

# AKROTEK®

## PK-VM GF 30 FR orange (8537)

PK GF30 FR(40)

AKROTEK® PK-VM GF 30 FR orange (8537) is a 30% glass fibre reinforced, flame retardant and process improved Polyketone compound, colored in orange similar to RAL 2003. The flame retardant system is free of red phosphorous and halogens. Due to its good chemical resistance, good dimensional stability and high elongation at break it is suitable for high voltage components in e-mobility.

### Features

hydrolysis / chemically stabilised    flame retardant

process improved    E-Mobility

### Regulatory



### Properties

#### Modulus

8.600 MPa

#### Strength

125 MPa

#### Impact

70 kJ/m<sup>2</sup>

## Mechanical Properties

### Tensile modulus

ISO 527-2

1 mm/min | d.a.m.

8600 MPa

1 mm/min | conditioned

8200 MPa

### Tensile stress at break

ISO 527-2

5 mm/min | d.a.m.

125 MPa

5 mm/min | conditioned

120 MPa

### Tensile strain at break

ISO 527-2

5 mm/min | d.a.m.

3,5 %

5 mm/min | conditioned

3,5 %

### Charpy impact strength

ISO 179-1/1eU

23°C | d.a.m.

70 kJ/m<sup>2</sup>

23°C | conditioned

70 kJ/m<sup>2</sup>

### Charpy notched impact strength

ISO 179-1/1eA

23°C | d.a.m.

13 kJ/m<sup>2</sup>

23°C | conditioned

15 kJ/m<sup>2</sup>

## Thermal Properties

#### RTI electrical

UL 746B

|    |                      |        |
|----|----------------------|--------|
| UL | 0,8mm Wall thickness | 105 °C |
| UL | 1,6mm Wall thickness | 105 °C |
| UL | 3,2mm Wall thickness | 105 °C |

#### RTI impact

UL 746B

|    |                      |       |
|----|----------------------|-------|
| UL | 0,8mm Wall thickness | 70 °C |
| UL | 1,6mm Wall thickness | 70 °C |
| UL | 3,2mm Wall thickness | 80 °C |

#### RTI strength

UL 746B

|    |                      |        |
|----|----------------------|--------|
| UL | 0,8mm Wall thickness | 115 °C |
| UL | 1,6mm Wall thickness | 115 °C |
| UL | 3,2mm Wall thickness | 125 °C |

#### Temperature of deflection under load HDT/A

ISO 75

|         |        |
|---------|--------|
| 1,8 MPa | 213 °C |
|---------|--------|

#### Melting temperature

ISO 11357-3

|              |        |
|--------------|--------|
| DSC, 10K/min | 220 °C |
|--------------|--------|

#### Ball pressure test

IEC 60695-10-2

> 115 °C

#### Coefficient of linear thermal expansion

ISO 11359-1/2

|                           |                          |
|---------------------------|--------------------------|
| 23°C to 80°C   parallel   | 0,14 10 <sup>-4</sup> /K |
| 23°C to 80°C   transverse | 1,19 10 <sup>-4</sup> /K |

## Flammability

#### Flammability

UL 94

|    |                       |           |
|----|-----------------------|-----------|
| UL | 0,8 mm Wall thickness | V-0 Class |
| UL | 1,6 mm Wall thickness | V-0 Class |
| UL | 3,2 mm Wall thickness | V-0 Class |

#### GWFI

IEC 60695-2-12

|    |                       |        |
|----|-----------------------|--------|
| UL | 0,8 mm Wall thickness | 960 °C |
| UL | 1,6 mm Wall thickness | 960 °C |
| UL | 3,2 mm Wall thickness | 960 °C |

#### GWIT

IEC 60695-2-13

|    |                       |        |
|----|-----------------------|--------|
| UL | 0,8 mm Wall thickness | 825 °C |
| UL | 1,6 mm Wall thickness | 825 °C |
| UL | 3,2 mm Wall thickness | 850 °C |

#### HWI

UL 746A

|    |                       |       |
|----|-----------------------|-------|
| UL | 0,8 mm Wall thickness | 0 PLC |
| UL | 1,6 mm Wall thickness | 0 PLC |
| UL | 3,2 mm Wall thickness | 0 PLC |

#### HAI

UL 746A

|    |                       |       |
|----|-----------------------|-------|
| UL | 0,8 mm Wall thickness | 0 PLC |
| UL | 1,6 mm Wall thickness | 0 PLC |
| UL | 3,2 mm Wall thickness | 0 PLC |

## Burning rate (<100 mm/min)

FMVSS 302

> 1 mm Thickness

+

## General Properties

### Density

ISO 1183

23°C

1,48 g/cm<sup>3</sup>

### Humidity absorption

ISO 1110

70°C, 62% r.H.

0,4 - 0,6 %

### Molding shrinkage

ISO 294-4

flow

0,3 - 0,5 %

transverse

0,8 - 1,0 %

## Electrical Properties

### Volume resistivity

IEC 62631-3-1

**UL** d.a.m.

10<sup>10</sup> Ω x cm

### Surface resistivity

IEC 62631-3-2

**UL** d.a.m.

10<sup>13</sup> Ω

### Comparative tracking index

IEC 60112

**UL** Test liquid A

600 V

### Comparative tracking index

ASTM D3638

**UL**

0 PLC

### Dielectric strength

IEC 60243

1 mm

29 kV/mm

### Inclined-Plane Tracking, IPT

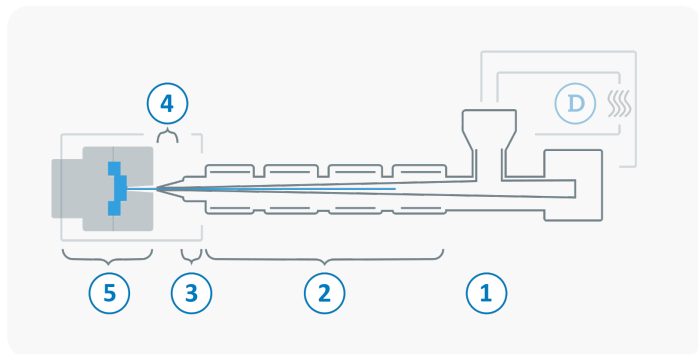
ASTM D2303-13

**UL**

1 kV

## Processing

The values mentioned are recommendations. We only recommend desiccant / dry air dryers or vacuum dryers. Too long a drying time and the resulting residual moisture content below the lower limit can lead to filling problems and surface defects. The specified drying time refers to closed and undamaged bagged material. When processing from previously opened bags or from octabins with polyolefin inliners, a longer drying time may be necessary. It is recommended to check the residual moisture content after the drying process.



|          |  |                      |
|----------|--|----------------------|
| <b>D</b> | <b>Drying time</b>   | <b>0 - 4 h</b>       |
|          | <b>Drying temperature (<math>\tau \leq -30^{\circ}\text{C}</math>)</b> | <b>80 °C</b>         |
|          | <b>Processing moisture</b>   | <b>0,02 - 0,1 %</b>  |
| <b>1</b> | <b>Feed section</b>  | <b>60 - 80 °C</b>    |
| <b>2</b> | <b>Temperature Zone 1 - Zone 4</b>                                     | <b>210 - 240 °C</b>  |
| <b>3</b> | <b>Nozzle temperature</b>  | <b>230 - 240 °C</b>  |
| <b>4</b> | <b>Melt temperature</b>  | <b>230 - 240 °C</b>  |
| <b>5</b> | <b>Mold temperature</b>  | <b>60 - 100 °C</b>   |
| <b>→</b> | <b>Holding pressure, spec.</b>   | <b>300 - 800 bar</b> |
| <b>←</b> | <b>Back pressure, spec.</b>  | <b>30 - 50 bar</b>   |
|          | <b>Injection speed</b>   | <b>medium</b>        |
|          | <b>Screw speed</b>   | <b>5 - 10 m/min</b>  |



Polyketones crosslink depending on time and temperature, crosslinking is noticed by an increase of viscosity and/or dark spots in natural colored compounds. The melt temperature should be at or below 240 °C and under no circumstances go beyond 250 °C because crosslinking speed will increase. The use of a hot runner system is not recommended when processing polyketone. However, if it is used, it should be noted that the residence time in the barrel including the hot runner should not exceed 4 min. If interruptions of more than 4 minutes are expected, the barrel and hot runner need to be purged and cleaned with polyolefins. The molding machine needs to be purged with polyolefins before and after processing of AKROTEK® PK! There is a risk of cross linking caused by reactions with POM or PA as well as unsuitable masterbatches or cleaning compounds! Crosslinking is noticed by an increase of viscosity and or dark spots in natural colored compounds. In this case purge immediately with polyolefins. Further processing instructions are available on request.