Teflon™ PTFE 640XT X

Fine Powder Fluoroplastic Resin

Product Information

Description

Teflon™ PTFE 640XT X is a polytetrafluoroethylene fine powder resin used primarily for paste extrusion. Teflon™ PTFE 640XT X offers the excellent combination of properties typical of Teflon™ fluoroplastic resins:

- Non-aging characteristics
- Chemical inertness to nearly all industrial chemicals and solvents
- Exceptional dielectric properties, stable with frequency and temperature
- Toughness and flexibility
- Low coefficient of friction
- Non-stick characteristics
- Negligible moisture absorption
- Excellent weather resistance
- Service temperature up to 260 °C (500 °F)
- Useful properties at -240 °C (-400 °F)

Teflon™ PTFE 640XT X is designed for processing over a wide extrusion reduction ratio range (250:1–5000:1), with excellent performance even at the top of this range. Due to its outstanding transformation characteristics, Teflon™ PTFE 640XT X can be extruded with very low lubricant levels over a wide reduction ratio range, while the extrusion pressure remains low. For example, Teflon™ PTFE 640XT X can be extruded into wire with excellent performance in the reduction ratio range of 1000:1–4500:1 with a single lubricant level of 16% (based on total weight). This means that a single PTFE/lubricant mixture can be used for many constructions being manufactured in the same size extruder line.

In addition, the excellent high reduction ratio performance means that products made in small-bore machines with other lower reduction ratio-rated fine powders can now be extruded in larger ones, representing a considerable economic advantage, as more material can be extruded per extrusion. This also means that longer lengths of wire or tubing can be achieved in one extrusion.

Teflon™ PTFE 640XT X meets the requirements of ASTM D4895, Type I, Grade 1, Class C.

Typical Applications

Teflon™ PTFE 640XT X is mainly used for insulation of high-performance wire and cables, as well as tubing. It is also suitable for other typical applications, such as additives where some properties of PTFE are required.

Processing

Teflon™ PTFE 640XT X is extruded using a liquid processing aid such as naphtha. In the paste extrusion process, the powder is mixed with a lubricant aid and then compressed into a cylindrical preform slug under light pressure (1.5–2.0 MPa [220–290 psi]). The preform slug is placed in the cylinder of a paste extruder, where the composition is forced under high pressure through a finishing die to produce beading, tubing, or wire coatings.

After extrusion, the product is a low-density, but coherent, fibrous structure. Teflon™ PTFE 640XT X is usually processed further, with heat, into a solid resin product such as tubing. Heat is applied in two steps, which may be taken in-line with extrusion or separately. The lubricant must be removed first, usually by heating within the range of 100–300 °C (212–572 °F). A sintering step follows to melt the resin above its melting point of approximately 342 °C (648 °F) and produce the void-free, solid PTFE resin.

Food Contact Compliance

Properly processed products (sintered at high temperatures common to the industry) made from Teflon™ PTFE 640XT X resin can qualify for use in contact with food in compliance with FDA 21 CFR 177.1550 and European Regulation (EU) No. 10/2011. For details and information, please contact your Chemours representative.

Safety Precautions

Before processing any fluoroplastics, read the Safety Data Sheet, available upon request from our Customer Service Group at (844) 773-CHEM/2436 in the U.S. or (302) 773-1000 outside of the U.S. Also read the detailed information in the latest edition of the "Guide to the Safe Handling of Fluoropolymer Resins,"

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published by the Fluoropolymers Division of The Society of the Plastics Industry (www.fluoropolymers.org) or by PlasticsEurope (www.plasticseurope.org).

Storage and Handling

Teflon™ PTFE fine powder resins must be handled carefully to avoid shearing the powder prior to extrusion. Fibrillation by shearing is not reversible, and damaged particles can appear as defects in the finished product. As temperature is reduced below the transition point of 19 °C (66 °F), the powder becomes progressively less sensitive to mechanical damage or compaction in its containers.

Chemours recommends that powder compacted during shipping and storage be restored to its optimum condition by cooling it for one or two days below 19 °C (66 °F), followed by screening through a 2–4.76 mm opening sieve (4–10 mesh). Lumps that are retained on the sieve that can be broken up by shaking at temperatures below 19 °C (66 °F) may be used; however, harder lumps that can not be broken up should be discarded.

All processing steps prior to preforming should be done at reduced temperature, but ambient dew point must be controlled to prevent condensation on the resin. Storage and handling facilities should be clean to avoid any cross-contamination. The high sintering temperature causes even very small foreign particles to become visible or to cause defects in finished products. Keep resin drums closed and clean.

Packaging

Teflon™ PTFE 640XT X resin is packaged in 25-kg (55.1-lb) plastic containers. For convenient shipment, orders of 300-kg (661.4-lb) pallets (12 drums) are recommended.

Typical Property Data for Teflon™ PTFE 640XT X Fine Powder Fluoroplastic Resin*

Property Test	Test Method		Unit	Typical Value
Average Particle Size, d50	ASTM D4895	ISO 12086	µm	450
Bulk Density	ASTM D4895	ISO 12086	g/L	525
Standard Specific Gravity	ASTM D4895	ISO 12086		2.159
Thermal Instability Index	ASTM D4895	ISO 12086		≤15
Extrusion Pressure at RR = 1600:1	ASTM D4895	ISO 12086	MPa (psi)	22 (3,190)
Extrusion Pressure at RR = 2500:1	ASTM D4895	ISO 12086	MPa (psi)	28 (4,061)
Melt Peak Temperature				
Initial	ASTM D4591	ISO 12086	°C (°F)	344 (651)
Second	ASTM D4591	ISO 12086	°C (°F)	326 (619)

Teflon™ PTFE 640XT X meets the requirements of ASTM D4895-15, Type I, Grade 1, Class C.
*Typical properties are not suitable for specification purposes.

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Replaces: K-25880
C-10138 (2/16)