Fluoropolymer HEAT EXCHANGERS

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Niche FLUOROPOLYMER PRODUCTS

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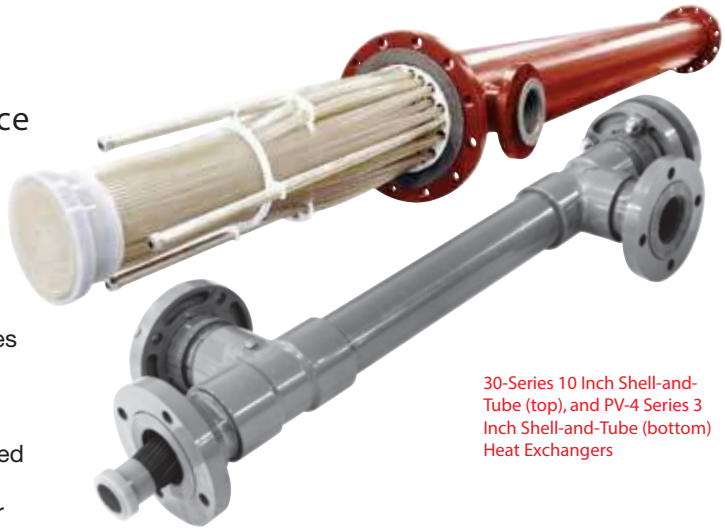
SHELL AND TUBE HEAT EXCHANGERS

- High Thermal Efficiency
- Unmatched Corrosion Resistance
- Unique Seal System
- FEP, PFA or Q Series Tubing



30-Series 10 Inch Shell-and-Tube (top), and PV-4 Series 3 Inch Shell-and-Tube (bottom) Heat Exchangers

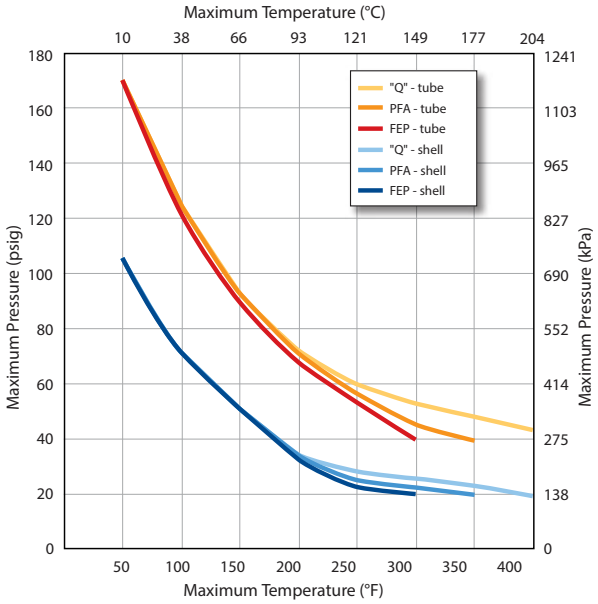
Niche Shell and Tube Heat Exchangers are available in a wide variety of capacities and sizes to meet virtually any type of process heating or cooling requirement. Niche Fluoropolymer Heat Exchanges are single pass, typically counter current flow designs incorporating the unmatched corrosion resistant qualities of fluoropolymer resins. Units are available with FEP, PFA and our proprietary highly conductive Q-series tubing. Most units can be supplied with shells made of Carbon Steel, Stainless Steel, PTFE lined, CPVC or a variety of materials to meet specific application requirements. Metal heat exchanger shells are ASME coded and equipped with TEMA/ANSI end nozzle connections.

Ordering Information

EXAMPLE: Q 105 CT M 30-8-VE			
Q	TUBING	P =	PFA
		Q =	PFA/Graphite
		(blank) =	FEP
105	MODEL NUMBER		
CT	SHELL	CT =	Carbon steel shell
M	END CONNECTIONS	M =	Metric
		(blank) =	ANSI
30	GENERATION		
8	NOMINAL LENGTH (ft.)		
V	O-RING SEAL MATERIAL	V =	VITON®
		E =	Ethylene propylene
		T =	Fluoropolymer encapsulated VITON®
		K =	KALREZ®
E	ENVELOPE GASKET MATERIAL	V =	VITON®
		E =	Ethylene propylene

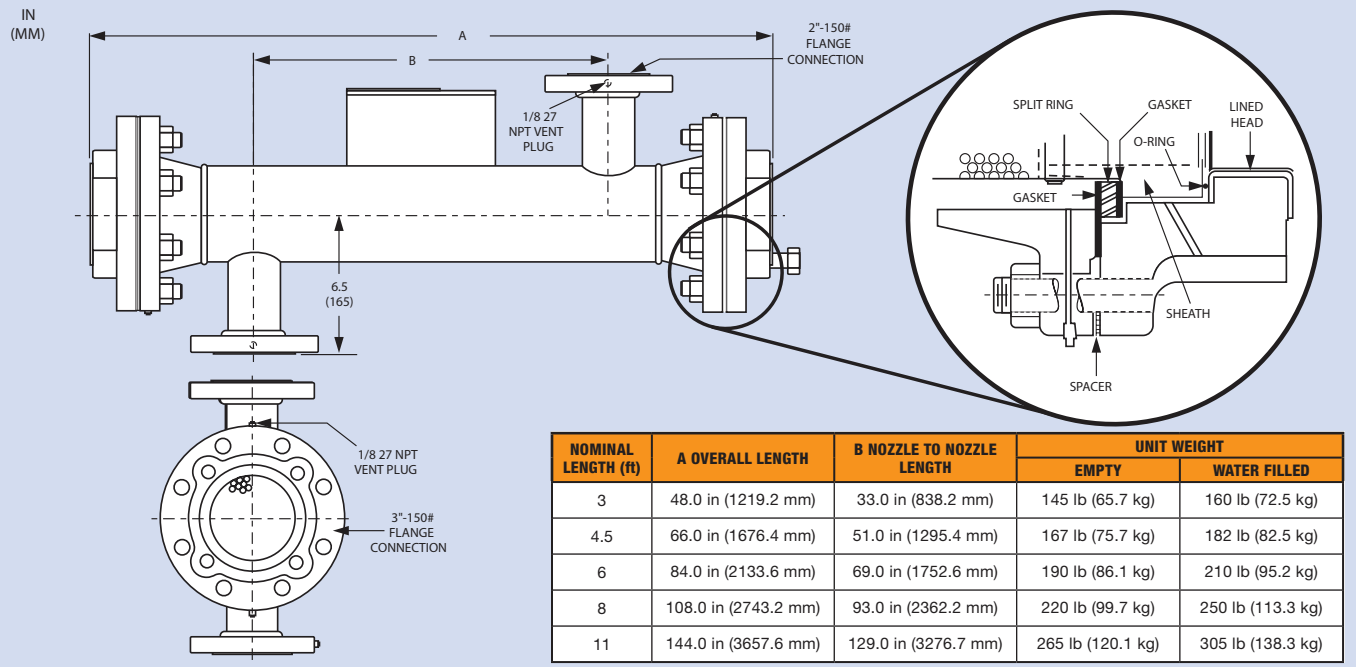
VITON® and KALREZ® are registered trademarks of the DuPont Company

Tube Side and Shell Side Pressure Limitations



FEP and PFA Series coils are considered inert to corrosive chemicals. Contact an *Niche* representative for chemical resistance data on your specific application. Q-Series heat exchangers are inert to most corrosive chemicals except for certain concentrated hot, oxidizing acids.

Dimensions - 30 Series - 4” Shell



NOMINAL LENGTH (ft)	A OVERALL LENGTH	B NOZZLE TO NOZZLE LENGTH	UNIT WEIGHT	
			EMPTY	WATER FILLED
3	48.0 in (1219.2 mm)	33.0 in (838.2 mm)	145 lb (65.7 kg)	160 lb (72.5 kg)
4.5	66.0 in (1676.4 mm)	51.0 in (1295.4 mm)	167 lb (75.7 kg)	182 lb (82.5 kg)
6	84.0 in (2133.6 mm)	69.0 in (1752.6 mm)	190 lb (86.1 kg)	210 lb (95.2 kg)
8	108.0 in (2743.2 mm)	93.0 in (2362.2 mm)	220 lb (99.7 kg)	250 lb (113.3 kg)
11	144.0 in (3657.6 mm)	129.0 in (3276.7 mm)	265 lb (120.1 kg)	305 lb (138.3 kg)

Heat Transfer Area - 30 Series - 4” Shell

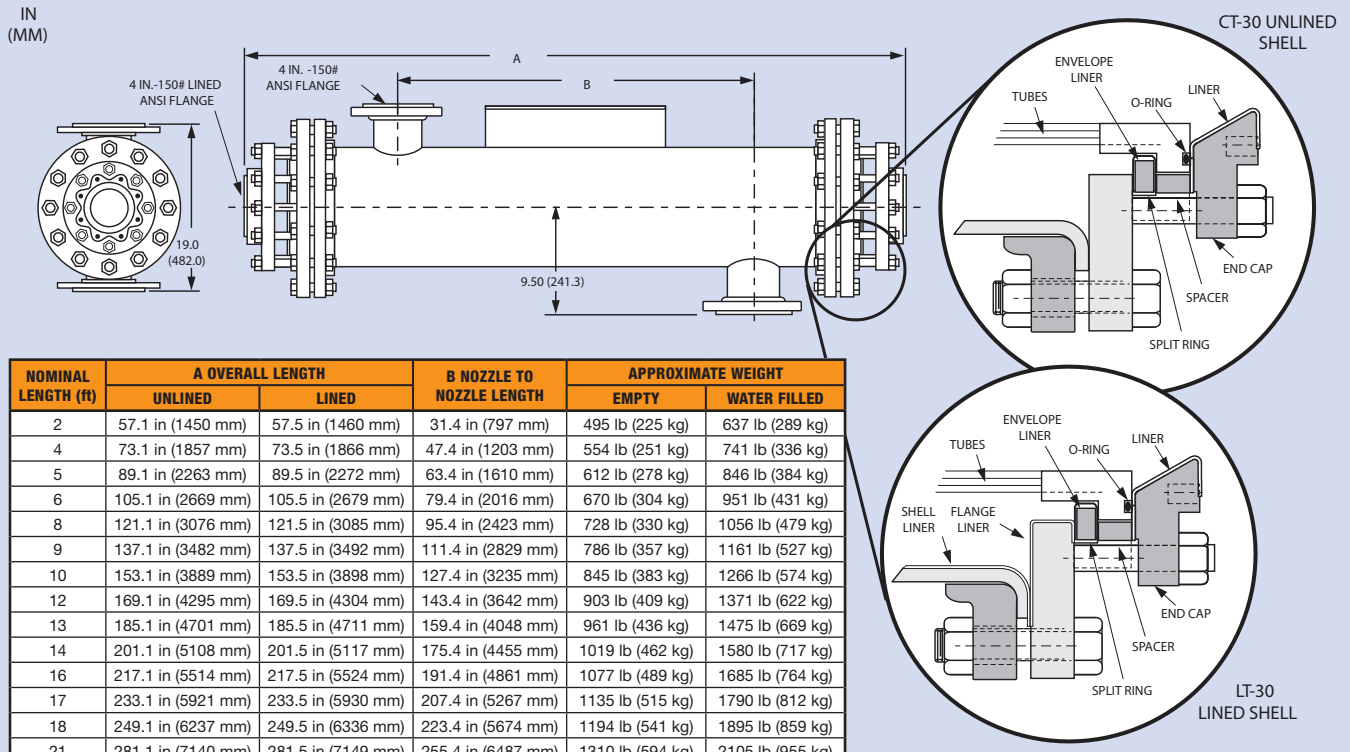
NOMINAL LENGTH (ft.)	MODEL 105	MODEL 220	MODEL 440
3	19.4 ft^2 (1.8 m^2)	30.2 ft^2 (2.8 m^2)	43.0 ft^2 (4.0 m^2)
4.5	29.0 ft^2 (2.7 m^2)	45.3 ft^2 (4.2 m^2)	64.8 ft^2 (6.0 m^2)
6	38.7 ft^2 (3.6 m^2)	60.5 ft^2 (5.6 m^2)	86.4 ft^2 (8.0 m^2)
8	51.6 ft^2 (4.8 m^2)	80.6 ft^2 (7.5 m^2)	115.2 ft^2 (10.7 m^2)
11	71.0 ft^2 (6.6 m^2)	110.8 ft^2 (10.3 m^2)	158.3 ft^2 (14.7 m^2)

Heat Transfer Area - 30 Series - 10” and 14’ Shell

NOMINAL LENGTH (ft.)	10” SHELL			14” SHELL
	MODEL 218	MODEL 525	MODEL 1000	MODEL 950
2	36 ft^2 (3.3 m^2)	57 ft^2 (5.2 m^2)	80 ft^2 (7.4 m^2)	102 ft^2 (9.5 m^2)
4	64 ft^2 (5.9 m^2)	102 ft^2 (9.4 m^2)	144 ft^2 (13.4 m^2)	183 ft^2 (17.0 m^2)
5	93 ft^2 (8.6 m^2)	147 ft^2 (13.6 m^2)	208 ft^2 (19.3 m^2)	264 ft^2 (24.5 m^2)
6	121 ft^2 (11.2 m^2)	192 ft^2 (17.8 m^2)	272 ft^2 (25.3 m^2)	345 ft^2 (32.0 m^2)
8	150 ft^2 (13.9 m^2)	237 ft^2 (22.0 m^2)	336 ft^2 (31.2 m^2)	425 ft^2 (39.5 m^2)
9	178 ft^2 (16.5 m^2)	283 ft^2 (26.2 m^2)	400 ft^2 (37.2 m^2)	508 ft^2 (47.2 m^2)
10	207 ft^2 (19.2 m^2)	328 ft^2 (30.4 m^2)	464 ft^2 (43.1 m^2)	589 ft^2 (54.7 m^2)
12	235 ft^2 (21.8 m^2)	373 ft^2 (34.6 m^2)	528 ft^2 (49.1 m^2)	670 ft^2 (62.2 m^2)
13	264 ft^2 (24.5 m^2)	418 ft^2 (38.8 m^2)	592 ft^2 (55.0 m^2)	750 ft^2 (69.7 m^2)
14	293 ft^2 (27.1 m^2)	463 ft^2 (43.0 m^2)	656 ft^2 (52.5 m^2)	831 ft^2 (77.2 m^2)
16	321 ft^2 (29.8 m^2)	509 ft^2 (47.2 m^2)	720 ft^2 (66.9 m^2)	914 ft^2 (84.9 m^2)
17	350 ft^2 (32.4 m^2)	554 ft^2 (51.4 m^2)	784 ft^2 (72.9 m^2)	995 ft^2 (92.4 m^2)
18	378 ft^2 (35.1 m^2)	599 ft^2 (55.6 m^2)	848 ft^2 (78.8 m^2)	1075 ft^2 (99.9 m^2)
21	435 ft^2 (40.4 m^2)	689 ft^2 (64.0 m^2)	976 ft^2 (90.7 m^2)	1237 ft^2 (114.9 m^2)
24	492 ft^2 (45.7 m^2)	780 ft^2 (72.4 m^2)	1104 ft^2 (102.6 m^2)	1400 ft^2 (130.1 m^2)

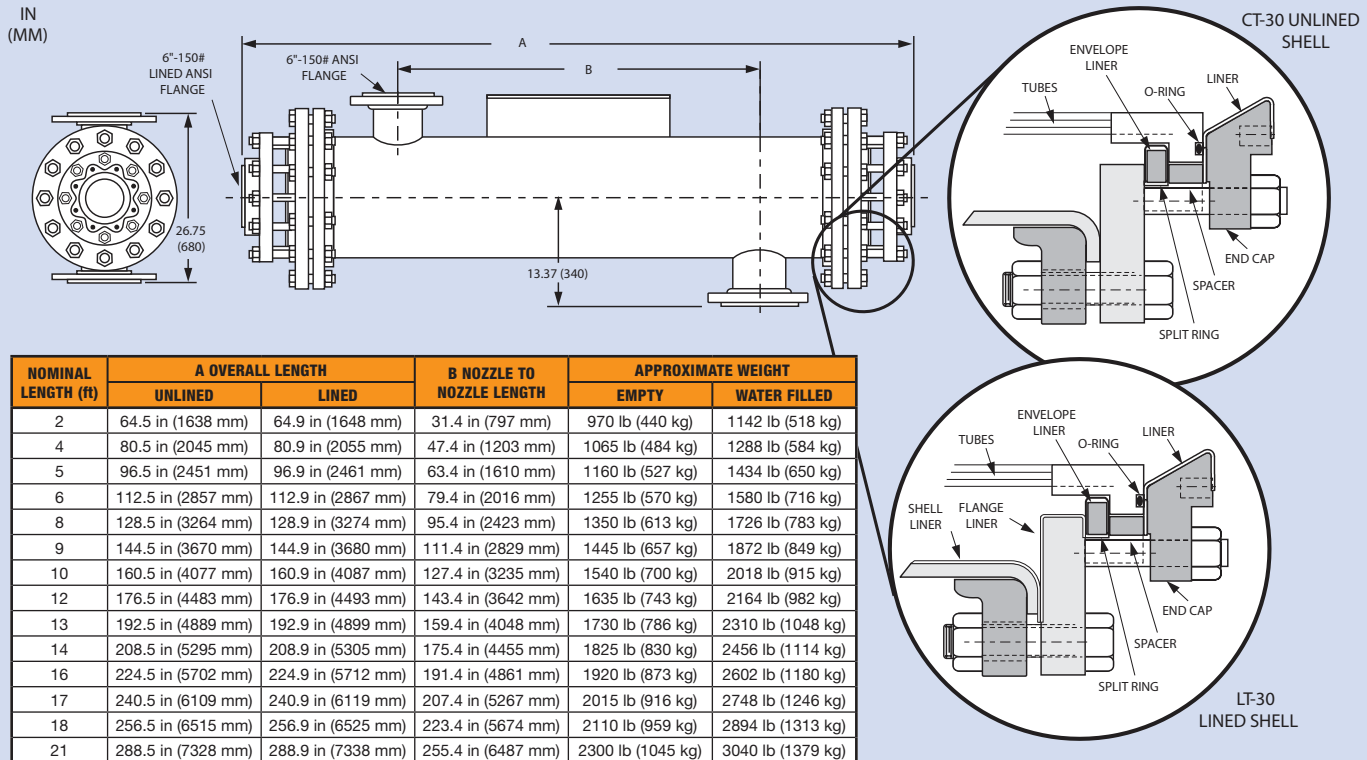
Dimensions - 30 Series - 4” Shell

Dimensions - 30 Series - 10” Shell



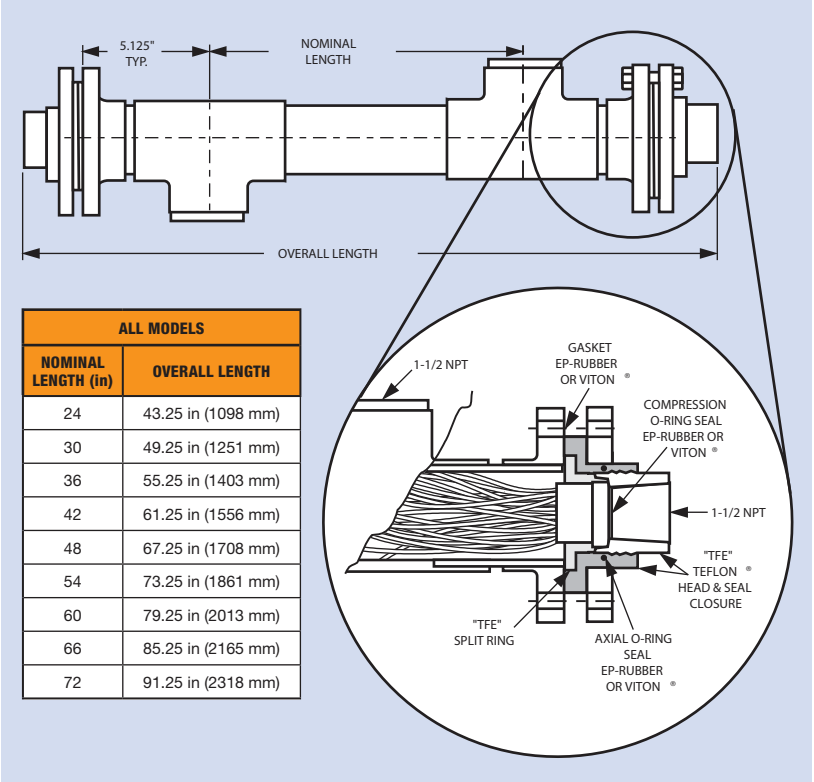
NOMINAL LENGTH (ft)	A OVERALL LENGTH		B NOZZLE TO NOZZLE LENGTH	APPROXIMATE WEIGHT	
	UNLINED	LINED		EMPTY	WATER FILLED
2	57.1 in (1450 mm)	57.5 in (1460 mm)	31.4 in (797 mm)	495 lb (225 kg)	637 lb (289 kg)
4	73.1 in (1857 mm)	73.5 in (1866 mm)	47.4 in (1203 mm)	554 lb (251 kg)	741 lb (336 kg)
5	89.1 in (2263 mm)	89.5 in (2272 mm)	63.4 in (1610 mm)	612 lb (278 kg)	846 lb (384 kg)
6	105.1 in (2669 mm)	105.5 in (2679 mm)	79.4 in (2016 mm)	670 lb (304 kg)	951 lb (431 kg)
8	121.1 in (3076 mm)	121.5 in (3085 mm)	95.4 in (2423 mm)	728 lb (330 kg)	1056 lb (479 kg)
9	137.1 in (3482 mm)	137.5 in (3492 mm)	111.4 in (2829 mm)	786 lb (357 kg)	1161 lb (527 kg)
10	153.1 in (3889 mm)	153.5 in (3898 mm)	127.4 in (3235 mm)	845 lb (383 kg)	1266 lb (574 kg)
12	169.1 in (4295 mm)	169.5 in (4304 mm)	143.4 in (3642 mm)	903 lb (409 kg)	1371 lb (622 kg)
13	185.1 in (4701 mm)	185.5 in (4711 mm)	159.4 in (4048 mm)	961 lb (436 kg)	1475 lb (669 kg)
14	201.1 in (5108 mm)	201.5 in (5117 mm)	175.4 in (4455 mm)	1019 lb (462 kg)	1580 lb (717 kg)
16	217.1 in (5514 mm)	217.5 in (5524 mm)	191.4 in (4861 mm)	1077 lb (489 kg)	1685 lb (764 kg)
17	233.1 in (5921 mm)	233.5 in (5930 mm)	207.4 in (5267 mm)	1135 lb (515 kg)	1790 lb (812 kg)
18	249.1 in (6237 mm)	249.5 in (6336 mm)	223.4 in (5674 mm)	1194 lb (541 kg)	1895 lb (859 kg)
21	281.1 in (7140 mm)	281.5 in (7149 mm)	255.4 in (6487 mm)	1310 lb (594 kg)	2105 lb (955 kg)
24	313.1 in (7953 mm)	313.5 in (7962 mm)	287.5 in (7299 mm)	1426 lb (647 kg)	2314 lb (1050 kg)

Dimensions - 30 Series - 14” Shell



NOMINAL LENGTH (ft)	A OVERALL LENGTH		B NOZZLE TO NOZZLE LENGTH	APPROXIMATE WEIGHT	
	UNLINED	LINED		EMPTY	WATER FILLED
2	64.5 in (1638 mm)	64.9 in (1648 mm)	31.4 in (797 mm)	970 lb (440 kg)	1142 lb (518 kg)
4	80.5 in (2045 mm)	80.9 in (2055 mm)	47.4 in (1203 mm)	1065 lb (484 kg)	1288 lb (584 kg)
5	96.5 in (2451 mm)	96.9 in (2461 mm)	63.4 in (1610 mm)	1160 lb (527 kg)	1434 lb (650 kg)
6	112.5 in (2857 mm)	112.9 in (2867 mm)	79.4 in (2016 mm)	1255 lb (570 kg)	1580 lb (716 kg)
8	128.5 in (3264 mm)	128.9 in (3274 mm)	95.4 in (2423 mm)	1350 lb (613 kg)	1726 lb (783 kg)
9	144.5 in (3670 mm)	144.9 in (3680 mm)	111.4 in (2829 mm)	1445 lb (657 kg)	1872 lb (849 kg)
10	160.5 in (4077 mm)	160.9 in (4087 mm)	127.4 in (3235 mm)	1540 lb (700 kg)	2018 lb (915 kg)
12	176.5 in (4483 mm)	176.9 in (4493 mm)	143.4 in (3642 mm)	1635 lb (743 kg)	2164 lb (982 kg)
13	192.5 in (4889 mm)	192.9 in (4899 mm)	159.4 in (4048 mm)	1730 lb (786 kg)	2310 lb (1048 kg)
14	208.5 in (5295 mm)	208.9 in (5305 mm)	175.4 in (4455 mm)	1825 lb (830 kg)	2456 lb (1114 kg)
16	224.5 in (5702 mm)	224.9 in (5712 mm)	191.4 in (4861 mm)	1920 lb (873 kg)	2602 lb (1180 kg)
17	240.5 in (6109 mm)	240.9 in (6119 mm)	207.4 in (5267 mm)	2015 lb (916 kg)	2748 lb (1246 kg)
18	256.5 in (6515 mm)	256.9 in (6525 mm)	223.4 in (5674 mm)	2110 lb (959 kg)	2894 lb (1313 kg)
21	288.5 in (7328 mm)	288.9 in (7338 mm)	255.4 in (6487 mm)	2300 lb (1045 kg)	3040 lb (1379 kg)
24	320.5 in (8141 mm)	320.9 in (8151 mm)	287.4 in (7299 mm)	2490 lb (1132 kg)	3186 lb (1445 kg)

Dimensions - PV-4 Series



ALL MODELS	
NOMINAL LENGTH (in)	OVERALL LENGTH
24	43.25 in (1098 mm)
30	49.25 in (1251 mm)
36	55.25 in (1403 mm)
42	61.25 in (1556 mm)
48	67.25 in (1708 mm)
54	73.25 in (1861 mm)
60	79.25 in (2013 mm)
66	85.25 in (2165 mm)
72	91.25 in (2318 mm)

Heat Transfer Area - PV-4 Series

NOMINAL LENGTH (ft.)	MODEL 40	MODEL 80	MODEL 180
2.0	5 ft^2 (0.47 m^2)	7 ft^2 (0.65 m^2)	12 ft^2 (1.09 m^2)
2.5	6 ft^2 (0.56 m^2)	9 ft^2 (0.81 m^2)	15 ft^2 (1.37 m^2)
3.0	8 ft^2 (0.72 m^2)	10 ft^2 (0.97 m^2)	18 ft^2 (1.64 m^2)
3.5	9 ft^2 (0.83 m^2)	12 ft^2 (1.13 m^2)	21 ft^2 (1.91 m^2)
4.0	10 ft^2 (0.95 m^2)	14 ft^2 (1.29 m^2)	24 ft^2 (2.19 m^2)
4.5	12 ft^2 (1.07 m^2)	16 ft^2 (1.46 m^2)	27 ft^2 (2.46 m^2)
5.0	13 ft^2 (1.19 m^2)	17 ft^2 (1.62 m^2)	29 ft^2 (2.73 m^2)
5.5	14 ft^2 (1.30 m^2)	19 ft^2 (1.78 m^2)	32 ft^2 (3.00 m^2)
6.0	15 ft^2 (1.42 m^2)	21 ft^2 (1.94 m^2)	35 ft^2 (3.28 m^2)

Specifications

	PV-4 SERIES 3" SHELL			30 SERIES 4" SHELL			30 SERIES 10" SHELL			30 SERIES 14" SHELL
Model Number	40	80	180	105	220	440	218	525	1000	900
Tube Outside Diameter	.250" (6.35mm)	.175" (4.45mm)	.125" (3.18mm)	.250" (6.35mm)	.175" (4.45mm)	.125" (3.18mm)	.375" (9.52mm)	.250" (6.35mm)	.175" (4.45mm)	.250" (6.35mm)
Tube Wall Thickness	.025" (.635mm)	.017" (.44mm)	.012" (.318mm)	.025" (.635mm)	.017" (.44mm)	.012" (.318mm)	.037" (.953mm)	.025" (.635mm)	.0175" (.445mm)	.025" (.635mm)
Typical Heat Transfer Coefficient (U) FEP & PFA	25-60 BTU/Hr.-ft.²-°F (141-341 watts/m²-°K)			25-60 BTU/Hr.-ft.²-°F (141-341 watts/m²-°K)			30-60 BTU/Hr.-ft.²-°F (171-341 watts/m²-°K)			30-60 BTU/Hr.-ft.²-°F (171-341 watts/m²-°K)
Typical Heat Transfer Coefficient (U) Q	35-100 BTU/Hr.-ft.²-°F (199-567 watts/m²-°K)			35-100 BTU/Hr.-ft.²-°F (199-567 watts/m²-°K)			42-90 BTU/Hr.-ft.²-°F (238-511 watts/m²-°K)			—
Shell Diameter	3" (76.2 mm)			4" (101.6 mm)			10" (254 mm)			14" (355.6 mm)
Shell Construction †	CPVC			Carbon Steel, unlined or lined with TEFLON®			Carbon Steel, unlined or lined with TEFLON®			Carbon Steel, unlined or lined with TEFLON®
Nominal Lengths	2-6 ft. (.6-1.8 m)			3-11 ft. (.9-3.35 m)			2-24 ft. (.6-7.31 m)			2-24 ft. (.6-7.31 m)
Area for Heat Transfer	5.1-35.5 ft.² (.5-3.2 m²)			19.4-158 ft.² (1.8-14.7 m²)			43-1100 ft.² (4.0-108 m²)			102-1400 ft.²
Bundle Configuration	Braided or Cross Flow Baffle*			SS Basket or Cross Flow Baffle*			Cross Flow Baffle			Cross Flow Baffle

** Special order bundle configuration.*

† Typical shell construction. Special material such as PP, CPVC, stainless steel or other metal alloys, and fiberglass available by special order. Custom configurations also available.

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42 MOUNTAIN AVENUE
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Fluoropolymer resins are generally considered inert to most chemicals. Under certain conditions of pressure and temperature, or combinations of chemicals, fluoropolymer tubing should not be used. Please contact Niche for discussion of your specific process to be certain that our products are appropriate for your intended use.

Adequate ventilation should be used where fluoropolymers are heated during tube repairs. Flu-like symptoms occur from exposure to vapors evolved from fluoropolymers at very high temperatures, up to 800F or from smoking materials that contain particles of fluoropolymers. Symptoms pass within 48 hours and are only adverse effects observed in humans to date. Unheated fluoropolymers are essentially inert and are rritating to the skin.

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