SeAH Changwon
Integrated Special Steel

SeAH CSS

SEAMLESS STEEL PIPES & TUBES

Contents

SeAH CSS's constant mission: Creating new value from steel for the world

Our constant mission is to open a door to the future of the global special steel industry.

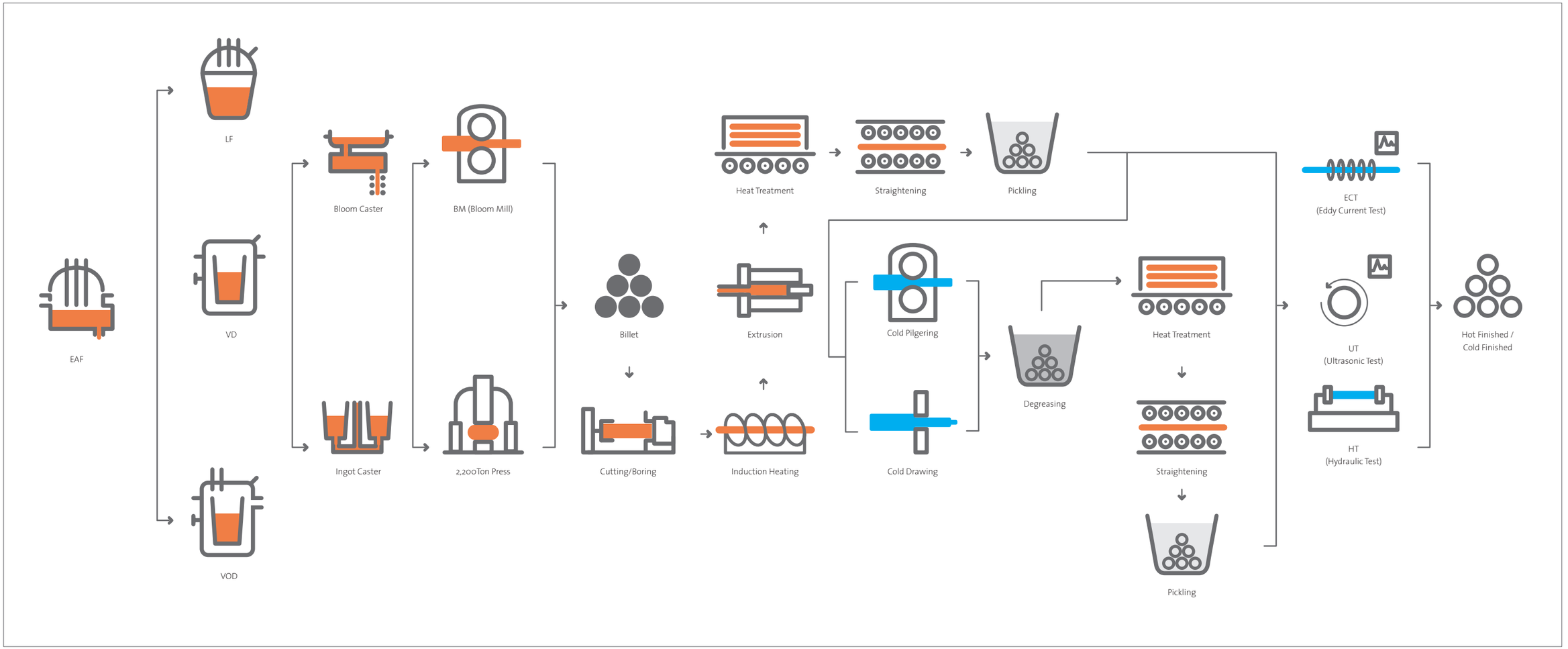
From high-tech industries including power generation, petrochemicals and semiconductors to futuristic industries such as nuclear power and aerospace, SeAH CSS is growing into a leader in stainless steel, tool steel, and Ni-alloys.

With our products, we aim to raise the level of customer satisfaction and set up the new industry standard by constantly challenging ourselves.

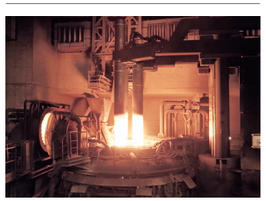
History

04/1966 Founded as Samyang Special Steel Co., Ltd.
12/1977 Completed a general special steel plant as Korea Specialty Steel Co., Ltd
(for round bars, steel pipes and plates)
06/1982 Changed its name to SAMMI General Special Steel Co., Ltd
04/1991 Opened its second special steel plant
(for steelmaking, rolling, processing)
02/1997 Annexed to POSCO Group
(for round bars and pipe business)
10/2006 Completed the 1st phase of its facility rationalization
(AOD, HV Mill, second acid cleaning plant and more)
02/2007 Renamed Changed its name to POSCO Specialty Steel Co., Ltd
04/2012 Completed the 2nd phase of its facility rationalization
(60 ton EAF, Bloom Caster, SBM and more)
03/2015 Acquired by SeAH Group and changed its name to SeAH Changwon Integrated Special Steel Co., Ltd

Manufacturing Process and Major Facilities

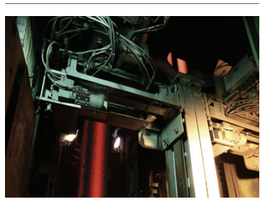


EAF



VOD

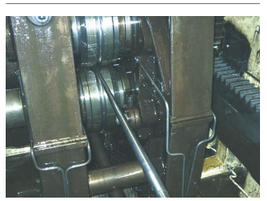
Bloom Caster



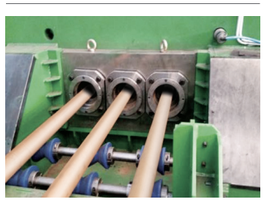
BM (Bloom Mill)

Extrusion

Cold Pilgering



Cold Drawing



NDT

Pipes

General Characteristics

Excellent corrosion resistance	Excellent weldability	High strength in a high pressure environment

Product Specifications

Grade	ASTM	TP304(L, H, N, LN), TP316(L, H, N, LN), TP317(L), TP321(H), TP310S(H), TP347(H), N08904, TP410, TP430, TP405, S32304, S31803, S32205, S32750, S32760, S31254, N06600, N08810, N06625, N08825, N06690, N04400, N02200, N07718, N09925, N08020, N09901, N05500
	JIS	304(L)TP, 316(L)TP, 317(L)TP, 321(H)TP, 310S(H)TP, 329J3LTP, 347(H)TP, 405TP, 410TP, 430TP
Outer diameter		10.5~273.1ø(1/8 ~ 10inch)
Thickness		1.0~23T(SCH5S~XXS)
Related standard		A312, A376, A790, G3459

Applied Areas

Utilized in petrochemicals, shipbuildings, and power plant pipes

Applications

Used for heating coils in a shipbuilding area


Used for petrochemical processing

Boilers & Heat Exchanger Tubes

General Characteristics

High strength under high temperture and high pressure environment	Excellent corrosion resistance	Excellent thermal conductivity

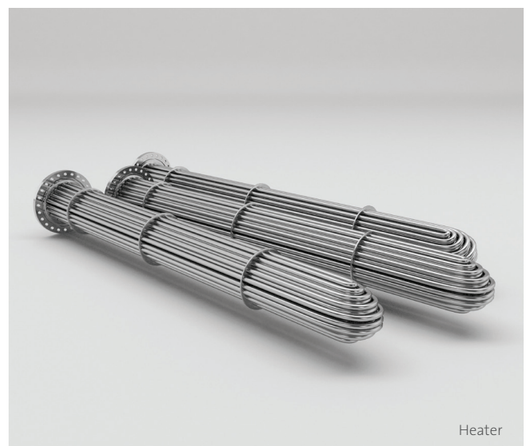
Product Specifications

Grade	ASTM	TP304(L, H, N, LN), TP316(L, H, N, LN), TP317(L), TP321(H), TP310S(H), TP347(H), S30432, S31254, N06600, N08810, N06625, N08825, N06690,N04400, N02200, N07718, N09925, N08020, N09901, N05500
	JIS	304(L)TB, 316(L)TB, 317(L)TB, 321(H)TB, 310S(H)TB, 329J3LTB, 347(H)TB, 405TB, 410TB, 430TB
	Others	SCA10, SCA12
Outer diameter		10 ~ 120ø
Thickness		1.0~30T
Related standard		A213, A268, A269, G3463

Applied Areas

Utilized in power plants and petrochemicals

Applications


Heater

Pipes for Machine Structural Use

General Characteristics

Excellent corrosion and heat resistance	Outstanding wear resistance	High strength

Product Specifications

Grade	ASTM	MT304(L), MT316(L), MT317, MT321, MT347, MT310S, MT410, MT430, MT405, 1040, 1045, 4130, 4140
	JIS	304(L)TKA, 316(L)TKA, 410TKA, 430TKA, SCR, SCM, STKM16A
Outer diameter		10.5 - 273.1ø (1/8 -10 inch)
Thickness		1.0 ~ 23T
Related standard		A511, A519, G3441, G3445, G3446

Applied Areas

Utilized in machinery, aircraft, and automotive parts

Applications

Applied to products for machine structural use

Heat Resistant Stainless Steel Pipes

Grade TP310S

General Characteristics

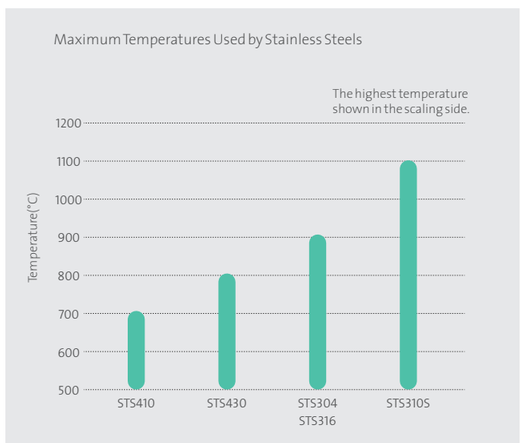
High Ni	High Cr	Low C
Enhances corrosion resistance	Outstanding corrosion resistance Durable at high temperture	Restricts carbide precipitation

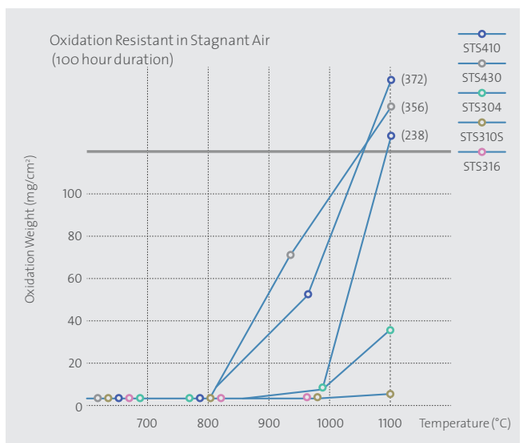
Chemical Composition Rate

Grade	Chemical composition rate(wt, %)						
	C	Si	Mn	P	S	Ni	Cr
310S	0.08 ↓	1.0 ↓	2.0 ↓	0.045 ↓	0.03 ↓	19~22	24~26

Applications

Applied to fine line heat treating furnaces, heat exchangers, and high temperature devices





Duplex

Grade S32304, S31803, S32750/60, S31500

General Characteristics

High strength	High corrosion resistance in sea water	Excellent weldability and machinability
High yield strength	Local corrosion resistant (e.g.crevice, pitting, intergranular, and stress corrosion)	

Chemical Composition Rate

Grade	UNS No	Chemical composition rate(wt, %)					PRE	Y.S. (Mpa)	T.S. (Mpa)	EL (%)
		C	N	Cr	Ni	Mo				
304L	S30400	0.035 ↓	-	18~20	8~11	-	18	205	515	40
316L	S31603	0.035 ↓	-	16~18	10~14	2~3	25	170	485	40
Duplex	S32304	0.03 ↓	0.05~0.2	21.5~24.5	3~5.5	0.05~0.6	28	400	600	25
	S31803	0.03 ↓	0.08~0.2	21~23	4.5~6.5	2.5~3.5	34	450	620	25
	S32750	0.03 ↓	0.24~0.32	24~26	6~8	3~5	42	550	800	15
	S31500	0.03 ↓	0.05~0.1	18~19	4.3~5.2	2.5~3.0	30	440	630	30

PRE:Pitting Resistance Equivalent

Applications

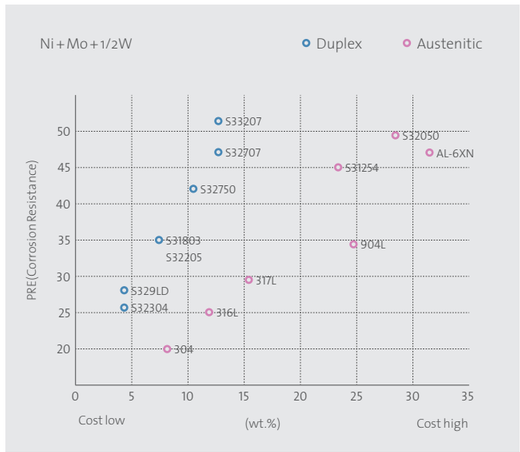
- Power plants, petrochemical plants
- Offshore plants, desalination plants
- Wastewater treatment facilities, general pipes in a chloridic environment
- Desulfurizers
- Heat exchangers

Available Product Size

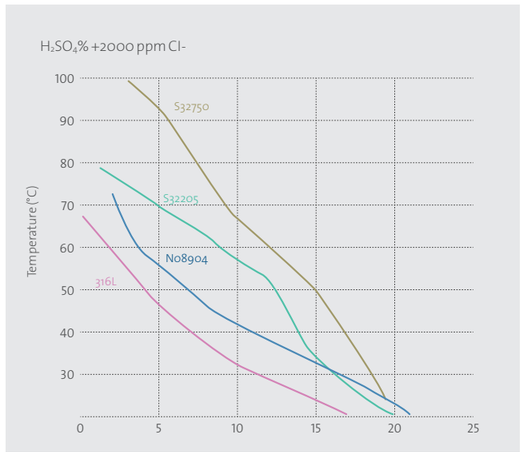
- Hot finished : Diameter 40-273.1 ø, thickness 4.ot or more
- Cold finished : Diameter 19.05-110 ø, thickness 1.65t or more

Corrosion Resistance

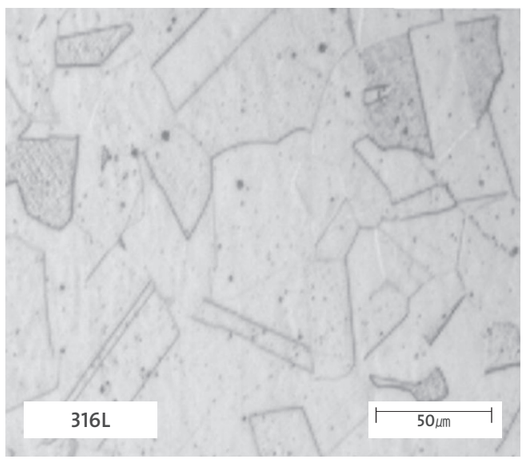
Duplex / Austenitic STS

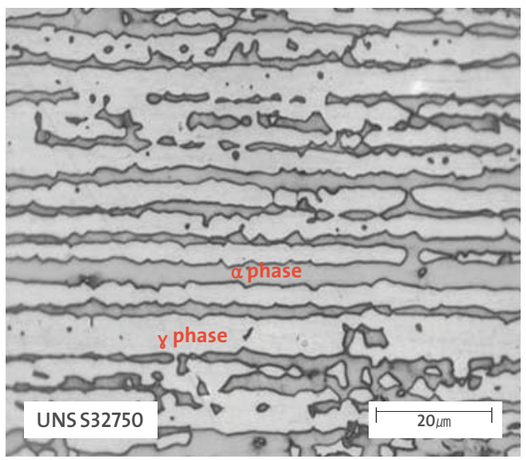


Corrosion Resistance
- ISO Corrosion, (0.1mm/year)



Microstructures





Boiler Tubes

Grade S30432(Code Case 2328), TP310HCbN

General Characteristics

High temperature corrosion resistance	Outstanding steam oxidation resistance	High temperature strength

Chemical Composition Rate

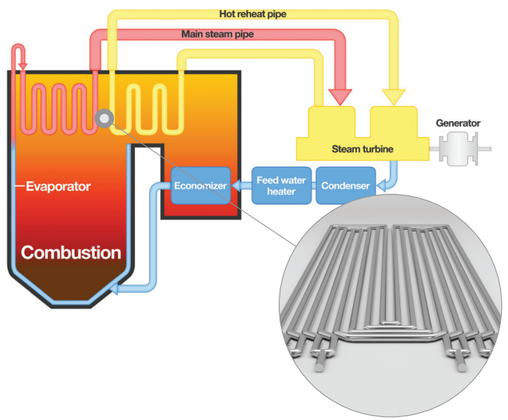
Grade	Chemical Composition(wt.%)									
S30432	C	Si	Mn	Ni	Cr	Nb	N	Cu	Al	B
	0.07~0.14	0.3 ↓	1.0 ↓	7.5~10.5	17.0~19.0	0.3~0.6	0.05~0.12	2.5~3.5	0.003~0.03	0.001~0.01
TP310HCbN	0.04~0.1	1.0 ↓	2.0 ↓	19~22	24~26	0.2~0.6	0.15~0.35	–	–	–

Mechanical Properties

Grade	Y.S(Mpa)	T.S(Mpa)	EL(%)	Hardness(HRB)	Grain Size
S30432	Min 235	Min 590	Min 35	Max 95	ASTM No.8
TP310HCbN	Min 295	Min 655	Min 30	Max 100	ASTM No. 7 ↓

Applications

- Applied to coal-firing boilers, super heaters, reheaters



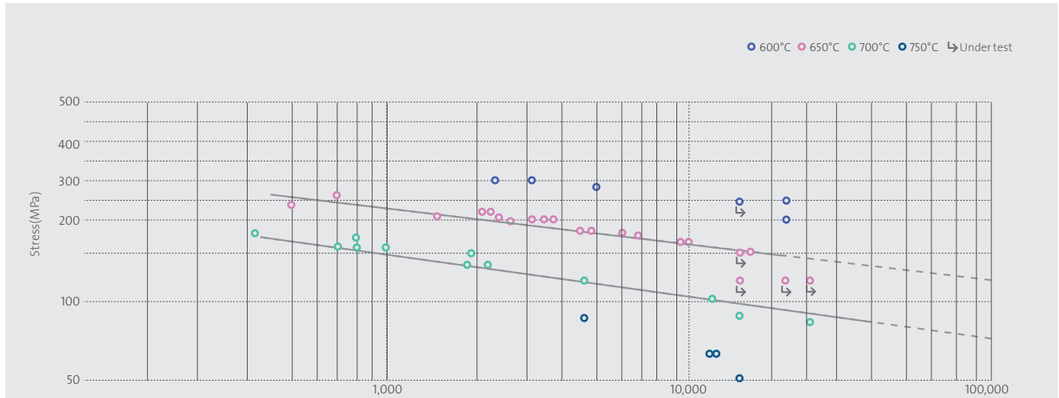
Product Size

- Outer diameter 30-80 mm, inner diameter 20-60 mm, length 8,000-15,000 mm (Retention of 3 Units of Facilities)
- Shot peening can be applied

  * Further discussion required for other sizes
- Boiler Tubes for HRSG available(Max.23,000L)

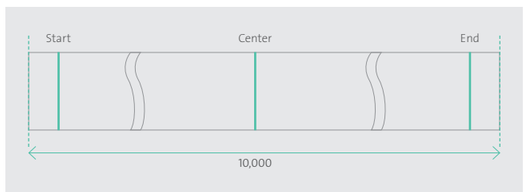
High Temperature Properties

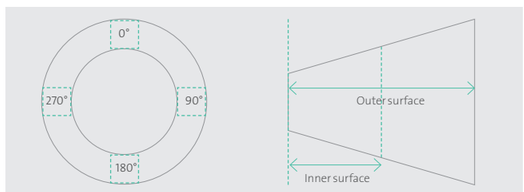
Stress-Rupture curve for S30432 (Up to 40,000 hours)

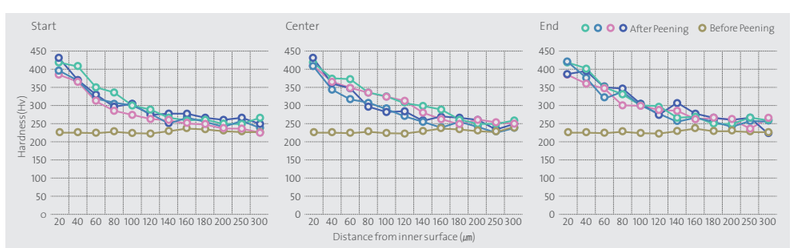


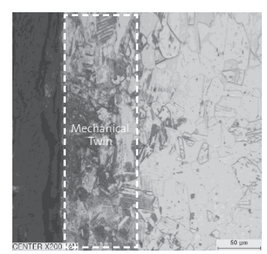
Shot Peening Properties

Shot balls sprayed inside the tube to enhance compressive residual stress and tensile strength









Heat and Corrosion Resistant Steel Pipes

Grade SCA10, SCA12

General Characteristics

High temperature corrosion resistance (800°~1200°C)	Excellent oxidation resistance	Outstanding thermal conductivity	Low thermal expansion co-efficiency

Chemical Composition Rate

Grade	Chemical composition rate(wt, %)			
	C	Si	Cr	Al
SCA10	0.03 ↓	0.7~1.2	17~19	0.7~1.2
SCA12	0.12 ↓	1.2~1.7	23~25	1.2~1.7

Mechanical Properties

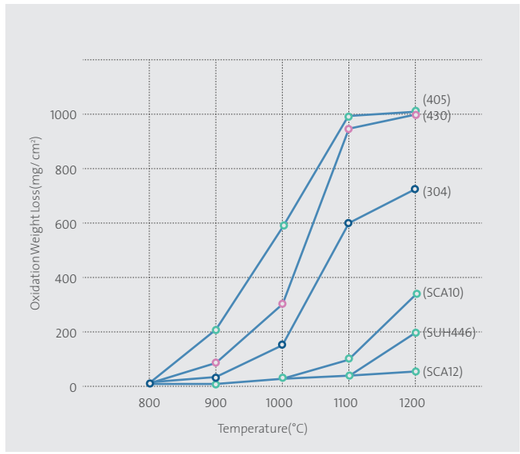
Grade	Y.S.(MPa)	T.S.(MPa)	EL(%)
SCA10	min 190	min 315	min 10
SCA12	min 210	min 315	min 8

Product Order Standards

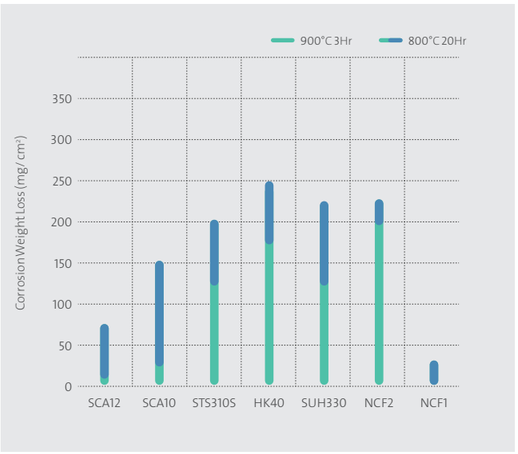
Type	Size(mm)			Tolerance(mm)		
	Outer diameter	Thickness	Length	Outer diameter	Thickness	Length
Hot finished	40ø~50ø	3.0t or higher	Less than 6,000	+0.8 -0.8	±17.5%	+10 -0
	51ø~62ø	4.0t or higher				
	62 ø or higher (need consultation)					

Properties

Oxidation reduced by continuous heating for 50 hours

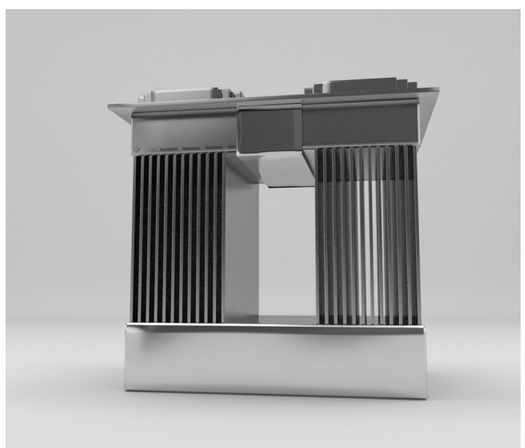


Vanadium attack resistance



Applications

Applied to recuperators and heating furnaces



Specifications

Type	ASTM	JIS	DIN	SeAH CSS Others	Chemical composition rate (%) C	SI	Mn	P	S	Ni	Cr	Mo	Others	Mechanical properties T.S (Mpa,N/mm²)	Y.S (Mpa,N/mm²)	EL. (%)	Applications
Austenitic	TP304	304TP(TB)			0.080	1.00	2.00	0.040	0.030	8.00 11.00	18.00 20.00			520 ↑	205 ↑	35 ↑	Outstanding corrosion resistance Heat exchanger tubes&pipes for chemical plants, power plants, shipbuildings
			1.4301		0.070	1.00	2.00	0.045	0.030	8.50 10.50	17.00 19.00			500~700	195 ↑	35 ↑	
		304LTP(TB)			0.030	1.00	2.00	0.040	0.030	9.00 13.00	18.00 20.00			480 ↑	175 ↑	35 ↑	
	TP304L				0.035	1.00	2.00	0.045	0.030	8.00 13.00	18.00 20.00			485 ↑	170 ↑	35 ↑	
			1.4306		0.030	1.00	2.00	0.045	0.030	10.00 12.50	18.00 20.00			500~700	195 ↑	35 ↑	
		310TP(TB)			0.150	1.50	2.00	0.040	0.030	19.00 22.00	24.00 26.00			520 ↑	205 ↑	35 ↑	
	TP310S				0.080	1.00	2.00	0.045	0.030	19.00 22.00	24.00 26.00	0.75		515 ↑	205 ↑	35 ↑	
		310STP(TB)			0.080	1.50	2.00	0.040	0.030	19.00 22.00	24.00 26.00			520 ↑	205 ↑	35 ↑	
		316TP(TB)			0.080	1.00	2.00	0.040	0.030	10.00 14.00	16.00 18.00	2.00 3.00		520 ↑	205 ↑	35 ↑	
	TP316				0.080	1.00	2.00	0.045	0.030	11.00 14.00	16.00 18.00	2.00 3.00		515 ↑	205 ↑	35 ↑	
			1.4401		0.070	1.00	2.00	0.045	0.030	10.50 13.50	16.50 18.50	2.00 2.50		510~710	205 ↑	35 ↑	
		316LTP(TB)			0.030	1.00	2.00	0.040	0.030	12.00 16.00	16.00 18.00	2.00 3.00		480 ↑	175 ↑	35 ↑	
	TP316L				0.035	1.00	2.00	0.045	0.030	10.00 14.00	16.00 18.00	2.00 3.00		515 ↑	205 ↑	35 ↑	
			1.4404		0.030	1.00	2.00	0.045	0.030	11.00 14.00	16.50 18.00	2.00 2.50		490~690	190 ↑	30 ↑	
			1.4435		0.030	1.00	2.00	0.045	0.025	12.50 15.00	17.00 18.50	2.50 3.00		490~690	190 ↑	30 ↑	
			1.4436		0.070	1.00	2.00	0.045	0.020	11.00 14.00	16.50 18.50	2.50 3.00		510~710	205 ↑	L : 40 ↑ T : 30 ↑	
		316TiTP(TB)			0.080	1.00	2.00	0.040	0.030	10.00 14.00	16.00 18.00	2.00 2.50	Ti : Min 5xC%	520 ↑	205 ↑	35 ↑	
			1.4571		0.080	1.00	2.00	0.045	0.030	10.50 13.50	16.50 18.50	2.00 2.50	Ti 5xC%~0.80	500~680	1) 190 ↑ 2) 210 ↑	L : 35 ↑ T : 30 ↑	
			1.4580		0.080	1.00	2.00	0.045	0.030	10.50 13.50	16.50 18.50	2.00 2.50	Nb 10xC%~1.00	510~740	215 ↑	L : 35 ↑ T : 30 ↑	
	TP317	317TP(TB)			0.080	1.00	2.00	0.040	0.030	11.00 14.00	18.00 20.00	3.00 4.00		520 ↑	205 ↑	35 ↑	
	TP317L	317LTP(TB)			0.030	1.00	2.00	0.040	0.030	11.00 15.00	18.00 20.00	3.00 4.00		515 ↑	205 ↑	35 ↑	
	TP321	321TP(TB)	1.4541		0.080	1.00	2.00	0.040	0.030	9.00 12.00	17.00 19.00		Ti 5xC%~0.70	520 ↑	205 ↑	35 ↑	
	TP347	347TP(TB)	1.4550		0.080	1.00	2.00	0.040	0.030	9.00 12.00	17.00 19.00		Nb : Min 10xC%	520 ↑	205 ↑	35 ↑	
	N08904				0.020	1.00	2.00	0.040	0.030	23.00 28.00	19.00 23.00	4.00 5.00	Cu : 1.00~2.00 N : Max 0.10	490 ↑	215 ↑	35 ↑	
	S31254				0.02	0.80	1.00	0.030	0.010	17.50 18.50	19.50 20.50	6.00 6.50	N : 0.18~0.22	675 ↑	310 ↑	35 ↑	
	TP304H	304HTP(TB)			0.040 0.100	0.75	2.00	0.040	0.030	8.00 11.00	18.00 20.00			520 ↑	205 ↑	35 ↑	Tubes for coal-firing boiler
	TP310H				0.040 0.100	1.00	2.00	0.045	0.030	19.00 22.00	24.00 26.00			515 ↑	205 ↑	35 ↑	
	TP316H	316HTP(TB)			0.040 0.100	0.75	2.00	0.030	0.030	11.00 14.00	16.00 18.00	2.00 3.00		520 ↑	205 ↑	35 ↑	
	TP321H	321HTP(TB)			0.04 0.10	0.75	2.00	0.030	0.030	9.00 13.00	17.00 20.00		Ti 4xC%~0.60	520 ↑	205 ↑	35 ↑	
	TP347H	347HTP(TB)			0.04 0.10	1.00	2.00	0.030	0.030	9.00 13.00	17.00 20.00		Nb 8xC%~1.00	520 ↑	205 ↑	35 ↑	
	S30432	KA-SUS304J1HTB	VdTUV 550/2		0.07 0.13	0.30	1.00	0.040	0.010	7.50 10.50	17.00 19.00		Al : 0.003~0.03 N : 0.05~0.12 B : 0.001~0.01 Cu : 2.5~3.5	590 ↑	235 ↑	35 ↑	
	TP310HCbN				0.04 0.1	1.0	2.00	0.045	0.030	22.00 19.00	26.00 24.00		N : 0.15~0.35 Nb : 0.2~0.6	655 ↑	295 ↑	30 ↑	

Specifications

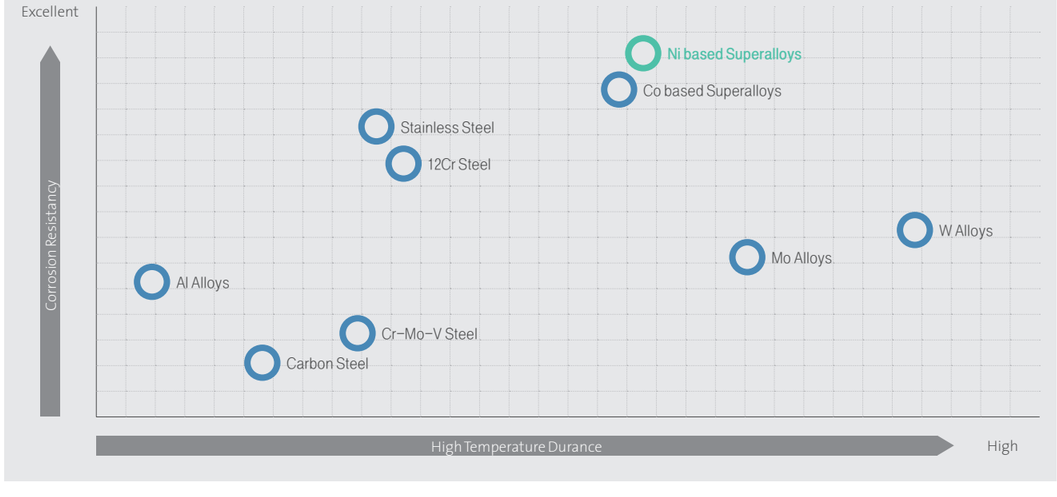
Type	ASTM	JIS	DIN	SeAH CSS Others	Chemical composition rate (%)								Others	Mechanical properties			Applications
					C	SI	Mn	P	S	Ni	Cr	Mo		T.S (Mpa,N/mm²)	Y.S (Mpa,N/mm²)	EL. (%)	
Austenitic	TP 304N(LN)									8.00	18.00		N : 0.10~0.16%	550 ↑	240 ↑	35 ↑	Excellent corrosion resistance Heat exchanger tubes&pipes for chemical plants, power plants
					0.035	1.00	2.00	0.045	0.030	11.00	20.00						
			1.4311							8.50	17.00		N : 0.12~0.22%	550~760	270 ↑	30 ↑	
					0.03	1.00	2.00	0.045	0.030	11.50	19.00						
	TP316N(LN)									11.00	16.00	2.00	N : 0.10~0.16%	550 ↑	240 ↑	35 ↑	
					0.035	0.75	2.00	0.040	0.030	14.00	18.00	3.00					
			1.4429							11.00	16.50	2.50	N : 0.12~0.22%	580~800	295 ↑	30 ↑	
					0.03	1.00	2.00	0.040	0.015	14.00	18.50	3.00					
	MT304(L)	304TKA								8.00	18.00			205 ↑	520 ↑	35 ↑	Excellent corrosion resistance Heat exchanger tubes&pipes for chemical plants, power plants
					0.035	1.00	2.00	0.040	0.030	11.00	20.00						
	MT316(L)	316TKA								10.00	16.00	2.00		520 ↑	205 ↑	35 ↑	
					0.035	1.00	2.00	0.040	0.030	14.00	18.00	3.00					
		321TKA								9.00	17.00		Ti 5xC%~0.60	520 ↑	205 ↑	35 ↑	
					0.08	1.00	2.00	0.040	0.030	13.00	19.00						
		347TKA								9.00	17.00		Nb : Min 10xC%	520 ↑	205 ↑	35 ↑	
					0.08	1.00	2.00	0.040	0.030	13.00	19.00						
Ferritic	TP405	405TP(TB)									11.50		Al : 0.10~0.30%	415 ↑	205 ↑	20 ↑	Excellent corrosion resistance Heat exchanger tubes&pipes for chemical plants, power plants
					0.08	1.00	1.00	0.040	0.030	0.50	14.50						
	TP430	430TP(TB)									16.00			-	-	-	
					0.12	0.75	1.00	0.040	0.030		18.00						
	TP410	410TP(TB)									11.50			415 ↑	205 ↑	20 ↑	
					0.15	1.00	1.00	0.040	0.030		13.50						
	MT410	410TKA									11.50			-	-	-	
					0.15	1.00	1.00	0.040	0.030		13.50						
Martensitic	MT430	430TKA									16.00			415 ↑	205 ↑	20 ↑	Excellent corrosion Pipes for aircrafts and automobiles
					0.12	0.75	1.00	0.040	0.030		18.00						
	MT405										11.50		Al : 0.10~0.30%	415 ↑	205 ↑	20 ↑	
					0.08	1.00	1.00	0.040	0.030	0.50	14.50						
				SCA10		0.70					17.00		Al : 0.70~1.20% Nb : 0.35~0.40%	440 ↑	260 ↑	10 ↑	High temperature Corrosion resistance
					0.012	1.00	0.75	0.030	0.003		19.00						
				SCA12		1.20					23.00		Al : 1.20~1.70% Nb : 0.35~0.40%	440 ↑	290 ↑	8 ↑	
					0.02	1.40	0.75	0.030	0.003		25.00						
Duplex	S32304									3.00	21.50	0.05	N : 0.05~0.20% Cu : 0.05~0.6%	400 ↑	600 ↑	25 ↑	Excellent corrosion resistance
					0.03	1.00	2.50	0.040	0.040	5.50	24.50	0.60					
	S31803		1.4462							4.50	21.00	2.50	N : 0.10~0.20%	620 ↑	450 ↑	25 ↑	
					0.03	1.00	2.00	0.030	0.015	6.50	23.00	3.50					
	S32205									4.50	22.00	3.00	N : 0.14~0.20%	655 ↑	485 ↑	25 ↑	
					0.03	1.00	2.00	0.030	0.020	6.50	23.00	3.50					
	S32750									6.00	24.00	3.00	N : 0.24~0.32% Cu : Max 0.5%	550 ↑	800 ↑	15 ↑	
					0.03	0.80	1.20	0.035	0.020	8.00	26.00	5.00					
	S32760									6.00	24.00	3.00	N : 0.2~0.3% Cu, W : 0.5~1.0%	550 ↑	750 ↑	25 ↑	
					0.05	1.00	1.00	0.030	0.010	8.00	26.00	4.00					
		329J3LTP(TB)								4.50	21.00	2.50	N : 0.08~0.20%	620 ↑	450 ↑	18 ↑	
					0.03	1.00	1.50	0.040	0.030	6.50	24.00	3.50					
Carbon Alloy Steel	1040				0.37	0.15	0.60						Cu : Max 0.35%	510 ↑	325 ↑	20 ↑	Applied to machinery, aircraft, automotive and other mechanical parts
					0.44	0.35	0.90	0.040	0.050	0.25	0.20						
		STKM16A			0.35		0.40							510 ↑	325 ↑	20 ↑	
					0.45	0.40	1.00	0.040	0.040								
	4130				0.28	0.15	0.40				0.80	0.15	Cu : Max 0.35%	565 ↑	300 ↑	10 ↑	
					0.33	0.35	0.60	0.035	0.040	0.25	1.10	0.25					
		SCM430TK			0.28	0.15	0.60				0.90	0.15		-	-	-	
					0.33	0.35	0.85	0.030	0.030		1.20	0.30					
	4140(H)				0.38	0.15	0.75				0.80	0.15	Cu : Max 0.35%	-	-	-	
					0.43	0.35	1.00	0.035	0.040	0.25	1.10	0.25					
		SCM440TK			0.38	0.15	0.60				0.90	0.15		-	-	-	
					0.43	0.35	0.85	0.030	0.030		1.20	0.30					
	8650(H)				0.47	0.15	0.70			0.35	0.35	0.15	Cu : Max 0.35%	740~850	350 ↑	15~80	
					0.54	0.35	1.05	0.035	0.040	0.75	0.65	0.25					
	8617(H)				0.14	0.15	0.60			0.35	0.35	0.15	Cu : Max 0.35%	530~650	330~550	20~80	
					0.20	0.35	0.95	0.035	0.040	0.75	0.65	0.25					

Specifications

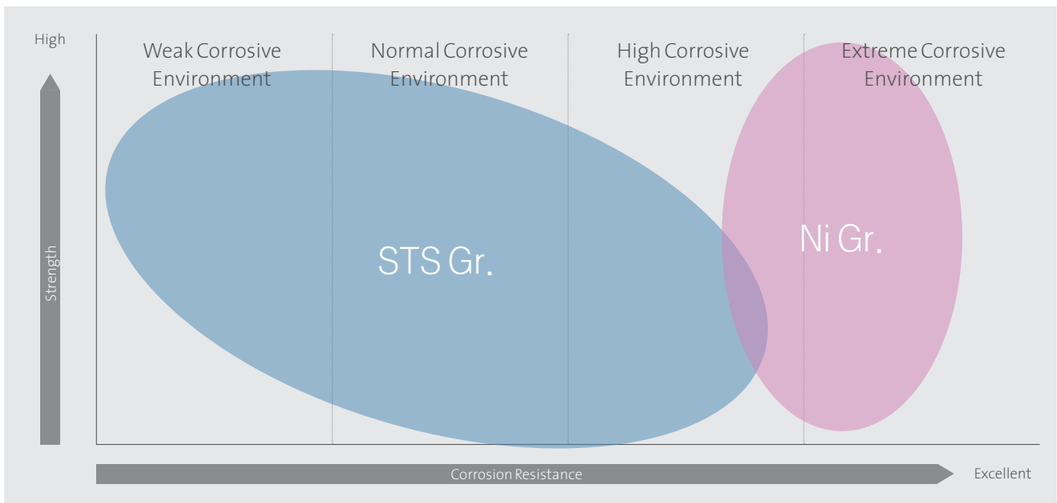
Type	Grade	UNS No.	Chemical composition rate (%)	Applications
NI ALLOY	ALLOY 718	N07718	Ni-18Cr-5.1Nb-3.1Mo	Rings, Gas Turbine Engines, Extrusion Dies
	ALLOY 600	N06600	Ni-15Cr-8Fe	Steam Generators
	ALLOY 800H	N08810	Ni-45Fe-22Cr	Pressure Vessels, Heat Exchanger, Industrial Furnace
	ALLOY 625	N06625	Ni-22Cr-9.4Mo-4Fe-3.9Nb	Petrochemical Parts
	ALLOY 825	N08825	Ni-30Fe-23Cr-3.3Mo-2.2Cu	Chemical Process Parts, , Fitting, Valves
	ALLOY 925	N09925	Ni-28Fe-20.5Cr-3.2Mo-2.3Ti	Petrochemical Valves, Hangers
	ALLOY 20	N08020	Ni-37Fe-20Cr-3.5Cu-2.3Mo	Chemical Process Pipes, Reactor Vessels
	ALLOY 901	N09901	Ni-36Fe-12.5Cr-6Mo-2.9Ti	-
	ALLOY 690	N06690	Ni-30Cr-9Fe	Petrochemical Heaters
	ALLOY K500	N05500	Ni-30Cu-2.7Al-2Fe-0.6Ti	Fitting, Valves
	ALLOY 400	N04400	Ni-30Cu-2Fe	Fitting, Valves
	ALLOY 200	N02200	99Ni	Marine and Offshore Engineering Parts, Salt Production Parts

Characteristics of Ni Alloys

Properties of Heat and Oxidation Resistance



Properties of Corrosion Resistance



Product Size

Cold finished(Consultation Required) | Cold finished | Hot finished | Hot & Cold finished

Outer diameter		Thickness																																																								
Nominal	mm	0.25	1.00	1.20	1.24	1.50	1.65	1.73	2.00	2.11	2.24	2.31	2.41	2.60	2.77	2.87	3.05	3.20	3.38	3.40	3.56	3.68	3.73	3.76	3.91	4.00	4.20	4.55	4.78	4.85	5.08	5.16	5.49	5.54	5.74	6.02	6.35	6.55	7.01	7.11	7.47	7.62	8.08	8.18	8.56	9.00	9.53	10.00	11.00	12.70	14.00	15.00	16.00	17.00	18.00	19.00	20.00	22.00	23.00	30.00
	3.175																																																											
	6.00																																																											
	8.00																																																											
	10.00																																																											
1/8	10.29				10S	20S		40S					80S																																															
	12.00																																																											
	12.70																																																											
1/4	13.72						10S		20S		40S							80S																																										
	14.00																																																											
	16.00																																																											
3/8	17.15						10S		10S			40S																																																
	18.00																																																											
	19.05																																																											
	20.00																																																											
1/2	21.34						5S			10S				20S	40S								80S																		XXS																			
	22.00																																																											
	25.40																																																											
3/4	26.67						5S			10S				20S		40S									80S																	XXS																		
	30.00																																																											
	31.80																																																											
	32.00																																																											
1	33.40						5S								10S		20S		40S									80S																		XXS														
	35.00																																							160																				
	38.00																																																											
	38.10																																																											
	40.00																																																											
1+1/4	42.16						5S								10S		20S				40S									80S							160										XXS													
	44.50																																																											
1+1/2	48.26						5S								10S		20S					40S									80S									160								XXS												
	50.80																																																											
	54.00																																																											
	57.10																																																											
2	60.33						5S								10S						20S				40S									80S											160				XXS											
	63.50																																																											
	70.00																																																											
2+1/2	73.03									5S							10S				20S											40S							80S								160				XXS									
3	88.90																10S									20S							40S									80S							160			XXS								
3+1/2	101.60																10S									20S									40S								80S																	
	108.00																																																											
4	114.30																10S									20S										40S									80S				120		160			XXS						
	120.00																																																											
	133.00																																																											
	139.80																																																											
5	141.30																			10S											20S							40S									80S		120		160			XXS						
	160.00																																																											
6	168.28																			10S																				40S									80S		120				160			XXS		
	180.00																																																											
8	219.08																							10S													20							40S						80S		100			120				60	
10	273.10																																				20									40S				60		80S							

*12m L Pipes Available (Consultation Required) * Coil Tubes (3.17-31.8 dia.) Available

Product Types

Specification		Specification No.	Grade	Remark
Stainless Steel	ASTM ASME	A/SA312	TP304(L,H,N,LN), TP316(L,H,N,LN), TP317(L), TP321(H), TP309S(H), TP310S(H), TP347(H)	Pipe
		A/SA376	TP304(H), TP304N(LN), TP316(H,N,LN), TP321(H), TP347(H)	
		A/SA790	S31803, S32205, S32304, S32750, S32760, S31500	
		A/SA213	TP304(L,H,N,LN), TP316(L,H,N,LN), TP317(L), TP321(H), TP309S(H), TP310S(H), TP347(H), S30432	Tube
		A/SA269	TP304(L,LN), TP316(L,LN), TP321, TP347	
		A/SA268	TP410, TP430, TP405	
		A/SA789	S31803, S32205, S32304, S32750, S32760, S31500	
		A511	MT304(L), MT316(L), MT317, MT321, MT347 MT310S, MT410, MT405, MT430	Mechanical Tube
	JIS	G3459	SUS304(L,H)TP, SUS316(L,H,TI)TP, SUS317(L)TP, SUS321(H)TP, SUS347(H)TP, SUS310S(H)TP, SUS329J1TP, SUS329J3LTP	Pipe
		G3463	SUS304(L,H)TB, SUS316(L,H,TI)TB, SUS317(L)TB, SUS321(H)TB, SUS347(H)TB, SUS405TB, SUS410TB, SUS430TB, SUS329J1TB, SUS329J3LTB	Boiler & Heat Exchanger Tube
		G3446	SUS304TKA, SUS316TKA, SUS321TKA, SUS347TKA, SUS410TKA, SUS430TKA	Mechanical Tube
	DIN /EN	17456 17458 10216-5	WNR1.4002, WNR1.4006, WNR1.4301, WNR1.4306, WNR1.4401, WNR1.4404, WNR1.4435, WNR1.4436, WNR1.4541, WNR1.4571	-
			WNR1.4462	Duplex
Carbon Steel	ASTM	A519	4140, 4130	Mechanical Tube
	AISI	-	4140(H), 4130(H), 8650(H)	-
	SAE	-	8617(H)	-
	JIS	G3441	SCR. SCM	Mechanical Tube
	ASTM	A519	1040. 1045	Mechanical Tube
	AISI	-	1040. 1045. 1137	-
	JIS	-	STKM16A	Mechanical Tube
Alloy Steel	ASTM ASME	B161/SB161	N02200	Pipe/Tube
		B163/SB163	N02200, N04400, N06600, N06690, N08810, N08825	Tube
		B167/SB167	N06600, N06690	Pipe/Tube
		B423/SB423	N08825	Pipe/Tube
		B444/SB444	N06625	Pipe/Tube

Specification	Specification No.	Description
ASTM	A213	(Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat Exchanger Tubes)
	A268	(Ferritic and Martensitic Stainless Steel Tubes for General Service)
	A269	(Austenitic Stainless Steel Tubes for General Service)
	A312	(Austenitic Stainless Steel Pipes)
	A376	(Seamless Austenitic Steel Pipes for High-Temperature Central-Station Service)
	A511	(Seamless Stainless Steel Mechanical Tubes)
	A519	(Seamless Carbon & Alloy Steel Mechanicak Tubes)
	A789/ A790	(Ferritic / Austenitic Stanless Steel Tubes & Pipes)
	B163	Seamless Nickel and Nickel Alloy Condenser and Heat Exchanger Tubes
	B829	General Requirements for Nickel and Nickel Alloys Seamless Pipes & Tubes
JIS	G 3441	(Alloy Steel Tubes for Machine Purposes)
	G 3445	(Carbon Steel Tubes for Machine Structural Purpose)
	G 3446	(Stainless Steel Tubes for Machine Structural Purpose)
	G 3459	(Stainless Steel Pipes)
	G 3463	(Stainless Steel Boiler and Heat Exchanger Tubes)
DIN	17456	(General Purpose Seamless Circular Stainless Steel Tubes)
	17458	(Seamless Circular Austenitic Stainless Steel Tubes Subject to special Requirements for Pressure Vessels and Chemical Plant)
	17459	(Seamless Circular High-Temperature Austenitic Steel Tubes)
EN	10216-5	Seamless steel tubes for pressure purposes–Technical delivery conditions (Stainless Steel Tubes)

Product Order Standards

Stainless Steel Pipes

t = Nominal wall thickness D = Ordered outside diameter (Unit: mm)

ASTM (Based on A999 for outside diameter tolerance, and A312 for thickness tolerance)				JIS (Based on G3459)						
Nominal diameter	Outer diameter	Outer diameter tolerance	Thickness tolerance	Nominal diameter A	Nominal diameter B	Outer diameter	Hot finished products: Outer diameter tolerance	Hot finished products: Thickness tolerance	Cold finished products: Outer diameter tolerance	Cold finished products: Thickness tolerance
1/8	10.29	+0.4 -0.8	+20.0% -12.5%	6	1/8	10.5	±0.5	T<4 : ± 0.5	±0.3	T<2 : ± 0.2
1/4	13.72			8	1/4	13.8				
3/8	17.15			10	3/8	17.3				
1/2	21.34			15	1/2	21.7				
3/4	26.67			20	3/4	27.2				
1	33.40			25	1	34				
1¼	42.16			32	1¼	42.7				
1½	48.26			40	1½	48.6				
2	60.33	±0.8	T/D≤5% +22.5% -12.5% T/D>5% +15.0% -12.5%	50	2	60.5	±1.0%	T≥4 : ± 12.5%	±1.0%	T≥2 : ± 10.0%
2½	73.03			65	2½	76.3				
3	88.90			80	3	89.1				
3½	101.60			90	3½	101.6				
4	114.30			100	4	114.3				
5	141.30	+1.6 -0.8		125	5	139.8				
6	168.3			150	6	165.2				
8	219.1	+2.4 -0.8		200	8	216.3				
10	273.1			250	10	267.4				

Stainless Steel Pipes for Heat Exchangers and Boilers

(Unit: mm)

ASTM (Based on A1016/M)					JIS (Based on G3463)						
Diameters	Diameter tolerance: Hot finished products	Diameter tolerance: Cold finished products	Thickness tolerance: Hot finished products	Thickness tolerance: Cold finished products	Diameters	Outer diameter tolerance: Hot finished products	Outer diameter tolerance: Cold finished products	Thickness	Hot finished products: 100ø↑	Hot finished products: 100ø↑	Cold finished products: 40ø↑	Cold finished products: 40ø↑
25.4 > O.D	+0.4 -0.8	± 0.1	2.4 ≥ t + 40% - 0%	+ 20% - 0%	40 > O.D	+0.4 -0.8	±0.25	2.0 > t	-	-	+0.4 -0	+22% -0%
25.4 ≤ O.D ≤ 38.1		± 0.15	2.4 < t ≤ 3.8 +35% -0%		40 ≤ O.D < 50			2.0 ≤ t < 2.4	+40% -0%	-		
38.1≤O.D ≤50.8		± 0.20			50 ≤ O.D < 60							
50.8 ≤ O.D < 63.5		± 0.25	3.8 < t ≤ 4.6 +33% -0%	+ 22% - 0%	60 ≤ O.D < 80		±0.30	2.4 ≤ t < 3.8	+35% -0%	+35% -0%	+20% -0%	
63.5 ≤ O.D ≤ 76.2		± 0.30	4.6 < t +28% -0%		80 ≤ O.D < 100			3.8 ≤ t < 4.6	+33% -0%	+33% -0%		
76.2 ≤ O.D ≤ 101.6		± 0.38			100 ≤O.D<120	+0.4 -1.2	+0.4, -0.6	4.6 ≤ t	+28% -0%	+28% -0%		
101.6 < O.D ≤ 141.3	+0.4 -1.2	+0.38 -0.64	-		120 ≤ O.D<140		+0.4, -0.8					

Mechanical Structure Steel Pipes (Based on A511 for STS Steels, and A519 for Carbon Alloy Steels)

		Hot finished products	Cold finished products
Outer diameter	50 > O.D	±0.50mm	±0.25mm
	50 ≤ O.D	±1%	±0.5%
Thickness	4 > t	+0.6 - 0.5mm	-
	4 ≤ T	+15% - 12.5%	-
	3 > T	-	±0.3mm
	3 ≤ T	-	±10%

ASTM and ASME (SCH5S, SCH10S, SCH40S, SCH80S : Based on ASME B36.19M / SCH160, XXS : Based on ASME B36.10M)

Nominal diameter	Outer diameter		SCH5S				SCH10S				SCH40S				SCH80S				SCH160				XXS			
			Thickness		Weight		Thickness		Weight		Thickness		Weight		Thickness		Weight		Thickness		Weight		Thickness		Weight	
NPS	in.	mm	in.	mm	lb/ft	kg/m	in.	mm	lb/ft	kg/m	in.	mm	lb/ft	kg/m	in.	mm	lb/ft	kg/m	in.	mm	lb/ft	kg/m	in.	mm	lb/ft	kg/m
1/8	0.045	10.29					0.049	1.24	0.186	0.277	0.068	1.73	0.245	0.365	0.095	2.41	0.314	0.468								
1/4	0.540	13.72					0.065	1.65	0.330	0.491	0.088	2.24	0.426	0.634	0.119	3.02	0.535	0.797								
3/8	0.675	17.15						·	0.423	0.631	0.091	2.31	0.567	0.845	0.126	3.20	0.739	1.10								
1/2	0.840	21.34	0.065	1.65	0.538	0.801	0.083	2.11	0.672	1.00	0.109	2.77	0.851	1.27	0.147	3.73	1.09	1.62	0.188	4.78	1.71	2.55	0.294	7.47	1.72	2.56
3/4	1.050	26.67	·	·	0.683	1.02	·	·	0.858	1.28	0.113	2.87	1.13	1.68	0.154	3.91	1.47	2.20	0.219	5.56	1.94	2.90	0.308	7.82	2.44	3.64
1	1.315	33.40	·	·	0.867	1.29	0.109	2.77	1.40	2.09	0.133	3.38	1.68	2.50	0.179	4.55	2.17	3.24	0.250	6.35	2.84	4.24	0.358	9.09	3.66	5.45
1¼	1.660	42.16	·	·	1.11	1.65	·	·	1.81	2.69	0.140	3.56	2.27	3.39	0.191	4.85	2.99	4.46	0.250	6.35	3.76	5.61	0.382	9.70	5.21	7.76
1½	1.900	48.26	·	·	1.27	1.90	·	·	2.09	3.11	0.145	3.68	2.72	4.05	0.200	5.08	3.63	5.41	0.281	7.14	4.86	7.25	0.400	10.16	6.41	9.55
2	2.375	60.33	·	·	1.60	2.39	·	·	2.64	3.93	0.154	3.91	3.65	5.44	0.218	5.54	5.02	7.49	0.344	8.74	7.46	11.11	0.436	11.07	9.03	13.45
2½	2.875	73.03	0.083	2.11	2.48	3.69	0.120	3.05	3.53	5.26	0.203	5.16	5.80	8.64	0.276	7.01	7.66	11.41	0.375	9.53	10.01	14.92	0.552	4.02	13.69	20.40
3	3.500	88.90	·	·	3.03	4.52	·	·	4.33	6.46	0.216	5.49	7.58	11.29	0.300	7.62	10.25	15.27	0.438	11.13	14.32	21.35	0.600	15.24	18.58	27.68
3½	4.000	101.60	·	·	3.47	5.18	·	·	4.97	7.41	0.226	5.74	9.11	13.57	0.318	8.08	12.51	18.63								
4	4.500	114.30	·	·	3.92	5.84	·	·	5.62	8.37	0.237	6.02	10.79	16.07	0.337	8.56	14.98	22.32	0.531	13.49	22.51	33.54	0.674	17.12	27.54	41.03
5	5.563	141.30	0.109	2.77	6.35	9.46	0.134	3.40	6.24	9.30	0.258	6.55	14.61	21.77	0.375	9.52	20.76	30.94	0.625	15.88	32.96	49.11	0.750	19.05	38.54	57.43
6	6.625	168.3	·	·	7.59	11.31	·	·	9.30	13.83	0.280	7.11	18.99	28.26	0.432	10.97	28.6	42.56	0.719	18.26	45.39	67.57	0.864	21.95	53.21	79.22
8	8.625	219.1	·	·	9.92	14.78	0.148	3.76	13.41	19.97	0.322	8.18	28.58	42.55	0.500	12.7	43.43	64.64	0.906	23.01	74.76	111.27	0.875	22.23	72.49	107.93
10	10.750	273.1	0.134	3.40	15.21	22.61	0.165	4.19	18.67	27.78	0.365	9.27	40.52	60.29	0.500	12.7	64.49	95.98	1.125	28.58	115.75	172.27	1.000	25.4	104.23	155.10

JIS (Based on JIS G3459)

Nominal Diameter		Outer diameter	SCH5S		SCH10S		SCH20S		SCH40		SCH80		SCH120		SCH160	
			Thickness	Weight	Thickness	Weight	Thickness	Weight	Thickness	Weight	Thickness	Weight	Thickness	Weight	Thickness	Weight
A	B	(mm)	(mm)	(kg/m)	(mm)	(kg/m)	(mm)	(kg/m)	(mm)	(kg/m)	(mm)	(kg/m)	(mm)	(kg/m)	(mm)	(kg/m)
6	1/8	10.5	1.0	0.234	1.2	0.275	1.5	0.333	1.7	0.369	2.4	0.479				
8	1/4	13.8	1.2	0.373	1.65	0.494	2.0	0.582	2.2	0.629	3.0	0.790				
10	3/8	17.3	1.2	0.476	1.65	0.637	2.0	0.755	2.3	0.851	3.2	1.11				
15	1/2	21.7	1.65	0.816	2.1	1.02	2.5	1.18	2.8	1.31	3.7	1.64			4.7	19.7
20	3/4	27.2	1.65	1.04	2.1	1.30	2.5	1.52	2.9	1.74	3.9	2.24			5.5	2.94
25	1	34.0	1.65	1.32	2.8	2.15	3.0	2.29	3.4	2.57	4.5	3.27			6.4	4.36
32	1¼	42.7	1.65	1.67	2.8	2.76	3.0	2.94	3.6	3.47	4.9	4.57			6.4	5.73
40	1½	48.6	1.65	1.91	2.8	3.16	3.0	3.37	3.7	4.10	5.1	5.47			7.1	7.27
50	2	60.5	1.65	2.39	2.8	3.98	3.5	4.92	3.9	5.44	5.5	7.46			8.7	11.1
65	2½	76.3	2.1	3.84	3.0	5.42	3.5	6.28	5.2	9.12	7.0	12.0			9.5	15.6
80	3	89.1	2.1	4.51	3.0	6.37	4.0	8.39	5.5	11.3	7.9	15.3			11.1	21.4
90	3½	101.6	2.1	5.15	3.0	7.29	4.0	9.63	5.7	13.5	8.1	18.7			12.7	27.8
100	4	114.3	2.1	5.81	3.0	8.23	4.0	10.9	6.0	16.0	8.6	22.4	11.1	28.2	13.5	33.6
125	5	139.8	2.8	9.46	3.4	11.4	5.0	16.6	6.6	21.7	9.5	30.5	12.7	39.8	15.9	48.6
150	6	165.2	2.8	11.3	3.4	13.7	5.0	20.0	7.1	28.0	11.0	42.3	14.3	53.8	18.2	66.6
200	8	216.3	2.8	14.9	4.0	21.2	6.5	34.0	8.2	42.5	12.7	64.4	18.2	89.8	23.0	111
250	10	267.4	3.4	22.4	4.0	26.2	6.5	42.2	9.3	59.8	15.1	94.9	21.4	132	28.6	170

Quality Assurance

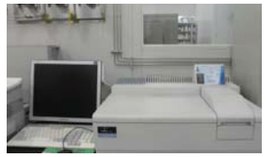
Test & analysis			
Chemical analysis		Material testing	
Instrumental analysis	Wet analysis	Testing of mechanical properties	Macro / Micro testing
• Spark emission spectrometry • X-ray fluorescence • Gas (H,O,N) analysis, carbon / sulfur analysis	• ICP emission • Atomic absorption • UV-VIS Spectrophotometry	• Tension test • Hardness test • Impact test • Fatigue test • Creep test • Illumination test • Thermal expansion test	• Heat Treated Structure Cleanliness • Grain Size Corrosion Test Scanning • Electron Microscope/Energy Dispersive Spectrometer (SEM/EDS)

X-Ray Fluorescence Spectrometer (XRF)

Atomic absorption spectrometer

Gas analyzer

Absorption spectrometer



Optical Emission Spectrometer (OES)

Creep tester

Inductively Coupled Plasma Mass Spectrometer

Hardness Tester

By using various testing and analytic instruments, SeAH CSS provides quality seamless pipes and tubes.

Certificates of Approval

ISO 9001:2008
ISO QUALITY MANAGEMENT SYSTEM

ISO/TS 16949:2009
ISO QUALITY MANAGEMENT SYSTEM

ISO 14001:2004
ISO ENVIRONMENTAL MANAGEMENT SYSTEM

KOSHA18001
KOSHA SAFE AND HEALTH MANAGEMENT SYSTEM

JAPANESE INDUSTRIAL STANDARDS

KOREA ELECTRIC POWER INDUSTRY CODE

AD 2000-MERKBLATT Wo
EUROPEAN DIRECTIVE 97/23/EC (PED)

KOREAN REGISTER

LLOYD'S REGISTER

DNV·GL
NORWAY & GERMANY REGISTER

BUREAU VERITAS

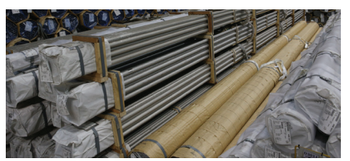
NORSOK M-650
(DUPLEX STS TUBES & PIPES)

Packing Types

Hessian Packing
- Vinyl+Hessian Packing

Wooden Slate
- Vinyl+Hessian Packing
- Wooden Slate Packing

Neno Fabric



Wooden Skid Packing
- Polyethylene Film Packing
- Wooden Skid packing

Wooden Box
- Vinyl+Hessian Packing
- Wooden Box Packing

Product Tags & Marking

Tag

Marking

Product Order Requirements

We can only provide the qualified product for you when you fully specify what you need
Be sure to provide detailed information for the line items below (Dial +82 2 6970 2368 for more questions)

[1] Applicable standards: ASTM, JIS, DIN and more [2] Steel grade, surface heat treatment, dimension
[3] Quantity and delivery [4] Applications, method of processing [5] Special requirements(if applicable)