

# Technical Data Sheet

# Ultrasint® PA11 ESD

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Version No.: 1.1, revised 04/2021

## General information

### Components

Polyamide 11 ESD powder for Laser Sintering

### Product Description

Ultrasint PA11® ESD, a bio-based material (castor oil), is a special material for applications requiring electrostatic discharge behavior of the printed part. Parts produced with this material show a reduced surface and volume resistivity compared to non-functionalized PA11. Typical applications are where electrostatic discharge matters, i.e. in the electronics industry. The material is suitable for production of functional parts and i.e. manufacturing tools and fixtures. Ultrasint® PA11 ESD is processable on most common LS printers. Parameters for printing will be provided.

Typical applications are:

- Durable jigs, fixtures and tools for electronics industry
- Electronic housings
- Chemical system components
- ESD safe prototypes and end-use part

### Delivery form & warehousing

Ultrasint® PA11 ESD should be stored at 15 – 25°C in its originally sealed package in a clean and dry environment.

### Product safety

Mandatory and recommended industrial hygiene procedures and the relevant industrial safety precautions must be followed whenever this product is being handled and processed. Product is sensitive to humid environment conditions. For additional information please consult the corresponding material safety data sheets.

### For your information

Ultrasint® PA11 ESD comes in natural grey color. Further electrical properties (e.g. volume resistivity, surface resistivity), chemical properties (e.g. resistance against particular substances) and tolerance for solvents are available upon request. Generally, these properties correspond to publicly available data on polyamides.

### Notice

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed.

The safety data given in this publication is for information purposes only and does not constitute a legally binding Material Safety Data Sheet (MSDS). The relevant MSDS can be obtained upon request from your supplier or you may contact Forward AM directly at [sales@basf-3dps.com](mailto:sales@basf-3dps.com).

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General Properties	Test Method	Typical Values
Bulk Density / kg/m <sup>3</sup>	DIN EN ISO 60	460
Printed Part Density / kg/m <sup>3</sup>	DIN EN ISO 1183-1	1070
Mean particle size d50 / μm	Laser Diffraction	40-50
Melting Temperature / °C	ISO 11357 (10 K/min)	204
Crystallization Temperature / °C	ISO 11357 (10 K/min)	162
Melt Volume Flow Rate / cm <sup>3</sup> /10min	ISO 1133 (220 °C, 2.16 kg)	20

Thermal Properties	Test Method	Typical Values <sup>1</sup>
HDT/A (1.8 MPa) / °C	ISO 75-2	111
HDT/B (0.45 MPa) / °C	ISO 75-2	186
Vicat/A (10 N) / °C	ISO 306	192
Vicat/B (50 N) / °C	ISO 306	183

Electrical Properties	Test Method	Typical Values (X-direction)	Typical Values (Z-direction)
Specific volume resistivity / Ωcm	IEC 62631-3-1	2.3•10 <sup>6</sup>	2.1•10 <sup>5</sup>
Specific surface resistivity / Ω	IEC 62631-3-2	1.3•10 <sup>4</sup>	3.4•10 <sup>4</sup>

Mechanical Properties	Test Method	Typical Values X-direction		Typical Values Z-direction	
		Dry <sup>1</sup>	Cond. <sup>2</sup>	Dry <sup>1</sup>	Cond. <sup>2</sup>
Tensile Strength / MPa	ISO 527-2 (23° C)	65	55	55	47
Tensile Modulus / MPa	ISO 527-2 (23° C)	3150	2300	2150	1550
Tensile Elongation at break / %	ISO 527-2 (23° C)	20	22	23	31
Tensile Strength / MPa	ISO 527-2 (80° C)	38	34	30	27
Tensile Modulus / MPa	ISO 527-2 (80° C)	900	800	550	500
Tensile Elongation at break / %	ISO 527-2 (80° C)	37	35	49	46
Flexural Modulus / MPa	DIN EN ISO 178	3050	2550	2100	1650
Charpy Impact Strength (notched) / kJ/m <sup>2</sup>	ISO 179-1	6.6	7.3	4.7	5.3
Charpy Impact Strength (unnotched) / kJ/m <sup>2</sup>	ISO 179-1	80	101	90	107
Izod Impact Strength (notched) / kJ/m <sup>2</sup>	ISO 180	7.0	7.9	5.0	5.5
Izod Impact Strength (unnotched) / kJ/m <sup>2</sup>	ISO 180	67	81	58	83

 Detailed material data and support for FEA simulations available on request ([sales@basf-3dps.com](mailto:sales@basf-3dps.com)).

1) Measured after drying 14 days at 80°C / vacuum. Water content is about 0.08% acc. to DIN EN ISO 15512

2) Measured after conditioning 14 days at 70°C / 62% r.h. Water content is about 0.8% acc. to DIN EN ISO 15512

All values measured with virgin material.