

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

Biocompatibility 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.

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/m ²	ISO 179/1eU
Charpy impact strength, -30°C	N / N	kJ/m ²	ISO 179/1eU
Charpy notched impact strength, +23°C	32 / 17	kJ/m ²	ISO 179/1eA

Type of failure	C / C	-	-
Charpy notched impact strength, -30°C	9 / 9	kJ/m ²	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/m ³	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/m ³	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