

### ALTAFLOR 451 HP PFA // Tubing

| Part Number     | ID    | OD    | +/-  | Wall  | +/-  |
|-----------------|-------|-------|------|-------|------|
| 451-0125-030-0C | 1/16  | 1/8   | .004 | 0.030 | .003 |
| 451-0250-030-0C | 3/16  | 1/4   | .004 | 0.030 | .003 |
| 451-0250-040-0C | .170  | 1/4   | .004 | 0.040 | .003 |
| 451-0250-047-0C | .156  | 1/4   | .004 | 0.047 | .003 |
| 451-0250-062-0C | 1/8   | 1/4   | .005 | 0.062 | .003 |
| 451-0375-062-0C | 1/4   | 3/8   | .005 | 0.062 | .003 |
| 451-0500-062-0C | 3/8   | 1/2   | .005 | 0.062 | .003 |
| 451-0750-062-0C | 5/8   | 3/4   | .005 | 0.062 | .003 |
| 451-1000-062-0C | 7/8   | 1     | .005 | 0.062 | .003 |
| 451-1250-075-0C | 1.100 | 1.250 | .008 | 0.075 | .005 |
| 451-1500-093-0C | 1.314 | 1.500 | .015 | 0.093 | .008 |

#### METRIC SIZES

|                 |      |      |      |       |      |
|-----------------|------|------|------|-------|------|
| 451-0157-040-0C | .078 | .157 | .005 | 0.040 | .003 |
|                 | 2mm  | 4mm  | .005 | 1mm   | .003 |
| 451-0236-040-0C | .157 | .236 | .005 | 0.040 | .003 |
|                 | 4mm  | 6mm  | .005 | 1mm   | .003 |
| 451-0315-040-0C | .236 | .315 | .005 | 0.040 | .003 |
|                 | 6mm  | 8mm  | .005 | 1mm   | .003 |
| 451-0394-040-0C | .315 | .394 | .005 | 0.040 | .003 |
|                 | 8mm  | 10mm | .005 | 1mm   | .003 |
| 451-0472-040-0C | .394 | .472 | .005 | 0.040 | .003 |
|                 | 10mm | 12mm | .005 | 1mm   | .003 |

Additional sizes up to 4" OD available upon request. Please contact Altaflo office for details. Available in natural color only. For pigmented items, see Altaflo 400 Series.

### ALTAFLOR 451 HP PFA // Schedule 40 Pipe

| Part Number     | NOMINAL SIZE | ACTUAL OD         | WALL                | STOCK LENGTH |
|-----------------|--------------|-------------------|---------------------|--------------|
| 451-0540-088-0C | 1/4"         | .540" $\pm$ .010  | .088" $\pm$ .020,-0 | 10ft         |
| 451-0840-109-0C | 1/2"         | .840" $\pm$ .010  | .109" $\pm$ .020,-0 | 10ft         |
| 451-1050-113-0C | 3/4"         | 1.050" $\pm$ .015 | .113" $\pm$ .020,-0 | 10ft         |
| 451-1315-133-0C | 1"           | 1.315" $\pm$ .015 | .133" $\pm$ .020,-0 | 10ft         |
| 451-1660-140-0C | 1-1/4"       | 1.660" $\pm$ .015 | .140" $\pm$ .020,-0 | 10ft         |
| 451-1900-145-0C | 1-1/2"       | 1.900" $\pm$ .015 | .145" $\pm$ .020,-0 | 10ft         |
| 451-2375-154-0C | 2"           | 2.375" $\pm$ .020 | .154" $\pm$ .020,-0 | 10ft         |

Altaflo maintains inventory of Schedule 40 Pipe in our 451 HP PFA Series. Schedule 40 Pipe is also available as a Custom Order in Altafluor 200, 400 & 480 Series resins.

### ALTAFLOR 451 HP PFA (high purity perfluoroalkoxy)

is commonly chosen for applications involving extreme chemical resistance combined with high purity requirements. Although HP PFA is available in a variety of resin grades, Altaflo 451 HP PFA tubing is made from a high molecular weight, high purity resin that provides excellent chemical resistance, highest purity levels (extractable data available upon request) and smooth surface finish.

Altaflo 451 HP PFA does not impart taste or odor. Altaflo 451 HP PFA tubing is ideal for use with flare or conventional fittings.

### Features

- Exclusive use of Chemours 451HP PFA resin
- 100% Virgin High Performance Grade resin used to resist stress cracking
- Chemically inert to nearly all industrial chemicals & solvents
- High thermal stability
- Low permeability
- Translucent
- Smooth surface finish resulting in less area of particle entrapment
- Moisture absorption nearly zero
- FDA compliant for food contact
- Non-Flammable
- Suitable for use with flare or conventional fittings
- Also available in pipe, coiled hose and convoluted constructions

### Applications

- Semiconductor
- Chemical process
- Heat Exchangers
- Laboratory applications
- Flow Monitoring
- Pharmaceutical

### Specifications

- **General:** Meets or exceeds the requirements listed in ASTM D 3307 Type II
- **Temperature:** -320°F to 500°F
- **Flammability:** Resin is UL 94 V0 rated. HP PFA resists combustion and does not promote flame spread
- **FDA:** 451 HP PFA resin is compliant with FDA regulation 21 CFR 177.1550, permitting its use in food contact applications
- **SEMI:** Meets or exceeds requirements of SEMI F57, F104, and C90

Due to the nature of applications involving the use of fluoropolymers, we suggest that all customers test product within the conditions specific to their application prior to use.

### ALTAFLO 451 HP PFA //

#### Bend Radius and Working Pressure Chart

| Part Number     | OD    | Wall  | ID    | Bend Radius | Working Pressure @ 73°F |
|-----------------|-------|-------|-------|-------------|-------------------------|
| 451-0125-030-OC | 0.125 | 0.030 | 0.062 | 1/2"        | 451                     |
| 451-0250-030-OC | 0.250 | 0.030 | 0.188 | 1"          | 226                     |
| 451-0250-040-OC | 0.250 | 0.040 | 0.170 | 1"          | 301                     |
| 451-0250-047-OC | 0.250 | 0.047 | 0.157 | 3/4"        | 353                     |
| 451-0250-062-OC | 0.250 | 0.062 | 0.125 | 1/2"        | 466                     |
| 451-0375-062-OC | 0.375 | 0.062 | 0.250 | 1"          | 311                     |
| 451-0500-062-OC | 0.500 | 0.062 | 0.375 | 2"          | 233                     |
| 451-0750-062-OC | 0.750 | 0.062 | 0.625 | 6"          | 155                     |
| 451-1000-062-OC | 1.000 | 0.062 | 0.875 | 22"         | 117                     |
| 451-1250-075-OC | 1.250 | 0.075 | 1.100 | 25"         | 75                      |
| 451-1500-093-OC | 1.500 | 0.093 | 1.314 | 25"         | 105                     |

#### Metric Sizes

|                 |       |       |       |        |     |
|-----------------|-------|-------|-------|--------|-----|
| 451-0157-040-OC | 0.157 | 0.040 | 0.079 | 1"     | 468 |
|                 | 4mm   | 1mm   | 2mm   |        |     |
| 451-0236-040-OC | 0.236 | 0.040 | 0.157 | 1-3/4" | 313 |
|                 | 6mm   | 1mm   | 4mm   |        |     |
| 451-0315-040-OC | 0.315 | 0.040 | 0.236 | 2-1/2" | 235 |
|                 | 8mm   | 1mm   | 6mm   |        |     |
| 451-0394-040-OC | 0.394 | 0.040 | 0.315 | 2-3/4" | 188 |
|                 | 10mm  | 1mm   | 8mm   |        |     |
| 451-0472-040-OC | 0.472 | 0.040 | 0.394 | 4"     | 156 |
|                 | 12mm  | 1mm   | 10mm  |        |     |

The above information is based on tests performed at 73° F and can vary in individual applications based on parameters such as temperature, chemical concentration, pressure, etc. Please consult factory for details.

For an estimate on burst pressure at ambient temperature we consider a 3:1 ratio when exposure temperature is 73° F. However Altaflo does not recommend exceeding the suggested Working Pressure listed.

Additional sizes up to 2" are available.

Available in natural color only. For pigmented items, see Altaflo 400 Series.

### ALTAFLO 451 HP PFA // Physical Properties

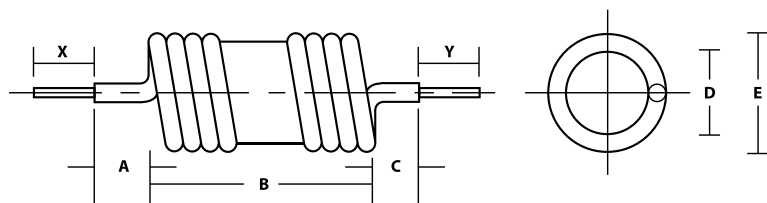
| PHYSICAL PROPERTY   | ASTM TEST METHOD | UNITS   | VALUES  |
|---------------------|------------------|---------|---------|
| Upper Service Temp. |                  |         | 500° F  |
| Specific Gravity    | D 792            |         | 2.15    |
| Tensile Strength    | D 1708           | PSI     | 4500    |
| Elongation          | D 638            | %       | 400     |
| Flex Modulus        | D 790            | PSI     | 90,000  |
| MIT Flex Life       | D 2176           |         | 500,000 |
| Hardness            | D 2240           | Shore D | 60      |

The above information is based on tests performed at 73° F and can vary in individual applications based on parameters such as temperature, chemical concentration, pressure, etc. Please consult factory for details.

NOTE: The values represented above are based on the use of 100% virgin grade high performance - low melt flow PFA resin as used in the production of Altaflo 451 Series Tubing. When comparing data it is critical that performance values are listed for the grade of resin used.

Due to the nature of applications involving the use of fluoropolymers, we suggest that all customers test product within the conditions specific to their application prior to use.

### ALTAFLOR 451 HP PFA // Coiled Hose



\*Custom item — see Coiled Hose Order Form for ordering information. Please consult the factory for additional details.

### ALTAFLOR 451 HP PFA // Standard Convoluted Construction

| Part Number      | Nominal OD Size | ID Min | ID Max | OD Max | Nominal Wall | Convolutions Per Inch |
|------------------|-----------------|--------|--------|--------|--------------|-----------------------|
| 45C-0375-020-0C* | 3/8             | 0.251  | 0.275  | 0.375  | 0.020        | 6                     |
| 45C-0500-023-0C* | 1/2             | 0.364  | 0.375  | 0.500  | 0.023        | 6                     |
| 45C-0625-025-0C* | 5/8             | 0.485  | 0.500  | 0.625  | 0.025        | 5.5                   |
| 45C-0750-025-0C* | 3/4             | 0.608  | 0.625  | 0.750  | 0.025        | 5                     |
| 45C-0875-025-0C* | 7/8             | 0.730  | 0.750  | 0.875  | 0.025        | 4                     |
| 45C-1000-025-0C* | 1               | 0.860  | 0.875  | 1.000  | 0.025        | 3.5                   |

### ALTAFLOR 451 HP PFA // Ultra Flex Convoluted Construction

| Part Number      | Nominal OD Size | ID Min | ID Max | OD Max | Nominal Wall | Convolutions Per Inch |
|------------------|-----------------|--------|--------|--------|--------------|-----------------------|
| 45U-0375-020-0C* | 3/8             | 0.251  | 0.275  | 0.375  | 0.020        | 9                     |
| 45U-0500-023-0C* | 1/2             | 0.364  | 0.375  | 0.500  | 0.023        | 9                     |
| 45U-0625-025-0C* | 5/8             | 0.485  | 0.500  | 0.625  | 0.025        | 9                     |
| 45U-0750-025-0C* | 3/4             | 0.608  | 0.625  | 0.750  | 0.025        | 8                     |
| 45U-0875-025-0C* | 7/8             | 0.730  | 0.750  | 0.875  | 0.025        | 8                     |
| 45U-1000-025-0C* | 1               | 0.860  | 0.875  | 1.000  | 0.025        | 8                     |

\*Custom item — please consult factory for lead time and minimum order requirements.  
Available in natural color only. For pigmented items, see Altaflo 400 Series.

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