

## VESTAMID® *Terra*

With the development of VESTAMID® *Terra*, Evonik has a new member of its VESTAMID® family: a group of new polyamides, the monomers for which are based entirely or partly on renewable raw materials.

- VESTAMID® *Terra* DS and
- VESTAMID® *Terra* HS

### VESTAMID® *Terra* DS, 100 percent natural

VESTAMID® *Terra* DS is based on polyamide 1010 und is the polycondensation product of 1,10-decamethylene diamine (D) and 1,10-decanedioic acid (sebacic acid—S). Because both monomers are extracted from castor oil, VESTAMID® *Terra* DS is a material that is based 100 percent on natural resources.

Technically speaking, VESTAMID® *Terra* DS occupies a position between the high-performance long-chain polyamides such as PA 12 and PA 1212 and the standard polyamides PA 6 und PA 66, which have a shorter chain length.

VESTAMID® *Terra* DS is semicrystalline, which is the reason for its high mechanical resistance and chemical stability. It absorbs little water and as a result its mechanical properties and high dimensional stability change little when exposed to fluctuating environmental humidity.

Despite its crystallinity, VESTAMID® *Terra* DS can be used to manufacture films with good transparency compared to other semicrystalline polyamides.

The high melting point of VESTAMID® *Terra* DS compounds results in a high heat deflection temperature that can be advantageous for some applications.



Because of its chemical and physical properties, and the plant origins of its monomers, VESTAMID® *Terra* DS is an interesting completion to conventional longer-chain polyamides, and it also meets the growing demand for materials made from renewable raw materials

### VESTAMID® *Terra* HS, partly based on renewable raw materials

VESTAMID® *Terra* HS is based on polyamide 610. PA 610 is the polycondensation product of 1,6-hexamethylene diamine (H) and 1,10-decanedioic acid (sebacic acid—S). Because sebacic acid is extracted from castor oil, VESTAMID® *Terra* HS is a material that is partly based on natural, renewable resources.

Technically speaking, VESTAMID® *Terra* HS occupies a position between the high-performance polyamide 612 and the standard polyamides PA 6 and PA 66.

Like VESTAMID® *Terra* DS, VESTAMID® *Terra* HS is also semicrystalline and thus has high mechanical resistance and chemical stability.

Due to its higher melting point, VESTAMID® *Terra* HS has a higher heat deflection temperature than VESTAMID® *Terra* DS.

## Important properties of VESTAMID® Terra DS

Property	Test method	Unit	medium visc.	high visc.	30 % GF
Solution viscosity (rel.)			1.9	2.1	1.9
Melting temperature	ISO 11357	°C	206	206	206
Glas transition temperature		°C	37	37	37
Water absorption at RT	Evonik	%	2	2	1.4
VICAT softening temperature Method B 50 N	ISO 306	°C	171	171	196
Tensile test	ISO 527				
Stress at yield		MPa	54	54	136
Strain at yield		%	5	5	4
Strain at break		%	> 100	> 100	5
Tensile modulus	ISO 527	MPa	1700	1700	7400
CHARPY impact strength	23 °C -40 °C	ISO 179/1eU kJ/m <sup>2</sup> kJ/m <sup>2</sup>	N N	N N	95 C 96 C
CHARPY notched impact strenght	23 °C -40 °C	ISO 179/1eA kJ/m <sup>2</sup> kJ/m <sup>2</sup>	7 C 7 C	11 C 14 C	19 C 11 C

N = no break

## Important properties of VESTAMID® Terra HS

Property	Test method	Unit	medium visc.	high visc.	30 % GF
Solution viscosity (rel.)			1,9	2,1	1,9
Melting temperature	ISO 11357	°C	222	222	222
Glas transition temperature		°C	48	48	48
Water absorption at RT	Evonik	%	3	3	2
VICAT softening temperature Method B 50 N	ISO 306	°C	196	196	217
Tensile test	ISO 527				
Stress at yield		MPa	61	61	147
Strain at yield		%	5	5	4
Strain at break		%	> 100	> 100	4
Tensile modulus	ISO 527	MPa	2100	2100	8300
CHARPY impact strength	23 °C -40 °C	ISO 179/1eU kJ/m <sup>2</sup> kJ/m <sup>2</sup>	N N	N N	89 C 88 C
CHARPY notched impact strenght	23 °C -40 °C	ISO 179/1eA kJ/m <sup>2</sup> kJ/m <sup>2</sup>	7 C 6 C	7 C 6 C	16 C 10 C

N = no break

\* = registered trademark

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