Additional Specifications for HPLC Low-Pressure PFA Tubing - Tech Information

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Overview

Perfluoroalkoxy (PFA) tubing is widely used in low-pressure HPLC fluid pathways due to its broad chemical compatibility, low extractables, and excellent mechanical durability. Extruders typically publish detailed physical, mechanical, electrical, and thermal specifications that reflect the material's stability across demanding conditions.

Understanding these characteristics helps ensure proper tubing selection for safe, consistent HPLC performance.

Physical Properties

PFA tubing exhibits stable physical characteristics ideal for precision solvent delivery:

- Density: 2.12–2.17 g/cc
- Water absorption: < 0.03%
- Percent crystallinity: 48–70%
- Refractive index: 1.350
- Radiation resistance: 1–10 MRad
- Oxygen index: > 95%

These traits help maintain dimensional stability and chemical resistance during routine HPLC operation.

Mechanical Properties

PFA tubing is designed for flexibility and durability while maintaining structural integrity:

- Hardness (Shore D): 55–60
- Ultimate tensile strength: 25–28 MPa
- Elongation at break: 250–420%
- Elastic modulus: 0.48 GPa
- Flexural modulus: 0.50–0.70 GPa
- Coefficient of friction: 0.04–0.20

These mechanical features make PFA ideal for low-pressure solvent transfer lines that require long-term reliability without brittleness.

Electrical Properties

For applications involving static-sensitive solvents or detector interfaces, PFA provides:

- Volume resistivity: 1.0×10^{18} Ω–cm
- Dielectric constant (1 MHz): 1.9–2.1
- Dielectric strength: 2030 V/mil

These properties support stable operation in instrument environments where electrical insulation is essential.

Thermal Properties

PFA's outstanding thermal range makes it suitable for high-and low-temperature lab environments:

- Thermal conductivity: 0.15–0.25 W/m–K
- Maximum service temperature: 260 °C
- Minimum service temperature: −200 °C
- Melt temperature: 300–315 °C
- Glass transition temperature: 90 °C
- Decomposition temperature: 475 °C
- Thermal expansion coefficient: 120–140 µm/m–°C

This broad thermal window allows the tubing to withstand temperature fluctuations without distortion or performance degradation.

Applications in HPLC

Low-pressure PFA tubing is commonly used for:

- Solvent transfer lines
- Waste and drain lines
- Degassed mobile phase outlets
- Non-pressurized or low-pressure flow paths

Its inertness helps minimize contamination, ensuring cleaner baselines and more reproducible chromatographic results.
Click *HERE* for Low Pressure, HPLC Tubing Ordering Information

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