

## SELECTIVE LASER SINTERING MATERIALS FOR UNLIMITED POSSIBILITIES



**PRODWAYS**  
THE NEW WAY OF PRODUCING

### **POLYMER POWDERS** FOR LASER SINTERING

[WWW.PRODWAYS.COM](http://WWW.PRODWAYS.COM)

#### **A WIDE RANGE OF POSSIBILITIES**

Our highly thermally-stable selective laser sintering technology is designed to work with premium powders allowing the design of new applications with great promise for your industry and with impressive performance in terms of mechanical, physical and aesthetic properties.

#### **INNOVATION AND EXPERTISE**

Prodways has a team of experts with the knowledge and experience to push materials technology into new territory. In addition, strong partnerships with established materials developers has allowed Prodways to be even more effective at providing solutions.



# ProMaker **P SERIES** COMPATIBLE MATERIALS

	PA12-S 1300*	PA12-S 1550*	PA12-GF 2500*	PA12-GFX 2550*	PA12-MF 6150*	PA12-CF 6500*
Appearance	Natural cream	Natural + mass coloring Black/Blue/Red/Grey	Natural cream	Grey color in mass	Natural cream	Black
Average particle size	N.A	42 µm	N.A	46 µm	N.A	N.A
Bulk Density	0.45 g/cm <sup>3</sup>	0.50 g/cm <sup>3</sup>	0.67 g/cm <sup>3</sup>	1.05 g/cm <sup>3</sup>	0.55 g/cm <sup>3</sup>	0.51 g/cm <sup>3</sup>
Density of parts	0.95 g/cm <sup>3</sup>	0.98 g/cm <sup>3</sup>	1.26 g/cm <sup>3</sup>	1.35 g/cm <sup>3</sup>	1.20 g/cm <sup>3</sup>	1.08 - 1.10 g/cm <sup>3</sup>
Moisture absorption	N.A	0.50% (ASTM D570)	N.A	0.33% (ASTM D570)	N.A	N.A
Melting Point	180°C	181°C - 183 °C	180°C	181°C - 183 °C	183°C	180°C
Heat Deflection 1.8 MPa	58°C	86°C	88°C	116°C	N.A	72°C
Tensile Strength	42 MPa	44 MPa	37 MPa	30 MPa	51 MPa	63 MPa
Tensile Modulus	1300 MPa	1550 MPa	2500 MPa	2550 MPa	6150 MPa	6500 MPa
Elongation @ break	30%	15%	5.0%	8%	5%	3%
Flexural Strength	40 MPa	N.A	54 MPa	N.A	76 MPa	85 MPa
Flexural Modulus	1200 MPa	1350 MPa	2200 MPa	2275 MPa	4633 MPa	3870 MPa
Impact Strength (unnotched Izod)	34 KJ/m <sup>2</sup>	68 KJ/m <sup>2</sup>	19 KJ/m <sup>2</sup>	80 KJ/m <sup>2</sup>	20.78 KJ/m <sup>2</sup>	15 KJ/m <sup>2</sup>
Shore Test (shore D)	N.A	68 Shore D	N.A	77 Shore D	N.A	N.A
Resistivity domain	Insulator	Insulator	N.A	Antistatic	N.A	N.A
Upper facing processed & blasting, Surface Ra	N.A	7 µm	N.A	8 µm	N.A	N.A
Upper facing after Finishing, Surface Ra	N.A	7 µm	N.A	1 µm	N.A	N.A
Testing standard / Certification	GB/T	ISO	GB/T	ISO	GB/T	GB/T
Specification	Excellent mechanical properties Good recyclability Color stability Good Antioxidative Activities Size stability	Fine granulometry #42 µm Lowest porosity remaining Refreshing allows a use in continuous sifting-regenerating cycles Economic cost of exploitation	Higher modulus range than standard PA12 nylon Higher heat deflection rates	Similar to PP 20% injected parts Fine granulometry #46 µm Lower porosity remaining for a composite Refreshing allows a use in continuous sifting-regenerating cycles Economic cost of exploitation Excellent behavior in temperature and good chemical resistance	Stable size, smooth surface Good recyclability High resistance to thermal deformation Small contractive rate Good mechanical properties due to the addition of mineral fabric	Improved strength Good heat deflection rates Good modulus range (4750 - 6500MPa) Uniform black color
Typical Application Examples	Spare parts manufacturing or big parts joining with adhesives Complex production and prototype plastic parts Making car's oil pipe and brake pipe	Ideal for a wide range of application from consumer goods to aerospace industry	Perfect for automotive industries Good for parts which require enhanced stiffness	Manufacturing of end-use complex parts Improved and reliable properties for a wide range of application from military to motorsport industry	Wide range of application for aerospace and automotive industry	Wide range of application for aerospace and automotive industry
By	Prodways Materials by Farsoon	Prodways Materials	Prodways Materials by Farsoon	Prodways Materials	Prodways Materials by Farsoon	Prodways Materials by Farsoon

	PA11-SX 1350*	PA11-SX 1450*	PA11-GF 3450*	PA11-GF 3450 Black*	FR 106*
Appearance	Mat black color in mass	Natural cream color	Natural cream to light grey color	Mat black	Natural cream color
Average particle size	50 µm	50 µm	55 µm	55 µm	95 µm
Bulk Density	0.55 g/cm <sup>3</sup>	0.55 g/cm <sup>3</sup>	0.95 g/cm <sup>3</sup>	0.95 g/cm <sup>3</sup>	0.45 g/cm <sup>3</sup>
Density of parts	1.02 g/cm <sup>3</sup>	1.02 g/cm <sup>3</sup>	1.40 g/cm <sup>3</sup>	1.40 g/cm <sup>3</sup>	1.07 g/cm <sup>3</sup>
Moisture absorption	1.12% (ASTM D570)	1.12% (ASTM D570)	0.85% (ASTM D570)	0.85% (ASTM D570)	N.A
Melting Point	199 °C	200 °C	200 °C	199 °C	189°C
Heat Deflection 1.8 MPa	46°C (ASTM D648)	47°C (ASTM D648)	133°C (ASTM D648)	133°C (ASTM D648)	70°C (ASTM D648)
Tensile Strength	45 MPa	45 MPa	33 MPa	33 MPa	26 MPa
Tensile Modulus	1350 MPa	1450 MPa	3450 MPa	3450 MPa	N.A
Elongation @ break (XY)	45%	45%	12%	12%	38%
Elongation @ break (Z)	21%	21%	9%	9%	21%
Flexural Strength	N.A	N.A	N.A	N.A	N.A
Flexural Modulus	1250 MPa	1300 MPa	2300 MPa	2300 MPa	1345 MPa
Impact Strength (unnotched Izod)	No break	No break	N.A	N.A	N.A
Shore Test (shore D)	75 Shore D	74 Shore D	N.A	N.A	N.A
Resistivity domain	Insulator	Insulator	Antistatic	Antistatic	Insulator
Upper facing processed & blasting, Surface Ra	9 µm	10 µm	11 µm	11 µm	N.A
Upper facing after Finishing, Surface Ra	7 µm	8 µm	8 µm	8 µm	N.A
Flammability 12 Second Burn	N.A	N.A	N.A	N.A	Pass
Flammability 60 Second Burn	N.A	N.A	N.A	N.A	Pass
Testing standard / Certification	ISO	ISO / Class VI certification**	ISO	ISO	ASTM / FAR 25.853 ***/ABD 0031***
Specification	Granulometry refined #50 µm Use in continuous sifting-regenerating cycles possible Mat black aspect and easy unpacking Ductility, elongation and shock resistance for snapfit and living hinges	Granulometry refined #50 µm Refreshing at 50% for medical applications (limited to 8-10 cycles) Quality control and Class VI certification **	Similar to injected PA6-MD30 or PP-GB Granulometry refined #55 µm Low shrinkage and reliable properties Refreshing at 50% limited to 8-10 cycles Economic cost of exploitation	Similar to injected PA6-MD30 or PP-GB Granulometry refined #55 µm Low shrinkage and reliable properties Refreshing at 50% limited to 8-10 cycles Economic cost of exploitation Mat black aspect and easy unpacking	Meet rigorous Federal Aviation Regulation (FAR) fire retardant requirement *** Superior toughness allows for thin walled features while saving space and weight designs Maintain exceptional mechanical strength
Typical Application Examples	Manufacturing of end-use complex parts for a wide range of application from aerospace to shoe industry	Manufacturing of final parts for medical sector	Manufacturing of end-use complex parts for a wide range of application from automotive to aerospace industry	Manufacturing of end-use complex parts for a wide range of application from automotive to military industry	Specifically engineered for producing parts with excellent fire retardancy while maintaining superior mechanical properties
By	Prodways Materials	Prodways Materials	Prodways Materials	Prodways Materials	ALM

\*Preliminary data. Performance characteristics of these materials may change according to product application, operating conditions, material combined or end use.

\*\* Under reference InnovPA 1450 from ExcelTec

\*\*\* Under reference FR 106 from ALM



ZI Les Garennes - 1-3, rue Chappe 78130 les Mureaux | Tel: +33 (0)1 30 90 44 12 | [www.prodways.com](http://www.prodways.com)

Photos: ©Prodways - ©Thinkstock - ©Shutterstock - V. 05/11/2015

©Prodways 2015 - The information contained in this document is not contractually binding and may not be reproduced without prior approval.

