

Product Information

# VESTODUR® X7212 NC

## GLASS FIBER REINFORCED AND FLAME RETARDANT POLYBUTYLENE TEREPHTHALATE MOLDING COMPOUND

**VESTODUR® X7212 NC** is a glass fiber-reinforced (45%), semi-crystalline thermoplastic compound for injection molding, based on polybutylene terephthalate (PBT). The self-extinguishing compound has a creamy-white colour.

VESTODUR® X7212 NC is used for parts of high mechanical and thermal resistance.

Test bars made of the compound are rated V-0 self-extinguishing according to UL94 by Underwriters Laboratories Inc.

The incorporated flame retardant is non-migrating. The additive has no corrosive effects on metal inserts or neighboring metal parts. Therefore, the compound is distinguished for moldings in the electrical and electronical industry. Laser marking with high contrasts is possible.

VESTODUR® X7212 is supplied as cylindrical pellets in polyethylene packaging.

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.

### Key Features

#### Processing

Injection molding

#### Delivery form

Pellets, Granules

#### Optics

Laser markable

#### Resistance to

Heat (thermal stability), Fire / burn

#### Additives

Glass fibers, Release agent, Flame retardant

Mechanical properties ISO	dry / cond	Unit	Test Standard
Tensile modulus	<b>15500 / 16100</b>	MPa	ISO 527
Tensile strength	<b>150 / 150</b>	MPa	ISO 527
Stress at break	<b>145 / 150</b>	MPa	ISO 527
Strain at break, B	<b>1.3 / 1.3</b>	%	ISO 527
Charpy impact strength, +23°C	<b>48 / 44</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Type of failure	<b>C / C</b>	-	-
Charpy impact strength, -30°C	<b>45 / 50</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Type of failure	<b>C / C</b>	-	-
Charpy notched impact strength, +23°C	<b>12 / 11</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Type of failure	<b>C / C</b>	-	-
Charpy notched impact strength, -30°C	<b>12 / 15</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Type of failure	<b>C / C</b>	-	-
Flexural modulus, 23°C	<b>16900 / 16300</b>	MPa	ISO 178
Flexural strength, 23°C	<b>240 / 220</b>	MPa	ISO 178
Flexural strain at flexural strength, 23°C	<b>1.5 / 1.5</b>	%	ISO 178
Flexural stress at break, 23°C	<b>240 / 220</b>	MPa	ISO 178
Flexural strain at break, 23°C	<b>1.5 / 1.5</b>	%	ISO 178

Thermal properties	dry / cond	Unit	Test Standard
Melting temperature	<b>223 / *</b>	°C	ISO 11357-1/-3
Glass transition temperature, DSC	<b>45 / *</b>	°C	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	<b>217 / *</b>	°C	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	<b>223 / *</b>	°C	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	<b>220 / *</b>	°C	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	<b>215 / *</b>	°C	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	<b>20 / *</b>	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, 23°C to 55 °C, normal	<b>40 / *</b>	E-6/K	ISO 11359-1/-2

Melting Temperature	<b>223</b>	°C	ASTM D 3418
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Physical properties	dry / cond	Unit	Test Standard
Density	<b>1840 / -</b>	kg/m <sup>3</sup>	ISO 1183
Water absorption	<b>0.3 / *</b>	%	Sim. to ISO 62
Humidity absorption	<b>0.1 / *</b>	%	Sim. to ISO 62
Shore D hardness	<b>86<sup>[b]</sup> / -</b>	-	ISO 7619-1
Density	<b>1840</b>	kg/m <sup>3</sup>	ASTM D 792

b: 3 seconds

Burning Behav.	dry / cond	Unit	Test Standard
Burning behav. at 1.5 mm nom. thickn.	<b>V-0 / *</b>	class	IEC 60695-11-10
Thickness tested	<b>1.5 / *</b>	mm	-
Burnin behav. at thickness h	<b>V-0 / *</b>	class	IEC 60695-11-10
Thickness tested	<b>3.0 / *</b>	mm	-
Burning behav. at thickness h	<b>V-0 / *</b>	class	IEC 60695-11-10
Thickness tested	<b>0.8 / *</b>	mm	-
Oxygen index	<b>37 / *</b>	%	ISO 4589-1/-2
Limiting Oxygen Index	<b>37</b>	%	ASTM D 2863
GWFI - thickness tested	<b>775</b>	mm	-
GWIT - thickness tested	<b>960</b>	mm	-
Hot Wire Ignition (HWI)	<b>3</b>	PL-Klasse	IEC 60695-2-20
HWI - thickness tested	<b>0.4</b>	mm	-
Hot Wire Ignition (HWI)	<b>3</b>	PL-Klasse	IEC 60695-2-20
HWI - thickness tested	<b>0.8</b>	mm	-
Hot Wire Ignition (HWI)	<b>3</b>	PL-Klasse	IEC 60695-2-20
HWI - thickness tested	<b>1.5</b>	mm	-
Hot Wire Ignition (HWI)	<b>1</b>	PL-Klasse	IEC 60695-2-20

HWI - thickness tested **3.0** mm -

<b>Electrical properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Surface resistivity, E	<b>* / 1E13</b>	Ohm	IEC 62631-3-2
Surface resistance, RSD	<b>1E13 / -</b>	Ohm	IEC 62631-3-2
Relative permittivity, 100Hz	<b>4.4 / -</b>	-	IEC 62631-2-1
Relative permittivity, 1MHz	<b>4.6 / -</b>	-	IEC 62631-2-1
Dissipation factor, 100Hz	<b>40 / -</b>	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	<b>130 / -</b>	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/P50	<b>30 / -</b>	kV/mm	Sim. to IEC 60243-1
CTI, test solution A, 50 drops value	<b>275 / -</b>	-	IEC 60112
Assessment of the insulation group	<b>III a</b>	-	DIN EN 60664-1
CTI, Performance Level Categories, PLC	<b>2</b>	class	ASTM D 3638

<b>Rheological properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Melt volume-flow rate, MVR	<b>8 / *</b>	cm <sup>3</sup> /10min	ISO 1133
Temperature	<b>250 / *</b>	°C	-
Load	<b>2.16 / *</b>	kg	-
Molding shrinkage, parallel	<b>0.2 / *</b>	%	ISO 294-4, 2577
Molding shrinkage, normal	<b>0.7 / *</b>	%	ISO 294-4, 2577
Mold temperature	<b>80 / *</b>	°C	-
Melt temperature	<b>260 / *</b>	°C	-

<b>Test specimen production</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Processing conditions acc. ISO	<b>7792</b>	-	ISO ....-2
Injection Molding, melt temperature	<b>260</b>	°C	ISO 294
Injection Molding, mold temperature	<b>80</b>	°C	ISO 294
Injection Molding, injection velocity	<b>200</b>	mm/s	ISO 294
Injection Molding, pressure at hold	<b>70</b>	MPa	ISO 294

### Characteristics

#### Applications

Electrical and Electronical

#### Color

Natural color

#### Special Characteristics

Light-stabilized, High heat resistant, Self-extinguishing

#### Additives

Release agent, Flame retardant, Heat stabilizer

#### Features

Non-corrosive, Non-migrating ingredients

### Chemical Media Resistance

#### Acids

- ✓ Acetic Acid (5% by mass) (23°C)
- ✓ Citric Acid solution (10% by mass) (23°C)
- ✗ Hydrochloric Acid (36% by mass) (23°C)
- ✗ Nitric Acid (40% by mass) (23°C)
- ✓ Sulfuric Acid (5% by mass) (23°C)

#### Bases

- ✗ Ammonium Hydroxide solution (10% by mass) (23°C)

#### Alcohols

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

#### Hydrocarbons

- ✓ iso-Octane (23°C)

#### Ketones

- ✗ Acetone (23°C)

#### Ethers

- ✓ Diethyl ether (23°C)

#### Mineral oils

- ✓ SAE 10W40 multigrade motor oil (23°C)
- ✓ Insulating Oil (23°C)

#### Standard Fuels

- ✓ Standard fuel without alcohol (pref. ISO 1817 Liquid C) (23°C)
- ✓ Diesel fuel (pref. ISO 1817 Liquid F) (23°C)
- ✓ Diesel fuel (pref. ISO 1817 Liquid F) (90°C)

**Salt solutions**

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

**Other**

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

<b>Rheological calculation properties</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Density of melt	<b>1560</b>	kg/m <sup>3</sup>	-
Thermal conductivity of melt	<b>0.35</b>	W/(m K)	-
Spec. heat capacity of melt	<b>1430</b>	J/(kg K)	-
Min. mold temperature	<b>50</b>	°C	-
Max. mold temperature	<b>120</b>	°C	-
Min. melt temperature	<b>240</b>	°C	-
Max. melt temperature	<b>280</b>	°C	-