

## Innov'PA 2550 GBAL Data Sheet

Exceltec's Innov'PA 2550 GBAL powder is a polyamide composite blend optimised for producing parts by laser or other radiation sintering. The product number – 2550 – indicates the flexural modulus in MPa, and the GBAL indicates that it contains both glass spheres and aluminium flakes.

Based on thermoplastic PA12, Innov'PA 2550 GBAL offers a unique combination of stiffness and elongation to break. This allows functional 'snap-fit' features to be produced in a material with flexural modulus representative of many commercial injection moulding blends.

Parts have an exceptional surface finish, and are an attractive grey colour. For cosmetic prototypes, parts can be polished and/or painted.

Innov'PA 2550 GBAL is very attractive commercially too, due to its low refresh rate and ability to reuse powder repeatedly.

Mechanically Innov'PA 2550 GBAL simulates talc-filled polypropylene, a widely used injection moulding material. Cohesion between layers is exceptional due to a new base formulation, and the material has high chemical resistance.

Innov'PA 2550 powder is finer than most other commercial powders, and the size range is more tightly controlled. As a result, the resolution of fine detail is excellent. The material has a wide process latitude, with minimal shrinkage compensation required.

Typical applications of parts produced in Innov'PA 2550 GBAL include fully functional components where precision, surface finish, mechanical properties dimensional and thermal stability are important.

The ease of finishing – simple blasting – makes this material very suitable for Rapid Manufacturing.

Innov'PA 2550 GBAL has been validated for use on both 3D/DTM and EOS laser sintering systems, and fully optimised building parameters are available.

In the UK, Exceltec is represented by T2M Limited.

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## General Properties

|   |                   |                               |
|---|-------------------|-------------------------------|
| Average Particle Size                   | Laser diffraction | 35 - 65µm                     |
| Powder packed density at 23°C           | ExcelTec method   | 1.05 ± 0.05 g/cm <sup>3</sup> |
| Part density                            | ExcelTec method   | 1.35 ± 0.05 g/cm <sup>3</sup> |
| Moisture absorption 24hrs, 50% RH, 23°C | ASTM D570         | 0.3 ± 0.05%                   |

## Thermal Properties

|  |                |  |
|--|----------------|--|
| T <sup>°</sup> f melting point                                 | DSC            | 181 - 185 °C                             |
| T <sup>°</sup> g glazing point                                 | DSC            | N/A                                      |
| Heat deflection temperature at 1.82 MPa                        | ASTM D648      | 116 ± 1°C                                |
| T <sup>°</sup> process<br><i>*according to machine reading</i> | Glazing method | -12 ± 2°C<br><i>(example: 174 ± 2°C)</i> |

## Mechanical Properties

|   |           |                             |
|---|-----------|-----------------------------|
| Tensile strength                            | ISO 527   | 30 ± 1 MPa*                 |
| Young's modulus                             | ISO 527   | 2,550 ± 100 MPa*            |
| Elongation at break                         | ISO 527   | 8 ± 1%*                     |
| Flexural modulus                            | ISO 178   | 2,275 - 25 MPa*             |
| Charpy impact strength - conditioned 24 hrs | ISO 179   | 15 ± 2 KJ/m <sup>2</sup>    |
| Charpy notched impact strength              | ISO 179   | 5 ± 0.5 KJ/m <sup>2</sup> * |
| Shore hardness                              | ISO R 868 | 77 ± 2 Shore D              |

\* Measurements taken after > 10 refresh cycles

## Chemical Resistance

The material is a composite glass/aluminium filler in a polyamide 12 matrix. This gives it good resistance to alkalis, hydrocarbons, oils, gasolines, gas oil and other common solvents. It may, however, be attacked by acids. Wall thicknesses of 1.6mm and over are effectively non-porous.

## Electrical Properties

|   |        |                           |
|---|--------|---------------------------|
| Volume resistivity at 50% RH, 23°C        | CEI 93 | 1.8E <sup>+7</sup> Ohms/m |
| Horizontal & vertical surface resistivity | CEI 93 | 1.5E <sup>+8</sup> Ohms   |

## Surface Finish

|  |          |            |
|--|----------|------------|
| Colour                                     | Visual   | Grey       |
| Up-facing surface, processed & blasted, Ra | ISO 4287 | 8 ± 1µm    |
| Up-facing surface, finished, Ra            | ISO 4287 | 1 ± 0.5 µm |

The mechanical properties can vary according to the positioning of the tensile bars within the build envelope, operating conditions and exposure parameters of the systems used. These data are the current state of our knowledge; they do not give the exact characteristics of the material and do not represent a guarantee.