Product Information

VESTAMID® Care ML21

HIGH VISCOSITY POLYAMIDE 12 FOR MEDICAL APPLICATION



VESTAMID® Care ML21 is resistant to body fluids and toxicologically safe.

Typical application areas for filled VESTAMID Care ML grades include catheters, housing parts, monitoring and imaging devices and durable medical equipment.

The advantages at a glance:

- High flexibility & elasticity
- Good rebound properties
- High impact resistance
- Excellent dimensional stability
- High chemical resistance
- Easy processability & colorability
- Plasticizer-free
- Gamma and EtO sterilization resistant
- Tough and resilient

Biocompatibility of VESTAMID® Care ML

Biocompatiblity was tested following ISO10993-1 recommendations for a surface medical device with up to 30 days body contact.

The material fulfills the requirements of USP<88> class VI.

Tests were performed by independent, certified laboratories.

Biocompatibility tests for VESTAMID® Care:

Standard	Description
ASTM F756-08	Hemocompatibility
ISO 10993-5	Cytotoxicity
ISO 10993-10	Sensitization: Maximization test according to Magnusson and Kligman
ISO 10993-10	Irritation: Intracutaneous Reactivity
ISO 10993-11	Acute Systemic Toxicity
USP Class VI	Acute Systemic Toxicity Intracutaneous Reactivity Muscle Implantation

Processing of VESTAMID® Care

For information about processing of VESTAMID®, please follow the general commendations about "Processing of VESTAMID® compounds".

The values presented are typical or average values, they do not constitute a specification.

FOR FURTHER INFORMATION PLEASE CONTACT US AT EVONIK-HP@EVONIK.COM
OR VISIT OUR PRODUCT AT WWW.EVONIK.COM/MEDICAL-TECHNOLOGY

EVONIK Leading Beyond Chemistry

Key Features

Industrial Sector
Sustainable, Medical Devices

Sustainability
Sustainable electricity

Processing
Injection molding

Delivery form
Pellets, Granules

Resistance to
Heat (thermal stability)

Conformity
Biocompatibility, Medical application

Additives
Unfilled

LCA-values	dry	Unit	Test Standard
LCA name of certificate	VESTAMID® L	-	ISO 14040, 14044
LCA certifier	TÜV Rheinland	-	ISO 14040, 14044
Blue water consumption	**14.4**	kg	ISO 14040, 14044
Global Warming Potential incl. bio. C incl. LUC	**5.8**	kg CO_2 eq./kg	ISO 14040, 14044
Global Warming Potential excl. bio. C incl. LUC	**5.8**	kg CO_2 eq./kg	ISO 14040, 14044
Land use (ReCiPe 2016)	**0**	Annual crop eq. y	ISO 14040, 14044
GWP savings as compared to 2023 reference	**-1.3**	kg CO_2 eq./kg	ISO 14040, 14044

Mechanical properties ISO	dry / cond	Unit	Test Standard
Tensile modulus	**1450 / 1100**	MPa	ISO 527
Tensile strength	**44 / 38**	MPa	ISO 527
Yield stress	**44 / 38**	MPa	ISO 527
Yield strain	**5 / 10**	%	ISO 527
Stress at 50% strain	**35 / -**	MPa	ISO 527
Stress at break	**46 / -**	MPa	ISO 527
Nominal strain at break, tB	**190 / >50**	%	ISO 527
Charpy impact strength, +23°C	**N / N**	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	**N / N**	kJ/m²	ISO 179/1eU
Charpy notched impact strength, +23°C	**32 / 17**	kJ/m²	ISO 179/1eA

Type of failure	**C / C**	-	-
Charpy notched impact strength, -30°C	**9 / 9**	kJ/m²	ISO 179/1eA
Type of failure	**C / C**	-	-
Flexural modulus, 23°C	**1400 / 1100**	MPa	ISO 178
Flexural stress at conv. deflection, 23°C	**45 / 35**	MPa	ISO 178
Flexural strength, 23°C	**60 / 45**	MPa	ISO 178
Flexural strain at flexural strength, 23°C	**6.5 / 8**	%	ISO 178

Thermal properties	dry / cond	Unit	Test Standard
Melting temperature	**178 / ***	°C	ISO 11357-1/-3
Glass transition temperature, DSC	**45 / ***	°C	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	**50 / ***	°C	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	**110 / ***	°C	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	**170 / ***	°C	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	**140 / ***	°C	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	**150 / ***	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, 23°C to 55 °C, normal	**150 / ***	E-6/K	ISO 11359-1/-2
Melting Temperature	**178**	°C	ASTM D 3418

Physical properties	dry / cond	Unit	Test Standard
Density	**1010 / 1010**	kg/m³	ISO 1183
Water absorption	**1.5 / ***	%	Sim. to ISO 62
Humidity absorption	**0.7 / ***	%	Sim. to ISO 62
Shore D hardness	**75[b] / -**	-	ISO 7619-1
Density	**1010**	kg/m³	ASTM D 792

b: 3 seconds

Burning Behav.	dry / cond	Unit	Test Standard
Burning behav. at 1.5 mm nom. thickn.	**HB / ***	class	IEC 60695-11-10

Thickness tested	**1.6 / ***	mm	-
Burnin behav. at thickness h	**HB / ***	class	IEC 60695-11-10
Thickness tested	**3.2 / ***	mm	-

Electrical properties	dry / cond	Unit	Test Standard
Volume resistivity, V	**>1E13 / 3E12**	Ohm*m	IEC 62631-3-1
Surface resistivity, E	*** / >1E15**	Ohm	IEC 62631-3-2
Surface resistivity, C, circular electrodes	**>1E15 / -**	Ohm per square	IEC 62631-3-2
Relative permittivity, 100Hz	**3.7 / 5**	-	IEC 62631-2-1
Relative permittivity, 1MHz	**3 / 3.3**	-	IEC 62631-2-1
Dissipation factor, 100Hz	**450 / 800**	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	**280 / 500**	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/S20, t. 1 mm	**- / 28**	kV/mm	IEC 60243-1
Dielectric strength, AC, S20/P50	**29 / -**	kV/mm	Sim. to IEC 60243-1
CTI, test solution A, 50 drops value	**600 / 600**	-	IEC 60112
Assessment of the insulation group	**I**	-	DIN EN 60664-1

Rheological properties	dry / cond	Unit	Test Standard
Melt volume-flow rate, MVR	**6 / ***	cm^3/10min	ISO 1133
Temperature	**230 / ***	°C	-
Load	**5 / ***	kg	-
Molding shrinkage, parallel	**0.7 / ***	%	ISO 294-4, 2577
Molding shrinkage, normal	**1.2 / ***	%	ISO 294-4, 2577

Test specimen production	dry	Unit	Test Standard
Injection Molding, melt temperature	**240**	°C	ISO 294
Injection Molding, mold temperature	**60**	°C	ISO 294
Injection Molding, injection velocity	**200**	mm/s	ISO 294

Characteristics

Special Characteristics
High heat resistant, High viscosity

Features
Low coefficient of friction

Regulatory
US Pharmacopeia Class VI conformity

Color
Natural color

Chemical Resistance
General chemical resistance

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