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- Misuse of technical information in the content could cause unexpected accidents.

Automotive Steel Leader



HYUNDAI  
**HYSCO**

HYUNDAI HYSCO

**STEEL PIPE**

# HYUNDAI HYSCO



Ulsan Works produces highly value added steel products which has annual capacity of production of 700,000 tonnage. It is the hive of steel pipe industry in Korea, retaining high technology and facilities.

The major products in steel pipe industry - OCTGs and gas pipes - are now being produced and supplied including almost 2,000 types of highly value added products such as industrial boiler tubes, pipes for mechanical and automobile structure. Especially, we are now giving spurs to development of the next generation steel pipe and new technology for reducing automobile weight through researching high technology field like hydro-forming.

After the ground-breaking in Yumpo Bay, Ulsan 1978, it has been leading mill in domestic steel pipe industry.

By acquiring ISO 9001/14001, we are now heading for the quality-first and ecofriendliness management.

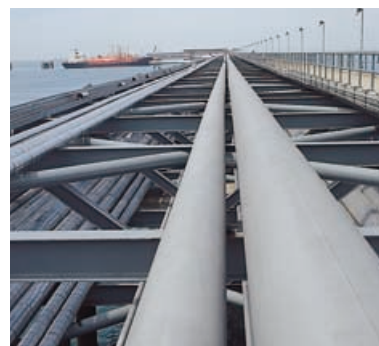
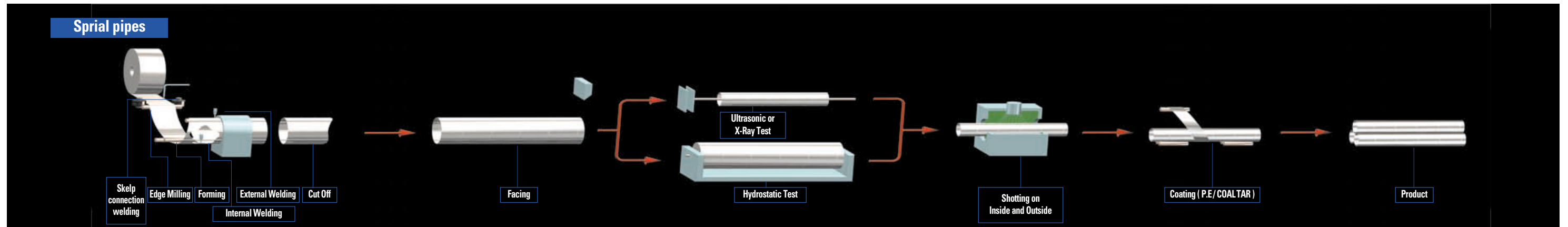
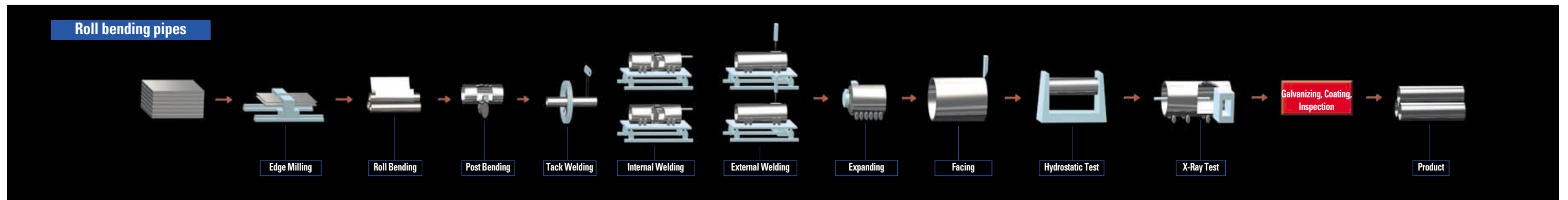
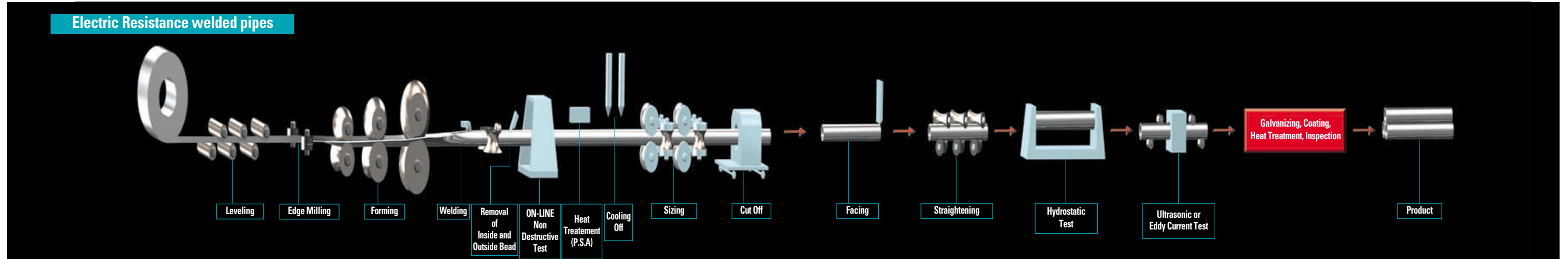
Ulsan Works will try to remain as leading steel plant in the world through developing new technology for welding and modeling, and parts that could reduce weight of automobiles.



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# MAJOR RPRODUCTION USAGE

HYUNDAI HYSCO

Type of pipes		Similar specification				Application
Type	Manufacturing method	Korea	Japan	U.S.A	U.K	
Steel pipes for ordinary piping	ERW	Carbon steel pipes for ordinary piping (KS D 3507/SPP)	Carbon steel pipes for ordinary piping (JIS G 3452/SGP)	ASTM A53	BS 1387	Steel pipes for steam, air, water, oil and gas etc. with relatively low pressure
	ERW	Galvanized steel pipes for water service (KS D 3537/SPPW)	Galvanized steel pipes for water service (JIS G 3442/SGPW)	ASTM A53	BS 1387	Steel pipes for water supply wity 100m or less at water head
	ERW Spiral Roll bending	Coated steel pipes for water works(KS D 3565/STWW) Fittings of coated steel pipes for water works (KS D 3578)	-	AWWA C200, C203	-	Steel pipes for water works
	Spiral Roll bending	Arc welded carbon steel pipes (KS D 3583/SPW)	Arc welded carbon steel pipes (JIS G 3457/STPY)	ASTM A 134, A139 A671, A672	-	Steel pipes for steam, air, water, oil and gas etc. with relatively low pressure
Steel pipes for pressure service	ERW	Carbon steel pipes for pressure service (KS D 3562/SPPS)	Carbon steel pipes for pressure service (JIS G 3454/STPG)	ASTM A53 API 5L	BS 3601	Steel pipes for application at a temperature of 350°C or less
	Roll bending	Arc welded carbon steel pipes (KS D 3583/SPW)	Arc welded carbon steel pipes (JIS G 3457/STPY)	-	-	Piping for steam, water, gas, air of comparatively low working pressure.
Steel pipes for structural purposes	ERW	Carbon steel tubes for machine structural purposes (KS D 3517/STKM)	Carbon steel tubes for machine structural purposes (JIS G 3445/STKM)	ASTM A513	BS 980 BS 1717 BS 1775	Steel pipes for application for mechanical Parts such as machinery, automobiles, bicycles, furniture and fixtures etc.
	ERW Spiral Roll bending	Carbon steel tubes for machine structural purposes (KS D 3566/STK)	Carbon steel tubes for machine structural purposes (JIS G 3444/STK)	ASTM A500	BS 980 BS 1139 BS 4848	Steel pipes for application for structures such as civil works, architecture, steel tower, scaffolding, piles, veranda and fence and post etc.
	ERW	Carbon steel square pipes for general structural purposes(KS D 3568/SPSR)	Carbon steel square pipes for general structural purposes (JIS G 3466/STKR)	ASTM A500	BS 4848	Steel pipes for application to civil works, architecture and other structures
	ERW Spiral Roll bending	Steel pipe piles (KS F 4602)	Steel pipe piles (JIS A 5525/SKK)	ASTM A252	-	Steel pipes for foundation civil works, architectures etc.
	Spiral Roll bending	-	-	Fabrication of structural steel pipe (API 2B)	-	Offshore structure. Piping and main structural members
	Line pipe	ERW Roll bending	-	-	API 5L (GR. A, B, X42, X46, X52 X56, X60, X65, X70, X80)	-
OCTG	ERW	-	-	API 5CT (H40, J55, K55, N80)	-	Steel pipes for development for petroleum and natural gas
Conduits	ERW	Rigid steel conduits (KS C 8401)	Rigid steel conduits (JIS C 8305)	ANSI C80.1 UL6	BS 31	Steel pipes for protection of electric cable at electric distribution lines
Steel tubes for boiler & heat exchanger	ERW	Carbon steel boiler and heat exchanger tubes (KS D 3563/STBH)	Carbon steel boiler and heat exchanger tubes (JIS G 3461/STB)	ASTM A 178, A 214, A 226	BS 3059 BS 3606	Water pipes for boiler, connection pipe, overheat engine, air preheating pipe and heat exchange pipes, condenser
Coated steel pipes	ERW Spiral Roll bending	-	-	-	-	Coated steel pipes for protection of outside surface of steel pipe for underground burial.
Steel tubes for tower structural purposes	ERW Spiral Roll bending	-	-	-	-	High tensile steel pipes applicable to electric transmission tower

KS : Korean standards JIS : Japanese Industrial Standards BS : British Standard API : American Petroleum Institute UL : Underwriters Laboratories  
 AWWA : American Water Works Association ASTM : American Society for Testing and Materials UK : United Kingdom  
 \* Please consult dimension of main pipes produced with market department.

# CERTIFICATE STATUS

HYUNDAI HYSCO

CERTIFICATE	CERTIFICATE NO.	CERTIFICATE NAME	Symbol	SCOPE	License No	Acquired Date	ISSUED BY
ISO	9002	ISO9002	-	MANUFACTURE OF MEPOL PRE-INSULATED PIPES, COATED PIPES, WELDED PIPES AND TUBES	955816	96.11.5 (93.10.18)	LRQA
	14001	ISO14001	-	SITE ACTIVITIES ASSOCIATED WITH THE MANUFACTURE OF STEEL AND COATED PIPES	770166	97.4.30	LRQA
KS	C 8401	Rigid steel conduit	-	THICK RIGID STEEL CONDUITS (GALVANIZED) NOT MORE THAN 104	1838	79.10.29	K.S.A
	D 3507	Carbon steel pipes for ordinary piping	SPP	ORDINARY, GALVANIZED 10A - 600A	1836	79.10.29	K.S.A
	D 3537	Galvanized steel pipes for water service	SPPW	10A - 500A	1837	79.10.29	K.S.A
	D 3562	Carbon steel pipes for pressure service	SPPS	SPPS38, SPPS 42 Sch40 15A - 500A Sch60 15A - 300A Sch80 15A - 200A	2475	79.10.29	K.S.A
	D 3563	Carbon steel pipes for boiler and heat exchanger	STBH	STBH 340 19.0mm - 114.3mm STBH 410 48.6mm - 139.8mm	2207	80.9.12	K.S.A
	D 3565	Coated steel pipes for water works	STWW	STWW 400 NOT MORE THAN 2600(A) NOT MORE THAN 3000(C,L)	2748	82.7.24	K.S.A
	D 3566	Carbon steel tubes for general structural purpose	STK	STK 290, 400, 490, 500 21.7mm - 609.6mm	2749	82.7.24	K.S.A
	D 3563	Carbon steel square pipes for general structural purpose	SPSR	SPSR 400, 490 20 x 20 - 150 x 150mm	2750	82.7.24	K.S.A
	D 3583	Arc welded carbon steel pipes	SPW	SPW400 650A - 2000A	5415	87.8.14	K.S.A
	D 3578	Pipe fittings of coated steel pipes for water service	-	F12, 15, 20 NOT MORE THAN 2400(A) NOT MORE THAN 3000(C,L)	10735	94.2.5	K.S.A
	D 3623	Corrosion resistance welded steel pipe for water service	SPCR	ORDINARY, GALVANIZED 15A - 350A	10883	94.4.9	K.S.A
	D 3631	Carbon steel pipes for fuel gas piping	SPPG	15A - 600A	99-0635	99.5.31	K.S.A
	D 3760	Galvanized steel pipes for vinyl housing	SPVH	15.9mm - 31.8mm	99-0958	99.10.28	K.S.A
	F 4602	Steel pipe piles	SPS	406.4 - 1016.0mm	2950	83.2.3	K.S.A
	M 3362	Polypropylene copolymer pipes	-	CLASS 1, CLASS 2	11728	95.2.28	K.S.A
	D 3626	Coated steel pipes for general water works	STWW	STWW400 C.L(350A - 2500A)	98-0242	98.10.30	K.S.A
D 3627	Pipe fittings of coated steel pipes for general water works	-	F12-C.L(350A - 3000A)	98-0243	98.10.30	K.S.A	
F 4605	Steel sheet piles	SKY	SKY400(500 - 1524mm)	98-0191	98.9.29	K.S.A	
A 5525	Steel pipe piles	SKK	FULL SIZE	KR9433	94.9.13	Administration of economy & Industry	
A 5530	Steel sheet piles	SKY	FULL SIZE	KR9433	99.8.4	Administration of economy & Industry	
C 8305	Rigid steel conduit	-	FULL SIZE	KR8859	88.9.12	Administration of economy & Industry	
G 3444	Carbon steel pipes for general structural purpose	STK	FULL SIZE	KR8419	84.9.25	Administration of economy & Industry	
G 3445	Carbon steel pipes for mechanical structural purpose	STKM	FULL SIZE	KR8419	95.2.6	Administration of economy & Industry	
G 3452	Carbon steel pipes for ordinary piping	SGP	FULL SIZE	KR8521	85.6.17	Administration of economy & Industry	
G 3454	Carbon steel pipes for pressure service	STPG	FULL SIZE	KR8521	85.6.17	Administration of economy & Industry	
G 3457	Arc welded carbon steel pipes	STPY	FULL SIZE	KR8521	90.3.23	Administration of economy & Industry	
G 3461	Carbon steel pipes for boiler and heat exchanger	STB	FULL SIZE	KR8522	85.6.17	Administration of economy & Industry	
G 3466	Carbon steel square pipes for general structural purpose	STKR	FULL SIZE	KR8419	84.9.25	Administration of economy & Industry	
API	5L	Line Pipe	5L	FULL SIZE	5L-0026	81.5.14	American Petroleum Institute
	5CT	Casing & Tubing	5CT	FULL SIZE	5CT-0030	81.5.14	American Petroleum Institute
	2B	Fabricated Structural steel Pipe	2B	FULL SIZE	2B-0050	97.4.21	American Petroleum Institute
Korea Register of Shipping	-	Steel tubes & pipes - Steel pipes for pressure service - Steel pipes for boiler & heat exchanger	-	RST 138-E-C, 142-E-C, 338-E-C, 342-E-C RSTH 33-E-C, 35-E-C, 42-E-C	ULS 00783-ST001	80.4.30	Korea shipping class
Lloyd's register	-	Welded pipes & tubes in austenitic stainless steel	-	MAX 320mm(Outside Diameter), MAX 8mm(Thickness)	MDOO/0735/0006/4	96.10.15	English shipping class
	-	Welded pipes & tubes in carbon and carbon - Manganese steel	-	MAX 610mm(Outside Diameter), MAX 13mm(Thickness)		80.5.1	
Det Norske Veritas	-	WELD PIPES & TUBES(SAW, PAW + TIG + ERW)	-	SAW Max. 2438.4mm x 25t PAW Max. 323.85mm x 7t TIG Max. 323.85mm x 3t ERW Max. 610mm x 18t	AMM - 449	82.8.26(SAW, PAW, TIG) 00.9.19(ERW)	Norway shipping class
Bureau Veritas	-	LONGITUDINALLY WELDED STEEL PIPES	-	ERW : MIN OD19.1mm x 1.4t MAX OD609.4mm x 12.6t SAW(R/B) : MIN ODE58.8mm x 6.0t MAX OD 1066.8mm x 25.0t	SMS II PSN / 5337 1.A0	97.10.15	French shipping class
Germanish Lloyd's	-	LONGITUDINALLY WELDED STEEL PIPES	STPG370	19.1mm - 609.6mm / 1.4mm - 12.6mm	WZ 802HHI	00.1.20	German shipping class
	-		STKR490	20mm - 400mm / 1.2mm - 16mm			
	-		STB340	20mm - 140mm / 1.2mm - 11mm			
	-		STPY400	558.8mm - 1066.8mm / 6.0mm - 25.0mm			
	-		SUS304LP SUS316LTD	MAX. 323.85mm / 0.5mm - 7.5mm			
RINA	-	STEEL TUBES AND PIPES	ERW	MAX. 610mm / max. 18.0mm	00/PM/TO/5256-1	00.04.11	Italian Shipping class
	-		SAW	MAX. 1524mm / max. 25.0mm	00/PM/TO/5256-1	00.04.11	Italian Shipping class
	-		TIG	MAX. 323.9mm / max. 8.0mm	00/PM/TO/5256-1	00.04.11	Italian Shipping class
American Bureau of Shipping	-	Welding Procedures Qualification Test Record	-	GMAW + SAW - Groove Joint Welding	ML 4 - 7	00.12.12	American Shipping class
UL	-	RIGID METAL CONDUIT	-	TYPE "L"(1/2" - 6")	E88167	94.6	Underwriters Laboratories Inc
	-	SPRINKLER	-	1 + 1/4" - 4" (Note, Thread applies to 1 - 2")	EKS217	99.3	
AN	D 3566	CARBON STEEL PIPES FOR ORDINARY	STK500	1, 2, 3, 4, 5, 6M	-	95.1	KOREA OCCUPATIONAL SAFETY & HEALTH AGENCY
SASO	-	V-02 STEEL AND IRON ALLOY PIPES	-	ASTM A53 Gr. B/API 5L Gr. B, ASTM A671/API 5L KS D3583/JIS G3457	R-301201 S2	01.6	SAUDI ARABIAN STANDARDS ORGANIZATION

Specification	KS D 3507 (JIS G 3452)	KS D 3537 (JIS G 3442)	KS D 3565			KS D 3583 (JIS G 3457)	KS D 3562 (JIS G 3454)		KS D 3569 (JIS G 3460)	KS D 3570 (JIS G 3456)					
	SPP (SGP)	SPPW (SGPW)	STWW 290 (300A below)	STWW 370 (300A below)	STWW 400 (350A below)	SPW 400 (STPY 400)	SPPS 38 (STPG 370)	SPPS 42 (STPG 410)	SPLT 39 (STPL 380)	SPHT 38 (STPT 370)	SPHT 42 (STPT 410)				
Name of specification	Carbon steel pipes for ordinary piping	Galvanized steel pipes for water service	Coated steel pipes for water works			Arc welded carbon steel pipes	Carbon steel pipes for pressure services		Steel pipes for low temperature service	Carbon steel pipes for high temperature service					
Chemical composition(%)	<b>C(Max.)</b>	-	-	0.25	0.25	0.25	0.25	0.30	0.25	0.25	0.30				
	<b>Si(Max.)</b>	-	-	-	-	-	0.35	0.35	0.35	0.10 - 0.35	0.10 - 0.35				
	<b>Mn(Max.)</b>	-	-	-	-	-	0.30 - 0.90	0.30 - 1.00	1.35	0.30 - 0.90	0.30 - 1.00				
	<b>P(Max.)</b>	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.035	0.035	0.035				
	<b>S(Max.)</b>	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.035	0.035	0.035				
	<b>Others</b>	-	-	-	-	-	-	-	-	-	-	-			
Mechanical properties	Tensile strength (Min.)	kgf/mm <sup>2</sup>	30	30	30	38	41	41	38	42	39	38	42		
		N/mm <sup>2</sup>	294	294	294	373	402	400	373	472	382	373	412		
	Yield point (Min.)	kgf/mm <sup>2</sup>	-	-	-	22	23	23	22	25	21	22	25		
		N/mm <sup>2</sup>	-	-	-	216	226	225	216	245	206	216	245		
	Elongation (Min.) (%)	No.11 specimen No.12 Specimen	30	30	30	30	-	-	30	25	35	30	25		
	No. 5 specimen	25	25	25	25	18	18	25	20	25	25	20			
Flattening test	H : Distance between Flattening plates(mm) D : Outside diameter of the pipe(mm) t : Wall thickness of the pipe(mm)	H = 2/3D	H = 2/3D	H = 2/3D (Electric resistance welded pipe)			-	Welded part H = 2/3D  Base metal H = 1/3D	$H = \frac{(4+e)t}{e+t/D}$  e = 0.08	$H = \frac{(1+e)t}{e+t/D}$  e = 0.07					
Bending test	Bending angle x Inside radius (D : Outside diameter of the pipe)	90° x 6D (pipes of 50A or below, substitute with flattening test)	90° x 8D (pipes of 50A or below)	-			-	90° x 6D (Pipes of 40A or below, substitute with flattening test)	90° x 6D (Pipes of 50mm or below, substitute with flattening test)	90° x 6D (Pipes of 50mm or below, substitute with flattening test)					
Hydrostatic test	Test pressure (kgf/cm <sup>2</sup> )	25	25	Letter symbol of grade		Test pressure		Schedule No.		Test pressure		Schedule No.		Test pressure	
				STWW 290		25		10		20		10		20	
				STWW 370		35		20		35		20		35	
STWW 400		A 25 B 20		30		50		30		50		30		50	
				60		90		40		60		40		60	
				60		90		60		90		60		90	
				80		120		80		120		80		120	
Non-destructive Test	Ultrasonic test or eddy current test	substitute with hydrostatic test	substitute with hydrostatic test	Substitute with hydrostatic test (Selection of one from ultrasonic test, eddy current test, radiographic test)			substitute with hydrostatic test	substitute with hydrostatic test	substitute with hydrostatic test	substitute with hydrostatic test	substitute with hydrostatic test				
Others	Galvanized pipes (uniformity test 5 times)	• Weight of zinc coating (average 600g/m <sup>2</sup> ) • Uniformity test 6 times	Tensile strength test for welded part (Arc welded steel pipes)			Tensile strength test for welded part	-	Charpy impact test							

Specification	KS D 3517 (JIS G 3445)																							
	STKM 11A	STKM 12A	STKM 12B	STKM 12C	STKM 13A	STKM 13B	STKM 13C	STKM 14A	STKM 14B	STKM 14C	STKM 15A	STKM 15C	STKM 16A	STKM 16C	STKM 17A	STKM 17C	STKM 18A	STKM 18B	STKM 18C	STKM 19A	STKM 19C	STKM 20A		
Name of specification	Carbon steel Tubes for machine structural purposes																							
Chemical composition(%)	<b>C(Max.)</b>	0.12	0.20	0.25			0.30			0.25 - 0.35	0.35 - 0.45	0.45 - 0.55	0.18		0.25		0.25							
	<b>Si(Max.)</b>	0.35	0.35	0.35			0.35			0.35	0.40	0.40	0.55		0.55		0.55							
	<b>Mn(Max.)</b>	0.60	0.60	0.30 - 0.90			0.30 - 1.00			0.30 - 1.00	0.40 - 1.00	0.40 - 1.00	1.50		1.50		1.60							
	<b>P(Max.)</b>	0.040	0.040	0.040			0.040			0.040	0.040	0.040	0.040		0.040		0.040							
	<b>S(Max.)</b>	0.040	0.040	0.040			0.040			0.040	0.040	0.040	0.040		0.040		0.040							
	<b>Others</b>	-	-	-			-			-	-	-	-		-		-							
Mechanical properties	Tensile strength (Min.)	kgf/mm <sup>2</sup>	30	35	40	48	38	45	52	42	51	56	48	59	52	63	56	66	45	50	52	50	56	55
		N/mm <sup>2</sup>	290	340	390	470	370	440	510	410	500	550	470	580	510	620	550	650	440	490	510	490	550	540
	Yield point (Min.)	kgf/mm <sup>2</sup>	-	18	28	36	22	31	39	25	36	42	28	44	33	47	35	49	28	32	39	32	42	40
		N/mm <sup>2</sup>	-	175	275	356	215	305	380	245	355	410	275	430	325	460	345	480	275	315	380	315	410	390
Elongation (Min.) (%)	No.11 specimen No.12 Specimen	35	35	25	20	30	20	15	25	15	15	22	12	20	12	20	10	25	23	15	23	15	23	
	No. 5 specimen	30	30	20	15	25	15	10	20	10	10	17	7	15	7	15	5	20	18	10	18	10	18	
Flattening test	H : Distance between Flattening plates(mm) D : Outside diameter of the pipe(mm) t : Wall thickness of the pipe(mm)	H = 1/2D	H = 2/3D	H = 2/3D	-	H = 2/3D	H = 3/4D	-	H = 3/4D	H = 7/8D	-	H = 3/4D	-	H = 7/8D	-	H = 7/8D	-	H = 7/8D	H = 7/8D	H = 7/8D	-	H = 7/8D	-	H = 7/8D
Bending test	Bending angle X Inside radius (D : Outside diameter of the pipe) pipes of 50mm or below (Outside Diameter)	180° X 4D	90° X 6D	90° X 6D	-	90° X 6D	90° X 6D	-	90° X 6D	90° X 8D	-	90° X 6D	-	90° X 8D	-	90° X 8D	-	90° X 6D	90° X 8D	-	90° X 6D	-	90° X 6D	
Hydrostatic test	Hydrostatic test pressure (kgf/cm <sup>2</sup> )	By agreement																						
Non-destructive Test	Ultrasonic test or eddy current test	By agreement																						
Others																								

Specification	KS D 3566 (JIS G 3444)					KS D 3568 (JIS G 3466)		KS F 4602 (JIS A 5525)		KS D 3780 (JIS G 3474)			
	STK 290 (STK 290)	STK 400 (STK 400)	STK 500 (STK 500)	STK 490 (STK 490)	STK 540 (STK 540)	SPSR 400 (STKR 400)	SPSR 490 (STKR 490)	SPS 400 (SKK 400)	SPS 490 (SKK 490)	STKT 540 (STKT 540)	STKT 590 (STKT 590)		
<b>Name of specification</b>	Carbon steel tubes for general structural purposes					Carbon steel square pipes for general structural purposes		Steel pipe piles		High tensile strength steel for tower structural purposes			
<b>Chemical composition(%)</b>	C(Max.)	0.25	0.24	0.18	0.23	0.25	0.18	0.25	0.18	0.23	0.12		
	Si(Max.)	-	-	0.35	0.55	-	0.55	-	0.55	0.55	0.40		
	Mn(Max.)	-	-	0.30-1.30	1.50	-	1.50	-	1.50	1.50	2.00		
	P(Max.)	0.050	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.030		
	S(Max.)	0.050	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.030		
	Others	-	-	-	-	-	-	-	-	-	0.15 (Nb+V)		
<b>Mechanical properties</b>	Tensile strength (Min.)	kgf/mm <sup>2</sup>	30	41	51	50	55	41	50	41	50	55	60 - 70
		N/mm <sup>2</sup>	290	400	500	490	540	400	490	400	490	540	590 - 740
	Yield point (Min.)	kgf/mm <sup>2</sup>	-	24	36	32	40	25	33	24	32	40	45
		N/mm <sup>2</sup>	-	235	356	315	390	245	325	235	315	390	440
Elongation (Min.) (%)	No.11 specimen No.12 Specimen	30	23	15	23	20	-	-	23	23	20	20	
	No. 5 specimen	25	18	10	18	16	23	23	18	18	16	16	
<b>Flattening test</b>	H : Distance between Flattening plates(mm) D : Outside diameter of the pipe(mm) t : Wall thickness of the pipe(mm)	H = 2/3D	H = 2/3D	H = 7/8D	H = 7/8D	H = 7/8D	-	H = 2/3D	H = 7/8D	H = 7/8D	H = 3/4D	-	-
<b>Bending test</b>	Bending angle X Inside radius (D : Outside diameter of the pipe)	90° × 6D	90° × 6D	90° × 8D	90° × 6D	90° × 6D	-	-	-	-	-	-	-
<b>Hydrostatic test</b>	Hydrostatic test pressure (kgf/cm <sup>2</sup> )	By agreement					-	-	By agreement		By agreement		-
<b>Non-destructive Test</b>	Ultrasonic test or eddy current test or radiographic test	By agreement					-	-	By agreement		By agreement		-
<b>Others</b>		Tensile strength test for welded part (Arc welded steel pipes 350mm or above)					Bending test for welded part at the request of client		Tensile strength test for welded part (Arc welded steel pipes)		Tensile strength test for welded part (Arc welded steel pipes 350mm or above) Impact test(STKT590) 0.40% or less for carbon unit quantity		-

Specification	API 5L (PSL I / PSL II)													API 5CT			
	A25		A	B	X42	X46	X52	X56	X60	X65	X70	X80	H40	J55	K55	N80	
	Class 1	Class 2															
<b>Application</b>	Line pipe													Casing Tubing			
<b>Chemical composition(%)</b>	C(Max.)	0.21	0.21	0.22	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	-	-	-	-
	Si(Max.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mn(Max.)	0.60	0.60	0.90	1.20	1.30	1.40	1.40	1.40	1.40	1.40	1.45	1.65	-	-	-	-
	P(Max.)	0.030	0.080	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030
	S(Max.)	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030
	Others	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Mechanical properties</b>	Tensile strength (Min.)	PSI	45,000	48,000	60,000	60,000	63,000	66,000	71,000	75,000	77,000	82,000	-	60000	75000	95000	10000
		MPa	310	331	414	414	434	455	490	517	531	565	-	414	517	655	689
	kgf/mm <sup>2</sup>	31.6	33.7	42.2	42.2	44.3	46.4	49.9	52.7	54.1	57.7	-	42.2	52.7	66.8	70.3	
Yield point (Min.)	PSI	25,000	30,000	35,000	42,000	46,000	52,000	56,000	60,000	65,000	70,000	-	40000-80000	55000-80000	80000-110000	-	
	MPa	172	207	241	290	317	359	386	414	448	483	-	276-552	379-552	552-758	-	
	kgf/mm <sup>2</sup>	17.6	21.6	24.6	29.5	32.3	36.6	39.4	42.2	45.7	49.2	-	28.1-56.2	38.7-56.2	56.2-77.3	-	
<b>Elongation (Min.) (%)</b>		<ul style="list-style-type: none"> <li>U.S. Customary Equation <math>e = 625,000(A^2/U^{0.8})</math></li> <li>Metric Equation <math>e = 1.944(A^2/U^{0.8})</math></li> </ul> e : Minimum elongation in 2 in. (50.80mm) in percent rounded to nearest 1/2 percent A : Cross-sectional area of the tensile test specimen in sq. in. (mm) U : Specified minimum ultimate tensile strength. PSI (MPa)															
<b>Flattening</b>	H : Distance between Flattening plates(mm) D : Outside diameter of the pipe(mm) t : Wall thickness of the pipe(mm)	Welded part H = 3/4D base metal H = 0.6D	<ul style="list-style-type: none"> <li>Weld ductility test</li> <li>Flattening test Welded part H = 2/3D Base metal H = 1/3D</li> </ul> $H = \frac{0.07t}{0.07+3t/D}$ (Grades less than x 52) $H = \frac{3.05t}{0.05+3t/D}$ (Grades x 52 or higher)														
<b>Bending test</b>	Bending angle X Inside radius (D : Outside diameter of the pipe)	90° × 12D (Nominal size 2 or below)	$D/t \geq 16$ $H = 0.50$ $3.93 \leq D/t < 16$ $H = D(0.98 - 0.0206D/t)$ $D/t < 16$ $H = D(0.83 - 0.0206D/t)$ $D/t < 3.93$ $H = D(1.104 - 0.0518D/t)$														
<b>Hydrostatic test</b>	P : Test pressure, PSI (MPa) S : Fiber stress, PSI (MPa) t : Wall thickness, in. (mm) D : Outside diameter, in. (mm)	U.S. Customary Formula		Grade		Size Designation		Percent of specified minimum yield strength(%)		P = $\frac{2St}{D}$		P = $\frac{2000St}{D}$		P = 2st/D		F factor	
				A25	5 7/8	60	-	STD		ALT				smaller than 10 3/4		10 3/4 and larger	All sizes
				A	2 3/4 over	60	75							H40	0.8	0.6	0.8
				B	2 3/4 over	60	75							J55	0.8	0.6	0.8
				X42-X80	5 7/8 below	60	75							K55	0.8	0.6	0.8
					5 7/8 - 8 7/8	75	75							N80	0.8	0.8	-
					8 7/8 - 20	85	85										
					20 over	90	90										
<b>NDT (Non-Destructive Test)</b>		Electric resistance welded pipe : Ultrasonic Test or Electromagnetic Test(Eddy Current Test) submerged-arc weld pipe : Radiographic test															
<b>Others</b>		Residual Magnetism Measurement															

**SPECIFICATIONS**

Specification	ASTM A53		ASTM A500				ASTM A513										
	A	B	A		B		MT 1010	MT 1015	MTX 1015	MT 1020	MTX 1020	1025	1026	1030	1035	4130	8630
<b>Classification</b>	Ordinary piping		General structural purposes				Machine structural purposes										
<b>Application</b>	Ordinary piping		General structural purposes				Machine structural purposes										
<b>C(Max.)</b>	0.25	0.30	Heat 0.26	Product 0.30	Heat 0.26	Product 0.30	0.05 - 0.15	0.10 - 0.20	0.10 - 0.20	0.15 - 0.25	0.15 - 0.25	0.22 - 0.28	0.22 - 0.28	0.27 - 0.34	0.31 - 0.38	0.28 - 0.33	0.28 - 0.33
<b>Si(Max.)</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.15 - 0.35	0.15 - 0.35
<b>Mn(Max.)</b>	0.95	1.20	-	-	-	-	0.30 - 0.60	0.30 - 0.60	0.60 - 0.90	0.30 - 0.60	0.70 - 1.00	0.30 - 0.60	0.60 - 0.90	0.60 - 0.90	0.60 - 0.90	0.40 - 0.60	0.70 - 0.90
<b>P(Max.)</b>	0.05	0.05	0.035	0.045	0.035	0.045	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
<b>S(Max.)</b>	0.045	0.045	0.035	0.045	0.035	0.045	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.040	0.040
<b>Others</b>	-	-	Cu 0.20 (Min.)	Cu 0.18 (Min.)	Cu 0.20 (Min.)	Cu 0.18 (Min.)	-	-	-	-	-	-	-	-	-	Cr 0.80-1.10 Mo 0.15-0.25	Cr 0.40-0.60 Mo 0.15-0.25 Ni 0.40-0.70
<b>Tensile strength (Min.)</b>	<b>PSI</b>	48000	6000	R 45000	S 45000	R 58000	S 58000	Type	Grade	Tensile strength Min. (PSI)	Yield point Min. (PSI)	Elongation Min(%)					
	<b>MPa</b>	330	415	310	310	400	400										
<b>kgf/mm<sup>2</sup></b>		33.8	42.2	31.6	31.6	40.8	40.8										
<b>Yield point (Min.)</b>	<b>PSI</b>	30000	35000	33000	39000	42000	46000	Normalized									
	<b>MPa</b>	205	240	228	269	290	317										
<b>kgf/mm<sup>2</sup></b>		21.1	24.6	23.3	27.4	29.6	32.3										
<b>Elongation (Min.)</b>		e = 625,000 A <sup>0.27</sup> /U <sup>0.93</sup>		25 (56t + 17.5)		23 (61t + 12)											
<b>H : Distance between Flattening plates(mm)</b> <b>H' : Inside distance between flattening plates(mm)</b> <b>D : Outside diameter of the pipe(mm)</b> <b>D' : Inside diameter of the pipe(mm)</b> <b>t : Wall thickness of the pipe(mm)</b>		NPS2 over Weld H = 2/3D Base metal H = 1/3D		Weld H = 2/3D Base metal H = 1/3D Soundness Test H = Contact Welded part is located at 90 degree		Welded part H = 2/3D Base metal H = 1/3D Welded part is located at 90 degree											
		Welded part is located at 90 degree															
<b>Bending angle X Inside radius (D : Outside diameter of the pipe)</b>		NPS2 below 90° x 12D close coiling 180° x 8D															
<b>P : Test pressure (PSI, MPa)</b> <b>D : Outside diameter(mm)</b> <b>t : Thickness(mm)</b>		P = $\frac{2St}{D}$				P = $\frac{2St}{D}$		s = allowable fiber stress of 14000PSI or 96.5MPa									
<b>NDT (Non-Destructive Test)</b>		Ultrasonic Test or Eddy current test				Eddy - Current Test or Ultrasonic Test or Flux leakage Test											
<b>Others</b>		Weight of zinc coating Average : Min. 550g/m <sup>2</sup> Individual : Min. 490g/m <sup>2</sup>				Flaring Test ID' = 1.15D' (60° tool) D' : Inside diameter ID : Enlarged inside diameter											

Specification	ASTM A589					BS 1387	BS 3601			BS 3602		BS 1775			
	TYPE 1		TYPE 2	TYPE 3	TYPE 4	(L)Light (M)Medium (H)Heavy	ERW 320	ERW 360	ERW 430	ERW 360	ERW 410	ERW 11	ERW 16	ERW 20	ERW 23
<b>Classification</b>	Drive Pipe (Grade A)	Drive Pipe (Grade B)	Water-Well Beamed and Drifted Pipe (Grade A)	Driven Well Pipe (Grade A)	Water-Well Casing Pipe (Grade A)	Ordinary piping	Pressure services			High-pressure services		Machine structural purposes, General structural purposes			
<b>Application</b>	Drive Pipe (Grade A)	Drive Pipe (Grade B)	Water-Well Beamed and Drifted Pipe (Grade A)	Driven Well Pipe (Grade A)	Water-Well Casing Pipe (Grade A)	Ordinary piping	Pressure services			High-pressure services		Machine structural purposes, General structural purposes			
<b>C(Max.)</b>	-	-	-	-	-	0.20	0.16	0.17	0.21	0.17	0.21	-	-	-	-
<b>Si(Max.)</b>	-	-	-	-	-	-	-	0.35	0.35	0.35	0.35	-	-	-	-
<b>Mn(Max.)</b>	-	-	-	-	-	1.20	0.30-0.70	0.40-0.80	0.40-1.20	0.40-0.80	0.40-1.20	-	-	-	-
<b>P(Max.)</b>	0.050	0.050	0.050	0.050	0.050	0.045	0.040	0.040	0.040	0.045	0.045	0.060	0.060	0.060	0.060
<b>S(Max.)</b>	0.060	0.060	0.060	0.060	0.060	0.045	0.040	0.040	0.040	0.045	0.045	0.060	0.060	0.060	0.060
<b>Others</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Tensile strength (Min.)</b>	<b>PSI</b>	48000	60000	48000		-	-	-	-	-	-	-	-	-	-
	<b>MPa</b>	331	413	331		320-460	320-460	360-500	430-570	360-500	410-550	309	386	463	494
<b>kgf/mm<sup>2</sup></b>	33.8	42.1	33.8		32.7-46.9	32.7-46.9	36.7-51.0	43.9-58.2	36.7-51.0	41.8-56.1	31.5	39.4	47.2	50.4	
<b>Yield point (Min.)</b>	<b>PSI</b>	30000	35000	30000		-	-	-	-	-	-	-	-	-	-
	<b>MPa</b>	207	241	207		195	195	235	275	215	245	170	247	309	355
<b>kgf/mm<sup>2</sup></b>	21.1	24.6	21.1		19.9	19.9	24.0	28.1	21.9	25.0	17.3	25.2	31.5	36.2	
<b>Elongation(Min.)</b>	e = 625,000(A <sup>0.27</sup> /U <sup>0.93</sup> )					20	25	25	22	24	22	600(TS/700(TS)) TS : Ton/in <sup>2</sup> , Kgf/mm <sup>2</sup>			
<b>H : Distance between Flattening plates</b> <b>H' : Inside distance between flattening plates</b> <b>D : Outside diameter of the pipe</b> <b>D' : Inside diameter of the pipe</b> <b>t : Wall thickness of the pipe</b>		DN Over 50 Welded part H = 0.75D Base metal H = 0.60D Welded part is located at 90 degree		H = $\frac{(1+e)t}{e+t/D}$		Class	Constant		H = $\frac{(1+e)t}{e+t/D}$	H' = 3t or H' = 1/2D' whichever is the smaller	H' = 6t or H' = 3/4D' whichever is the smaller	H' = 8t or H' = 7/8D' whichever is the smaller	H' = 6t or H' = 3/4D' whichever is the smaller		
					Welded part		Base metal	e = 0.10						e = 0.08	
<b>Bending angle X Inside radius (D : Outside diameter, t : Wall thickness)</b>		DN 50 below Black pipes 180° x 6D Galvanized pipes 90° x 8D								Outside diameter of bar is 4t					
<b>P : Test pressure (bar)</b> <b>S : Fiber stress, PSI(MPa)</b> <b>D : Outside diameter(mm)</b> <b>t : Thickness(mm)</b>		Prescribed according to dimension and grade		51 (50 bar)			P = $\frac{20St}{D}$ (bar) S : 80% of the specified minimum yield strength			P = $\frac{20St}{D}$ (bar) S : 80% of the specified minimum yield strength Max : 143Kgf/cm <sup>2</sup> (140bar)					
<b>NDT (Non-Destructive Test)</b>				Eddy Current Test(substitute with hydrostatic test)			Eddy Current Test (Applied to pipes with Outside diameter of 180mm or less as substitution for hydrostatic test)			Ultrasonic Test					
<b>Others</b>				Bore Test(hot-dip zinc coated tubes)						The Charpy V-notch Impact test		Drift Expanding Test 1D = 1.125D'    1D = 1.10D'    1D = 1.075D'    1D = 1.10D'			



Specification	ASTM A135		ASTM A178			ASTM A252				
	A	B	A	C	D	A	B	C		
<b>Classification</b>	Sprinkler		Boiler & Heat exchanger			Steel Pipe Piles				
<b>Application</b>	Sprinkler		Boiler & Heat exchanger			Steel Pipe Piles				
<b>Chemical composition(%)</b>	<b>C(Max.)</b>	0.25	0.30	0.60 - 0.18	0.35	0.27	-	-	-	
	<b>Si(Max.)</b>	-	-	-	-	0.10	-	-	-	
	<b>Mn(Max.)</b>	0.95	1.20	0.27 - 0.63	0.80	1.00 - 1.50	-	-	-	
	<b>P(Max.)</b>	0.035	0.035	0.035	0.035	0.030	-	-	-	
	<b>S(Max.)</b>	0.035	0.035	0.035	0.035	0.015	0.050	0.050	0.050	
	<b>Others</b>	-	-	-	-	-	-	-	-	
<b>Mechanical properties</b>	<b>Tensile strength (Min.)</b>	<b>PSI</b>	48000	60000	47000	60000	70000	50000	60000	66000
		<b>MPa</b>	331	414	325	415	485	345	414	455
		<b>kgf/mm<sup>2</sup></b>	33.8	42.2	33.1	42.2	49.3	35.2	42.2	46.5
	<b>Yield point (Min.)</b>	<b>PSI</b>	30000	35000	26000	37000	40000	30000	35000	45000
		<b>MPa</b>	207	241	180	255	275	205	240	310
		<b>kgf/mm<sup>2</sup></b>	21.1	26.7	18.3	26.1	28.2	21.1	24.7	31.7
<b>Elongation(min.)</b>	E = 56t+17.50	E = 48t+15.00	35	30 (e = 48t+15.0)	30 (e = 48t+15.0)	30 (e = 48t+15.0)	25 (e = 40t+12.5)	20 (e = 32t+10.0)		
<b>Flattening test</b>	<b>H : Distance between Flattening plates</b> <b>H' : Inside distance between flattening plates</b> <b>D : Outside diameter of the pipe</b> <b>D' : Inside diameter of the pipe</b> <b>t : Wall thickness of the pipe</b>	0°, 90°	0°, 90°	TEST	TEST	TEST	-	-	-	
	<b>Bending angle X Inside radius</b> <b>(D : Outside diameter</b> <b>t : Wall thickness)</b>	-	-	-	-	-	-	-	-	
<b>Hydrostatic test</b>	<b>P : Test pressure</b> <b>S : Fiber stress, PSI (MPa)</b> <b>D : Outside diameter(mm)</b> <b>t : thickness(mm)</b>	P = 2St/D	P = 2St/D	-	-	-	-	-	-	
<b>NDT (Non-Destructive Test)</b>	Eddy Current Test & Ultrasonic Test (Substitute with Hydrostatic Test)		UT or ECT	UT or ECT	UT or ECT	-	-	-	-	
<b>Others</b>	-	-	Flange Test, Crush Test, Reverse flattening Test	Flange Test, Reverse flattening Test	Flange Test, Reverse flattening Test	-	-	-	-	

Specification	ASTM A249					
	TP304	TP304L	TP316	TP316L		
<b>Classification</b>	Boiler, Superheater, Heat Exchanger & Condenser Tubes					
<b>Application</b>	Boiler, Superheater, Heat Exchanger & Condenser Tubes					
<b>Chemical composition(%)</b>	<b>C(Max.)</b>	0.08	0.035	0.08	0.035	
	<b>Si(Max.)</b>	0.75	0.75	0.75	0.75	
	<b>Mn(Max.)</b>	2.0	2.0	2.0	2.0	
	<b>P(Max.)</b>	0.04	0.04	0.04	0.04	
	<b>S(Max.)</b>	0.03	0.03	0.03	0.03	
	<b>Others</b>	Ni, Cr	Ni, Cr	Ni, Cr, Mo	Ni, Cr, Mo	
<b>Mechanical properties</b>	<b>Tensile strength (Min.)</b>	<b>PSI</b>	75000	70000	75000	70000
		<b>MPa</b>	515	485	515	485
		<b>kgf/mm<sup>2</sup></b>	52.8	49.3	52.8	49.3
	<b>Yield point (Min.)</b>	<b>PSI</b>	30000	25000	30000	25000
		<b>MPa</b>	205	170	205	170
		<b>kgf/mm<sup>2</sup></b>	21.1	17.6	21.1	17.6
<b>Elongation(min.)</b>	35	35	35	35		
<b>Flattening test</b>	<b>H : Distance between Flattening plates</b> <b>H' : Inside distance between flattening plates</b> <b>D : Outside diameter of the pipe</b> <b>D' : Inside diameter of the pipe</b> <b>t : Wall thickness of the pipe</b>	$H = \frac{(1+e)t}{e+t/D}$ e : 0.07(C : 0.19% over)				
	<b>Bending angle X Inside radius</b> <b>(D : Outside diameter</b> <b>t : Wall thickness)</b>	-				
<b>Hydrostatic test</b>	<b>P : Test pressure</b> <b>S : Fiber stress, PSI (MPa)</b> <b>D : Outside diameter(mm)</b> <b>t : thickness(mm)</b>	-				
<b>NDT (Non-Destructive Test)</b>	Eddy Current Test (Substitute with Hydrostatic Test)					
<b>Others</b>	Flange Test, Reverse Bend Test, Hardness Test					

Specification		ASTM A671							
		CA55	CB60	CB65	CB70	CC60	CC65	CC70	
Classification									
Application		-							
Chemical composition(%)	C(Max.)	0.28	0.24	0.28	0.31	0.21	0.24	0.27	
	Si(Max.)	-	0.15 ~ 0.40	0.15 ~ 0.40	0.15 ~ 0.40	0.15 ~ 0.40	0.15 ~ 0.40	0.15 ~ 0.40	
	Mn(Max.)	0.90	0.90	0.90	1.20	0.60 ~ 0.90	0.85 ~ 1.20	0.85 ~ 1.20	
	P(Max.)	0.035	0.035	0.035	0.035	0.035	0.035	0.035	
	S(Max.)	0.04	0.035	0.035	0.035	0.035	0.035	0.035	
	Others	-	-	-	-	-	-	-	
Mechanical properties	Tensile strength (min.)	PSI	-	-	-	-	-	-	
		MPa	380 ~ 515	415 ~ 550	450 ~ 585	485 ~ 620	415 ~ 550	450 ~ 585	485 ~ 620
		kgf/mm <sup>2</sup>	33.8 ~ 52.6	42.4 ~ 56.1	45.9 ~ 59.7	45.9 ~ 63.3	42.4 ~ 56.1	45.9 ~ 59.7	49.5 ~ 63.3
	Yield point (min.)	PSI	-	-	-	-	-	-	-
		MPa	205	220	240	260	220	240	260
		kgf/mm <sup>2</sup>	21.0	22.5	24.5	26.6	22.5	24.5	26.6
	Elongation(min.)	27	25	23	21	25	23	21	
Flattening test		-	-	-	-	-	-	-	
Bending test		-	-	-	-	-	-	-	
Hydrostatic test	Class 10		-		P = 2St/D				
	Class 11		-						
	Class 12		TEST						
	Class 13		TEST						
	Class 20		-						
	Class 21		-						
	Class 22		TEST						
	Class 23		TEST						
NDT (Non-Destructive Test)	Class 10		-						
	Class 11		TEST(RT)						
	Class 12		TEST(RT)						
	Class 13		-						
	Class 20		-						
	Class 21		TEST(RT)						
	Class 22		TEST(RT)						
	Class 23		-						
Others		-							

Specification		ASTM A672											
		A45	A50	A55	B55	B60	B65	B70	C55	C60	C65	C70	
Classification													
Application		-											
Chemical composition(%)	C(Max.)	0.17	0.22	0.28	0.20	0.24	0.28	0.31	0.18	0.21	0.24	0.27	
	Si(Max.)	-	-	-	0.15 ~ 0.40	0.15 ~ 0.40	0.15 ~ 0.40	0.15 ~ 0.40	0.15 ~ 0.40	0.15 ~ 0.40	0.15 ~ 0.40	0.15 ~ 0.40	
	Mn(Max.)	0.90	0.90	0.90	0.90	0.90	0.90	1.20	0.60 ~ 0.90	0.60 ~ 0.90	0.85 ~ 1.20	0.85 ~ 1.20	
	P(Max.)	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	
	S(Max.)	0.04	0.04	0.04	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	
	Others	-	-	-	-	-	-	-	-	-	-	-	
Mechanical properties	Tensile strength (min.)	PSI	-	-	-	-	-	-	-	-	-	-	
		MPa	315 ~ 450	345 ~ 485	380 ~ 515	380 ~ 515	415 ~ 550	450 ~ 585	485 ~ 620	380 ~ 515	415 ~ 550	450 ~ 585	485 ~ 620
		kgf/mm <sup>2</sup>	32.2 ~ 45.9	35.2 ~ 49.5	38.8 ~ 52.6	38.8 ~ 52.6	42.4 ~ 56.1	45.9 ~ 59.7	49.5 ~ 63.3	38.8 ~ 52.6	42.2 ~ 56.1	45.9 ~ 59.7	49.5 ~ 63.3
	Yield point (min.)	PSI	-	-	-	-	-	-	-	-	-	-	
		MPa	165	185	205	205	220	240	260	205	220	240	260
		kgf/mm <sup>2</sup>	16.9	18.9	21.0	21.0	22.5	24.5	26.6	21.0	22.5	24.6	26.6
	Elongation(min.)	30	28	27	27	25	23	21	27	25	23	21	
Flattening test		-											
Bending test		-											
Hydrostatic test	Class 10		-		P = 2St/D								
	Class 11		-										
	Class 12		TEST										
	Class 13		TEST										
	Class 20		-										
	Class 21		-										
	Class 22		TEST										
	Class 23		TEST										
NDT (Non-Destructive Test)	Class 10		-										
	Class 11		TEST(RT)										
	Class 12		TEST(RT)										
	Class 13		-										
	Class 20		-										
	Class 21		TEST(RT)										
	Class 22		TEST(RT)										
	Class 23		-										
Others		-											

Carbon steel pipes for ordinary piping KS D 3507 SPP(JIS G 3452 SGP)

Nominal diameter		Outside diameter mm	tolerances on outside diameter		Wall thickness mm	Tolerances on wall thickness	Unit weight excluding socket kg/m
A	B		Taper threaded pipe	Others			
10	3/8	17.3	± 0.5mm(± 0.5mm)		2.35(2.3)	+Not specified -12.5%	0.866(0.851)
15	1/2	21.7	± 0.5mm(± 0.5mm)		2.65(2.8)		1.25(1.31)
20	3/4	27.2	± 0.5mm(± 0.5mm)		2.65(2.8)		1.60(1.68)
25	1	34.0	± 0.5mm(± 0.5mm)		3.25(3.2)		2.45(2.43)
32	1 1/4	42.7	± 0.5mm(± 0.5mm)		3.25(3.5)		3.16(3.38)
40	1 1/2	48.6	± 0.5mm(± 0.5mm)		3.25(3.5)		3.63(3.89)
50	2	60.5	± 0.5mm(± 0.5mm)	± 1%(± 1%)	3.65(3.8)		5.12(5.31)
65	2 1/2	76.3	± 0.7mm(± 0.7mm)	± 1%(± 1%)	3.65(4.2)		6.34(7.47)
80	3	89.1	± 0.8mm(± 0.8mm)	± 1%(± 1%)	4.05(4.2)		8.49(8.79)
90	3 1/2	101.6	± 0.8mm(± 0.8mm)	± 1%(± 1%)	4.05(4.2)		9.74(10.1)
100	4	114.3	± 0.8mm(± 0.8mm)	± 1%(± 1%)	4.5(4.5)		12.2(12.2)
125	5	139.8	± 0.8mm(± 0.8mm)	± 1%(± 1%)	4.85(4.5)		16.1(15.0)
150	6	165.2	± 0.8mm(± 0.8mm)	± 1%(± 1.6mm)	4.85(5.0)		19.2(19.8)
175	7	190.7	± 0.9mm(± 0.9mm)	± 1%(± 1.6mm)	5.3(5.3)		24.2(24.2)
200	8	216.3	± 1.0mm(± 1.0mm)	± 1%(± 0.8%)	5.85(5.8)		30.4(30.1)
225	9	241.8	± 1.2mm(± 1.2mm)	± 1%(± 0.8%)	6.2(6.2)		36.0(36.0)
250	10	267.4	± 1.3mm(± 1.3mm)	± 1%(± 0.8%)	6.40(6.6)		41.2(42.4)
300	12	318.5	± 1.5mm(± 1.5mm)	± 1%(± 0.8%)	7.00(6.9)		53.8(53.0)
350	14	355.6	-(-)	± 1%(± 0.8%)	7.60(7.9)		65.2(67.7)
400	16	406.4	-(-)	± 1%(± 0.8%)	7.9(7.9)		77.6(77.6)
450	18	457.2	-(-)	± 1%(± 0.8%)	7.9(7.9)	87.5(87.5)	
500	20	508.0	-(-)	± 1%(± 0.8%)	7.9(7.9)	97.4(97.4)	
550	22	558.8	-	± 1%	7.9	107	
600	24	609.6	-	± 1%	7.9	117	

Arc welded carbon steel pipes KS D 3583 SPW400(JIS G 3457 STPY400)

(unit : kg/m)

Nominal diameter		Wall thickness (mm) Outside diameter(mm)	6.0	6.4	7.1	7.9	8.7	9.5	10.3	11.1	11.9	12.7	13.1	15.1	15.9
A	B		6.0	6.4	7.1	7.9	8.7	9.5	10.3	11.1	11.9	12.7	13.1	15.1	15.9
650	26	660.4	96.8	103	114	127	140	152	165	178	190	203			
700	28	711.2	104	111	123	137	151	164	178	192	205	219			
750	30	762.0		119	132	147	162	176	191	206	220	235			
800	32	812.8		127	141	157	173	188	204	219	235	251	258	297	312
850	34	863.6				167	183	200	217	233	250	266	275	316	332
900	36	914.4				177	194	212	230	247	265	282	291	335	352
1000	40	1016.0				196	216	236	255	275	295	314	324	373	392
1100	44	1117.6						260	281	303	324	346	357	411	432
1200	48	1219.2						283	307	331	354	378	390	448	472
1350	54	1371.6									399	426	439	505	532
1500	60	1524.0									444	473	488	562	591
1600	64	1625.6											521	600	631
1800	72	1828.8											587	675	711
2000	80	2032.0												751	791

Coated steel pipes for water works KS D 3565 STWW

Nominal diameter	Outside diameter	STWW 40					
		Nominal wall thickness					
		A			B		
A	mm	Wall thickness mm	Weight kg/m	Test pressure kgf/cm <sup>2</sup>	Wall thickness mm	Weight kg/m	Test pressure kgf/cm <sup>2</sup>
350	355.6	6.0	51.7	25	-	-	-
400	406.4	6.0	59.2	25	-	-	-
450	457.2	6.0	66.8	25	-	-	-
500	508.0	6.0	74.3	25	-	-	-
600	609.6	6.0	89.3	25	-	-	-
700	711.2	7.0	122	25	6.0	104	20
800	812.8	8.0	159	25	7.0	139	20
900	914.4	8.0	179	25	7.0	157	20
1000	1016.0	9.0	223	25	8.0	199	20
1100	1117.6	10.0	273	25	8.0	219	20
1200	1219.2	11.0	328	25	9.0	269	20
1350	1371.6	12.0	402	25	10.0	366	20
1500	1524.0	14.0	521	25	11.0	410	20
1600	1625.6	15.0	596	25	12.0	477	20
1650	1676.4	15.0	615	25	12.0	493	20
1800	1828.8	16.0	715	25	13.0	582	20
1900	1930.4	17.0	802	25	14.0	662	20
2000	2032.0	18.0	894	25	15.0	746	20
2100	2133.6	19.0	991	25	16.0	836	20
2200	2235.2	20.0	1090	25	16.0	876	20
2300	2336.8	21.0	1200	25	17.0	973	20
2400	2438.4	22.0	1310	25	18.0	1070	20
2500	2540.0	23.0	1430	25	18.0	1120	20
2600	2641.6	24.0	1550	25	19.0	1230	20

ASTM A53

Table with columns for NPS Designator, Outside diameter, Wall thickness, Nominal weight, Test pressure, Weight class, and Schedule No. Includes data for pipe sizes 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2, 3, 3 1/2, and 4.

Table with columns for NPS Designator, Outside diameter, Wall thickness, Nominal weight, Test pressure, Weight class, and Schedule No. Includes data for pipe sizes 5, 6, 8, and 10.





# CARBON STEEL TUBES FOR BOILER & HEAT EXCHANGER

HYUNDAI HYSKO

Carbon steel boiler and heat exchanger tubes KS D 3563 STBH(JIS G 3461 STB)

(unit : kg/m)

Thickness (mm)	Outside diameter (mm)																		
	1.2	1.6	2.0	2.3	2.6	2.9	3.2	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	8.0	9.5	11.0	12.5
15.9	0.435	0.564	0.686	0.771	0.853	0.930													
19.0	0.527	0.687	0.838	0.947	1.05	1.15													
21.7	0.607	0.793	0.972	1.10	1.22	1.34	1.46												
25.4	0.716	0.939	1.15	1.31	1.46	1.61	1.75	1.89											
27.2	0.769	1.01	1.24	1.41	1.58	1.74	1.89	2.05	2.29										
31.8	0.906	1.19	1.47	1.67	1.87	2.07	2.26	2.44	2.74	3.03									
34.0		1.28	1.58	1.80	2.01	2.22	2.43	2.63	2.96	3.27	3.58								
38.1		1.44	1.78	2.03	2.28	2.52	2.75	2.99	3.36	3.73	4.08	4.42							
42.7			2.01	2.29	2.57	2.85	3.12	3.38	3.82	4.24	4.65	5.05	5.43						
45.0			2.12	2.42	2.72	3.01	3.30	3.58	4.04	4.49	4.93	5.36	5.77	6.17					
48.6			2.30	2.63	2.95	3.27	3.58	3.89	4.40	4.89	5.38	5.85	6.30	6.75	7.18				
50.8			2.41	2.75	3.09	3.43	3.76	4.08	4.62	5.14	5.65	6.14	6.63	7.10	7.56	8.44	9.68	10.8	11.8
54.0			2.56	2.93	3.30	3.65	4.01	4.36	4.93	5.49	6.04	6.58	7.10	7.61	8.11	9.07	10.4	11.7	12.8
57.1			2.72	3.11	3.49	3.88	4.25	4.63	5.24	5.84	6.42	7.00	7.56	8.11	8.65	9.69	11.2	12.5	13.7
60.3			2.88	3.29	3.70	4.10	4.51	4.90	5.55	6.19	6.82	7.43	8.03	8.62	9.20	10.3	11.9	13.4	14.7
63.5				3.47	3.90	4.33	4.76	5.18	5.87	6.55	7.21	7.87	8.51	9.14	9.75	10.9	12.7	14.2	15.7
65.0				3.56	4.00	4.44	4.88	5.31	6.02	6.71	7.40	8.07	8.73	9.38	10.0	11.2	13.0	14.6	16.2
70.0				3.84	4.32	4.80	5.27	5.74	6.51	7.27	8.01	8.75	9.47	10.2	10.9	12.2	14.2	16.0	17.7
76.2				4.19	4.72	5.24	5.76	6.27	7.12	7.96	8.78	9.59	10.4	11.2	11.9	13.5	15.6	17.7	19.6
82.6							6.27	6.83	7.75	8.67	9.57	10.5	11.3	12.2	13.1	14.7	17.1	19.4	21.6
88.9							6.76	7.37	8.37	9.37	10.3	11.3	12.3	13.2	14.1	16.0	18.6	21.1	23.6
101.6								8.47	9.63	10.8	11.9	13.0	14.1	15.2	16.3	18.5	21.8	24.6	27.5
114.3									10.9	12.2	13.5	14.8	16.0	17.3	18.5	21.0	24.6	28.0	31.4
127.0									12.1	13.6	15.0	16.5	17.9	19.3	20.7	23.5	27.5	31.5	35.3
139.8											18.2	19.8	21.4	22.9	26.0	30.5	34.9	39.2	

# CARBON STEEL PIPES FOR PRESSURE SERVICE

HYUNDAI HYSKO

Carbon steel pipes for Pressure Service KS D 3562 SPPS(JIS G 3451 STPG)

Nominal diameter	Outside diameter	Nominal wall thickness																		
		Schedule 10			Schedule 20			Schedule 30			Schedule 40			Schedule 60			Schedule 80			
		Wall thick-ness	weight	Test pressure	Wall thick-ness	weight	Test pressure	Wall thick-ness	weight	Test pressure	Wall thick-ness	weight	Test pressure	Wall thick-ness	weight	Test pressure	Wall thick-ness	weight	Test pressure	
A	B	mm	mm	kg/m	kg/cm <sup>2</sup> (MPa)	mm	kg/m	kg/cm <sup>2</sup> (MPa)	mm	kg/m	kg/cm <sup>2</sup> (MPa)	mm	kg/m	kg/cm <sup>2</sup> (MPa)	mm	kg/m	kg/cm <sup>2</sup> (MPa)	mm	kg/m	kg/cm <sup>2</sup> (MPa)
10	3/8	17.3	-	-	-	-	-	-	-	-	-	2.3	0.851	-	2.8	1.00	-	3.2	1.11	-
15	1/2	21.7	-	-	-	-	-	-	-	-	-	2.8	1.31	-	3.2	1.46	-	3.7	1.64	-
20	3/4	27.2	-	-	-	-	-	-	-	-	-	2.9	1.74	-	3.4	2.00	-	3.9	2.24	-
25	1	34.0	-	-	-	-	-	-	-	-	-	3.4	2.57	-	3.9	2.89	-	4.5	3.27	-
32	1 1/4	42.7	-	-	-	-	-	-	-	-	-	3.6	3.47	-	4.5	4.24	-	4.9	4.57	-
40	1 1/2	48.6	-	-	-	-	-	-	-	-	-	3.7	4.10	-	4.5	4.89	-	5.1	5.47	-
50	2	60.5	-	-	-	3.2	4.52	-	-	-	-	3.9	5.44	-	4.9	6.72	-	5.5	7.46	-
65	2 1/2	76.3	-	-	-	4.5	7.97	-	-	-	-	5.2	9.12	-	6.0	10.4	-	7.0	12.0	-
80	3	89.1	-	-	-	4.5	9.39	-	-	-	-	5.5	11.3	-	6.6	13.4	-	7.6	15.3	-
90	3 1/2	101.6	-	-	-	4.5	10.8	-	-	-	-	5.7	13.5	-	7.0	16.3	-	8.1	18.7	-
100	4	114.3	-	-	-	4.9	13.2	-	-	-	-	6.0	16.0	-	7.1	18.8	-	8.6	22.4	-
125	5	139.8	-	-	20	5.1	16.9	35	-	-	50	6.6	21.7	60	8.1	26.3	90	9.5	30.5	120
150	6	165.2	-	-	(2.0)	5.5	21.7	(3.5)	-	-	(5.0)	7.1	27.7	(6.0)	9.3	35.8	(9.0)	11.0	41.8	(12.0)
200	8	216.3	-	-	-	6.4	33.1	-	7.0	36.1	-	8.2	42.1	-	10.3	52.3	-	12.7	63.8	-
250	10	267.4	-	-	-	6.4	41.2	-	7.8	49.9	-	9.3	59.2	-	12.7	79.8	-	15.1	93.9	-
300	12	318.5	-	-	-	6.4	49.3	-	8.4	64.2	-	10.3	78.3	-	14.3	107	-	17.4	129	-
350	14	355.6	6.4	55.1	-	7.9	67.7	-	9.5	81.1	-	11.1	94.3	-	15.1	127	-	19.0	158	-
400	16	406.4	6.4	63.1	-	7.9	77.6	-	9.5	93.0	-	12.7	123	-	16.7	160	-	21.4	203	-
450	18	457.2	6.4	71.1	-	7.9	87.5	-	11.1	122	-	14.3	156	-	19.0	205	-	23.8	254	-
500	20	508.0	6.4	79.2	-	9.5	117	-	12.7	155	-	15.1	184	-	20.6	248	-	26.2	311	-
550	22	558.8	6.4	87.2	-	9.5	129	-	12.7	171	-	15.9	213	-	-	-	-	-	-	-
600	24	609.6	6.4	95.2	-	9.5	141	-	14.3	228(210)	-	-	-	-	-	-	-	-	-	-

Carbon steel tubes for general structural purposes KS D 3566 STK (JIS G 3444 STK)

Outside diameter	Wall thickness	weight	Cross-sectional area	Geometrical moment of inertia	Section modulus	Radius of gyration of area
mm	mm	kg/m	cm <sup>2</sup>	cm <sup>4</sup>	cm <sup>3</sup>	cm
21.7	2.0 (2.0)	0.972 (0.972)	1.238 (1.238)	0.607 (0.607)	0.560 (0.560)	0.700 (0.700)
27.2	2.0 (2.0)	1.24 (1.24)	1.583 (1.583)	1.26 (1.26)	0.930 (0.930)	0.890 (0.890)
	2.3 (2.3)	1.41 (1.41)	1.799 (1.799)	1.41 (1.41)	1.03 (1.03)	0.880 (0.880)
34.0	2.3 (2.3)	1.80 (1.80)	2.291 (2.291)	2.89 (2.89)	1.70 (1.70)	1.12 (1.12)
42.7	2.3 (2.3)	2.29 (2.29)	2.919 (2.919)	5.97 (5.97)	2.80 (2.80)	1.43 (1.43)
	2.5 (2.5)	2.49 (2.49)	3.157 (3.157)	6.40 (6.40)	3.00 (3.00)	1.42 (1.42)
	2.8	2.76	3.510	7.02	3.29	1.41 (1.41)
48.6	2.3 (2.3)	2.63 (2.63)	3.345 (3.345)	8.99 (8.99)	3.70 (3.70)	1.64 (1.64)
	2.5 (2.5)	2.84 (2.84)	3.621 (3.621)	9.65 (9.65)	3.97 (3.97)	1.63 (1.63)
	2.8 (2.8)	3.16 (3.16)	4.029 (4.029)	10.6 (10.6)	4.36 (4.36)	1.62 (1.62)
	3.2 (3.2)	3.58 (3.58)	4.564 (4.564)	11.8 (11.8)	4.86 (4.86)	1.61 (1.61)
60.5	2.3 (2.3)	3.30 (3.30)	4.205 (4.205)	17.8 (17.8)	5.90 (5.90)	2.06 (2.06)
	3.2 (3.2)	4.52 (4.52)	5.760 (5.760)	23.7 (23.7)	7.84 (7.84)	2.03 (2.03)
	4.0 (4.0)	5.57 (5.57)	7.100 (7.100)	28.5 (28.5)	9.41 (9.41)	2.00 (2.00)
76.3	2.8 (2.8)	5.08 (5.08)	6.465 (6.465)	43.7 (43.7)	11.5 (11.5)	2.60 (2.60)
	3.2 (3.2)	5.77 (5.77)	7.349 (7.349)	49.2 (49.2)	12.9 (12.9)	2.59 (2.59)
	4.0 (4.0)	7.13 (7.13)	9.085 (9.085)	59.5 (59.5)	15.6 (15.6)	2.56 (2.56)
89.1	2.8 (2.8)	5.96 (5.96)	7.591 (7.591)	70.7 (70.7)	15.9 (15.9)	3.05 (3.05)
	3.2 (3.2)	6.78 (6.78)	8.636 (8.636)	79.8 (79.8)	17.9 (17.9)	3.04 (3.04)
	4.0 (4.0)	8.39	10.69	97.0	21.8	3.01 (3.01)
101.6	3.2 (3.2)	7.76 (7.76)	9.892 (9.892)	120 (120)	23.6 (23.6)	3.48 (3.48)
	4.0 (4.0)	9.63 (9.63)	12.26 (12.26)	146 (146)	28.8 (28.8)	3.45 (3.45)
	5.0 (5.0)	11.9 (11.9)	15.17 (15.17)	177 (177)	34.9 (34.9)	3.42 (3.42)
114.3	3.2 (3.2)	8.77 (8.77)	11.17 (11.17)	172 (172)	30.2 (30.2)	3.93 (3.93)
	3.6 (3.6)	9.83 (9.83)	12.52 (12.52)	192 (192)	33.6 (33.6)	3.92 (3.92)
	4.5 (4.5)	12.2 (12.2)	15.52 (15.52)	234 (234)	41.0 (41.0)	3.89 (3.89)
	5.6	15.0	19.12	283	49.6	3.85 (3.85)
139.8	3.6 (3.6)	12.1 (12.1)	15.40 (15.40)	357 (357)	51.1 (51.1)	4.82 (4.82)
	4.0 (4.0)	13.4 (13.4)	17.07 (17.07)	394 (394)	56.3 (56.3)	4.80 (4.80)
	4.5 (4.5)	15.0 (15.0)	19.13 (19.13)	438 (438)	62.7 (62.7)	4.79 (4.79)
	6.0 (6.0)	19.8 (19.8)	25.22 (25.22)	566 (566)	80.9 (80.9)	4.74 (4.74)
165.2	4.5 (4.5)	17.8 (17.8)	22.72 (22.72)	734 (734)	88.9 (88.9)	5.68 (5.68)
	5.0 (5.0)	19.8 (19.8)	25.16 (25.16)	808 (808)	97.8 (97.8)	5.67 (5.67)
	6.0 (6.0)	23.6 (23.6)	30.01 (30.01)	952 (952)	115 (115)	5.63 (5.63)
	7.0 (7.0)	27.3 (27.3)	34.79 (34.79)	109 x 10 (109 x 10)	132 (132)	5.60 (5.60)
190.7	4.5 (4.5)	20.7 (20.7)	26.32 (26.32)	114 x 10 (114 x 10)	120 (120)	6.59 (6.59)
	5.0 (5.0)	22.9 (22.9)	29.17 (29.17)	126 x 10 (126 x 10)	132 (132)	6.57 (6.57)
	6.0 (6.0)	27.3 (27.3)	34.82 (34.82)	149 x 10 (149 x 10)	156 (156)	6.53 (6.53)
	7.0 (7.0)	31.7 (31.7)	40.40 (40.40)	171 x 10 (171 x 10)	179 (179)	6.50 (6.50)
	(8.2)	(36.9)	(47.01)	(196 x 10)	(206)	(6.46)
216.3	4.5 (4.5)	23.5 (23.5)	29.94 (29.94)	168 x 10 (168 x 10)	155 (155)	7.49 (7.49)
	(5.8)	(30.1)	(38.36)	(213 x 10)	(197)	(7.45)
	6.0 (6.0)	31.1 (31.1)	39.61 (39.61)	219 x 10 (219 x 10)	203 (203)	7.44 (7.44)
	7.0 (7.0)	36.1 (36.1)	46.03 (46.03)	252 x 10 (252 x 10)	233 (233)	7.40 (7.40)
	8.0 (8.0)	41.1 (41.1)	52.35 (52.35)	284 x 10 (284 x 10)	263 (263)	7.37 (7.37)
	(8.2)	(42.1)	(53.61)	(291 x 10)	(269)	(7.36)
267.4	6.0 (6.0)	38.7 (38.7)	49.27 (49.27)	421 x 10 (421 x 10)	315 (315)	9.24 (9.24)
	(6.6)	(42.4)	(54.08)	(460 x 10)	(344)	(9.22)
	7.0 (7.0)	45.0 (45.0)	57.27 (57.27)	486 x 10 (486 x 10)	363 (363)	9.21 (9.21)
	8.0 (8.0)	51.2 (51.2)	65.19 (65.19)	549 x 10 (549 x 10)	411 (411)	9.18 (9.18)
	9.0 (9.0)	57.4 (57.4)	73.06 (73.06)	611 x 10 (611 x 10)	457 (457)	9.14 (9.14)
	(9.3)	(59.2)	(75.41)	(629 x 10)	(470)	(9.13)

Outside diameter	Wall thickness	weight	Cross-sectional area	Geometrical moment of inertia	Section modulus	Radius of gyration of area
mm	mm	kg/m	cm <sup>2</sup>	cm <sup>4</sup>	cm <sup>3</sup>	cm
318.5	6.0 (6.0)	46.2 (46.2)	58.91 (58.91)	719 x 10 (719 x 10)	452 (452)	11.1 (11.1)
	7.0 (6.9)	53.8 (53.8)	68.50 (68.50)	813 x 10 (820 x 10)	552 (552)	11.0 (11.0)
	8.0 (8.0)	61.3 (61.3)	78.04 (78.04)	941 x 10 (941 x 10)	591 (591)	11.0 (11.0)
	9.0 (9.0)	68.7 (68.7)	87.51 (87.51)	105 x 10 <sup>2</sup> (105 x 10 <sup>2</sup> )	659 (659)	10.9 (10.9)
	(10.3)	(78.3)	(99.73)	(119 x 10 <sup>2</sup> )	(744)	(10.9)
355.6	6.3 (6.4)	54.3 (54.3)	69.13 (69.13)	105 x 10 <sup>2</sup> (107 x 10 <sup>2</sup> )	593 (602)	12.4 (12.4)
	8.0 (7.9)	68.6 (68.6)	87.36 (87.36)	132 x 10 <sup>2</sup> (130 x 10 <sup>2</sup> )	742 (734)	12.3 (12.3)
	9.0 (9.0)	76.9 (76.9)	98.00 (98.00)	147 x 10 <sup>2</sup> (147 x 10 <sup>2</sup> )	828 (828)	12.3 (12.3)
	(9.5)	(81.1)	(103.3)	(155 x 10 <sup>2</sup> )	(871)	(12.2)
	12.0 (12.0)	102 (102)	129.5 (129.5)	191 x 10 <sup>2</sup> (191 x 10 <sup>2</sup> )	108 x 10 (108 x 10)	12.2 (12.2)
	(12.7)	(107)	(136.8)	(201 x 10 <sup>2</sup> )	(113 x 10)	(12.1)
406.4	(7.9)	(77.6)	(98.90)	(196 x 10 <sup>2</sup> )	(967)	(14.1)
	9.0 (9.0)	88.2 (88.2)	112.4 (112.4)	222 x 10 <sup>2</sup> (222 x 10 <sup>2</sup> )	109 x 10 (109 x 10)	14.1 (14.1)
	(9.5)	(93.0)	(118.5)	(223 x 10 <sup>2</sup> )	(115 x 10)	(14.0)
	12.0 (12.0)	117 (117)	148.7 (148.7)	289 x 10 <sup>2</sup> (289 x 10 <sup>2</sup> )	142 x 10 (142 x 10)	14.0 (14.0)
	(12.7)	(123)	(157.1)	(305 x 10 <sup>2</sup> )	(150 x 10)	(13.9)
	16.0 (16.0)	154 (154)	196.2 (196.2)	374 x 10 <sup>2</sup> (374 x 10 <sup>2</sup> )	184 x 10 (184 x 10)	13.8 (13.8)
	19.0 (19.0)	182 (182)	231.2 (231.2)	435 x 10 <sup>2</sup> (435 x 10 <sup>2</sup> )	214 x 10 (214 x 10)	13.7 (13.7)
457.2	9.0 (9.0)	99.5 (99.5)	126.7 (126.7)	318 x 10 <sup>2</sup> (318 x 10 <sup>2</sup> )	140 x 10 (140 x 10)	15.8 (15.8)
	(9.5)	(105)	(133.6)	(335 x 10 <sup>2</sup> )	(147 x 10)	(15.8)
	12.0 (12.0)	132 (132)	167.8 (167.8)	416 x 10 <sup>2</sup> (416 x 10 <sup>2</sup> )	182 x 10 (182 x 10)	15.7 (15.7)
	(12.7)	(139)	(177.3)	(438 x 10 <sup>2</sup> )	(192 x 10)	(15.7)
	16.0 (16.0)	174 (174)	221.8 (221.8)	540 x 10 <sup>2</sup> (540 x 10 <sup>2</sup> )	236 x 10 (236 x 10)	15.6 (15.6)
	19.0 (19.0)	205 (205)	261.6 (261.6)	629 x 10 <sup>2</sup> (629 x 10 <sup>2</sup> )	275 x 10 (275 x 10)	15.5 (15.5)
500	9.0 (9.0)	109 (109)	138.8 (138.8)	418 x 10 <sup>2</sup> (418 x 10 <sup>2</sup> )	167 x 10 (167 x 10)	17.4 (17.4)
	12.0 (12.0)	144 (144)	184.0 (184.0)	548 x 10 <sup>2</sup> (548 x 10 <sup>2</sup> )	219 x 10 (219 x 10)	17.3 (17.3)
	14.0 (14.0)	168 (168)	213.8 (213.8)	632 x 10 <sup>2</sup> (632 x 10 <sup>2</sup> )	253 x 10 (253 x 10)	17.2 (17.2)
508.0	(7.9)	(97.4)	(124.1)	(388 x 10 <sup>2</sup> )	(153 x 10)	(17.7)
	9.0 (9.0)	111 (111)	141.1 (141.1)	439 x 10 <sup>2</sup> (439 x 10 <sup>2</sup> )	173 x 10 (173 x 10)	17.6 (17.6)
	(9.5)	(117)	(148.8)	(462 x 10 <sup>2</sup> )	(182 x 10)	(17.6)
	12.0 (12.0)	147 (147)	187.0 (187.0)	575 x 10 <sup>2</sup> (575 x 10 <sup>2</sup> )	226 x 10 (227 x 10)	17.5 (17.5)
	(12.7)	(155)	(197.6)	(606 x 10 <sup>2</sup> )	(239 x 10)	(17.5)
	14.0 (14.0)	171 (171)	217.3 (217.3)	663 x 10 <sup>2</sup> (663 x 10 <sup>2</sup> )	261 x 10 (261 x 10)	17.5 (17.5)
	16.0 (16.0)	194 (194)	247.3 (247.3)	749 x 10 <sup>2</sup> (749 x 10 <sup>2</sup> )	295 x 10 (295 x 10)	17.4 (17.4)
	19.0 (19.0)	229 (229)	291.9 (291.9)	874 x 10 <sup>2</sup> (874 x 10 <sup>2</sup> )	344 x 10 (344 x 10)	17.3 (17.3)
	22.0 (22.0)	264 (264)	335.9 (335.9)	994 x 10 <sup>2</sup> (994 x 10 <sup>2</sup> )	391 x 10 (391 x 10)	17.2 (17.2)
558.8	9.0 (9.0)	122 (122)	155.5 (155.5)	588 x 10 <sup>2</sup> (588 x 10 <sup>2</sup> )	210 x 10 (210 x 10)	19.4 (19.4)
	12.0 (12.0)	162 (162)	206.1 (206.1)	771 x 10 <sup>2</sup> (771 x 10 <sup>2</sup> )	276 x 10 (276 x 10)	19.3 (19.3)
	16.0 (16.0)	214 (214)	272.8 (272.8)	101 x 10 <sup>3</sup> (101 x 10 <sup>3</sup> )	360 x 10 (360 x 10)	19.2 (19.2)
	19.0 (19.0)	253 (253)	322.2 (322.2)	118 x 10 <sup>3</sup> (118 x 10 <sup>3</sup> )	421 x 10 (421 x 10)	19.1 (19.1)
	22.0 (22.0)	291 (291)	371.0 (371.0)	134 x 10 <sup>3</sup> (134 x 10 <sup>3</sup> )	479 x 10 (479 x 10)	19.0 (19.0)
600	9.0 (9.0)	131 (131)	167.1 (167.1)	730 x 10 <sup>2</sup> (730 x 10 <sup>2</sup> )	243 x 10 (243 x 10)	20.9 (20.9)
	12.0 (12.0)	174 (174)	221.7 (221.7)	958 x 10 <sup>2</sup> (958 x 10 <sup>2</sup> )	320 x 10 (320 x 10)	20.8 (20.8)
	14.0 (14.0)	202 (202)	257.7 (257.7)	111 x 10 <sup>3</sup> (111 x 10 <sup>3</sup> )	369 x 10 (369 x 10)	20.7 (20.7)
	16.0 (16.0)	230 (230)	293.6 (293.6)	125 x 10 <sup>3</sup> (125 x 10 <sup>3</sup> )	418 x 10 (418 x 10)	20.7 (20.7)
609.6	9.0 (9.0)	133 (133)	169.8 (169.8)	766 x 10 <sup>2</sup> (766 x 10 <sup>2</sup> )	251 x 10 (251 x 10)	21.2 (21.2)
	(9.5)	(141)	(179.1)	(806 x 10 <sup>2</sup> )	(265 x 10)	(21.2)
	12.0 (12.0)	177 (177)	225.3 (225.3)	101 x 10 <sup>3</sup> (101 x 10 <sup>3</sup> )	330 x 10 (330 x 10)	21.1 (21.1)
	(12.7)	(187)	(238.2)	(106 x 10 <sup>3</sup> )	(348 x 10)	(21.2)
	14.0 (14.0)	206 (206)	262.0 (262.0)	116 x 10 <sup>3</sup> (116 x 10 <sup>3</sup> )	381 x 10 (381 x 10)	21.1 (21.1)
	16.0 (16.0)	234 (234)	298.4 (298.4)	132 x 10 <sup>3</sup> (132 x 10 <sup>3</sup> )	432 x 10 (432 x 10)	21.0 (21.0)
	19.0 (19.0)	277 (277)	352.5 (352.5)	154 x 10 <sup>3</sup> (154 x 10 <sup>3</sup> )	505 x 10 (505 x 10)	20.9 (20.9)
	22.0 (22.0)	319 (319)	406.1 (406.1)	176 x 10 <sup>3</sup> (176 x 10 <sup>3</sup> )	576 x 10 (576 x 10)	20.8 (20.8)



Steel pipe piles KS F 4602(TABLE.1) / JIS A 5525

Outside diameter	Wall thickness	Cross-sectional area	Unit weight	Geometrical moment of inertia	Modulus of section	Radius of gyration of area	Outside surface area
				cm <sup>4</sup>	cm <sup>3</sup>	cm	m <sup>2</sup> /m
				I	Z	i	
400	9	110.6	86.8	211 × 10 <sup>2</sup>	106 × 10	13.8	1.26
	10	122.5	96.2	233 × 10 <sup>2</sup>	117 × 10	13.8	1.26
	11	134.4	106	254 × 10 <sup>2</sup>	127 × 10	13.8	1.26
	12	146.3	115	276 × 10 <sup>2</sup>	138 × 10	13.7	1.26
500	9	138.8	109	418 × 10 <sup>2</sup>	167 × 10	17.4	1.57
	10	153.9	121	462 × 10 <sup>2</sup>	185 × 10	17.3	1.57
	11	169.0	133	505 × 10 <sup>2</sup>	202 × 10	17.3	1.57
	12	184.0	144	548 × 10 <sup>2</sup>	219 × 10	17.3	1.57
	13	198.9	156	590 × 10 <sup>2</sup>	236 × 10	17.2	1.57
	14	213.8	168	632 × 10 <sup>2</sup>	253 × 10	17.2	1.57
600	9	167.1	131	730 × 10 <sup>2</sup>	243 × 10	20.9	1.88
	10	185.4	145	807 × 10 <sup>2</sup>	269 × 10	20.9	1.88
	11	203.5	160	883 × 10 <sup>2</sup>	294 × 10	20.8	1.88
	12	221.7	174	958 × 10 <sup>2</sup>	319 × 10	20.8	1.88
	13	239.7	188	103 × 10 <sup>3</sup>	344 × 10	20.8	1.88
	14	257.7	202	111 × 10 <sup>3</sup>	369 × 10	20.7	1.88
	15	275.7	216	118 × 10 <sup>3</sup>	393 × 10	20.7	1.88
	16	293.6	230	125 × 10 <sup>3</sup>	467 × 10	20.7	1.88
700	9	195.4	153	117 × 10 <sup>3</sup>	333 × 10	24.4	2.20
	10	216.8	170	129 × 10 <sup>3</sup>	369 × 10	24.4	2.20
	11	238.1	187	141 × 10 <sup>3</sup>	404 × 10	24.4	2.20
	12	259.4	204	154 × 10 <sup>3</sup>	439 × 10	24.3	2.20
	13	280.6	220	166 × 10 <sup>3</sup>	473 × 10	24.3	2.20
	14	301.7	237	178 × 10 <sup>3</sup>	507 × 10	24.3	2.20
	15	322.8	253	189 × 10 <sup>3</sup>	541 × 10	24.2	2.20
	16	343.8	270	201 × 10 <sup>3</sup>	575 × 10	24.2	2.20

Steel pipe piles KS F 4602(TABLE.2) / JIS A 5525

Outside diameter	Wall thickness	Cross-sectional area	Unit weight	Geometrical moment of inertia	Modulus of section	Radius of gyration of area	Outside surface area
				cm <sup>4</sup>	cm <sup>3</sup>	cm	m <sup>2</sup> /m
				I	Z	i	
406.4	9	112.4	88.2	222 × 10 <sup>2</sup>	109 × 10	14.0	1.28
	10	124.5	97.8	245 × 10 <sup>2</sup>	120 × 10	14.0	1.28
	11	136.6	107.0	267 × 10 <sup>2</sup>	132 × 10	14.0	1.28
	12	148.7	117	289 × 10 <sup>2</sup>	142 × 10	14.0	1.28
508.0	9	141.1	111	439 × 10 <sup>2</sup>	173 × 10	17.6	1.60
	10	156.4	123	485 × 10 <sup>2</sup>	191 × 10	17.6	1.60
	11	171.8	135	531 × 10 <sup>2</sup>	209 × 10	17.6	1.60
	12	187.0	147	575 × 10 <sup>2</sup>	227 × 10	17.5	1.60
	13	202.2	159	620 × 10 <sup>2</sup>	244 × 10	17.5	1.60
609.6	14	217.3	171	663 × 10 <sup>2</sup>	261 × 10	17.5	1.60
	9	169.8	133	766 × 10 <sup>2</sup>	251 × 10	21.2	1.92
	10	188.4	148	847 × 10 <sup>2</sup>	278 × 10	21.2	1.92
	11	206.9	162	927 × 10 <sup>2</sup>	304 × 10	21.2	1.92
	12	225.3	177	101 × 10 <sup>3</sup>	330 × 10	21.2	1.92
	13	243.6	191	108 × 10 <sup>3</sup>	356 × 10	21.2	1.92
711.2	14	262.0	206	116 × 10 <sup>3</sup>	381 × 10	21.2	1.92
	15	280.2	220	124 × 10 <sup>3</sup>	407 × 10	21.0	1.92
	16	298.4	234	132 × 10 <sup>3</sup>	431 × 10	21.0	1.92
	9	198.5	156	122 × 10 <sup>3</sup>	344 × 10	24.8	2.23
	10	220.3	173	135 × 10 <sup>3</sup>	381 × 10	24.8	2.23
	11	242.0	190	148 × 10 <sup>3</sup>	417 × 10	24.8	2.23
	12	263.6	207	161 × 10 <sup>3</sup>	453 × 10	24.7	2.23
812.8	13	285.1	224	174 × 10 <sup>3</sup>	489 × 10	24.7	2.23
	14	306.6	241	186 × 10 <sup>3</sup>	524 × 10	24.7	2.23
	15	328.1	258	199 × 10 <sup>3</sup>	559 × 10	24.6	2.23
	16	349.4	274	211 × 10 <sup>3</sup>	594 × 10	24.6	2.23
	9	227.3	178	184 × 10 <sup>3</sup>	452 × 10	28.4	2.55
	10	252.2	198	203 × 10 <sup>3</sup>	500 × 10	28.4	2.55
	11	277.1	217	223 × 10 <sup>3</sup>	548 × 10	28.4	2.55
	12	301.9	237	242 × 10 <sup>3</sup>	596 × 10	28.3	2.55
914.4	13	326.6	256	261 × 10 <sup>3</sup>	643 × 10	28.3	2.55
	14	351.3	276	280 × 10 <sup>3</sup>	690 × 10	28.2	2.55
	15	376.0	295	299 × 10 <sup>3</sup>	736 × 10	28.2	2.55
	16	400.5	314	318 × 10 <sup>3</sup>	782 × 10	28.2	2.55
	12	340.2	267	346 × 10 <sup>3</sup>	758 × 10	31.9	2.87
	13	368.1	289	374 × 10 <sup>3</sup>	818 × 10	31.9	2.87
	14	396.0	311	401 × 10 <sup>3</sup>	878 × 10	31.8	2.87
	15	423.8	333	429 × 10 <sup>3</sup>	928 × 10	31.8	2.87
1016.0	16	451.6	354	456 × 10 <sup>3</sup>	997 × 10	31.8	2.87
	17	479.3	376	483 × 10 <sup>3</sup>	106 × 10 <sup>2</sup>	31.7	2.87
	18	506.9	398	509 × 10 <sup>3</sup>	111 × 10 <sup>2</sup>	31.7	2.87
	19	534.5	420	536 × 10 <sup>3</sup>	117 × 10 <sup>2</sup>	31.7	2.87
	12	378.5	297	477 × 10 <sup>3</sup>	939 × 10 <sup>2</sup>	35.5	3.19
	13	409.6	322	515 × 10 <sup>3</sup>	101 × 10 <sup>2</sup>	35.5	3.19
	14	440.7	346	553 × 10 <sup>3</sup>	109 × 10 <sup>2</sup>	35.4	3.19
	15	471.7	370	591 × 10 <sup>3</sup>	116 × 10 <sup>2</sup>	35.4	3.19
1016.0	16	502.6	395	628 × 10 <sup>3</sup>	124 × 10 <sup>2</sup>	35.4	3.19
	17	533.5	419	666 × 10 <sup>3</sup>	131 × 10 <sup>2</sup>	35.3	3.19
	18	564.4	443	703 × 10 <sup>3</sup>	138 × 10 <sup>2</sup>	35.3	3.19
	19	595.1	467	740 × 10 <sup>3</sup>	146 × 10 <sup>2</sup>	35.2	3.19

















API 5L

Table with columns: Nominal size, Outside diameter, Wall thickness, Weight, and Test pressure (A, B) including STD and ALT grades. Rows include sizes 24, 26, and 28.

Table with columns: Test pressure (X42, X46, X52, X56, X60, X65, X70, X80) including psi values for various grades. Rows include sizes 24, 26, and 28.

API 5L

Nominal size	Outside diameter		Wall thickness		Weight			Test pressure												
								A				B								
								STD		ALT		STD		ALT						
in.	in.	mm	Grade	in.	mm	lb/ft	kg/ft	kg/m	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100				
28	28.000	711.0	XS	0.500	12.7	146.85	66.66	218.60	640	44	800	55	750	52	940	65				
				0.562	14.3	164.69	74.88	245.68	720	50	900	62	840	58	1050	72				
				0.625	15.9	182.73	83.07	272.54	800	55	1000	69	940	65	1170	81				
				0.688	17.5	200.68	91.22	299.28	880	61	1110	76	1030	71	1290	89				
				0.750	19.1	218.27	99.33	325.89	960	66	1210	83	1120	77	1410	97				
				0.812	20.6	235.78	106.90	350.72	1040	72	1300	90	1220	84	1520	105				
				0.875	22.2	253.48	114.93	377.08	1120	77	1410	97	1310	90	1640	113				
				0.938	23.8	271.10	122.93	403.32	1210	83	1510	104	1410	97	1760	121				
				1.000	25.4	288.36	130.89	429.44	1290	89	1610	111	1500	103	1880	130				
				30	30.000	762.0	STD	0.250	6.4	79.43	36.35	119.25	300	21	370	25	350	24	440	30
								0.281	7.1	89.19	40.29	132.17	340	23	420	29	390	27	490	34
0.312	7.9	98.93	44.78					146.91	370	25	470	32	440	30	550	38				
0.344	8.7	108.95	49.26					161.61	410	-	520	-	480	-	600	-				
0.375	9.5	118.65	53.73					176.29	450	31	560	39	520	36	660	45				
0.406	10.3	128.32	58.20					190.93	490	-	610	-	590	-	710	-				
0.438	11.1	138.29	62.65					205.54	530	37	660	45	610	42	770	53				
0.469	11.9	147.92	67.09					220.12	560	-	700	-	660	-	820	-				
XS	0.500	12.7	157.53					71.53	234.67	600	41	750	52	700	48	880	61			
	0.562	14.3	176.69					80.37	263.67	670	46	840	58	790	54	980	68			
	0.625	15.9	196.08					89.17	292.54	750	52	940	65	880	61	1090	75			
	0.688	17.5	215.38					97.93	321.29	830	57	1030	71	960	66	1200	83			
	0.750	19.1	234.29					106.65	349.91	900	62	1120	77	1050	72	1310	90			
	0.812	20.6	253.12				114.80	376.63	970	67	1220	84	1140	79	1420	98				
	0.875	22.2	272.17				123.44	405.00	1050	72	1310	90	1220	84	1530	105				
	0.938	23.8	291.14				132.06	433.26	1130	78	1410	97	1310	90	1640	113				
	1.000	25.4	309.72				140.63	461.38	1200	83	1500	103	1400	96	1750	121				
	1.062	27.0	328.22				149.16	489.38	1270	88	1590	110	1490	103	1860	128				
	1.125	28.6	346.93				157.66	517.25	1350	93	1690	116	1580	109	1970	136				
	1.188	30.2	365.56				166.11	544.99	1430	99	1780	123	1660	114	2080	143				
	1.250	31.8	383.81				174.53	572.61	1500	103	1880	130	1750	121	2190	151				
32	32.000	813.0	STD				0.250	6.4	84.77	38.80	127.30	280	19	350	24	330	23	410	28	
							0.281	7.1	95.19	43.01	141.10	320	22	400	28	370	25	460	32	
							0.312	7.9	105.59	47.80	156.84	350	24	440	30	410	28	510	35	
							0.344	8.7	116.30	52.60	172.56	390	-	480	-	450	-	560	-	
							0.375	9.5	126.66	57.38	188.24	420	29	530	37	490	34	620	43	
				0.406	10.3	136.99	62.14	203.88	460	-	570	-	530	-	670	-				
				0.438	11.1	147.64	66.90	219.50	490	34	620	43	570	39	720	50				
				0.469	11.9	157.94	71.66	235.09	530	-	660	-	620	-	770	-				
				XS	0.500	12.7	168.21	76.40	250.64	560	39	700	48	660	45	820	56			
					0.562	14.3	188.70	85.85	281.65	630	43	790	54	740	51	920	63			
					0.625	15.9	209.43	95.26	312.54	700	48	880	61	820	56	1030	71			
					0.688	17.5	230.08	104.64	343.30	770	53	970	67	900	62	1130	78			
					0.750	19.1	250.31	113.97	373.93	840	58	1050	72	980	68	1230	85			
			0.812		20.6	270.47	122.69	402.54	910	63	1140	79	1070	74	1330	92				
			0.875		22.2	290.86	131.96	432.93	980	68	1230	85	1150	79	1440	99				
			0.938		23.8	311.17	141.18	463.19	1060	73	1320	91	1230	85	1540	106				
			1.000		25.4	331.08	150.36	493.32	1120	77	1410	97	1310	90	1640	113				
			1.062		27.0	350.90	159.51	523.33	1190	82	1490	103	1390	96	1740	120				
			1.125		28.6	370.96	168.62	553.22	1270	88	1580	109	1480	102	1850	127				
			1.188		30.2	390.94	177.69	582.98	1340	92	1670	115	1560	107	1950	134				
			1.250		31.8	410.51	186.72	612.61	1410	97	1760	121	1640	113	2050	141				

Test pressure							
X42	X46	X52	X56	X60	X65	X70	X80
psi	psi	psi	psi	psi	psi	psi	psi
1350	1480	1670	1800	1930	2090	2250	2570
1520	1660	1880	2020	2170	2350	2530	2890
1690	1850	2090	2250	2410	2610	2810	3000
1860	2030	2300	2480	2650	2870	3000	3000
2020	2220	2510	2700	2890	3000	3000	3000
2190	2400	2710	2920	3000	3000	3000	3000
2360	2590	2920	3000	3000	3000	3000	3000
2530	2770	3000	3000	3000	3000	3000	3000
2700	2960	3000	3000	3000	3000	3000	3000
630	690	780	840	900	980	1050	1200
710	780	880	940	1010	1100	1180	1350
790	860	970	1050	1120	1220	1310	1500
870	950	1070	1160	1240	1340	1440	1650
940	1040	1170	1260	1350	1460	1580	1800
1020	1120	1270	1360	1460	1580	1710	1950
1100	1210	1370	1470	1580	1710	1840	2100
1180	1290	1460	1580	1690	1830	1970	2250
1260	1380	1560	1680	1800	1950	2100	2400
1420	1550	1750	1890	2020	2190	2360	2700
1580	1720	1950	2100	2250	2440	2630	3000
1730	1900	2150	2310	2480	2680	2890	3000
1890	2070	2340	2520	2700	2920	3000	3000
2050	2240	2530	2730	2920	3000	3000	3000
2200	2420	2730	2940	3000	3000	3000	3000
2360	2590	2930	3000	3000	3000	3000	3000
2520	2760	3000	3000	3000	3000	3000	3000
2680	2930	3000	3000	3000	3000	3000	3000
2840	3000	3000	3000	3000	3000	3000	3000
2990	3000	3000	3000	3000	3000	3000	3000
3000	3000	3000	3000	3000	3000	3000	3000
590	650	730	790	790	910	980	1130
660	730	820	890	950	1030	1110	1260
740	810	910	980	1050	1140	1230	1400
810	890	1010	1080	1160	1260	1350	1550
890	970	1100	1180	1270	1370	1480	1690
960	1050	1190	1280	1370	1480	1600	1830
1030	1130	1280	1380	1480	1600	1720	1970
1110	1210	1370	1480	1580	1710	1850	2110
1180	1290	1460	1580	1690	1830	1970	2250
1330	1450	1640	1770	1900	2050	2210	2530
1480	1620	1830	1970	2110	2290	2460	2810
1630	1780	2010	2170	2320	2520	2710	3000
1770	1940	2190	2360	2530	2740	2950	3000
1920	2100	2380	2560	2740	2970	3000	3000
2070	2260	2560	2760	2950	3000	3000	3000
2220	2430	2740	2950	3000	3000	3000	3000
2360	2590	2920	3000	3000	3000	3000	3000
2510	2750	3000	3000	3000	3000	3000	3000
2660	2910	3000	3000	3000	3000	3000	3000
2810	3000	3000	3000	3000	3000	3000	3000
2950	3000	3000	3000	3000	3000	3000	3000

API 5L

Nominal size	Outside diameter		Wall thickness		Weight			Test pressure								
								A				B				
								STD		ALT		STD		ALT		
in.	in.	mm	Grade	in.	mm	lb/ft	kg/ft	kg/m	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100
34	34.000	864.0	STD	0.250	6.4	90.11	41.25	135.35	260	18	330	23	310	21	390	27
				0.281	7.1	101.19	45.73	150.03	300	21	370	25	350	24	430	30
				0.312	7.9	112.25	50.83	166.78	330	23	410	28	390	27	480	33
				0.344	8.7	123.65	55.93	183.50	360	-	460	-	420	-	530	-
				0.375	9.5	134.67	61.01	200.18	400	28	500	34	460	32	580	40
				0.406	10.3	145.67	66.09	216.84	430	-	540	-	500	-	630	-
				0.438	11.1	157.00	71.16	233.46	460	32	580	40	540	37	680	47
				0.469	11.9	167.95	76.22	250.05	500	-	620	-	580	-	720	-
				0.500	12.7	178.89	81.26	266.61	530	37	660	45	620	43	770	53
				0.562	14.3	200.70	91.33	299.64	600	41	740	51	690	48	870	60
			0.625	15.9	222.78	101.36	332.53	660	45	830	57	770	53	970	67	
			0.688	17.5	244.77	111.35	365.31	730	50	910	63	850	59	1060	73	
			0.750	19.1	266.33	121.30	397.95	790	54	990	68	930	64	1160	80	
			0.812	20.6	287.81	130.59	428.44	860	59	1070	74	1000	69	1250	86	
			0.875	22.2	309.55	140.47	460.85	930	64	1160	80	1080	74	1350	93	
			0.938	23.8	331.21	150.30	493.12	990	68	1240	85	1160	80	1450	100	
			1.000	25.4	352.44	160.10	525.27	1060	73	1320	91	1240	85	1540	106	
			1.062	27.0	373.59	169.86	557.29	1120	77	1410	97	1310	90	1640	113	
			1.125	28.6	394.99	179.59	589.19	1190	82	1490	103	1390	96	1740	120	
			1.188	30.2	416.31	187.27	620.96	1260	87	1570	108	1470	101	1830	126	
1.250	31.8	437.21	198.91	652.60	1320	91	1650	114	1540	106	1930	133				
36	36.000	914.0	STD	0.250	6.4	95.45	43.66	143.24	250	17	310	21	290	20	360	25
				0.281	7.1	107.20	48.40	158.79	280	19	350	24	330	23	410	28
				0.312	7.9	118.92	53.80	176.52	310	21	390	27	360	25	450	31
				0.344	8.7	131.00	59.20	194.22	340	-	430	-	400	-	500	-
				0.375	9.5	142.68	64.59	211.90	380	26	470	32	440	30	550	38
				0.406	10.3	154.34	66.92	219.54	410	-	510	-	470	-	590	-
				0.438	11.1	166.35	75.33	247.15	440	30	550	38	510	35	640	44
				0.469	11.9	177.97	80.69	264.72	470	-	590	-	550	-	680	-
				0.500	12.7	189.57	86.04	282.27	500	34	620	43	580	40	730	50
				0.562	14.3	212.70	96.70	317.27	560	39	700	48	660	45	820	56
			0.625	15.9	236.13	107.33	352.14	620	43	780	54	730	50	910	63	
			0.688	17.5	259.47	117.92	386.88	690	48	860	59	800	55	1000	69	
			0.750	19.1	282.35	128.47	421.50	750	52	940	65	880	61	1090	75	
			0.812	20.6	305.16	138.33	453.84	810	56	1020	70	950	65	1180	81	
			0.875	22.2	328.24	148.81	488.22	880	61	1100	75	1020	70	1280	88	
			0.938	23.8	351.25	159.25	522.47	940	65	1170	81	1090	75	1370	94	
			1.000	25.4	373.80	169.65	556.59	1000	69	1250	86	1170	81	1460	101	
			1.062	27.0	396.27	180.01	590.58	1060	73	1330	92	1240	85	1550	107	
			1.125	28.6	419.02	190.33	624.45	1130	78	1410	97	1310	90	1640	113	
			1.188	30.2	441.69	200.62	658.19	1190	82	1480	102	1390	96	1730	119	
1.250	31.8	463.91	210.86	691.81	1250	86	1560	107	1460	101	1820	125				

Test pressure							
X42	X46	X52	X56	X60	X65	X70	X80
psi	psi	psi	psi	psi	psi	psi	psi
560	610	690	740	790	860	930	1060
620	680	770	830	890	970	1040	1190
690	760	860	920	990	1070	1160	1320
760	840	950	1020	1090	1180	1270	1460
830	910	1030	1110	1190	1290	1390	1590
900	990	1120	1200	1290	1400	1500	1720
970	1070	1210	1300	1390	1510	1620	1860
1040	1140	1290	1390	1490	1610	1740	1990
1110	1220	1380	1480	1590	1720	1850	2120
1250	1370	1550	1670	1790	1930	2080	2380
1390	1520	1720	1850	1990	2150	2320	2650
1530	1680	1890	2040	2190	2370	2550	2910
1670	1830	2060	2220	2380	2580	2780	3000
1810	1980	2240	2410	2580	2790	3000	3000
1950	2130	2410	2590	2780	3000	3000	3000
2090	2280	2580	2780	2980	3000	3000	3000
2220	2440	2750	2960	3000	3000	3000	3000
2360	2590	2920	3000	3000	3000	3000	3000
2500	2740	3000	3000	3000	3000	3000	3000
2640	2890	3000	3000	3000	3000	3000	3000
2780	3000	3000	3000	3000	3000	3000	3000
520	580	650	700	750	810	880	1000
590	650	730	790	840	910	980	1120
660	720	810	870	940	1010	1090	1250
720	790	890	960	1030	1120	1200	1380
790	860	980	1050	1120	1220	1310	1500
850	930	1060	1140	1220	1320	1420	1620
920	1010	1140	1230	1310	1420	1530	1750
980	1080	1220	1310	1410	1520	1640	1880
1050	1150	1300	1400	1500	1620	1750	2000
1180	1290	1460	1570	1690	1820	1970	2250
1310	1440	1620	1750	1880	2030	2190	2500
1440	1580	1790	1930	2060	2240	2410	2750
1580	1720	1950	2100	2250	2440	2630	3000
1710	1870	2110	2270	2440	2640	2840	3000
1840	2010	2280	2450	2620	2840	3000	3000
1970	2160	2440	2630	2810	3000	3000	3000
2100	2300	2600	2800	3000	3000	3000	3000
2230	2440	2760	2970	3000	3000	3000	3000
2360	2590	2930	3000	3000	3000	3000	3000
2490	2730	3000	3000	3000	3000	3000	3000
2630	2870	3000	3000	3000	3000	3000	3000

API 5L

Nominal size	Outside diameter		Wall thickness		Weight		Test pressure												
							A				B								
							STD		ALT		STD		ALT						
in.	in.	mm	Grade	in.	mm	lb/ft	kg/ft	kg/m	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100			
38	38.000	965.0	STD	0.312	7.9	125.58	56.83	186.46	300	21	370	25	340	23	430	30			
				0.344	8.7	138.35	62.54	205.17	330	23	410	28	380	26	480	33			
				0.375	9.5	150.69	68.23	223.84	360	25	440	30	410	28	520	36			
				0.406	10.3	163.01	73.91	242.49	380	26	480	33	450	31	560	39			
				0.438	11.1	175.71	79.59	261.11	410	28	520	36	480	33	610	42			
				0.469	11.9	187.99	85.25	279.69	440	30	560	39	520	36	650	45			
				XS	0.500	12.7	200.25	90.90	298.24	470	32	590	41	550	38	690	48		
					0.562	14.3	224.71	102.18	335.25	530	37	670	46	620	43	780	54		
					0.625	15.9	249.48	113.43	372.14	590	41	740	51	690	48	860	59		
			0.688		17.5	274.16	124.63	408.89	650	45	810	56	760	52	950	65			
			0.750		19.1	298.37	135.79	445.52	710	49	890	61	830	57	1040	72			
			0.812		20.6	322.50	146.23	479.75	770	53	960	66	900	62	1120	77			
			0.875		22.2	346.93	157.32	516.14	830	57	1040	72	970	67	1210	83			
			0.938		23.8	371.28	168.37	552.40	890	61	1110	76	1040	72	1300	90			
			1.000		25.4	395.16	179.38	588.53	950	65	1180	81	1110	76	1380	95			
			40	40.000	1016.0	STD	0.312	7.9	132.25	59.86	196.39	280	19	350	24	330	23	410	28
							0.344	8.7	145.69	65.87	216.11	310	21	390	27	360	25	450	31
							0.375	9.5	158.70	71.87	235.79	340	23	420	29	390	27	490	34
0.406	10.3	171.68					77.86	255.45	370	25	460	32	430	30	530	37			
0.438	11.1	185.06					83.84	275.07	390	27	490	34	460	32	570	39			
0.469	11.9	198.01					89.81	294.66	420	29	530	37	490	34	620	43			
XS	0.500	12.7					210.93	95.77	314.22	450	31	560	39	520	36	660	45		
	0.562	14.3					236.71	107.67	353.24	510	35	630	43	590	41	740	51		
	0.625	15.9					262.83	119.52	392.13	560	39	700	48	660	45	820	56		
	0.688	17.5				288.86	131.34	430.90	620	43	770	53	720	50	900	62			
	0.750	19.1				314.39	143.12	469.55	680	47	840	58	790	54	980	68			
	0.812	20.6				339.84	154.13	505.66	730	50	910	63	850	59	1070	74			
	0.875	22.2				365.62	165.83	544.06	790	54	980	68	920	63	1150	79			
	0.938	23.8				391.32	177.49	582.33	840	58	1060	73	980	68	1230	85			
	1.000	25.4				416.52	189.12	620.48	900	62	1120	77	1050	72	1310	90			
42	42.000	1067.0				STD	0.344	8.7	153.04	69.20	227.05	290	20	370	25	340	23	430	30
							0.375	9.5	166.71	75.51	247.74	320	22	400	28	380	26	470	32
							0.406	10.3	180.35	81.81	268.40	350	24	430	30	410	28	510	35
			0.438	11.1	194.42		88.10	289.03	380	26	470	32	440	30	550	38			
			0.469	11.9	208.03		94.37	309.62	400	28	500	34	470	32	590	41			
			XS	0.500	12.7		221.61	100.64	330.19	430	30	540	37	500	34	620	43		
				0.562	14.3		248.72	113.15	371.22	480	33	600	41	560	39	700	48		
				0.625	15.9		276.18	125.62	412.13	540	37	670	46	620	43	780	54		
				0.688	17.5		303.55	138.05	452.91	590	41	740	51	690	48	860	59		
				0.750	19.1	330.41	150.44	493.57	640	44	800	55	750	52	940	65			
				0.812	20.6	357.19	162.02	531.57	700	48	870	60	810	56	1020	70			

Test pressure							
X42	X46	X52	X56	X60	X65	X70	X80
psi	psi	psi	psi	psi	psi	psi	psi
620	680	770	830	890	960	1030	1180
680	750	850	910	980	1060	1140	1300
750	820	920	990	1070	1150	1240	1420
810	880	1000	1080	1150	1250	1350	1540
870	950	1080	1160	1240	1350	1450	1660
930	1020	1160	1240	1330	1440	1560	1780
990	1090	1230	1330	1420	1540	1660	1890
1120	1220	1380	1490	1600	1730	1860	2130
1240	1360	1540	1560	1780	1920	2070	2370
1370	1500	1690	1830	1960	2120	2280	2610
1490	1630	1850	1990	2130	2310	2490	2840
1620	1770	2000	2150	2310	2500	2690	3000
1740	1910	2160	2320	2490	2690	2900	3000
1870	2040	2310	2490	2670	2890	3000	3000
1990	2180	2460	2650	2840	3000	3000	3000
2110	2310	2620	2820	3000	3000	3000	3000
2240	2450	2770	2980	3000	3000	3000	3000
2360	2590	2930	3000	3000	3000	3000	3000
2490	2720	3000	3000	3000	3000	3000	3000
590	650	730	790	840	910	980	1120
650	710	800	870	930	1010	1080	1240
710	780	880	940	1010	1100	1180	1350
770	840	950	1020	1100	1190	1280	1460
830	910	1020	1100	1180	1280	1380	1580
890	970	1100	1180	1270	1370	1480	1690
940	1040	1170	1260	1350	1460	1580	1800
1060	1160	1320	1420	1520	1640	1770	2020
1180	1290	1460	1580	1690	1830	1970	2250
1300	1420	1610	1730	1860	2010	2170	2480
1420	1550	1760	1890	2020	2190	2360	2700
1530	1680	1900	2050	2190	2380	2560	2920
1650	1810	2050	2200	2360	2560	2760	3000
1770	1940	2190	2360	2530	2740	2950	3000
1890	2070	2340	2520	2700	2920	3000	3000
2010	2200	2490	2680	2870	3000	3000	3000
2130	2330	2630	2830	3000	3000	3000	3000
2250	2460	2780	2990	3000	3000	3000	3000
2360	2590	2930	3000	3000	3000	3000	3000
620	680	770	830	880	960	1030	1180
680	740	840	900	960	1040	1130	1290
730	800	900	970	1040	1130	1220	1390
790	860	980	1050	1130	1220	1310	1500
840	920	1050	1130	1210	1310	1410	1610
900	990	1110	1200	1290	1390	1500	1710
1010	1110	1250	1350	1450	1570	1690	1930
1120	1230	1390	1500	1610	1740	1880	2140
1240	1360	1530	1650	1770	1920	2060	2360
1350	1480	1670	1800	1930	2090	2250	2570
1460	1600	1810	1950	2090	2260	2440	2780

API 5L

Nominal size	Outside diameter		Wall thickness			Weight			Test pressure																
									A				B												
									STD		ALT		STD		ALT										
in.	mm	Grade	in.	mm	lb/ft	kg/ft	kg/m	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100										
42	42.000	1067.0				384.31	174.34	571.98	750	52	940	65	880	61	1090	75									
									800	55	1000	69	940	65	1170	81									
									860	59	1070	74	1000	69	1250	86									
									910	63	1140	79	1060	73	1330	92									
									960	66	1210	83	1130	78	1410	97									
									1020	70	1270	88	1190	82	1480	102									
									1070	74	1340	92	1250	86	1560	107									
44	44.000	1118.0				160.39	72.54	237.99	280	19	350	24	330	23	410	28									
									310	21	380	26	360	25	450	31									
									330	23	420	29	390	27	480	33									
									360	25	450	31	420	29	520	36									
									380	26	480	33	450	31	560	39									
									410	28	510	35	480	33	600	41									
									460	32	570	39	540	37	670	46									
									510	35	640	44	600	41	750	52									
									560	39	700	48	660	45	820	56									
									610	42	770	53	720	50	890	61									
									660	45	830	57	780	54	970	67									
									720	50	890	61	840	58	1040	72									
									770	53	960	66	900	62	1120	77									
									820	56	1020	70	950	65	1190	82									
									870	60	1090	75	1010	70	1270	88									
									920	63	1150	79	1070	74	1340	92									
									970	67	1210	83	1130	78	1420	98									
									1020	70	1280	88	1190	82	1490	103									
									46	46.000	1168.0				167.74	75.81	248.72	270	19	240	23	310	21	390	27
																		290	20	370	25	340	23	430	30
																		320	22	400	28	370	25	460	32
																		340	23	430	30	400	28	500	34
370	25	460	32	430	30	540	37																		
390	27	490	34	460	32	570	39																		
440	30	550	38	510	35	640	44																		
490	34	610	42	570	39	710	49																		
540	37	670	46	630	43	790	54																		
590	41	730	50	680	47	860	59																		
640	44	790	54	740	51	930	64																		
680	47	860	59	800	55	1000	69																		
730	50	920	63	860	59	1070	74																		
780	54	980	68	910	63	1140	79																		
830	57	1040	72	970	67	1210	83																		
880	61	1100	76	1030	71	1280	88																		
930	64	1160	80	1080	74	1360	94																		
980	68	1220	84	1140	79	1430	99																		
48	48.000	1219.0				175.08	79.14	259.66										260	18	320	22	300	21	380	26
																		280	19	350	24	330	23	410	28
																		300	21	380	26	360	25	440	30
																		330	23	410	28	380	26	480	33
									350	24	440	30	410	28	510	35									
									380	26	470	32	440	30	550	38									

Test pressure							
X42	X46	X52	X56	X60	X65	X70	X80
psi	psi	psi	psi	psi	psi	psi	psi
1580	1720	1950	2100	2250	2440	2630	3000
1690	1850	2090	2250	2410	2610	2810	3000
1800	1970	2330	2400	2570	2790	3000	3000
1910	2090	2370	2550	2730	2960	3000	3000
2030	2220	2510	2700	2890	3000	3000	3000
2140	2340	2650	2850	3000	3000	3000	3000
2250	2460	2790	3000	3000	3000	3000	3000
590	650	730	790	840	910	990	1130
640	710	800	860	920	1000	1070	1230
700	760	860	930	1000	1080	1160	1330
750	820	930	1000	1080	1160	1250	1430
810	880	1000	1070	1150	1250	1340	1530
860	940	1060	1150	1230	1330	1430	1640
970	1060	1200	1290	1380	1490	1610	1840
1070	1180	1330	1430	1530	1660	1790	2050
1180	1290	1460	1580	1690	1830	1970	2250
1290	1410	1600	1720	1840	1990	2150	2450
1400	1530	1730	1860	1990	2160	2330	2600
1500	1650	1860	2000	2150	2330	2510	2860
1610	1770	2000	2150	2300	2490	2690	3000
1720	1880	2130	2290	2450	2660	2860	3000
1820	2000	2260	2430	2610	2820	3000	3000
1930	2120	2390	2580	2760	2990	3000	3000
2040	2240	2530	2720	2920	3000	3000	3000
2150	2350	2660	2860	3000	3000	3000	3000
570	620	700	750	810	870	940	1080
620	680	760	820	880	950	1030	1170
670	730	830	890	950	1030	1110	1270
720	790	890	960	1030	1110	1200	1370
770	840	950	1030	1100	1190	1280	1470
820	900	1020	1100	1170	1270	1370	1570
920	1010	1140	1230	1320	1430	1540	1760
1030	1120	1270	1370	1470	1590	1710	1960
1130	1240	1400	1510	1620	1750	1880	2150
1230	1350	1530	1640	1760	1910	2050	2350
1330	1460	1650	1780	1910	2070	2220	2540
1440	1580	1780	1920	2050	2230	2400	2740
1540	1690	1910	2060	2200	2390	2570	2940
1640	1800	2030	2190	2350	2540	2740	3000
1750	1910	2160	2330	2490	2700	2910	3000
1850	2020	2290	2470	2640	2860	3000	3000
1950	2140	2420	2600	2790	3000	3000	3000
2050	2250	2540	2740	2930	3000	3000	3000
540	590	670	720	770	840	900	1030
590	650	730	790	840	910	980	1130
640	700	790	850	910	990	1070	1220
690	760	850	920	990	1070	1150	1310
740	810	910	980	1060	1140	1230	1410
790	860	980	1050	1120	1220	1310	1500



API 5L

Nominal size	Outside diameter		Wall thickness		Weight			Test pressure													
								A				B									
								STD		ALT		STD		ALT							
in.	in.	mm	Grade	in.	mm	lb/ft	kg/ft	kg/m	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100					
48	48.000	1219.0			0.562	14.3	284.73	129.49	424.82	420	29	530	37	490	34	610	42				
					0.625	15.9	316.23	143.78	471.73	470	32	590	41	550	38	680	47				
					0.688	17.5	347.64	158.04	518.51	520	36	640	44	600	41	750	52				
					0.750	19.1	378.47	172.26	565.16	560	39	700	48	660	45	820	56				
					0.812	20.6	409.22	185.56	608.78	610	42	760	52	710	49	890	61				
					0.875	22.2	440.38	199.70	655.19	660	45	820	56	770	53	960	66				
					0.938	23.8	471.46	213.81	701.47	700	48	880	61	820	56	1030	71				
					1.000	25.4	501.96	227.88	747.63	750	52	940	65	880	61	1090	75				
					1.062	27.0	532.38	241.91	793.66	800	55	1000	69	930	64	1160	80				
					1.125	28.6	563.20	255.90	839.56	840	58	1050	72	980	68	1230	85				
					1.188	30.2	593.94	269.85	885.34	890	61	1110	76	1040	72	1300	90				
					1.250	31.8	624.11	283.77	930.99	940	65	1170	81	1090	75	1370	94				
					52	52.000	1321.0	STD	0.375	9.5	206.76	93.65	307.25	260	18	320	22	300	21	380	26
									0.406	10.3	223.72	101.47	332.92	280	19	350	24	330	23	410	28
0.438	11.1	241.20	109.29	358.55					300	21	380	26	350	24	440	30					
0.469	11.9	258.11	117.09	384.16					320	22	410	28	380	26	470	32					
0.500	12.7	275.01	124.89	409.74					350	24	430	30	400	28	500	34					
0.562	14.3	308.74	140.45	460.79					390	27	490	34	450	31	570	39					
0.625	15.9	342.93	155.97	511.72					430	30	540	37	500	34	630	43					
0.688	17.5	377.03	171.46	562.53					480	33	600	41	560	39	690	48					
XS	0.750	19.1	410.51	186.90				613.20	520	36	650	45	610	42	760	52					
	0.812	20.6	443.91	201.35				660.60	560	39	700	48	660	45	820	56					
	0.875	22.2	477.76	216.72				711.03	610	42	760	52	710	49	880	61					
	0.938	23.8	511.53	232.06				761.34	650	45	810	56	760	52	950	65					
	1.000	25.4	544.68	247.35				811.52	690	48	870	60	810	56	1010	70					
	1.062	27.0	577.75	262.61				861.57	740	51	920	63	860	59	1070	74					
	1.125	28.6	611.26	277.83				911.50	780	54	970	67	910	63	1140	79					
	1.188	30.2	644.69	293.00				961.30	820	56	1030	71	960	66	1200	83					
1.250	31.8	677.51	308.15	1010.98	870	60	1080	74	1010	70	1260	87									
56	56.000	1422.0		0.375	9.5	222.78	100.86	330.91	240	17	300	21	280	19	350	24					
				0.406	10.3	241.06	109.29	358.57	260	18	330	23	300	21	380	26					
				0.438	11.1	259.90	117.71	386.20	280	19	350	24	330	23	410	28					
				0.469	11.9	278.15	126.13	413.80	300	21	380	26	350	24	440	30					
				0.500	12.7	296.37	134.53	441.37	320	22	400	28	380	26	470	32					
				0.562	14.3	332.75	151.31	496.41	360	25	450	31	420	29	530	37					
				0.625	15.9	369.63	168.04	551.32	400	28	500	34	470	32	590	41					
				0.688	17.5	406.42	184.74	606.11	440	30	550	38	520	36	650	45					
				0.750	19.1	442.55	201.40	660.77	480	33	600	41	560	39	700	48					
				0.812	20.6	478.60	216.99	711.91	520	36	650	45	610	42	760	52					
				0.875	22.2	515.14	233.57	766.32	560	39	700	48	660	45	820	56					
				0.938	23.8	551.60	250.12	820.61	600	41	750	52	700	48	880	61					
				1.000	25.4	587.40	266.63	874.78	640	44	800	55	750	52	940	65					
				1.062	27.0	623.12	283.10	928.82	680	47	850	59	800	55	1000	69					
				1.125	28.6	659.32	299.54	982.73	720	50	900	62	840	58	1050	72					
				1.188	30.2	695.45	315.93	1036.52	760	52	950	65	890	61	1110	76					
1.250	31.8	730.91	332.29	1090.18	800	53	1000	69	940	65	1170	81									
60	60.000	1524.0		0.375	9.5	238.80	108.41	355.69	230	16	280	19	260	18	330	23					
				0.406	10.3	258.40	117.31	384.89	240	17	300	21	280	19	360	25					
				0.438	11.1	278.62	126.49	415.00	260	18	330	23	310	21	380	26					
				0.469	11.9	298.19	135.38	444.15	280	19	350	24	330	23	410	28					

Test pressure							
X42	X46	X52	X56	X60	X65	X70	X80
psi	psi	psi	psi	psi	psi	psi	psi
890	970	1100	1180	1260	1370	1480	1690
980	1080	1220	1310	1410	1520	1640	1880
1080	1190	1340	1440	1550	1680	1810	2060
1180	1290	1460	1580	1690	1830	1970	2250
1280	1400	1580	1710	1830	1980	2130	2440
1380	1510	1710	1840	1970	2130	2300	2630
1480	1620	1830	1970	2110	2290	2460	2810
1580	1720	1950	2100	2250	2440	2630	3000
1670	1830	2070	2230	2390	2590	2790	3000
1770	1940	2190	2360	2530	2740	2950	3000
1870	2050	2320	2490	2670	2900	3000	3000
1970	2160	2440	2620	2810	3000	3000	3000
550	600	680	730	780	840	910	1040
590	650	730	790	840	910	980	1120
640	700	790	850	910	990	1060	1210
680	750	840	910	970	1060	1140	1300
730	800	900	970	1040	1130	1210	1380
820	890	1010	1090	1170	1260	1360	1560
910	1000	1130	1210	1300	1410	1510	1730
1000	1100	1240	1330	1430	1550	1670	1910
1090	1190	1350	1450	1560	1690	1820	2080
1180	1290	1460	1570	1690	1830	1970	2250
1270	1390	1580	1700	1820	1970	2120	2420
1360	1490	1690	1820	1950	2110	2270	2600
1450	1590	1800	1940	2080	2250	2420	2770
1540	1690	1910	2060	2210	2390	2570	2940
1640	1790	2030	2180	2340	2530	2730	3000
1730	1890	2140	2300	2470	2670	2880	3000
1820	1990	2250	2420	2600	2810	3000	3000
510	550	630	670	720	780	840	960
550	600	680	730	780	850	910	1040
590	650	730	790	840	920	990	1130
630	690	780	840	900	980	1060	1210
680	740	840	900	960	1040	1130	1290
760	830	940	1010	1080	1170	1260	1450
840	920	1040	1120	1210	1310	1410	1610
930	1020	1150	1240	1330	1440	1550	1770
1010	1110	1250	1350	1450	1570	1690	1930
1100	1200	1360	1460	1570	1700	1830	2090
1180	1290	1460	1570	1690	1830	1970	2250
1270	1390	1570	1690	1810	1960	2110	2410
1350	1480	1670	1800	1930	2090	2250	2570
1430	1570	1780	1910	2050	2220	2390	2730
1520	1660	1880	2020	2170	2350	2530	2890
1600	1760	1990	2140	2290	2480	2670	3000
1690	1850	2090	2250	2410	2610	2810	3000
470	520	590	630	680	730	790	900
510	560	630	680	730	790	850	970
550	600	680	740	790	850	920	1050
590	650	730	790	840	910	980	1130

API 5L

Nominal size	Outside diameter		Wall thickness		Weight			Test pressure								
								A				B				
								STD		ALT		STD		ALT		
in.	in.	mm	Grade	in.	mm	lb/ft	kg/ft	kg/m	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100
60	60.000	1524.0		0.500	12.7	317.73	144.26	473.31	300	21	380	26	350	24	440	30
				0.562	14.3	356.76	162.27	532.38	340	23	420	29	390	27	490	34
				0.625	15.9	396.33	180.23	591.32	380	26	470	32	440	30	550	38
				0.688	17.5	435.81	198.16	650.13	410	28	520	36	480	33	600	41
				0.750	19.1	474.59	216.05	708.82	450	31	560	39	530	37	660	45
				0.812	20.6	513.29	232.78	763.72	490	34	610	42	570	39	710	49
				0.875	22.2	552.52	250.59	822.16	530	37	660	45	610	42	770	53
				0.938	23.8	591.67	268.37	880.48	560	39	700	48	660	45	820	56
				1.000	25.4	630.12	286.11	938.67	600	41	750	52	700	48	880	61
				1.062	27.0	668.48	303.80	996.73	640	44	800	55	740	51	930	64
				1.125	28.6	707.38	321.46	1054.67	680	47	840	58	790	54	980	68
				1.188	30.2	746.20	339.08	1112.48	710	49	890	61	830	57	1040	72
				1.250	31.8	784.31	356.67	1170.17	750	52	940	65	880	61	1090	75
64	64.000	1626.0		0.375	9.5	254.82	115.43	378.70	210	14	260	18	250	17	310	21
				0.406	10.3	275.75	125.08	410.38	230	16	290	20	270	19	330	23
				0.438	11.1	297.33	134.73	442.04	250	17	310	21	290	20	360	25
				0.469	11.9	318.22	144.37	473.66	260	18	330	23	310	21	380	26
				0.500	12.7	339.09	154.00	505.26	280	19	350	24	330	23	410	28
				0.562	14.3	380.76	173.23	568.35	320	22	400	28	370	25	460	32
				0.625	15.9	423.03	192.42	631.31	350	24	440	30	410	28	510	35
				0.688	17.5	465.21	211.58	694.15	390	27	480	33	450	31	560	39
				0.750	19.1	506.63	230.69	756.86	420	29	530	37	490	34	620	43
				0.812	20.6	547.98	248.58	815.54	460	32	570	39	530	37	670	46
				0.875	22.2	589.90	267.61	878.00	490	34	620	43	570	39	720	50
				0.938	23.8	631.74	286.62	940.34	530	37	660	45	620	43	770	53
				1.000	25.4	672.84	305.58	1002.56	560	39	700	48	660	45	820	56
				1.062	27.0	713.85	324.51	1064.65	600	41	750	52	700	48	870	60
				1.125	28.6	755.44	343.39	1126.61	630	43	790	54	740	51	920	63
				1.188	30.2	796.95	362.24	1188.44	670	46	840	58	780	54	970	67
1.250	31.8	837.71	381.05	1250.15	700	48	880	61	820	56	1030	71				
68	68.000	1727.0		0.469	11.9	338.26	153.41	503.30	250	17	310	21	290	20	360	25
				0.500	12.7	360.45	163.64	536.89	260	18	330	23	310	21	390	27
				0.562	14.3	404.77	184.09	603.96	300	21	370	25	350	24	430	30
				0.625	15.9	449.73	204.49	670.91	330	23	410	28	390	27	480	33
				0.688	17.5	494.60	224.86	737.73	360	25	460	32	420	29	530	37
				0.750	19.1	538.67	245.19	804.43	400	28	500	34	460	32	580	40
				0.812	20.6	582.66	264.21	866.84	430	30	540	37	500	34	630	43
				0.875	22.2	627.28	284.47	933.30	460	32	580	40	540	37	680	47
				0.938	23.8	671.82	304.68	999.62	500	34	620	43	580	40	720	50
				1.000	25.4	715.56	324.86	1065.82	530	37	660	45	620	43	770	53
				1.062	27.0	759.22	345.00	1131.89	560	39	700	48	660	45	820	56
				1.125	28.6	803.50	365.10	1197.84	600	41	740	51	690	48	870	60
				1.188	30.2	847.70	385.16	1263.66	630	43	790	54	730	50	920	63
				1.250	31.8	891.11	405.19	1329.36	660	45	830	57	770	53	970	67

Test pressure							
X42	X46	X52	X56	X60	X65	X70	X80
psi	psi	psi	psi	psi	psi	psi	psi
630	690	780	840	900	980	1050	1200
710	780	880	940	1010	1100	1180	1350
790	860	980	1050	1130	1220	1310	1500
870	950	1070	1160	1240	1340	1440	1650
950	1030	1170	1260	1350	1460	1580	1800
1020	1120	1270	1360	1460	1580	1710	1950
1100	1210	1370	1470	1580	1710	1840	2100
1180	1290	1460	1580	1690	1830	1970	2250
1260	1380	1560	1680	1800	1950	2100	2400
1340	1470	1660	1780	1910	2070	2230	2550
1420	1550	1760	1890	2030	2190	2360	2700
1500	1640	1850	2000	2140	2320	2490	2850
1580	1720	1950	2100	2250	2440	2630	3000
440	490	550	590	630	690	740	840
480	530	590	640	690	740	800	910
520	570	640	690	740	800	860	990
550	610	690	740	790	860	920	1060
590	650	730	790	840	910	980	1130
660	730	820	890	950	1030	1110	1260
740	810	910	980	1050	1140	1230	1410
810	890	1010	1080	1160	1260	1350	1550
890	970	1100	1180	1270	1370	1480	1690
960	1050	1190	1280	1370	1480	1600	1830
1030	1130	1280	1380	1480	1600	1720	1970
1110	1210	1370	1480	1580	1710	1850	2110
1180	1290	1460	1570	1690	1830	1970	2250
1250	1370	1550	1670	1790	1940	2090	2390
1330	1460	1650	1770	1900	2060	2210	2530
1400	1540	1740	1870	2000	2170	2340	2670
1480	1620	1830	1970	2110	2290	2460	2810
520	570	650	700	740	810	870	990
560	610	690	740	790	860	930	1060
620	680	770	830	890	970	1040	1190
690	760	860	930	990	1080	1160	1320
760	840	950	1020	1090	1180	1270	1460
830	910	1030	1110	1190	1290	1390	1590
900	990	1120	1200	1290	1400	1500	1720
970	1070	1200	1300	1390	1510	1620	1850
1040	1140	1290	1390	1490	1610	1740	1990
1110	1220	1380	1480	1590	1720	1850	2120
1180	1290	1460	1570	1690	1830	1970	2250
1250	1370	1550	1670	1790	1940	2080	2380
1320	1450	1640	1760	1890	2040	2200	2520
1390	1520	1720	1850	1990	2150	2320	2650

API 5L

Nominal size	Outside diameter		Wall thickness		Weight			Test pressure								
								A				B				
								STD		ALT		STD		ALT		
in.	in.	mm	Grade	in.	mm	lb/ft	kg/ft	kg/m	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100	psi	kpa × 100
72	72.000	1829.0		0.500	12.7	381.81	173.38	568.83	250	17	310	21	290	20	360	25
				0.562	14.3	428.78	195.05	639.93	280	19	350	24	330	23	410	28
				0.625	15.9	476.43	216.69	710.91	310	21	390	27	360	25	460	32
				0.688	17.5	523.99	238.28	781.75	340	23	430	30	400	28	500	34
				0.750	19.1	570.71	259.83	852.47	380	26	470	32	440	30	550	38
				0.812	20.6	617.35	280.01	918.66	410	28	510	35	470	32	590	41
				0.875	22.2	664.66	301.49	989.14	440	30	550	38	510	35	640	44
				0.938	23.8	711.89	322.93	1059.49	470	32	590	41	550	38	680	47
				1.000	25.4	758.28	344.33	1129.69	500	34	630	43	580	40	730	50
				1.062	27.0	804.59	365.70	1199.81	530	37	660	45	620	43	770	53
				1.125	28.6	851.56	387.03	1269.78	560	39	700	48	660	45	820	56
1.188	30.2	898.45	408.32	1339.62	590	41	740	51	690	48	870	60				
1.250	31.8	944.51	429.57	1409.34	630	43	780	54	730	50	910	63				
76	76.000	1930.0		0.500	12.7	403.17	183.02	600.46	240	17	300	21	280	19	350	24
				0.562	14.3	452.79	205.91	675.55	270	19	330	23	310	21	390	27
				0.625	15.9	503.13	228.76	750.51	300	21	370	25	350	24	430	30
				0.688	17.5	553.38	251.56	825.34	330	23	410	28	380	26	480	33
				0.750	19.1	602.75	274.34	900.05	360	25	440	30	410	28	520	36
				0.812	20.6	652.04	295.65	969.97	380	26	480	33	450	31	560	39
				0.875	22.2	702.04	318.34	1044.43	410	28	520	36	480	33	600	41
				0.938	23.8	751.96	341.00	1118.76	440	30	560	39	520	36	650	45
				1.000	25.4	801.00	363.62	1192.97	470	32	590	41	550	38	690	48
				1.062	27.0	849.96	386.20	1267.06	500	34	630	43	590	41	730	50
				1.125	28.6	899.62	408.74	1341.02	530	37	670	46	620	43	780	54
1.188	30.2	949.20	431.24	1414.84	560	39	700	48	660	45	820	56				
1.250	31.8	997.91	453.71	1488.55	590	41	740	51	690	48	860	59				
80	80.000	2032.0		0.562	14.3	476.80	216.87	711.52	250	17	320	22	300	21	370	25
				0.625	15.9	529.83	240.94	790.50	280	19	350	24	330	23	410	28
				0.688	17.5	582.77	264.98	869.36	310	21	390	27	360	25	450	31
				0.750	19.1	634.79	288.98	948.09	340	23	420	29	390	27	490	34
				0.812	20.6	686.73	311.44	1021.78	370	25	460	32	430	30	530	37
				0.875	22.2	739.42	335.36	1100.27	390	27	490	34	460	32	570	39
				0.938	23.8	792.03	359.25	1178.63	420	29	530	37	490	34	620	43
				1.000	25.4	843.72	383.09	1256.86	450	31	560	39	530	37	660	45
				1.062	27.0	895.33	406.90	1334.97	480	33	600	41	560	39	700	48
				1.125	28.6	947.68	430.67	1412.95	510	35	630	43	590	41	740	51
				1.188	30.2	999.95	454.40	1490.80	530	37	670	46	620	43	780	54
1.250	31.8	1051.31	478.09	1568.53	560	39	700	48	660	45	820	56				

Test pressure							
X42	X46	X52	X56	X60	X65	X70	X80
psi	psi	psi	psi	psi	psi	psi	psi
530	570	650	700	750	810	880	1000
590	650	730	790	840	910	980	1120
660	720	810	870	940	1020	1090	1250
720	790	890	960	1030	1120	1200	1380
790	860	980	1050	1130	1220	1310	1500
850	930	1060	1140	1220	1320	1420	1620
920	1010	1140	1220	1310	1420	1530	1750
980	1080	1220	1310	1410	1520	1640	1880
1050	1150	1300	1400	1500	1630	1750	2000
1120	1220	1380	1490	1590	1730	1860	2120
1180	1290	1460	1570	1690	1830	1970	2250
1250	1370	1540	1660	1780	1930	2080	2380
1310	1440	1630	1750	1880	2030	2190	2500
500	540	620	660	710	770	830	950
560	610	690	750	800	870	930	1060
620	680	770	830	890	960	1040	1180
680	750	850	910	980	1060	1140	1300
750	820	920	990	1070	1150	1240	1420
810	880	1000	1080	1150	1250	1350	1540
870	950	1080	1160	1240	1350	1450	1660
930	1020	1160	1240	1330	1440	1560	1780
990	1090	1230	1330	1420	1540	1660	1890
1060	1160	1310	1410	1510	1630	1760	2010
1120	1230	1390	1490	1600	1730	1870	2130
1180	1290	1460	1580	1690	1830	1970	2250
1240	1360	1540	1660	1780	1920	2070	2370
530	580	660	710	760	820	890	1010
590	650	730	790	840	910	980	1130
650	710	800	870	930	1010	1080	1240
710	780	880	940	1010	1100	1180	1350
770	840	950	1020	1100	1190	1280	1460
830	910	1020	1100	1180	1280	1380	1580
890	970	1100	1180	1270	1370	1480	1690
950	1030	1170	1260	1350	1460	1580	1800
1000	1100	1240	1340	1430	1550	1670	1910
1060	1160	1320	1420	1520	1650	1770	2030
1120	1230	1390	1500	1600	1740	1870	2140
1180	1290	1460	1570	1690	1830	1970	2250



BS 1387

Classification	Nominal Bore		Outside diameter(black pipes)				Wall thickness		Nominal weight(black pipes)					
			Max.		Min.				Plain end			Screwed & socketed		
	in.	mm	in.	mm	in.	mm	in.	mm	lb/ft	kg/ft	kg/m	lb/ft	kg/ft	kg/m
Light weight pipes (L)	3/8	10	0.673	17.1	0.657	16.7	0.071	1.8	0.450	0.204	0.670	0.454	0.206	0.676
	1/2	15	0.843	21.4	0.827	21.0	0.079	2.0	0.636	0.289	0.947	0.642	0.291	0.956
	3/4	20	1.059	26.9	1.039	26.4	0.091	2.3	0.927	0.421	1.38	0.934	0.424	1.39
	1	25	1.331	33.8	1.307	33.2	0.102	2.6	1.331	0.604	1.98	1.344	0.610	2.00
	1 1/4	32	1.673	42.5	1.650	41.9	0.102	2.6	1.707	0.774	2.54	1.727	0.783	2.57
	1 1/2	40	1.906	48.4	1.882	47.8	0.114	2.9	2.170	0.985	3.23	2.197	0.997	3.27
	2	50	2.370	60.2	2.346	59.6	0.114	2.9	2.742	1.244	4.08	2.789	1.265	4.15
	2 1/2	65	2.992	76.0	2.961	75.2	0.126	3.2	3.837	1.740	5.71	3.918	1.777	5.83
	3	80	3.492	88.7	3.461	87.9	0.126	3.2	4.516	2.048	6.72	4.630	2.100	6.89
Medium weight pipes (M)	3/8	10	0.685	17.4	0.661	16.8	0.091	2.3	0.564	0.256	0.839	0.568	0.258	0.845
	1/2	15	0.854	21.7	0.831	21.1	0.102	2.6	0.813	0.369	1.21	0.820	0.372	1.22
	3/4	20	1.071	27.2	1.047	26.6	0.102	2.6	1.048	0.475	1.56	1.055	0.479	1.57
	1	25	1.346	34.2	1.315	33.4	0.126	3.2	1.619	0.735	2.41	1.633	0.741	2.43
	1 1/4	32	1.689	42.9	1.657	42.1	0.126	3.2	2.083	0.945	3.10	2.103	0.954	3.13
	1 1/2	40	1.921	48.8	1.890	48.0	0.126	3.2	2.399	1.088	3.57	2.426	1.100	3.61
	2	50	2.394	60.8	2.354	59.8	0.142	3.6	3.380	1.533	5.03	3.427	1.554	5.10
	2 1/2	65	3.016	76.6	2.969	75.4	0.142	3.6	4.321	1.960	6.43	4.401	1.996	6.55
	3	80	3.524	89.5	3.469	88.1	0.157	4.0	5.624	2.551	8.37	5.739	2.603	8.54
	4	100	4.524	114.9	4.461	113.3	0.177	4.5	8.198	3.719	12.2	8.400	3.810	12.5
Heavy weight pipes (H)	3/8	10	0.685	17.4	0.661	16.8	0.114	2.9	0.685	0.311	1.02	0.692	0.314	1.03
	1/2	15	0.854	21.7	0.831	21.1	0.126	3.2	0.968	0.439	1.44	0.974	0.442	1.45
	3/4	20	1.071	27.2	1.047	26.6	0.126	3.2	1.257	0.570	1.87	1.263	0.573	1.88
	1	25	1.346	34.2	1.315	33.4	0.157	4.0	1.976	0.896	2.94	1.989	0.902	2.96
	1 1/4	32	1.689	42.9	1.657	42.1	0.157	4.0	2.553	1.158	3.80	2.574	1.167	3.83
	1 1/2	40	1.921	48.8	1.890	48.0	0.157	4.0	2.943	1.335	4.38	2.970	1.347	4.42
	2	50	2.394	60.8	2.354	59.8	0.177	4.5	4.160	1.887	6.19	4.207	1.908	6.26
	2 1/2	65	3.016	76.6	2.969	75.4	0.177	4.5	5.329	2.417	7.93	5.409	2.454	8.05
	3	80	3.524	89.5	3.469	88.1	0.197	5.0	6.920	3.139	10.3	7.056	3.200	10.5
	4	100	4.524	114.9	4.461	113.3	0.213	5.4	9.744	4.420	14.5	9.945	4.511	14.8
5	125	5.535	140.6	5.461	138.7	0.213	5.4	12.028	5.456	17.9	12.364	5.608	18.4	
6	150	6.539	166.1	6.461	164.1	0.213	5.4	14.312	6.492	21.3	14.716	6.675	21.9	

BS 1387-Commercial Steel Tubes (HYUNDAI HYSCO THIN WALL TUBES)

Classification	Nominal Bore		Outside diameter(black pipes)				Wall thickness		Nominal weight(black pipes)			
			Max.		Min.				Plain end		Screwed & socketed	
	in.	mm	in.	mm	in.	mm	in.	mm	lb/ft	kg/m	lb/ft	kg/m
1/2	15	0.841	21.4	0.825	21.0	0.075	1.9	0.607	0.904	0.614	0.914	
3/4	20	1.059	26.9	1.041	26.4	0.083	2.1	0.854	1.272	0.866	1.284	
1	25	1.328	33.8	1.309	33.2	0.091	2.3	1.19	1.77	1.21	1.787	
1 1/4	32	1.670	42.5	1.650	41.9	0.091	2.3	1.52	2.26	1.54	2.280	
1 1/2	40	1.903	48.4	1.882	47.8	0.099	2.5	1.89	2.81	1.92	2.830	
2	50	2.370	60.2	2.347	59.6	0.103	2.6	2.46	3.67	2.51	3.693	
2 1/2	65	2.991	76.0	2.960	75.2	0.114	2.9	3.49	5.20	3.56	5.228	
3	80	3.491	88.7	3.460	87.9	0.114	2.9	4.10	6.11	4.21	6.136	
4	100	4.481	113.9	4.450	113.0	0.126	3.2	5.84	8.70	6.00	8.736	
5	125	5.534	140.6	5.459	138.7	0.177	4.5	10.07	15.00	10.38	15.103	
6	150	6.359	166.1	6.459	164.1	0.177	4.5	11.96	17.82	12.38	17.933	

API 2B

- » API 2B pipe is suitable for use in connection of welded offshore structures.
- » The purchaser shall specify the grade and quality of plate steel to be used.
- » Dimension (Outside diameter, thickness, length) are specified by purchaser.
- » Tolerance on roundness, straightness, circumference are determined by purchaser and API 2B requirements.
- » HYSCO produces API 2B pipe in accordance with API 2B and purchase requirements.

CONDUITS

Rigid steel conduits KS C8401 (JIS C8305)  
Heavy gauge

Size designation	Outside diameter	Tolerances on outside diameter	Wall thickness	weight	Effective length of threads(mm)	
	mm	mm	mm	kg/m	Max.	Min.
G16	21.0	±0.3	2.3	1.06	19	16
G22	26.5	±0.3	2.3	1.37	22	19
G28	33.3	±0.3	2.5	1.90	25	22
G36	41.9	±0.3	2.5	2.43	28	25
G42	47.8	±0.3	2.5	2.79	28	25
G54	59.6	±0.3	2.8	3.92	32	28
G70	75.2	±0.3	2.8	5.00	36	32
G82	87.9	±0.3	2.8	5.88	40	36
G92	100.7	±0.4	3.5	8.39	42	36
G104	113.4	±0.4	3.5	9.48	45	39

Light gauge

Size designation	Outside diameter	Tolerances on outside diameter	Wall thickness	weight	Effective length of threads(mm)	
	mm	mm	mm	kg/m	Max.	Min.
C19	19.1	±0.2	1.6	0.690	14	12
C25	25.4	±0.2	1.6	0.939	17	15
C31	31.8	±0.2	1.6	1.19	19	17
C39	38.1	±0.2	1.6	1.44	21	19
C51	50.8	±0.2	1.6	1.94	24	22
C63	63.5	±0.35	2.0	3.03	27	25
C75	76.2	±0.35	2.0	3.66	30	28

Threadless conduits

Size designation	Outside diameter	Tolerances on outside diameter	Wall thickness	weight
	mm	mm	mm	kg/m
E19	19.1	±0.15	1.2	0.530
E25	25.4	±0.15	1.2	0.716
E31	31.8	±0.15	1.4	1.05
E39	38.1	±0.15	1.4	1.27
E51	50.8	±0.15	1.4	1.71
E63	63.5	±0.25	1.6	2.44
E75	76.2	±0.25	1.8	3.30



UL 6-Rigid metal conduits

Size designation	Inside diameter		Outside diameter		Wall thickness		Length without socket		Minimum weight of 10 units with coupling	
	in.	mm	in.	mm	in.	mm	ft & in.	mm	PE	TC
3/8	0.493	12.52	0.675	17.15	0.091	2.31	9-11 <sup>1</sup> / <sub>2</sub>	3035	0.258	0.258
1/2	0.632	16.05	0.840	21.34	0.104	2.64	9-11 <sup>1</sup> / <sub>4</sub>	3030	0.371	0.376
3/4	0.836	21.23	1.050	26.67	0.107	2.72	9-11 <sup>1</sup> / <sub>4</sub>	3030	0.490	0.499
1	1.063	27.00	1.315	33.40	0.126	3.20	9-11	3025	0.726	0.739
1 <sup>1</sup> / <sub>4</sub>	1.394	35.41	1.660	42.16	0.133	3.38	9-11	3025	0.985	1.000
1 <sup>1</sup> / <sub>2</sub>	1.624	41.25	1.900	48.26	0.138	3.51	9-11	3025	1.181	1.200
2	2.083	52.91	2.375	60.33	0.146	3.71	9-11	3025	1.579	1.610
2 <sup>1</sup> / <sub>2</sub>	2.489	63.22	2.875	73.03	0.193	4.90	9-10 <sup>1</sup> / <sub>2</sub>	3010	2.059	2.590
3	3.090	78.49	3.500	88.90	0.205	5.21	9-10 <sup>1</sup> / <sub>2</sub>	3010	3.277	3.370
3 <sup>1</sup> / <sub>2</sub>	3.570	90.68	4.000	101.60	0.215	5.46	9-10 <sup>1</sup> / <sub>4</sub>	3005	3.946	4.100
4	4.050	102.87	4.500	114.30	0.225	5.72	9-10 <sup>1</sup> / <sub>4</sub>	3005	4.668	4.790
5	5.073	128.85	5.563	141.30	0.245	6.22	9-10	2995	6.315	6.510
6	6.093	154.76	6.625	168.28	0.266	6.76	9-10	2995	8.207	8.520

ANSI C80.1-Rigid steel conduits

Size designation	Inside diameter		Outside diameter		Wall thickness		Length without socket		Minimum weight of 10 units with coupling	
	in.	mm	in.	mm	in.	mm	ft & in.	m	lb	kg
3/8	0.493	12.5	0.675	17.1	0.091	2.31	9-11 <sup>1</sup> / <sub>2</sub>	3.04	51.5	23.36
1/2	0.632	16.1	0.840	21.3	0.104	2.64	9-11 <sup>1</sup> / <sub>4</sub>	3.03	79.0	35.83
3/4	0.836	21.2	1.050	26.7	0.107	2.72	9-11 <sup>1</sup> / <sub>4</sub>	3.03	105.0	47.63
1	1.063	27.0	1.315	33.4	0.126	3.20	9-11	3.02	153.0	69.40
1 <sup>1</sup> / <sub>4</sub>	1.394	35.4	1.660	42.2	0.133	3.38	9-11	3.02	201.0	91.17
1 <sup>1</sup> / <sub>2</sub>	1.624	41.2	1.900	48.3	0.138	3.51	9-11	3.02	249.0	112.95
2	2.083	52.9	2.375	60.3	0.146	3.71	9-11	3.02	332.0	150.59
2 <sup>1</sup> / <sub>2</sub>	2.489	63.2	2.875	73.0	0.193	4.90	9-10 <sup>1</sup> / <sub>2</sub>	3.01	527.0	239.04
3	3.090	78.5	3.500	88.9	0.205	5.21	9-10 <sup>1</sup> / <sub>2</sub>	3.01	682.6	309.63
3 <sup>1</sup> / <sub>2</sub>	3.570	90.7	4.000	101.6	0.215	5.46	9-10 <sup>1</sup> / <sub>4</sub>	3.00	831.0	376.94
4	4.050	102.9	4.500	114.3	0.225	5.72	9-10 <sup>1</sup> / <sub>4</sub>	3.00	972.3	441.04
5	5.073	128.9	5.563	141.3	0.245	6.22	9-10	3.00	1313.6	595.85
6	6.093	154.8	6.625	168.3	0.266	6.76	9-10	3.00	1745.3	791.67

Fence Tubings

Size	Outside diameter		Wall thickness		Weight of Plain Ends		
	mm	in.	mm	in.	lb/ft	kg/ft	kg/m
0.840	21.34	0.840	2.03	1.080	0.65	0.30	0.97
0.854	21.69	0.854	1.91	0.075	0.62	0.28	0.93
1.050	26.67	1.050	2.34	0.092	0.94	0.43	1.40
1.315	33.40	1.315	1.19	0.047	0.64	0.29	0.95
			1.40	0.055	0.74	0.34	1.10
			1.65	0.065	0.87	0.39	1.29
			1.75	0.069	0.92	0.42	1.37
			1.83	0.072	0.96	0.43	1.42
			20.1	0.079	1.04	0.47	1.55
			2.31	0.091	1.19	0.54	1.77
1.660	42.16	1.660	2.39	0.094	1.23	0.56	1.83
			2.64	0.104	1.36	0.62	2.02
			2.95	0.116	1.91	0.87	2.85
			1.40	0.055	0.84	0.37	1.20
			1.65	0.065	0.94	0.43	1.41
			1.75	0.069	1.11	0.50	1.65
			1.83	0.072	1.17	0.53	1.74
			2.01	0.079	1.22	0.55	1.82
			2.39	0.094	1.33	0.60	1.99
			2.64	0.104	1.57	0.71	2.34
1.900	48.26	1.900	2.95	0.116	1.73	0.78	2.57
			1.40	0.055	1.08	0.49	1.61
			1.65	0.065	1.27	0.58	1.89
			1.75	0.069	1.35	0.61	2.01
			1.83	0.072	1.41	0.64	2.10
			2.01	0.079	1.54	0.70	2.29
			2.39	0.094	1.81	0.82	2.70
			2.64	0.104	1.99	0.90	2.97
			2.95	0.116	2.21	1.00	3.29
			2.375	60.33	2.375	1.40	0.055
1.65	0.065	1.60				0.73	2.39
1.75	0.069	1.70				0.77	2.53
1.83	0.072	1.77				0.80	2.64
2.01	0.079	1.94				0.88	2.89
2.875	73.03	2.875	2.39	0.094	2.29	1.04	3.41
			2.64	0.104	2.52	1.14	3.76
			2.95	0.116	2.80	1.27	4.17
2.975	75.56	2.975	2.95	0.116	3.42	1.55	5.09
			5.16	0.203	5.79	2.63	8.63
3.000	76.2	3.000	3.25	0.128	3.89	1.76	5.77
3.475	88.27	3.475	2.11	0.083	2.59	1.17	3.84
			3.25	0.128	3.93	1.78	5.84
3.500	88.90	3.500	3.25	0.128	4.58	2.08	6.82
			3.05	0.120	4.33	1.96	6.43
4.000	101.6	4.000	3.25	0.128	4.61	2.09	6.86
			3.40	0.134	5.53	2.51	8.23
			3.68	0.145	5.97	2.71	8.89
			5.74	0.226	9.11	4.13	13.55

# BOILER TUBE

HYSKO

## Boiler Tube(ASTM A178/ASME SA178 Gr.A, Gr.C, Gr.D)

Outside diameter	Wall Thickness	Wall Thickness														
		in.	0.095	0.100	0.105	0.110	0.115	0.120	0.125	0.130	0.135	0.140	0.145	0.150	0.165	0.175
		mm	2.41	2.54	2.67	2.79	2.92	3.05	3.18	3.30	3.43	3.56	3.68	3.81	4.19	4.45
1 1/4	31.8	0.581	0.608	0.638	0.663	0.690	0.718	0.744	0.769	0.794	0.821	0.845	0.870	0.942	0.991	
1 1/2	38.1	0.706	0.740	0.777	0.808	0.842	0.877	0.910	0.940	0.973	1.01	1.04	1.07	1.16	1.22	
1 3/4	44.5	0.834	0.875	0.918	0.956	0.996	1.04	1.08	1.12	1.15	1.20	1.23	1.27	1.38	1.46	
2	50.8	0.959	1.01	1.06	1.10	1.15	1.20	1.24	1.29	1.33	1.38	1.42	1.47	1.60	1.69	
2 1/2	63.5	1.21	1.27	1.34	1.39	1.45	1.52	1.58	1.63	1.69	1.76	1.81	1.87	2.04	2.16	
3	76.2	1.46	1.54	1.62	1.69	1.76	1.84	1.91	1.98	2.05	2.13	2.20	2.27	2.48	2.63	
3 1/4	82.6	1.59	1.67	1.76	1.84	1.92	2.00	2.08	2.15	2.23	2.32	2.39	2.47	2.70	2.86	
3 1/2	88.9	1.72	1.81	1.90	1.98	2.07	2.16	2.25	2.33	2.41	2.50	2.58	2.67	2.92	3.09	
4	101.6	1.97	2.07	2.18	2.27	2.37	2.48	2.58	2.67	2.77	2.88	2.97	3.07	3.36	3.56	

## CONVERSION METHOD

### 1. Unit Weight Calculation Method

$$W = 0.02466(D-t)t$$

W : Weight per unit length(kg/m)

t : Thickness of steel pipes(mm)

D : Outside diameter of steel pipes(mm)

$$W = 10.68(D-t)t$$

W : Weight per unit length(lb/ft.)

t : thickness of steel pipes(in.)

D : Outside diameter of steel pipes(in.)

### 2. Conversion of unit

	Items	Unit
Length	1.00000	mm
	1.00000 x 10 <sup>3</sup>	m
	3.93701 x 10 <sup>2</sup>	in.
	3.28084 x 10 <sup>3</sup>	ft
Weight per unit length	1.00000	kg/m
	3.04800 x 10 <sup>1</sup>	kg/ft
	6.71971 x 10 <sup>1</sup>	lb/ft
Force per unit area	1.00000	N/mm <sup>2</sup> (MPa)
	1.01972 x 10 <sup>1</sup>	kgf/mm <sup>2</sup>
	1.01972 x 10	kgf/cm <sup>2</sup>
	1.45038 x 10 <sup>2</sup>	lbf/in <sup>2</sup>
Temperature	32+9/5°C	F

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## Introduction of affiliated company

- HYUNDAI MOTOR COMPANY (www.hyundai-motor.com)
- KIA MOTORS Co., Ltd. (www.kia.co.kr)
- HYUNDAI MOBIS (www.mobis.co.kr)
- INI STEEL COMPANY (www.inisteel.co.kr)
- BNG Steel Co., Ltd. (www.bngsteel.co.kr)
- Rotem Company (www.rotem.co.kr)
- Autoever Systems Corp. (www.autoever.com)
- e-HD.com., Inc (www.e-hd.com)
- KEFICO Corporation (www.kefico.co.kr)
- KOREA DTS., Inc (www.kdts.co.kr)
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