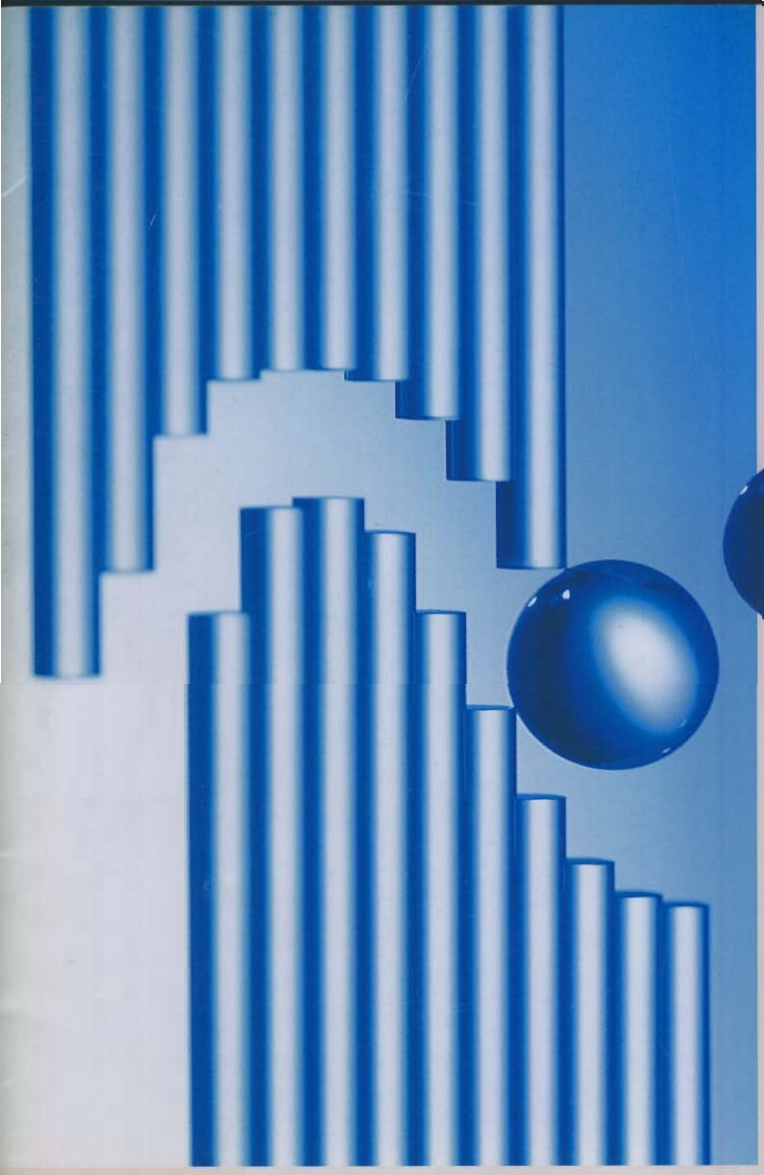
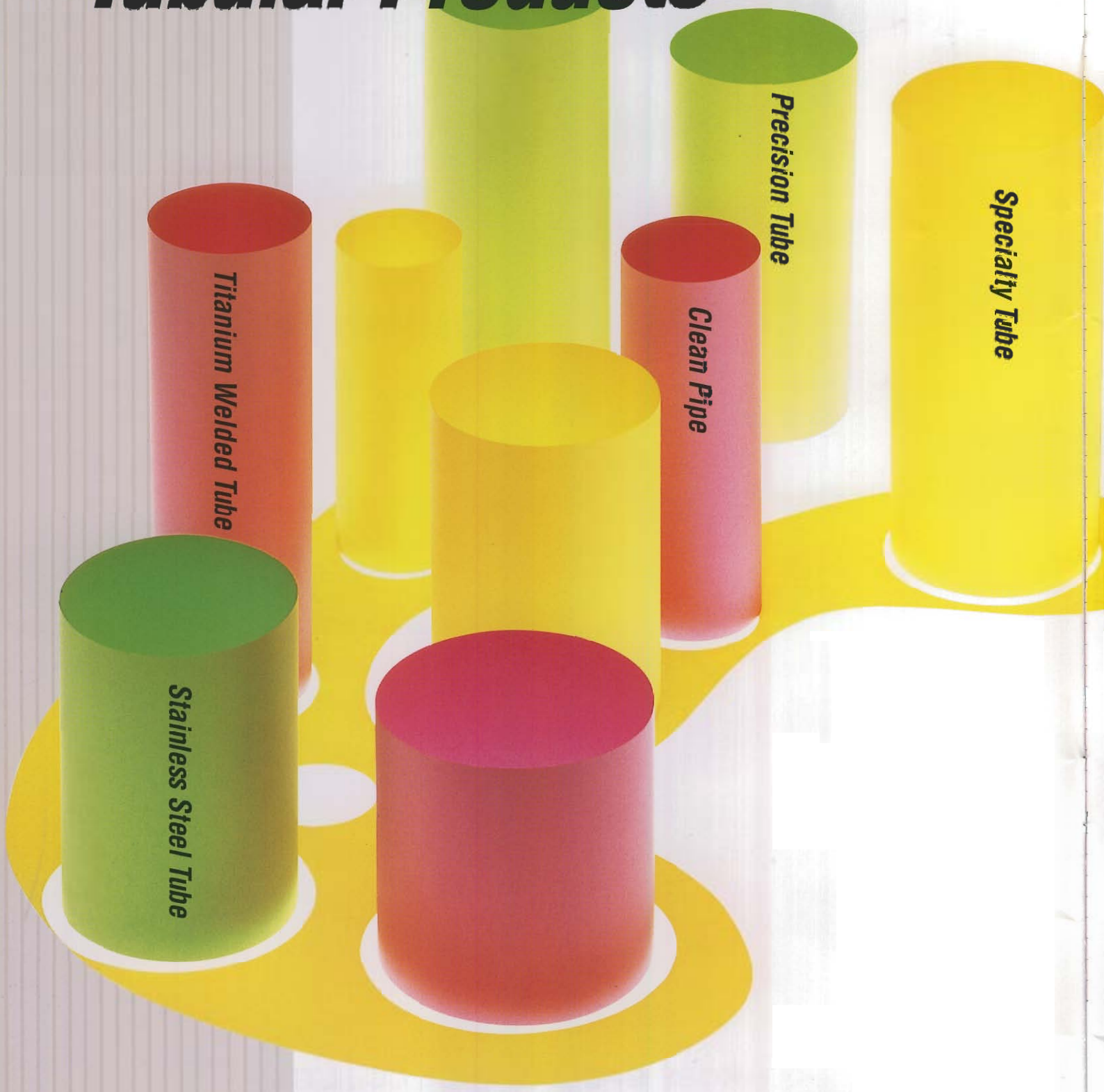


COMPANY PROFILE

KOBE SPECIAL TUBE CO., LTD.

A Leader in High-Grade Seamless Steel Tubular Products



KOBE SPECIAL TUBE CO., LTD. is located in the historic Chofu area of Shimonoseki City which is in the westernmost part of Honshu Island. Our history as a manufacturer of seamless steel tubular products goes back to 1956, when we introduced the Ugine Sejournet hot extrusion process to Japan. Since then we have continued to supply the international market with top-quality products, adding Titanium Welded Tube, Precision Tube, and Clean Pipe in the 1980's. To maintain top quality, we have continually improved our production technology and have sustained a firm commitment to strict quality standards.

Rapid changes in the energy, electronics and aerospace fields have led to corresponding developments in seamless tube production in recent years. There is an unprecedented demand for seamless tubular products with ultra-smooth surfaces, precise dimensions, and high levels of corrosion resistance and cleanliness. This trend has been accompanied by a diversification of product shapes and stricter quality standards. Kobe Special Tube is ready to meet today's technological challenges with an integrated management system that effectively utilizes the expertise we have gained through many years of production experience.

Major Products

Stainless Steel Tubes and Pipe	●Piping use for nuclear power plants, Chemical industry, Petrochemical industry, etc. ●Heat exchanger use for power plants, Petrochemical industry, etc. ●Mother tubes for redrawing ●Industrial machinery use
Precision Tube	●Fuel Cladding Tubes for FBR, Control rods for PWR, Tapered tubes for rocket engines, Clean pipe for the semiconductor industry
Specialty Tube	●Wrapper tubes for FBR, Torque tubes for aircraft, Electro-polished pipe
Clean Pipe	●Electro-polished tube (EP) ●Bright-annealed tube (BA)
Titanium Welded Tube	●Condenser tubes for thermal and nuclear power plants, Tubes for desalination plants

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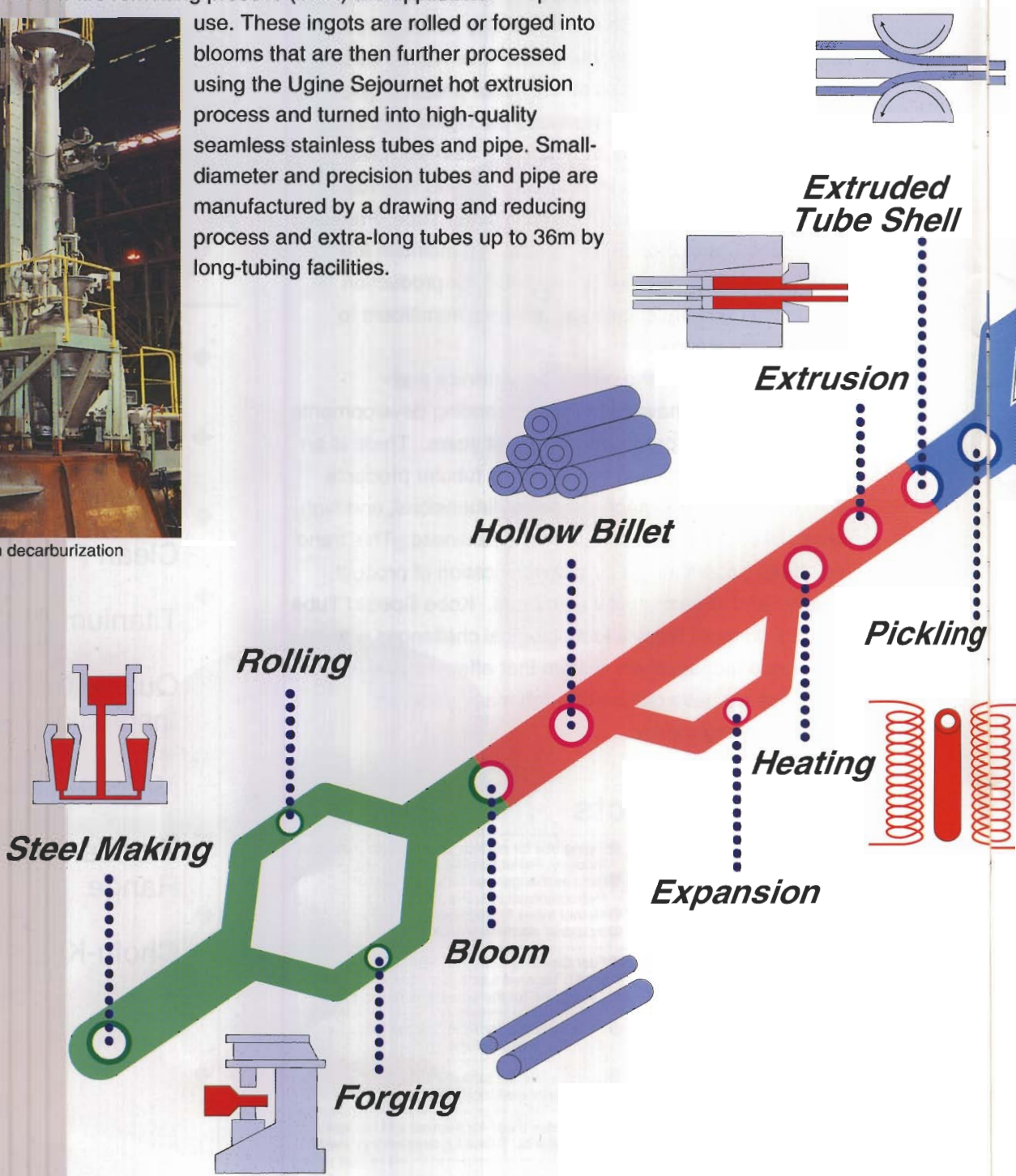
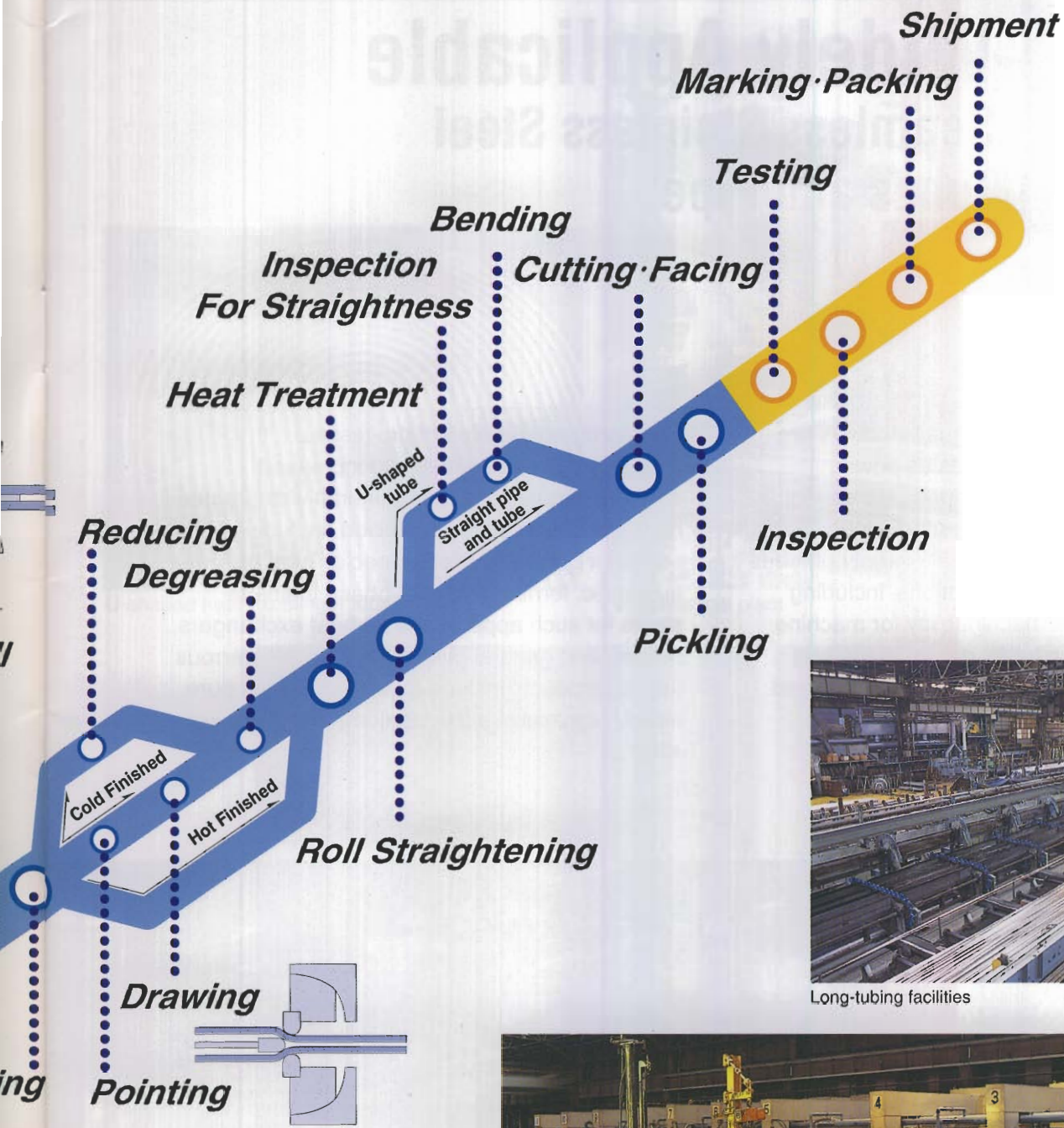
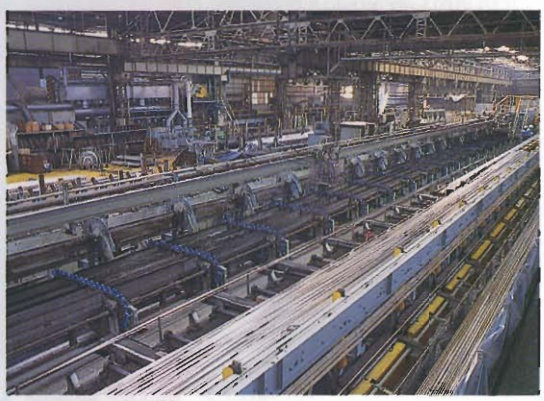
Production Process of Seamless Stainless Steel Tubes and Pipe

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.

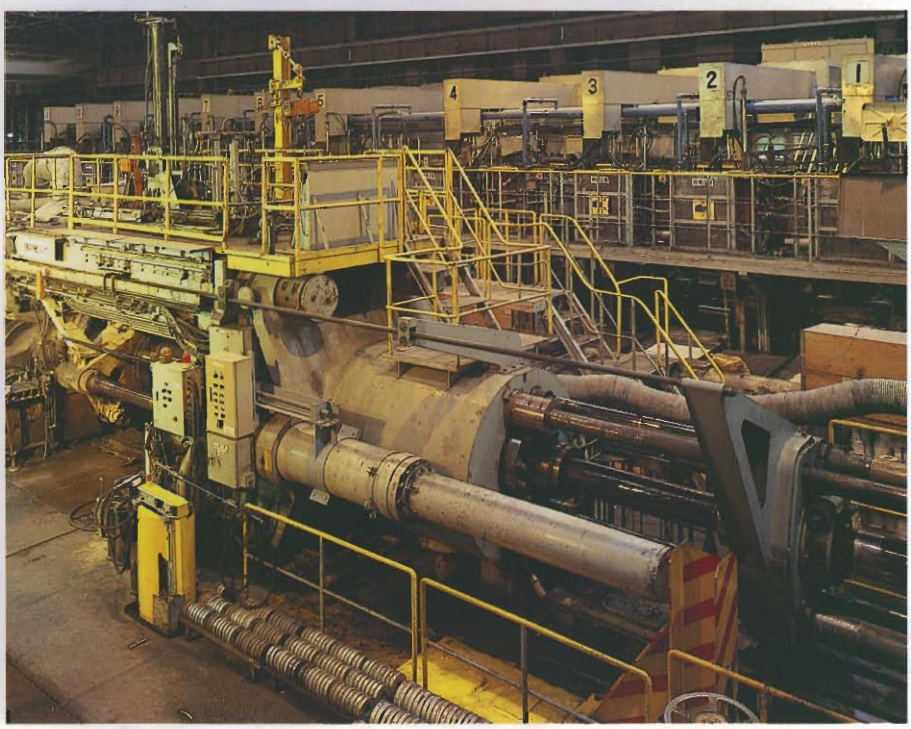
Vacuum oxygen decarburization process(VOD)





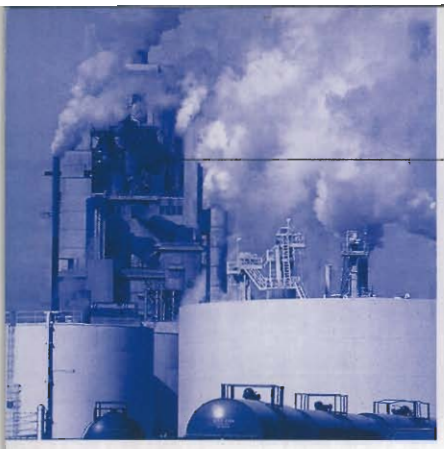


Long-tubing facilities



2,000 ton extrusion press

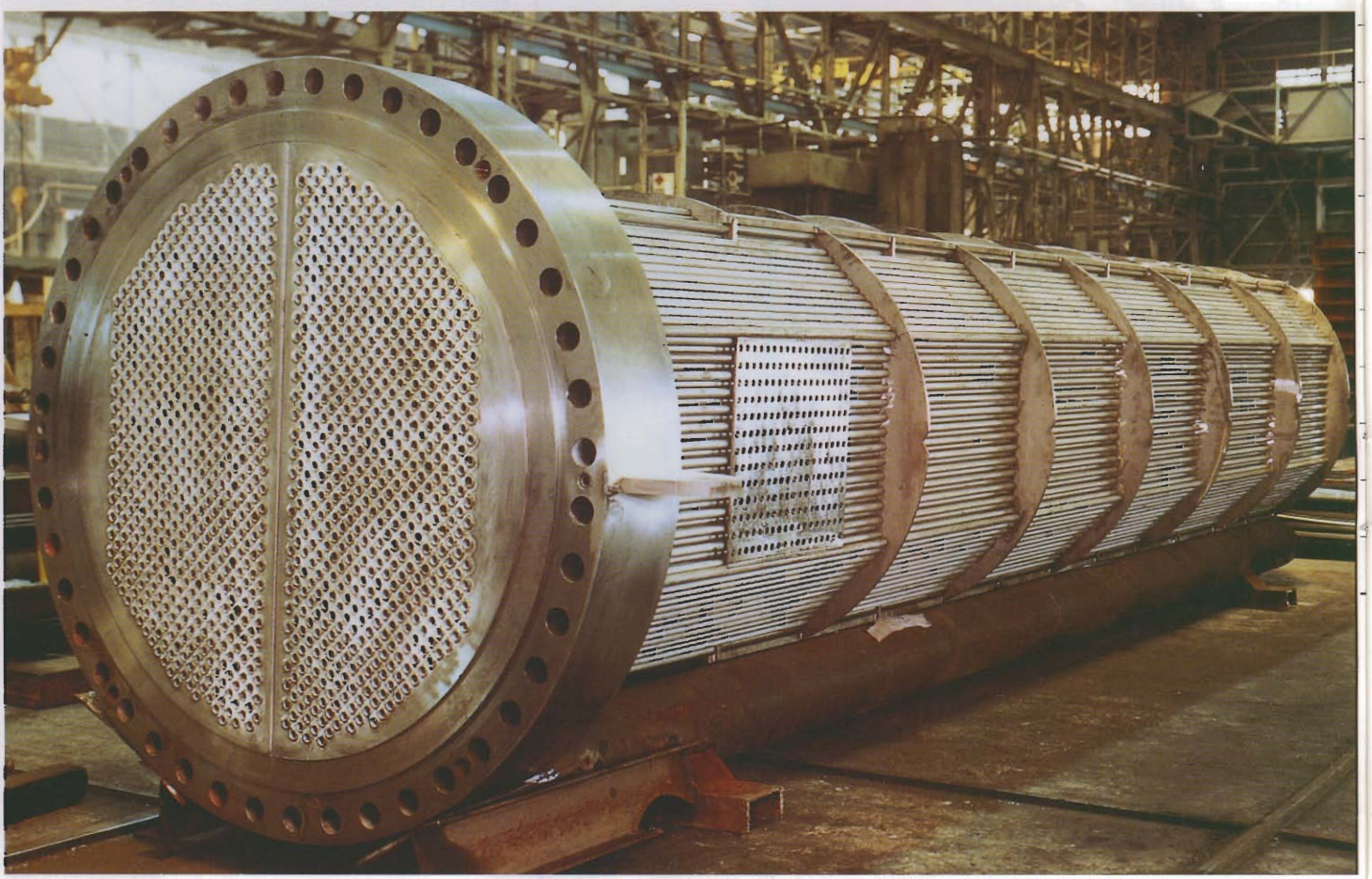
Through-type annealing furnace



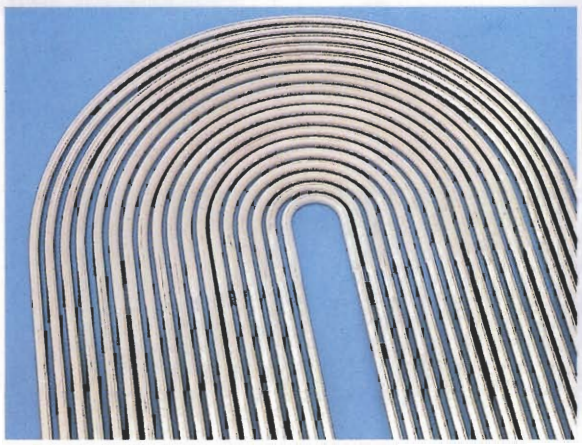
Stainless Steel Tube

Widely Applicable
Seamless Stainless Steel Tubes and Pipe

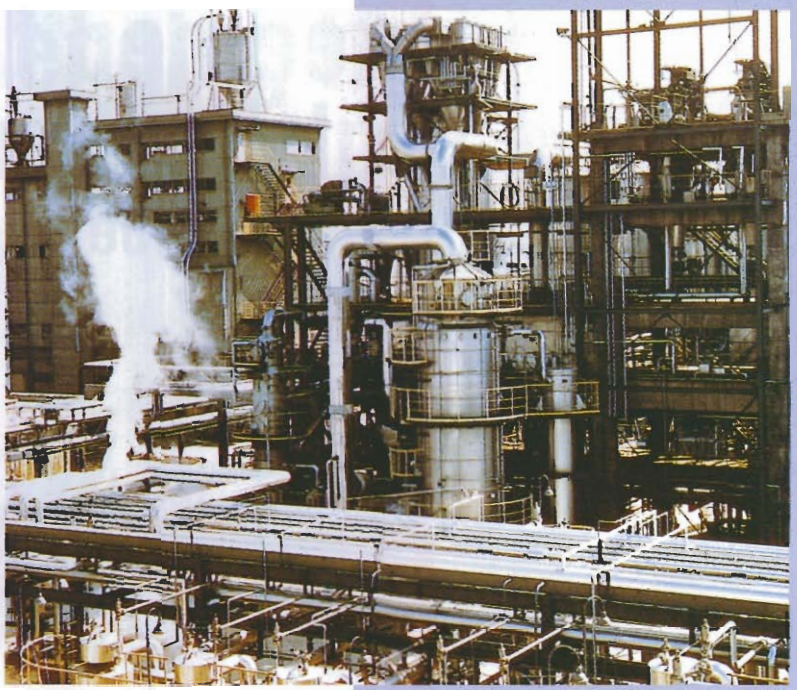
Seamless stainless steel tubular products are used extensively in such fields as power generation, petrochemicals, food processing, and industrial machinery manufacturing. Kobe Special Tube offers a wide variety of tubes and pipe for industrial applications, including tubes with excellent machinability for machine parts and extra-long tubes (up to 36 meters) used in feedwater heaters in conventional and nuclear power plants. Kobe Special Tube's products were the first in Japan to receive approval for use in the Stamicarbon and Snamprogretti urea plant processes. Recent years have witnessed increased demand for stainless tube material with greater resistance to heat and corrosion, including seawater corrosion. Kobe Special Tube provides austenitic, ferritic, and dual-phase stainless steels for such applications as heat exchangers, boilers, and general piping systems. Nonferrous tubular products include those made from pure nickel, high nickel alloy, titanium, and zirconium alloy.



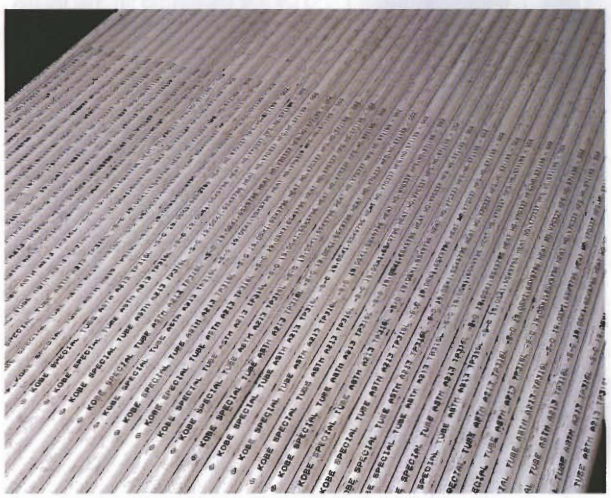
Heat exchanger



U-shaped heat exchanger tubes



Petrochemical plant



Stainless steel pipe

Urea fertilizer plant

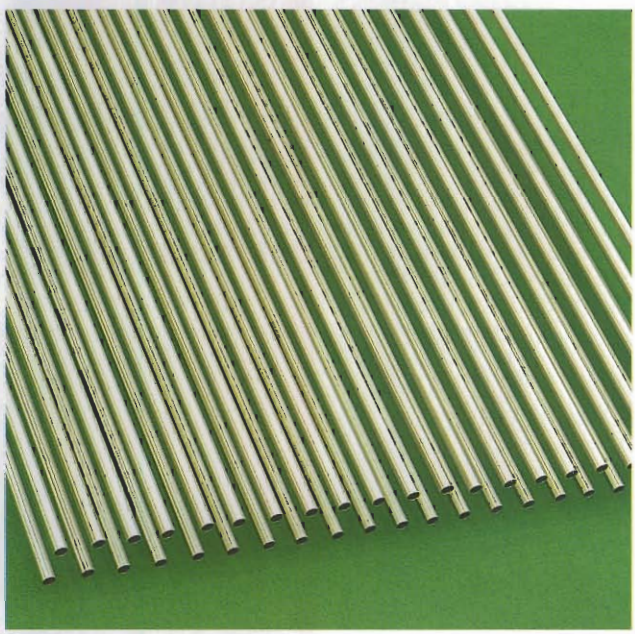
Nuclear power plant

Precision Tube

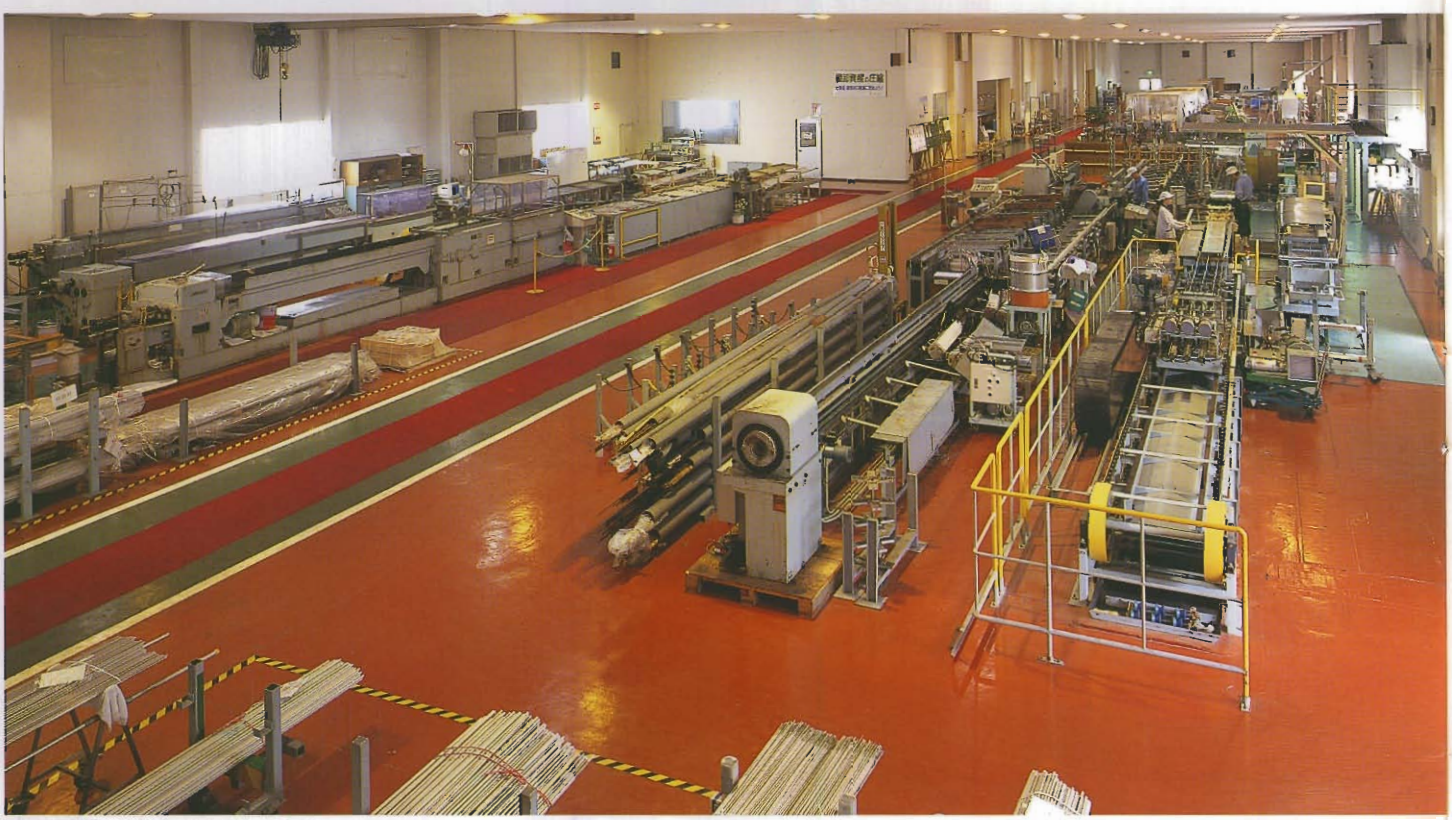
Esteemed for High Technology

Precision Tube

Kobe Special Tube has realized a high-quality, small diameter tube with excellent dimensional accuracy and surface quality. It is used for such applications as stainless steel fuel cladding tubes for fast breeder reactors, medical equipment, and electric parts. Since 1987, the product has been manufactured in a new air-conditioned and clean factory.



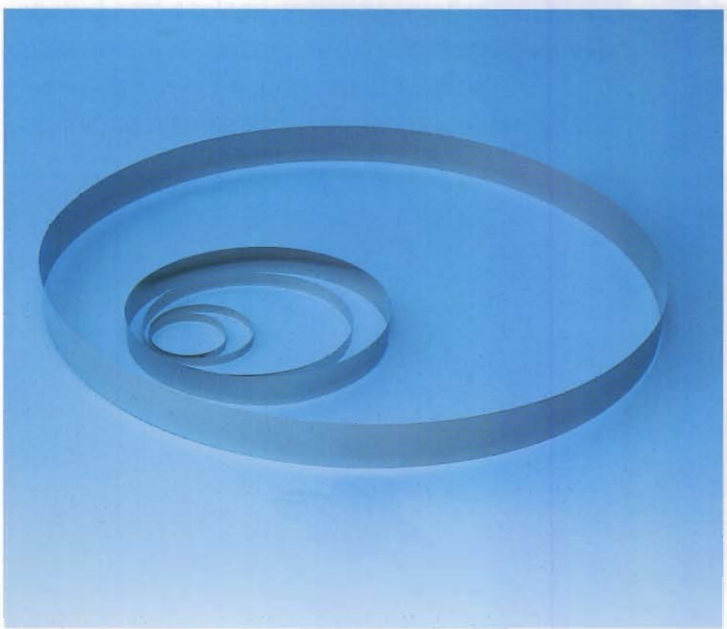
Stainless steel fuel cladding tubes for fast breeder reactors



Work space for precision tube

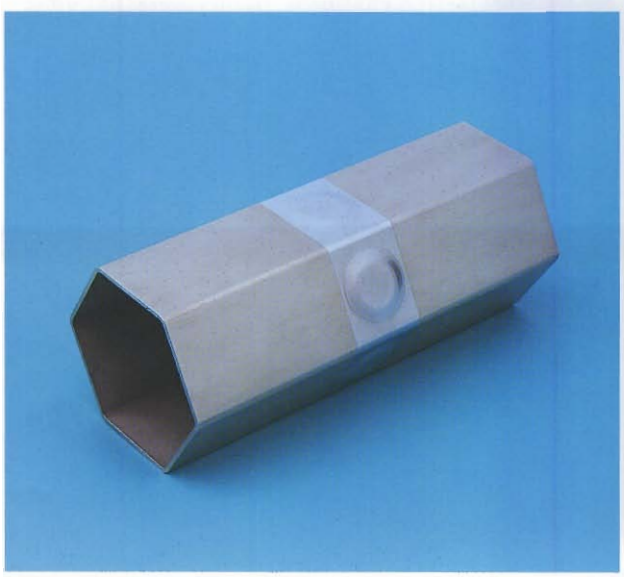
Challenging the Future
Specialty Tube

Kobe Special Tube developed seamless tubes for use in the MONJU fast breeder reactor built in Japan. Made of modified TP316 stainless steel, these tubes feature excellent creep strength and resistance to swell. New facilities for the mass production of these tubes were completed in 1987. In addition to these products, new ferritic steels, including one strengthened by oxide dispersion, are also being developed.

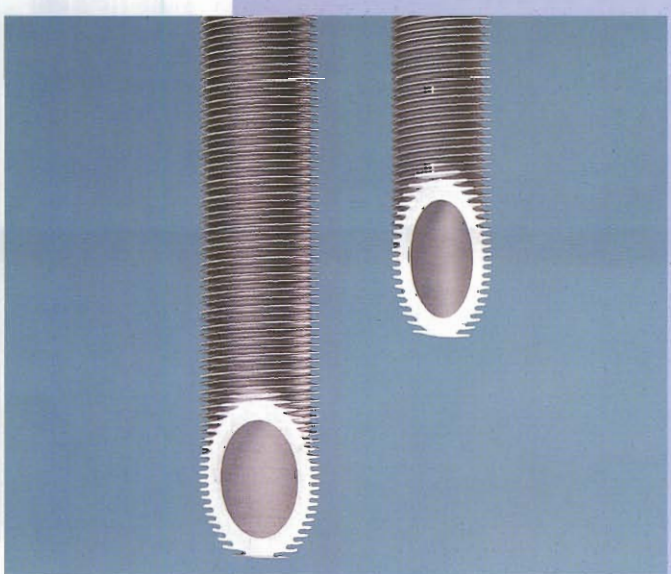


Steel belt

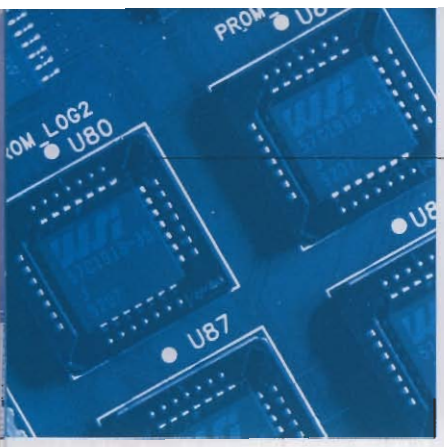
Torque tubes



Wrapper tube with pad



Low-finned tubes

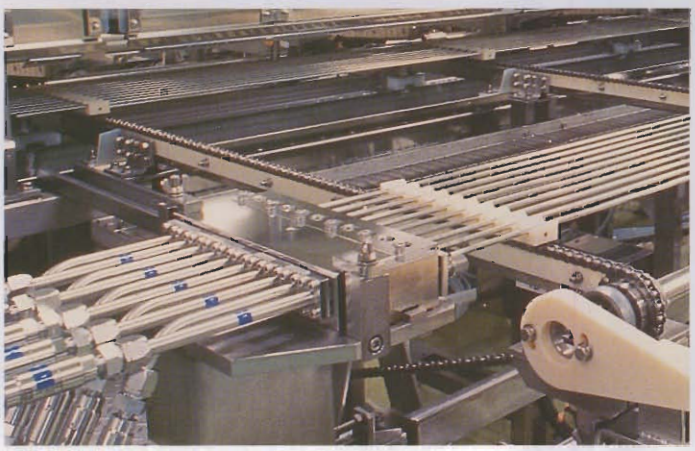


Clean Pipe

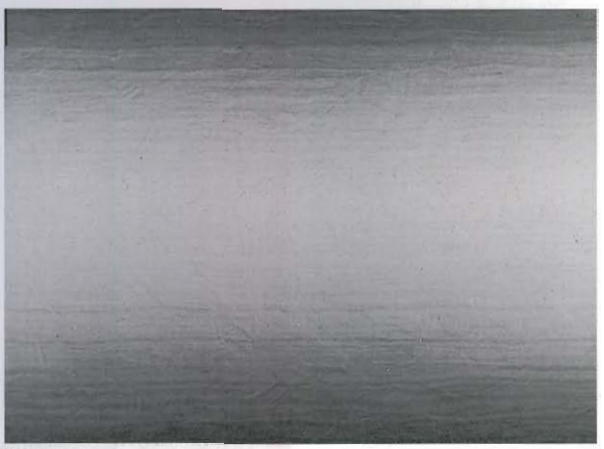
For Distribution of Ultra-High-Purity Gases in Semiconductor Plants

EXCEL CLEAN® PIPE

Tubes and pipe featuring very smooth and clean inner surfaces are required for the distribution of high-purity gases in the semiconductor and biotechnology industries.
Kobe Special Tube has answered this need with the EXCEL CLEAN pipe that leads the industry in Japan. Our superior technology is evident in our precise control of all production stages from melting to tube-making, and in the development of new manufacturing techniques that include bright annealing, electro-chemical buffing, and electro-polishing.



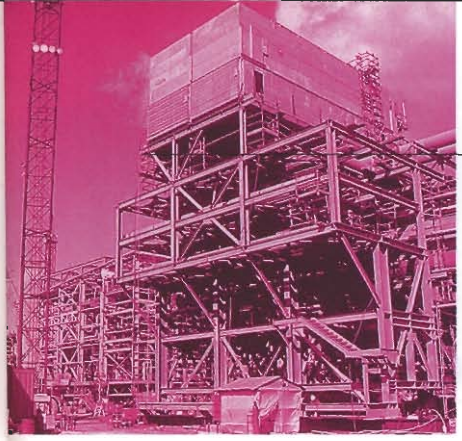
Final rinsing line in clean room



SEM photograph of inner surface

EXCEL CLEAN EP PIPE

Work space of EP tubes

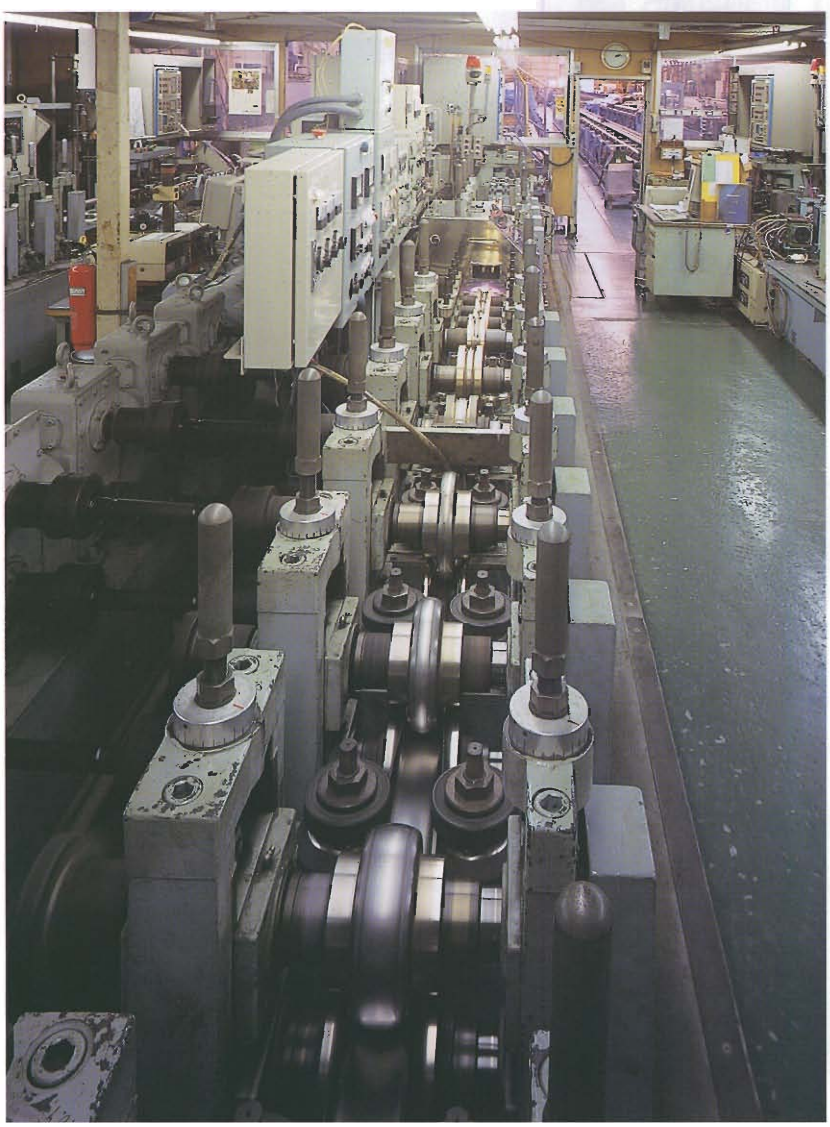


Titanium Welded Tube

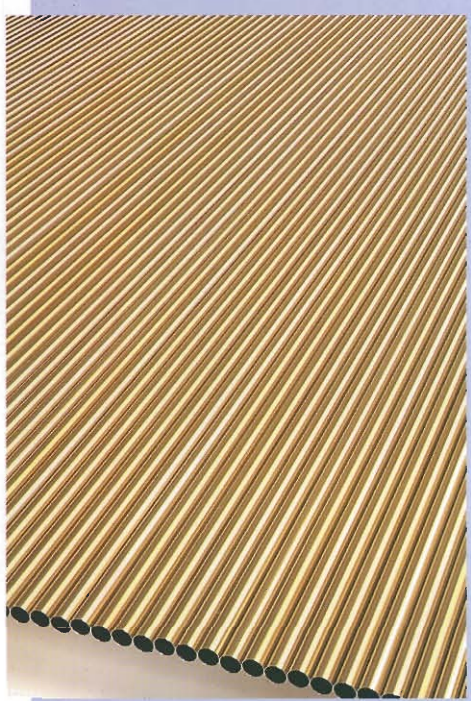
Efficient Tube for an Advanced New Age

Titanium Welded Tube

Thanks to its salient features of high resistance to corrosion and heat, light weight, and high strength, titanium is being used more and more in the aerospace field, the chemical industry, thermal and nuclear power generation, seawater desalination, and the construction of deep-sea survey submarines. Finding expanding applications in aerospace, on land, and in the ocean, titanium is attracting much attention as a new basic metal for coming generations. Kobe Special Tube produces such titanium welded tubes as condenser tubes for thermal and nuclear power generation and tubes for desalination plants, chemical plants, wheelchairs, bicycles, and motorcycle mufflers.



Manufacturing room



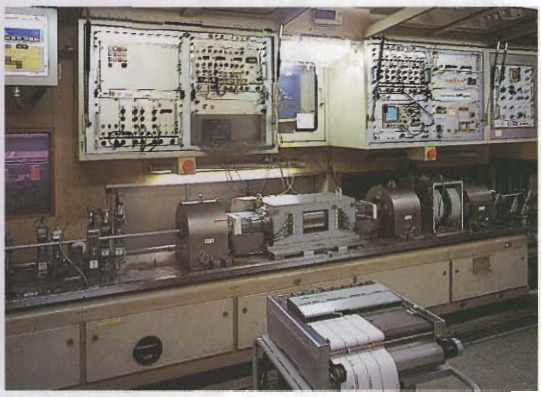
Titanium welded tube

Quality Control and Inspection System

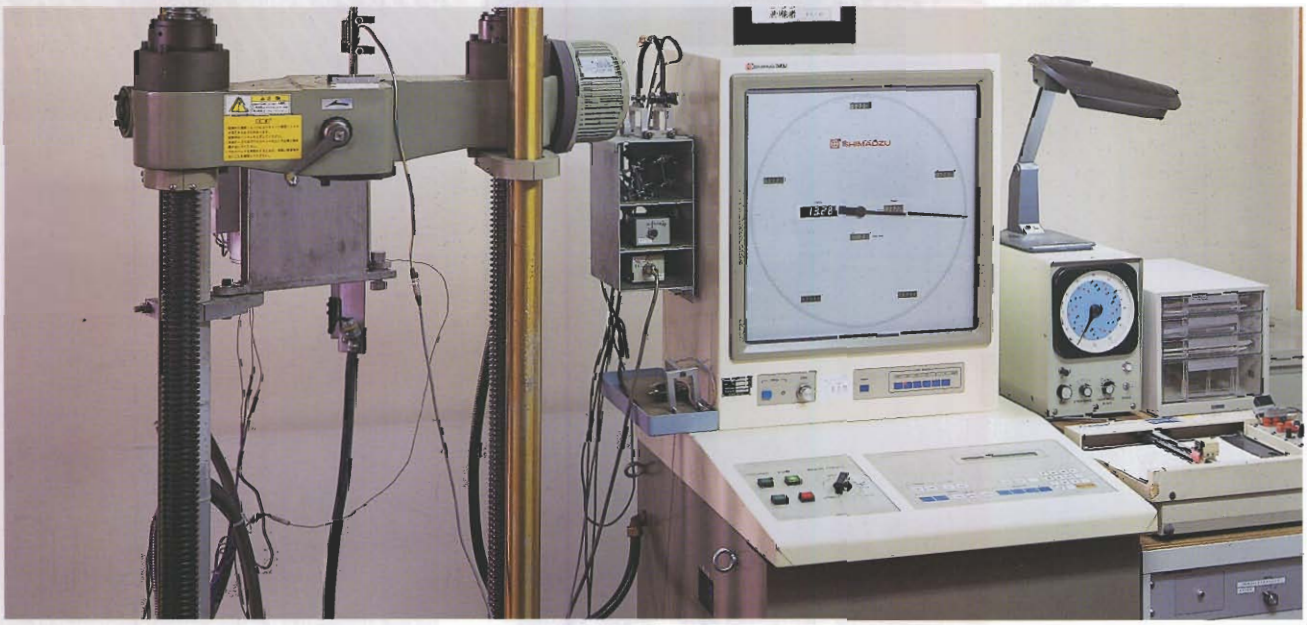
Quality Control

Kobe Special Tube has establised a strict quality control system to ensure customer satisfaction. In accordance with the system, we carefully manufacture and inspect our products at every stage of production. Before shipment, all products are inspected to ensure that they meet their intended uses and specifications. Due in part to this commitment to quality control, the Chofu-Kita Plant has been approved by a number of organizations, including ISO 9002, JIS, LR, NV, and TUV.

Corrosion tesing equipment



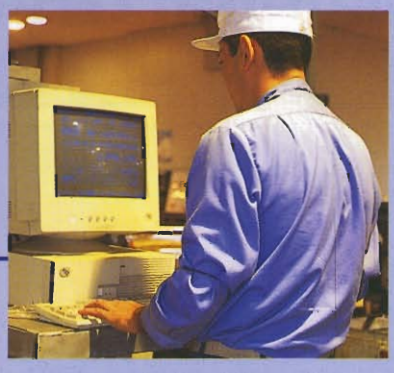
Combined ultrasonic and eddy current tester



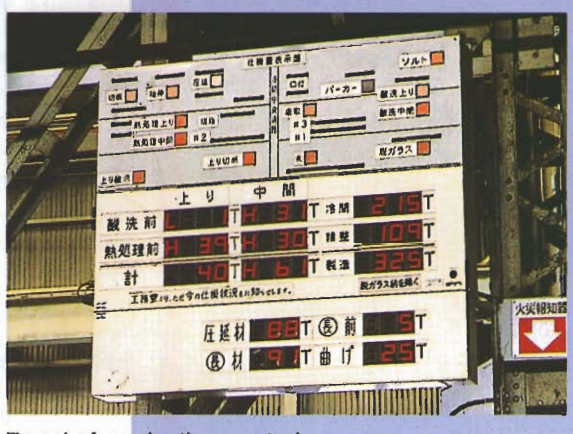
100 ton tensile test machine

Production Control

In all aspects of production control we adopt a computer system so that high-quality products can be made with the shortest possible lead time. Every stage of the production process, from acceptance of orders to shipment, is controlled in detail by our online-real-time system. This system forges an organic connection with management of accounting, purchasing, and handling, a connection we call the "Integrated Management System". We can precisely and rapidly meet all requirements of our customers.



Input of production information



Panel of production control

Environment Control

The Chofu-Kita Plant, which overlooks the beautiful marine vista of Setouchi, places a high priority on protecting the environment. From the aspect of clean air, we have five facilities to eliminate acid gas and one to eliminate ash from a hazardous waste incinerator. We cope with water preservation with total waste water treatment facilities for all waste water in the plant. In addition, our automatic monitoring system works continuously to keep the environment clean.

Water cleaning facility

Automatic monitoring system

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-1.5 Si-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-1.5Mo	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		
RESCOLOY195M	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	
RESCOLOY262	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	

Cu	Ti	N	Others	Applicable Standards JIS	ASTM	DIN	Main Uses
				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
0~1.25					TP443／MT443／UNS S44300		Soot blowers
		0.01~0.25			TP446／MT446／UNS S44600		Chemical reactors, heat-resistant protective pipe
0 max		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	

Cu	Ti	N	Others	Applicable Standards JIS	ASTM	DIN	Main Uses
				SUS329J1TP SUS329J1TB	TP329		Heat exchangers that must be resistant to stress corrosion cracking
	5×C~0.65						
		0.05~0.10			A789／A790 UNS S31500	1.4417	Heat exchangers and piping that must be resistant to crevice corrosion
	0.20~0.40						
-0.70		0.08~0.20		SUS329J4LTP SUS329J4LTB	A789★ A790 UNS S31803	1.4462★	Heat exchangers that must be resistant to stress corrosion cracking
-0.70		0.18~0.22					
-0.70		0.10~0.20					Heat exchangers and piping that must be resistant to crevice corrosion
		0.08~0.20		SUS329J3LTP SUS329J3LTB			Tubing for deep sour well environments
		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		

Ti	N	Others	Applicable Standards JIS	ASTM	DIN	Main Uses
			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, semiconductor manufacturing equipment
	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	

u	Ti	N	Others	Applicable Standards JIS	ASTM	DIN	Main Uses
			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		
max.		0.020 max.				1.4435	Urea plants, heat exchangers and piping that must be especially resistant to corrosion
max.		0.10~0.14				1.4466	
						1.4449	Heat exchangers and piping that must be resistant to phosphoric and sulfuric acids
~4.00			Nb8×C min				
~4.00			Nb+Ta 8×C~1.00		B729 UNS N08020		
~2.00				SUS890LTP SUS890LTB	B677 UNS N08904	1.4539	
	5×C min.				B622 UNS N08320		
~1.80	5×C min.						
3.5	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
~2.00		0.15~0.25			B690★ UNS N08366		
max.	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
max.	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
~4.50			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

Cu	Ti	Others	Applicable Standards JIS	ASTM	DIN	Main Uses
5 max.		Fe 0.40 max.		B163 UNS N02200		Chemical plant, heat exchangers, rocket engines
0 max.		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
0~3.00	0.60~1.20	Al 0.20 max.	NCF825TP NCF825TB	B423 UNS N08825		Heat exchangers and piping that must be resistant to chloride solution
0~2.00	0.8~1.2					Tubing for deep sour well environments
	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

Others	Ti	Applicable Standards JIS	ASTM	Main Uses
	remains	TTP270,TTH270	Grade 1 (B337,B338)	Chemical machinery and equipment which require corrosion resistance
	remains	TTP340,TTH340	Grade 2 (B337,B338)	Urea plants
	remains	TTP480,TTH480	Grade 3 (B337,B338)	Thermal, nuclear power plants heat exchangers
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

Outside diameter (in)	Outside diameter (mm)	Wall thickness (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

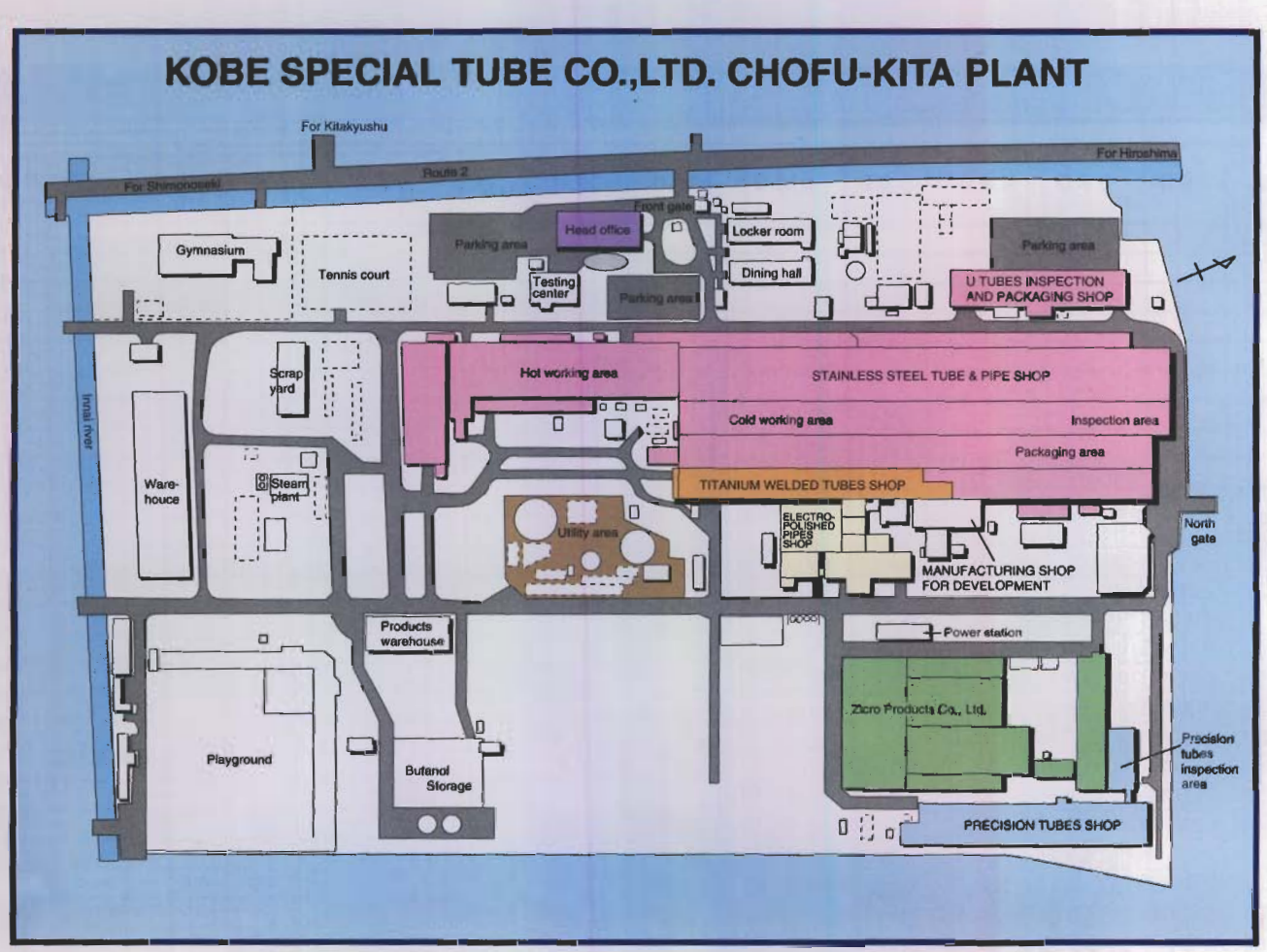
(Unit:kg/m)

Cold finished | Hot&Cold finished | Hot finished

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. CHOFU-KITA PLANT



Outline

1. Location

Head Office Chofu-Kita Plant
13-1, Chofuminato-machi, Shimonoseki-City, Yamaguchi, 752-0953 JAPAN
Tel.0832-46-3781 Fax.0832-45-1092

Sales Department Tokyo Office
9-12, Kitashinagawa, 5-chome, Shinagawa-ku, TOKYO, 141-8688 JAPAN
Tel.03-5739-5051 Fax.03-5739-5055

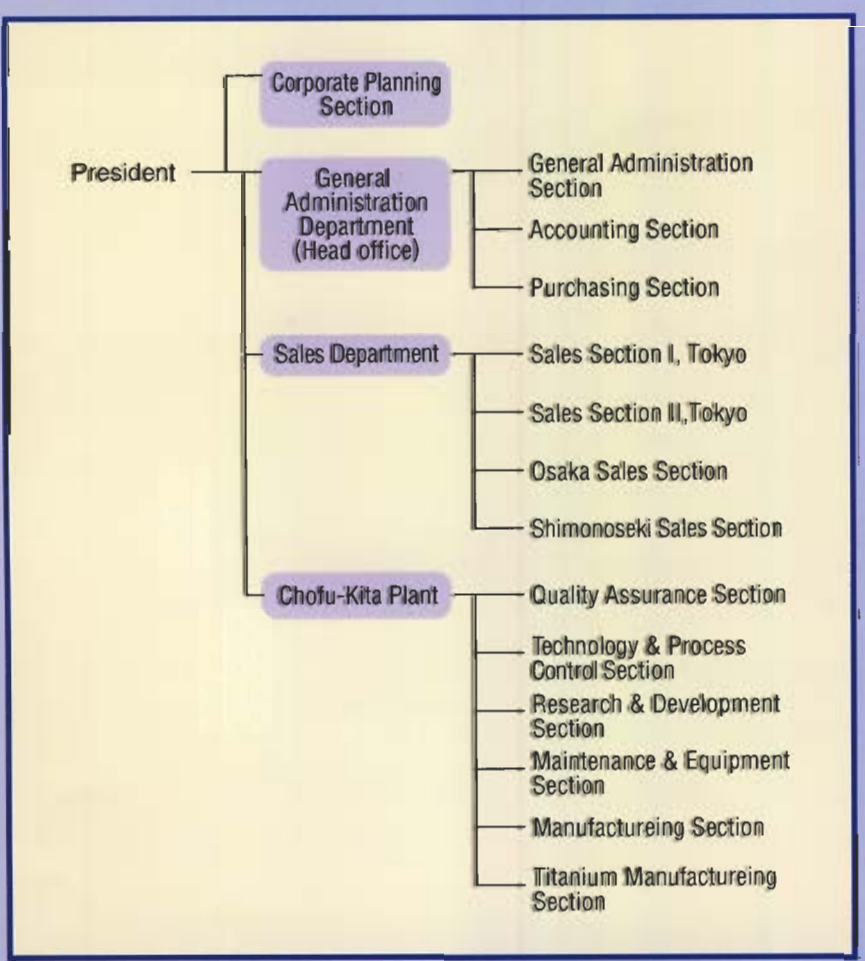
Sales Department Osaka Office
Midosuji Mitsui Bldg., 1-3, Bingomachi 4-chome, Chuo-ku, Osaka, 541-8536 JAPAN
Tel.06-6206-6305 Fax.06-6206-6471

2. Site and Building of Head Office Chofu-Kita Plant

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

3. Employees

272 ('02.3.1)



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 Zircoo Products Co., Ltd.