



Spirally Submerged Arc Welded Steel Pipes



Our Story

Established in Adana in 1967, Mazlum Mangtay is one of the most important companies in Turkey's pipe and drilling sector. The company has been drilling since the 1950s; and began manufacturing pipes in 1987 after experiencing difficulty finding good quality pipes for its own wells. When the company started producing spiral-welded steel pipes in 1995, Mazlum Pipes secured its position as an important brand name in Turkey's pipe sector. In June 2010 the company moved its pipe production factory from its 12.000m² facility to a new one in the Adana Organize Industrial Park just outside the city. The new 24.000m² location includes an area dedicated to polyethylene coating. Mazlum Mangtay, Co. started out as a local family company in Adana and has

"Our biggest earning is experiencing the satisfaction of our customer as the water flows."

Mazlum MANGTAY

has grown to become one of Turkey's most established corporations. The addition of a third spiral-welded pipe machine has made it one of Turkey's most sought-after companies. The addition of the new factory has almost doubled the company's production with an annual capacity now reaching 80.000 tons, meeting Turkish and international standards. Mazlum Pipes plans to increase its exports to include not only Turkey, but countries around the world.



Spirally Submerged Arc
Welded Steel Pipes



Spirally Submerged Arc Welded Steel Pipes



ANNUAL PRODUCTION

80.000 ton

PRODUCTION RANGE

219,1-3.048 mm (85/8 - 120")

WALL THICKNESS

4mm-25 mm (0.157"-1")

PIPE LENGTH

6-16 m (Special production up to 46 m)

RAW MATERIAL

Hot rolled steel Coils

WELDING PROCESS

Internal and external submerged arc welding with single, tandem or triple technique (SAW)

Spiral welded steel pipe (SAWH I)

219,1 mm - 812,8 mm

Spiral welded steel pipe (SAWH II)

219,1 mm - 2032 mm

Spiral welded steel pipe (SAWH III)

711,2 mm - 3048 mm





Product groups & Production Norms

Piling Pipes (EN 10219-1, ASTM A252)

Water Line Pipes (EN 10217-1, EN 10224)

- Drilling Pipes (API 5D) :

- Filtered Drilling Pipes

- Closed Drilling Pipes

Bridge Type Filtered Pipes

Energy(Petroleum and Gas) Pipes (API 5L, ISO 11960:2004)

Casing and Tubing Pipes (OCTG) (ASTM A252, API 5CT)



MATERIAL QUALITY

API 5L (Grade A-X80)

EN 10025 (S235-S355)

EN 10217-1 (P195TR1-P265TR2)

PETROLEUM AND GAS LINE PIPES

API 5L

EN 10208

TS 6047

DIN 17172

GOST 20295

PILINGS

ASTM A 252

GENERAL

BS 3601

NF A 49150

DIN EN 10224

ASTM A 53

PIPE JOINT DETAILS

Welded

Flanged

Spherical

Spigot and socket

WATER LINE PIPES

AWWA C 200

TS EN 10217-1

DIN 2460

BS 534

UNI 6363

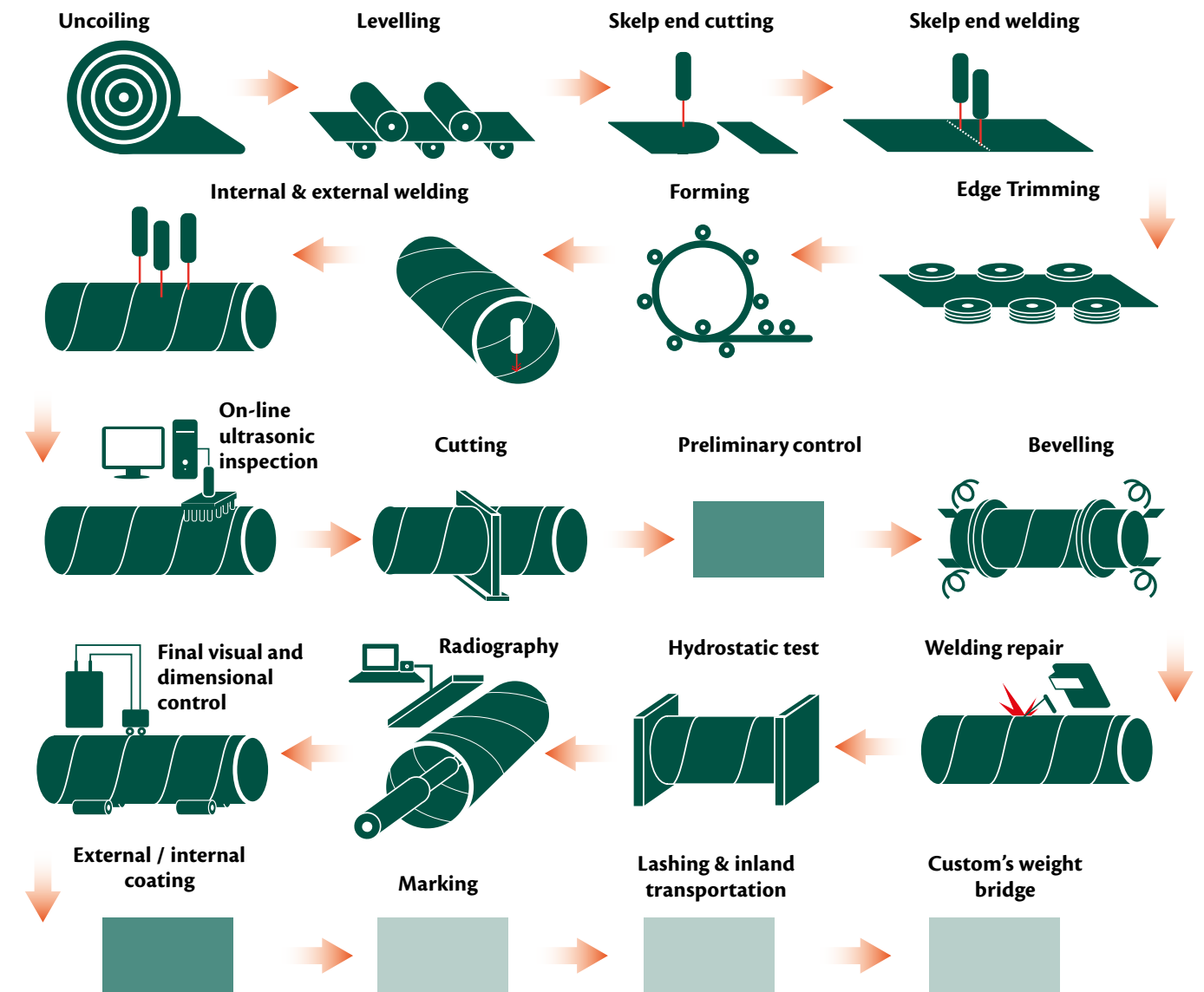
FITTINGS

AWWA C 208

BS 534



Production flow chart





Production norms and standards

Natural Gas and Crude Oil Pipeline Pipes

API 5L

DIN 17172

TS 6047

GOST 20295

Water Pipeline Pipes

TS 10217-1

DIN 2460

AWWA C-200

BS 534

UNI 6363

Pipes For General Uses

DIN 1626

BS 3601

Piling Pipes

ASTM A-252

JIS A-5525

Pipe Fitting

AWWA C-208

BS 534

ISO 3183 ve EN 10219





Raw Material Supply



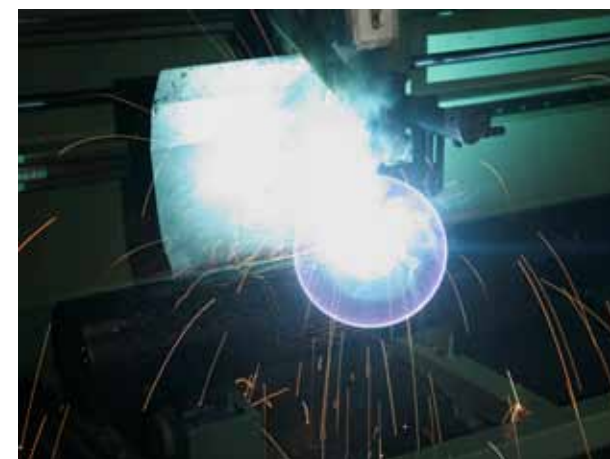
Raw Material Supply :

Raw material is supplied only directly from approved HRC producers. Mill Test Certificates showing full mechanical and chemical properties should 100% conform the tests applied at the final receipt of materials on our own labs.

Coil Preparation :

HRC Coils that will be used for production is selected from coil list which approved by Quality department. The coil list can be performed via either electronic media or a written report. The identification of coil is checked corresponding with coil label and coil list.

The heat and coil number of selected coil is be recorded to the pipe production report that showing related pipe number.



Following steps are taken during test and inspection of Raw material:

- Documentation control,
- Unloading visual-dentification check,
- Storage criteria,
- Verification of Phsical and Chemical properties,
- Releasing Process ,
- Quarantine Process,
- Returning back/rejecting the material.





Bevelling

Steel Pipes are conically beveled according to the standards in order to clean from the burs. The beveled pipes are sent to hydrostatic test



Beveling Units

Unit 1:Pipe Dia.: 219,1-1219mm Pipe Length: 6,0-12,5m
 Unit 2:Pipe Dia.: 406-3048mm Pipe Length: 6,0-12,5m

Hydrostatic Test

Pipe Diameters: 219,1-1828mm
 Pipe Length: 6,0-13,5m
 500tons-100 bar

Hydrostatic test pressure; $P = 20 \times t_{min} \times \text{percentage coefficient} \times S_{min} / D$

- P = Test pressure (Bar)
- t min = Min specified wall thickness
- S min = Specified minimum yield strength (MPa)
- D = Nominal outside diameter of pipe (mm)
- Per. coefficient = A value according to Standards or customer specification (sample 0,90)



Internal and external welding



Internal and external welding :

Immediately after the pipe forming process, inside welding is carried out around 30 mm behind the edge contact point by submerged arc welding process. Followed by half helical turn which depending on machine design external welding is carried out depending on pipe diameter and wall thickness; in addition to the individual and relative. All the welding parameters (Current, voltage, speed and etc.) and welding consumables are specified in Welding Procedure Specifications.

Ultrasonic Inspection:

The produced pipes are control and record by Automatic On-Line Ultrasonic Control and computer systems. The faultless pipe production is realized by applying advanced ultrasonic evaluation system and program. The produced pipes are performing body and HAZ lamination and weld seam testing.

The length cutting shall be carried out by plasma cutting method according to customer specification.



Coating

Bitumen Coating

To prevent rusting in pipes used for natural gas and petrol lines, this coating is applied to the outside of pipes by wrapping. All our applications are in accordance with the following applied standards: TS 4356,DIN 30673

Pipes can be coated externally with bitumen + reinforced glass as per DIN 30673 to maintain a higher corrosion strength.

The bitumen layer coated on the pipe surface can increase the anti-corrosion properties of the casting pipes. The coating of the equipment has the effect of flat and tidy surface, free of bubbles and the solid fixing between the coating layer and the coated body.

Reinforcement can be maintained- by fiber-glass applications

USAGE/PURPOSE (Ideally suited for) ;

Protection of galvanised iron gutters, down-pipes, metal pipes and metals exposed to weather Priming dry concrete decks An adhesive to adhere to Malthoid to metal

SURFACE PREPARATION

All surfaces must be thoroughly clean, dry, sound and free from grease, oils, waxes and all loose materials.



Visual inspection	Impact resistance
Coating thickness	Indentation hardness
Holiday Test	Elongation at failure
Adhesion Test by Hanging Weight	Cathodic Disbonding
Adhesion Test by Tensometer	Electric Resistivity

Polyethylene Coating



A dust coating is sprayed onto th cleaned and warmed pipe, creating a sticky coating. When the pipe is hot, liquid polyethylene band is wrapped around the pipe. In order to protect the outer surface against corrosion and to prolong its lifespan, three layers of polyethylene or polypropylene coating are applied. The coating is in accordance with DIN 30670, 30678, TS 51139 and UNI 9099 standards.

Following to surface preparation , pre-heating is managed on a continuous coating line without any risk of deterioration (external pipe wall, bevels, coating) during the various heating, powder spraying, curing and quenching operations. The pipes are heated for coating application using natural gas with back system. The pipe temperature shall be according to the production and coating norms, The temperature is measured continuously by the control equipment which shall be pyrometer, thermocouples, infra-red sensors, or equivalent proper methods.

No chemical treatment of the surface of steel using chromates, phosphates or any other chemical is allowed, to improve adhesion. Required adhesion is be obtained only by using suitable fusion bonded epoxy primer and surface preparation.

PE Coating process consists of ;

First layer : electro statically applied fusion bonded epoxy primer

Second layer : extruded adhesive wrapping

Third layer : extruded polyethylene wrapping Coating

Epoxy Coating



The main application field of solvent-free epoxy paint is fresh water lines. This kind of process cures a coating with excellent corrosion resistance to fresh water, sea water, crude oil and to abrasion. It is applicable in thick coats by standard heavy duty airless spray equipment. Harmless to grain cargo. It use as a lining in potable water tanks and pipelines, where solvent-free materials are required. If required to be used for potable water, the surface should be prepared to abrasive blasting to min. Sa 2½ with a surface profile corresponding to ISO

Comparator Rough Medium (G) profile.

Oil and grease must be removed with suitable detergent, salts and other contaminants by (high pressure) fresh water hosing prior to blasting. After blasting, clean the surface carefully from abrasives and dust.

Steel surfaces having been exposed to salt water, excessive amounts of salt residues in pitting may call for dry abrasive blasting, high pressure fresh water hosing, drying, and finally, dry abrasive blasting again. Alternatively, water jetting may be used provided the steel surface has already the surface profile as described above. The

application shall be done with twin feed hot airless spray equipment complying with the instructions recommended and given by the paint manufacturer and shall be done in a manner to prevent sags and runs and to provide adequate thickness in crevices and angles.

There are two methods for application ; Fixed boom system consists of : Fixed boom and pipe cart for linear movement and pipe turning roll on pipe cart for circumferential movement of pipe. Movable boom system consists of : Boom/ boom carriage and pipe turning roll unit



Sandblasting is very necessary for surface preparation for steel pipes. Sandblasting removes rust, existing coatings, mill scale, dirt, oil, grease, and other contaminants. It creates an anchor pattern for the primer.

Sandblasting does not remove all the salt from the substrate surface. Before sandblasting newly manufactured or repainted steel, pressure washing or steam cleaning is necessary. Salt Test Kits are used for determining the cleanliness of the surface.

There are standards for the degree of cleanliness of the sandblasted steel substrate. All paint specifications that include sandblasting should specify the type of blast required. The standards currently in use follow the guidelines provided by NACE (National Association of Corrosion Engineers), SSPC

(Steel Structures Painting Council) or Sa (Swedish Pictorial Standards).

“Commercial Blast”: NACE 1-2-3, SSPC-SP5-6-10, or Sa ½-1-2, all those method of preparing steel surfaces provides free of all visible oil, grease, dirt, dust, mill scale, rust and paint. Generally, evenly dispersed, very light shadows, streaks and discolouration caused by stains of rust, stains of mill scale, and stains of previously applied paint may remain on no more than 33% of the surface. Slight residues of rust and paint may also be left in the craters of pits if the original surface is pitted.

The sandblast profile: the height from the top of the peaks to the depth of the pits, is a consideration when choosing a primer. A common practice is to recommend a primer that can easily be applied to a dry film thickness that exceeds the height of the profile.

Sandblasting





Coating Standarts

Exterior Coating Types and Standards

Polyethylene	Epoxy	Bitumen
DIN 30670	AWWA C-210	DIN 30673
NFA 49-710	NFA 49-709	TS 4356
TS 5139	TS EN 10289	BS 4147
TS EN 10288	API RP 5L2	
AWWA C-215	BS 5493	
UNI 9099		

Interior Coating Types and Standards

Epoxy	Coal-Tar Enamel
AWWA C-210	AWWA C-203
NFA 49-709	BS 4164
TS EN 10289	
AWWA C-213	

Polypropylene	Polyurethane
DIN 30678	AWWA C-222
NFA 49-711	BS EN 10290

POLIETHYLENE COATING TESTS

Visual control
Coating thickness
Holiday test
Adhesion test
Impact resistance
% Elongation
Cathodic disbondment test
Electricity resistance test

EPOXY COATING TESTS

Surface cleaning degree
Surface roughness
Powder test
Coating thickness
Shore D hardness
Impact resistance
Adhesion test - pull-off
Curing test
Electrical Insulation test
Cathodic corrosion test



Transportation



Our plants are located close to main ports of the region. There are two main container ports and five berth/ports in the region enabling us to decide in accordance to our project. We are in position to transport our pipes through those container ports on 20"/40"/40"HC container basis or by Bulk vessel based on charter-party.

Following to transfer of the goods to loading port, all the required lashing, stowage and dunnaging material is supplied for securing the cargo in or on deck stowage. In addition, Our Professional team specialized in stevedoring activities and have a wide range and immediately available stock of lashing materials, we do secure, separate and maintain the best lashing service for overseas vessel transportation.

Besides the P&I, our QC team and 3rd party inspector attended, accompanies all the loading operation to prevent any damage and inpuirities.

We are always in close contact with the owner/downer of the vessel's to get the best freights, lumpsum or part cargo options carefully studied to get the best efficiency/freight ratio.

An inspection report and cargo receipt (B/L and Mate's receipt) is supplied to our customers immediately right after the operation completed.

Piling Pipes

Piling pipes are total engineering solutions. The design, production, installation and quality assurance that are a part of each steel pile combine to eliminate guesswork and produce a known, reliable and cost effective product that can accommodate a wide variety of subsurface conditions.

Piling pipes are usually the most cost effective deep foundation solution. You pay only for what you need. There are no hidden extra costs or added expenses for site clean-up. Mazlum produces wide variety of materials and shapes available for piling , allowing them to be driven by modern hammers to increased working loads thus requiring fewer piles per project, resulting in substantial savings in foundation costs.

Materials used for steel pipe piles are general structural steels that are in accordance with SFS 200 . Where a high structural capacity of the pile is required the amount of steel in pipes can be reduced by using a high strength steel, as pipe steels X 60 and X 70 in accordance with standard API 5L.

The main piling pipe norms we are producing accordingly are EN 10219-1 , ASTM A 252

For your off-shore port/berth projects please advise us for determining your technical(material,size etc) requirements.

Connecting our steel pipes to sheet piles: C6 interlocks or with C9

Related to tubular piling pipes, for your Combined Wall (Combi-Wall) applications, we are in position to manage applications of C6 and C9 interlock welding operations. Please contact us for detailed information.



Mobile, On Site Production



In time we are introduced with projects with a very big disadvantage of transportation costs due to difficulties in accessing the site area or the distance resulting very high freight charges.

To overcome this issue we studied the example applications, and considering what the contractors requires, we focused on and invested on the concept; Mobile Production whose also called On-site production.

Through this concept method of production we mobilised some of our production lines, managed in re-constructing those units as transferable,

movable and re-installable.

At the moment we have the capability of transporting some of our production lines to the site area directly and making production on –site, supplying the pipes directly to the contractor, saving high freight costs, saving time.

Keep your schedule for your project, do not delay them,

Save from high transport costs,

Get what you instantly need, welcome flexibility,

Own your private pipe your production plant on your site,



A black and white photograph of a large industrial facility, likely a steel mill. In the foreground, rows of large, dark, cylindrical objects, possibly coils of steel, are arranged in perspective, leading towards a large, complex industrial structure in the background. The structure features a prominent arched opening and is surrounded by various pipes, walkways, and structural elements. The facility has a high ceiling with a corrugated metal roof, and bright light enters from the right side, creating a strong contrast and highlighting the textures of the materials.



Preassure test tables

DIAMETER ø (mm)	WALL THICKNESS (mm)																
	4	4,5	5	5,6	6,3	7,1	8	8,8	10	11	12	14	16	18	20	22	25
219,1	60	68	75	84	95	107	120	132									
244,5	54	60	67	75	85	95	107	118									
273	48	54	60	67	76	86	96	106	121								
323,9	41	46	51	57	64	72	81	89	102	112							
355,6	37	42	46	52	58	66	74	82	93	102	111						
406,4	32	36	41	45	51	58	65	71	81	89	97						
457,2	29	32	36	40	45	51	58	63	72	79	86						
508	26	29	32	36	41	46	52	57	65	71	78	91					
558,8			29	33	37	42	47	52	59	65	71	82					
609,6			27	30	34	38	43	47	54	59	65	76	86				
660,4			25	28	31	35	40	44	50	55	60	70	80				
711,2			23	26	29	33	37	41	46	51	56	65	74	83	93		
762				24	27	31	35	38	43	47	52	60	69	78	86		
812,8				23	25	29	32	36	40	45	49	57	65	73	81		
914,4					23	26	29	32	36	40	43	50	58	65	72	79	
1016						23	26	28	32	36	39	45	52	58	65	71	
1117,6						21	24	26	29	32	35	41	47	53	59	65	
1219,2							22	24	27	30	32	38	43	49	54	59	
1320,8							20	22	25	27	30	35	40	45	50	55	
1422,4								20	23	25	28	32	37	42	46	51	58
1524								19	22	24	26	30	35	39	43	47	54
1625,6									20	22	24	28	32	36	40	45	51
1727,2									19	21	23	27	30	34	38	42	48
1828,8									18	20	22	25	29	32	36	40	45
1930										19	20	24	27	31	34	38	43
2032										18	19	23	26	29	32	36	40
2134											19	22	25	28	31	34	39
2235											18	21	24	26	29	32	37
2337												20	23	25	28	31	35
2438												19	22	24	27	30	34
2540												18	21	23	26	28	32

DIAMETER ø (mm)	WALL THICKNESS (mm)																
	4	4,5	5	5,6	6,3	7,1	8	8,8	10	11	12	14	16	18	20	22	25
219,1	70	79	88	98	111	125	141	155									
244,5	63	71	79	88	99	112	126	138									
273	56	63	71	79	89	100	113	124	141								
323,9	48	53	59	67	75	84	95	105	119	131							
355,6	43	49	54	61	68	77	87	95	108	119	130						
406,4	38	43	47	53	60	67	76	83	95	104	114						
457,2	34	38	42	47	53	60	67	74	84	93	101						
508	30	34	35	42	48	54	61	67	76	83	91	106					
558,8	28	31	34	39	43	49	55	61	69	76	83	96					
609,6	25	28	32	35	40	45	50	56	63	69	76	88	101				
660,4		26	29	33	37	41	47	51	58	64	70	82	93				
711,2			27	30	34	38	43	48	54	60	65	76	87	97	108		
762				25	28	32	36	40	44	51	56	61	71	81	91	101	
812,8				24	27	30	34	38	42	47	52	57	66	76	85	95	
914,4					24	27	30	34	37	42	46	51	59	67	76	84	
1016						24	27	30	33	38	42	45	53	61	68	76	83
1117,6							24	28	30	34	38	41	48	55	62	69	76
1219,2							22	25	28	32	35	38	44	51	57	63	69
1320,8								23	26	29	32	35	41	47	53	58	64
1422,4								22	24	27	30	32	38	43	49	54	60
1524								20	22	25	28	30	35	40	45	51	56
1625,6									21	24	26	28	33	38	43	47	52
1727,2									20	22	25	27	31	36	40	45	49
1828,8									19	21	23	25	29	34	38	42	46
1930										20	22	24	28	32	36	40	44
2032											21	23	27	30	34	38	42
2134												22	25	29	32	36	40
2235													24	28	31	34	38
2337														23	26	30	33
2438															22	25	28
2540																21	24

Preassure test tables

DIAMETER (mm)	ET KALINLIĞI (mm)																
	4	4,5	5	5,6	6,3	7,1	8	8,8	10	11	12	14	16	18	20	22	25
219,1	91	102	113	127	143	161	182										
244,5	81	91	101	114	128	144	162										
273	73	82	91	102	115	129	146	160									
323,9	61	69	77	86	97	109	123	135									
355,6	56	63	70	78	88	99	112	123	140								
406,4	49	55	61	69	77	87	98	108	122	135							
457,2	44	49	54	61	69	77	87	96	109	120							
508	39	44	49	55	62	69	78	86	98	108	117						
558,8	36	40	44	50	56	63	71	78	89	98	107	124					
609,6	33	37	41	46	51	58	65	72	81	90	98	114					
660,4	30	34	38	42	47	53	60	66	75	83	90	105	120				
711,2		31	35	39	44	50	56	62	70	77	84	98	112	126			
762			33	37	41	46	52	57	65	72	78	91	104	117	130		
812,8				34	39	43	49	54	61	67	73	86	98	110	122	135	153
914,4					34	39	44	48	54	60	65	76	87	98	109	120	136
1016						31	35	39	43	49	54	59	68	78	88	98	108
1117,6							32	36	39	44	49	53	62	71	80	89	98
1219,2							29	33	36	41	45	49	57	65	73	82	90
1320,8								30	33	38	41	45	53	60	68	75	83
1422,4									28	31	35	38	42	49	56	63	70
1524										26	29	33	36	39	46	52	59
1625,6										24	27	31	34	37	43	49	55
1727,2											25	29	32	35	40	46	52
1828,8												24	27	30	33	38	44
1930													26	28	31	36	41
2032														24	27	29	34
2134															26	28	33
2235																27	31
2337																	30
2438																	
2540																	

Technical Appendix

Unit Weight Table WALL THICKNESS																			
DIAMETER (mm)		4.0	4.5	5	5.6	6.3	7.1	8	8.8	10	12	14	16	18	20	22	24	26	28
INCH	mm																		
8	219.1	21.2	23.8	26.4	29.5	33.1	37.1	41.6											
10	273	26.5	29.8	33	36.9	41.4	46.6	52.3											
12	323.9	31.6	35.4	39.3	44	49.3	55.5	62.3	68.4	77.4									
14	355.6	34.7	39	43.2	48.3	54.3	61	68.6	75.3	85.2	101.7	117.9							
16	406.4	39.7	44.6	49.5	55.3	62.2	69.9	78.6	86.3	97.8	116.7	135.5							
18	457.2	44.7	50.2	55.8	62.4	70.1	78.8	88.6	97.3	110.3	131.7	153	174.1	195	215.6	236.1	256.4	276.5	296.4
20	508	49.7	55.9	62	69.4	77.9	87.7	98.6	108.3	122.8	146.8	170.5	194.1	217.5	240.7	263.7	286.5	309	331.4
22	558.8	54.7	61.5	68.3	76.4	85.8	96.6	108.7	119.4	135.3	161.8	188.1	214.2	240.1	265.7	291.2	316.5	341.6	366.5
24	609.6			74.5	83.4	93.7	105.5	118.7	130.4	147.9	176.8	205.6	234.2	262.6	290.8	318.8	346.6	374.2	401.6
26	660.4			80.8	90.4	101.6	114.4	128.7	141.4	160.4	191.9	223.2	254.3	285.1	315.8	346.3	376.6	406.8	436.7
28	711.2			87.1	97.4	109.5	123.3	138.7	152.4	172.9	206.9	240.7	274.3	307.7	340.9	373.9	406.7	439.3	471.7
30	762				104.5	117.4	132.2	148.7	163.5	185.4	221.9	258.2	294.3	330.2	366	401.5	436.8	471.9	506.8
32	812.8				111.5	125.3	141.1	158.8	174.5	198	237	275.8	314.4	352.8	391	429	466.8	504.5	541.9
34	863.6					133.2	150	168.8	185.5	210.5	252	293.3	334.4	375.3	416.1	456.6	496.9	537	577
36	914.4					141.1	158.9	178.8	196.5	223	267	310.9	354.5	397.9	441.1	484.1	527	569.6	612
38	965.2					149	167.7	188.8	207.5	235.6	282.1	328.4	374.5	420.4	466.2	511.7	557	602.2	647.1
40	1016					156.9	176.6	198.9	218.6	248.1	297.1	345.9	394.6	443	491.2	539.3	587.1	634.7	682.2
42	1066.8						185.5	208.9	229.6	260.6	312.1	363.5	414.6	465.5	516.3	566.8	617.2	667.3	717.3
44	1117.6						194.4	218.9	240.6	273.1	327.2	381	434.6	488.1	541.3	594.4	647.2	699.9	752.3
46	1168.4							228.9	251.6	285.7	342.2	398.5	454.7	510.6	566.4	621.9	677.3	732.5	787.4
48	1219.2							238.9	262.7	298.2	357.2	416.1	474.7	533.2	591.4	649.5	707.4	765	822.5
50	1270							249	273.7	310.7	372.3	433.6	494.8	555.7	616.5	677.1	737.4	797.6	857.6
52	1320.8							259	284.7	323.2	387.3	451.2	514.8	578.3	641.6	704.6	767.5	830.2	892.7
54	1371.6								295.7	335.8	402.3	468.7	534.9	600.8	666.6	732.2	797.6	862.7	927.7
56	1422.4								306.8	348.3	417.4	486.2	554.9	623.4	691.7	759.7	827.6	895.3	962.8
58	1473.2								317.8	360.8	432.4	503.8	575	645.9	716.7	787.3	857.7	927.9	997.9
60	1524								328.8	373.4	447.4	521.3	595	668.5	741.8	814.9	887.8	960.5	1033
62	1574.8								339.8	385.9	462.5	538.9	615	691	766.8	842.4	917.8	993	1068
64	1625.6								350.9	398.4	477.5	556.4	635.1	713.6	791.9	870	947.9	1025.6	1103.1
66	1676.4								361.9	410.9	492.5	573.9	655.1	736.1	816.9	897.5	978	1058.2	1138.2
68	1727.2								372.9	423.5	507.6	591.5	675.2	758.7	842	925.1	1008	1090.7	1173.3
70	1778									436	522.6	609	695.2	781.2	867	952.7	1038.1	1123.3	1208.3
72	1828.8									448.5	537.6	626.5	715.3	803.8	892.1	980.2	1068.2	1155.9	1243.4
74	1879.6									461	552.7	644.1	735.3	826.3	917.2	1007.8	1098.2	1188.5	1278.5
76	1930.4									473.6	567.7	661.6	755.3	848.9	942.2	1035.3	1128.3	1221	1313.6
80	2032									498.6	597.8	696.7	795.4	894	992.3	1090.5	1188.4	1286.2	1383.7
82	2082.8										612.8	714.2	815.5	916.5	1017.4	1118	1218.5	1318.7	1418.8
84	2133.6										627.8	731.8	835.5	939.1	1042.4	1145.6	1248.5	1351.3	1453.9
86	2184.4										642.9	749.3	855.6	961.6	1067.5	1173.1	1278.6	1383.9	1489
88	2235.2										657.9	766.8	875.6	984.2	1092.5	1200.7	1308.7	1416.5	1524
90	2286											784.4	895.7	1006.7	1117.6	1228.3	1338.7	1449	1559.1
92	2336.8											801.9	915.7	1029.3	1142.6	1255.8	1368.8	1481.6	1594.2
94	2387.6											819.5	935.7	1051.8	1167.7	1283.4	1398.9	1514.2	1629.3
96	2438.4											837	955.8	1074.4	1192.8	1310.9	1428.9	1546.7	1664.3
98	2489.2											854.5	975.8	1096.9	1217.8	1338.5	1459	1579.3	1699.4
100	2540											872.1	995.9	1119.5	1242.9	1366.1	1489.1	1611.9	1734.5
102	2590.8											889.6	1015.9	1142	1267.9	1393.6	1519.1	1644.4	1769.6
104	2641.6											907.2	1036	1164.6	1293	1421.2	1549.2	1677	1804.6
106	2692.4											924.7	1056	1187.1	1318	1448.7	1579.3	1709.6	1839.7
108	2743.2											942.2	1076	1209.7	1343.1	1476.3	1609.3	1742.2	1874.8
110	2794												1096.1	1232.2	1368.1	1503.9	1639.4	1774.7	1909.9
112	2844.8												1116.1	1254.8	1393.2	1531.4	1669.5	1807.3	1944.9
114	2895.6												1136.2	1277.3	1418.2	1559	1699.5	1839.9	1980
116	2946.4												1156.2	1299.9	1443.3	1586.5	1729.6	1872.4	2015.1
118	2997.2												1176.3	1322.4	1468.4	1614.1	1759.7	1905	2050.2
120	3048												1196.3	1345	1493.4	1641.7	1789.7	1937.6	2085.2

Standard	Type of Pipe	Grade	max	max	max	max	max	max	max	max	min	max	max	max	max
EN 10217-1	SAW	P195	0.13	0.35	0.70	0.025	0.020	0.300	0.080	0.300	-	0.30	0.02	0.01	0.04
		P235	0.16	0.35	1.20	0.025	0.020	0.300	0.080	0.300	-	0.30	0.02	0.01	0.04
		P265	0.20	0.40	1.40	0.025	0.020	0.300	0.080	0.300	-	0.30	0.02	0.01	0.04

Standard	Grade	max		max	max	max	max	max	max
EN 10025-2		≤16	16<≤40						
	S235JR	0.19	0.19	-	1.50	0.045	0.045	0.014	0.60
	S235JO	0.19	0.19	-	1.50	0.040	0.040	0.014	0.60
	S235J2	0.19	0.19	-	1.50	0.035	0.035	-	0.60
	S275JR	0.24	0.24	-	1.60	0.045	0.045	0.014	0.60
	S275JO	0.21	0.21	-	1.60	0.040	0.040	0.014	0.60
	S275J2	0.21	0.21	-	1.60	0.035	0.035	-	0.60
	S355JR	0.27	0.27	0.60	1.70	0.045	0.045	0.014	0.60
	S355JO	0.23	0.23	0.60	1.70	0.040	0.040	0.014	0.60
	S355J2	0.23	0.23	0.60	1.70	0.035	0.035	-	0.60
	S355K2	0.23	0.23	0.60	1.70	0.035	0.035	-	0.60

		Temperature	Yield Strength (min.)		Tensile Strength	Impact Test		
Standard	Grade	oC	(MPa)		(MPa)	J		
EN 10025-2			≤16	16<≤40				
	S235JR	20	235	225	360-510	27	27	27
	S235JO	0	235	225	360-510	27	27	27
	S235J2	-20	235	225	360-510	27	27	27
	S275JR	20	275	265	410-560	27	27	27
	S275JO	0	275	265	410-560	27	27	27
	S275J2	-20	275	265	410-560	27	27	27
	S355JR	20	355	345	470-630	27	27	27
	S355JO	0	355	345	470-630	27	27	27
	S355J2	-20	355	345	470-630	27	27	27
	S355K2	-20	355	345	470-630	40	27	27

Steel grade (Steel name)	Mass fraction, based upon heat and product analyses ^a							
	C max. ^b	Mn max. ^b	P		S max.	V max.	Nb max.	Ti max.
			min.	max.				
Seamless pipe								
L175 or A25	0,21	0,60	-	0,030	0,030	-	-	-
L175P or A25P	0,21	0,60	0,045	0,080	0,030	-	-	-
L210 or A	0,22	0,90	-	0,030	0,030	-	-	-
L245 or B	0,28	1,20	-	0,030	0,030	c,d	c,d	d
L290 or X42	0,28	1,30	-	0,030	0,030	d	d	d
L320 or X46	0,28	1,40	-	0,030	0,030	d	d	d
L360 or X52	0,28	1,40	-	0,030	0,030	d	d	d
L390 or X56	0,28	1,40	-	0,030	0,030	d	d	d
L415 or X60	0,28e	1,40e	-	0,030	0,030	f	f	f
L450 or X65	0,28e	1,40e	-	0,030	0,030	f	f	f
L485 or X70	0,28e	1,40e	-	0,030	0,030	f	f	f
Welded pipe								
L175 or A25	0,21	0,60	-	0,030	0,030	-	-	-
L175P or A25P	0,21	0,60	0,045	0,080	0,030	-	-	-
L210 or A	0,22	0,90	-	0,030	0,030	-	-	-
L245 or B	0,26	1,20	-	0,030	0,030	c,d	c,d	d
L290 or X42	0,26	1,30	-	0,030	0,030	d	d	d
L320 or X46	0,26	1,40	-	0,030	0,030	d	d	d
L360 or X52	0,26	1,40	-	0,030	0,030	d	d	d
L390 or X56	0,26	1,40	-	0,030	0,030	d	d	d
L415 or X60	0,26e	1,40e	-	0,030	0,030	f	f	f
L450 or X65	0,26e	1,45e	-	0,030	0,030	f	f	f
L485 or X70	0,26e	1,65e	-	0,030	0,030	f	f	f

Production Specifications

AWWA C 200			
MECHANICAL SPECIFICATIONS			
Steel Grade	Yield Strength min. (MPa)	Tensile Strength min. (MPa)	Elongation (50 mm)% min
ASTM A-570 / A-570 M gr 30	340	205	25
ASTM A-570 / A-570 M gr 33	360	230	23
ASTM A-570 / A-570 M gr 36	365	250	22
ASTM A-570 / A-570 M gr 40	380	275	21
ASTM A-570 / A-570 M gr 45	415	310	19
ASTM A-570 / A-570 M gr 50	450	345	17
ASTM A-570 / A-570 M gr 55	480	380	15
ASTM A-36 / A-36 M	400-550	250	23
ASTM A-283 / A-283 M gr C	380-515	205	25
ASTM A-283 / A-283 M gr D	415-550	230	23

ASTM A-139 Gr.A	48 (330)	30 (205)	35
ASTM A-139 Gr.B	60 (415)	35 (240)	30
ASTM A-139 Gr.C	60 (415)	42 (290)	25
ASTM A-139 Gr.D	60 (415)	46 (315)	23
ASTM A-139 Gr.E	66 (455)	52 (360)	22

ASTM A 252			
MECHANICAL SPECIFICATIONS			
Steel Grade	Yield Strength min. (MPa)	Tensile Strength min. (MPa)	Elongation (50 mm)% min
GRADE 1	345	205	30
GRADE 2	414	240	25
GRADE 3	455	310	20

COATING THICKNESS		
Nominal Diameter (DN)	(mm)	
	Normal coating	Thick coating
DN<100	1.8	2.5
100≤DN<250	2	2.5
250≤DN<500	2.2	3
500≤DN<800	2.5	3.5
800≤DN	3	3.5

Standard Description	Steel Grade	CHEMICAL ANALYSIS (%)				MECHANICAL PROPERTIES		HYDROSTATIC TEST PRESSURE (bar)	MECHANICAL TESTS	NON-DESTRUCTIVE TESTS	TOLERANCES				
		C Max.	Si Max.	Mn Max.	S Max.	Yield Strength (MPa)	Ultimate Tensile Strength (MPa)				DIAMETER		THICKNESS	PIPE ENDS	WEIGHT
											PIPE ENDS	BODY			
ASTMA 252	Gr.1	max. Phosphorus (P) %0,050				345	205	---	Material Tensile	---	±1%	t<%12,5	30o +5 -0 1,6±0,8mm	W>%15	
	Gr.2					414	240		Welding Tensile						
	Gr.3					455	310		Chemical Tensile						

BARE PIPE TESTS			
Test	Region	Frequency	Specifications
Tensile Testing	Main material	1 / lot	ReH, Rm, A ve ReH/Rm
	Weld seam		Rm
Charpy Impact Test	Main material	1 team (3 pieces) / lot	Absorbed energy
	Weld seam	1 team (3 pieces) / lot	Absorbed energy
	HAZ Region	1 team (3 pieces) / lot	Absorbed energy
Guided Bend Test	Weld seam	2 / lot	Welding quality
Macrotest	Weld seam	1 / lot	Weld bead geometry

Standart Description	Steel Grade		CHEMICAL ANALYSIS (%)				MECHANICAL PROPERTIES		HYDROSTATIC TEST	MECHANICAL TESTS	NON- DESTRUCTIVE TESTS	TOLERANCES			
			C Max.	Si Max.	Mn Max.	S Max.	Yield Strength (MPa)	Ultimate Tensile Strength (MPa)	PRESSURE (bar)			DIAMETER	THICKNESS	PIPE ENDS	WEIGHT
												BODY			
API 5L	PSL 2						PSL 2		According To Hydrostatic Test Formula	Welding Tensile and Bending Test Chemical Analysis Fracture Tough- ness Test Drop Weight Tear Test	100% Ultra- sonic Inspect- ion and 200 mm from Pipe Ends shall be Radiographic Inspected	> 36";+6,4 mm,-3,2 mm 20"≤D≤36"; 0,75%-0,25% 2 3/8≤D<20"; ±1%	≤Gr B; ≤2 7/8, +20% -12,5% 2 7/8<D<20"; +15%, -12,5% D≥20"; +17,5%,-12,5%	Pipe ends 30o +5 -0 Root face 1,6±0,8mm	Single length +10%,-3,5% Truck Load -1,75%
	B	0,22	-	1,20	0,025	0,015	241 - 448	414 - 758							
	X42	0,22	-	1,30	0,025	0,015	290 - 496	414 - 758							
	X46	0,22	-	1,40	0,025	0,015	317 - 524	434 - 758							
	X52	0,22	-	1,40	0,025	0,015	359 - 531	455 - 758							
	X56	0,22	-	1,40	0,025	0,015	386 - 544	490 - 758							
	X60	0,22	-	1,40	0,025	0,015	414 - 565	517 - 758							
	X65	0,22	-	1,45	0,025	0,015	448 - 600	531 - 758							
	X70	0,22	-	1,45	0,025	0,015	483 - 621	565 - 758							
EN 10217-1	TR1						TR1		According To Hydrostatic Test Formula k=0,90, max. 70 bar	-Material Tensile -Welded Tensile -Bending Test -Chemical Analysis		D≤219,1mm; ±1% or ±0,5 mm whichever is bigger D>219,1mm; ±0,75% or ±6 mm whichever is smaler	t≤5mm; ±10% or ±0,3 mm whichever is bigger 5<t<40mm; ±8% or ±2 mm whichever is smaler	Pipe ends 30o +5 -0 Root face 1,6±0,8mm	
	P195	0,13	0,35	0,70	0,025	0,020	*t≤16mm; 195 16<t≤40 mm; 185"	320 - 440							
	P235	0,22	-	1,30	0,025	0,020	*t≤16mm; 235 16<t≤40 mm; 225"	360 - 500							
	P265	0,22	-	1,40	0,025	0,020	*t≤16mm; 265 16<t≤40 mm; 255"	410 - 570							





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