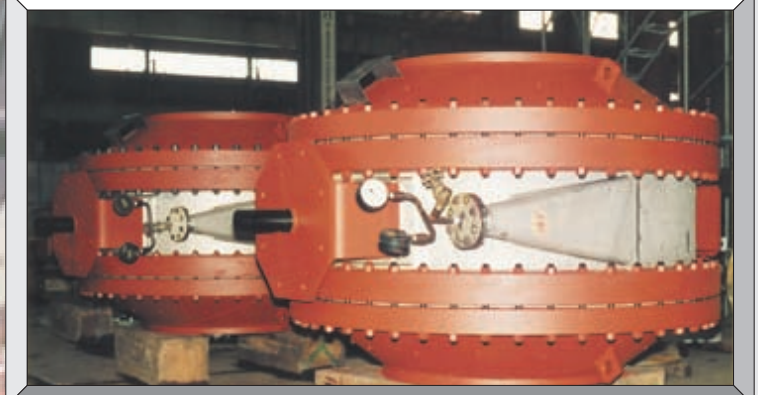
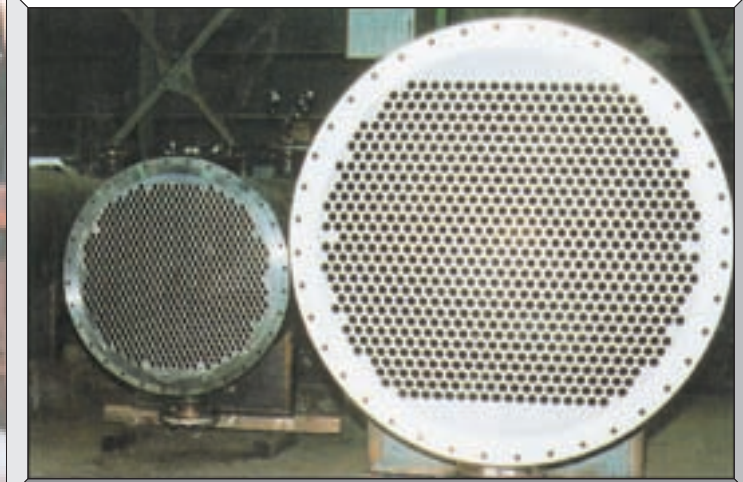
KUROSE





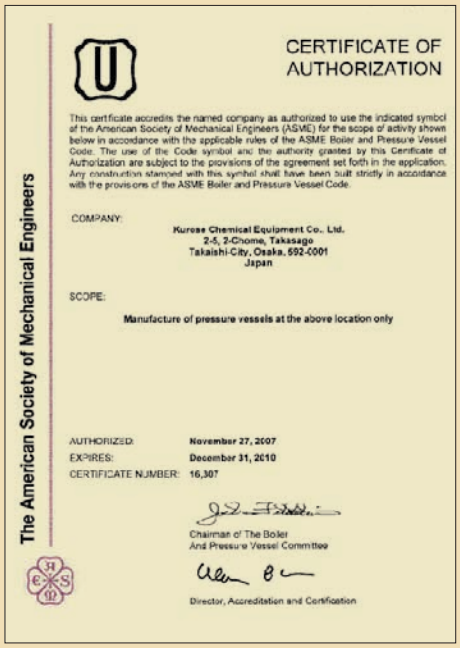
Kurose Chemical Equipment Co., Ltd. was established in 1925 and has become one of the leading companies manufacturing pressure vessels made of special corrosion-resistant materials.

Especially in high performance SPIRAL HEAT EXCHANGERS, we can be proud of excellent production scale and fine reputation for producing many satisfactory results.

As for quality assurance, we were authorized by ASME to use "U"STAMP in 1980 and obtained the ninth renewal authorization by ASME in 2007.

Additionally, we were certified the Manufacture License of Special Equipment by People's Republic of China in 2007.

We are continuously making efforts in order to improve the reliability of our products.



CERTIFICATE OF AUTHORIZATION

The American Society of Mechanical Engineers

This certificate accredits the named company as authorized to use the indicated symbol of the American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the Code symbol and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with this symbol shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY:
Kurose Chemical Equipment Co., Ltd.
2-5, 2-Chome, Takasago
Takaishi-City, Osaka, 592-2001
Japan

SCOPE:
Manufacture of pressure vessels at the above location only

AUTHORIZED: November 27, 2007
EXPIRES: December 31, 2010
CERTIFICATE NUMBER: 16,307

Chairman of The Boiler And Pressure Vessel Committee

Director, Accreditation and Certification

中华人民共和国
特种设备制造许可证
Manufacture License of Special Equipment
People's Republic of China
（压力容器）(Pressure Vessel)

No.: TS2200235-2011

公司/ Company: KUROSE CHEMICAL EQUIPMENT CO., LTD.

地址/ Address: 2-5,2-CHOME, TAKASAGO, TAKAISHI-CITY, OSAKA 592-2001, JAPAN

经审查，准予从事下列压力容器的制造：
Has been audited and approved to manufacture the Pressure Vessels within the scope as:

压力容器 D1, D2 / Pressure Vessels D1, D2

审批机关：
Approval/Issue Organ:
General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China

发证机关：
Issue Organ:

有效期至：2011 年 02 月 14 日
Date of Expiration: Feb. 14, 2011

发证日期：2006 年 02 月 15 日
Date of Issue: Feb. 15, 2006

国家质量监督检验检疫总局制

INDEX

PROFILE

Kurose Chemical Equipment Co., Ltd.

Established : August 1, 1925
Capital Funds : ￥90,000,000
Staff : 100
Certification :
Authorized factory for
ASME "U"stamp
Authorized factory for
Manufacture License of Special Equipment
by People's Republic of China
Authorized factory for
1st Class Boiler and Pressure Vessels
Authorized Factory for
High Pressure Gas facilities

HISTORY

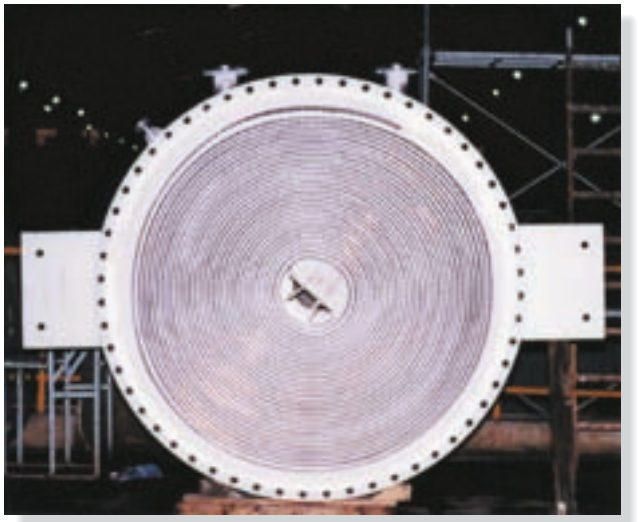
1925 Established to manufacture chemical equipment
1952 Expanded the factory
Started manufacturing of Titanium vessel
1955 Open Tokyo Branch
1956 Supplied the reactor made of Hastelloy®
1961 Concluded a technical license agreement for
SPIRAL Heat Exchanger with
AB Rosenblads patenter of Sweden
1976 Concluded a technical license agreement for
Pressure Plate Filter with
BHS-Bayerische Berg-Hutten-und Salzwerke
1977 Authorized by ASME to use “U” Stamp in Osaka City
1980 Head Office Factory removed to Takaishi City
Authorized by ASME to use "U" Stamp in new Factory
1998 Authorized by People's Republic of China for
Safety Quality License for Import Boilers and
Pressure Vessel
2002 Supplied Spiral Heat Exchanger to Liquid Crystal
Display plant
2004 Achieved 380 Spiral Heat Exchangers supplied
to insatant noodle production plant in China
2007 Ninth renewal of ASME "U" Stamp
Authorized by People's Republic of China for
Manufacture License of Special Equipment
Start of Full-Automatic Welding machine operation
for a part of Spiral Heat Exchanger
2008 Renovate of Factory

KUROSE SPIRAL HEAT EXCHANGER

KUROSE Spiral Heat Exchanger is known as the excellent heating device for energy saving as compared to the conventional heat exchanger.

Kurose Chemical Equipment Co., Ltd. is the leading company of Spiral Heat Exchanger.
Our products have been useful for many chemical plants and many ecology plants in the world.

KUROSE Spiral Heat Exchanger is far more compact and easy installation than the tubular heat exchanger.



ADVANTAGES

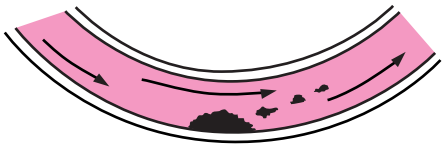
High Overall Heat Transfer Coefficient

Spiral flow passage easily creates turbulent flow.
Optimum flow speed can be set by selecting the most suitable spiral channel, which permits remarkably high heat transfer.

Virtually dirt-free

The rotary current of spiral heat exchanger possesses the property of scraping off and spilling the sludge (solids).

Even though scale adhere to it, when the cross-section of the adherent part becomes smaller, the flowing speed would turn quick and bring the function of auto-cleaning into play owing to the one-way flows. Thereafter it is unnecessary to dismantle for cleaning.



Efficient use of Temperature Difference

The fully countercurrent system (TYPE-1) is able to exchange heat even when temperature difference is very low and is therefore the optimum system for saving energy.

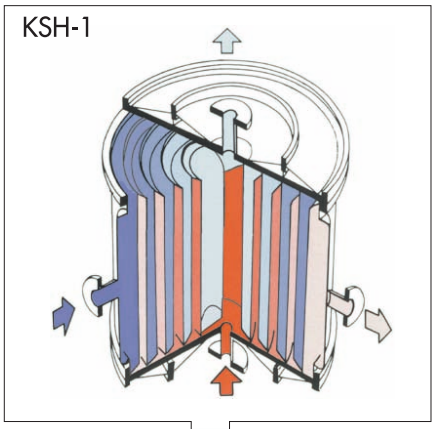
Easy Maintenance

The inside is easily accessed and checked, simply by removing the covers on both sides.

Space-saving

Its high-performance structure results in very compact equipment.

TYPE

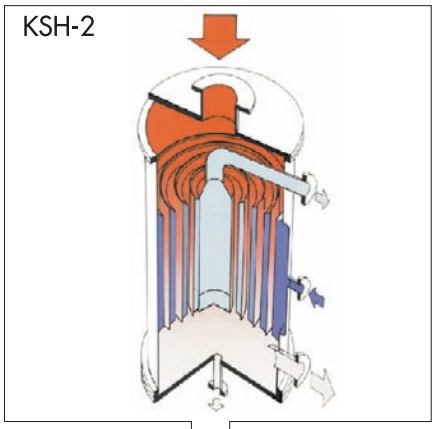


Both fluids are Spiral Flow

Fully countercurrent

Liquid -to- Liquid

Heat exchanger for liquid to liquid with low temperature difference
Slurry heat exchanger
Interchanger for sterilization in incubator Waste heat recovery

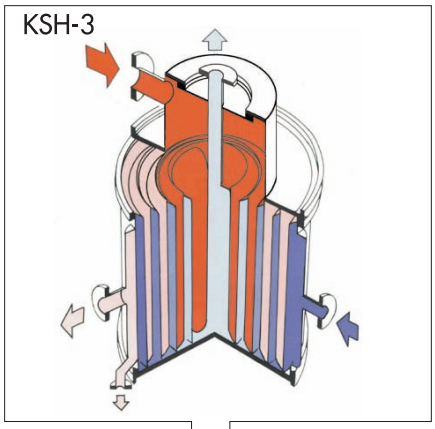


Spiral Flow and axial Flow

Steam and/or Large volumes Gas

Steam and/or Gas to Liquid;
Large volume Liquid to Liquid

Condenser
Heater
Tower Top Condenser
Cold Trap
Reboiler



Mixed Spiral Flow and Axial Flow

Condensation and sub-Cooling

Steam to Liquid

Reflux Condenser
Heater
Condenser/Cooler
Sterilizer

TECHNOLOGY DATA

Overall heat-transfer coefficient : Water – Water	1000～2500 kcal/m2hr℃
Max. Operating Temperature :	-196～450℃
Max. Operating Pressure :	2.5MPaG
Max. Area :	550 m2
Material :	Stainless Steel(Include Duplex) Titanium, Zirconium Hastelloy® Nickel Monel High Alloy Steel
Design Code	ASME-U Manufacture License(China) High Pressure Gas Safety Law Pressure Vessel Construction Code

Hastelloy® is the trade name of Haynes international Inc.

High performance heat exchanger can be used just like VALVE FEELING.

Our MINI- SPIRAL has been achieved to most compact, and the structure is not necessary for this PORTABLE MINI- SPIRAL.

ADVANTAGES

Most Compact and high performance
Made of all Stainless Steel
Quick delivery

MATERIAL

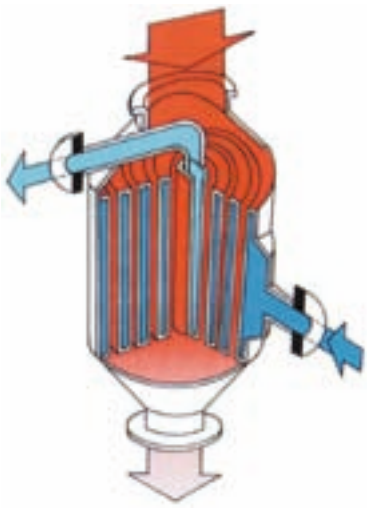
Standard: SUS 316
Specially, for High Pressure applications
and for high grade materials such Titanium,
Hastelloy®, Nickel, etc can be supplied.

APPLICATIONS

For Laboratories or Pilot Plants
Vent Condensers, Sampling Coolers
For Air Conditioners (Heaters, Humidifiers)
Solvent Recovery
Temperature control

KMSA

KMSB



STANDARD

Type		KMSA		KMSB	
		03	06	03	06
Heat Exchange Area		0.3㎡	0.6㎡	0.3㎡	0.6㎡
Material		SUS316			
Max.operating press.		0.6 MpaG			
Max.operating temp.		185 ℃			
Nozzle	Spiral	All 15A JIS10K FL		15A JIS10K FL	
	Axial			40A	50A
				JIS10K FL	
Plate Width		100 mm			
Empty Weight		8 kg	11 kg	10 kg	15 kg

HIGH GRADE ALLOY

In 1952, KUROSE Chemical Equipment Co., Ltd. started to design and fabricate HIGH GRADE ALLOY (Titanium, Hastelloy®, Monel, Pure Nickel, Duplex and their clad steel) earlier than other companies and is authorized by Japanese Labor Safety Health Low.

TITANIUM

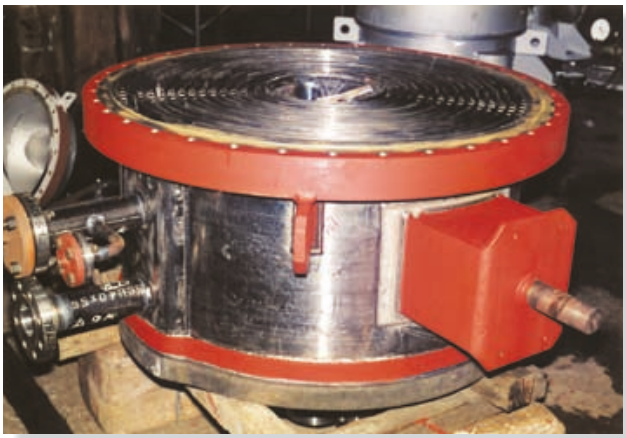
Spiral Heat Exchanger
Type KSH-2
Area 300㎡(170㎡+130㎡)

HASTELLOY®

Reactor

MONEL

Column



PURE NICKEL

Spiral Heat Exchanger
Type KSH-1

INQUIRIES

Please send FAX or E-mail, using bellow Inquiry Format for Heat exchanger.

Your Company Name					
Section of Contact Person					
Contact Person					
Phone		FAX		E-mail	

		Hot Side	Cold Side
Product Name Use			
1	Fluid Name (composition)		
2	Flow Capacity		
3	Inlet Temperature		
4	Outlet Temperature		
5	Heat Exchanged		
6	Inlet Pressure		
7	Allowance Pressure Drop		
8	Maximum Operating Press.		
9	Maximum Operating Temp.		
10	Materials		
11	Density		
12	Specific Heat		
13	Thermal Conductivity		
14	Viscosity		
15	Latent Heat		
16	Fouling Factor		
17	Others		

If vapor contains inert gas, please clarify its composition.

KUROSE CHEMICAL EQUIPMENT CO., LTD

http://www.kurose.co.jp/index_e.htm

HEAD OFFICE FACTORY
2-5, 2-chome, Takasago, Takaishi-City,
Osaka 592 - 0001 Japan
Tel : +81 72 268 1371
Fax : +81 72 268 1367

TOKYO OFFICE
Shinkawaohara Bldg., 27-8, 1-chome,
Shinkawa, Chuo-ku, Tokyo 104-0033 Japan
Tel : +81 3 3553 3711
Fax : +81 3 3553 3715

OSAKA OFFICE
Ozawa Bldg., 19-12, 1-chome, Edobori,
Nishi-ku, Osaka 550-0002 Japan
Tel : +81 6 64440881
Fax : +81 6 6444 0885

MALAYSIA
No 2, Jalan TP 2, Taman Perindustrian SIME UEP,
47600 Subang Jaya, Selangor
Tel : +603 5880 4185
Fax : +603 8081 7185
Emai : heatexc@hsiaka-asia.com

07. 11. 2,000三宝