

# Dow ENDURANCE™ HFDC-0586 BK S

Crosslinkable Semiconductive Shielding Compound

The Dow Chemical Company

Message:

DOW ENDURANCE™ HFDC-0586 BK S is a specially formulated semiconductive, vulcanizable compound designed for use as an extruded conductor shield and bonded insulation shield applications in medium and high voltage crosslinked polyethylene insulated cables.(1) DOW ENDURANCE™ HFDC-0586 BK S has stable volume resistivity characteristics at elevated temperatures and is formulated with a polymer system that has demonstrated compatibility with copper and aluminum conductors. DOW ENDURANCE™ HFDC-0586 BK S meets stringent requirements for product smoothness. For conductor shield of HV and EHV cables rated above 138 kV, the supersmooth semiconductive compound, DOW ENDURANCE™ HFDA-0801 BK EC, formulated with an acetylene carbon black is recommended.

Specifications

DOW ENDURANCE™ HFDC-0586 BK S is designed for use in power distribution cables. Cables with conductor and insulation shielding of DOW ENDURANCE™ HFDC-0586 BK S, prepared using sound commercial fabrication practice, would be expected to meet the following specifications:

- AEIC: CS8, CS9
- BS: 6622
- CEA: WCWG-01, WCWG-02
- ICEA: S-94-649, S-97-682 AND S-66-524 (NEMA WC7)
- IEC: 60502, 60840
- DIN: VDE 0273, 0263
- Edf: HN-33-S-23, HN-33-S-52
- ESI: 09-14
- HD: 620 S1
- UL: 1072

(1) DOW ENDURANCE™ HFDC-0586 BK S is recommended for use in conjunction with DOW cross-linked polyethylene and tree-retardant cross-linked polyethylene compounds For other polymer insulations such as EPR and EPDM's the user is cautioned to establish the utility of DOW ENDURANCE™ HFDC-0586 BK with each formulation.

General Information			
Agency Ratings	AEIC CS8		
	AEIC CS9		
	BS 6622		
	EDF HN 33-S-23		
	EDF HN 33-S-52		
	HD 620 S1		
	ICEA S-66-524		
	ICEA S-94-649		
	ICEA S-97-682		
	IEC 60502		
	IEC 60840		
	NEMA WC-7		
	UL 1072		
	VDE 0263		
	VDE 0273		
Forms	Particle		
Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.09	g/cm³	ASTM D792

Environmental Stress-Cracking Resistance (100% Igepal, F0)	> 504	hr	ASTM D1693
Mechanical	Nominal Value	Unit	Test Method
Tensile Strength	16.9	MPa	ASTM D638
Tensile Elongation (Break)	320	%	ASTM D638
Aging	Nominal Value	Unit	Test Method
Tensile strength retention-1 week (150°C)	95	%	ASTM D638
Elongation retention rate-1 week (150°C)	95	%	ASTM D638
Thermal	Nominal Value	Unit	Test Method
Brittleness Temperature	-40.0	°C	ASTM D746
Electrical	Nominal Value	Unit	Test Method
Volume Resistivity			ASTM D991
23°C	15	ohms · cm	ASTM D991
90°C	40	ohms · cm	ASTM D991
130°C	40	ohms · cm	ASTM D991
Additional Information			

Nominal property values above represent tests on molded, stress-relieved slabs. Cure times were 15 minutes at 175°C. Smoothness  
DOW ENDURANCE™ HFDC-0586 BK S meets the strict standards of smoothness established for a cross linkable cable semiconductive shield compound. 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 shipping container meets or exceeds the product's smoothness standard. The smoothness standard of DOW ENDURANCE™ HFDC-0586 BK S has been designed to meet the industry expectations for semiconductive shield materials in high voltage cables.

Each batch of DOW ENDURANCE™ HFDC-0586 BK S meets the following smoothness requirement:

Protrusion Height / Maximum Allowable

60-69 μm / 1 per m<sup>2</sup>

>75 μm / 0 per m<sup>2</sup>

Storage

The environment or conditions of storage greatly influences the recommended storage time. Storage should be in accordance with good manufacturing practices. If proper warehousing and storage temperatures [dry conditions, between 50°F and 86°F (10°C and 30°C) in temperature] are utilized, this product may be stored by the customer for up to one year. It is recommended that the practice of using the product on a first-in / first-out basis be established. Storage under extreme conditions may affect the quality, processing, or performance of the product.

Extrusion	Nominal Value	Unit
Drying Temperature	60.0	°C
Drying Time	< 6.0	hr
Melt Temperature	116 - 141	°C
Extrusion instructions		

DOW ENDURANCE™ HFDC-0586 BK S provides excellent surface finish and outstanding output rates over a broad range of conditions. For optimum results, melt extrusion temperatures in the suggested range of 240 to 285°F (115 to 140°C) to avoid pre-cure or scorch. Extruder barrel settings of 110°C (230°F) are suggested as a starting point while learning to process DOW ENDURANCE™ HFDC-0586 BK S. Specific machine settings will depend on the extruder design and must be established through conventional practices. Dehumidified hopper drying at 140°F (60°C) for up to 6 hours may be employed to remove moisture prior to extrusion.

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