

# SOLEF® 21216 / 1001

PVDF Copolymer (VF<sub>2</sub> - HFP)

Very high molecular weight - Lithium batteries.  
Exclusively available as powder.

Physical properties	Standards	Units	
Density	ISO 1183	g/cm <sup>3</sup>	<b>1.78</b>
Water absorption (24 h at 23°C)	ISO 62 (method 1)	%	<b>&lt; 0.04</b>
Melt Flow Index	ASTM D 1238		
	230°C, 10 kg	g/10 min	<b>1.3<sup>(1)</sup></b>
	230°C, 5 kg	g/10 min	-
	230°C, 2.16 kg	g/10 min	-

## Mechanical properties

<b>Tensile</b>	ASTM D 638		
Tensile stress at yield	23 °C, 50 mm/min	MPa/psi	<b>15 - 25/2175 - 3625</b>
Tensile stress at break		MPa/psi	<b>25 - 45/3625 - 6525</b>
Elongation at yield		%	<b>15 - 18</b>
Elongation at break		%	<b>300 - 650</b>
Modulus	23 °C, 1 mm/min	MPa/psi	<b>500/72500</b>
<b>Flexion</b>	ASTM D 790		
Maximum load	23 °C 2 mm/min	MPa/psi	-
Modulus		MPa/psi	<b>400/58000</b>
IZOD impact (notched V 10 mm - at 23 °C - 4 mm thick)	ASTM D 256	J/m	-
Shore D Hardness (2 mm thick)	ASTM D 2240	-	-
Abrasion resistance	TABER CS 10/1 kg	mg/1000 rev	<b>5 - 15</b>
Friction coefficient:	ASTM D 1894	static	<b>0.2 - 0.4</b>
		dynamic	<b>0.2 - 0.3</b>

## Thermal properties

<b>Crystallinity by DSC</b>	ASTM D 3418		
Melting point		°C/°F	<b>135/275</b>
Heat of fusion (80 °C to end of melting)		J/g	<b>26</b>
Crystallizing point		°C/°F	<b>98/208</b>
Crystallization heat		J/g	<b>28</b>
<b>VICAT point</b> (4 mm thick)	ISO 306		
load 1 kg		°C/°F	<b>131/268</b>
<b>Deflection temperature</b> (4 mm thick)	ASTM D 648		
load 0.46 MPa	after annealing	°C/°F	-
load 1.82 MPa		°C/°F	<b>39/102</b>
Glass transition (T <sub>g</sub> )	DMTA	°C/°F	<b>- 30/- 22</b>
Brittleness temperature (on 2 mm pressed sheet)	ASTM D 746 A	°C/°F	<b>- 35/- 31</b>

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Thermal properties (continuation)	Standards	Units	
Molding shrinkage		%	-
Thermal stability	TGA beginning- and at 1% weight loss in air	°C/°F	330 - 350/626 - 662
Linear thermal expansion coefficient	ASTM D 696	10 <sup>-6</sup> K <sup>-1</sup>	160 - 180
Thermal conductance at 23°C	ASTM C 177	W/m.K	0.18
Specific heat	23 °C & 100 °C	J/g.K	1.2 - 1.6

## Electrical properties

Surface resistivity Voltage < 1V, after 2 min - 500 V at 23 °C	[ ASTM D 257 DIN 53483	ohm/square	≥ 1.10 <sup>14</sup>
Volume resistivity Intensity = 10 mA, after 2 min at 23 °C	[ ASTM D 257 DIN 53483	ohm.cm	≥ 1.10 <sup>14</sup>
Dielectric constant at 1 MHz	ASTM D 150	-	7
Tg delta at 1 MHz	ASTM D 150	-	0.2

## Fire resistance

UL-94 Flammability test	UL-94	Class	-
Limiting Oxygen Index (sheet 3 mm thick)	ASTM D 2863	%	44

(1) MFI under 21.6 kg/230°C. Intrinsic viscosity (25°C/DMF): 0,21 l/g.

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January 2003