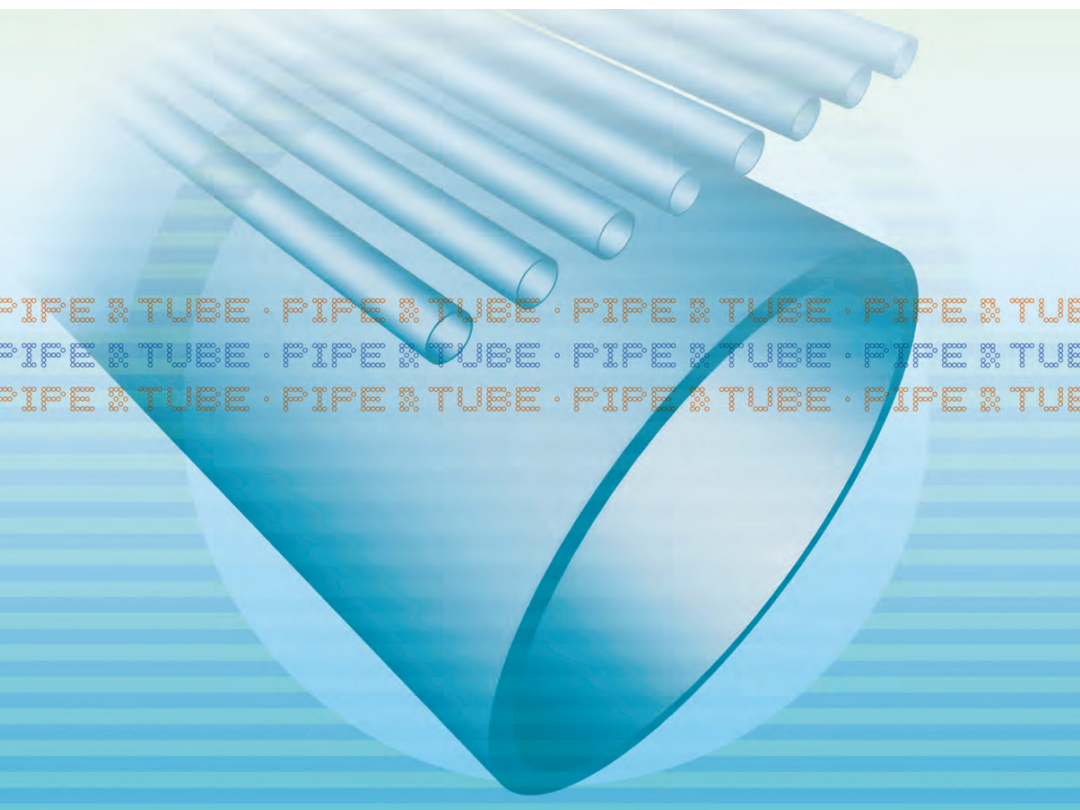


NIPPON STEEL & SUMITOMO METAL

Pipes & tubes of Nippon Steel & Sumitomo Metal



Distributor



中華五金有限公司
CHUNG WAH METAL CO., LTD.



NIPPON STEEL &
SUMITOMO METAL



Introduction

We have been manufacturing boiler steel tubes and pipes used in all fields, mainly power generation boilers, up to the present day, ever since we first started manufacturing seamless steel tubes for boilers for the first time in Japan in 1912.

During this time, higher temperatures and pressures and larger-capacity boilers have been developed and have undergone rapid technological innovations, together with changes in fuel conditions. Recently in particular, high-efficiency generation has been demanded in order to control total carbon dioxide emissions, from the viewpoint of the worldwide conservation of the global environment, and ultra-supercritical pressure boilers, pressurized fluidized bed boilers, gas turbine-combined power generation boilers, and high-efficiency industrial waste incineration boilers have been constructed one after another, as new thermal power generation boilers. Steel tubes and pipes, to be used to respond to these situations, have been demanded to maintain both high quality and high performance. There has also emerged a need for various steel tubes and pipes such as economic steel tubes and specially-shaped steel tubes.

In rapid response to these requests, as an advanced manufacturer of boiler steel tubes and pipes, we have aggressively proceeded with the development of new materials, improvement of production technology, installation of new facilities, and improvement of inspection and quality control technologies.

We are confident that our boiler steel tubes and pipes will fulfill your expectations in every aspect, such as quality, performance, and access to service networks across various countries.

APPLICABLE SPECIFICATION

1. Line Pipes (Carbon Steel)

API 5L	Line Pipe (Grade B, X42, X46, X52, X56, X60, X65, X70, X80, X90, X100)
ISO 3183	Petroleum and natural gas industries -Steel Pipe for Pipelines-
DNV OS-F101	Submarine Pipeline Systems (Applicable Design Code)
ASTM A53	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Seamless
ASTM A106	Seamless Carbon Steel Pipe for High-Temperature Service
ASTM A333	Seamless Steel Pipe for Low-Temperature Service
DIN 1629	Seamless Non-Alloy Steel Tubes
CSA Z245.1-M1982	Steel Line Pipe
JIS G3454	Carbon Steel Pipes for Pressure Service (STPG)
JIS G3455	Carbon Steel Pipes for high Pressure Service (STS)

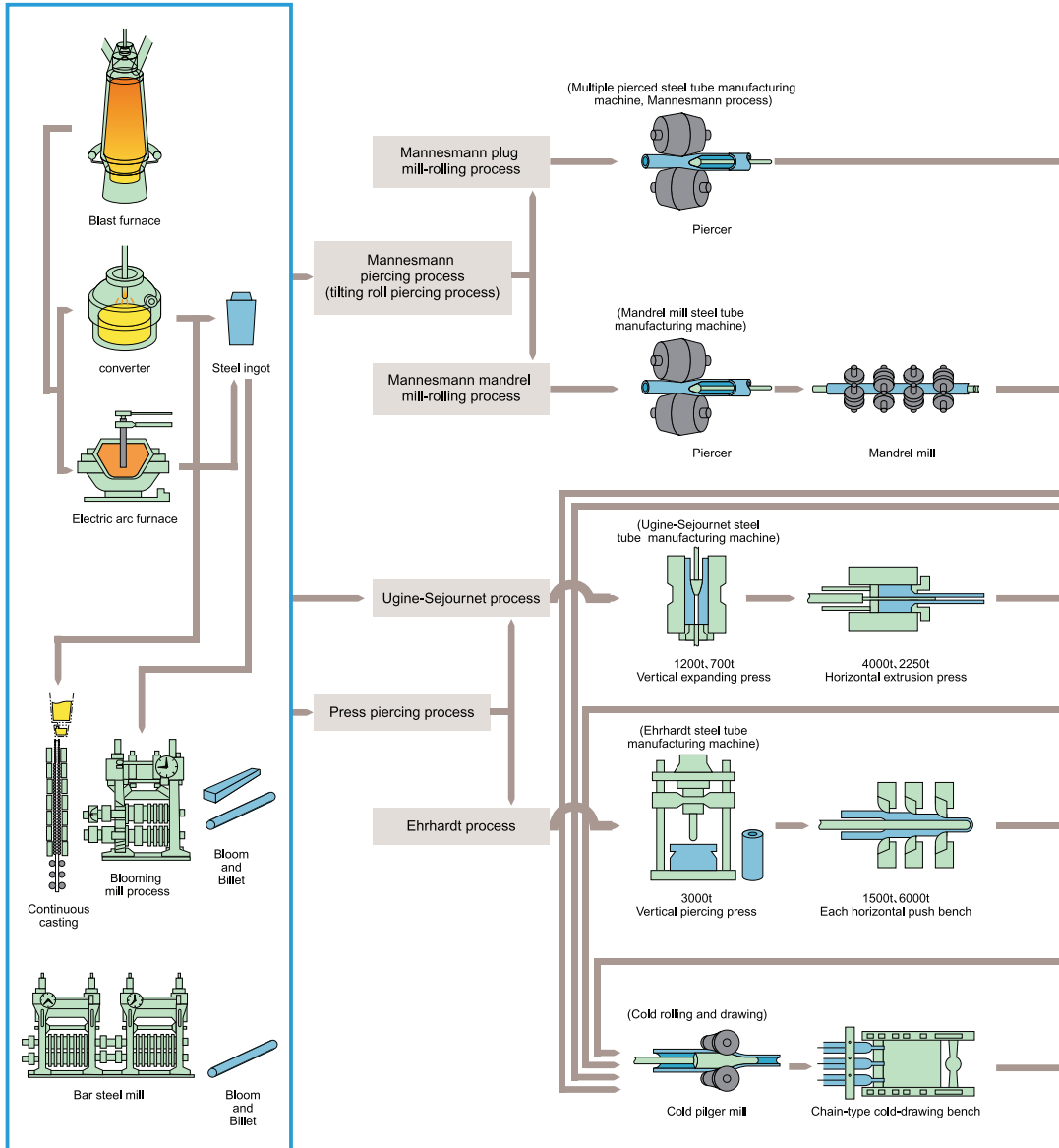
2. Line Pipes (Corrosion Resistant Alloy)

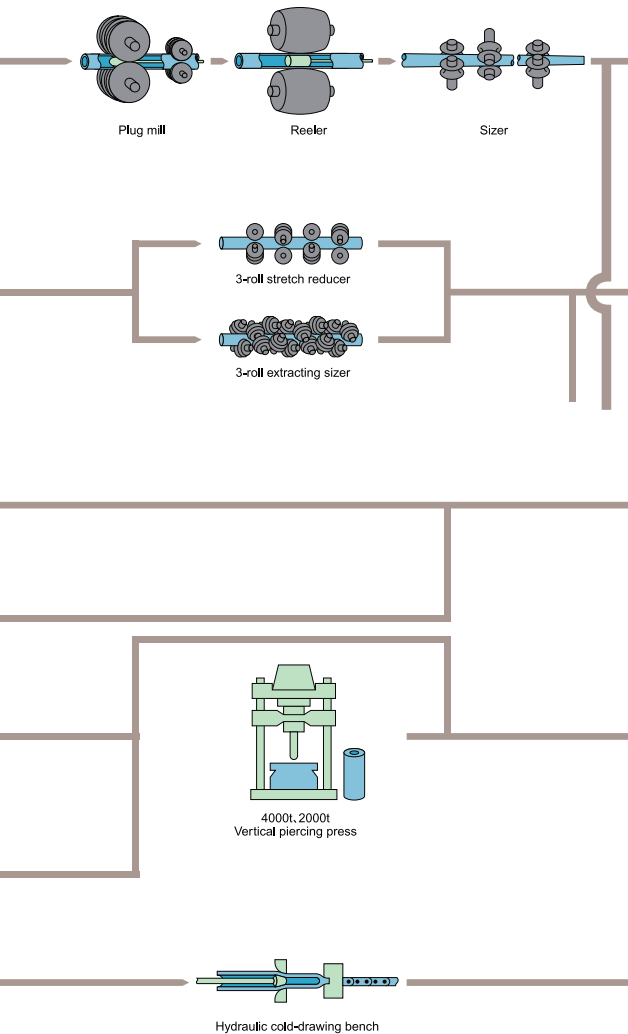
API 5LC	CRA Line Pipe
DNV OS-F101	Submarine Pipeline Systems (Applicable Design Code)
ASTM A790	(S31803) Seamless Ferritic / Austenitic Stainless Steel Pipe
ASTM A790	(S31260) seamless Ferritic / Austenitic Stainless Steel Pipe

1 Integrated production system

Manufacturing process of seamless steel tubes and pipes

(Some steel grades are not applicable in the following flow.)





Product	Works	Manufacturable range (outside diameter)	Feature
Hot-finished seamless steel tubes and pipes	Tokyo Works	25.4 ~168.3mm	1. The tube manufacturing efficiency is high. 2. Large-diameter, thin-wall seamless steel tubes can be manufactured.
Hot-finished seamless steel tubes and pipes	Wakayama Works	31.8 ~426.0mm	1. The tube manufacturing efficiency is high. 2. The surface is smooth, and thickness deviation is small.
Hot-finished seamless steel tubes and pipes Special steel shapes tubes and pipes	Amagasaki Works Hikari Pipe & Tube Div.	33.4 ~275.0mm Outside diameter 275 mm or less Minimum cross-section area 100 mm ²	1. High alloy, stainless steel, and special metal tubes and pipes can be manufactured. 2. Various special steel shapes tubes and pipes can be manufactured by changing die and mandrel shapes. 3. An order for small-hot and multiple-product types can be filled.
Hot-finished seamless steel pipes Large welded joint	Amagasaki Works Nippon Steel & Sumikin Kikoh Company, Ltd.	165.2 ~1270.0mm 21.7 ~914.4mm	1. This product is suited for manufacturing large-diameter, thick-wall steel pipes. 2. The external and internal surfaces can be machined.
Cold-finished seamless steel tubes and pipes	Amagasaki Works Wakayama Works (Kainan) Hikari Pipe & Tube Div.	6.0 ~508.0mm 15.9 ~1270.0mm 6.0 ~168.3mm	1. The dimensions are accurate, and their dispersion is small. 2. The external and internal surfaces are finely finished.

Developed Seamless Tubes and Pipes Products for Boilers

Main proprietary steel grades

Classification	Brand name	Compositions	Applicable standard (abbreviation)			Characteristics ●Example of application
			ASTM / ASME	EN, etc.	JIS/MTI standard	
Ferritic steel tubes and pipes Carbon steel tubes Low-alloy steel tubes High chrome steel tubes and pipes	S-TEN™1	0.3Cu-0.1Sb	ASTM ASME CC 2494		KA-STB380J2 KA-STPT380J2	Sulfuric and hydrochloric acid dew-point corrosion-resistance steel ●ERW tubes, seamless tubes, and heat exchanger tubes
	CR1A	1.25Cr-0.3Cu			KA-STBA10	Sulfuric acid dew-point corrosion-resistance steel ●ERW tubes, seamless tubes, and heat exchanger tubes
	HCM2S™	2.25Cr-1.6W-V-Nb	ASTM A213 T23/A335 P23 ASME CC 2199		KA-STBA24J1 KA-STPA24J1	High-strength 2.25Cr ferritic steel tubes ●Heat exchanger tubes and header pipes for heat recovery steam generator ●Thermal power generation boiler pipes, superheater tubes, and reheater tubes
	HCM9M	9Cr-2Mo			KA-STBA27 KA-STPA27	High Cr steel tubes ●Pipes, headers, superheater tubes, and reheater tubes
	[Gr.91] Developed by U.S. Oak Ridge National Laboratory	9Cr-1Mo-V-Nb	ASTM A213 T91/A335 P91 ASME SA-213 T91/SA-335 P91		KA-STBA28 KA-STPA28	High-strength, high-Cr steel tubes (This product was commercialized as a world-first.) ●Main steam pipes, headers, reheater pipes, superheater tubes, and reheater tubes of thermal power generation boilers ●Heat exchanger steel tubes for the chemical industry
	Gr.92(NF616)	9Cr-1.8W-V-Nb	ASTM A213 T92/A335 P92 ASME SA-213/SA-335 CC2179	VdTÜV 552/2	KA-STBA29 KA-STPA29	World's highest-strength, high-Cr steel tubes ●Main steam pipes, headers, reheater pipes, superheater tubes, and reheater tubes of ultra-supercritical pressure boilers
	HCM12A (Single phase)	11Cr-2W-0.4Mo-1Cu-V-Nb	ASTM A213 T122/A335 P122 ASME SA-213/SA-335 CC2180		KA-SUS410J3TB KA-SUS410J3TP	High-corrosion-resistance, high-strength, high-Cr steel tubes ●Main steam pipes, headers, reheater pipes, superheater tubes, and reheater tubes
	HCM12A (Dual phase)	12Cr-2W-0.4Mo-1Cu-V-Nb			KA-SUS410J3DTB	High-corrosion-resistance, high-strength, high-Cr steel tubes ●Heat exchanger tubes
	HCM12	12Cr-1Mo-1W-V-Nb		VdTÜV 510/2	KA-SUS410J2TB	High-corrosion-resistance, high-Cr steel tubes ●Heat exchanger tubes of black liquor recovery boilers
	TP347HFG	18Cr-12Ni-0.6Nb	ASTM A213TP347HFG (S34710) ASME SA-213 TP347HFG	VdTÜV 547/2		Superior steam oxidation resistance 18Cr austenitic stainless steel tubes with fine-grained microstructure using an original process ●Superheater tubes and reheater tubes of ultra-supercritical pressure boilers ●Heat exchanger tubes of biomass boilers
Austenitic stainless steel tubes and pipes	SUPER304H™	18Cr-9Ni-3Cu-Nb-N	ASTM A213 (S30432) ASME SA-213 CC2328	VdTÜV 550/2	KA-SUS304J1HTB	Superior steam oxidation-resistance and high-strength 18Cr austenitic stainless steel tubes ●Superheater tubes and reheater tubes of ultra-supercritical pressure boilers
	XA704	18Cr-9Ni-2W-Nb-V-N	ASTM A213 TP347W (S34705) ASME CC 2475	VdTÜV 554/2	KA-SUS347J1TB	Excellent intergranular corrosion resistance, high-strength 18Cr austenitic stainless steel tubes ●Superheater tubes and reheater tubes
	NF709	22.5Cr-25Ni-1.5Mo-Nb-N	ASTM A213 TP310MoCbN(S31025) ASME CC 2581	VdTÜV 563/2	KA-SUS310J2TB	High-strength 20 to 25Cr austenitic stainless steel tubes ●Superheater tubes and reheater tubes ●Heat exchanger tubes of refuse incineration and biomass boilers
	HR3C	25Cr-20Ni-Nb-N	ASTM A213 TP310HCbN(S31042) ASME SA-213 TP310HCbN	VdTÜV 546/2	KA-SUS310J1TB	High-strength 25Cr austenitic stainless steel tubes ●Superheater tubes and reheater tubes ●Heat exchanger tubes of black liquor recovery, refuse incineration, and biomass boilers
	YUS™170	25Cr-13Ni-0.8Mo-0.3N			KA-SUS309J1TB	High-corrosion-resistance 25Cr austenitic stainless steel tube ●Heat exchanger tubes of black liquor recovery and refuse incineration boilers ●Heat exchanger tubes and pipes for the chemical industry
	HR2M(HR2EL)	22Cr-14Ni-1.5Mo-N			KA-SUS309J2TB	High-corrosion-resistance 22Cr austenitic stainless steel tubes ●Heat exchanger tubes of black liquor recovery and refuse incineration boilers
	MN25R	25Cr-14Ni-0.8Mo-0.3N-LC-Low Si	ASTM A213 TP309LMoN (S30925) ASME CC 2639		KA-SUS309J3LTB	High-corrosion-resistance 25Cr austenitic stainless steel tubes ●Heat exchanger tubes of black liquor recovery boilers
	HR11N	29Cr-42Ni-1Mo-N	ASTM B407 (N06811) ASME SB-407 CC2518			High-corrosion-resistance, Ni-based alloy tubes ●Heat exchanger tubes of waste to energy plant and black liquor recovery boilers
	SUPER625	22Cr-50Ni-9Mo-Nb	ASTM B444 (N06852) ASME SB-407 CC2520			High-corrosion-resistance, Ni-based alloy tubes ●Heat exchanger tubes of waste to energy plant black liquor recovery boilers
	HR6W	23Cr-45Ni-7W-Ti-Nb	ASTM B167 (N06674) ASME SB-167 CC2684	VdTÜV 559/2		High-strength, high-corrosion-resistance, Ni-based alloy tubes for next-generation A-USC boilers ●Main steam pipes, reheater pipes, superheater tubes, and reheater tubes.

* HCM2S, HCM9M, HCM12A, HCM12, and MN25R were developed jointly with Mitsubishi Heavy Industries, Ltd.

CC : Code Case () is the UNS number code.

MTI means Ministry of Economy, Trade and Industry

compositions(mass%)										Normal-temperature tensile property		
C	Si	Mn	P	S	Ni	Cr	Mo	N	Others	TS, min. MPa	YS, min. MPa	EL, min. %
0.14max.	0.55max.	1.60max.	0.025max.	0.025max.	0.50max.		0.20max.		Cu : 0.25-0.50 Sb : 0.15max.	380	230	35/30
0.10max.	0.20-0.80	0.80max.	0.025max.	0.015-0.030		1.00-1.50			Cu : 0.25-0.35	410	255	25
0.04-0.10	0.50max.	0.10-0.60	0.030max.	0.010max.		1.90-2.60	0.50-0.30	0.030max.	W : 1.45-1.75 V : 0.20-0.30 Nb : 0.02-0.08 sol.Al : 0.030max. B : 0.0005-0.0060	510	400	20
0.08max.	0.50max.	0.30-0.70	0.030max.	0.030max.		8.00-10.00	1.80-2.20			510	295	25
0.06-0.12	0.20-0.50	0.30-0.60	0.020max.	0.010max.	0.40max.	8.00-9.50	0.85-1.05	0.030-0.070	V : 0.18-0.25 Nb : 0.06-0.10 sol.Al : 0.04max.	590	410	20 hardness HRC ≤ 25
0.07-0.13	0.50max.	0.30-0.60	0.020max.	0.010max.	0.40max.	8.50-9.50	0.30-0.60	0.030-0.070	W : 1.50-2.00 V : 0.15-0.25 Nb : 0.04-0.09 sol.Al : 0.04max. B : 0.001-0.006	620	440	20 hardness HRC ≤ 25
0.07-0.14	0.50max.	0.70max.	0.020max.	0.010max.	0.50max.	10.00-11.50	0.25-0.60	0.040-0.100	Cu : 0.30-1.70 W : 1.50-2.60 V : 0.15-0.30 Nb : 0.04-0.10 sol.Al : 0.040max. B : 0.0005-0.005	620	400	20
0.07-0.14	0.50max.	0.70max.	0.020max.	0.010max.	0.50max.	11.51-12.50	0.25-0.60	0.040-0.100	Cu : 0.30-1.70 W : 1.50-2.50 V : 0.15-0.30 Nb : 0.04-0.10 sol.Al : 0.040max. B : 0.0005-0.005	620	400	20
0.14max.	0.50max.	0.30-0.70	0.030max.	0.030max.		11.00-13.00	0.80-1.20		W : 0.80-1.20 V : 0.20-0.30 Nb : 0.20max.	590	390	20
0.06-0.10	0.75max.	2.00max.	0.045max.	0.030max.	9.0-13.0	17.0-19.0			8 × C-1.10	550	205	35
0.07-0.13	0.30max.	1.00max.	0.040max.	0.010max.	7.50-10.50	17.00-19.00		0.05-0.12	Cu : 2.50-3.50 Nb : 0.30-0.60	590	235	35
0.05max.	1.00max.	2.00max.	0.040max.	0.030max.	8.0-11.0	17.0-20.0	—	0.10-0.25	Nb : 0.25-0.50 V : 0.20-0.50 W : 1.50-2.60	620	260	30
0.10max.	1.00max.	1.50max.	0.030max.	0.030max.	23.0-26.0	19.5-23.0	1.0-2.0	0.10-0.25	Nb : 0.10-0.40 Ti : 0.20max. B : 0.002-0.010	640	270	30
0.10max.	1.50max.	2.00max.	0.030max.	0.030max.	17.00-23.00	23.00-27.00		0.15-0.35	Nb : 0.20-0.60	660	295	30
0.06max.	1.50max.	2.00max.	0.040max.	0.030max.	12.00-16.00	23.00-26.00	0.50-1.20	0.25-0.40		690	345	40
0.04max.	1.00max.	2.50-3.50	0.030max.	0.030max.	12.50-15.50	21.00-23.00	1.00-2.00	0.10-0.25		590	245	35
0.025max.	0.70max.	2.00max.	0.040max.	0.030max.	13.0-16.0	23.0-26.0	0.5-1.2	0.25-0.40		640	260	30
0.03max.	0.60max.	2.00max.	0.030max.	0.010max.	38.0~46.0	27.0~31.0	0.50-1.50	0.10-0.20		585	240	30
0.05max.	0.50max.	0.50max.	0.015max.	0.015max.	Bal.	20.0~23.0	8.0-10.0		Fe : 15.0-20.0 Ti : 0.40max. Al : 0.40max.	585	240	30
0.10max.	1.0max.	1.50max.	0.030max.	0.015max.	Bal.	21.5~24.5		0.02max.	Fe : 20.0-27.0 W : 6.0-8.0 Ti : 0.05-0.20 Nb : 0.10-0.35 B : 0.0005-0.006	590	235	30

Typical steel grades and main application examples

Steel grade	Compositions	Our own developed steel	Applicable Standards (abbreviation)				Application						
			ATSM (U.S.)	EN (U.K.)	DIN (DE)	JIS (JP) Thermal power standard (T)	(1)Economizer tube	(2)Evaporator	(3)Superheater tube	(4)Reheater tube	(5)Main steam tube	(6)Reheat pipe	(7)Feed water heater tube
Sulfuric acid corrosion-resistant steel	S-TEN™1 (0.3Cu-0.1Sb)	○	A423, Gr.3 (ASME CC2494)			KA-STB380J2	○(Economizer and air preheater)						
	CR1A (1.25Cr-0.3Cu)	○				KA-STBA10	○(Economizer and air preheater)						
Carbon steel	0.15-0.25C		A53-Gr.A, B			STB340(STB35) STB410(STB42) STB510(STB52) STPT370(STPT38) STPT410(STPT42)	○	○					○
			A106-Gr.A, B A178-Gr.A, C A192		St45 St45.4 St45.8 C22								
	0.25-0.35C		A210-Gr.A-1			STPT480(STPT49)	○	○					○
Low-alloy steel	0.3-0.5Mo		T1, T1a P1		15Mo3 16Mo5	STBA12, 13 STPA12		○	○	○			○
	0.5Cr-0.5Mo-V				14MoV63			○	○	○			
	0.5Cr-0.5Mo		T2 P2			STBA20 STPA20		○	○	○	○		
	1Cr-0.5Mo		T12 P12		13CrMo44	STBA22 STPA22		○	○	○	○		
	2.25Cr-1Mo		T22 P22		10CrMo910	STBA24 STPA24		○	○	○	○		
	HCM2S™* (2.25Cr-1.6W-V-Nb)	○	T23 P23 (ASME CC2199)	—	—	KA-STBA24J1 KA-STPA24J1		○	○	○	○		
High chrome ferritic steel	9Cr-1Mo		T9 P9		X12CrMo91	STBA26 STPA26		○	○	○	○		
	HCM9M* (9Cr-2Mo)	○	—	—	—	STBA27 STPA27		○	○	○			
	9Cr-1Mo-V-Nb		T91 P91	—	X10CrMoV Nb9-1	KA-STBA28 KA-STPA28		○	○	○			
	NF616 (9Cr-1.8W-V-Nb)	○	T92 P92 (ASME CC2179)	VdTÜV 552/2	X10CrWMoV Nb9-2	KA-STBA29 KA-STPA29		○	○	○			
	HCM12A* (11Cr-0.3Mo-2W-V-Nb)	○	T122 P122 (ASME CC2180)		—	KA-SUS410J3TB KA-SUS410J3TP KA-SUS410J3DTB		○	○	○			
	HCM12* (12Cr-1Mo-1W-V-Nb)	○	—	VdTÜV 510/2	—	KA-SUS410J2TB		○	○				
	12Cr-1Mo-0.3V			—	X20CrMoV121			○	○	○			
Austenitic stainless steel	18Cr-8Ni		TP304 TP304H		X5CrNi89 X6CrNi1810	SUS304 SUS304H			○				○
	18Cr-8Ni-Ti		TP321 TP321H		X6CrNiTi189 X8CrNiTi1810	SUS321 SUS321H			○	○			
	18Cr-8Ni-Nb		TP347, TP347H TP348, TP348H		X6CrNiNb189	SUS347 SUS347H			○	○			
	TP347HFG (18Cr-11Ni-0.6Nb)	○	TP347HFG	VdTÜV 547/2	X8CrNiNb1811				○	○			
	SUPER304H™ (18Cr-9Ni-3Cu-V-Nb)	○	UNS 30432 (ASME CC2328)	VdTÜV 550/2	X10CrNiCuNb 189	KA-SUS304J1HTB							
	XA704 (18Cr-9Ni-2W-V-Nb-N)	○	UNS S34705 (ASME CC2475)	VdTÜV 554/2		KA-SUS347J1TB			○	○			
	16Cr-14Ni-2.5Mo		TP316 TP316H		X5CrNiMo 17132	SUS316 SUS316H			○	○			
	NF709 (22Cr-25Ni-1.5Mo-Nb-N)	○	TP310MoCbN (ASME CC2581)	VdTÜV 563/2	X6CrNiMo 17132	KA-SUS310J2TB			○	○			
	HR3C (25Cr-20Ni-Nb-N)	○	TP310HCbN (ASME TP310HCbN)	VdTÜV 546/2	X6CrNiNbN 2520	KA-SUS310J1TB			○	○			
	YUS™170	○				KA-SUS309J1TB			○	○			
	MN25*	○	TP309LMoN (ASME CC2639)			KA-SUS309J3TB			○	○			

* HCM2S, HCM9M, HCM12A, HCM12, and MN25R were developed jointly with Mitsubishi Heavy Industries, Ltd.

Features



Consistent quality control

Consistent control is performed from the material design stage, in order to deliver materials that meet customer needs. Strict quality control is performed from the raw material processing and steel-making stages to deliver high quality materials.



Abundant steel grades

In addition to the steel grades specified in the JIS and ASTM standards, our proprietary characteristic steel grades are also available.



Numerous acquired certifications

Many JIS, TÜV, and ship-class standard certifications and approvals have been acquired.



Substantial process control and service organization

Production is based on rational process control to ensure that you are satisfied about the delivery date. Appropriate technical services are also provided based on state-of-art research, experience, and track records.

Main production specifications

	Standard No.	Title
ASTM/ASME	A182/SA-182	Forged or Rolled Alloy and Stainless Steel Flanges, Forged fittings, and Valves and Patrs for High Temperature Service
	A213/SA-213	Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater and Heat-Exchanger Tubes
	A268/SA-268	Seamless and Welded Ferritic and Martensitic Stainless Steel Tubing for General Service
	A312/SA-312	Seamless, Welded and Heavy Cold Worked Austenitic Stainless Steel Pipes
	A335/SA-335	Seamless Ferritic Alloy-Steel Pipe for High-Temperature Service
	A376/SA-376	Seamless Austenitic Steel Pipe for High-Temperature Central-Station Service
	A403/SA-403	Wrought Austenitic Stainless Steel Piping Fittings
	A789/SA-789	Seamless and Welded Ferritic/Austenitic Stainless Steel Tubing for General Service
	A790/SA-790	Seamless and Welded Ferritic/Austenitic Stainless Steel Pipes
	B161/SB-161	Nickel Seamless Pipes and Tubes
	B163/SB-163	Seamless Nickel and Nickel Alloys Condensor and Heat Exchanger Tubes
EN	10216-5	Seamless Steel Tubes for Pressure Purposes, Technical Delivery Conditions, Stainless Steel Tubes
JIS	G 3446	Stainless steel pipes for machine and structural purposes
	G 3459	Stainless steel pipes
	G 3463	Stainless steel boiler and heat exchanger tubes
	G 3467	Steel tubes for fired heater
	G 4906	Seamless nickel-chromium-iron alloy heat exchanger tubes
	H 4552	Nickel and nickel alloy seamless pipes and tubes

Available Size Range (Example)

Hot-finished seamless steel tubes and pipes

Nominal diameter		Outside diameter	Wall Thickness (mm)																								Outside diameter
(A)	(B)	(mm)	2.8	3	3.5	4	5	6	7	8	9	10	11	12	13	14	15	17	20	25	30	35	40	45	(mm)		
25	1	34.0																							34.0		
		38.1																							38.1		
40	1½	48.6																							48.6		
50	2	60.5																							60.5		
65	2½	76.3																							76.3		
		82.6																							82.6		
80	3	89.1																							89.1		
90	3½	101.6																							101.6		
100	4	114.3																							114.3		
		(120.0)																							(120.0)		
		130.0																							130.0		
125	5	139.8																							139.8		
		(150.0)																							(150.0)		
150	6	165.2																							165.2		
		(170.0)																							(170.0)		
	7	190.7																							190.7		
200	8	216.3																							216.3		
250	10	267.4																							267.4		
300	12	318.5																							318.5		
350	14	355.6																							355.6		
400	16	406.4																							406.4		
(A)	(B)	(mm)	2.8	3	3.5	4	5	6	7	8	9	10	11	12	13	14	15	17	20	25	30	35	40	45	(mm)		
Nominal diameter		Outside diameter	Wall Thickness (mm)																						Outside diameter		

Remarks 1. Be aware that there is a range where manufacturing can be difficult, depending on the material properties.
2. Consult with us about ultra-thin items near the manufacturable limit beforehand.
3. Consultation regarding size for anything not in this table is also available.

Seamless forged pipe (hot finished)

Nominal diameter		Outside diameter	Wall Thickness (mm)																						Outside diameter
(A)	(B)	(mm)	20	24	30	35	40	45	50	55	60	70	80	90	100	120	140	160	180	200	220	240	(mm)		
		152.4																						152.4	
150	6	165.2																						165.2	
	7	190.7																						190.7	
200	8	216.3																						216.3	
250	10	267.4																						267.4	
300	12	318.5																						318.5	
350	14	355.6																						355.6	
400	16	406.4																						406.4	
450	18	457.2																						457.2	
500	20	508.0																						508.0	
550	22	558.8																						558.8	
600	24	609.6																						609.6	
650	26	660.4																						660.4	
700	28	711.2																						711.2	
750	30	762.0																						762.0	
800	32	812.8																						812.8	
850	34	863.6																						863.6	
900	36	914.4																						914.4	
1000	40	1016.0																						1016.0	
1100	44	1117.6																						1117.6	
1200	48	1219.2																						1219.2	
1300	50	1270.0																						1270.0	
(A)	(B)	(mm)	20	24	30	35	40	45	50	55	60	70	80	90	100	120	140	160	180	200	220	240	(mm)		
Nominal diameter		Outside diameter	Wall Thickness (mm)																						Outside diameter

Remark Consultation regarding size for anything not in this table is also available.

Product outline (applications and standards)

Common grade seamless pipes and tubes for the chemical industry

Classification	Grade	Component	Applicable standard			Characteristics ※ Example of an application
			ASTM/ASME (example of a standard)	EN, etc.	JIS (example of a standard)	
Austenitic stainless steel	303	18Cr-8Ni-S	S30300	1.4305	SUS303	Free cutting steel
	304	18Cr-8Ni	S30400	1.4301	SUS304	Basic steel grade: ※ General-purpose steel for numerous applications in many fields
	304H	18Cr-8Ni+High C	S30409	1.4948	SUS304H	
	304L	18Cr-8Ni-Low C	S30403	1.4307	SUS304L	
	304N	18Cr-8Ni-N	S30451 (ASTM A213 TP304N)	1.4315	(SUS304N1)	High strength
	304LN	18Cr-8Ni-Low C-N	S30453 (ASTM A213 TP304LN)	1.4311	(SUS304LN)	Intergranular corrosion resistance
	309	22Cr-12Ni	S30909	1.4829	SUS309	Oxidation resistance: ※ Chemical plant pipes and tubes ※ Radiant tubes ※ Thermocouple protection tubes
	309S	22Cr-12Ni	S30908		SUS309S	
	310	25Cr-20Ni	S31009	1.4842	SUS310	
	310S	25Cr-20Ni	S31008		SUS310S	Seawater resistance: ※ Seawater desalination plant pipes Corrosion resistance: ※ LNG plant pipes ※ Boilers, nuclear power and chemical industry pipes and tubes
	312L	20Cr-18Ni-6Mo-0.2N	S31254	1.4547	SUS312L	
	316	18Cr-12Ni-2Mo	S31600	1.4401	SUS316	
	316H	18Cr-12Ni-2Mo+High C	S31609	1.4918	SUS316H	Intergranular corrosion resistance
	316L	18Cr-12Ni-2Mo-Low C	S31603	1.4404	SUS316L	
	316Ti	18Cr-12Ni-Mo-Ti	S31635 (ASTM A213 TP316Ti)	1.4571	SUS316Ti (JIS G3163)	
	317	18Cr-12Ni-3Mo	S31700		SUS317	Pitting corrosion resistance: ※ Chemical tanker pipes
	317L	18Cr-12Ni-3Mo-Low C	S31703	1.4438	SUS317L	Intergranular corrosion resistance: ※ Chemical plant pipes
	321	18Cr-9Ni-Ti	S32100	1.4541	SUS321	High-temperature strength: ※ Boiler heater tubes and reheater tubes
	321H	18Cr-9Ni-Ti+High C	S32109	1.4940	SUS321H	Intergranular corrosion resistance: ※ Chemical plant pipes and tubes
	347	18Cr-9Ni-Nb	S34700	1.4550	SUS347	High-temperature strength: ※ Boiler heater tubes and reheater tubes
	347H	18Cr-9Ni-Nb+Low C	S34709	1.4942	SUS347H	
Duplex stainless steel	310MoLN	25Cr-22Ni-2Mo-N	S31050 (ASTM A213)	1.4466		Intergranular corrosion resistance: ※ Urea reactor tubes
	329J3L	22Cr-5Ni-3Mo-0.15N	S31803 (ASTM A789)	1.4462 NORSOK M-630/M-650	SUS329J3L	High strength, high corrosion resistance: ※ Various heat exchanger tubes
	329J4L	25Cr-7Ni-3Mo-0.2N	S31260 (ASTM A789)		SUS329J4L	
	S31500	18.5Cr-5Ni-2.7Mo	S31500 (ASTM A789)	1.4410 NORSOK M-630/M-650		
	S32205	22.5Cr-6Ni-3Mo-0.2N	S32205 (ASTM A789)			High strength, high corrosion resistance: ※ Seawater desalination plant pipes
Martensitic stainless steel	405	13Cr-Al	S40500 (ASTM A268 TP405)	1.4002	SUS405 (JIS G3463)	Low thermal expansion: ※ Automotive exhaust system pipes
	410	13Cr	S41000 (ASTM A213 TP444)	1.4006	SUS410 (JIS G3463)	
Ferritic stainless steel	430	18Cr	S43000 (ASTM A268 TP430)	1.4016	SUS430 (JIS G3463)	Chloride corrosion resistance and stress corrosion crack resistance: ※ Water heater pipes
	444	19Cr-2Ni-Ti/Nb	S44400 (ASTM A213 TP444)	1.4521	SUS444 (JIS G3463)	
	446	25Cr-N	S44600 (ASTM A268 TP446-1)			
High Ni alloy	800	20Cr-30Ni-Ti	N08800 (ASTM B163)	1.4558	NCF800 (JIS G4904)	High corrosion resistance
	800H	20Cr-30Ni-Ti+High C	N08810 (ASTM B163)	1.4876	NCF800H (JIS G4904)	High strength, high corrosion resistance: ※ Chemical plant heater tubes and reheater tubes
	904L	20Cr-25Ni-4.5Mo-Cu	N08904 (ASTM A312)	1.4539	SUS890L (JIS G3463)	High corrosion resistance: ※ Various heat exchanger tubes
	28	27Cr-31Ni-3.5Mo-Cu	N08028 (ASTM B668)	1.4563		High pitting corrosion resistance: ※ Seawater heat exchanger tubes
	254SMO	20Cr-18Ni-6Mo-Cu-N	S31254 (ASTM A312)	1.4547		High corrosion resistance
	20	20Cr-35Ni-2Mo-3Cu-Nb	N08020 (ASTM B729)	2.4660		High corrosion resistance and stress corrosion crack resistance: ※ Heat exchanger tubes for petroleum refining
	825	20Cr-42Ni-3Mo-2Cu-Ti	N08825 (ASTM B163)	2.4858	NCF825 (JIS G4904)	Oxidation resistance: ※ Thermocouple protection tubes
Ni-based alloy	600	15Cr-8Fe-Ni base	N06600 (ASTM B163)	2.4816	NCF600 (JIS G4904)	Oxidation resistance and carburization resistance
	601	23Cr-1.4Al-Ni base	N06601 (ASTM B163)	2.4581		High corrosion resistance and stress corrosion crack resistance: ※ Seawater heat exchanger tubes
	625	22Cr-9Mo-Ni base	N06625 (ASTM B444)	2.4856	NCF625 (JIS G4904)	High corrosion resistance
	690	29Cr-9Fe-Ni base	N06690 (ASTM B163)	2.4642	NCF690 (JIS G4904)	
	C22	21Cr-13Mo-3W-Ni base	N06022 (ASTM B622)	2.4602	NW6022 (JIS H4552)	High acid resistance: ※ Heat exchanger tubes for chemical plants
	276	15.5Cr-16Mo-5Fe-Ni base	N10276 (ASTM B622)	2.4819	NW0276 (JIS H4552)	
	200	Ni	N02200 (ASTM B161)	2.4066	NW2200 (JIS H4552)	High corrosion resistance: ※ Heat exchanger tube for caustic soda and hydrogen chloride plants
	201	Ni-Low C	N02201 (ASTM B161)	2.4068	NW2201 (JIS H4552)	

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Chemical compositions (mass%)										Room-temperature tensile property		
C	Si	Mn	P	S	Ni	Cr	Mo	N	Others	TS, min. MPa	YS, min. MPa	EL, min. %
0.15max.	1.00max.	2.00max.	0.20max.	0.15max.	8.00~10.00	17.00~19.00	0.60max.	—	—	520	205	40
0.08max.	1.00max.	2.00max.	0.045max.	0.030max.	8.00~11.00	18.00~20.00	—	—	—	520	205	35
0.04~0.10	0.75max.	2.00max.	0.040max.	0.030max.	8.00~11.00	18.00~20.00	—	—	—	520	205	35
0.030max.	1.00max.	2.00max.	0.045max.	0.030max.	9.00~13.00	18.00~20.00	—	—	—	480	175	35
0.08max.	1.00max.	2.00max.	0.045max.	0.030max.	8.0~11.0	18.0~20.0	—	0.10~0.16	—	550	240	35
0.035max.	1.00max.	2.00max.	0.045max.	0.030max.	8.00~11.0	18.0~20.0	—	0.10~0.16	—	515	205	35
0.15max.	1.00max.	2.00max.	0.040max.	0.030max.	12.00~15.00	22.00~24.00	—	—	—	520	205	35
0.08max.	1.00max.	2.00max.	0.045max.	0.030max.	12.00~15.00	22.00~24.00	—	—	—	520	205	35
0.15max.	1.50max.	2.00max.	0.040max.	0.030max.	19.00~22.00	24.00~26.00	—	—	—	520	205	35
0.08max.	1.50max.	2.00max.	0.045max.	0.030max.	19.00~22.00	24.00~26.00	—	—	—	520	205	35
0.02max.	0.80max.	1.00max.	0.030max.	0.015max.	17.50~19.50	19.00~21.00	6.00~7.00	0.16~0.23	Cu:0.50~1.00	650	300	35
0.08max.	1.00max.	2.00max.	0.045max.	0.030max.	10.00~14.00	16.00~18.00	2.00~3.00	—	—	520	205	35
0.04~0.10	0.75max.	2.00max.	0.030max.	0.030max.	11.00~14.00	16.00~18.00	2.00~3.00	—	—	520	205	35
0.030max.	1.00max.	2.00max.	0.045max.	0.030max.	12.00~16.00	16.00~18.00	2.00~3.00	—	—	480	175	35
0.08max.	0.75max.	2.00max.	0.030max.	0.030max.	11.00~14.00	16.00~18.00	2.00~3.00	—	—	520	205	35
0.08max.	1.00max.	2.00max.	0.045max.	0.030max.	11.00~15.00	18.00~20.00	3.00~4.00	—	—	520	205	35
0.030max.	1.00max.	2.00max.	0.045max.	0.030max.	11.00~15.00	18.00~20.00	3.00~4.00	—	—	480	175	35
0.08max.	1.00max.	2.00max.	0.045max.	0.030max.	9.00~13.00	17.00~19.00	—	—	Ti:5× C% ,min	520	205	35
0.04~0.10	0.75max.	2.00max.	0.030max.	0.030max.	9.00~13.00	17.00~20.00	—	—	Ti:4× C% ~0.60	520	205	35
0.08max.	1.00max.	2.00max.	0.045max.	0.030max.	9.00~13.00	17.00~19.00	—	—	Nb:10× C% ,min	520	205	35
0.04~0.10	1.00max.	2.00max.	0.030max.	0.030max.	9.00~13.00	17.00~20.00	—	—	Nb:8× C% ~1.00	520	205	35
0.025max.	0.40max.	2.00max.	0.020max.	0.030max.	21.0~23.0	24.0~26.0	2.00~3.00	0.10~0.16	—	540	255	25
0.030max.	1.00max.	1.50max.	0.040max.	0.030max.	4.50~6.50	21.00~24.00	2.50~3.50	0.08~0.20	—	620	450	18
0.030max.	1.00max.	1.50max.	0.040max.	0.030max.	5.50~7.50	24.00~26.00	2.50~3.50	0.08~0.30	—	620	450	18
0.030max.	1.40~2.00	1.20~2.00	0.030max.	0.030max.	4.3~5.2	18.00~20.00	2.50~3.50	0.05~0.10	—	630	440	30
0.030max.	1.00max.	2.00max.	0.030max.	0.020max.	4.5~6.5	22.0~23.0	3.0~3.5	0.14~0.20	—	655	450	25
0.030max.	0.80max.	1.20max.	0.035max.	0.020max.	6.0~8.0	24.0~26.0	3.0~5.0	0.24~0.32	Cu:0.50max.	800	550	15
0.08max.	1.00max.	1.00max.	0.040max.	0.030max.	0.60max.	11.50~14.50	—	—	Al:0.10~0.30	410	205	20
0.15max.	1.00max.	1.00max.	0.040max.	0.030max.	—	11.50~13.50	—	—	—	410	205	20
0.12max.	0.75max.	1.00max.	0.040max.	0.030max.	—	16.00~18.00	—	—	—	410	245	20
0.025max.	1.00max.	1.00max.	0.040max.	0.030max.	—	17.00~20.00	1.75~2.50	0.025max.	(Ti+Nb+Zr): 8× (C%+N%) ~0.80	410	245	20
0.20max.	1.00max.	1.50max.	0.040max.	0.030max.	0.75max.	23.00~27.00	—	0.10~0.25	—	485	275	18
0.10max.	1.00max.	1.50max.	0.030max.	0.015max.	30.00~35.00	19.00~21.00	—	—	Cu:0.75max. Al:0.15~0.60 Ti:0.15~0.60	450	175	30
0.05~0.10	1.00max.	1.50max.	0.030max.	0.015max.	30.00~35.00	19.00~21.00	—	—	Cu:0.75max. Al:0.15~0.60 Ti:0.15~0.60	450	175	30
0.02max.	1.00max.	2.00max.	0.040max.	0.030max.	23.00~28.00	19.00~23.00	4.00~5.00	—	Cu:1.00~2.00	490	215	35
0.030max.	1.0max.	2.50max.	0.030max.	0.030max.	30.00~34.00	26.0~28.0	3.0~4.0	—	Cu:0.6~1.4	500	214	40
0.020max.	0.80max.	1.00max.	0.030max.	0.010max.	17.5~18.5	19.5~20.5	6.0~6.5	0.18~0.22	Cu:0.50~1.00	655	310	35
0.07max.	1.00max.	2.00max.	0.045max.	0.035max.	32.0~38.0	19.00~21.00	2.00~3.00	—	Cu:3.00~4.00 Nb+Ta:8× C-1.00	550	240	30
0.05max.	0.50max.	1.00max.	0.030max.	0.015max.	38.00~46.00	19.50~23.50	2.50~3.50	—	Cu:1.50~3.00 Al:0.20max. Ti:0.60~1.20	585	235	30
0.15max.	0.50max.	1.00max.	0.030max.	0.015max.	72.00min	14.00~17.00	—	—	Fe:6.00~1.00 Cu:0.50max.	550	245	30
0.10max.	0.5max.	1.5max.	—	0.015max.	58.00~63.00	21.0~25.0	—	—	Al:1.0~1.7 Cu:1.0max.	550	205	30
0.10max.	0.50max.	0.50max.	0.015max.	0.015max.	58.00min	20.00~23.00	8.00~10.00	—	Fe:5.00max. Al:0.40max. Ti:0.40max. Nb+Ta:3.15~4.15	690 Solution	275 Solution	30
0.05max.	0.50max.	0.50max.	0.030max.	0.015max.	58.00min	27.00~31.00	—	—	Fe:7.0~11.0 Cu:0.50max.	590	245	30
0.015max.	0.08max.	0.50max.	0.025max.	0.020max.	Remnant	20.0~22.5	12.5~14.5	—	Fe:4.0~6.0 Co:2.5max. W:2.5~3.5 V:0.35max.	690	310	45
0.010max.	0.08max.	1.00max.	0.040max.	0.030max.	Remnant	14.5~16.5	15.0~17.0	—	Fe:4.0~7.0 Co:2.5max. W:3.0~4.5 Fe:0.4max. Cu:0.2max.	690	260	40
0.15max.	0.3max.	0.3max.	—	0.010max.	99.0min	—	—	—	Fe:0.4max. Cu:0.2max.	380	105	35
0.02max.	0.3max.	0.3max.	—	0.010max.	99.0min	—	—	—	Fe:0.4max. Cu:0.2max.	345	85	35

Product outline (applications and standards)

Developed seamless steel pipes and tubes for the chemical industry

Classification	Grade	Composition	Applicable standard			
			ASTM/ASME (example of a standard)	EN, etc.	JIS	
Austenitic stainless steel	YUS™ 270	20Cr-18Ni-6Mo-0.7Cu-0.2N-LC	S31254 (ASTM A312)	1.4547	JIS G3463 SUS312LTB	High corrosion resistance (pitting corrosion resistance, seawater resistance and acid resistance): - Heat exchanger pipes and tubes for seawater desalination plants - Seawater heat exchanger pipes and tubes for various chemical plants - Food plant pipes handling high salinity
	347AP	18Cr-10Ni-0.3Nb	S34751 (ASTM A312) ASME CC2196			Polythionic acid stress corrosion crack resistance and weld crack resistance: Petroleum refining plant furnace tubes
	NSSMC™ 317CU	18Cr-18Ni-3.5Mo-4Cu				Sulfuric and hydrochloric acid dew point corrosion resistance (comparable to Ni-based alloy): Exhaust gas pipes and heat exchanger tubes for sulfur fuel boilers
	HRX19™	22Cr-13Ni-5Mn-2Mo-0.3N	ASME TPXM-19			Hydrogen embrittlement resistance, High strength High pressure gaseous hydrogen supply tubes for hydrogen stations
Duplex stainless steel	YUS™ DX1	22Cr-5Ni-3Mo-0.13Cu-LC	S31803 (ASTM A789)	1.4462	JIS G3463 SUS329J3LTB	High corrosion resistance (stress corrosion crack, general corrosion and crevice corrosion resistance): Heat exchanger pipes and tubes for various chemical plants
	DP11A	24Cr-4Ni-Mo-Cu-N				
	DP12	25Cr-7Ni-2.7Mo-W-N	S31260 (ASTM A789)		JIS G3463 SUS329J4L	High corrosion resistance (urea corrosion and stress corrosion crack resistance): Urea reactor tubes
	DP3 DP3N	25Cr-7Ni-3.3Mo-N-W	S31260 (ASTM A789)		JIS G3463 SUS329J4L	High corrosion resistance (pitting corrosion, seawater and crevice corrosion resistance): Seawater heat exchanger tubes for various chemical plants
	DP3W	25Cr-7Ni-3.2Mo-2W-N	S39274 (ASTM A789) ASME CC2427	NORSOK M-630/M-650		High corrosion resistance (pitting corrosion, seawater and crevice corrosion resistance): Umbilical tubes and seawater heat exchanger tubes
	DP28W™	27.5Cr-7.7Ni-2.2W-Mo-N	S32808 (ASTM A789) ASME CC2496			High corrosion resistance (urea corrosion and stress corrosion crack resistance): Urea reactor tubes
Ferritic stainless steel	YUS™ 190	19Cr-2Mo-Ti-Nb-JULC-LN	S44400 (ASTM A268)	1.4521	JIS G3463 SUS444TB	Stress corrosion crack resistance (general corrosion resistance at SUS304 or higher): - Heat exchanger pipes and tubes for various chemical plants - Small hot-water/steam boilers
High Ni alloy	HK4M	25Cr-25Ni				Oxidation resistance, carburization resistance, and high-temperature strength (700 to 1,100°C) Cracking tubes for ethylene plants
	Grade HPM	25Cr-38Ni-Mo-Si				Furnace pipes for hydrogen refineries Example of use: HK4M to 1,050°C and HPM to 1,100°C
Ni-based alloy	NSSMC™ 845	22.5Cr-47Ni-3Cu-6Mo-3.5W	N06845 (ASTM B423)			Pitting corrosion resistance and acid resistance (sulfuric acid, hydrochloric acid, nitric acid, formic acid, etc.) Highly corrosion-resistant pipes and heat exchanger tubes for the chemical industry
	NSSMC™ 696	30Cr-60Ni-2Cu-1.5Si	N06696 (ASTM B167) ASME CC2652			Metal dusting corrosion resistance, carburization resistance, and high-temperature strength - Heating furnace pipes for synthetic gas plants - High-temperature pipes for direct reduction iron plants

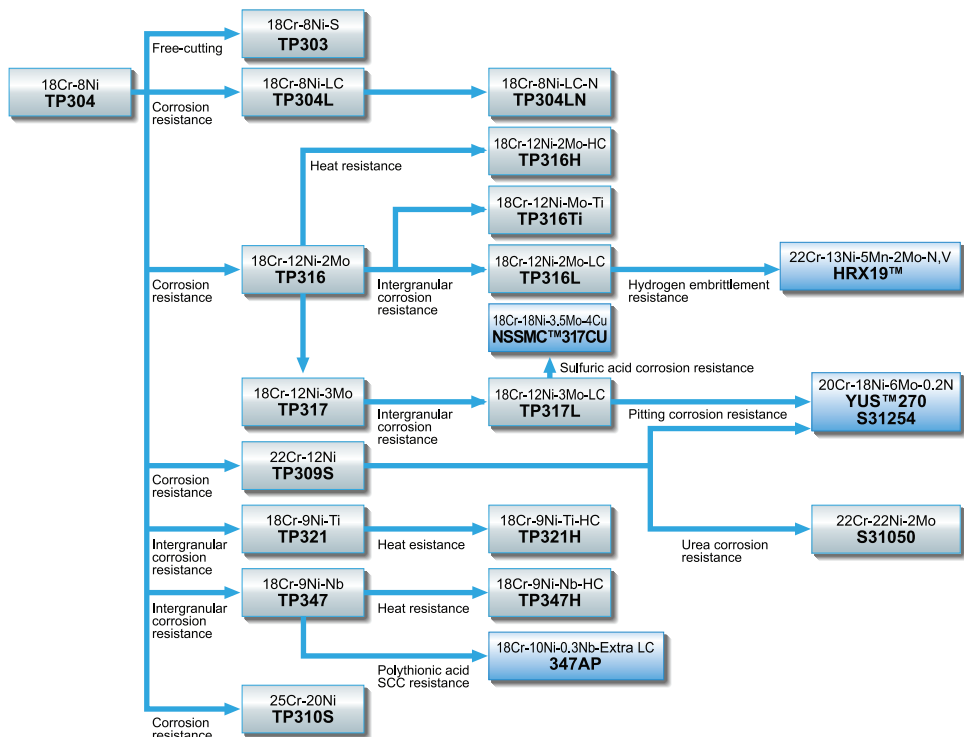
Note 1: DP28W™ is steel developed jointly with Toyo Engineering Corporation.

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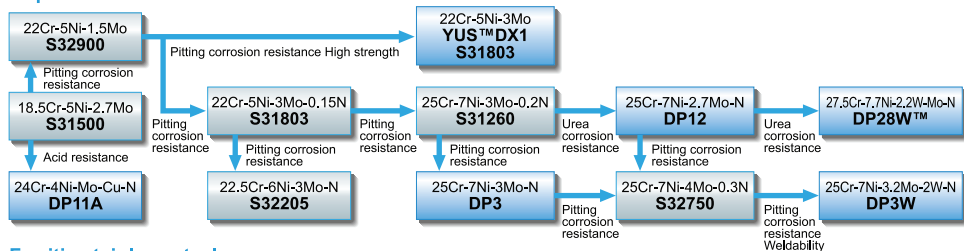
Compositions (mass%)										Room-temperature tensile property		
C	Si	Mn	P	S	Ni	Cr	Mo	N	Others	TS, min, MPa	0.2% PS, min, MPa	EL, min, %
0.020max.	0.80max.	1.00max.	0.030max.	0.015max.	17.50~19.50	19.00~21.00	6.00~7.00	0.16~0.25	Cu:0.50~1.00	650	300	35
0.005~0.020	1.00max.	2.00max.	0.045max.	0.030max.	9.00~13.00	17.00~20.00	—	0.06~0.10	Nb:0.20~0.50 Nb $\leq$ 15C	515	205	35
0.030max.	1.00max.	2.00max.	0.040max.	0.010max.	15.10~16.50	17.00~19.00	3.10~4.00	0.045max.	Cu:3.5~5.0	480	175	35
0.005~0.060	0.20~1.00	4.30~6.00	0.030max.	0.010max.	12.0~13.5	21.5~23.5	1.50~3.00	0.25~0.40	Nb:0.15~0.30 V:0.15~0.30	800	430	35
0.030max.	1.00max.	2.00max.	0.030max.	0.020max.	4.50~6.50	21.00~23.00	2.50~3.50	0.08~0.20	—	620	450	18
0.030max.	1.5max.	2.00max.	0.040max.	0.015max.	3.0~5.0	22.0~25.0	0.15~0.50	0.05~0.25	Cu:1.0~2.0	600	400	25
0.030max.	1.00max.	1.50max.	0.040max.	0.030max.	5.5~7.5	24.00~26.00	2.50~3.50	0.08~0.30	—	620	450	18
0.030max.	1.00max.	1.50max.	0.040max.	0.030max.	5.5~7.5	24.00~26.00	2.50~3.50	0.08~0.30	—	620	450	18
0.030max.	0.80max.	1.00max.	0.030max.	0.020max.	6.0~8.0	24.0~26.0	2.5~3.5	0.24~0.32	Cu:0.20~0.80 W:1.50~2.50	800	550	15
0.030max.	0.50max.	1.10max.	0.030max.	0.010max.	7.0~8.2	27.0~27.9	0.80~1.20	0.30~0.40	W:2.10~2.50	800	550	15
0.015max.	0.50max.	0.50max.	0.040max.	0.030max.	—	18.00~20.00	1.75~2.25	0.025max.	(Ti+Nb) $\leq$ 16 (C+N)	410	245	20
0.2~0.3	0.75max.	1.50max.	0.020max.	0.030max.	24.0~26.0	24.0~26.0	—	—	Ti:0.20~0.60 Al:0.20~0.60 B:0.002~0.007	520	235	25
0.10~0.20	1.40~2.00	1.50max.	0.020max.	0.030max.	37.0~40.0	23.0~26.0	1.00~3.00	—	Ti:0.20~0.60 B:0.010max. Zr:0.050max.	520	206	25
0.05max.	0.50max.	0.5max.	—	0.010max.	44.0~55.0	20.0~25.0	5.0~7.0	—	Cu:2.0~4.0 W:2.00~5.00	690	276	30
0.15max.	1.0~2.5	1.0max.	—	0.010max.	Remnant	28.0~32.0	1.0~3.0	—	Fe:2.0~6.0 Cu:1.5~3.0 Ti:1.0max.	586	240	30

System diagram of stainless steel and Ni-based alloy

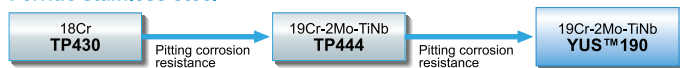
Austenitic stainless steel



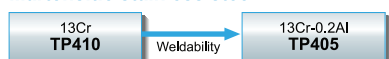
Duplex stainless steel



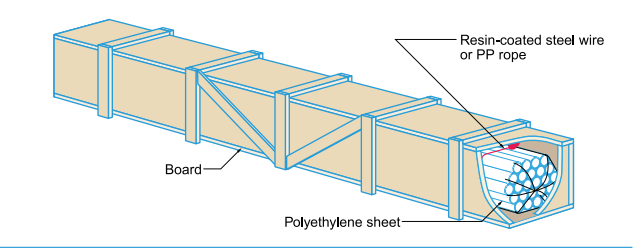
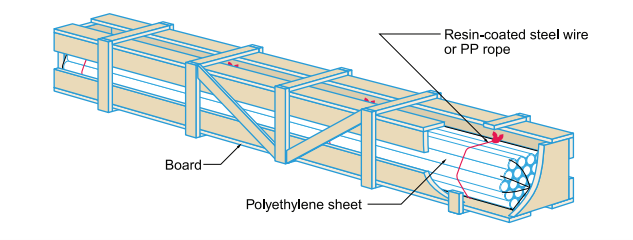
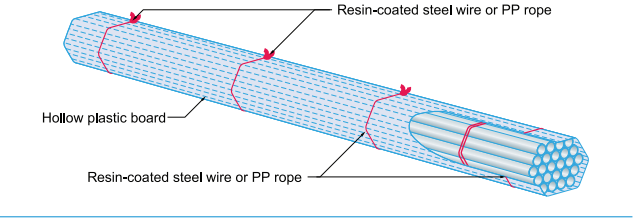
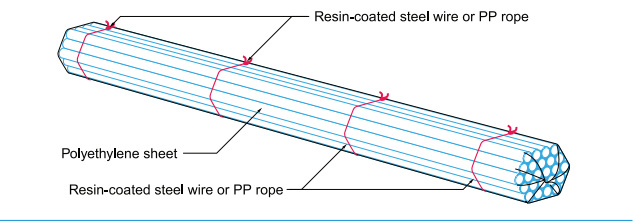
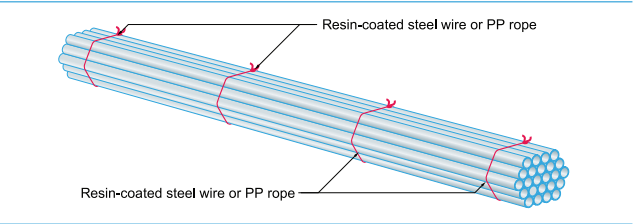
Ferritic stainless steel



Martensitic stainless steel



Example of Packing

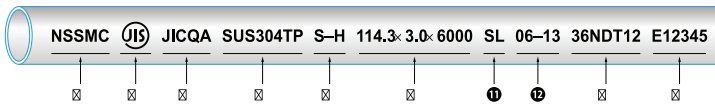


Example of Indications

〈ASTM〉 ☒ This is an example. Indication is based on cargo mark reports, in principle.



〈JIS〉



☒	Manufacturer's band or name
☒	Standard abbreviation
☒	Manufacturing method
☒	Dimensions (outside diameter × thickness × length)
☒	Inspection number (serial number)
☒	Heat number (molten steel number)
☒	Country of origin
☒	JIS mark
☒	Certification body code
☒	Type code
①	Works abbreviation
②	Date of manufacture (month/two low-order digits for year)

Requests during orders

When ordering or inquiring about our stainless steel pipes and tubes, you are requested to inform us about the following items.

1. Steel pipe standard and type
2. Dimensions (outside diameter, thickness, and length)
3. Quantity
4. Delivery date and destination
5. Applications and usage condition
6. Packing type
7. Number of copies of the inspection certificate
8. With or without a witnessed inspection
9. Other and specially requested items

NIPPON STEEL & SUMITOMO METAL

<http://www.nssmc.com/>

URL: <http://www.tubular.nssmc.com/>

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Pipes & tubes of Nippon Steel & Sumitomo Metal

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