

## Polyamide fine composite powder PFP03: Innov'PA 1550 for systems of Rapid Prototyping

### Description, Applications :

Innov'PA 1550 is a fine powder based on polyamide 12 (thermoplastic) especially formulated to function on rapid prototyping systems by laser sintering or radiation. It enables to obtain productions of models and functional parts in "plastic engineering" with long cycle of life and excellent chemical resistance.

This polyamide powder gives final productions in natural color (white-cream towards the yellow in mass).

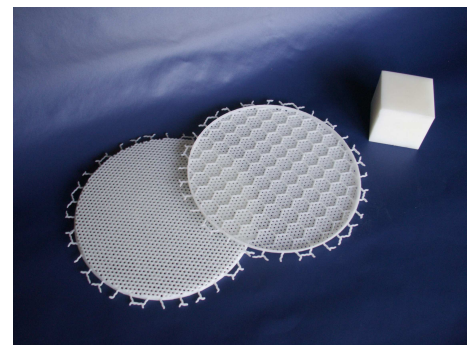
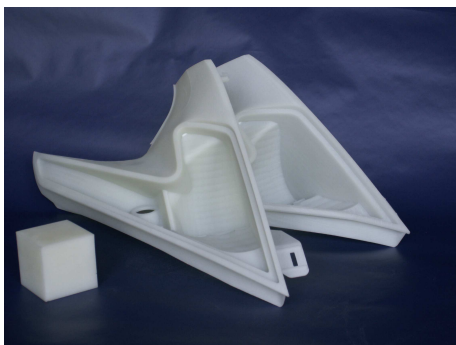
**Innov'PA 1550 is based on a new formulation with improved mechanical characteristics.** The whole of the improvements of the mechanical properties gives a better cohesion of the layers involving a more plastic behavior and responsive mechanics of the parts manufactured approaching the injected one. A simple blasting of the part obtain is enough, these parts can be finished and painted if needed. A refined specifies granulometry, precise and very tightened allows to obtain an excellent resolution of contour and surface.

These innovative properties make possible to consider **Rapid Manufacturing**.

The process ability of the powder on the rapid prototyping systems is optimized; thus all the powder of a building can be re-used after sifting. The refreshing factor for regeneration, because of the adapted formulation of **Innov'PA 1550**, is lower than the usual rates used on the various systems of rapid prototyping.

**The typical applications of Innov'PA 1550 are parts and models of design, functional, precise, requested mechanically, chemically and in temperature.**

- Granulometry refined around 45 µm
- Excellent resolution of contour and surface for Rapid Manufacturing
- Mechanical properties and mechanical behavior such as injected parts
- Exploitable on any type of system of prototyping: Pluri-manufacturers
- Use continues powder cycles sifting-regenerating
- Regeneration factor lowered
- Aspect and natural coloring of the product, cohesion of layer
- Chemical resistance of Polyamide 12
- Economic cost of exploitation (ratio Q Powder/ Number of building)
- Provisioning independent of the manufacturers



### 1. General Properties :

Measurement	Method & Condition	Metric Value
Average particle size	Diffraction laser	40 < ___ < 50 μm
powder packed Density 23°C	Method ExcelTec	0.5 ± 0.05 g/cm <sup>3</sup>
Part density 23°C	Method ExcelTec	0.98 ± 0.05 g/cm <sup>3</sup>
Moisture absorption 24 hrs, 50% HR, 23°C	ASTM D570	0.50 ± 0.05 %

### 2. Thermal Properties :

Measurement	Method & Condition	Metric Value
T°f Melting point	DSC	181 < ___ < 185 °C
T°g Glazing point	DSC	34 ± 2 °C
Heat Deflection Temperature at 1.82 MPa	ASTM D648	86 ± 1 °C
T° Process <i>* according to machine reading</i>	Glazing method	- 14 ± 2 °C (ex : 174 °C ± 2)*

### 3. Mechanical Properties :

Measurement	Method & Condition	Metric Value
Tensile strength	ISO 527	45 ± 1 MPa *
Young Modulus	ISO 527	1 550 ± 150 MPa *
Elongation at break	ISO 527	16 ± 2 % *
Flexural Modulus	ISO 178	1 350 ± 25 MPa *
Charpy – Impact strength	ISO 179	80 dry / ± 2 KJ/m <sup>2</sup> * 50 cond. 24 hrs
Charpy – Notched impact strength	ISO 179	6 ± 0.5 KJ/m <sup>2</sup> *
Shore Test (Shore D) <i>* statistics after several cycles &gt;10 refresh</i>	ISO R 868	68 ± 3 Shore D

### 4. Chemical Resistances :

Matrix in Polyamide 12 with a good chemical resistance to alkaline, hydrocarbons, oils, gasoline's, gas oil and solvents. Attack by the acids. Sealing of wall starting from 1.6 mm thickness.

### 5. Electrical Properties :

Measurement	Method & Condition	Metric Value
Volume resistivity 50% HR, 23°C	CEI 93	1.4 E <sup>+13</sup> Ohms/m
Horizontal and Vertical Surface Volume resistivity	CEI 93	1.7 E <sup>+15</sup> Ohms

Isolant
Anti Statique
Dissipateur
Conducteur

1E<sup>+15</sup> 1E<sup>+14</sup> 1E<sup>+13</sup> 1E<sup>+12</sup> 1E<sup>+11</sup> 1E<sup>+10</sup> 1E<sup>+9</sup> 1E<sup>+8</sup> 1E<sup>+7</sup> 1E<sup>+6</sup> 1E<sup>+5</sup> 1E<sup>+4</sup> 1E<sup>+3</sup> 1E<sup>+2</sup> 1E<sup>+1</sup>

Ohms/m

### 6. Surface Finish :

Measurement	Method & Condition	Metric Value
natural Coloration	Visual	White creams to yellow in mass
Upper Facing processed & blasting, Surface Ra S Ra	ISO 4287	9 ± 1 μm
Upper Facing after Finishing, Surface Ra S Ra	ISO 4287	< 1 ± 0.5 μm

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.