

Product Information

# VESTAMID® E55-S3

## HEAT- AND LIGHT-STABILIZED COMPOUND BASED ON POLYAMIDE 12 ELASTOMER FOR MOLDING OF SPORT SHOE SOLES

**VESTAMID® E55-S3** 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 represent thermoplastic elastomers generically characterized as polyether block copolyamides (PEBA) consisting of PA 12 and polyether segments.

VESTAMID® E55-S3 is especially developed for sport shoe soles. It has good impact strength at low temperatures.

VESTAMID® E55-S3 is supplied as spherical pellets in moisture-proof packaging, ready for processing.

The process temperatures should be within a range of 190°C – 230°C.

Pigmentation may affect 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.

### Key Features

#### Industrial Sector

Sustainable, Industry and Engineering, Sports and Lifestyle

#### Sustainability

Sustainable electricity

#### Processing

Injection molding, Extrusion

#### Delivery form

Pellets, Granules

#### Optics

Translucent

#### Resistance to

Heat (thermal stability), Hydrolysis / hot water, UV / light / weathering, Wear / abrasion, Fatigue resistance

#### Additives

Unfilled

LCA-values	dry	Unit	Test Standard
LCA name of certificate	<a href="#">VESTAMID® E mix</a>	-	ISO 14040, 14044
LCA certifier	<a href="#">TÜV Rheinland</a>	-	ISO 14040, 14044
Blue water consumption	<b>14.2</b>	kg	ISO 14040, 14044
Global Warming Potential incl. bio. C incl. LUC	<b>6.5</b>	kg CO <sub>2</sub> eq./kg	ISO 14040, 14044
Global Warming Potential excl. bio. C incl. LUC	<b>6.5</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>-1.6</b>	kg CO <sub>2</sub> eq./kg	ISO 14040, 14044

Mechanical properties ISO	dry / cond	Unit	Test Standard
Tensile modulus	<b>31200 / -</b>	psi	ISO 527
Tensile strength	<b>5510 / -</b>	psi	ISO 527
Stress at 50% strain	<b>2470 / -</b>	psi	ISO 527
Typical for the mat. nom. strain at br., tB	<b>200</b>	%	ISO 527
Tensile creep modulus, 0,5% Strain, 1000h	<b>* / 14500</b>	psi	ISO 899-1
Charpy impact strength, +23°C	<b>N / -</b>	ftlb/in <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30°C	<b>N / -</b>	ftlb/in <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, +23°C	<b>N / -</b>	ftlb/in <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -30°C	<b>10.5 / -</b>	ftlb/in <sup>2</sup>	ISO 179/1eA
Type of failure	<b>C / -</b>	-	-
Tensile-impact strength, notched, atN +23°C	<b>99.9 / -</b>	ftlb/in <sup>2</sup>	ISO 8256/1
Flexural modulus, 23°C	<b>28400 / -</b>	psi	ISO 178

Mechanical properties (TPE)	dry / cond	Unit	Test Standard
Stress at 10% elongation	<b>1810 / -</b>	psi	ISO 527
Stress at 100% elongation	<b>2610 / -</b>	psi	-
Stress at 300% elongation	<b>4350 / -</b>	psi	ISO 527
Strain at break TPE	<b>&gt;300 / -</b>	%	ISO 527

Thermal properties	dry / cond	Unit	Test Standard
Melting temperature	331 / *	°F	ISO 11357-1/-3
Glass transition temperature, DSC	-4 / *	°F	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	113 / *	°F	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	194 / *	°F	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	320 / *	°F	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	212 / *	°F	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	0.000111 / *	in/in/°F	ISO 11359-1/-2
Coeff. of linear therm. expansion, 23°C to 55 °C, normal	0.000111 / *	in/in/°F	ISO 11359-1/-2
Melting Temperature	331	°F	ASTM D 3418

Physical properties	dry / cond	Unit	Test Standard
Density	1.03 / -	g/cm <sup>3</sup>	ISO 1183
Water absorption	1.1 / *	%	Sim. to ISO 62
Humidity absorption	0.5 / *	%	Sim. to ISO 62
Shore D hardness	55 <sup>[b]</sup> / -	-	ISO 7619-1
Density	1.03	g/cm <sup>3</sup>	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	0.0630 / *	in	-
Burnin behav. at thickness h	HB / *	class	IEC 60695-11-10
Thickness tested	0.1260 / *	in	-

Electrical properties	dry / cond	Unit	Test Standard
Volume resistivity, V	3E9 / -	Ohm*m	IEC 62631-3-1
Relative permittivity, 100Hz	9.5 / -	-	IEC 62631-2-1
Relative permittivity, 1MHz	4.3 / -	-	IEC 62631-2-1

Dissipation factor, 100Hz	<b>950 / -</b>	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	<b>1100 / -</b>	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/P50	<b>965 / -</b>	V/mil	Sim. to IEC 60243-1

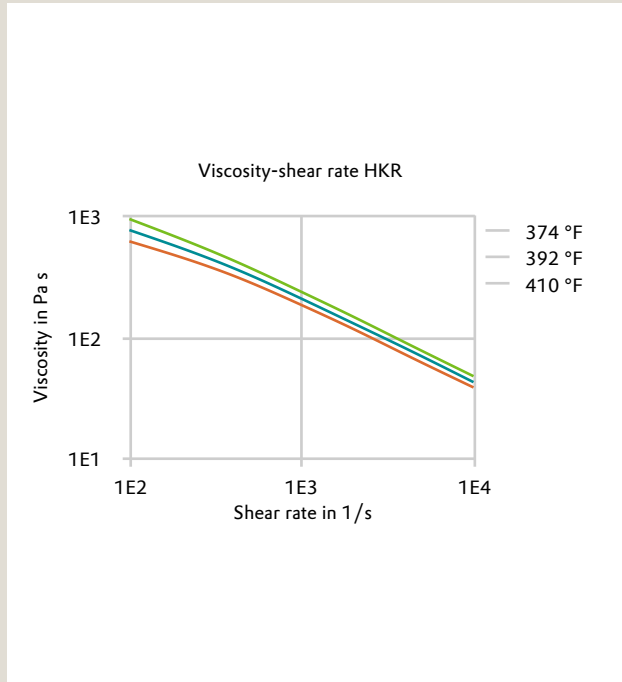
<b>Rheological properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Melt volume-flow rate, MVR	<b>36 / *</b>	cm <sup>3</sup> /10min	ISO 1133
Temperature	<b>240 / *</b>	°C	-
Load	<b>2.16 / *</b>	kg	-
Molding shrinkage, parallel	<b>0.8 / *</b>	%	ISO 294-4, 2577
Molding shrinkage, normal	<b>1.3 / *</b>	%	ISO 294-4, 2577
Mold temperature	<b>95 / *</b>	°F	-
Melt temperature	<b>392 / *</b>	°F	-

<b>Polymer analytics</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Viscosity number	<b>5260 / *</b>	in <sup>3</sup> /lb	ISO 307, 1157, 1628

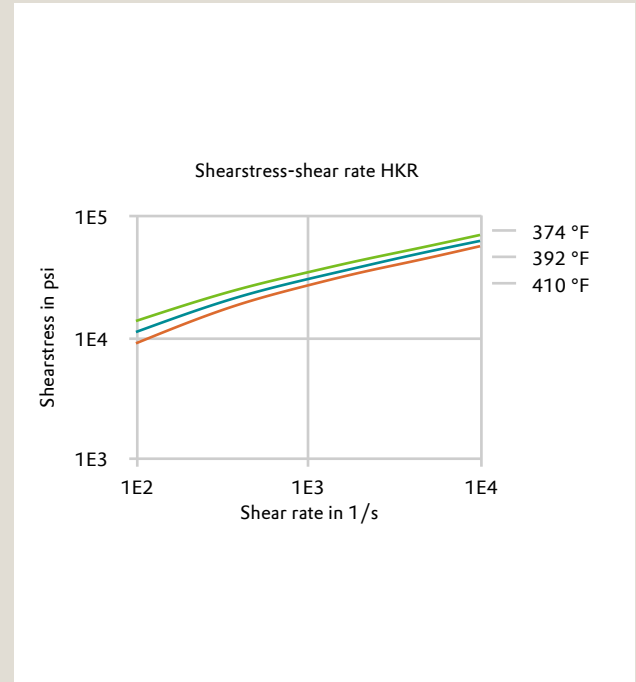
<b>Test specimen production</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Injection Molding, melt temperature	<b>428</b>	°F	ISO 294
Injection Molding, mold temperature	<b>95</b>	°F	ISO 294
Injection Molding, injection velocity	<b>7.87</b>	in/s	ISO 294
Injection Molding, pressure at hold	<b>10200</b>	psi	ISO 294

Diagrams

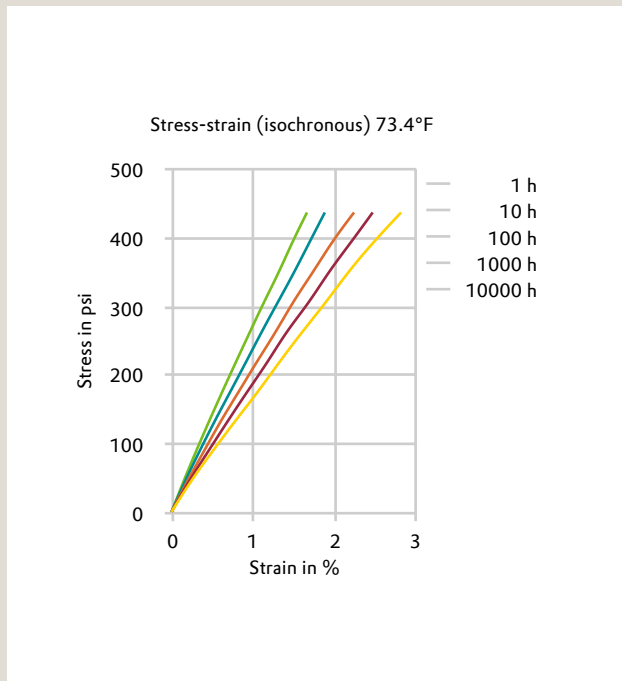
Viscosity-shear rate HKR



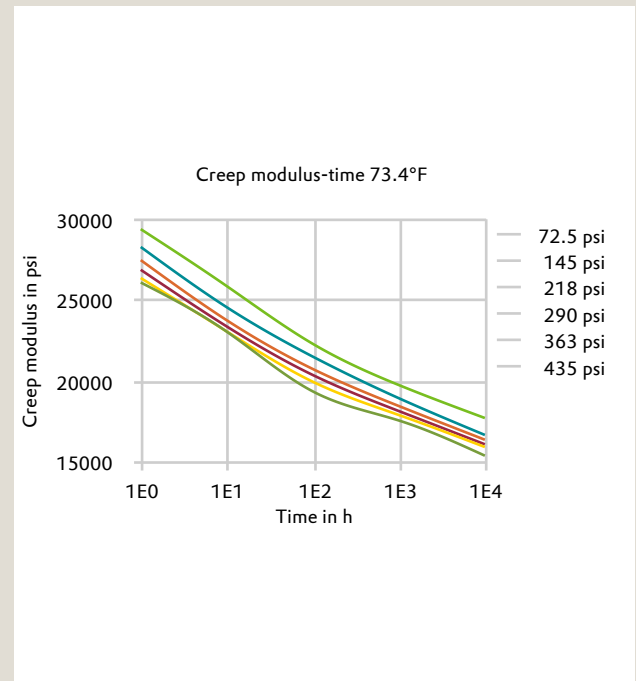
Shearstress-shear rate HKR



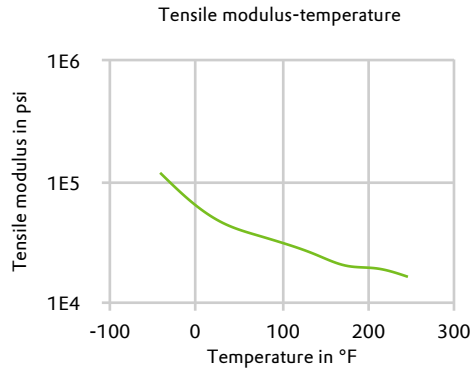
Stress-strain (isochronous) 73°F



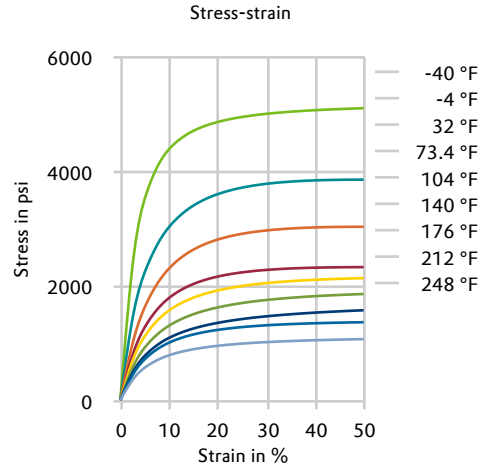
Creep modulus-time 73°F



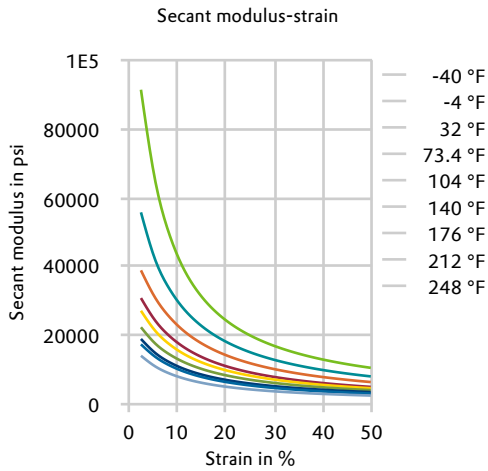
Tensile modulus-temperature



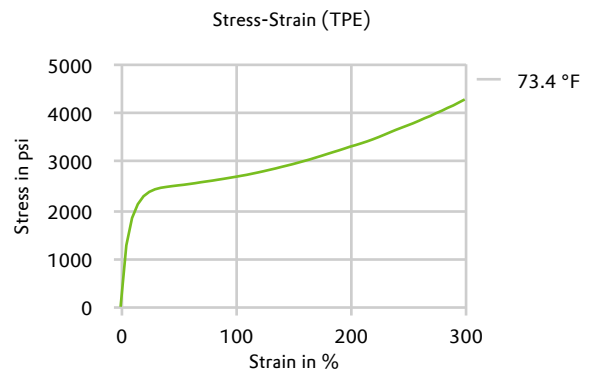
Stress-strain



Secant modulus-strain



Stress-Strain (TPE)



### Characteristics

#### Processing

Profile extrusion

#### Color

Natural color

#### Special Characteristics

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

#### Additives

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
Ejection temperature	<b>320</b>	°F	-
Min. mold temperature	<b>59</b>	°F	-
Max. mold temperature	<b>104</b>	°F	-
Min. melt temperature	<b>392</b>	°F	-
Max. melt temperature	<b>464</b>	°F	-