

CARLSSON & MÖLLER

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BEMALON VMX FG

Type of plastics: Semi-crystalline thermoplastic, PE-UHMW, modified
(Visual, Metal detectable & X-ray) Area of application: Food

	Mat.	Test methods	Unit	Value
Physical properties (indicative values*)				
Colour				grey
Average molar mass (average molecular weight) (1)			10 ⁶ g/mol	9
Density		ISO 1183-1	g/cm ³	1.01
Water absorption				
• at saturation in water of +23°C		ISO 62	%	<0.1
Thermal properties (2)				
Melting temperature (DSC, +10°C/min)		ISO 11357-1/-3	°C	135
Thermal conductivity at +23°C			W/(K.m)	-
Coefficient of linear thermal expansion			m/(m.K)	200E-6
• average value between +23°C and +100°C				
Temperature of deflection under load				
• method A: 1.8 MPa	+	ISO 75-1/-2	°C	42
Vicat softening temp VST/B50			°C	82
Max. allowable service temperature in air				
• for short periods (a few hours) (3)			°C	120
• continuously 20.000 h (4)			°C	80
Min. service temperature (5)			°C	-150
Flammability (6)				
• "Oxygen Index"		ISO 4589-1/-2	%	<20
• according to UL 94 (6 mm thickness)				HB
Mechanical properties at +23°C (7)				
Tension test (8)				
• tensile stress at yield (9)	+	ISO 527-1/2	MPa	20
• tensile strain at yield (9)	+	ISO 527-1/-2	%	11
• tensile strain at break (9)	+	ISO 527-1/-2	%	>50
• tensile modulus of elasticity (10)	+	ISO 527-1/-2	MPa	755
Compression test (11)				
• compressive stress at 1 / 2 / 5 % nominal strain (10)	+	ISO 604	MPa	6/10/16.5
Charpy impact strength-unnotched (12)	+	ISO 179-1/1eU	kJ/m ²	no break
Charpy impact strength-notched	+	ISO 179-1/1eA	kJ/m ²	114P
Charpy impact strength - double 14° notch (13)	+	ISO 11542-2	kJ/m ²	184
Ball indentation hardness (14)	+	ISO 2039-1	N/mm ²	36
Shore hardness D (14)				62
Relative volume loss in a wear test "sand-water slurry"		TIVAR 100=100		90
Electrical properties at +23°C				
Electric strength (15)	+	IEC 60243-1	kV/mm	
Volume resistivity	+	IEC 60093	Ohm.cm	>10E14
Surface resistivity	+	IEC 60093	Ohm/sq	>10E12
Relative permittivity ϵ_r				
• at 100Hz	+	IEC 60250		-
• at 1 MHz	+	IEC 60250		-
Electric loss $\tan \delta$				
• at 100 HZ	+	IEC 60250		-
• at 1 MHz	+	IEC 60250		--
Comparative tracking index (CTI)	+	IEC 60112		-

Legend:

+ : values referring to dry material
++ : values referring to material in equilibrium with the standard atmosphere 23°C / 50% RH (mostly derived from literature)

(1) This is the average molar mass of the PE-UHMW 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 (η) being the intrinsic viscosity (Staudinger index) derived from a viscosity measurement according to ISO 1628-3:2001, using decahydronaphthalene as a solvent (concentration 0.001 g/cm³).

(2) The figures given for these properties are for the most part derived from raw material supplier data and other publications.

(3) 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 about 50% as compared with the original value. The temperature value given here is thus based on the thermal-oxidative degradation which takes place and causes a reduction in properties.

Note, however, that the maximum allowable service temperature depends in many cases essentially on the duration and the magnitude of the mechanical stresses to which the material is subjected.

(5) Impact strength decreasing with decreasing temperature, the minimum allowable service temperature is practically mainly determined by the extent to which the material is subjected to impact. The value given here is based on unfavourable impact conditions and may consequently not be considered as being the absolute practical limit.

(6) These estimated ratings, derived from raw material supplier data and other publications, are not intended to reflect hazards presented by the material under actual fire conditions.

(7) The figures given for these properties are average values of tests run on test specimens machined out of 20 - 30 mm thick plates.

(8) Test specimens: Type 1 B

(9) Test speed: 50 mm/min

(10) Test speed: 1 mm/min

(11) Test specimens: cylinders Ø8 mm x 16 mm

(12) Pendulum used: 15 J

(13) Pendulum used: 25 J

(14) Measured on 10 mm thick test specimens.

(15) Electrode configuration: Ø25 / Ø75 mm coaxial cylinders; in transformer oil according to IEC 60296; 1 mm thick test specimens.

Please note that the electric strength of black or coloured material can be considerably lower than the figures listed in the table which refers to **natural** material.

** This table, mainly to be used for comparison purposes, is a valuable help in the choice of a material. The data listed here fall within the normal range of product properties. However, they are not guaranteed and they should not be used to establish material specification limits nor used alone as the basis of design.*

The material meets the EU regulation 10/2011 regarding materials and plastics intended to come into contact with food. Declaration of materials can be obtained on request.

Values are based on manufacturer data and are not binding. Differences in values may occur