



# Dow ENDURANCE™ HFDK-4201 SC

## Crosslinkable Power Cable Insulation Compound

### Overview

DOW ENDURANCE™ HFDK-4201 SC is a long-life, unfilled, crosslinkable, low density, super clean polyethylene insulation compound developed especially for the insulation of high voltage power cables. DOW ENDURANCE™ HFDK-4201 SC has been designed with a non-migrating stabilizer providing high thermal stability and optimum crosslinking behavior. It has an enhanced degree of scorch retardance for fine mesh filtering and long production run lengths during cable manufacture.

DOW ENDURANCE™ HFDK-4201 SC is recommended for the insulation of high voltage power transmission cables rated up to 230 kV.

### Specifications

HFDK-4201 SC is designed for use in power distribution and transmission cables. Cables insulated with HFDK-4201 SC, using sound commercial manufacturing practice, would be expected to meet the latest editions of the following specifications and regulations:

- IEC 62067, 60840
- CENELEC HD 632 S3
- GB/T 11017, GB/Z 18890

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Density <sup>1</sup> (73°F (23°C))	0.920 g/cm <sup>3</sup>	0.920 g/cm <sup>3</sup>	ASTM D792
Moisture	< 200 ppm	< 200 ppm	Dow Method
Mechanical	Nominal Value (English)	Nominal Value (SI)	Test Method
Tensile Strength <sup>2</sup>	2900 psi	20.0 MPa	ASTM D638
Tensile Elongation <sup>2</sup>	500 %	500 %	ASTM D638
Thermal	Nominal Value (English)	Nominal Value (SI)	Test Method
Hot Set - Under Load/Without Load @ 392°F (392°F (200°C))	<100%/<5% %	<100%/<5% %	IEC 60811-2-1
Aging	Nominal Value (English)	Nominal Value (SI)	Test Method
Change in Tensile Properties - 7 days @ 320°F <sup>2</sup> (320°F (160°C))	< 25 %	< 25 %	ASTM D638
Electrical	Nominal Value (English)	Nominal Value (SI)	Test Method
Volume Resistivity <sup>3</sup> (73°F (23°C))	> 1.0E+16 ohms·cm	> 1.0E+16 ohms·cm	ASTM D257
Dielectric Strength <sup>4</sup>			ASTM D149
0.125 in (3.18 mm), Method A (Short-Time)	> 760 V/mil	> 30 kV/mm	
0.125 in (3.18 mm), Method B (Step-by-Step)	> 590 V/mil	> 23 kV/mm	
0.125 in (3.18 mm), Method C (Slow Rate-of-Rise)	> 1000 V/mil	> 39 kV/mm	
Dielectric Constant <sup>5</sup> (73°F (23°C))	2.30	2.30	ASTM D150
Dissipation Factor <sup>5</sup> (73°F (23°C))	3.0E-4	3.0E-4	ASTM D150



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## Additional Information

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Nominal property values representing tests on molded, stress-relieved slabs. Cure times were 15 minutes at 175°C.

Tests are made in accordance with current ASTM, IEC, ISO or Dow Methods.

### Cleanliness Requirements

DOW ENDURANCE™ HFDK-4201 SC meets very high standards for cleanliness (super clean) established for an unfilled, crosslinkable cable insulation compound. Throughout the production process, the product is tested to ensure a high level of cleanliness. Extruded tapes are scanned by an automatic inspection system in a clean room. The purity data is managed using an acceptance sampling procedure, which ensures that the product meets or exceeds Dow super-clean standards.

### Storage

The environment or conditions of storage greatly influences the recommended storage time. Storage under extreme conditions may affect the quality, processing, or performance of the product. Storage should be in accordance with good manufacturing practices. The recommended storage conditions, in the original unopened packages, are dry conditions with temperatures between 50°F and 86°F (10°C and 30°C). When stored between 50°F and 86°F (10°C and 30°C), the product may be used for up to one year from the date of sale or two years from the date of manufacture, whichever comes first. The recommended maximum storage time is 1 year at 104°F (40°C). It is recommended that the practice of using the product on a first-in / first-out basis be established.

### Packaging

DOW ENDURANCE™ HFDK-4201 SC can be delivered in different packaging types dependent on the specific material handling needs. This includes 590kg UNICLEAN™ octabins, 500kg bottom unloading octabins, 1000kg bottom unloading octabins or 20MT van boxes. Please consult with your local Dow sales representative to discuss your packaging needs.

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## Extrusion Notes

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DOW ENDURANCE™ HFDK-4201 SC provides excellent performance and outstanding output rates over a range of extrusion conditions. For optimum results, melt extrusion temperatures in the range of 115°C to 135°C (240°F to 275°F) are recommended. Screen packs are recommended if there is a need to improve the homogenization of the melt or as protection from contamination entering the extrusion process during product unloading and processing. The use of a 100-60-40-20 mesh screen pack is commonly used however, specific processing recommendations can only be made when information about the application and actual extrusion and processing equipment types are known. It is recommended melt pressures and optionally melt temperatures should be monitored during cable production. Prior to cable production, processing conditions, melt temperatures and melt pressures should be established by bleeding trials. During start-up it is recommended to use the thermoplastic peroxide free compound in order to achieve stable extrusion conditions.

## Notes

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

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<sup>1</sup> ASTM D792/ISO 1183

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<sup>2</sup> ASTM D638/IEC 60811-1-1

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<sup>3</sup> ASTM D257/IEC 60093

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<sup>4</sup> ASTM D149/IEC 60243-1

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<sup>5</sup> ASTM D150/IEC 60250

