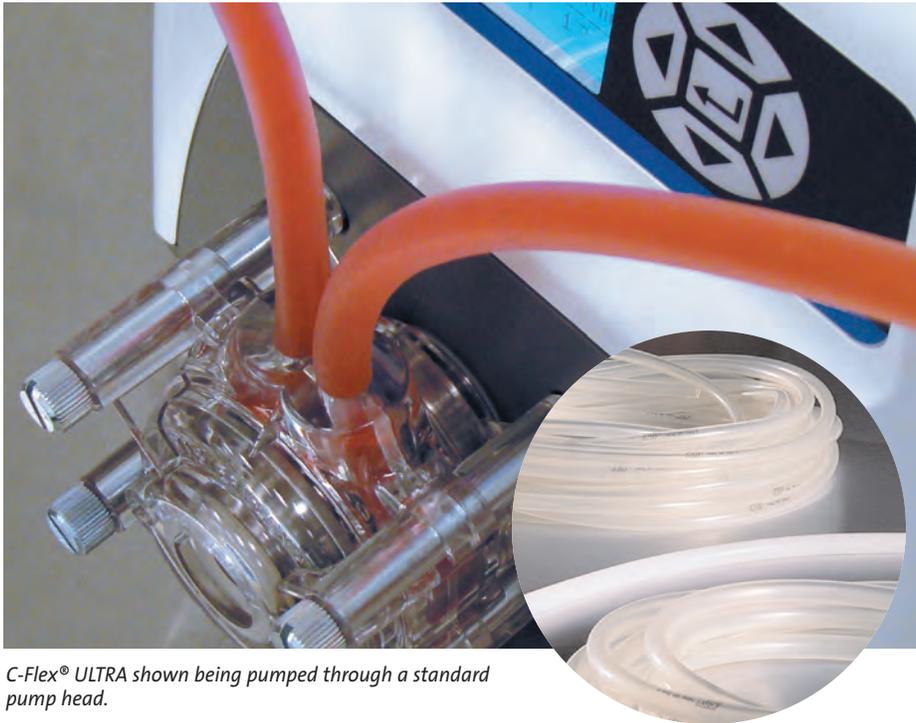


# C-FLEX<sup>®</sup> ULTRA Biopharmaceutical Pump Tubing



C-Flex<sup>®</sup> ULTRA shown being pumped through a standard pump head.

## C-Flex<sup>®</sup> ULTRA Thermoplastic Pump Tubing

C-Flex<sup>®</sup> — from Saint-Gobain Performance Plastics — a unique, patented thermoplastic elastomer specifically designed to meet the critical demands of the biopharmaceutical world.

C-Flex<sup>®</sup> ULTRA exceeds the industry's demands for a flexible, clear, sealable, and weldable pump tube for fluid processing applications. This new 60A C-Flex<sup>®</sup> material has been developed to outperform existing C-Flex<sup>®</sup> and every other 'look-alike' on the market.

**Feature Rich Formulation.** C-Flex<sup>®</sup> ULTRA complies with USP Class VI standards and is manufactured by Saint-Gobain under strict GMP guidelines. It is non-pyrogenic, non-cytotoxic and has excellent resistance to acids and alkalis. The ULTRA formula is significantly less permeable than silicone.

**Sealable and weldable.** C-Flex<sup>®</sup> ULTRA can be thermally sealed and rewelded making it ideal for the biopharmaceutical filling and sampling processes.

**Significantly extends the life of pump heads.** The lack of surface tackiness typically found with TPE tubing reduces the need to clean gummy pump heads - greatly extending their life.



In a 24-hour pumping trial, competitive tubing failed at less than 12 hours.

### BIOPHARMACEUTICAL PRODUCTS

*C-Flex<sup>®</sup> ULTRA Pump Tubing is perfect for single-use assemblies, pumping, process filling and sampling applications in Bioprocessing.*

- Very low spallation during the pumping process - lower spallation than any other TPE or silicone formulations.
- Exceptional pump life. At 600 rpm's C-Flex<sup>®</sup> ULTRA is still pumping after 2,000 hours of continuous operation.\*
- The smoother outer surface achieved by the new ULTRA formula does not gum pump heads like other TPE's.
- Excellent clarity – fluid is easily visible through the translucent tubing wall.
- Sealable and weldable either pre or post-gamma irradiation.
- Available in 10 standard sizes (ID x OD). Custom sizes, lengths and packaging also available upon request.
- Produced from the same C-Flex<sup>®</sup> materials that have been validated by biopharmaceutical companies for over two decades.
- Information on C-Flex<sup>®</sup> bio-compatibility is available to assist in the validation of C-Flex for your application. Contact Saint-Gobain Performance Plastics at (800) 541-6880 or (727) 531-4191 to request a validation package or access to the FDA Drug Master File.

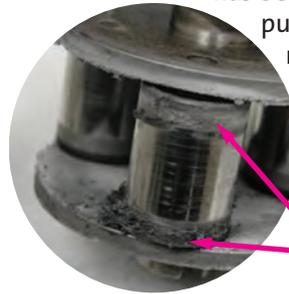
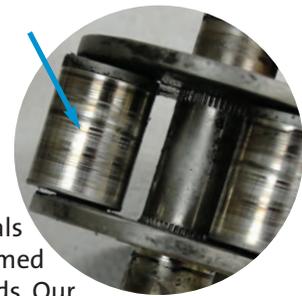
\* tests performed by independent lab at 600 rpm/15lbs back pressure.

## C-Flex® ULTRA Pump Tubing Inventoried Sizes

| PART NUMBER | I.D. (INCHES) | O.D. (INCHES) | WALL (INCHES) | I.D. (MM) | O.D. (MM) | WALL (MM) |
|-------------|---------------|---------------|---------------|-----------|-----------|-----------|
| 700-125-2   | 1/8           | 1/4           | 0.063         | 3.18      | 6.35      | 1.59      |
| 700-188-2   | 3/16          | 5/16          | 0.063         | 4.76      | 7.94      | 1.59      |
| 700-188-3   | 3/16          | 3/8           | 0.094         | 4.76      | 9.52      | 2.38      |
| 700-250-2   | 1/4           | 3/8           | 0.063         | 6.35      | 9.52      | 1.59      |
| 700-250-3   | 1/4           | 7/16          | 0.094         | 6.35      | 11.11     | 2.38      |
| 700-250-4   | 1/4           | 1/2           | 0.125         | 6.35      | 12.70     | 3.18      |
| 700-313-3   | 5/16          | 1/2           | 0.094         | 7.94      | 12.70     | 2.38      |
| 700-375-2   | 3/8           | 1/2           | 0.063         | 9.52      | 12.70     | 1.59      |
| 700-375-4   | 3/8           | 5/8           | 0.125         | 9.52      | 15.88     | 3.18      |
| 700-500-4   | 1/2           | 3/4           | 0.125         | 12.7      | 19.05     | 3.18      |

### C-Flex® ULTRA is easy on pump heads

Universally one of the problems with TPE materials has been gummed pump heads. Our new C-Flex® ULTRA formula has been designed to provide a very smooth outer surface. The net result is far less wear and tear on the pump heads.



Gummed pump head using competitive tubing.

## C-Flex® ULTRA Typical Physical Properties

| Property                                  | ASTM Method | Unit   | Unsterilized   | Gamma Irradiated   | Autoclaved  |
|---|-------------|--|--|--|---|
| Durometer Hardness                        | D2240       | Shore A  | 62   | 60   | 65  |
| Density                                   |             | g/cc   | 0.888  | 0.889  | 0.887   |
| Tensile Strength                          | D412        | psi<br>MPa   | 735<br>5.1   | 645<br>4.5   | 705<br>4.9  |
| Ultimate Elongation                       | D412        | %  | 725  | 885  | 695   |
| 100% Modulus                              | D412        | psi<br>MPa   | 280<br>1.9   | 255<br>1.8   | 300<br>2.1  |
| 300% Modulus                              | D412        | psi<br>MPa   | 390<br>2.7   | 350<br>2.4   | 415<br>2.9  |
| Graves Tear Strength                      | D624        | pli<br>kN/m  | 150<br>26.3  | 140<br>24.5  | 170<br>29.8   |
| Tensile Set @ 300% Stretch                | D412        | %  | 40   | 50   | 35  |
| Compression Set @22 hrs, 70°C             | D395        | %  | 30   | 44   | 38  |
| Water Absorption                          | D570        | %  | 0.037  | 0.020  | 0.176   |
| Low Temperature Brittleness Point         | D746        | °C<br>°F   | -64<br>-83   | -61<br>-78   | -62<br>-80  |
| Low Temperature Flexibility @ -50°C/-58°F | D380        | Pass/Fail  | Pass   | Pass   | Pass  |
| Oxygen Permeability                       | D1434       | (cm³.cm)/(cm².sec.atm)<br>(cm³.cm)/(cm².sec.Pa)<br>(cm³.cm)/(cm².sec.cmHg)<br>(cm³.mil)/(100in².24 hr.atm) | 8.47 x 10 <sup>-8</sup><br>8.36 x 10 <sup>-13</sup><br>1.11 x 10 <sup>-9</sup><br>1.86 x 10 <sup>3</sup> | 3.75 x 10 <sup>-7</sup><br>3.70 x 10 <sup>-12</sup><br>4.93 x 10 <sup>-9</sup><br>8.23 x 10 <sup>3</sup> | 1.49 x 10 <sup>-7</sup><br>1.47 x 10 <sup>-12</sup><br>1.97 x 10 <sup>-9</sup><br>3.28 x 10 <sup>3</sup>  |
| Nitrogen Permeability                     | D1434       | (cm³.cm)/(cm².sec.atm)<br>(cm³.cm)/(cm².sec.Pa)<br>(cm³.cm)/(cm².sec.cmHg)<br>(cm³.mil)/(100in².24 hr.atm) | 2.60 x 10 <sup>-7</sup><br>2.57 x 10 <sup>-12</sup><br>3.42 x 10 <sup>-9</sup><br>5.71 x 10 <sup>3</sup> | 4.65 x 10 <sup>-7</sup><br>4.59 x 10 <sup>-12</sup><br>6.12 x 10 <sup>-9</sup><br>1.02 x 10 <sup>4</sup> | 1.48 x 10 <sup>-7</sup><br>1.46 x 10 <sup>-12</sup><br>1.95 x 10 <sup>-9</sup><br>3.25 x 10 <sup>3</sup>  |
| Air Permeability                          | D1434       | (cm³.cm)/(cm².sec.atm)<br>(cm³.cm)/(cm².sec.Pa)<br>(cm³.cm)/(cm².sec.cmHg)<br>(cm³.mil)/(100in².24 hr.atm) | 2.11 x 10 <sup>-7</sup><br>2.08 x 10 <sup>-12</sup><br>2.78 x 10 <sup>-9</sup><br>4.64 x 10 <sup>3</sup> | 3.12 x 10 <sup>-7</sup><br>3.08 x 10 <sup>-12</sup><br>4.10 x 10 <sup>-9</sup><br>6.85 x 10 <sup>3</sup> | 6.06 x 10 <sup>-8</sup><br>5.98 x 10 <sup>-13</sup><br>7.97 x 10 <sup>-10</sup><br>1.33 x 10 <sup>3</sup> |
| Carbon Dioxide Permeability               | D1434       | (cm³.cm)/(cm².sec.atm)<br>(cm³.cm)/(cm².sec.Pa)<br>(cm³.cm)/(cm².sec.cmHg)<br>(cm³.mil)/(100in².24 hr.atm) | 1.57 x 10 <sup>-7</sup><br>1.55 x 10 <sup>-12</sup><br>2.07 x 10 <sup>-9</sup><br>3.45 x 10 <sup>3</sup> | 1.94 x 10 <sup>-7</sup><br>1.92 x 10 <sup>-12</sup><br>2.56 x 10 <sup>-9</sup><br>4.27 x 10 <sup>3</sup> | 2.93 x 10 <sup>-7</sup><br>2.89 x 10 <sup>-12</sup><br>3.86 x 10 <sup>-9</sup><br>6.44 x 10 <sup>3</sup>  |

**C-FLEX® TUBING IS NOT INTENDED FOR USE AS AN IMPLANT MATERIAL**

Distributed by:

### BIOPHARMACEUTICAL PRODUCTS

*Come through clean.™*

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Toll-Free: (800) 541-6880  
Fax: (727) 299-2569



C-Flex® is a registered trademark of Saint-Gobain Performance Plastics Corporation.



**IMPORTANT:** It is the user's responsibility to ensure the suitability and safety of Saint-Gobain Performance Plastics tubing for all intended uses. Laboratory and clinical tests must be conducted in accordance with applicable regulatory requirements in order to determine the safety and effectiveness for use of tubing in any particular application.

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