



CATALOGUE No. ZP08

FLUOROPLASTIC CHEMICAL-RESISTANT HEAT EXCHANGER

Technical Data



NIPPON VALQUA INDUSTRIES, LTD.

<http://WWW.valqua.co.jp>

Fluoroplastic Chemical-Resistant Heat Exchanger



- Fluoroplastic, as with other plastics, is high in purity. As a result of this property, fluoroplastic is becoming increasingly important in high-tech industries, such as semiconductor manufacturing, in which high-purity chemical liquids and ultra-high-purity water are used.
- Fluoroplastic has excellent resistance to chemicals, heat, and stains. The fluoroplastic chemical-resistant heat exchanger, which makes the most of these resistance properties, is suitable for the cooling and heating of corrosive fluid and condensation of corrosive gas.
- Fluoroplastic has poor heat conductivity compared to metals. That has been a drawback when used for heat exchangers in the past. The fluoroplastic chemical-resistant heat exchanger has solved this problem by increasing the heat-exchanging surface area using a honeycomb structure binding together many small-diameter heat transfer tubes.
- The fluoroplastic chemical-resistant heat exchanger comes in two types, the shell tube type and the immersion type. You can choose the one suitable for your application in the semiconductor, chemistry, iron manufacture, plating, crystalline liquid, and various other industries.

Features

- The principal feature is the flexible tube bundle consisting of fluoroplastic (PTFE, PFA) Valflon® tubes bound in an integral double-ended honeycomb structure. The honeycomb is finished with uniform quality through the use of our unique technology.
- Anti-static specifications are available for heating applications. (Pat. No. 1390535)
- An anti-static exchanger is also available for production.
- Clean specifications are available for applications in clean rooms.
- Resists up to a saturated steam pressure of 0.49 MPa {5 kgf/cm²}.
- Has excellent chemical resistance.
- Non-adhesive. Sludge and scale hardly adhere to the heat exchanger, and can be easily removed.
- Produces no toxic substances.

Scope of Application

Maximum Temperature And Pressure Performance



	Tube size	
	ø5.8 x ø6.35	ø2.4 x ø3.2
Tube	0.20 {2.0} (133°C)	0.49 {5.0} (158°C)
Shell	0.14 {1.4} (125°C)	0.20 {2.0} (133°C)

Saturated-steam usage limit pressure: MPa {kgf/cm² max}

► Plantex, Ltd. is responsible for the engineering, assembly, and service of the fluoroplastic chemical-resistant heat exchanger.

* Valflon® is the registered trademark of Nippon Valqua Industries, Ltd. for its fluoroplastic products.

Heat Exchanger Types

Type and Specification Coding			Tube Bundle Model Code and Effective Heat-Exchange Area (A)			Final code		
Type	Type Code	Specification Code	Model Code	Standard Model		Shell and Connector Materials		
				Code	A value (m ²)			
Shell Type	Shell tube  Straight: S U-shaped: U	 General: OGO Clean: OCO	103	010-040	1.0-4.0	(Shell material)		
			203	020-080	2.0-8.0	-CS (carbon steel)		
			403	080-240	8.0-24	-S (stainless steel)		
			1003	200-700	20-70	-FL (fluoroplastic lining)		
			106	020-080	2.0-8.0	-PVC (rigid PVC pipe)		
			306	080-240	4.0-24			
			506	100-700	10-70			
Immersion Type	Loose random: LR Tight module: TM	General: } OGE Anti-static: }	23	002-010	0.2-1.0	(Connector material)		
			43	004-010	0.4-1.0			
			103	010-040	1.0-4.0	-S (stainless steel)		
				Clean: } OCE Anti-static: }	203	020-080	2.0-8.0	
					403	080-240	4.0-24	-F (fluoroplastic)
					1003	200-700	20-70	
Coding example	STS-OCO-403-080-S				Straight shell tube, clean specifications, Model 403 A = 8 m ² , SUS shell			
	LR-OGO-203-030-F				Loose random, general specifications, Model 203 A = 3 m ² , fluoroplastic connector			
	TM-OGE-1003-300-S				Tight module, anti-static specifications, Model 1003 A = 30 m ² , SUS connector			

Gasket Types: Fluoro Rubber (FPM), EPDM, Kalrez®, Crystal Rubber®

▼ Honeycomb Specifications

Model Code	Effective Heat-Exchange Area (A) m ²	(A) m ² /m	Effective Length (mm) per m ²	Overall Sectional Area of the Flow Path (m ²)	Tube Bundle Setup	
					Number of tubes	Tube size
23	0.2-1.0	0.167	5984	0.000859	19	Outer, inner, and effective diameters 3.2 x 2.4 x 2.8 Thickness: 0.4 t
43	0.4-2.0	0.325	3073	0.000167	37	
103	1.0-4.0	0.950	1053	0.000488	108	
203	2.0-8.0	1.62	614.5	0.000836	185	
403	8.0-24.0	4.12	242.4	0.00212	469	
1003	20.0-70.0	9.03	110.7	0.00464	1027	
46	0.5-2.0	0.664	1516	0.000749	37	Outer, inner, and effective diameters 6.35 x 5.08 x 5.715 Thickness: 0.635 t
66	0.5-2.0	1.09	913.1	0.00123	61	
106	2.0-8.0	2.28	438.6	0.00257	127	
306	8.4-24.0	4.86	205.6	0.00549	271	
506	10.0-70.0	9.82	101.9	0.0110	547	

ST (Shell Tube)

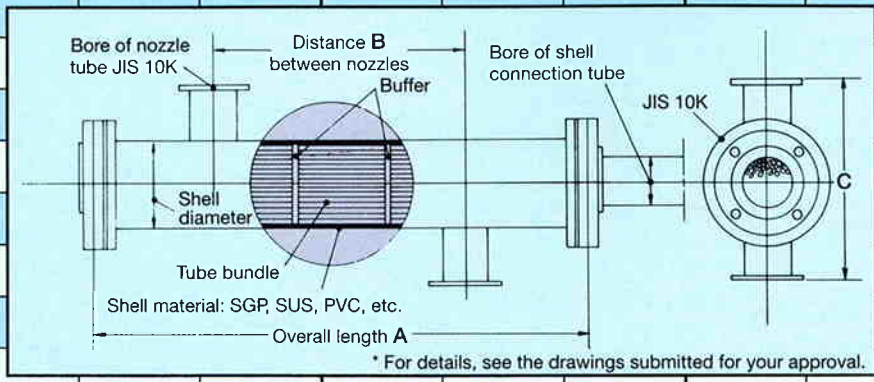
(In mm)

Model		Code		106			306			506		
Effective Heat-Exchange Surface Area (A)	Dimensions of Related Parts	Shell Connection Tube	Shell Diameter	Nozzle Tube	Shell Connection Tube	Shell Diameter	Nozzle Tube	Shell Connection Tube	Shell Diameter	Nozzle Tube		
		80A	125A	50A	100A	200A	100A	150A	300A	100A		
Code	m ²	A	B	Weight (kg) of the Shell-Tube Type (C = 300)	A	B	Weight (kg) of the Shell-Tube Type (C = 440)	A	B	Weight (kg) of the Shell-Tube Type (C = 560)		
010	1.0											
015	1.5											
020	2.0	1250	880	90								
025	2.5	1470	1100	95								
030	3.0	1690	1320	100								
035	3.5	1910	1540	105								
040	4.0	2130	1760	110	1320	830	146					
050	5.0	2570	2200	120	1520	1030	153					
060	6.0	3010	2640	130	1730	1240	160					
065	6.5											
070	7.0	3440	3070	140	1930	1440	168					
080	8.0	3880	3510	150	2140	1650	175					
090	9.0				2350	1860	183					
100	10.0				2550	2060	190	1580	1020	340		
120	12.0				2960	2470	205	1790	1230	355		
140	14.0				3370	2880	220	1990	1430	370		
160	16.0				3780	3290	235	2200	1640	385		
180	18.0				4190	3700	250	2400	1840	400		
190	19.0											
200	20.0				4610	4120	265	2600	2040	415		
220	22.0				5020	4530	280	2810	2250	430		
240	24.0				5430	4940	295	3010	2450	445		
260	26.0							3210	2650	460		
280	28.0							3420	2860	475		
300	30.0							3620	3060	490		
350	35.0							4130	3570	530		
400	40.0							4640	4080	565		
500	50.0							5660	5100	640		
600	60.0							6680	6120	680		
700	70.0							7700	7140	715		

Type Sizing Table

Model codes with the final number of 6: 6.35 x 5.08 x 0.635 tubes are used
 Model codes with the final number of 3: 3.20 x 2.40 x 0.4 tubes are used

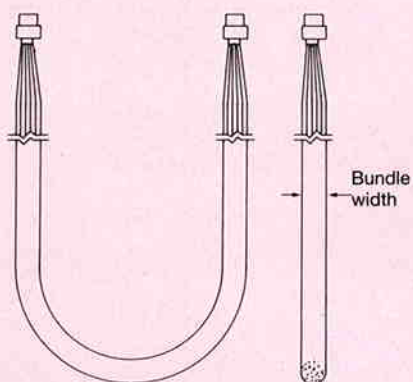
103			203			403			1003		
Shell Connection Tube	Shell Diameter	Nozzle Tube	Shell Connection Tube	Shell Diameter	Nozzle Tube	Shell Connection Tube	Shell Diameter	Nozzle Tube	Shell Connection Tube	Shell Diameter	Nozzle Tube
40A	80A	25A	50A	125A	50A	80A	150A	80A	100A	250A	100A
A	B	Weight (kg) of the Shell-Tube Type (C = 260)	A	B	Weight (kg) of the Shell-Tube Type (C = 300)	A	B	Weight (kg) of the Shell-Tube Type (C = 360)	A	B	Weight (kg) of the Shell-Tube Type (C = 440)
1370	1060	35									
1890	1580	40									
2420	2110	45	1690	1230	70						
2950	2640	50	1910	1540	75						
3470	3160	55	2220	1850	80						
4000	3690	60	2530	2160	85						
4530	4220	65	2830	2460	90	1390	970	95			
			3450	3080	100	1640	1220	100			
			4060	3690	110	1880	1460	105			
			4680	4310	120	2120	1700	110			
			5290	4920	130	2360	1940	115			
						2610	2190	120			
						2850	2430	125			
						3330	2910	135			
						3820	3400	145			
						4300	3880	155			
						4790	4370	165			
						5270	4850	175	2720	2220	300
						5760	5340	185	2940	2440	310
						6240	5820	195	3160	2660	320
									3380	2880	330
									3600	3100	340
									3830	3330	350
									4380	3880	375
									4930	4430	405
									6040	5540	460
									7150	6650	520
									8250	7750	580



LR (Loose Random) and TM (Tight Module)



Model		23			43			103		
Code		Nominal length	Bundle (for LR)	Mass when unloaded	Nominal length	Bundle (for LR)	Mass when unloaded	Nominal length	Bundle (for LR)	Mass when unloaded
Code	m ²	L mm	Width in mm	Kg	L mm	Width in mm	Kg	L mm	Width in mm	Kg
002	0.2	1230	15-20	0.21						
004	0.4	2430	15-20	0.38	1270	25-30	0.41			
006	0.6	3630	15-20	0.56	1890	25-30	0.59			
007	0.7									
008	0.8	4820	15-20	0.74	2500	25-30	0.70			
010	1.0	6020	15-20	0.91	3120	25-30	0.94	1110	45-50	1.13
015	1.5				4650	25-30	1.38	1640	45-50	1.57
020	2.0				6190	25-30	1.82	2160	45-50	2.01
025	2.5							2690	45-50	2.45
030	3.0							3220	45-50	2.88
040	4.0							4270	45-50	3.77



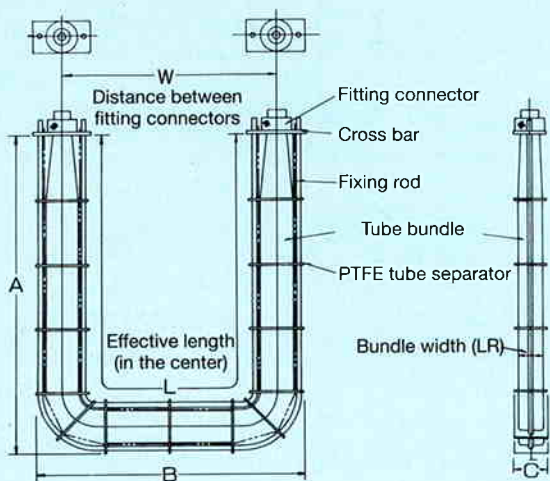
◀ LR <Loose Random> type

This is the basic unit of the tube bundle bound in the double-ended honeycomb structure. As shown to the left, the bundle can easily be bent into any shape when immersed in a tank.

Models 23, 43, 103, 203, 403, and 1003

The fitting connectors [F] and [S] are used for both the LR and TM types.

- Application: Semiconductor etching, chemical plating tank, etc.



◀ TM <Tight Module> Type

The tube bundle is divided by the specified number of PTFE tube separators and fixed with a rod that is also used as a sinker, as to the shown left.

- The symbols used for the dimensions are determined in accordance with the installation conditions.

* For details, see the drawings submitted for your approval.