10.02	0.37	90.76	78.85	11.9	0.36	0.38	0.5476	40.48	60.24
12	12.75	11.94	0.41	127.64	111.9	15.74	0.3	0.32	0.7763	53.6	79.77
14	14	13.13	0.44	153.94	135.3	18.64	0.27	0.28	0.9354	63	93.75
16	16	15	0.5	201.05	176.7	24.35	0.24	0.25	1.223	78	116.08
18	18	16.88	0.56	254.85	224	30.85	0.21	0.23	1.555	105	156.26
20	20	18.81	0.59	314.15	278	36.15	0.19	0.2	1.926	123	183.05
24	24	22.63	0.69	452.4	402.1	50.3	0.16	0.17	2.793	171	254.48

ASTM A53 pipe - also referred to as ASME SA53 pipe - is intended for mechanical and pressure applications.





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Agent's Stamp:

A large, empty rectangular box with rounded corners and a black border, intended for an agent's stamp or signature.