



DOW ENDURANCE™ HFDK-0587 BK

Crosslinkable Semiconductive Shielding Compound

Description

DOW ENDURANCE™ HFDK-0587 BK is a crosslinkable semi-conductive compound based on an ethylene copolymer.

DOW ENDURANCE™ HFDK-0587 BK offers outstanding extrusion properties and allows high rates, low melt pressure and temperature generation result in outstanding scorch resistance and excellent smoothness under a wide processing window.

Applications

DOW ENDURANCE™ HFDK-0587 BK is recommended as conductor and bonded insulation shielding for medium voltage XLPE power cables.

Specifications

Power cables with conductor and insulation shielding made of DOW ENDURANCE™ HFDK-0587 BK, prepared using sound, commercial fabrication practice, would be expected to meet the following cable specification(s):

- IEC: 60502 and 60840
- HD: 620 S1 and 632 S1
- BS: 6622
- DIN: VDE 0273 and 0263
- EDF: HN-33-S-23 and HN-33-S-52

Consult the regulations for complete details.

Properties¹

Physical	Nominal Value	Unit (English)	Nominal Value	Unit (SI)	Test Method ²
Density	1.10	g/cm ³	1.10	g/cm ³	ISO 1183
Moisture Content	400	ppm	400	ppm	DIN 53715
Mechanical	Nominal Value	Unit (English)	Nominal Value	Unit (SI)	Test Method
Tensile Strength ³	3050	psi	21.0	MPa	IEC 60811-1-1
Tensile Elongation (Break)	200	%	200	%	IEC 60811-1-1
Thermal	Nominal Value	Unit (English)	Nominal Value	Unit (SI)	Test Method
Hot Set ⁴					IEC 811-2-1
Elongation with Load: 392°F (200°C)	40	%	40	%	
Elongation without Load: 392°F (200°C)	0.0	%	0.0	%	

1. Typical properties: these are not to be construed as specifications.
2. ISO: International Standardization Organization
DIN: Deutsche Industrie Norm
IEC: International Electrotechnical Commission
3. 0.98 in/min (25 mm/min)
4. 0.4 MPa



Properties (Cont.)

Aging	Nominal Value	Unit (English)	Nominal Value	Unit (SI)	Test Method
Retention of Tensile Elongation – 10 days 302°F (150°C)	90	%	90	%	IEC 60811-1-1
Retention of Tensile Strength – 10 days 302°F (150°C)	90	%	90	%	IEC 60811-1-1

Electrical	Nominal Value	Unit (English)	Nominal Value	Unit (SI)	Test Method
Volume Resistivity					IEC 60093
73°F (23°C)	10	ohms•cm	10	ohms•cm	
194°F (90°C)	30	ohms•cm	30	ohms•cm	

Additional Information

Smoothness: DOW ENDURANCE™ HFDK-0587 BK meets the strict standards of smoothness established for a crosslinkable semi conductive shielding compound for power cable. Throughout the production process, the product is tested to ensure smoothness. Extruded tapes are scanned by an automatic inspection system in a clean room. The tape smoothness data is managed using an acceptance sampling plan, which ensures that material in each shipping container meets or exceeds the products smoothness standard. For DOW ENDURANCE™ HFDK-0587 BK the material smoothness standard has been designed to meet the stringent CENELEC industry specifications for semi-conductive shielding materials on cable, also during high-speed cable production

Extrusion	Nominal Value	Unit (English)	Nominal Value	Unit (SI)	Test Method
Drying Temperature	158	°F	70	°C	
Drying Time	4.0	hr	4.0	hr	
Melt Temperature	248 to 284	°F	120 to 140	°C	

Extrusion Notes

DOW ENDURANCE™ HFDK-0587 BK provides excellent surface finish and outstanding processing behavior over a broad range of conditions. For optimum results, melt extrusion temperatures in the range of 120 to 140°C are recommended. The following extruder barrel and die setting are recommended as a starting point while learning to process DOW ENDURANCE™ HFDK-0587 BK. Specific machine settings will depend on the extruder and die designs and must be established through conventional practices. In general, a 20/80 mesh screen pack is advised.

- For Mallefer extruders, a dual flight metering screw of 20-22/1, L/D and 2.0-2.5 compression ratio, running at 5–20 rpm is recommended.
- For Troester extruders, if screw cooling is not used, or is used at relatively high settings of around 105°C, Z1 and Z2 should be run somewhat cooler than indicated below.

Recommended drying conditions are 70°C for 4 h.

Default temperature settings for Mallefer 20 D Extruders with normal screw:

- Feed Section: 25°C
- Zone 1: NXW 80°C, MPW 60°C
- Zone 2: 100°C
- Zone 3: 110°C
- Zone 4: 110°C
- Zone 5-6 Clamp: 110°C
- Zone 7-8 Connection: 120°C
- Head/Die: 120°C
- Screw Cooling: None
- Hopper Cooling: None



Properties (Cont.)

Extrusion Notes

Default temperature settings for Troester extruders:

- Feed Section: 50 to 60°C
 - Zone 1: 110 to 115°C
 - Zone 2: 115°C
 - Zone 3: 115°C
 - Zone 4: 115°C
 - Zone 5-6 Clamp: 115 to 120°C
 - Zone 7-8 Connection: 120°C
 - Head/Die: 120°C
 - Screw Cooling: 85 to 105°C
 - Hopper Cooling: None
-

