

## UNIGARD™ RE DFDC-1638 BK

Non-Halogen, Flame Retardant, Thermoplastic Jacket Compound

The Dow Chemical Company

### Описание материалов:

No halogen, flame retardant, thermoplastic sheath material

UNIGARD™RE DFDC-1638 Black is a halogen-free, high flame retardant grade, thermoplastic, low smoke, low corrosion and low toxicity material. This material is used in the field of universal electric sheath. The sheath made with this product can easily pass the IEEE-383/UL-1685 (limited smoke production test) vertical bracket cable combustion test. Of course, the structure of the cable plays an important role in the flame retardant performance. The maximum operating temperature of cables using this material as a sheath can be as high as 90°C.

This product can replace PVC, low-smoke PVC and halogen-containing rubber as sheath materials. It has excellent fire safety (low smoke, low corrosion and low toxicity) and good performance balance. This product can meet or exceed the specifications of many industries for sheath materials: UL-1277 bracket cables, general-purpose communication cables required by UL Subject 444, rail transit applications and various international application fields.

As a halogen-free flame retardant sheath material, DFDC-1638 Black can also be used to replace ordinary non-halogen sheath products. Compared with the existing non-halogen sheath products, the extrusion temperature of this product is higher (up to 392 °F [200°C]), and the common single spiral metering PE screw can be used for extrusion processing.

#### Features

UNIGARD RE DFDC-1638 Black has the following characteristics:

High flame retardancy (IEEE 383 combustion test grade)

Environmental protection (lead-free, halogen-free, sulfur-free/antimony-free)

low smoke, low corrosiveness and low toxicity

Easy extrusion without special screw

Excellent cutting resistance, extrusion resistance and wear resistance

Good UV resistance, moisture resistance and waterproof performance

Has a good balance between toughness and flexibility

electrical mark resistance and corrosion resistance

### Главная Информация

Используется	Огнезащитный кожух Промышленный кабельный кожух LSZH Куртка Применение проводов и кабелей Оболочка провода связи		
Рейтинг агентства	IEEE 383 UL 1277 UL 1685 UL 444		
Формы	Частицы		
Метод обработки	Экструзия		
Физический	Номинальное значение	Единица измерения	Метод испытания
Плотность	1.50	g/cm <sup>3</sup>	ASTM D1505
Механическое поглощение воды-7 дней(70 °C)	14.3	mg/in <sup>2</sup>	UL 1581

Устойчивость к истиранию <sup>1</sup>	1	%	ASTM D1044
Усадка-4 часа(100 °C)	5.3	%	REA 89
Предел прочности при растяжении			ASTM D638
100°C <sup>2</sup>	95	%	ASTM D638
7 days : 121°C	110	%	ASTM D638
Коэффициент удлинения			ASTM D638
100°C <sup>3</sup>	70	%	ASTM D638
7 days : 121°C	63	%	ASTM D638
Термическая деформация			UL 1581
100°C	5.2	%	UL 1581
121°C	49	%	UL 1581
Тест на кислотный газ			MIL C-24643
Acid by Weight	0.43	%	MIL C-24643
US Navy pH	3.30		MIL C-24643
Токсичность	0.820		NES 713
Кислотный газ выброс pH-Международный электротехнический комм.	5.20	ppg	IEC 754-2
Проводимость кислотного газа-Изменение проводимости		µS/mm	IEC 754-2
Индекс температуры (сгорание)-Критический	> 375	°C	NES 715
Дыма (2,54 мм)	12.0		NES 711
Плотность Дыма			ASTM E662
Flaming Mode - D1.5 : 2.54 mm	0.40		ASTM E662
Flaming Mode - D4.0 : 2.54 mm	2.7		ASTM E662
Flaming Mode - Dm, (corr.) : 2.54 mm	59		ASTM E662
Non-flaming Mode - D1.5 : 2.54 mm	0.70		ASTM E662
Non-flaming Mode - D4.0 : 2.54 mm	21		ASTM E662
Non-flaming Mode - Dm, (corr.) : 2.54 mm	280		ASTM E662
Устойчивость к треку и эрозии	Pass @ 240 hrs		ASTM D2132
Сопrotивление солнечному свету	Pass		UL 1581
Экологическое сопротивление растрескиванию (10% Igepal)	720	hr	ASTM D1693
<b>Твердость</b>	<b>Номинальное значение</b>	<b>Единица измерения</b>	<b>Метод испытания</b>
Твердость дюрометра (Shore A)	88		ASTM D2240
<b>Механические</b>	<b>Номинальное значение</b>	<b>Единица измерения</b>	<b>Метод испытания</b>
Прочность на растяжение	13.8	MPa	ASTM D638
Удлинение при растяжении (Break)	160	%	ASTM D638
Флекторный модуль-1% Secant	207	MPa	ASTM D790

Эластомеры	Номинальное значение	Единица измерения	Метод испытания
Tear Strength (Split)	6.1	kN/m	ASTM D470
Тепловой	Номинальное значение	Единица измерения	Метод испытания
Температура ломкости	-20.0	°C	ASTM D746
Электрический	Номинальное значение	Единица измерения	Метод испытания
Сопrotивление громкости	3.9E+14	ohms-cm	ASTM D257
Диэлектрическая постоянная			ASTM D150
60 Hz	3.72		ASTM D150
100 kHz	3.63		ASTM D150
1 MHz	3.56		ASTM D150
Коэффициент рассеивания			ASTM D150
60 Hz	5.0E-3		ASTM D150
100 kHz	7.2E-3		ASTM D150
1 MHz	0.013		ASTM D150
Воспламеняемость	Номинальное значение	Единица измерения	Метод испытания
Индекс кислорода	40	%	ASTM D2863
Дополнительная информация	Номинальное значение	Метод испытания	

Fluid Resistance: Diesel Fuel, MIL-F-16884, 24 hrs, 35°C

Extruded tapes (25 mil) or compression-molded plaques, except for these items based on 45 mil/14 AWG (1.63 mm dia.) wires.

Tensile Strength Retention: 76%

Elongation Retention: 112%

Hydraulic Fuel, MIL-H-5606, 24 hrs, 49°C

Extruded tapes (25 mil) or compression-molded plaques, except for these items based on 45 mil/14 AWG (1.63 mm dia.) wires.

Tensile Strength Retention: 66%

Elongation Retention: 98%

Hydraulic Fuel, MIL-H-17672, 24 hrs, 49°C

Tensile Strength Retention: 72%

Elongation Retention: 105%

Lubricating Oil, MIL-L-23699, 24 hrs, 49°C

Tensile Strength Retention: 80%

Elongation Retention: 116%

ASTM #2 Oil, 4 hrs, 70°C

Tensile Strength Retention: 65%

Elongation Retention: 87%

## Инструкции по экструзии

DFDC-1638 Black can be processed on a wide range of commercially available cable fabrication equipment. Generally, it is recommended that a low compression, shallow metering PE screw be used for processing this product. A very low compression (1.1:1 type) screw can be used successfully; however, breakerplate and 20/40 mesh screen pack should be used to generate adequate back-pressure. Based on tests completed on 2.5 inch, 24:1 Davis Standard extruder, the following typical conditions are recommended as a starting point. However, it may be necessary to optimize conditions for a given set of construction, extruder-screw configuration and tooling. Extruder

Extruder L/D 20:1 to 24:1

Screw Metering Depths:

2.5 in: 110-130 mil

3.5 in: 140-170 mil

4.5 in: 200-240 mil

Compression Ratio 3:1

Temperature Profile

Feed Zone: 300°F-325°F (149°C-162°C)

Barrel Zone: 380°F-400°F (193°C-204°C)

Head/Die Zone: 350°F-360°F (175°C-180°C)

Flat temperature profile: 360°F-400°F (180°C-204°C)

Draw-Down Ratio (DDR)

Core Diameter less than 0.5 in (13 mm) 1:1 to 1.25:1

Core Diameter greater than 0.5 in (13 mm) 2:1

Tooling

Semi-pressure tooling improves surface finish. Tube-on tooling: Retract guider-tip slightly into die.

Die

Short-land tapered die is preferred.

Vacuum

Though not usually necessary, on occasion, may help obtain a tight jacket and offset any low DDR effect.

Air-Gap/Cooling Water

Short air gap (such as 6 inches or 150 mm) and ambient water.

Pre-Drying

Pre-drying at approximately 158°F (70°C) for 4 hours is recommended in commercially available dehumidifying dryers. Do not heat over 195°F (90°C).

## NOTE

- |    |  |
|----|--|
| 1. | 1000 cycles  |
| 2. | 10 days. Based on 0.045 in./14 AWG (1.63 mm dia.) wires. |
| 3. | 10 days. Based on 0.045 in./14 AWG (1.63 mm dia.) wires. |

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