

Product Information

VESTAMID® NRG 2101 YE

FOR GAS PIPES AND FITTINGS



VESTAMID® NRG 2101 YE is a high molecular grade PA 12 material developed by Evonik.

Its superior performance characteristics make it an ideal choice for expanding the use of thermoplastic piping systems at higher operating pressures and larger diameters to replace metallic piping systems in a safe and cost effective manner.

Besides extending the operating pressure limits of thermoplastic piping systems, VESTAMID® NRG 2101 YE offers many of the same benefits, and in most instances more superior performance, as conventional PE piping systems.

- Tough and durable
- Corrosion resistant
- Resistant to heavy hydrocarbons
- High resistance to Slow Crack Growth and Rapid Crack Propagation
- Increased installation efficiencies
- Worry free performance

These characteristics make the VESTAMID® NRG 2101 yellow material an ideal choice when selecting appropriate thermoplastic piping materials in extending your gas distribution infrastructure.

We recommend a processing temperature between 230°C (446°F) and 260°C (500°F) - in some cases up to 280°C (536°F) - during the injection molding and extrusion process.

The mold temperature should be within a range of 60°C (140°F) to 100°C (212°F). Drying at 80°C (176°F) for 2 hours to 4 hours before processing is recommended.

Polyamide 12 is a high performance thermo-plastic polymer with increased performance characteristics that translates into safe operations over the life of the installed pipe- line. It has a considerable record of safe and proven experience in many demanding applications, including fuel lines in passenger cars, air brake tubing in trucks and off-shore applications.

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.

VESTAMID® NRG

Key Features

Industrial Sector

Sustainable, Industry and Engineering, Energy, Oil and Gas

Sustainability

Sustainable electricity

Processing

Injection molding, Extrusion

Delivery form

Pellets, Granules

Resistance to

Heat (thermal stability), Hydrolysis / hot water, UV / light / weathering, Fatigue resistance, Oil / fuels

Electrical

Insulating

Additives

Unfilled

LCA-values	dry	Unit	Test Standard
LCA name of certificate	VESTAMID® L Compound low	-	ISO 14040, 14044
LCA certifier	TÜV Rheinland	-	ISO 14040, 14044
Blue water consumption	25.7	kg	ISO 14040, 14044
Global Warming Potential incl. bio. C incl. LUC	6.1	kg CO ₂ eq./kg	ISO 14040, 14044
Global Warming Potential excl. bio. C incl. LUC	6.1	kg CO ₂ eq./kg	ISO 14040, 14044
Land use (ReCiPe 2016)	0.1	Annual crop eq. y	ISO 14040, 14044
GWP savings as compared to 2023 reference	-2.5	kg CO ₂ eq./kg	ISO 14040, 14044

Mechanical properties ISO	dry / cond	Unit	Test Standard
Tensile modulus	189000 / -	psi	ISO 527
Tensile strength	5800 / -	psi	ISO 527
Yield stress	5800 / -	psi	ISO 527
Yield strain	12 / -	%	ISO 527
Stress at 50% strain	5220 / -	psi	ISO 527
Stress at break	6960 / -	psi	ISO 527
Nominal strain at break, tB	175 / -	%	ISO 527
Typical for the mat. nom. strain at br., tB	>220^[n]	%	ISO 527
Charpy impact strength, +23°C	N / -	ftlb/in ²	ISO 179/1eU
Charpy impact strength, -30°C	N / -	ftlb/in ²	ISO 179/1eU

Charpy impact strength, -40°C	N / -	ftlb/in ²	ISO 179/1eU
Charpy notched impact strength, +23°C	21.4 / -	ftlb/in ²	ISO 179/1eA
Type of failure	P(C) / -	-	-
Charpy notched impact strength, 0°C	11.9 / -	ftlb/in ²	ISO 179/1eA
Type of failure	C / -	-	-
Charpy notched impact strength, -30°C	8.56 / -	ftlb/in ²	ISO 179/1eA
Type of failure	C / -	-	-
Charpy notched impact strength, -40°C	4.28 / -	ftlb/in ²	ISO 179/1eA
Type of failure	C / -	-	-
Flexural modulus, 23°C	181000 / -	psi	ISO 178
Flexural stress at conv. deflection, 23°C	6240 / -	psi	ISO 178
Flexural strength, 23°C	7690 / -	psi	ISO 178
Flexural strain at flexural strength, 23°C	7 / -	%	ISO 178
Flexural stress at break, 23°C	N / -	psi	ISO 178
Flexural strain at break, 23°C	N / -	%	ISO 178

n: specimen milled from pipe wall

Thermal properties	dry / cond	Unit	Test Standard
Melting temperature	351 / *	°F	ISO 11357-1/-3
Glass transition temperature, DSC	96.8 / *	°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	293 / *	°F	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	338 / *	°F	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	302 / *	°F	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	8.0E-5 / *	in/in/°F	ISO 11359-1/-2
Melting Temperature	351	°F	ASTM D 3418

Physical properties	dry / cond	Unit	Test Standard
Density	1.02 / -	g/cm ³	ISO 1183
Water absorption	1.6 / *	%	Sim. to ISO 62
Humidity absorption	0.9 / *	%	Sim. to ISO 62
Shore D hardness	73 ^[b] / -	-	ISO 7619-1
Ball indentation hardness	11000 / -	psi	ISO 2039-1
Density	1.02	g/cm ³	ASTM D 792

b: 3 seconds

Electrical properties	dry / cond	Unit	Test Standard
Volume resistivity, V	>1E13 / -	Ohm*m	IEC 62631-3-1
Surface resistivity, C, circular electrodes	>1E15 / -	Ohm/sq	IEC 62631-3-2
Relative permittivity, 50Hz	3.6 / -	-	IEC 62631-2-1
Relative permittivity, 100Hz	3.5 / -	-	IEC 62631-2-1
Relative permittivity, 1MHz	2.9 / -	-	IEC 62631-2-1
Dissipation factor, 1MHz	225 / -	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/S20, t. 1 mm	1070 / -	kV/in	IEC 60243-1

Rheological properties	dry / cond	Unit	Test Standard
Melt volume-flow rate, MVR	3 / *	cm ³ /10min	ISO 1133
Temperature	235 / *	°C	-
Load	10 / *	kg	-
Molding shrinkage, parallel	0.5 / *	%	ISO 294-4, 2577
Molding shrinkage, normal	1.6 / *	%	ISO 294-4, 2577
Mold temperature	140 / *	°F	-
Melt temperature	500 / *	°F	-

Test specimen production	dry	Unit	Test Standard
Injection Molding, melt temperature	500	°F	ISO 294

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Injection Molding, mold temperature	140	°F	ISO 294
Injection Molding, injection velocity	7.87	in/s	ISO 294

Characteristics

Applications

Tube and hose

Processing

Profile extrusion, Pipe/Tube extrusion

Special Characteristics

Halogen-free, Phosphorus-free, High impact strength, Semi-crystalline, Environmental stress crack resistance, Light-stabilized, U.V. stabilized, High heat resistant, High viscosity

Features

Weldable, High melt strength

Color

Yellow

Additives

Heat stabilizer

Delivery form

Spherical pellets

Chemical Resistance

Solvent resistance, Grease resistance, Oil resistance, Ozone resistance, Aging resistance, Fuel resistance, General chemical resistance