



# PERFORM

## PA 11 GLASS BEADS & ALUMINIUM

**FABULOUS**  
MATERIALS

PERFORM is a fine composite powder charged with glass beads and aluminium particles based on polyamide 11 (thermoplastic) especially formulated to function on rapid prototyping systems by laser sintering (SLS, LS) or radiation (IRS, MJF). It enables to obtain productions of models and functional parts in "plastic engineering" with long cycle of life and excellent chemical resistance.

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## PA 11 GBAL



Typical features :

**Glass beads & aluminium**  
filled PA11  
**Fine granulometry**  
general purpose material

Applications examples :

- Automotive hot parts
- Aerospace
- Functional and mechanical parts

Refresh rate :

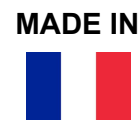
# 50 %

LIMITED TO MAX 12 CYCLES

The process ability of the powder on your systems is optimized ; thus all the powder of a building can be re-used after sifting.

Key Points :

**Unique properties & performances based on PA 11**



### General Properties :

<b>Chemical Nature of the Preparation :</b>	POLYAMIDE 11 composite with glass beads and aluminium, Presence of additives	
<b>Physical State (20°C) and Color :</b>	Solid (powder composite) Grade : GREY in mass	
<b>Average Particle Size :</b> Grain Size : Grain Size : Grain Size :	<b>Diffraction laser :</b> D10 D50 D90	45 <_ < 65 µm 35 µm 60 µm 90 µm
<b>Powder packed Density 23 ° C :</b> <b>Part Density :</b> 23°C Moisture absorption 24 hrs :	<b>Method FABULOUS :</b> <b>Method FABULOUS :</b> ASTM D570	1 +/- 0,05 g/cm <sup>3</sup> (estimate) 1,35 +/- 0,05 g/cm <sup>3</sup> (estimate) 0,85 +/- 0,05 % (estimate)

### Mechanical Properties :

<b>Young Modulus*</b>	ISO 527	2200 - 2700 MPa
<b>Flexural Modulus*</b>	ISO 178	Estimate > 2000 MPa
<b>Tensile strength (Average XY)*</b>	ISO 527	30 +/- 3 MPa
<b>Tensile strength (Average Z)*</b>	ISO 527	27 +/- 3 MPa
<b>Elongation at break (Average XY)*</b>	ISO 527	Estimate 20 %
<b>Elongation at break (Average Z)*</b>	ISO 527	Estimate > 10 %
<b>Charpy – Impact strength*</b>	ISO 179 (20°C)	NC
*statistics after several cycles		50 cond. 24 hrs

The mechanical properties can vary according to the positioning of the tensile bars, operating conditions and exposure parameters of the systems used. These data rest on the current state of our knowledge. They do not give the exact characteristics of material and does not represent a guarantee.



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### Thermal Properties :

<b>T<sup>f</sup> Melting Point :</b>	DSC	196 < _ < 204 °C
<b>T° Process :</b> According to machine the Grey color offset the reading :	Glazing Method	-12 +/- 2 °C (ex : 186 °C +/-2)
<b>Flammability – Fire Classification UL-94</b> following ASTM D618(ISO 921) with a barrel 125 x 13 x 13 mm	<b>UL94</b> vertical & Horizontal test	<b>Charged grade: HC</b> Out Classification

### Electrical Properties :

According to the value reach in CEI 93 the material is considered as : **ANTISTATIC to DISSIPATOR**

Volume resistivity	CEI 93	Estimate < 1 E+10 Ohms/m
Horizontal surface Voluminal resistivity	CEI 93	Estimate < 1 E+9 Ohms
Vertical surface Voluminal resistivity	CEI 93	Estimate < 1 E+9 Ohms

### Surface Finish :

<b>Natural Coloration :</b>	Visual	Aluminium GREY
<b>Shore D Hardness :</b>	ISO 868 (20°C)	Estimate > 80 Shore D
Surface Ra/ Upper Facing processed & blasting :	ISO 4287	12 +/- 2 µm
Surface Ra/ Upper Facing after Finishing :	ISO 4287	8 +/- 1 µm

### Chemical Properties :

Matrix in Polyamide 11 with a good chemical resistance to alkaline, hydrocarbons, oils, gasoline's, gas oil and solvents.  
Attack by the acids. Sealing of wall starting from **1.8 mm thickness**.

<b>SOLUBILITY :</b> WATER :	Insoluble in Water (20 °C) < 1 mg/m3 (estimated)
Solvents :	Soluble in :Mineral acids, Phenols Insoluble in most organic solvents Insoluble in : Chlorinated solvents ,Alkaline conditions Charge: Insoluble in almost all chemicals, except hydrofluoric acid
Odor :	None
pH:	NA
Melting Point / Range :	130 ° C < T < 220 °C
Decomposition Temperature :	> 400 °C
Explosive Properties :	Dust may form explosive mixture in air ( <b>30 - 60 g/m³</b> ) Test of dust behavior in explosions : Kst = 200 - 250 m.bar/s CARE / 301 m.bar/s Explosibility class : St2 CARE Standard : ISO 6184/1 - ASTM E 1226
Explosive Limits :	Lower : in air <b>30 - 60 g/m3</b> Higher : In air Approximately 200 g/m3 (estimated)

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