



THE GUND COMPANY

MANUFACTURERS & FABRICATORS OF ENGINEERED MATERIAL SOLUTIONS

FEP vs. PTFE in Wire Insulation

The Cost Impacts and Application Considerations

When asked what insulation to use for a wire, and you are given an option between FEP and PTFE, keep the information below in mind when making that selection. While you can't go wrong with either, there are cost impact and end application items you should keep in mind.

COMPARATIVE ANALYSIS OF FEP AND PTFE FOR WIRE INSULATION

Fluorinated Ethylene Propylene (FEP) and Polytetrafluoroethylene (PTFE) are two fluoropolymer materials widely used for wire insulation, particularly in high-performance and harsh environments. This article provides a detailed comparison of these materials across key properties to help you make an informed decision for your specific application.

THERMAL PROPERTIES

FEP and PTFE exhibit distinct thermal characteristics. FEP has a maximum operating temperature of approximately 200°C (392°F) and a melting point of around 260°C (500°F). In contrast, PTFE can withstand higher temperatures, with a maximum operating temperature of about 260°C (500°F) and a melting point of approximately 327°C (621°F). This makes PTFE more suitable for extreme heat applications.

ELECTRICAL PROPERTIES

Both FEP and PTFE are excellent insulators, making them ideal for high-frequency and high-voltage applications. They share similar dielectric strengths and constants, with a dielectric constant of around 2.1.

MECHANICAL PROPERTIES

When it comes to mechanical properties, FEP is more flexible and easier to extrude, making it better suited for tight spaces and dynamic applications. It also has good toughness and moderate abrasion resistance. On the other hand, PTFE is less flexible, softer, and more prone to creep, with lower abrasion resistance.

CHEMICAL RESISTANCE

Both materials offer excellent resistance to chemicals, solvents, and UV exposure. However, PTFE is slightly more inert, providing superior chemical resistance.

PROCESSABILITY

FEP is a thermoplastic, making it easier and cheaper to process compared to PTFE, which is not melt-processable and requires sintering. This makes FEP more cost-effective for high-volume production.

TYPICAL APPLICATIONS

FEP is commonly used in aerospace wiring, medical devices, data cables, and automotive sensors. PTFE, with its higher thermal resistance and superior chemical inertness, is used in high-temperature environments, microwave cables, chemical plants, and military-grade wiring.

SUMMARY

- **CHOOSE FEP FOR:** Flexibility, ease of processing, cost-efficiency, and good thermal/electrical performance.
- **CHOOSE PTFE FOR:** Maximum thermal resistance, superior chemical inertness, and extreme environments.

The Gund Company custom fabricates insulation materials to the exact specifications and drawings specified by our customers. We offer our customers the proper product for their specific application. A variety of dimensions and diameter sizes are available. Product colors vary according to material type. Additional data and samples are available on request.



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MARKETS



Switchgear



Electronics



Power Generators



Motor Applications



Transformers



Metals Processing



Electric Vehicles



Military/Aerospace



Oil & Gas



Medical



Space

OUR EXPERTISE IS YOUR COMPETITIVE ADVANTAGE

We manufacture and custom-fabricate a complete line of components for 11 markets (on the left). As TGC better understands these markets – we can expand into other applications for our products.

As an employer, we are one family, acting in accordance with our Core Values: respect, trust, growth, passion, connection, teamwork, integrity, and performance. Collectively, we recognize and serve others so that lives are transformed!

Material Families:

- Thermoset Rigid Laminates & Composites
- Flexible Laminates, Papers, Films & Felts
- Thermoplastic Materials
- Elastomeric Materials

Engineering Capabilities:

- Custom Material Development
- Resin Formulation
- Laboratory Testing
- Comparative Materials Evaluation

Manufacturing Capabilities:

- Compression Molding
- Autoclave & Light RTM Molding
- Pultrusion / Extrusion of Rods & Shapes
- Filament, Convolute & Wet Winding Tubes
- Additive & Injection Molding
- Infusion & B-Stage Composites Lay-Up
- Hand Lay-Up & Spray-Up Molding

Conversion Capabilities:

- Die, Laser & Knife Cutting
- Waterjet Cutting
- Rotary Die Cutting
- Slitting
- Thermoforming

Fabrication Capabilities:

- 5-Axis Machining
- CNC Milling
- Routing
- Turning & Lathe Cutting
- Punching
- Bending



THE GUND COMPANY GLOBAL FOOTPRINT

