

Product Information

VESTAMID® eCO E40 CC50

HEAT- AND LIGHT-STABILIZED POLYAMIDE 12 ELASTOMER FOR MOLDING OF SPORT SHOE SOLES

VESTAMID® eCO E40 CC50 is a PA 12 elastomer consisting of PA 12 segments and softening segments. The material is free of volatile or migrating plasticizer.

The VESTAMID® E represents thermoplastic elastomers generically characterized as polyether block copolyamides (PEBA) consisting of PA 12 and polyether segments.

VESTAMID® eCO E40 CC50 is especially developed for sport shoe soles. It has good impact strength at low temperatures.

eCO stands for Evoniks aim to reduce CO₂ through use of renewable or circular feedstocks via mass-balance approach.

VESTAMID® eCO E40 CC50 is supplied as spherical pellets in moisture-proof packaging, ready for processing.

The process temperatures should be within a range of 170°C – 210°C.

The use of colorants may affect property values.

Inside the original and undamaged packaging, the product has a shelf life of at least 2 years when stored in dry rooms at temperatures not exceeding 30°C.

The results presented were generated from a small number of production lots. They are therefore provisional and not yet the result of a statistical analysis.

Key Features

Industrial Sector

Sustainable, Industry and Engineering, Sports and Lifestyle

Delivery form

Pellets, Granules

Sustainability

RFP (reduced foot print), eCO

Resistance to

Heat (thermal stability), UV / light / weathering

Processing
Injection molding, Extrusion

Additives
Unfilled

LCA-values	dry	Unit	Test Standard
LCA name of certificate	VESTAMID® eCO E40 - CC50 - circular content	-	ISO 14040, 14044
LCA certifier	TÜV Rheinland	-	ISO 14040, 14044
Blue water consumption	11.3	kg	ISO 14040, 14044
Global Warming Potential incl. bio. C incl. LUC	4.3	kg CO ₂ eq./kg	ISO 14040, 14044
Global Warming Potential excl. bio. C incl. LUC	4.5	kg CO ₂ eq./kg	ISO 14040, 14044
Land use (ReCiPe 2016)	0.1	Annual crop eq. y	ISO 14040, 14044

Mechanical properties ISO	dry / cond	Unit	Test Standard
Tensile modulus	87 / -	MPa	ISO 527
Tensile strength	17 / -	MPa	ISO 527
Stress at 50% strain	9 / -	MPa	ISO 527
Typical for the mat. nom. strain at br., tB	200	%	ISO 527
Tensile creep modulus, 0,5% Strain, 1h	* / 80	MPa	ISO 899-1
Tensile creep modulus, 0,5% Strain, 1000h	* / 60	MPa	ISO 899-1
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	N / N	kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -30°C	N / N	kJ/m ²	ISO 179/1eA
Tensile-impact strength, notched, atN +23°C	160 / 210	kJ/m ²	ISO 8256/1
Flexural modulus, 23°C	90 / -	MPa	ISO 178
Puncture - maximum force, +23°C	880 / -	N	ISO 6603-2
Puncture - maximum force, -30°C	1740 / -	N	ISO 6603-2
Puncture energy, +23°C	14 / -	J	ISO 6603-2

Puncture energy, -30°C	25 / -	J	ISO 6603-2
Taber Abrasion Resistance, S33, 2x 500g	< 15 / -	mg/100 cycles	DIN 53754

Mechanical properties (TPE)	dry / cond	Unit	Test Standard
Stress at 5% elongation	4.3 / -	MPa	ISO 527
Stress at 10% elongation	6.4 / -	MPa	ISO 527
Stress at 20% elongation	8.5 / -	MPa	ISO 527
Stress at 50% elongation	10 / -	MPa	ISO 527
Stress at 100% elongation	11.6 / -	MPa	-
Stress at 300% elongation	20.9 / -	MPa	ISO 527
Strain at break TPE	333 / -	%	ISO 527
Stress at break TPE	22.4 / -	MPa	ISO 527
Compression set at 70 °C, 24h	47 / -	%	ISO 815
Compression set at 100 °C, 24h	84 / -	%	ISO 815
Compression set at 23 °C, 24h	32 / -	%	-

Thermal properties	dry / cond	Unit	Test Standard
Melting temperature	150 / *	°C	ISO 11357-1/-3
Glass transition temperature, DSC	-60 / *	°C	ISO 11357-1/-2
Temp. of deflection under load B, 0.45 MPa	55 / *	°C	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	125 / *	°C	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	60 / *	°C	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	240 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, 23°C to 55 °C, normal	210 / *	E-6/K	ISO 11359-1/-2
Melting Temperature	150	°C	ASTM D 3418

Physical properties	dry / cond	Unit	Test Standard
Density	1010 / 1020	kg/m ³	ISO 1183
Water absorption	1 / *	%	Sim. to ISO 62

Humidity absorption	0.4 / *	%	Sim. to ISO 62
Shore D hardness	40^[b] / -	-	ISO 7619-1
Compression Set under constant strain, 23°C	32 / -	%	ISO 815
Compression Set under constant strain, 70°C	47 / -	%	ISO 815
Compression Set under constant strain, 100°C	84 / -	%	ISO 815
Density	1010	kg/m ³	ASTM D 792

b: 3 seconds

Burning Behav.	dry / cond	Unit	Test Standard
UL Yellow Card available	yes / *	-	-
Burning behav. at 1.5 mm nom. thickn.	HB / *	class	IEC 60695-11-10
Thickness tested	1.5 / *	mm	-

Electrical properties	dry / cond	Unit	Test Standard
Volume resistivity, V	2E9 / 3E8	Ohm*m	IEC 62631-3-1
Surface resistivity, E	* / 2E13	Ohm	IEC 62631-3-2
Relative permittivity, 100Hz	7.5 / 9.5	-	IEC 62631-2-1
Relative permittivity, 1MHz	4.9 / 5.5	-	IEC 62631-2-1
Dissipation factor, 100Hz	700 / 3000	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	1200 / 1200	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/S20, t. 1 mm	- / 36	kV/mm	IEC 60243-1
Dielectric strength, AC, S20/P50	35 / -	kV/mm	Sim. to IEC 60243-1

Rheological properties	dry / cond	Unit	Test Standard
Melt volume-flow rate, MVR	40 / *	cm ³ /10min	ISO 1133
Temperature	240 / *	°C	-
Load	2.16 / *	kg	-
Molding shrinkage, parallel	0.5 / *	%	ISO 294-4, 2577
Molding shrinkage, normal	1.1 / *	%	ISO 294-4, 2577

VESTAMID®

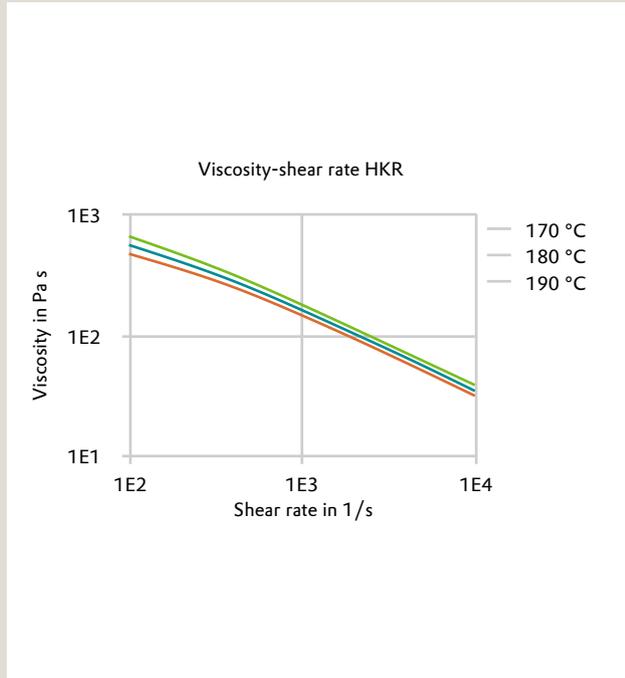
Mold temperature	35 / *	°C	-
Melt temperature	200 / *	°C	-

Polymer analytics	dry / cond	Unit	Test Standard
Viscosity number	190 / *	cm ³ /g	ISO 307, 1157, 1628

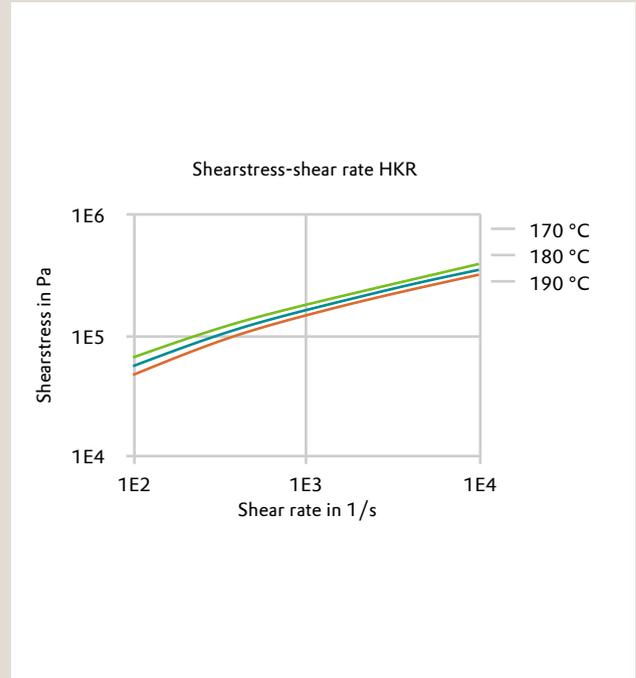
Test specimen production	dry	Unit	Test Standard
Injection Molding, melt temperature	180	°C	ISO 294
Injection Molding, mold temperature	35	°C	ISO 294
Injection Molding, injection velocity	200	mm/s	ISO 294
Injection Molding, pressure at hold	70	MPa	ISO 294

Diagrams

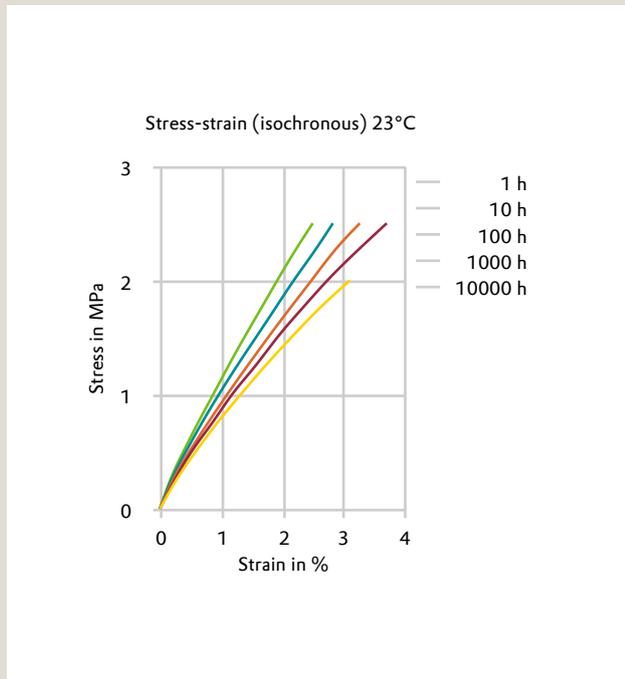
Viscosity-shear rate HKR



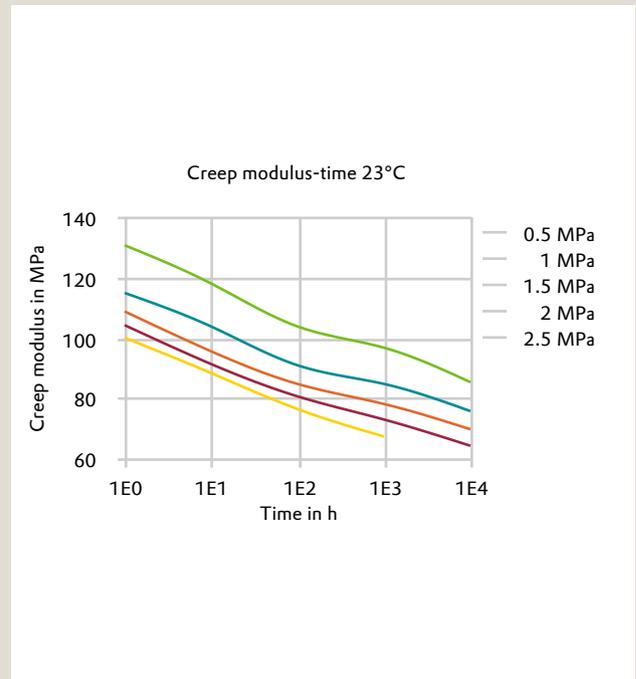
Shearstress-shear rate HKR



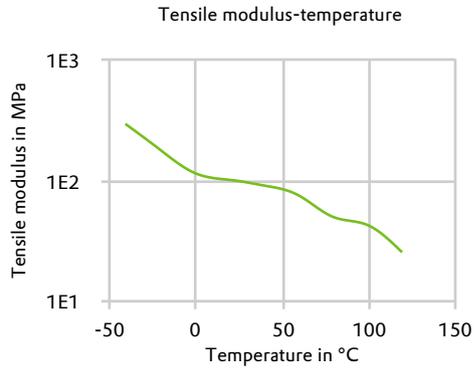
Stress-strain (isochronous) 23°C



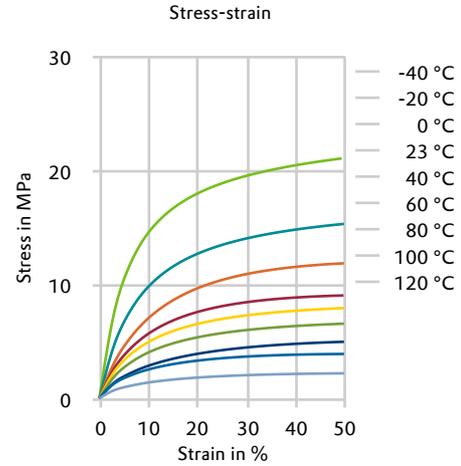
Creep modulus-time 23°C



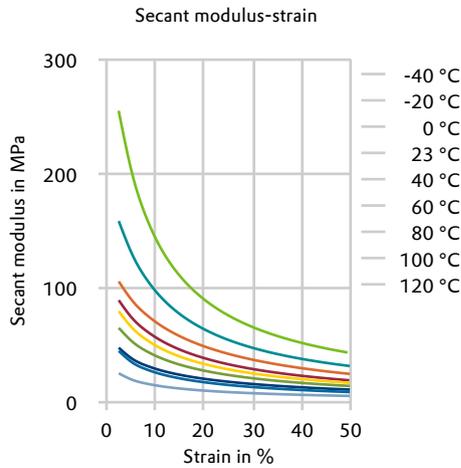
Tensile modulus-temperature



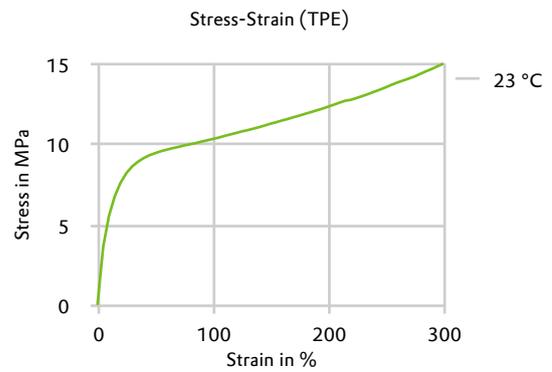
Stress-strain



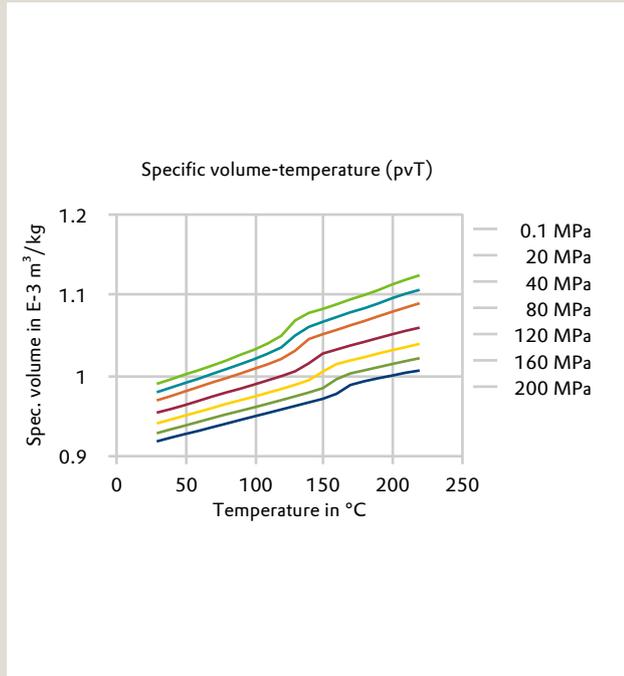
Secant modulus-strain



Stress-Strain (TPE)



Specific volume-temperature (pvT)



Characteristics

Processing

Profile extrusion

Color

Natural color

Special Characteristics

Light-stabilized, U.V. stabilized, High heat resistant

Additives

Plasticizer, Light stabilizer, Heat stabilizer

Chemical Media Resistance

Acids

- ✓ Acetic Acid (5% by mass) (23°C)
- ✓ Citric Acid solution (10% by mass) (23°C)

Bases

- ✓ Sodium Hydroxide solution (35% by mass) (23°C)
- ✓ Sodium Hydroxide solution (1% by mass) (23°C)
- ✓ Ammonium Hydroxide solution (10% by mass) (23°C)

Alcohols

- ✓ Isopropyl alcohol (23°C)
- ✓ Methanol (23°C)
- ✓ Ethanol (23°C)

Hydrocarbons

- ✓ n-Hexane (23°C)
- ✓ Toluene (23°C)
- ✓ iso-Octane (23°C)

Ketones

- ✓ Acetone (23°C)

Ethers

- ✓ Diethyl ether (23°C)

Salt solutions

- ✓ Sodium Chloride solution (10% by mass) (23°C)
- ✓ Sodium Carbonate solution (20% by mass) (23°C)
- ✓ Sodium Carbonate solution (2% by mass) (23°C)

Other

- ✓ Ethyl Acetate (23°C)
- ✓ Hydrogen peroxide (23°C)
- ✓ Water (23°C)

Rheological calculation properties	dry	Unit	Test Standard
Min. mold temperature	15	°C	-
Max. mold temperature	40	°C	-
Min. melt temperature	180	°C	-
Max. melt temperature	220	°C	-