Dow ENDURANCE™ HFDK-4201 EHV

Crosslinkable Power Cable Insulation Compound

The Dow Chemical Company

Message:

Ultra-clean polyethylene material, used for ultra-high voltage power cable insulation material
HFDK-4201 EHV is a primary color, cross-linked polyethylene material with extremely high purity, specially used as EHV power cable with high electrical stress Insulation material. HFDK-4201 EHV contains stabilizer that will not permeate, has high heat resistance stability, long-term stability, and optimal crosslinking performance.
Specification requirements:
When adopting the most advanced cable manufacturing specifications, cables using ultra-clean HFDK-4201 EHV meet the requirements of the following standards:
IEC 62067: >150kV - <500kV
IEC 60840: >30kV - <150kV
AEIC CS9: >45kV - <345kV
Application areas:
It is recommended to use HFDK-4201 EHV as an insulation material for ultra-high voltage cables (>220kV).

General Information			
Uses	Extra High Voltage Insulation Underground cable Wire and cable applications Insulating material		
Agency Ratings	AEIC CS9 HD 632 S2 ICEA S-108-720 IEC 60840 IEC 62067		
Forms	Particle		
Physical	**Nominal Value**	**Unit**	**Test Method**
Density [1]	0.921	g/cm³	ISO 1183
Melt Mass-Flow Rate (MFR) (130°C/2.16 kg)	0.30	g/10 min	ISO 1133
Moisture [2]		ppm	Internal method
Change in Tensile Properties - 10 days (150°C)		%	IEC 60811-1-1
Thermoset [3]			IEC 811-2-1
Elongation under Load : 200°C	75	%	IEC 811-2-1
Permanent Deformation : 200°C	0.0	%	IEC 811-2-1
Gottfert Elastograph - Torque	0.60	N·m	ISO 6502
Reaction Speed - t90 (180°C)	5.0	min	ISO 6502
Mechanical	**Nominal Value**	**Unit**	**Test Method**
Tensile Strength	20.0	MPa	IEC 60811-1-1

Tensile Elongation (Break)	500	%	IEC 60811-1-1
Electrical	Nominal Value	Unit	Test Method
Volume Resistivity	1.0E+16	ohms·cm	IEC 60093
Dielectric Strength	40	kV/mm	IEC 60243-1
Dielectric Constant (1 MHz)	< 2.30		IEC 60250
Dissipation Factor (50 Hz)	3.0E-4		IEC 60250
Additional Information	Nominal Value	Unit	Test Method

Cleanliness:
Extraordinary cleanliness is assured through a number of precautions taken during the manufacturing of DOW ENDURANCE™ HFDK-4201 EHV. The specifications are set to exclude metallic contaminants >50µm and other contaminants >70µm via continuous sampling. Contaminant counts/kg of particles <70µm are reported.
Processing Recommendations.DOW ENDURANCE HFDK-4201 EHV provides excellent surface finish and outstanding output rates over a broad range of conditions. For optimum results, melt extrusion temperatures of 115 -140°C, and preferably 130°C, are recommended for HV/EHV applications.If desirable, DOW ENDURANCE HFDK-4201 EHV allows the use of fine mesh screens (400mesh/30µm or 635mesh/20µm) without causing pressure build up over time. For normal use a 250 mesh screen (50µm) is sufficient.At start-up, it is recommended to use DFDK-4850 transition compound to achieve stable extruder conditions.Stabilization system and color development.The Dow ENDURANCE™ HFDK-4201 EHV is equipped with a very efficient stabilization system, providing excellent stability against both thermal degradation and scorch. The stabilizer is compatible with PE and does not recrystallize in the end product. The result is cables without crystal contamination or sweat-out issues. Most AOs add color to plastic when exposed to heat. The interaction of the AO and peroxide in the HFDK-type XLPE generates a reddish-orange color in thermoplastic material. During crosslinking this, this color becomes totally transparent in the melt, or translucent white upon solidification. For thick walled cables and/or cables with higher heat exposure, a greenish-yellow color may appear. The strength of this color is increasing with the heat exposure. The coloration of the caused by the interaction of the AO and the peroxide does not involve the polymer. The ppm level of coloring agents measured in the plastic represents a fraction of a percent of the AO, and therefore does not influence the polymer, nor the AO itself. The performance and service life of the finished cable is therefore not affected by the color.Note that the transition compound DFDK-4850 does not show this color as peroxide is not present in the transition material.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. DOW ENDURANCE HFDK-4201 EHV is extremely storage stable at elevated temperatures. Peroxide may start to migrate at temperatures below 15°C.The recommended maximum storage time is 1 year at 40°C and not more than 2 months below 15°C. In general, the material can be used within two years after production if stored the remaining time between 15 and 30°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 EHV can be delivered in Dow's UNICLEAN™ big bags or in 1000 kg octabins.

Extrusion	Nominal Value	Unit
Melt Temperature	115 - 140	°C

Extrusion instructions

加工建议:可在 115 -140°C 的熔体温度下加工 HFDK-4201 EHV,对于 HV/EHV 应用最好为
130°C.只有在需要改进熔体的同质性,或在卸料和加工期间防止污染物进入时才需要筛网组.如需要,HFDK-4201 EHV 允许使用精细网筛(400
网孔/65µm),而不会造成压力随着时间的推移而增加.对于一般使用,250 网筛 (100µm) 已足够.开始时,建议使用 DFDK-4850 实现稳定的挤塑机条件.

NOTE	
1.	Base resin
2.	Karl Fischer titration
3.	0.2 MPa

Recommended distributors for this material

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