

## Unic Film UMC-Series black EV20520

**Unic Film UMC-Series black** (EV20520) displays a very well-balanced property profile, such as a high abrasion and wear resistance, a low sliding friction coefficient as well as a high impact strength; conductive; high molecular weight; FDA compliant, for which reason present series is particularly applied and used in the food and beverage industry, in the storage and packaging industry as well as in the mechanical engineering sector.

	Test Method	Unit	Value
<b>General Physical Properties</b>			
density	DIN EN ISO 1183	g/cm <sup>3</sup>	0.94
molecular weight (1)		10 <sup>6</sup> g/mol	10
<b>Thermal Properties (2)</b>			
melting temperature (DSC, 10 K/min)	DIN 3146	°C	135
heat conductivity (+23 °C)	DIN 52612-1	W/(m*K)	0.41
average coefficient of linear thermal expansion (23 to 60 °C)	ISO 11359 parts 1 and 2	°C <sup>-1</sup>	~ 2*10 <sup>-4</sup>
service temperature, long term (3)	reference values	°C	-200 ... 80
service temperature, short term (max) (4)	reference values	°C	130
<b>Mechanical Properties</b>			
ultimate elongation at break (5)	DIN EN ISO 527-1/-2	%	400
tensile modulus of elasticity (5)(6)	DIN EN ISO 52 -1/-2	MPa	500
notch impact strength (7)(2)	DIN EN ISO 11542 part 2	kJ/m <sup>2</sup>	≥ 90
shore hardness (8)	DIN EN ISO 868	D scale	65
<b>Electrical Properties</b>			
contact resistance	DIN EN 60079-0 and/or 13463-1	Ω * cm	<10 <sup>4</sup>
surface resistance	DIN EN 60079-0 and/or 13463-1	Ω	<10 <sup>3</sup>
dielectric strength (9)	DIN EN 60079-0 and/or 13463-1	kV/mm	./.

**The values indicated herein are mean values safeguarded by continuous monitoring and recurring testing. Present data exclusively represent the properties of the materials (indicative values) – unless expressly agreed, they shall not be contractually guaranteed.**

- (1) This is the average molar mass of the PE-UHMW (= ultra-high molecular weight polyethylene) resins – irrespective of any additives – used for the manufacture of this material. It is calculated by means of the Margolies equation  $M = 5.37 \times 10^4 \times [\eta]^{1.49}$  with  $[\eta]$  being the intrinsic viscosity (Staudinger index), derived from a viscosity measurement according to ISO 1628-3:2001, using decahydronaphtalene as a solvent (concentration of 0.0002 g/cm<sup>3</sup>).
- (2) The values given for these properties are, for the most part, derived from raw material supplier data (material data sheet) as well as from other publications.
- (3) Valid only for short time exposure (a few hours) in applications where no or only a very low load is applied to the material.
- (4) Temperature resistance over a period of 20,000 hours. After this period of time, there is a decrease in tensile strength – measured at 23 °C – of approximately 50% as compared with the original value. The maximum allowable service temperature indicated herein is thus based on the thermal-oxidative degradation taking place, causing a reduction in properties. Note, however, that in many cases the highest admissible service temperature essentially depends on the duration and the magnitude of the mechanical load/stress the material is subjected to during heat exposure.
- (5) Average values from test specimen taken (machine direction orientation)
- (6) Test speed: 1 mm/min
- (7) With 14° sharp, double-sided V-notch
- (8) Measured on 10 mm thick test specimens for a duration of 15 seconds
- (9) Electrode configuration: two (2) coaxial cylinders (ø25 mm / ø75mm); in transformer oils according to IEC (= International Electrotechnical Commission) Regulation No 60296; measured on 1 mm thick test specimen. It is important to note that the dielectric strength of UniC Film black may be considerably lower than the value indicated in the table for UniC Film off-white.

Present table shall provide valuable assistance in the choice of material. The data listed herein are within the normal range of product properties. However, they are not guaranteed and they should neither be used to establish material specifications/specification limits nor should they be consulted as a basis of design.

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