



Technical Data Sheet

DOW ENDURANCE™ HFDK-0587 BK S

Crosslinkable Semiconductive Shielding Compound with Superior Smoothness

Description

DOW ENDURANCE™ HFDK-0587 BK S is a crosslinkable semi-conductive compound based on an ethylene copolymer, and a select clean furnace type carbon black providing excellent smoothness compared to standard semicons.

DOW ENDURANCE™ HFDK-0587 BK S offers outstanding extrusion properties, 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 S is recommended as conductor and bonded insulation shielding for high voltage XLPE power cables. DOW ENDURANCE™ HFDK-0587 S is especially developed for use in high voltage cables, where it provides a clean and smooth interface with the insulation XLPE. DOW ENDURANCE™ HFDK-0587 BK S provides a good resistance to welding when high degassing temperatures are used.

Specifications

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

- IEC: 60502, 60840 and 62067
- HD: 620 S1 and 632 S1
- BS: 6622
- DIN: VDE 0273 and 0263
- Edf: HN-33-S-23 and HN-33-S-52
- US: ICEA S-108-720

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					
Tensile Strength	3050	psi	21.0	MPa	IEC 60811-1-1
Tensile Elongation (Break)	200	%	200	%	IEC 60811-1-1

1. Typical properties: these are not to be construed as specifications.
2. ISO: International Standardization Organization
DIN: Deutsche Industrie Norm
IEC: International Electrotechnical Commission

Properties (Cont.)

Thermal	Nominal Value	Unit (English)	Nominal Value	Unit (SI)	Test Method
Hot Set ³					IEC 811-2-1
Elongation with Load: 392°F (200°C)	40	%	40	%	
Elongation without Load: 392°F (200°C)	0.0	%	0.0	%	
Aging					
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					
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 S 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 the material in each shipping container meets or exceeds the products smoothness standard. The DOW ENDURANCE™ HFDK-0587 BK S material smoothness standard has been designed to approach that offered by acetylene based supersmooth semi conductive compounds, thus meeting requirements for HV and select EHV use.

Extrusion Notes

DOW ENDURANCE™ HFDK-0587 BK S 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 135°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 S. 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 Maillefer extruders, a dual flight metering screw of 20-22/1, LID and 2.0-2.5 compression ratio, running at 8–20 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. Running the screw cooling at around 85°C reduces the specific output, practical for HV use.

Recommended drying conditions are 70°C for 4 h, the target moisture level being below 500 ppm.

Default temperature settings for Maillefer 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

3. 0.4 MPa

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°C
 - Hopper Cooling: None
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