


DARK is a fine composite powder based on polyamide 11 (thermoplastic) especially formulated to function on powder bed systems by laser sintering (SLS, LS, compact & desktop SLS). It enables to obtain productions of models and functional parts in "plastic engineering" with long cycle of life and excellent chemical resistance.

 <p><b>PA11 Black</b></p>	<p>Typical features :</p> <ul style="list-style-type: none"> <li>● PA11 Black in the mass</li> <li>● Better elasticity than PA12</li> <li>● Sustainable material (bio-sourced)</li> </ul>	<p>Applications examples :</p> <ul style="list-style-type: none"> <li>➔ Automotive &amp; aerospace industries</li> <li>➔ Large parts as fuel or oil tanks</li> <li>➔ Detailed parts with better performances than PA12 on Desktop SLS</li> </ul>
	<p>Refresh rate :</p> <p><b>50 %</b> <i>Recommended</i></p>	<p>Key Points :</p> <ul style="list-style-type: none"> <li>● Industrial SLS</li> <li>● High-compatibility with Compact &amp; Desktop SLS</li> <li>● Ductility &amp; Elongation</li> <li>● No dying necessary (black deep colour in mass)</li> </ul>



MADE IN



### General Properties :

<p><b>Chemical Nature of the Preparation :</b></p> <p><b>Physical State (20°C) and Color :</b></p>	<p>POLYAMIDE 11, Presence of additives Possible presence of : Carbon black Colored grade = DARK Solid (powder) Colored Grade : Mass Black</p>	
<p><b>Average Particle Size :</b> Grain Size : Grain Size : Grain Size :</p> <p><b>Powder packed Density 23 ° C :</b> <b>Part Density :</b> 23°C Moisture absorption 24 hrs :</p>	<p><b>Diffraction laser :</b> D10 D50 D90</p> <p><b>Method FABULOUS :</b> <b>Method FABULOUS :</b> ASTM D570</p>	<p>45 &lt; _ &lt; 60 µm 30 µm 50 µm 90 µm</p> <p>0,55 +/- 0,05 g/cm³ 1 +/- 0,05 g/cm³ 1,12 +/- 0,05 %</p>

### Mechanical Properties :

<p><b>Young Modulus*</b> <b>Flexural Modulus*</b> <b>Tensile strength (Average XY)*</b> <b>Tensile strength (Average Z)*</b> <b>Elongation at break (Average XY)*</b> <b>Elongation at break (Average Z)*</b> <b>Charpy – Impact strength*</b> <i>*statistics after several cycles</i></p>	<p>ISO 527 ISO 178 ISO 527 ISO 527 ISO 527 ISO 527 ISO 179 (20°C)</p>	<p>&gt; 1500 MPa &gt; 1300 MPa 45 +/- 3 MPa 40 +/- 3 MPa 40 +/- 5 % 20 +/- 3 % NO BREAK dry/Cond.24 hrs KJ/m² 50 cond. 24 hrs</p>
--	---	---

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.

## Thermal Properties :

<b>T°f Melting Point :</b>	<b>DSC</b>	<b>196 &lt;_ &lt; 204 °C</b>
<b>T° Process :</b> According to machine the Black color offset the reading :	<b>Glazing Method</b>	<b>- 12 +/- 2 °C</b> <b>Indus : 187 °C +/-2 Desktop : 194°C +/-2</b>
<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>Colored grade: HC</b> <b>Out Classification</b>

## Electrical Properties :

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

<b>Volume resistivity</b>	<b>CEI 93</b>	<b>1.3 E+13 Ohms/m</b>
<b>Horizontal surface Voluminal resistivity</b>	<b>CEI 93</b>	<b>1.2 E+15 Ohms</b>
<b>Vertical surface Voluminal resistivity</b>	<b>CEI 93</b>	<b>1.5 E+15 Ohms</b>

## Surface Finish :

<b>Natural Coloration :</b>	<b>Visual</b>	<b>Mass Black</b>
<b>Shore D Hardness :</b>	<b>ISO 868 (20°C)</b>	<b>80 +/- 2 Shore D</b>
<b>Surface Ra/ Upper Facing processed &amp; blasting :</b>	<b>ISO 4287</b>	<b>10 +/- 2 µm</b>
<b>Surface Ra/ Upper Facing after Finishing :</b>	<b>ISO 4287</b>	<b>6 +/- 1 µm (blasting)</b> <b>2 +/- 1 µm (tribofinishing)</b>

## 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 **1.6 mm thickness**.

<b>SOLUBILITY :</b> <b>WATER :</b>	<b>Insoluble in Water on the basis of its structure at 20 °C &lt; 1 mg/m3 (estimated)</b> <b>Soluble in :Mineral acids, Phenols</b>
<b>Solvents :</b>	<b>Insoluble in most organic solvents</b> <b>Insoluble in : Chlorinated solvents, Alkaline conditions</b>
<b>Odor :</b> <b>pH:</b>	<b>None</b> <b>NA</b>
<b>Melting Point / Range :</b> <b>Decomposition Temperature :</b> <b>Explosive Properties :</b>	<b>&gt; 180 °C</b> <b>Polymer: &gt; 350 °C</b> <b>Dust may form explosive mixture in air (30 - 60 g/m3)</b> <b>Test of dust behavior in explosions :</b> <b>Kst = 200 - 250 m.bar/s CARE / 301 m.bar/s</b> <b>Explosibility class : St2 CARE.</b> <b>Standard : ISO 6184/1 - ASTM E 1226</b>
<b>Explosive Limits :</b>	<b>Lower : in air 30 - 60 g/m3</b> <b>Higher: In air Approximately 200 g/m3 (estimated)</b>

Data Sheet\_DARK PA11\_ Jan 2023.