

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

**NEW!**



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

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

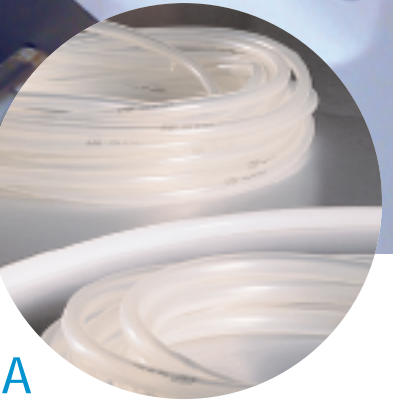
C-Flex<sup>®</sup> — from Saint-Gobain Performance Plastics — a unique, patented thermoplastic elastomer specifically designed to meet the critical demands of the biopharmaceutical world, is now BETTER THAN EVER.

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. It has been extensively tested by independent organizations and is consistently outperforming every known competitor.

**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 concentrated acids and alkalis. The ULTRA formula is significantly less permeable than silicone and has low platelet adhesion and low protein binding characteristics.

**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

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

**C-Flex<sup>®</sup> ULTRA outperforms any TPE on the market today.**

- 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 **NOW** 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.
- C-Flex<sup>®</sup> ULTRA has been designed to continue the tradition of providing the biopharmaceutical industry with over 25 years of success with the original C-Flex<sup>®</sup> family of TPE tubing.

\* 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 pump still pumping after 171 hours.

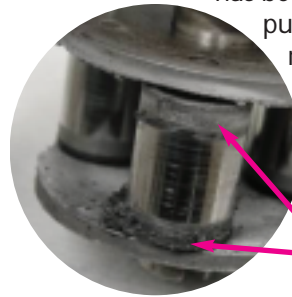
### C-Flex® ULTRA is easy on pump heads

Universally one of the problems with TPE materials

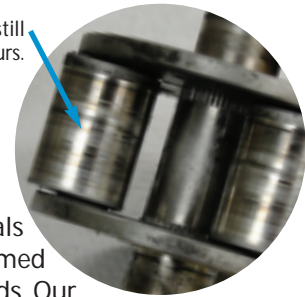
has been gummed pump heads. Our

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       | (cm <sup>3</sup> .cm)/(cm <sup>2</sup> .sec.atm)       | 8.47 x 10 <sup>-8</sup>  | 3.75 x 10 <sup>-7</sup>  | 1.49 x 10 <sup>-7</sup>  |
|   |             | (cm <sup>3</sup> .cm)/(cm <sup>2</sup> .sec.Pa)        | 8.36 x 10 <sup>-13</sup> | 3.70 x 10 <sup>-12</sup> | 1.47 x 10 <sup>-12</sup> |
|   |             | (cm <sup>3</sup> .cm)/(cm <sup>2</sup> .sec.cmHg)      | 1.11 x 10 <sup>-9</sup>  | 4.93 x 10 <sup>-9</sup>  | 1.97 x 10 <sup>-9</sup>  |
|   |             | (cm <sup>3</sup> .mil)/(100in <sup>2</sup> .24 hr.atm) | 1.86 x 10 <sup>3</sup>   | 8.23 x 10 <sup>3</sup>   | 3.28 x 10 <sup>3</sup>   |
| Nitrogen Permeability                     | D1434       | (cm <sup>3</sup> .cm)/(cm <sup>2</sup> .sec.atm)       | 2.60 x 10 <sup>-7</sup>  | 4.65x10 <sup>-7</sup>    | 1.48x10 <sup>-7</sup>    |
|   |             | (cm <sup>3</sup> .cm)/(cm <sup>2</sup> .sec.Pa)        | 2.57 x 10 <sup>-12</sup> | 4.59x10 <sup>-12</sup>   | 1.46x10 <sup>-12</sup>   |
|   |             | (cm <sup>3</sup> .cm)/(cm <sup>2</sup> .sec.cmHg)      | 3.42 x 10 <sup>-9</sup>  | 6.12x10 <sup>-9</sup>    | 1.95x10 <sup>-9</sup>    |
|   |             | (cm <sup>3</sup> .mil)/(100in <sup>2</sup> .24 hr.atm) | 5.71 x 10 <sup>3</sup>   | 1.02 x 10 <sup>4</sup>   | 3.25 x 10 <sup>3</sup>   |
| Air Permeability                          | D1434       | (cm <sup>3</sup> .cm)/(cm <sup>2</sup> .sec.atm)       | 2.11 x 10 <sup>-7</sup>  | 3.12 x 10 <sup>-7</sup>  | 6.06 x 10 <sup>-8</sup>  |
|   |             | (cm <sup>3</sup> .cm)/(cm <sup>2</sup> .sec.Pa)        | 2.08 x 10 <sup>-12</sup> | 3.08 x 10 <sup>-12</sup> | 5.98 x 10 <sup>-13</sup> |
|   |             | (cm <sup>3</sup> .cm)/(cm <sup>2</sup> .sec.cmHg)      | 2.78 x 10 <sup>-9</sup>  | 4.10 x 10 <sup>-9</sup>  | 7.97 x 10 <sup>-10</sup> |
|   |             | (cm <sup>3</sup> .mil)/(100in <sup>2</sup> .24 hr.atm) | 4.64 x 10 <sup>3</sup>   | 6.85 x 10 <sup>3</sup>   | 1.33 x 10 <sup>3</sup>   |
| Carbon dioxide permeability               | D1434       | (cm <sup>3</sup> .cm)/(cm <sup>2</sup> .sec.atm)       | 1.57 x 10 <sup>-7</sup>  | 1.94 x 10 <sup>-7</sup>  | 2.93 x 10 <sup>-7</sup>  |
|   |             | (cm <sup>3</sup> .cm)/(cm <sup>2</sup> .sec.Pa)        | 1.55 x 10 <sup>-12</sup> | 1.92 x 10 <sup>-12</sup> | 2.89 x 10 <sup>-12</sup> |
|   |             | (cm <sup>3</sup> .cm)/(cm <sup>2</sup> .sec.cmHg)      | 2.071 x 10 <sup>-9</sup> | 2.56 x 10 <sup>-9</sup>  | 3.86 x 10 <sup>-9</sup>  |
|   |             | (cm <sup>3</sup> .mil)/(100in <sup>2</sup> .24 hr.atm) | 3.45 x 10 <sup>3</sup>   | 4.27 x 10 <sup>3</sup>   | 6.44 x 10 <sup>3</sup>   |

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

### biopharmaceutical products

Come through clean.™

Saint-Gobain Performance Plastics-Clearwater

4451 110th Avenue North

Clearwater, FL 33762

Tel: (727) 531-4191

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.

For a period of 6 months from the date of first sale, Saint-Gobain Performance Plastics Corporation warrants this product to be free from defects in materials and workmanship. Our only obligation will be to replace any portion proving defective, or at our option, to refund the purchase price thereof. User assumes all other risk, if any, including the risk of injury, loss or damage, direct or consequential, arising out of the use, misuse, or inability to use, this product. SAINT-GOBAIN PERFORMANCE PLASTICS CORPORATION SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND RESULTING FROM THE USE OF THIS PRODUCT. THIS WARRANTY IS IN LIEU OF THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. No deviation is authorized.

Saint-Gobain Performance Plastics Corporation assumes no obligations or liability for any advice furnished by it, or for results obtained with respect to those products. All such advice is given and accepted at the buyer's risk.