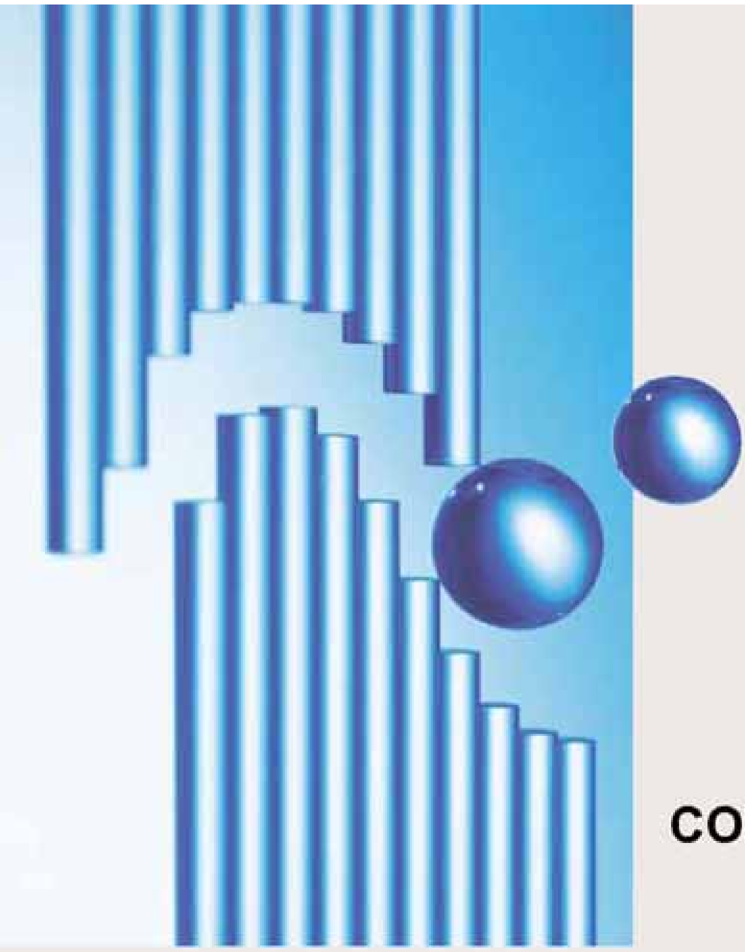

COMPANY PROFILE

회사소개서

KOBE SPECIAL TUBE CO., LTD.

A Leader in High-Grade Seamless Steel Tubular Products

Titanium Welded Tube
Stainless Steel Tube

- 특수재질 관
- 정밀 강관
- Clean pipe
- 티타늄 용접관
- 스테인레스 스틸 관

고베 스페셜 튜브 주식회사는 혼슈 섬 서쪽의 역사깊은 시모노세키 Chofu에 위치해 있으며 우리의 Seamless Steel 튜브제조의 역사는 우리가 Ugine Sejournett열간 인장방식을 처음 소개한 1956년으로 거슬러 올라가며, 그 이래로 1980년 티타늄 용접튜브와 정밀규격의 파이프를 포함하여 최고품질의 제품을 지속적으로 생산해왔습니다.

최고의 품질을 유지하고자 우리는 끊임없는 생산기술의 개발과 엄격한 품질기준을 지켜왔습니다.

최근 에너지, 전자산업 과 우주항공산업시장의 격변하는 요구에도 발맞추어 Seamless Tube들을 개발해왔습니다. 전례없이 높아지는 제품 표면의 편평도, 정밀규격, 내식성 및 고청결도를 요구하는 최근의 시장경향은 제품형태의 다각화와 더욱 엄격한 품질관리를 요구하고 있습니다.

고베스페셜튜브는 다년간 제조경험을 통해 습득한 전문기술을 활용하여 고효율 통합 경영 방식과 오늘날 발전된 기술적인 도전을 위한 준비된 기업입니다.

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주요제품

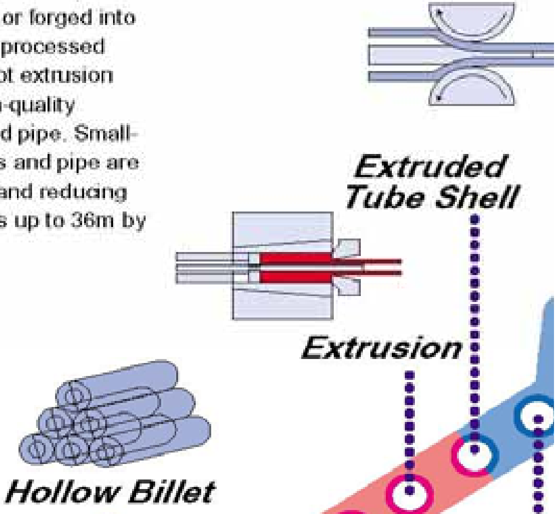
Stainless Steel Tubes and Pipe 스테인레스 튜브 및 파이프	●Piping use for nuclear power plants, Chemical industry, Petrochemical industry, etc. (화학, 원자력, 석유화학용) ●Heat exchanger use for power plants, Petrochemical industry, etc. ●Mother tubes for redrawing ●Industrial machinery use (석유화학, 발전소 열교환기 및 모재, 산업용)
Precision Tube 정밀규격 관	●Fuel Cladding Tubes for FBR, Control rods for PWR, Tapered tubes for rocket engines, Clean pipe for the semiconductor industry (연료 관, 제어봉, 로케엔진용관, 반도체산업용)
Specialty Tube 특수 관	●Wrapper tubes for FBR, Torque tubes for aircraft, Electro-polished pipe (항공기용 동력전달용, 전기광택용)
Titanium Welded Tube 티탄 용접관	●Condenser tubes for thermal and nuclear (발전소용 컨덴스 튜브, 담수화 공장) power plants, Tubes for desalination plants

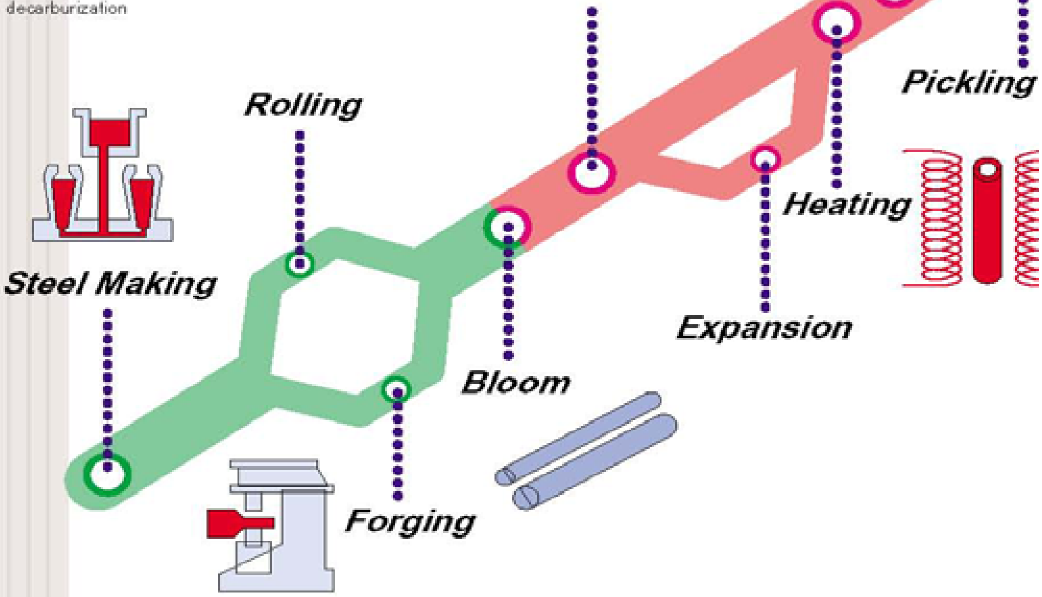
Production Process of Seamless Stainless Steel Tubes and Pipe

관 및 파이프의 제조공정

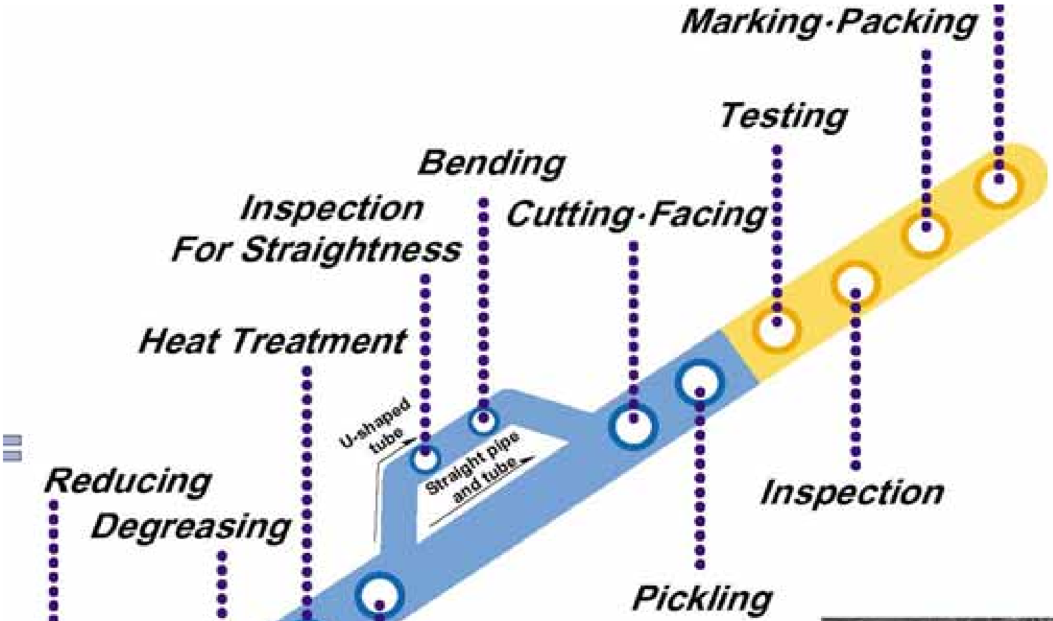
Kobe Special Tube's seamless stainless tubes and pipe are made with a variety of sophisticated equipment. Our high-quality ingots are produced utilizing electric arc melting and vacuum-oxygen decarburization (VOD). Our vacuum induction melting process (VIM), electroslag remelting process (ESR), and vacuum arc remelting process (VAR) are applicable for special use. These ingots are rolled or forged into blooms that are then further processed using the Ugine Sejournet hot extrusion process and turned into high-quality seamless stainless tubes and pipe. Small-diameter and precision tubes and pipe are manufactured by a drawing and reducing process and extra-long tubes up to 36m by long-tubing facilities.

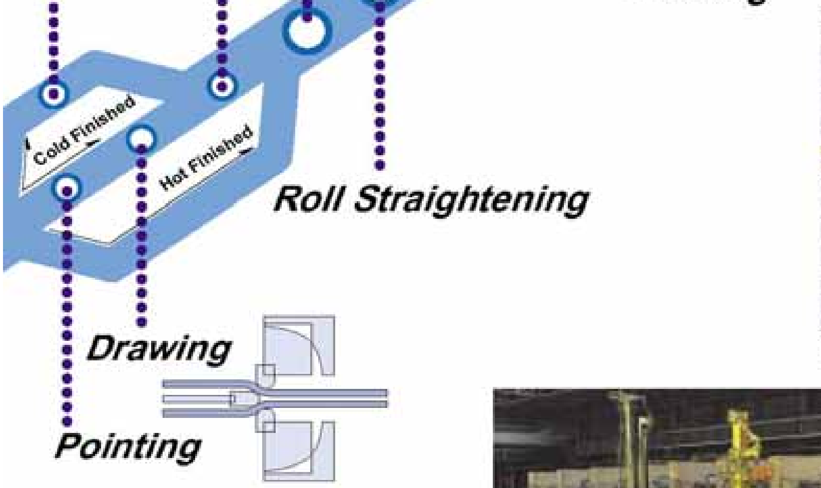
Vacuum oxygen decarburization process(VOD)


Extruded Tube Shell
Extrusion
Hollow Billet


Pickling
Rolling
Heating
Steel Making
Expansion
Bloom
Forging

Shipment


Marking·Packing
Testing
Bending
Inspection For Straightness
Cutting·Facing
Heat Treatment
U-shaped tube
Straight pipe and tube
Inspection
Pickling
Reducing
Degreasing


Cold Finished
Hot Finished
Roll Straightening
Drawing
Pointing

Long-tubing facilities

Through-type annealing furnace 2,000 ton extrusion press

Stainless Steel Tube

Seamless Stainless Steel Tubes and Pipe

Stainless Steel Tube
Widely Applicable
Seamless Stainless Steel
Tubes and Pipe

다양한 분야로의 응용

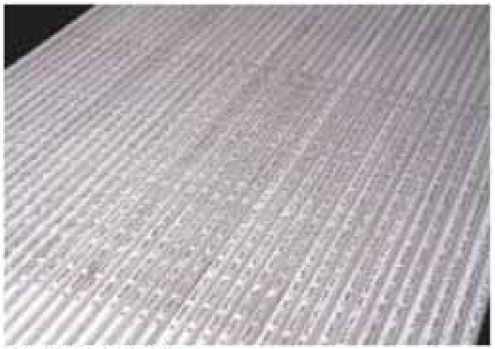
Seamless stainless steel관 제품은 발전소, 석유화학, 식품산업, 산업기계등의 광대한 분야에서 응용된다. 고베는 광대한 분야에 적용할 수 있는 다양한 종류의 제품을 우수한 기계적 성질과 재래형/원자력 발전소에 쓰이는 feedwater heater같은 설비를 위해 특별히 긴 길이(최장 36m)의 튜브와 파이프를 공급하고 있다.

특히 일본최초로 Stamicabon과 Snamprogetti사등의 요소공장에 납품허가를 획득했으며, 더욱더 높은 내열성, 내식성 (특히 해수에 대한 내식성) 스테인레스제품을 요구하는 최근의 경향에 맞춰나가고 있으며, 열교환기, 보일러, 제관을 위한 Austenitic, ferritic 그리고 이중적인 스테인레스제품을 생산하고 순니켈 고니켈알로이, 지르코늄 알로이등의 비철류 관제품까지 생산하고 있다.

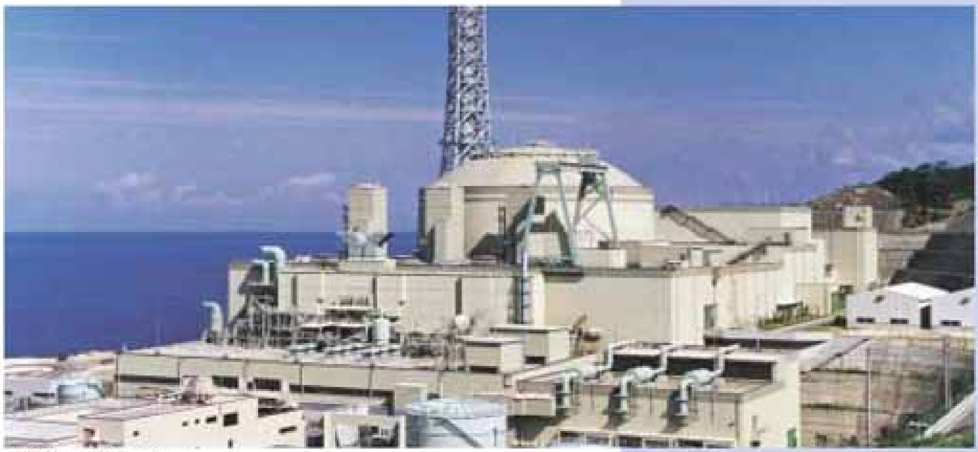
H

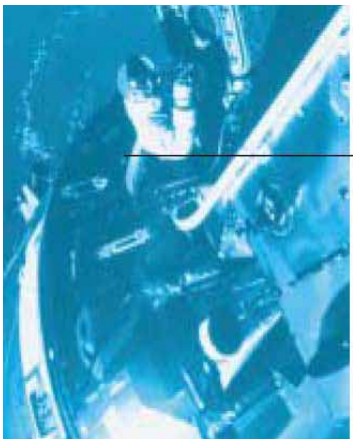
U-shaped heat exchanger tubes

Petrochemical plant


Stainless steel pipe

Urea fertilizer plant


Nuclear power plant



Precision Tube

Esteemed for High Technology

Precision Tube

정밀튜브

고베는 고도의 정확도와 표면품질을 가진 소구경 튜브와 고품질을 실현하고 있습니다.

이 제품들은 고속핵반응로 용 스테인리스피복 튜브, 의료기기, 전기부품에 적용되고 있으며 1987년 이래로 첨단 공조를 갖춘 청정한 환경에서 생산되고 있다.

Stainless steel fuel cladding tubes for fast breeder reactors

Work space for precision tube

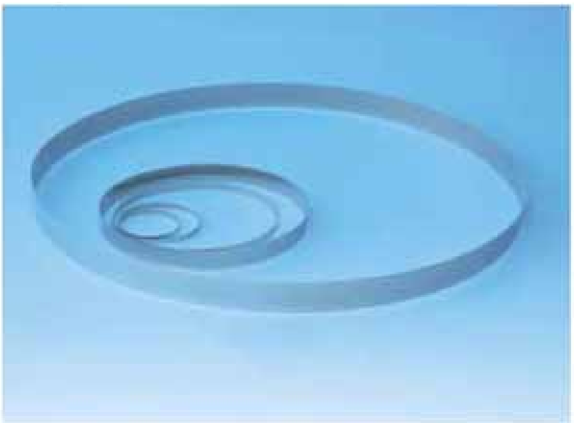
Specialty Tube

Challenging the Future

Specialty Tube

특수튜브

고베는 일본에 건설된 MONJU고속핵반응로의 사용을 위한 TP316재질을 변형하여 우수한 creep응력 Swell에 고항성의 특징을 가진 이음매 없는 튜브 (Seamless Tube)를 개발한 바 있고, 이 튜브의 대량 생산을 위한 새로운 시설이 1987년에 완성되었다.



Steel belt

Torque tubes

Wrapper tube with pad

Low-finned tubes

Titanium Welded Tube

Efficient Tube for an Advanced New Age
Titanium Welded Tube

Titanium Welded Tube
Efficient Tube for an Advanced New Age
Titanium Welded Tube

부식과 열에 대한 높은 저항성, 저중량, 고강도 등의 두드러진 특성 덕분에 티타늄은 우주항공산업, 화학산업과 핵발전소와 해수담수화시설, 심해조사 잠수함의 건조에도 사용된다. 우주에서,땅위에서 그리고 해양에서 응용분야를 확장해가면서 티타늄은 차세대의 새로운 기초소재로서 많은 주목을 받고 있다. Kobe는 담수화시설과 화공산업과 휠체어와 자전거와 오토바이 배기부품를 위해 열이고 재래식 및 핵 발전소용 콘덴서 튜브와 같은 티타늄 용접관을 공급한다.

조관실 전경

티타늄 용접관

Quality Control and Inspection System

Quality Control

Kobe튜브는 고객 만족을 위해 엄격한 품질 제어 시스템을 확립했으며. 이 시스템에 의거하여 신중하게 제품을 생산하고 생산의 모든 단계에서 검사한다. 선적에 앞서 주문의 용도와 사양을 만족시킬 수 있는지 확인하기 위해 모든 제품이 검사된다. Chofu-Kita 공장은 이와같이 품질에 대한 약속을 지키기 위해 ISO9002, JIS, LR, NV, TUV 같은 다양한 국제인증기관에 의해 승인되었다.

Corrosion tesing equipment

Combined ultrasonic and eddy current tester

100 ton tensile test machine

품질관리

고품질과 최단기간 납품을 달성하기 위해서, 완벽한 생산관리를 위해서 컴퓨터 시스템을 채택하였다. 온라인상의 세밀한 실시간 관리시스템이 주문에서 선적까지 생산공정의 모든 단계를 컨트롤한다. 이 "통합관리시스템"은 회계, 구매, 출하를 유기적인 연결속에 진행하여 고객의 모든 요건을 신속정확하게 충족시킬 수 있다.

환경관리

Setouchi의 아름다운 해안 경치속에서 Chofu-Kita공장은 환경보호를 최우선시하며, 깨끗한 대기를 보존하기 위해 다섯개의 산성개스 처리장치와 하나의 소각로용 유해물질 방지장치를 갖추었다, 또한 하수처리장치를 갖추어 깨끗한 물을 보존하고자 노력하고 있으며, 우리의 깨끗한 환경을 보존하기 위해 자동 감시시설을 지속적으로 운영중이다.

Material Grades

Ferritic Stainless Steel Tubes and Pipe

Code	Material Grade	Chemical Composition (%)								
		C,max	Si,max	Mn,max	P,max	S,max	Ni	Cr	Mo	Cu
403	13Cr -LSi	0.15	0.50	1.00	0.040	0.030	0.50	11.50~13.00		
405	13Cr -0.2Al	0.08	1.00	1.00	0.040	0.030	0.50	11.50~14.50		
409	11Cr -Ti	0.08	1.00	1.00	0.040	0.030	0.50	10.50~11.75		
409L	LC-11Cr -Ti	0.03	1.00	1.00	0.040	0.030	0.50	10.50~11.75		
410	13Cr	0.15	0.75	1.00	0.040	0.030	0.50	11.50~13.50		
410Ti	13Cr -Ti	0.08	1.00	1.00	0.040	0.030	0.50	11.50~13.50		
430	17Cr	0.12	0.75	1.00	0.040	0.030	0.50	16.00~18.00		
430Ti	17Cr -Ti	0.10	1.00	1.00	0.040	0.030	0.75	16.00~18.00		
436L	18Cr -1Mo-Ti	0.025	1.00	1.00	0.040	0.030	0.50	16.00~19.00	0.75~1.25	
XM-8	18Cr -Ti	0.07	1.00	1.00	0.040	0.030	0.50	17.00~19.00		
RESCOLOY182	ELC-18Cr -2Mo-Nb	0.015	0.40	0.40	0.035	0.025	0.50	18.50~19.30	1.80~2.30	
443	22Cr -1Cu	0.20	0.75	1.00	0.040	0.030	0.50	18.00~23.00		0.90~1.25
446	25Cr	0.20	0.75	1.50	0.040	0.030	0.50	23.00~30.00		
XM27	ULC-28Cr -1Mo	0.010	0.40	0.40	0.020	0.020	0.50	25.00~27.50	0.75~1.50	0.20 max
SHOMAC302	ULC-30Cr -2Mo	0.005	0.20	0.10	0.020	0.015	0.20	29.00~31.00	1.70~2.00	
RECLOY10	ELC-18Cr -1si-1Al-Nb	0.020	0.7~1.20	1.00	0.040	0.030		17.00~19.00		
RECLOY12	ELC-24Cr -1.5Si-1.5Al-Nb	0.020	1.10~1.60	1.00	0.040	0.030		23.00~25.00		

Dual-Phase Stainless Steel Tubes and Pipe

Code	Material Grade	Chemical Composition (%)								
		C,max	Si,max	Mn,max	P,max	S,max	Ni	Cr	Mo	Cu
329	25Cr -4Ni-15Mo	0.08	0.75	1.00	0.040	0.030	3.00~6.00	23.00~28.00	1.00~3.00	
KES329LR	ELC-22Cr -6Ni-Ti	0.020	0.80	0.80	0.035	0.025	5.30~6.30	21.00~23.00		
RESCOLOY 195M	LC-19Cr -5Ni-2.7Mo-1.5Si	0.030	1.40~2.00	1.20~2.00	0.030	0.030	4.25~5.25	18.00~19.00	2.50~3.00	
RESCOLOY 262	ELC-21Cr -6Ni-2Mo-Ti	0.020	0.80	0.80	0.035	0.025	5.50~6.50	20.00~22.00	1.80~2.50	
KES329W	LC-22Cr -6Ni-3Mo-0.5Cu-N	0.030	1.00	1.50	0.035	0.010	4.50~6.50	21.00~23.00	2.50~3.50	0.30~0.70
KES329XM	LC-22Cr -6.5Ni-3.5Mo-0.5Cu-0.2N	0.030	1.00	2.50~3.50	0.030	0.010	6.00~7.00	21.50~22.50	3.00~4.00	0.30~0.70
KES329X	LC-22Cr -6.5Ni-3.5Mo-0.5Cu-0.15N	0.040~0.080	1.00	2.50~3.50	0.030	0.010	6.00~7.00	21.50~22.50	3.00~4.00	0.30~0.70
329J3L	LC-22Cr -5Ni-3Mo-N	0.030	1.00	1.50	0.040	0.030	4.50~6.50	21.00~24.00	2.50~3.50	
329J4L	LC-25Cr -6Ni-3Mo-N	0.030	1.00	1.50	0.040	0.030	5.50~7.50	24.00~26.00	2.50~3.50	

Ti	N	Others	Applicable Standards			Main Uses
			JIS	ASTM	DIN	
			SUS403			Heat exchangers
		Al 0.10~0.30	SUS405TB	TP405／MT405／ UNS S40500	1.4002	
6×C-0.75			SUS409TB	TP409／ UNS S40900		
6×C-0.75			SUS409LTP SUS409LTB			
			SUS410TB SUS410TK	TP410／MT410／ UNS S41000	1.4000 1.4006	
6×C-0.75			SUS410TiTB	UNS S40800		
			SUS430TB SUS430TK	TP430／MT430／ UNS S43000	1.4016	
7×Cmin				TP430Ti UNS S43036	1.4510	
8×(C+N)-0.80	0.025 max.		SUS436LTP SUS436LTB			
12×C-1.10	0.04 max.	Al 0.15 max.	SUSXM8TB	TP439 UNS S43035		Moisture separator heaters
	0.025 max.	Nb 8(C+N)~0.80	SUS444TP SUS444TB	18Cr-2Mo UNS S44400	1.4521(Ti) 1.4522(Nb)	Chemical reactors, heat exchangers
				TP443／MT443／ UNS S44300		Soot blowers
	0.01-0.25			TP446／MT446／ UNS S44600		Chemical reactors, heat-resistant protective pipe
	0.015 max.	Ni+Cu 0.50 max. Nb 0.05~0.20	SUSXM27TB	TPXM-27 UNS S44627		Heat exchangers and piping that must be resistant to crevice corrosion
	0.010 max.					
		Al 0.70~1.20 Nb+Ta 10×(C+N)~0.4			1.4742	Chemical reactors, heat exchangers, and heat-resistant protective pipe for such uses as recuperators in limestone roaster furnaces
		Al 1.20~1.70 Nb+Ta 10×(C+N)~0.4			1.4762	

Ti	N	Others	Applicable Standards			Main Uses
			JIS	ASTM	DIN	
			SUS329J1TP SUS329J1TB	TP329		Heat exchangers that must be resistant to stress corrosion cracking Heat exchangers and piping that must be resistant to crevice corrosion
5×C-0.65						
	0.05-0.10			A789／A790 UNS S31500	1.4417	
0.20-0.40						
	0.08-0.20		SUS329J4LTP SUS329J4LTB	A789★ A790 UNS S31803	1.4462★	Heat exchangers that must be resistant to stress corrosion cracking Heat exchangers and piping that must be resistant to crevice corrosion Tubing for deep sour well environments
	0.18-0.22					
	0.10-0.20					
	0.08-0.20		SUS329J3LTP SUS329J3LTB			
	0.08-0.20		SUS329J4LTP SUS329J4LTB			

Note:Standards marked with an asterisk★ apply to similar, but not identical, materials.

Austenitic Stainless Steel Tubes and Pipe

Code	Material Grade	Chemical Composition (%)								
		C,max	Si,max	Mn,max	P,max	S,max	Ni	Cr	Mo	Cu
303	18Cr -9Ni-S	0.15	1.00	2.00	0.20	0.15min	8.00~10.00	17.00~19.00		
303se	13Cr -8Ni-Se	0.15	1.00	2.00	0.20	0.060	8.00~10.00	17.00~19.00		
304	19Cr -9Ni	0.08	0.75	2.00	0.040	0.030	8.00~11.00	18.00~20.00		
304H	HC-19Cr -9Ni	0.04~0.10	0.75	2.00	0.040	0.030	8.00~11.00	18.00~20.00		
304L	LC-19Cr -11Ni	0.030	0.75	2.00	0.040	0.030	9.00~13.00	18.00~20.00		
304N	19Cr -9Ni-N	0.08	0.75	2.00	0.040	0.030	8.00~11.00	18.00~20.00		
304LN	LC-19Cr -9Ni-N	0.030	0.75	2.00	0.040	0.030	8.00~11.00	18.00~20.00		
KES304ELC	ELC-19Cr -10Ni-N	0.020	0.75	2.00	0.040	0.030	9.00~13.00	18.00~20.00		
KES304ELN	ELC-19Cr -10Ni-N	0.020	0.75	2.00	0.040	0.030	9.00~11.00	18.00~20.00		
316	17Cr -12Ni-2.5Mo	0.08	0.75	2.00	0.040	0.030	11.00~14.00	16.00~18.00	2.00~3.00	
316H	HC-17Cr -12Ni-2.5Mo	0.04~0.10	0.75	2.00	0.030	0.030	11.00~14.00	16.00~18.00	2.00~3.00	
316L	LC-17Cr -14Ni-2.5Mo	0.030	0.75	2.00	0.040	0.030	12.00~16.00	16.00~18.00	2.00~3.00	
316N	17Cr-12Ni-2.5Mo-N	0.08	0.75	2.00	0.040	0.030	11.00~14.00	16.00~18.00	2.00~3.00	
316LN	LC-17Cr-12Ni-2.5Mo-N	0.030	0.75	2.00	0.040	0.030	11.00~14.00	16.00~18.00	2.00~3.00	
KES316ELN	ELC-17Cr-13Ni-2.5Mo-N	0.020	0.75	2.00	0.040	0.030	12.00~14.00	16.00~18.00	2.00~3.00	
316B	18Cr-12Ni-2.5Mo-Ti	0.10	1.00	2.00	0.040	0.030	10.50~13.50	16.50~18.50	2.00~2.50	
316J1	18Cr-12Ni-2Mo-2Cu	0.08	1.00	2.00	0.045	0.030	10.00~14.00	17.00~19.00	1.20~2.75	1.00~2.50
316J1L	LC-18Cr-14Ni-2Mo-2Cu	0.030	1.00	2.00	0.045	0.030	12.00~16.00	17.00~19.00	1.20~2.75	1.00~2.50
317	19Cr-13Ni-3.5Mo	0.08	0.75	2.00	0.040	0.030	11.00~15.00	18.00~20.00	3.00~4.00	
317L	LC-19Cr-14Ni-3.5Mo	0.030	0.75	2.00	0.040	0.030	11.00~15.00	18.00~20.00	3.00~4.00	
321	18Cr-11Ni-Ti	0.08	0.75	2.00	0.040	0.030	9.00~13.00	17.00~19.00		
321H	HC-18Cr-11Ni-Ti	0.04~0.10	0.75	2.00	0.030	0.030	9.00~13.00	17.00~20.00		
347	18Cr-11Ni-Nb	0.08	0.75	2.00	0.040	0.030	9.00~13.00	17.00~19.00		
347H	HC-18Cr-11Ni-Nb	0.04~0.10	0.75	2.00	0.030	0.030	9.00~13.00	17.00~20.00		

			Applicable Standards			Main Uses
Ti	N	Others	JIS	ASTM	DIN	
			SUS303		1.4305	Machined parts
		Se 0.15min	SUS303Se			
			SUS304TP／SUS304TB SUS304TK／SUS304TF	TP304／MT304／ UNS S30400	1.4301	Corrosion-resistant heat exchangers, tubing, and piping
			SUS304HTP／SUS304HTB SUS304HTF	TP304H UNS S30409		Boilers and piping that must be resistant to high temperatures
			SUS304LTP SUS304LTB	TP304L／MT304L UNS S30403	1.4306	Heat exchangers and piping that require corrosion-resistant welds
	0.10~0.16		SUS304N1	TP304N UNS S30451		High-strength, corrosion-resistant heat exchangers, tubing, and piping
	0.10~0.16		SUS304LN	TP304LN UNS S30453		Boilers and piping that must be resistant to high temperatures
						Equipment that must be especially corrosion-resistant, nuclear fuel reprocessing equipment
	0.12 max.					Equipment that must be especially corrosion-resistant, nuclear plant
			SUS316TP／SUS316TB SUS316TK／SUS316TF	TP316／MT316 UNS S31600	1.4401 1.4436	Corrosion-resistant heat exchangers, tubing, and piping Nuclear fuel cladding tubes and wrapper tubes for fast breeder reactors
			SUS316HTP／SUS316HTB SUS316HTF	TP316H UNS S31609		Boilers and piping that must be resistant to high temperatures
			SUS316LTP SUS316LTB	TP316L／MT316L UNS S31603	1.4435 1.4404	Heat exchangers and piping that require corrosion-resistant welds
	0.10~0.16		SUS316N	TP316N UNS S31651		High-strength, corrosion-resistant heat exchangers, tubing, and piping
	0.10~0.16		SUS316LN	TP316LN UNS S31653		Boilers and piping that must be resistant to high temperatures
	0.12 max.				1.4429	Nuclear plant, boiler tubes, and other equipment that must possess excellent corrosion resistance and creep strength
5×C min.					1.4571	Heat exchangers and piping that must be resistant to phosphoric and sulfuric acids
			SUS316J1			
			SUS316J1L			
			SUS317TP SUS317TB	TP317／MT317 UNS S31700		
			SUS317LTP SUS317LTB	TP317L UNS S31703		
5×C min.			SUS321TP／SUS321TB SUS321TK／SUS321TF	TP321／MT321 UNS S32100	1.4541	Corrosion-resistant heat exchangers, tubing and piping
4×C~0.60			SUS321HTP／SUS321HTB SUS321HTF	TP321H UNS S32109		Boilers and piping that must be resistant to high temperatures
		Nb+Ta 10×Cmin	SUS347TP／SUS347TB SUS347TK／SUS347TF	TP347／MT347 UNS S34700	1.4550	Corrosion-resistant heat exchangers, tubing and piping
		Nb+Ta 8×C~1.00	SUS347HTP／SUS347HTB SUS347HTF	TP317H UNS S34709		Boilers and piping that must be resistant to high temperatures

Austenitic Stainless Steel Tubes and Pipe

Code	Material Grade	Chemical Composition (%)								
		C,max	Si,max	Mn,max	P,max	S,max	Ni	Cr	Mo	Cu
348	18Cr -11Ni-Nb-(Ta)	0.08	0.75	2.00	0.040	0.030	9.00~13.00	17.00~20.00		
348H	HC-18Cr -11Ni-Nb-(Ta)	0.04~0.10	0.75	2.00	0.040	0.030	9.00~13.00	17.00~20.00		
309	23Cr -14Ni	0.15	0.75	2.00	0.040	0.030	12.00~15.00	22.00~24.00		
309S	23Cr-14Ni	0.08	1.00	2.00	0.040	0.030	12.00~15.00	22.00~24.00		
310	25Cr-20Ni	0.15	0.75	2.00	0.040	0.030	19.00~22.00	24.00~26.00		
310S	25Cr-20Ni	0.08	1.50	2.00	0.040	0.030	19.00~22.00	24.00~26.00		
KES310ELC	ELC-25Cr-20Ni	0.020	0.30	2.00	0.030	0.030	19.50~21.50	23.50~25.50		
KESU1	ELC-18Cr-15Ni-2Mo	0.015	0.75	1.55~1.95	0.028	0.010	13.50~15.00	17.20~18.00	2.20~2.60	0.25 max.
KESU2	ELC-25Cr-22Ni-2Mo	0.015	0.40	1.55~1.95	0.020	0.010	21.50~22.50	24.50~25.50	2.00~2.30	0.47 max.
4449	17Cr-16Ni-5Mo	0.07	1.00	2.00	0.045	0.030	12.50~14.50	16.00~18.00	4.00~5.00	
KCP20A	20Cr-29Ni-2.5Mo-3.5Cu	0.07	1.00	2.00	0.040	0.030	24.00~38.00	19.00~21.00	2.00~5.00	1.00~4.00
KCP20B	20Cr-34Ni-2.5Mo-3.5Cu	0.07	1.00	2.00	0.045	0.035	32.00~38.00	19.00~21.00	2.00~3.00	3.00~4.00
KCP25	ELC-20Cr-25Ni-4.5Mo-Cu	0.020	1.00	2.00	0.020	0.015	24.00~26.00	19.20~20.50	4.00~5.00	1.00~2.00
KCP25A	22Cr-26Ni-5Mo-Ti	0.05	1.00	2.50	0.040	0.030	25.00~27.00	21.00~23.00	4.00~6.00	
KCP25T	21Cr-25Ni-4.5Mo-1.5Cu-Ti	0.06	0.17~1.00	1.20~2.00	0.035	0.030	24.00~26.00	20.00~22.00	4.00~5.00	1.20~1.80
KCP28T	24Cr-28Ni-3Mo-3Cu-Ti	0.06	0.80	2.00	0.045	0.030	26.00~29.00	22.00~25.00	2.50~3.50	2.5~3.5
836L	LC-20Cr-25Ni-6Mo	0.030	1.00	2.00	0.040	0.030	24.00~25.00	19.00~24.00	5.00~7.00	
KMSA1	ELC-25Cr-19Ni-3Mo-2.5Mn-0.3N	0.020	0.50	2.00~4.00	0.035	0.015	18.00~22.00	24.00~26.00	2.00~4.00	
KES825M1	20Cr-22Ni-5Mo-1.5Cu-N	0.050	1.00	3.00~4.00	0.035	0.010	22.00~24.00	20.00~21.00	5.00~6.00	1.00~2.00
KIN800AT	20Cr-33Ni-A-Ti	0.10	1.00	1.50	0.030	0.015	30.00~35.00	19.00~23.00		0.75 max.
KIN800H	HC-20Cr-33Ni-Al-Ti	0.05~0.10	1.00	1.50	0.030	0.015	30.00~35.00	19.00~23.00		0.75 max.
KIN800N	LC-20Cr-33Ni-Al-Ti	0.030	0.30~0.70	0.40~1.00	0.020	0.015	32.00~35.00	20.00~23.00		
15-5PH	15Cr-5Ni-3Cu-Nb	0.07	1.00	1.00	0.030	0.015	3.50~5.50	14.00~15.50		2.50~4.50
A286	15Cr-26Ni-2Ti-1.3Mo	0.08	1.00	2.00	0.040	0.030	24.00~27.00	13.50~16.00	1.00~1.50	

			Applicable Standards			Main Uses
Ti	N	Others	JIS	ASTM	DIN	
		Nb+Ta 10×C~1.00 Ta 0.10 max.		TP348 UNS S34800		Corrosion-resistant heat exchangers, tubing, and piping
		Nb+Ta 8×C~1.00 Ta 0.10 max.		TP348H UNS S34809		Boilers and piping that must be resistant to high temperatures
			SUS309TP SUS309TB	TP309／MT309 UNS S30900		Heat exchangers and piping that must be resistant to oxidation and corrosion at high temperatures
			SUS309STP SUS309STB	TP309S／MT309S UNS S30908		
			SUS310TP／SUS310TB SUS310TF	TP310／MT310 UNS S31000		
			SUS310STP SUS310STB	TP310S (UNS S31008) MT310S		
	0.020 max.				1.4435	Urea plants, heat exchangers and piping that must be especially resistant to corrosion
	0.10~0.14				1.4466	
					1.4449	Heat exchangers and piping that must be resistant to phosphoric and sulfuric acids
		Nb8×C min				
		Nb+Ta 8×C~1.00		B729 UNS N08020		
			SUS890LTP SUS890LTB	B677 UNS N08904	1.4539	
5×C min.				B622 UNS N08320		
5×C min.						
0.5~0.9						
	0.025 max.		SUS836LTP SUS836LTB			
	0.20~0.40	V 0.10~0.40		B720 UNS N08310		Heat exchangers and piping that must be resistant to chloride solution
	0.15~0.25			B690★ UNS N08366		
0.15~0.60		Al 0.15~0.60	NCF800TP／NCF800TB NCF800TF	B163／B407 UNS N08800		Heat exchangers and piping that must be resistant to oxidation and corrosion at high temperatures
0.15~0.60		Al 0.15~0.60	NCF800HTP／NCF800HTB NCF800HTF	B163／B407 UNS N08810		
12×C~0.60		Al 0.15~0.45／Co 0.10 max.				Heat exchangers for nuclear applications
		Nb 0.15~0.45			AMS5659	Hydraulic systems for aerospace vehicles, torque tubes
1.90~2.35		V 0.10~0.50／B0.001~0.010 Al 0.35 max.	SUH660	A453	AMS5731／AMS5732 AMS5734	Rocket engines

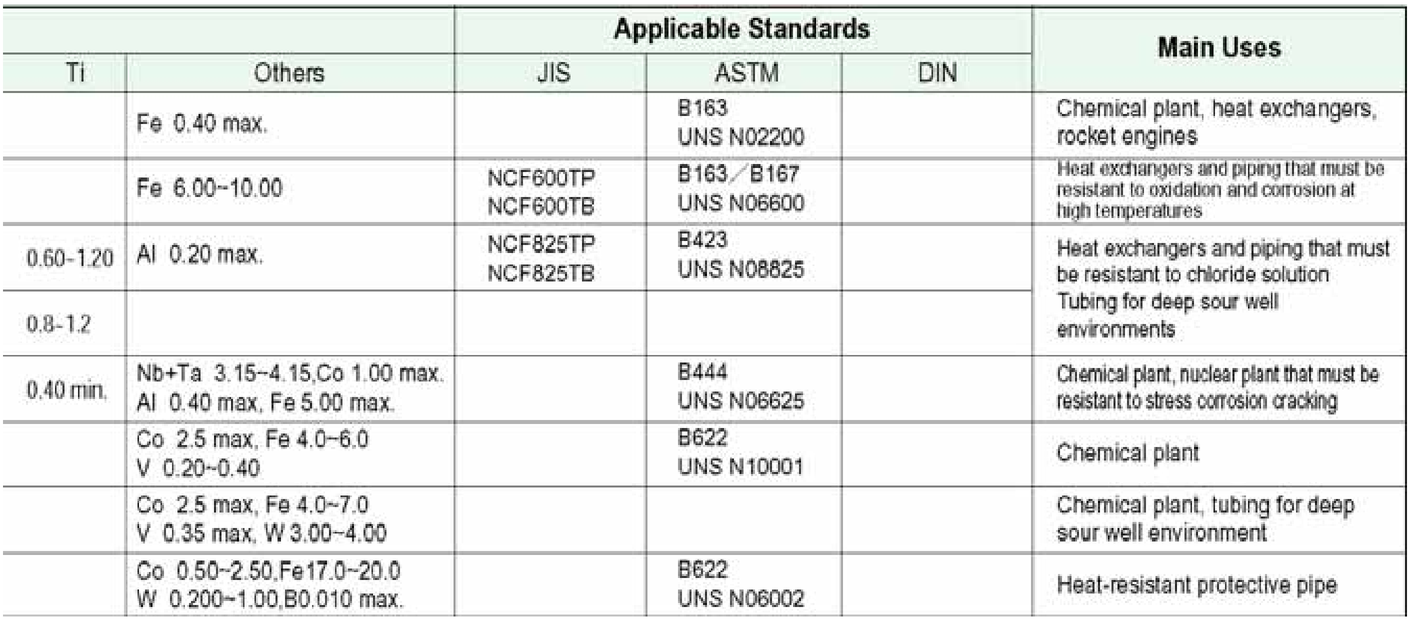
Note:Standards marked with an asterisk★ apply to similar, but not identical, materials.

Nickel and Nickel Alloy Tubes and Pipe

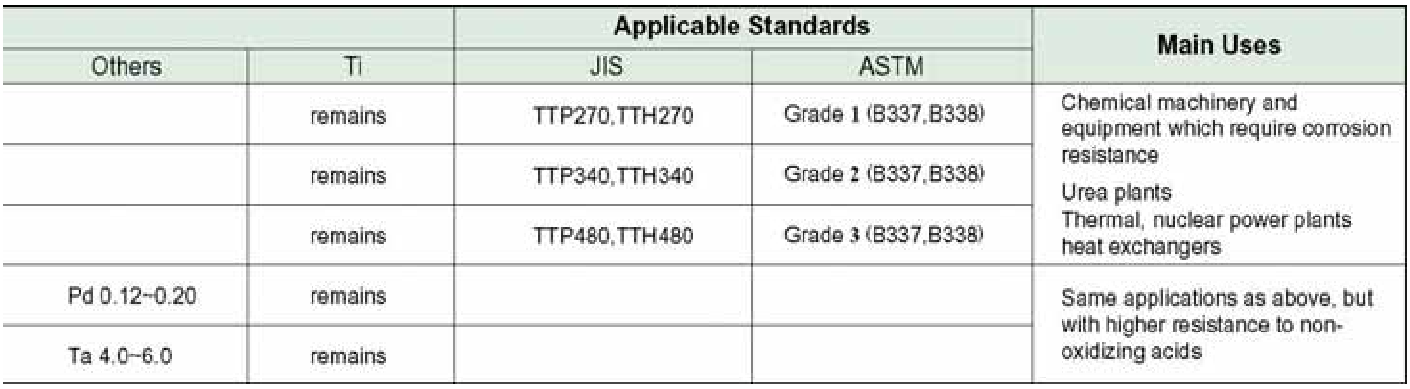
Code	Material Grade	Chemical Composition (%)								
		C,max	Si,max	Mn,max	P,max	S,max	Ni	Cr	Mo	Cu
KTA200	Pure Ni	0.15	0.35	0.35		0.01	99.0 min.			0.25 max.
KIN600	72Ni-15Cr	0.15	0.50	1.00	0.030	0.015	72 min.	14.00~17.00		0.50 max.
KTA825	21Cr-40Ni-3Mo-2Cu-Al,Ti	0.05	0.50	1.00	0.030	0.015	38.0~46.0	19.50~23.50	2.50~3.50	1.50~3.00
KES825M2	25Cr-40Ni-5Mo-1.5Cu-Al,Ti	0.05	1.00	2.00	0.040	0.010	40.0~42.0	24.0~26.0	5.00~6.00	1.00~2.00
KTA625	61Ni-22Cr-9Mo-Nb	0.10	0.50	0.50	0.015	0.015	58.0 min.	20.0~23.0	8.00~10.00	
KTA HB	66Ni-27Mo-5Fe	0.05	1.00	1.00	0.040	0.030	Bal.	1.00 max.	26.00~28.00	
KTA HC	60Ni-16Cr-16Mo-4W-Fe	0.08	1.00	1.00	0.040	0.030	Bal.	14.5~16.5	15.00~17.00	
KTA HX	48Ni-22Cr-9Mo-Fe,Co,W	0.05~0.15	1.00	1.00	0.040	0.030	Bal.	20.50~23.00	8.00~10.00	

Titanium and Titanium Alloy Tubes and Pipe

Material Grade	Chemical Composition (%)			
	N,max	H,max	Fe,max	O,max
KS40	0.03	0.010	0.10	0.10
KS50	0.03	0.010	0.15	0.15
KS70	0.05	0.010	0.30	0.30
KS50-Pd	0.03	0.010	0.05	0.15
KS50-Ta	0.03	0.010	0.15	0.15



		Applicable Standards			Main Uses
Ti	Others	JIS	ASTM	DIN	
	Fe 0.40 max.		B163 UNS N02200		Chemical plant, heat exchangers, rocket engines
	Fe 6.00~10.00	NCF600TP NCF600TB	B163／B167 UNS N06600		Heat exchangers and piping that must be resistant to oxidation and corrosion at high temperatures
0.60-1.20	Al 0.20 max.	NCF825TP NCF825TB	B423 UNS N08825		Heat exchangers and piping that must be resistant to chloride solution Tubing for deep sour well environments
0.8-1.2					
0.40 min.	Nb+Ta 3.15~4.15,Co 1.00 max. Al 0.40 max, Fe 5.00 max.		B444 UNS N06625		Chemical plant, nuclear plant that must be resistant to stress corrosion cracking
	Co 2.5 max, Fe 4.0~6.0 V 0.20~0.40		B622 UNS N10001		Chemical plant
	Co 2.5 max, Fe 4.0~7.0 V 0.35 max, W 3.00~4.00				Chemical plant, tubing for deep sour well environment
	Co 0.50~2.50,Fe17.0~20.0 W 0.200~1.00,B0.010 max.		B622 UNS N06002		Heat-resistant protective pipe



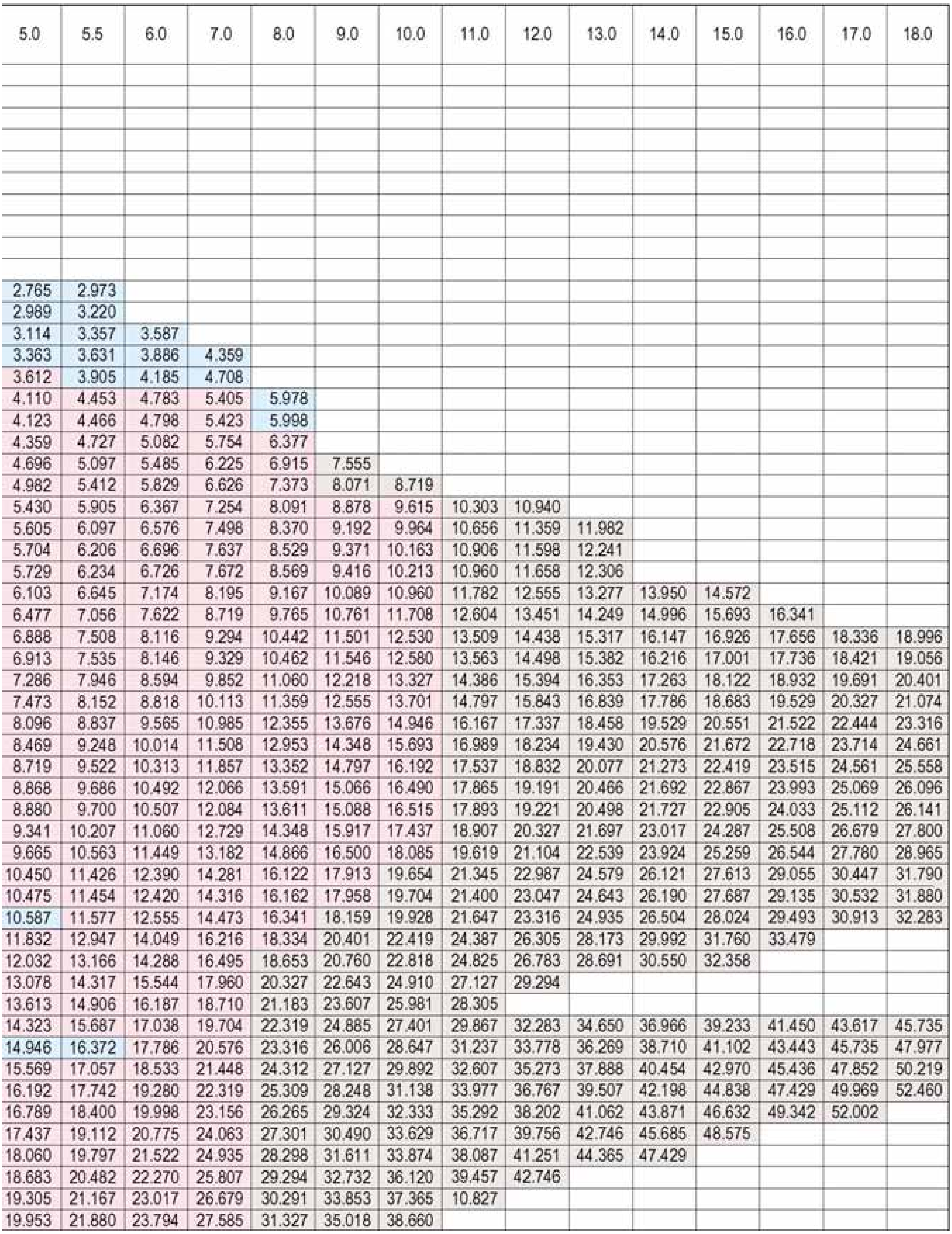
		Applicable Standards		Main Uses
Others	Ti	JIS	ASTM	
	remains	TTP270,TTH270	Grade 1 (B337,B338)	Chemical machinery and equipment which require corrosion resistance Urea plants Thermal, nuclear power plants heat exchangers
	remains	TTP340,TTH340	Grade 2 (B337,B338)	
	remains	TTP480,TTH480	Grade 3 (B337,B338)	
Pd 0.12~0.20	remains			Same applications as above, but with higher resistance to non-oxidizing acids
Ta 4.0~6.0	remains			

Standard Manufacturing Range

🟦 Cold finished ■🟥 Hot&Cold finished ■ Hot finished

Outside diameter (in)	Wall thickness (mm) / Outside diameter (mm)	1.0	1.2	1.6	1.8	2.0	2.3	2.6	2.9	3.0	3.5	4.0	4.5
	6.0	0.125	0.143	0.715									
	8.0	0.174	0.203	0.255	0.278	0.299							
	10.0	0.224	0.263	0.335	0.368	0.399	0.441						
1/2	12.7	0.291	0.344	0.442	0.489	0.533	0.596						
	13.8	0.319	0.377	0.486	0.538	0.588	0.659	0.725					
	15.0	0.349	0.413	0.534	0.592	0.648	0.728	0.803					
	17.3	0.406	0.481	0.626	0.695	0.762	0.859	0.952	1.040	1.069			
	20.0	0.473	0.562	0.733	0.816	0.897	1.014	1.127	1.235	1.270			
	21.7	0.516	0.613	0.801	0.892	0.981	1.111	1.237	1.358	1.397	1.587	1.764	
1	25.4	0.608	0.723	0.949	1.058	1.166	1.323	1.477	1.625	1.674	1.909	2.132	2.343
	27.2	0.653	0.777	1.020	1.139	1.255	1.427	1.593	1.755	1.808	2.066	2.312	2.545
	29.0	0.697	0.831	1.092	1.220	1.345	1.530	1.710	1.885	1.943	2.223	2.491	2.746
	30.0	0.722	0.861	1.132	1.264	1.395	1.587	1.775	1.958	2.018	2.310	2.591	2.858
	32.0	0.772	0.921	1.212	1.354	1.495	1.702	1.904	2.102	2.167	2.485	2.790	3.083
	34.0	0.822	0.980	1.291	1.444	1.594	1.816	2.034	2.247	2.317	2.659	2.989	3.307
	38.0	0.922	1.100	1.451	1.623	1.794	2.045	2.293	2.536	2.616	3.008	3.388	3.755
1-1/2	38.1	0.924	1.103	1.455	1.628	1.799	2.051	2.299	2.543	2.623	3.017	3.398	3.766
	40.0	0.971	1.160	1.530	1.713	1.893	2.160	2.422	2.680	2.765	3.182	3.587	3.979
	42.7		1.241	1.638	1.834	2.028	2.315	2.597	2.875	2.967	3.418	3.856	4.282
	45.0		1.309	1.730	1.937	2.142	2.446	2.746	3.041	3.139	3.618	4.085	4.540
	48.6		1.417	1.873	2.098	2.322	2.653	2.979	3.301	3.408	3.932	4.444	4.943
	50.0			1.929	2.161	2.391	2.733	3.070	3.402	3.512	4.054	4.583	5.100
2	50.8			1.961	2.197	2.431	2.779	3.122	3.460	3.572	4.124	4.663	5.190
	51.0			1.969	2.206	2.441	2.790	3.135	3.475	3.587	4.141	4.683	5.212
	54.0			2.088	2.341	2.591	2.962	3.329	3.691	3.811	4.403	4.982	5.549
	57.0			2.208	2.475	2.740	3.134	3.523	3.908	4.035	4.664	5.281	5.885
	60.3			2.340	2.623	2.905	3.323	3.737	4.147	4.282	4.952	5.610	6.255
	60.5			2.348	2.632	2.914	3.334	3.750	4.161	4.297	4.970	5.630	6.277
2-1/2	63.5			2.467	2.767	3.064	3.506	3.944	4.378	4.521	5.231	5.929	6.614
	65.0				2.834	3.139	3.592	4.041	4.486	4.633	5.362	6.078	6.782
	70.0				3.058	3.388	3.879	4.365	4.847	5.007	5.798	6.576	7.342
	73.0					3.537	4.051	4.560	5.064	5.231	6.059	6.875	7.679
	75.0					3.637	4.165	4.689	5.208	5.381	6.234	7.074	7.903
3	76.2					3.697	4.234	4.767	5.295	5.470	6.338	7.194	8.037
	76.3					3.702	4.240	4.773	5.302	5.478	6.347	7.204	8.048
	80.0					3.886	4.452	5.013	5.570	5.754	6.670	7.573	8.463
	82.6						4.601	5.181	5.757	5.949	6.896	7.832	8.755
3-1/2	88.9						4.962	5.589	6.213	6.419	7.446	8.459	9.461
	89.1						4.973	5.602	6.227	6.434	7.463	8.479	9.483
	90.0						5.025	5.661	6.292	6.502	7.542	8.569	9.584
	100.0							6.308	7.014	7.249	8.413	9.565	10.705
4	101.6							6.412	7.130	7.368	8.553	9.725	10.884
	110.0								7.737	7.996	9.285	10.562	11.826
	114.3								8.047	8.317	9.660	10.990	12.308
	120.0										10.157	11.558	12.947
	125.0										10.593	12.056	13.507
	130.0										11.029	12.555	14.068
	135.0										11.465	13.053	14.628
	139.8										11.883	13.531	15.166
	145.0										12.337	14.049	15.749
	150.0										12.773	14.547	16.310
	155.0										13.209	15.046	16.870
	160.0										13.644	15.544	17.431
	165.2										14.098	16.062	18.014

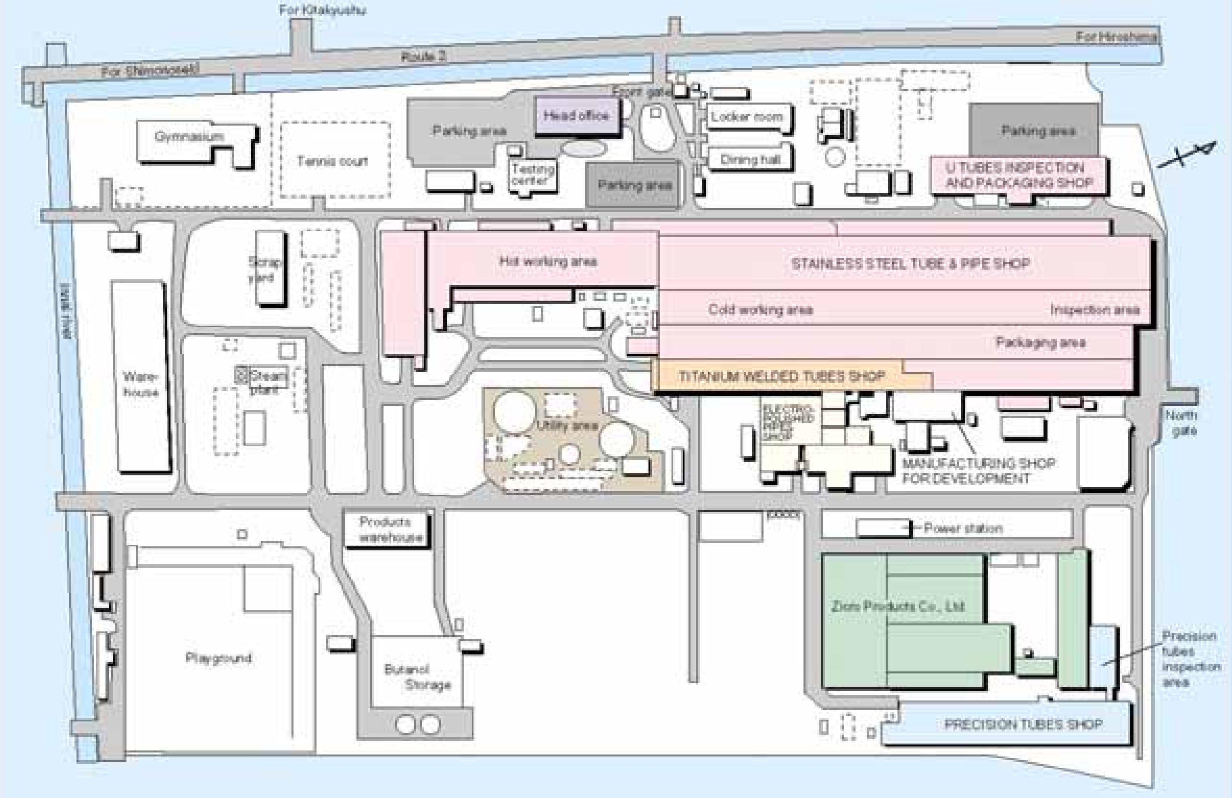
(Unit:kg/m)

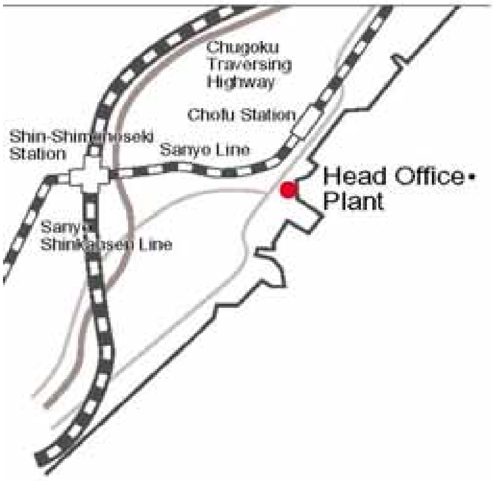


5.0	5.5	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0
2.765	2.973													
2.989	3.220													
3.114	3.357	3.587												
3.363	3.631	3.886	4.359											
3.612	3.905	4.185	4.708											
4.110	4.453	4.783	5.405	5.978										
4.123	4.466	4.798	5.423	5.998										
4.359	4.727	5.082	5.754	6.377										
4.696	5.097	5.485	6.225	6.915	7.555									
4.982	5.412	5.829	6.626	7.373	8.071	8.719								
5.430	5.905	6.367	7.254	8.091	8.878	9.615	10.303	10.940						
5.605	6.097	6.576	7.498	8.370	9.192	9.964	10.656	11.359	11.982					
5.704	6.206	6.696	7.637	8.529	9.371	10.163	10.906	11.598	12.241					
5.729	6.234	6.726	7.672	8.569	9.416	10.213	10.960	11.658	12.306					
6.103	6.645	7.174	8.195	9.167	10.089	10.960	11.782	12.555	13.277	13.950	14.572			
6.477	7.056	7.622	8.719	9.765	10.761	11.708	12.604	13.451	14.249	14.996	15.693	16.341		
6.888	7.508	8.116	9.294	10.442	11.501	12.530	13.509	14.438	15.317	16.147	16.926	17.656	18.336	18.996
6.913	7.535	8.146	9.329	10.462	11.546	12.580	13.563	14.498	15.382	16.216	17.001	17.736	18.421	19.056
7.286	7.946	8.594	9.852	11.060	12.218	13.327	14.386	15.394	16.353	17.263	18.122	18.932	19.691	20.401
7.473	8.152	8.818	10.113	11.359	12.555	13.701	14.797	15.843	16.839	17.786	18.683	19.529	20.327	21.074
8.096	8.837	9.565	10.985	12.355	13.676	14.946	16.167	17.337	18.458	19.529	20.551	21.522	22.444	23.316
8.469	9.248	10.014	11.508	12.953	14.348	15.693	16.989	18.234	19.430	20.576	21.672	22.718	23.714	24.661
8.719	9.522	10.313	11.857	13.352	14.797	16.192	17.537	18.832	20.077	21.273	22.419	23.515	24.561	25.558
8.868	9.686	10.492	12.066	13.591	15.066	16.490	17.865	19.191	20.466	21.692	22.867	23.993	25.069	26.096
8.880	9.700	10.507	12.084	13.611	15.088	16.515	17.893	19.221	20.498	21.727	22.905	24.033	25.112	26.141
9.341	10.207	11.060	12.729	14.348	15.917	17.437	18.907	20.327	21.697	23.017	24.287	25.508	26.679	27.800
9.665	10.563	11.449	13.182	14.866	16.500	18.085	19.619	21.104	22.539	23.924	25.259	26.544	27.780	28.965
10.450	11.426	12.390	14.281	16.122	17.913	19.654	21.345	22.987	24.579	26.121	27.613	29.055	30.447	31.790
10.475	11.454	12.420	14.316	16.162	17.958	19.704	21.400	23.047	24.643	26.190	27.687	29.135	30.532	31.880
10.587	11.577	12.555	14.473	16.341	18.159	19.928	21.647	23.316	24.935	26.504	28.024	29.493	30.913	32.283
11.832	12.947	14.049	16.216	18.334	20.401	22.419	24.387	26.305	28.173	29.992	31.760	33.479		
12.032	13.166	14.288	16.495	18.653	20.760	22.818	24.825	26.783	28.691	30.550	32.358			
13.078	14.317	15.544	17.960	20.327	22.643	24.910	27.127	29.294						
13.613	14.906	16.187	18.710	21.183	23.607	25.981	28.305							
14.323	15.687	17.038	19.704	22.319	24.885	27.401	29.867	32.283	34.650	36.966	39.233	41.450	43.617	45.735
14.946	16.372	17.786	20.576	23.316	26.006	28.647	31.237	33.778	36.269	38.710	41.102	43.443	45.735	47.977
15.569	17.057	18.533	21.448	24.312	27.127	29.892	32.607	35.273	37.888	40.454	42.970	45.436	47.852	50.219
16.192	17.742	19.280	22.319	25.309	28.248	31.138	33.977	36.767	39.507	42.198	44.838	47.429	49.969	52.460
16.789	18.400	19.998	23.156	26.265	29.324	32.333	35.292	38.202	41.062	43.871	46.632	49.342	52.002	
17.437	19.112	20.775	24.063	27.301	30.490	33.629	36.717	39.756	42.746	45.685	48.575			
18.060	19.797	21.522	24.935	28.298	31.611	33.874	38.087	41.251	44.365	47.429				
18.683	20.482	22.270	25.807	29.294	32.732	36.120	39.457	42.746						
19.305	21.167	23.017	26.679	30.291	33.853	37.365	10.827							
19.953	21.880	23.794	27.585	31.327	35.018	38.660								

The manufacturing range of Type 304 Stainless Steel Tubes and Pipe is above-mentioned. Please consult Kobe Special Tube about dimensions not listed here.

KOBE SPECIAL TUBE CO.,LTD. PLANT


For Kitakyushu
For Shimonoseki
Route 2
For Hiroshima
Front gate
Gymnasium
Tennis court
Parking area
Head office
Testing center
Parking area
Locker room
Dining hall
Parking area
U TUBES INSPECTION AND PACKAGING SHOP
Scrap yard
Hot working area
STAINLESS STEEL TUBE & PIPE SHOP
Cold working area
Inspection area
Packaging area
TITANIUM WELDED TUBES SHOP
Ware-house
Steam plant
Utility area
ELECTRO-POLISHED PIPES SHOP
MANUFACTURING SHOP FOR DEVELOPMENT
North gate
Products warehouse
Power station
Zions Products Co., Ltd.
Precision tubes inspection area
Playground
Butanol Storage
PRECISION TUBES SHOP


Chugoku Traversing Highway
Chofu Station
Shin-Shimonoseki Station
Sanyo Line
Head Office • Plant
Sanyo Shinkansen Line

Outline

1. Location

Head Office • Plant
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Tel.0832-46-3781 Fax.0832-45-1092

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9-12, Kitashinagawa, 5-chome, Shinagawa-ku,
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Tel.03-5739-5051 Fax.03-5739-5055

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Midosuji Mitsui Bldg., 1-3, Bingomachi 4-chome,
Chuo-ku, Osaka, 541-8536 JAPAN
Tel.06-6206-6305 Fax.06-6206-6471

2. Site and Building of Head Office • Plant

Site area	214,607m²
Factory area	62,705m²

3. Employees

about 400

Head Office • Plant
Tokyo Office
Osaka Office

- President
  - Planning & Administration Department
    - Planning Section
    - General Administration Section
    - Accounting & Finance Section
    - Purchasing Section
  - Sales Department
    - Sales Section I, Tokyo
    - Sales Section II, Tokyo
    - Osaka Sales Section
    - Products Marketing & Technical Service Section, Tokyo
  - Chofu-Kita Plant
    - Technology & Process Control Section
    - Research & Development Section
    - Quality System Section
    - Stainless Steel Production Section
    - Titanium Section
    - Maintenance & Equipment Section

The 1950's

'56 Technical Agreement with CEFILAC
'58 Hot Extrusion Shop
'59 Cold Working Shop
'59 Began to Operate as Chofu-Kita Plant of Kobe Steel, Ltd.

The 1960's

'60 Use of JIS Mark on Product Approved
'60 Authorization of Lloyd's
'65 Authorization of TUV
'67 Authorization of NV
'67 Introduction of QC Activity

The 1970's

'70 Reinforcement of Fuel Cladding Tube Shop
'72 Technical Agreement with GE
'73 U-Tube Inspection and Packing Shop
'75 Long-Tubing Facilities
'79 Award by Minister of MITI

The 1980's

'81 New Shop for Nuclear Fuel Cladding Tube
'82 Introduction of TQC
'87 Precision Tube Shop
'88 Titanium Welded Tube Shop
'89 EP Pipe Shop
'89 Awarded the Deming Prize

The 1990's

'90 Introduction of TPM
'91 Reinforcement of Nuclear Fuel Cladding Tube Shop
'92 Authorization of ISO9002
'94 Expanded Extrusion press Capacity
'96 Established Kobe Special Tube

The 2000's

'00 Zircaloy Fuel Cladding tube section separated and established Zirco Products Co. Ltd
'02 Renewed as ISO9001 Company (Version 2000)

KOBE SPECIAL TUBE CO., LTD.

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