Product Information

# VESTAMID® NRG 1001

## HIGH-VISCOSITY, PLASTICIZED, IMPACT- MODIFIED, HEAT- AND LIGHT-STABILIZED PA12 COMPOUND FOR EXTRUSION

**VESTAMID® NRG 1001 NC** is a high-viscosity, plasticized and impact-modified PA 12 compound with heat and light stabilizers for the extrusion of flexible tubing and hoses especially for oil and petrochemical applications.

VESTAMID® NRG 1001 NC is characterized by easy processing and good dimensional control during pipe extrusion, especially when processing large pipe diameters.

Properties of compounds based on polyamide 12 vary little with changing humidity due to low moisture absorption.

Parts made of the described semi-crystalline material are characterized by exceptional impact strength, low coefficient of sliding friction and good chemical resistance.

The recommended process temperature for extrusion is 220°C to 250°C.

VESTAMID® NRG 1001 NC is supplied ready for use in moisture-proof bags.

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 shown have been generated from a low number of production lots. Therefore, they are preliminary and not yet the result of a statistical evaluation. Therefore they must not be used to establish specifications.

### Key Features

**Industrial Sector**
Sustainable, Energy, Oil and Gas

**Sustainability**
Sustainable electricity

**Processing**
Extrusion

**Delivery form**
Pellets, Granules

**Resistance to**
Hydrolysis / hot water, UV / light / weathering, Oil / fuels

**Additives**
Unfilled

| LCA-values | dry | Unit | Test Standard |
|---|---|---|---|
| LCA name of certificate | VESTAMID® L Compound medium | - | ISO 14040, 14044 |
| LCA certifier | TÜV Rheinland | - | ISO 14040, 14044 |
| Blue water consumption | **25.6** | kg | ISO 14040, 14044 |
| Global Warming Potential incl. bio. C incl. LUC | **6.0** | kg $CO_2$ eq./kg | ISO 14040, 14044 |
| Global Warming Potential excl. bio. C incl. LUC | **6.0** | 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 | **-2.4** | kg $CO_2$ eq./kg | ISO 14040, 14044 |

| Mechanical properties ISO | dry / cond | Unit | Test Standard |
|---|---|---|---|
| Tensile modulus | **53700 / 53700** | psi | ISO 527 |
| Tensile strength | **6090 / -** | psi | ISO 527 |
| Stress at 50% strain | **3920 / 3480** | psi | ISO 527 |
| Stress at break | **6090 / 7540** | psi | ISO 527 |
| Nominal strain at break, tB | **200 / 300** | % | ISO 527 |
| Typical for the mat. nom. strain at br., tB | **⩾150** | % | ISO 527 |
| Charpy impact strength, +23°C | **N / N** | ftlb/in² | ISO 179/1eU |
| Charpy impact strength, -30°C | **N / N** | ftlb/in² | ISO 179/1eU |
| Charpy notched impact strength, +23°C | **61.8 / 61.8** | ftlb/in² | ISO 179/1eA |
| Type of failure | **P / P** | - | - |
| Charpy notched impact strength, -30°C | **3.33 / 6.18** | ftlb/in² | ISO 179/1eA |
| Type of failure | **C / C** | - | - |
| Flexural modulus, 23°C | **55100 / 52200** | psi | ISO 178 |
| Flexural stress at conv. deflection, 23°C | **1890 / 1740** | psi | ISO 178 |
| Flexural strength, 23°C | **2900 / 2900** | psi | ISO 178 |
| Flexural strain at flexural strength, 23°C | **9 / 9** | % | ISO 178 |
| Flexural stress at break, 23°C | **N / N** | psi | ISO 178 |

| | | | |
|---|---|---|---|
| Flexural strain at break, 23°C | **N / N** | % | ISO 178 |

| **Thermal properties** | **dry / cond** | **Unit** | **Test Standard** |
|---|---|---|---|
| Melting temperature | **342 / *** | °F | ISO 11357-1/-3 |
| Glass transition temperature, DSC | **55.4 / *** | °F | ISO 11357-1/-2 |
| Temp. of deflection under load A, 1.80 MPa | **127 / *** | °F | ISO 75-1/-2 |
| Temp. of deflection under load B, 0.45 MPa | **221 / *** | °F | ISO 75-1/-2 |
| Vicat softening temperature A, 10 N, 50 K/h | **333 / *** | °F | ISO 306 |
| Vicat softening temperature B, 50 N, 50 K/h | **250 / *** | °F | ISO 306 |
| Melting Temperature | **342** | °F | ASTM D 3418 |

| **Physical properties** | **dry / cond** | **Unit** | **Test Standard** |
|---|---|---|---|
| Density | **1.02 / -** | g/cm³ | ISO 1183 |
| Water absorption | **1.3 / *** | % | Sim. to ISO 62 |
| Humidity absorption | **0.7 / *** | % | Sim. to ISO 62 |
| Density | **1.02** | g/cm³ | ASTM D 792 |

| **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 | **1.5E9 / 2E9** | Ohm*m | IEC 62631-3-1 |
| Surface resistivity, C, circular electrodes | **2.6E14 / 1.1E13** | Ohm/sq | IEC 62631-3-2 |
| Test specimen | **Platte 130x130x1 mm/** | - | - |
| Relative permittivity, 50Hz | **11.9 / -** | - | IEC 62631-2-1 |

| | | | |
|---|---|---|---|
| Relative permittivity, 100Hz | **11 / -** | - | IEC 62631-2-1 |
| Relative permittivity, 1MHz | **3.5 / -** | - | IEC 62631-2-1 |
| Dissipation factor, 50Hz | **1760 / -** | E-4 | IEC 62631-2-1 |
| Dissipation factor, 100Hz | **1780 / -** | E-4 | IEC 62631-2-1 |
| Dissipation factor, 1MHz | **1120 / -** | E-4 | IEC 62631-2-1 |
| Dielectric strength, AC, S20/S20, t. 1 mm | **914 / 889** | kV/in | IEC 60243-1 |

| Rheological properties | dry / cond | Unit | Test Standard |
|---|---|---|---|
| Melt volume-flow rate, MVR | **N / A / *** | $cm^3$/10min | ISO 1133 |
| Molding shrinkage, parallel | **0.7 / *** | % | ISO 294-4, 2577 |
| Molding shrinkage, normal | **1.6 / *** | % | ISO 294-4, 2577 |
| Mold temperature | **140 / *** | °F | - |
| Melt temperature | **554 / *** | °F | - |

| Pipes Properties | dry / cond | Unit | Test Standard |
|---|---|---|---|
| Yield stress, pipe, 23°C | **3770 / *** | psi | Evonik standard |
| Yield strain, pipe, 23°C | **35 / *** | % | Evonik standard |
| Strain at break, pipe, 23°C | **200 / *** | % | Evonik standard |

| Test specimen production | dry | Unit | Test Standard |
|---|---|---|---|
| Injection Molding, melt temperature | **554** | °F | ISO 294 |
| Injection Molding, mold temperature | **140** | °F | ISO 294 |
| Injection Molding, injection velocity | **7.87** | in/s | ISO 294 |

## Characteristics

**Applications**
Tube and hose

**Color**
Natural color

**Processing**
Profile extrusion, Pipe/Tube extrusion

**Special Characteristics**
High impact strength, Semi-crystalline, Light-stabilized, High heat resistant, High viscosity

**Features**
Low coefficient of friction

**Additives**
Plasticizer, Impact restistant, Light stabilizer, Heat stabilizer

**Delivery form**
Cylindrical pellets

**Chemical Resistance**
General chemical resistance