

# SHELL AND TUBE HEAT EXCHANGERS

## PV4 Series Shell & Tube Heat Exchangers (3 inch shell)

- High thermal efficiency
- Unmatched corrosion resistance
- Unique seal system
- FEP, PFA or Q series tubing

Niche Model PV4 Series Shell and Tube Heat Exchangers are small, inexpensive units ideal for low flow processes. Their design maximizes the heat transfer performance of FEP or PFA, as well as "Q" Series fluoropolymer tubing.

### Specifications

| Model Number                                    | 40                                                                        | 80                | 180               |
|-------------------------------------------------|---------------------------------------------------------------------------|-------------------|-------------------|
| Tube Outside Diameter                           | .250"<br>(6.35mm)                                                         | .175"<br>(4.45mm) | .125"<br>(3.18mm) |
| Tube Wall Thickness                             | .025"<br>(.635mm)                                                         | .017"<br>(.44mm)  | .012"<br>(.318mm) |
| Typical Heat Transfer Coefficient (U) FEP & PFA | 25-60 BTU/Hr.-ft. <sup>2</sup> -°F<br>(141-341 watts/m <sup>2</sup> -°K)  |                   |                   |
| Typical Heat Transfer Coefficient (U) Q         | 35-100 BTU/Hr.-ft. <sup>2</sup> -°F<br>(199-567 watts/m <sup>2</sup> -°K) |                   |                   |
| Shell Diameter                                  | 3" (76.2 mm)                                                              |                   |                   |
| Shell Construction†                             | CPVC                                                                      |                   |                   |
| Nominal Lengths                                 | 2-6 ft. (.6-1.8 m)                                                        |                   |                   |
| Area for Heat Transfer                          | 4.4-33.4 ft. <sup>2</sup> (.4-3.1 m <sup>2</sup> )                        |                   |                   |
| Bundle Configuration                            | Braided or Cross Flow Baffle*                                             |                   |                   |

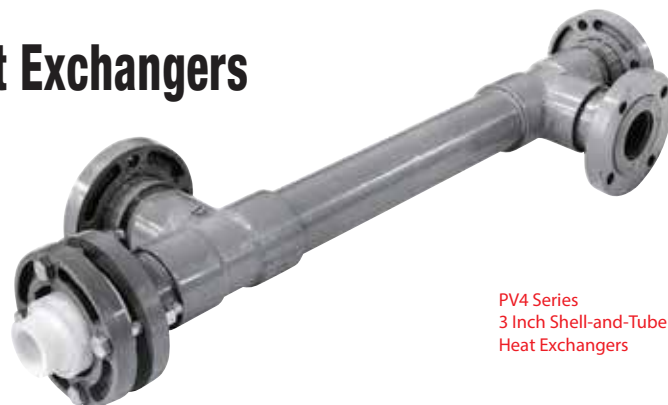
### Model Number

| EXAMPLE: Q 80 PV 4 4 V E |                          |         |                                     |
|--------------------------|--------------------------|---------|-------------------------------------|
| Q                        | TUBING                   | P       | = PFA                               |
|                          |                          | Q       | = PFA/Graphite                      |
|                          |                          | (blank) | = FEP                               |
| 80                       | MODEL NUMBER             |         |                                     |
| PV                       | SHELL †                  | PV      | = CPVC shell                        |
| 4                        | GENERATION               |         |                                     |
| 4                        | 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                |

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\* Special order bundle configuration.

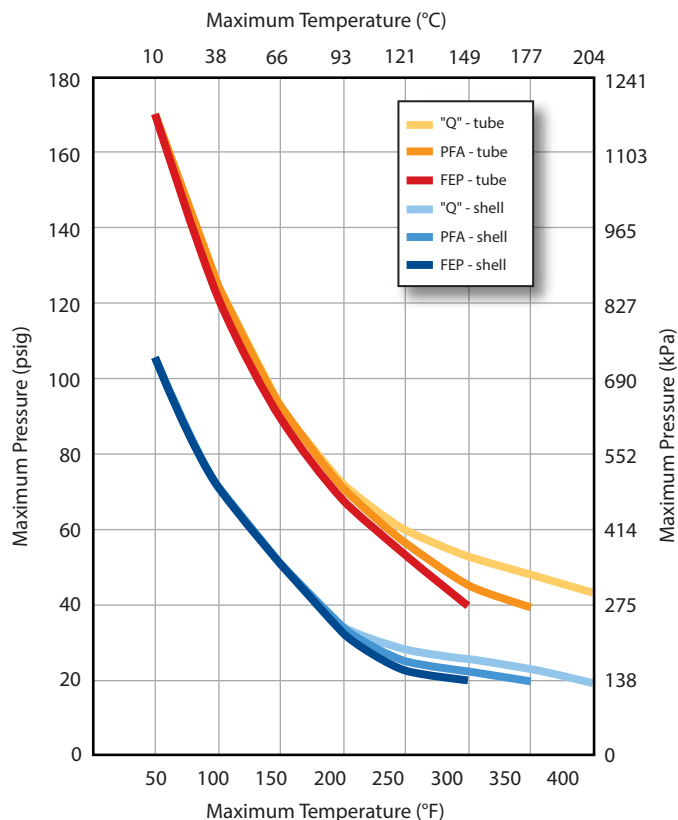
† Typical shell construction. Special material such as PP, CPVC, stainless steel or other metal alloys, are available by special order. Custom configurations also available.



PV4 Series  
3 Inch Shell-and-Tube  
Heat Exchangers

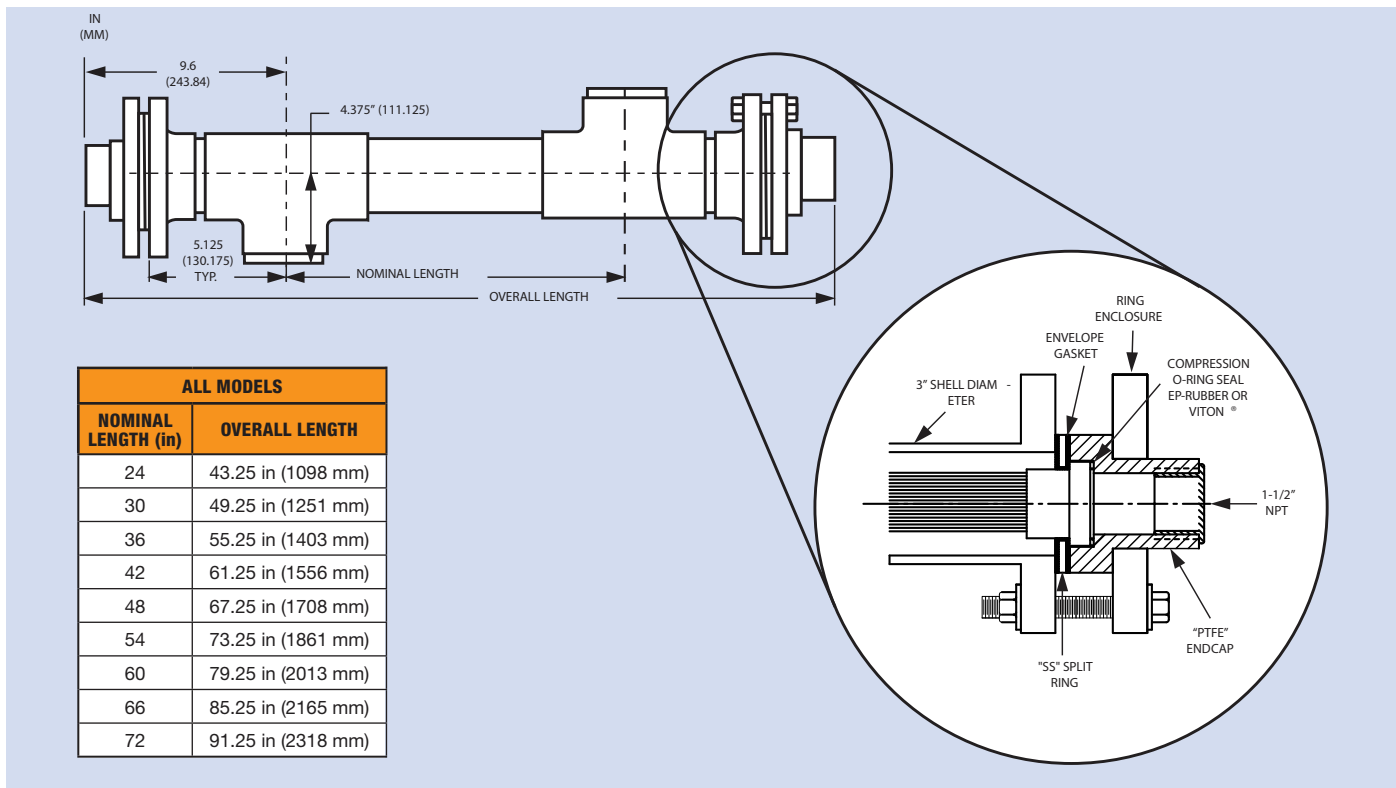
Niche PV4 Heat Exchangers come in standard designs shown in this bulletin and can be custom designed to meet customers' special process needs. Contact Niche or your local agent for additional information.

### Operation Limits



NOTE: The curves on the chart are for the fluoropolymer bundles only. The CPVC shell has an operating limit of 200 °F (93 °C)

Dimensions - PV4 Series



NOTE: All outlets are 1-1/2" NPT. For alternatives contact your Niche Representative

Heat Transfer Area

| NOMINAL LENGTH (t) | MODEL 40        |                | MODEL 80        |                | MODEL 180       |                |
|--------------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|
|                    | FT <sup>2</sup> | M <sup>2</sup> | FT <sup>2</sup> | M <sup>2</sup> | FT <sup>2</sup> | M <sup>2</sup> |
| 2.0                | 4.4             | 0.4            | 6.2             | 0.6            | 9.8             | 0.9            |
| 2.5                | 5.7             | 0.5            | 8               | 0.7            | 12.8            | 1.2            |
| 3.0                | 7               | 0.6            | 9.9             | 0.9            | 15.7            | 1.5            |
| 3.5                | 8.3             | 0.8            | 11.7            | 1              | 18.7            | 1.7            |
| 4.0                | 9.6             | 0.9            | 13.5            | 1.2            | 21.6            | 2              |
| 4.5                | 10.9            | 1              | 15.4            | 1.4            | 24.6            | 2.3            |
| 5.0                | 12.2            | 1.1            | 17.2            | 1.6            | 27.5            | 2.6            |
| 5.5                | 13.5            | 1.3            | 19              | 1.8            | 30.5            | 2.8            |
| 6.0                | 14.9            | 1.4            | 20.8            | 1.9            | 33.4            | 3.1            |

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.



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1M617P (040013)

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 nonirritating to the skin.

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