



# AXELERON™ FO 8864 BK CPD

## Black Medium Density Polyethylene Compound for Cable Jacketing

### Overview

AXELERON™ FO 8864 BK CPD is a high molecular weight, linear medium-density polyethylene black compound ("CPD") developed for fiber optic and conventional metallic conductor cable jacketing applications. The compound has very good processability and provides a tough cable jacket. AXELERON™ FO 8864 BK CPD also provides excellent resistance to environmental stress cracking and to weathering and thermal-oxidative degradation.

AXELERON™ FO 8864 BK CPD provides excellent low temperature optic signal attenuation performance in fiber optic cable jacketing applications. The compound combines reduced extrusion shrinkback stress with excellent tensile modulus properties. This minimizes the contractive forces exerted by the cable jacket on the optic cable core during temperature cycling.

### Specifications

AXELERON™ FO 8864 BK CPD meets the following raw material specifications:

- ASTM D 1248: Type II, Class C, Category 4, Grades E9 and J4
- Federal LP-390C: Type III, Class M, Grades 2, 3, Category 4
- REA PE 39 and 89 (Raw Material Sections)

| Physical  | Nominal Value (English) | Nominal Value (SI)      | Test Method |
|---|-------------------------|-------------------------|-------------|
| Density   | 0.941 g/cm <sup>3</sup> | 0.941 g/cm <sup>3</sup> | ASTM D792   |
| Melt Mass-Flow Rate (190°C/2.16 kg)             | 0.70 g/10 min           | 0.70 g/10 min           | ASTM D1238  |
| Environmental Stress-Cracking Resistance (ESCR) |                         |                         | ASTM D1693  |
| 10% Igepal, F0                                  | > 1000 hr               | > 1000 hr               |             |
| Carbon Black Content                            | 2.6 %                   | 2.6 %                   | ASTM D1603  |
| Absorption Coefficient - (kAB/m)                | > 400                   | > 400                   | ASTM D3349  |
| Mechanical                                      | Nominal Value (English) | Nominal Value (SI)      | Test Method |
| Tensile Modulus - 1% Secant <sup>1</sup>        |                         |                         | ASTM D638   |
| -40°F (-40°C)                                   | 150000 psi              | 1030 MPa                |             |
| -4°F (-20°C)                                    | 115000 psi              | 793 MPa                 |             |
| 32°F (0°C)                                      | 80100 psi               | 552 MPa                 |             |
| 68°F (20°C)                                     | 45000 psi               | 310 MPa                 |             |
| 104°F (40°C)                                    | 29900 psi               | 206 MPa                 |             |
| 140°F (60°C)                                    | 18000 psi               | 124 MPa                 |             |
| Tensile Strength <sup>2</sup>                   | 4100 psi                | 28.3 MPa                | ASTM D638   |
| Tensile Elongation <sup>2</sup> (Break)         | 800 %                   | 800 %                   | ASTM D638   |
| Thermal   | Nominal Value (English) | Nominal Value (SI)      | Test Method |
| Brittleness Temperature                         |                         |                         | ASTM D746   |
| -- <sup>3</sup>                                 | < -148 °F               | < -100 °C               |             |
| -- <sup>4</sup>                                 | -85.0 °F                | -65.0 °C                |             |
| CLTE - Flow <sup>5</sup>                        |                         |                         | ASTM D696   |
| -40°F (-40°C)                                   | 5.6E-5 in/in/°F         | 1.0E-4 cm/cm/°C         |             |
| -4°F (-20°C)                                    | 7.8E-5 in/in/°F         | 1.4E-4 cm/cm/°C         |             |
| 32°F (0°C)                                      | 7.8E-5 in/in/°F         | 1.4E-4 cm/cm/°C         |             |
| 68°F (20°C)                                     | 1.1E-4 in/in/°F         | 2.0E-4 cm/cm/°C         |             |
| 104°F (40°C)                                    | 1.3E-4 in/in/°F         | 2.4E-4 cm/cm/°C         |             |
| 140°F (60°C)                                    | 1.6E-4 in/in/°F         | 2.8E-4 cm/cm/°C         |             |
| Electrical                                      | Nominal Value (English) | Nominal Value (SI)      | Test Method |
| Dielectric Strength                             | 500 V/mil               | 20 kV/mm                | ASTM D149   |
| Dielectric Constant                             | 2.50                    | 2.50                    | ASTM D1531  |
| Dissipation Factor                              | 3.0E-4                  | 3.0E-4                  | ASTM D1531  |



| Extrusion        | Nominal Value (English) | Nominal Value (SI) |
|------------------|-------------------------|--------------------|
| Melt Temperature | 450 °F                  | 232 °C             |

#### Extrusion Notes

AXELERON™ FO 8864 BK CPD has good extrusion processing latitude. High, stable output rates and moderate melt temperatures and pressures are obtainable with both polyethylene barrier and metering type extruder screws. Typical extrusion conditions are listed below; the exact conditions will depend upon the equipment used and the application.

#### Extruder

- Screw Type: PE Metering
- Screw LD: 18:1 to 24:1
- Compression Ratio: 2.5:1 to 3.0:1
- Screen Pack: 20/40/60/20 mesh

#### Temperature Profile

- Hopper: Water Cooling
- Feed Zone: 300°F (150°C)
- Center Zones: 440°F (225°C)
- Metering Zone: 440°F (225°C)
- Head: 440°F (225°C)
- Die: 440°F (225°C)
- Melt Temperature: 450°F (230°C)

AXELERON™ FO 8864 BK CPD cable jacketing can be applied with either pressure or sleeving (tube-on) type extrusion tooling. With tube-on extrusion, a minimum tubing tip diameter and a 2:1 drawdown ratio is recommended. If necessary, a higher drawdown ratio can be used to increase jacket tightness.

#### Notes

These are typical properties only and are not to be construed as specifications. Users should confirm results by their own tests.

<sup>1</sup> Reduced testing speed of 0.10 inch/min (2.5 mm/min) with an initial 1.50 inch (38mm) jaw separation. Modulus data will vary with testing speed. Unless otherwise noted, amples are tested in accordance with ASTM D 1248, "Polyethylene Plastics Molding and Extrusion Materials."

<sup>2</sup> Type IV, 2.0 in/min (50 mm/min)

<sup>3</sup> Notched, F20

<sup>4</sup> Notched, F50

<sup>5</sup> COE data generated on Dupont 942 Thermomechanical Analyzer.

