ABCorp™
Secure since 1795

3D Printing Materials Guide

Secure Manufacturing

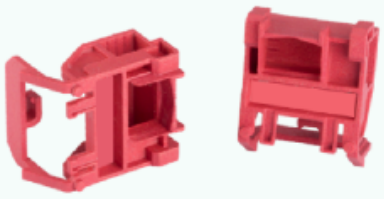
- When it comes to **bespoke and highly exacting manufacturing** - no other company has more experience.
- The products we touch cannot tolerate error, and the processes we design ensure their integrity.
- We have done many things over the years, but identifying simple solutions to complex problems is what we do best.
- If you question how to adapt in a rapidly changing world, it would be fair to say we have some experience in that area - more than two centuries of it.

Materials

In any manufacturing company, but especially in Additive Manufacturing, materials and how they act are among the most important offerings. Here at ABCorp, we understand materials, whether discussing with one of our material engineers or providing a suite of materials to our clients and prospective clients to get the most out of their part. In this document, we go over the industrial quality materials we offer to help you understand and make an informed decision.

What We Offer

HP 3D HR PA12	HP 3D HR PA11	HP 3D Polypropylene	BASF Ultrasint™ TPU01
			
Strong, functional, and detailed parts at lowest cost	Producing strong ductile, quality parts	Chemical resistant, weldable, low moisture absorption, and functional parts	Ideal for parts requiring shock absorption, energy return, or flexibility

Single Color	Spot Colors	Full Color Spectrum
		
Add color at the part level, just prior to printing	Add text and face colors using a variety of CAD solutions	Add texture maps with tools similar to 3D animation

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The Specifics

HP 3D High Reusability PA 12

Ideal for producing strong, quality parts at a low cost per part

Produce strong, functional, detailed complex parts

- Robust thermoplastic produces high-density parts with balanced property profiles and strong structures
- Provides good chemical resistance to oils, greases, aliphatic hydrocarbons, and alkalies
- Ideal for complex assemblies, housings, enclosures, and watertight applications
- Biocompatibility—meets USP Class I-VI and US FDA guidance for Intact Skin Surface Devices

Quality at a low-cost per part

- Achieve a low cost per part and reduce your total cost of ownership
- Minimize waste—reuse surplus powder batch after batch and get functional parts, no throwing away anymore
- Get consistent performance while achieving up to 80% surplus powder reusability
- Optimize cost and part quality—cost-efficient material with industry-leading surplus powder reusability

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Engineered for HP Multi Jet Fusion technology

- Designed for the production of functional parts across a variety of industries
- Provides the best balance between performance and reusability
- Achieves watertight properties without any additional post-processing
- Engineered to produce final parts and functional prototypes with fine detail and dimensional accuracy

	Value	Method
Powder melting point (DSC)	187° C 369° F	ASTM D3418
Particle size	60 µm	ASTM D3451
Bulk density of powder	0.425 g/cm³ 0.015 lb/in³	ASTM D1895

HP 3D High Reusability PA 11

Ideal for producing ductile, quality parts

Produce strong, ductile, functional parts

- Thermoplastic material delivering optimal mechanical properties
- Provides excellent chemical resistance5 and enhanced elongation at break
- Impact resistance and ductility4 for prostheses, insoles, sports goods, snap fits, living hinges, and more
- Biocompatibility—meets USP Class I-VI and US FDA guidance for Intact Skin Surface Devices

Minimize waste with a renewable raw material

- Renewable raw material from vegetable castor oil (reduced environmental impact)
- Minimize waste—reuse surplus powder batch after batch and get functional parts, no throwing away anymore
- Get consistent performance while achieving up to 70% surplus powder reusability
- Optimize cost and part quality—cost efficient material with industry-leading surplus powder reusability

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Engineered for HP Multi Jet Fusion technology

- Designed for production of functional and final parts across a variety of industries
- Provides the best balance between performance and reusability
- Easy-to-process material enables high productivity and less waste
- Engineered to reliably produce final parts and functional prototypes with fine detail, dimensional accuracy

Data courtesy of OT4 Orthopädietechnik GmbH

Data courtesy of Bowman - Additive Production

	Value	Method
Powder melting point (DSC)	202° C 396° F	ASTM D3418
Particle size	54 µm	ASTM D3451
Bulk density of powder	0.48 g/cm³ 0.017 lb/in³	ASTM D1895

HP 3D High Reusability PP enabled by BASF

Chemical resistant, weldable, low moisture absorption, functional parts

Genuine, functional PP parts

- Get the same properties as many commonly used PPs with this genuine polypropylene material
- Accelerate your product development process using the same prototyping material as the final part

Chemical resistance, low moisture absorption

- Excellent chemical resistance and low moisture absorption ideal for piping or fluid systems and containers
- Outstanding welding capabilities with other PP parts produced with traditional methods like injection molding
- Versatile material ideal for a wide range of automotive, industrial, and consumer goods applications

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Lowest cost HP 3D material for HP Multi Jet Fusion

- Our best value HP 3D material delivers consistent performance with up to 100% surplus powder reuse
- Provides the optimal balance between performance and cost

	Value	Method
Powder melting point (DSC)	138° C 280° F	ASTM D3418
Particle size	62 µm	ASTM D3451
Bulk density of powder	0.34 g/cm³ 0.012 lb/in³	ASTM D1895

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BASF Ultrasint® TPU01

Flexible, functional parts

Produce flexible TPU parts

- High throughput
- Excellent quality
- Excellent detail
- Many applications

Typical applications

- Sports & Leisure
- Footwear
- Transportation Industry
- Jigs & Fixtures

Data courtesy of BASF

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General Properties	Test Method	Typical Values
Bulk Density / g/cm³	DIN EN ISO 60	0.5
Printed Part Density / g/m³	DIN EN ISO 1183-1	1.1
Mean particle size d50 / µm	ISO 13320	70-90
Glass transition Temperature / °C	ISO 11357 (20 K/min)	-48
Melting Temperature / °C	ISO 11357 (20 K/min)	120-150

Mechanical Properties	Test Method	Typical Values1 X-Direction	Typical Values1 Z-Direction
Hardness Shore A	DIN ISO 7619-1	88-90	88-90
Tensile Strength / MPa	DIN 53504, S2	9	7
Tensile Elongation at break / %	DIN 53504, S2	280	150
Tensile Modulus / MPa	ISO 527-2, 1A	85	85
Flexural Modulus / MPa	DIN EN ISO 178	75	75
Tear resistance (propagation, Trouser) / kN/m	DIN ISO 34-1, A	21	18
Tear resistance (initiation, Graves) / kN/m	DIN ISO 34-1, B	38	37
Compression Set B (23°C, 72h) / %	DIN ISO 815-1	23	24
Rebound resilience / %	DIN 53512	53	63
Abrasion resistance / mm³	DIN ISO 4649	95	100
Charpy Impact Strength (notched, 23°C) / kJ/m²	DIN EN ISO 179-1	No break	No break
Charpy Impact Strength (notched, -10°C) / kJ/m²	DIN EN ISO 179-1	46	44
Fatigue behavior (Bossflex, 100k cycles, 23°C)	ASTM D7057	No cut growth	
Fatigue behavior (Bossflex, 100k cycles, 10°C)	ASTM D7057	No cut growth	

HP 3D High Reusability CB PA 12

Engineering-grade full-color and white parts

Strong, functional complex parts

- Robust thermoplastic produces high density parts with balanced property profiles and strong structures
- Provides excellent chemical resistance to oils, greases, aliphatic hydrocarbons, and alkalies
- Ideal for color and white parts like jigs, fixtures, labeling, presentation models, functional prototypes

Full-color and white quality parts

- Produce functional parts in full color and white with optimal mechanical
- properties
- Get consistent performance while achieving up to 80% surplus powder reusability
- Optimize cost and quality—full-color and white functional parts and industry-leading reusability

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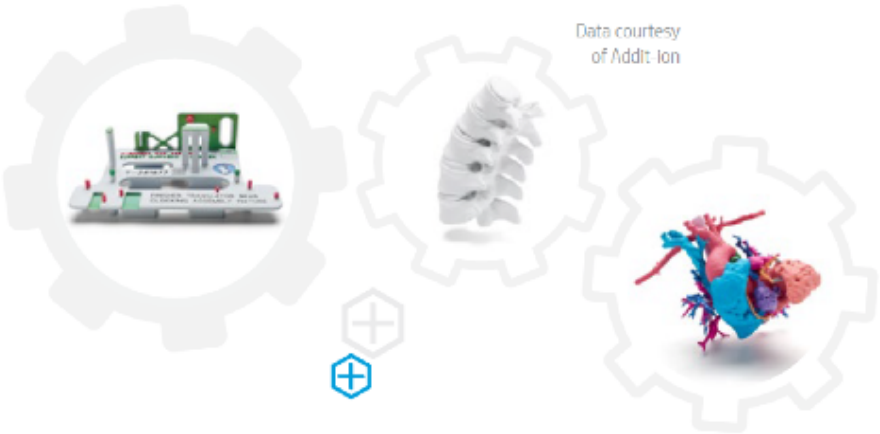
Engineered for HP Multi Jet Fusion technology

- Designed for the production of full-color and white functional parts across a variety of industries
- Provides the best balance between Color and white performance, and reusability
- Engineered to produce functional prototypes with fine detail and dimensional accuracy



Data courtesy of Addit ion

Data courtesy of Phoenix Children's Hospital; Heart of Jemma

	Value	Method
Powder melting point (DSC)	189° C 372.2° F	DIN EN ISO 11357
Particle size	58 µm	ISO 8130/13
Bulk density of powder	0.442 g/cm³ 0.016 lb/in³	ISO 60

ABCorp™
Secure since 1795

Throughout the past 225+ years, ABCorp provided Essential goods and services to world-class companies and federal, state, and local government agencies in more than 120 countires. Now, ABCorp is pleased to expand our partnership with HP and launch the first global, enterprise-grade additive manufacturing platform.

We hope that you found this guide insightful. We'll reach out to see how you can leverage this technology to benefit your business. In the meantime, please feel free to contact us directly with any questions you may have.

For more information on materials and how to buy parts, contact us at 3D@abcorp.com or 617-325-9600