

Product Information

**VESTAMID® Care ML17**

**LOW VISCOSITY POLYAMIDE 12 FOR MEDICAL APPLICATION**



VESTAMID® Care ML17 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

**Key Features**

**Industrial Sector**

Sustainable, Medical Devices

**Sustainability**

Sustainable electricity

**Processing**

Injection molding

**Delivery form**

Pellets, Granules

**Optics**

Translucent

**Conformity**

Biocompatibility, Medical application

**Additives**

Unfilled

LCA-values	dry	Unit	Test Standard
LCA name of certificate	<a href="#">VESTAMID® L</a>	-	ISO 14040, 14044
LCA certifier	<a href="#">TÜV Rheinland</a>	-	ISO 14040, 14044
Blue water consumption	<b>14.4</b>	kg	ISO 14040, 14044
Global Warming Potential incl. bio. C incl. LUC	<b>5.8</b>	kg CO <sub>2</sub> eq./kg	ISO 14040, 14044
Global Warming Potential excl. bio. C incl. LUC	<b>5.8</b>	kg CO <sub>2</sub> eq./kg	ISO 14040, 14044
Land use (ReCiPe 2016)	<b>0</b>	Annual crop eq. y	ISO 14040, 14044
GWP savings as compared to 2023 reference	<b>-1.3</b>	kg CO <sub>2</sub> eq./kg	ISO 14040, 14044

Mechanical properties ISO	dry / cond	Unit	Test Standard
Tensile modulus	<b>1400 / 1120</b>	MPa	ISO 527
Tensile strength	<b>43 / 41</b>	MPa	ISO 527
Yield stress	<b>43 / 41</b>	MPa	ISO 527
Yield strain	<b>5 / 13</b>	%	ISO 527
Stress at 50% strain	<b>31 / 31</b>	MPa	ISO 527
Stress at break	<b>58 / 32</b>	MPa	ISO 527
Nominal strain at break, tB	<b>320 / 40</b>	%	ISO 527
Charpy impact strength, +23°C	<b>N / N</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30°C	<b>N / 50</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Type of failure	<b>- / C(N)</b>	-	-

Charpy impact strength, -40°C	<b>N / -</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, +23°C	<b>4.5 / 4.5</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Type of failure	<b>C / C</b>	-	-
Charpy notched impact strength, -30°C	<b>6 / 5</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Type of failure	<b>C / C</b>	-	-
Charpy notched impact strength, -40°C	<b>6 / -</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Type of failure	<b>C / -</b>	-	-
Flexural modulus, 23°C	<b>1430 / 1120</b>	MPa	ISO 178
Flexural stress at conv. deflection, 23°C	<b>47 / 35</b>	MPa	ISO 178
Flexural strength, 23°C	<b>58 / 48</b>	MPa	ISO 178
Flexural strain at flexural strength, 23°C	<b>7 / 8</b>	%	ISO 178

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

<b>Physical properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Density	<b>1020 / -</b>	kg/m <sup>3</sup>	ISO 1183
Water absorption	<b>1.5 / *</b>	%	Sim. to ISO 62
Humidity absorption	<b>0.7 / *</b>	%	Sim. to ISO 62
Shore D hardness	<b>75<sup>[b]</sup> / -</b>	-	ISO 7619-1
Density	<b>1020</b>	kg/m <sup>3</sup>	ASTM D 792

b: 3 seconds

<b>Burning Behav.</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Burning behav. at 1.5 mm nom. thickn.	<b>HB / *</b>	class	IEC 60695-11-10
Thickness tested	<b>1.6 / *</b>	mm	-
Burnin behav. at thickness h	<b>HB / *</b>	class	IEC 60695-11-10
Thickness tested	<b>3.2 / *</b>	mm	-

<b>Electrical properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Volume resistivity, V	<b>&gt;1E13 / 2.3E12</b>	Ohm*m	IEC 62631-3-1
Surface resistivity, C, circular electrodes	<b>&gt;1E15 / &gt;1E15</b>	Ohm per square	IEC 62631-3-2
Relative permittivity, 50Hz	<b>3.9 / -</b>	-	IEC 62631-2-1
Relative permittivity, 100Hz	<b>3.8 / -</b>	-	IEC 62631-2-1
Relative permittivity, 1MHz	<b>2.9 / -</b>	-	IEC 62631-2-1
Dissipation factor, 100Hz	<b>500 / -</b>	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	<b>281 / -</b>	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/P50	<b>26 / -</b>	kV/mm	Sim. to IEC 60243-1

<b>Rheological properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Melt volume-flow rate, MVR	<b>21 / *</b>	cm <sup>3</sup> /10min	ISO 1133
Temperature	<b>210 / *</b>	°C	-
Load	<b>2.16 / *</b>	kg	-
Molding shrinkage, parallel	<b>0.7 / *</b>	%	ISO 294-4, 2577
Molding shrinkage, normal	<b>1.2 / *</b>	%	ISO 294-4, 2577
Mold temperature	<b>60 / *</b>	°C	-
Melt temperature	<b>210 / *</b>	°C	-

<b>Test specimen production</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Injection Molding, melt temperature	<b>210</b>	°C	ISO 294
Injection Molding, mold temperature	<b>60</b>	°C	ISO 294

## VESTAMID® Care

Injection Molding, injection velocity

**200**

mm/s

ISO 294

### Characteristics

#### Applications

Encapsulation, Tube and hose

#### Special Characteristics

Low viscosity

#### Features

Low coefficient of friction

#### Regulatory

US Pharmacopeia Class VI conformity

#### Color

Natural color

#### Chemical Resistance

General chemical resistance