



PolyJet 3D Printers



SYSTEMS AND MATERIALS
OVERVIEW

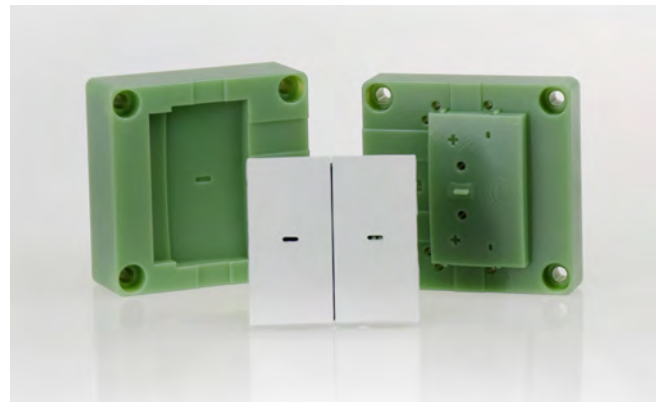
PolyJet 3D Printers

Broad Versatility with Extraordinary Realism

PolyJet™ 3D Printers empower professional designers, engineers, educators and healthcare professionals to create and problem-solve with precision, speed and realism. The power lies with PolyJet technology, curable liquid photopolymers capable of producing very fine layers for smooth surfaces, intricate details and vivid color.

The versatility of PolyJet technology is based on a wide range of available material properties and a suite of 3D printers to suit varied budgets and applications. No matter the industry, PolyJet technology provides the power to solve problems and create opportunities.

- Product designers and developers can create realistic prototypes and models with full-color elements, labels and true-to-life textures in one operation, to gain focus-group feedback before committing to full production.
- Full-color, flexible materials enable lifelike anatomical models for physician training and pre-surgical planning that lower operating room costs and improve patient outcomes.
- Injection molds made with simulated engineering plastic are produced faster and for less cost than metal molds, making low-volume production economically viable.
- Dental labs can increase productivity by making multiple models and try-ins in a single print operation to boost production capacity and fuel growth.



PolyJet 3D Printers

3D Printers for Any Application

PolyJet 3D Printers are scaled to meet diverse needs in capability and production capacity. The printers fall within two groups: single-material printers that jet one material (base resin) at a time and multi-material printers with the capacity to jet several base resins simultaneously.

Single Material

Single-material printers start with affordable desktop models, featuring PolyJet technology's fine resolution and smooth surface finish. Depending on the specific model, these printers employ a single base resin or several base resins, with a choice of either rigid or flexible characteristics. All single-material printers use SUP705 support material, removable with a WaterJet. Several models are also compatible with SUP706 soluble support for hands-free, labor-saving support removal.

Multi-Material

Multi-material printers offer the most in PolyJet versatility, performance and productivity, exploiting the benefits of multi-jetting technology. Multi-material printers enable mixed parts, the combination of several base resins in the same part and Digital Materials, individual base resins blended to create new materials with distinct properties. Mixed trays are also possible, meaning one build tray can accommodate multiple parts made with different materials, increasing production efficiency. Large-capacity needs are easily handled by the Objet1000 Plus™, boasting the largest build volume of any PolyJet 3D Printer.

At the top of the versatility and performance spectrum are the Stratasys J735™ and Stratasys J750™, equipped with over 500,000 colors, texture-mapping and the full complement of rigid and flexible materials. These printers provide the capability to produce everything from visually stunning, ultra-real prototypes to tools featuring soft-touch parts, to visually and tactilely realistic medical models.

See the Results



This clear goblet was 3D printed on the Objet30 Pro™ using VeroClear™ material.



The wood-grain texture, simulated leather shift boot and intricate dials on this prototype auto console resulted from a single print on a Stratasys J750.



Connex3™ 3D Printers combine color and multiple textures for ultra-realistic prototypes and models.



This fixture combines a soft, non-marring black surface on top of a rigid white frame, produced in a single operation on a Connex1™ Printer.

PolyJet 3D Printers

SINGLE-MATERIAL PRINTERS



	OBJET24™	OBJET30™ OBJET30 PRO OBJET30 PRIME™	OBJET EDEN260VS™
Maximum Build Size (XYZ)	234 x 192 x 148.6 mm (9.21 x 7.55 x 5.85 in.)	294 x 192 x 148.6 mm (11.57 x 7.55 x 5.85 in.)	255 x 252 x 200 mm (10.0 x 9.9 x 7.9 in.)
System Size and Weight	825 x 620 x 590 mm (32.28 x 24.4 x 23.22 in.) 93 kg (205 lbs.)	826 x 600 x 620 mm (32.5 x 23.6 x 24.4 in.) 106 kg (234 lbs.)	870 x 1200 x 735 mm (34.2 x 47.2 x 29 in.) 254 kg (559 lbs.)
Layer Thickness	Horizontal build layers down to 28 microns (0.0011 in.)	Objet30: 28 microns (0.0011 in.) Objet30 Pro: 28 microns (0.0011 in.), 16 microns (0.0006 in.) for VeroClear material Objet30 Prime: 28 microns (0.0011 in.) for Tango™ materials; 16 microns (0.0006 in.) for all other materials	Horizontal build layers as fine as 16 microns (.0006 in.)
Accuracy ¹	0.1 mm (0.0039 in.)	0.1 mm (0.0039 in.)	20-85 microns for features below 50 mm; up to 200 microns for full model size
Model Material Options	Rigid Opaque: VeroWhitePlus™	Objet30 <ul style="list-style-type: none"> Rigid Opaque: VeroWhitePlus, VeroGray™, VeroBlue™, VeroBlack™, VeroBlackPlus™ Simulated Polypropylene: Durus™ Objet30 Pro <ul style="list-style-type: none"> Rigid Opaque: VeroWhitePlus, VeroGray, VeroBlue, VeroBlack, VeroBlackPlus Transparent: VeroClear Simulated Polypropylene: Rigur™, Durus High Temperature Objet30 Prime <ul style="list-style-type: none"> Rigid Opaque: VeroWhitePlus, VeroGray, VeroBlue, VeroBlack, VeroBlackPlus Transparent: VeroClear and RGD720 Simulated Polypropylene: Rigur, Durus High Temperature Rubber-Like: TangoGray™ and TangoBlack™ Biocompatible 	<ul style="list-style-type: none"> Rigid Opaque: VeroWhitePlus, VeroBlackPlus², VeroGray, VeroBlue Rubber-like²: TangoPlus™, TangoBlackPlus™, TangoBlack, TangoGray Transparent: VeroClear and RGD720² Simulated Polypropylene²: Rigur and Durus High Temperature² Biocompatible²
Digital Material Options	—	—	—
Support Material	SUP705 (WaterJet removable)	SUP705 (WaterJet removable) SUP706 (soluble)	SUP705 (WaterJet removable) SUP707 (soluble)
Software	Objet Studio™	Objet Studio	Objet Studio

¹ Varies depending on part geometry, size, orientation, material and post-processing method.

² Works with SUP705 support material only

PolyJet 3D Printers

MULTI-MATERIAL PRINTERS



	OBJET260/500 CONNEX1	OBJET260/350/500 CONNEX3	STRATASYS J735/J7500	OBJET1000 PLUS™
Maximum Build Size (XYZ)	<p>Objet260: 255 x 252 x 200 mm (10.0 x 9.9 x 7.9 in.)</p> <p>Objet500: 490 x 390 x 200 mm (19.3 x 15.4 x 7.9 in.)</p>	<p>Objet260: 255 x 252 x 200 mm (10.0 x 9.9 x 7.9 in.)</p> <p>Objet350: 342 x 342 x 200 mm (13.4 x 13.4 x 7.9 in.)</p> <p>Objet500: 490 x 390 x 200 mm (19.3 x 15.4 x 7.9 in.)</p>	<p>Stratasys J735: 350 x 350 x 200 mm (13.7 x 13.7 x 7.6 in.)</p> <p>Stratasys J750: 490 x 390 x 200 mm (19.3 x 15.35 x 7.9 in.)</p>	<p>1000 x 800 x 500 mm (39.3 x 31.4 x 19.6 in.)</p> <p>Max model weight on tray: 135 kg</p>
System Size and Weight	<p>Objet260: 870 x 1200 x 735 mm (34.2 x 47.2 x 29 in.); 264 kg (581 lbs.)</p> <p><i>Material Cabinet:</i> 330 x 1170 x 640 mm (13 x 46.1 x 25.2 in.); 76 kg (168 lbs.)</p> <p>Objet500: 1400 x 1260 x 1100 mm (55.1 x 49.6 x 43.4 in.); 430 kg (948 lbs.)</p> <p><i>Material Cabinet:</i> 330 x 1170 x 640 mm (13 x 46.1 x 25.2 in.); 76 kg (168 lbs.)</p>	<p>Objet260: 870 x 1200 x 735 mm (34.2 x 47.2 x 29 in.); 264 kg (581 lbs.)</p> <p><i>Material Cabinet:</i> 330 x 1170 x 640 mm (13 x 46.1 x 25.2 in.); 76 kg (168 lbs.)</p> <p>Objet350/500: 1400 x 1260 x 1100 mm (55.1 x 49.6 x 43.4 in.); 430 kg (948 lbs.)</p> <p><i>Material Cabinet:</i> 330 x 1170 x 640 mm (13 x 46.1 x 26.2 in.); 76 kg (168 lbs.)</p>	<p>1400 x 1260 x 1100 mm (55.1 x 49.6 x 43.3 in.); 430 kg (948 lbs.)</p> <p><i>Material Cabinet:</i> 670 x 1170 x 640 mm (26.4 x 46.1 x 25.2 in.); 152 kg (335 lbs.)</p>	<p>1960 x 2868 x 2102 mm (77.5 x 113 x 83 in.); 2200 kg (4850 lbs.)</p>
Layer Thickness	Horizontal build layers as fine as 16 microns (.0006 in.)	Horizontal build layers as fine as 16 microns (.0006 in.)	Horizontal build layers down to 14 microns (.00055 in.)	Horizontal build layers as fine as 16 microns (0.0006 in.)
Accuracy ¹	Up to 200 microns for full model size (for rigid materials only, depending on geometry, build parameters and model orientation)	Up to 200 microns for full model size (for rigid materials only, depending on geometry, build parameters and model orientation)	Up to 200 microns for full model size (for rigid materials only, depending on geometry, build parameters and model orientation)	Up to 600 microns for full model size (for rigid materials only, depending on geometry, build parameters and model orientation)
Model Material Options ²	<ul style="list-style-type: none"> • Rigid Opaque: VeroWhitePlus, Vero PureWhite™, VeroBlackPlus, VeroGray and VeroBlue • Rubber-like: Agilus30™, TangoPlus, TangoBlackPlus, TangoBlack, TangoGray • Transparent: VeroClear and RGD720 • Simulated Polypropylene: Rigur and Durus • High Temperature • Biocompatible 	<ul style="list-style-type: none"> • Rigid Opaque: VeroWhitePlus, Vero PureWhite, VeroBlackPlus, VeroGray and VeroBlue; VeroCyan™, VeroMagenta™ and VeroYellow™; VeroMagentaV™ and VeroYellowV™ • Rubber-like: Agilus30, TangoPlus, TangoBlackPlus, TangoBlack, TangoGray • Transparent: VeroClear and RGD720 • Simulated Polypropylene: Rigur and Durus • High Temperature • Biocompatible 	<ul style="list-style-type: none"> • Full Vero family of opaque materials including neutral shades and vibrant colors • Rubber-like: Agilus30, TangoPlus and TangoBlackPlus • Transparent VeroClear and RGD720 • VeroFlex™ family 	<ul style="list-style-type: none"> • Transparent rigid: VeroClear • Rubber-like: TangoPlus and TangoBlackPlus • Rigid Opaque: Vero family • Simulated Polypropylene: Rigur
Digital Material Options	—	<ul style="list-style-type: none"> • Vibrant blended colors in Rigid Opaque • Translucent colored tints • Rubber-like materials in a variety of Shore A values • Digital ABS Plus™ for durability, including blends with rubber • Simulated polypropylene materials with improved heat resistance 	<p>Unlimited number of composite materials including:</p> <ul style="list-style-type: none"> • Over 500,000 colors • Digital ABS Plus and Digital ABS2 Plus™ in ivory and green materials in a variety of Shore A values • Translucent color tints 	<ul style="list-style-type: none"> • Transparent shades and patterns • Rigid Opaque shades • Rubber-like blends in a range of Shore A values • Simulated Polypropylene blends in rigid and flexible options
Support Material	SUP705 (WaterJet removable) SUP706 (soluble)	SUP705 (WaterJet removable) SUP706 (soluble)	SUP705 (WaterJet removable) SUP706 (soluble)	SUP705 (WaterJet removable)
Software	Objet Studio	Objet Studio GrabCAD Print™	PolyJet Studio™ GrabCAD Print	GrabCAD Print









¹Varies depending on part geometry, size, orientation, material and post-processing method.

²See PolyJet Color Spec Sheet for additional material color information relevant to Connex3 systems.

PolyJet 3D Printers

PolyJet 3D Printers use photopolymers, which are capable of simulating properties ranging from rubber-like to transparent – even high toughness and heat resistance.

Digital Materials expand the possibilities by blending two or more base resins to create thousands of material combinations. Achieve full color capabilities, translucencies, Shore A values and other properties for maximum product realism.

Material	Highlights
 <p>Digital Materials</p>	<ul style="list-style-type: none"> • Wide range of flexibility, from Shore A 27 to Shore A 95 • Rigid materials ranging from simulated standard plastics to the toughness and temperature resistance of Digital ABS Plus • Vibrant colors in rigid or flexible materials, with over 360,000 color options on the Stratasys J750 • Available on PolyJet multi-jetting 3D printers
 <p>Digital ABS Plus</p>	<ul style="list-style-type: none"> • Simulates ABS plastics by combining strength with high temperature resistance • Digital ABS2 Plus offers enhanced dimensional stability for thin-walled parts • Ideal for functional prototypes, snap-fit parts for high or low temperature usage, electrical parts, castings, mobile telephone casings and engine parts and covers
 <p>High Temperature</p>	<ul style="list-style-type: none"> • Exceptional dimensional stability for thermal functional testing • Combine with PolyJet rubber-like materials to produce varying Shore A values, gray shades and high temperature parts with overmolding • Ideal for form, fit and thermal functional testing, high-definition models requiring excellent surface quality, exhibition models that endure strong lighting conditions, taps, pipes and household appliances, hot air and hot water testing
 <p>Transparent</p>	<ul style="list-style-type: none"> • Print clear and tinted parts and prototypes with VeroClear and RGD720 • Combine with color materials for stunning transparent shades • Ideal for form and fit testing of see-through parts, like glass, consumer products, eyewear, light covers and cases, visualization of liquid flow, medical applications, artistic and exhibition modeling
 <p>Rigid Opaque</p>	<ul style="list-style-type: none"> • Brilliant color options for unprecedented design freedom • Combine with rubber-like materials for overmolding, soft touch handles and more • Ideal for fit and form testing, moving and assembled parts, sales, marketing and exhibition models, assembly of electronic components and silicone molding
 <p>Simulated Polypropylene</p>	<ul style="list-style-type: none"> • Simulates the appearance and functionality of polypropylene • Ideal for prototyping containers and packaging, flexible snap-fit applications and living hinges, toys, battery cases, laboratory equipment, loudspeakers and automotive components
 <p>Rubber-like</p>	<ul style="list-style-type: none"> • Offers various levels of elastomer characteristics • Combine with rigid materials for a variety of Shore A values, from Shore A 27 to Shore A 95 • Ideal for rubber surrounds and overmolding, soft-touch coatings and nonslip surfaces, knobs, grips, pulls, handles, gaskets, seals, hoses, footwear, and exhibition and communication models
 <p>Biocompatible</p>	<ul style="list-style-type: none"> • Features high dimensional stability and colorless transparency • Has five medical approvals including cytotoxicity, genotoxicity, delayed type hypersensitivity, irritation and USP plastic class VI • Ideal for applications requiring prolonged skin contact of more than 30 days and short-term mucosal-membrane contact of up to 24 hours



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POLYJET MATERIAL SPECIFICATIONS

Materials	Digital ABS Plus	High Temperature	Transparent		Rigid Opaque (Vero family)	
	Digital ABS Plus, Green, made of RGD515 Plus & RGD535 Digital ABS Plus, Ivory, made of RGD515 Plus & RGD531	RGD525	RGD720	VeroClear RGD810	Vero PureWhite™ RGD837, VeroGray RGD850, VeroBlackPlus RGD875, VeroWhitePlus RGD835, VeroYellow RGD836, VeroCyan RGD841, VeroMagenta RGD851, VeroMagentaV, VeroYellowV	VeroBlue RGD840
Tensile Strength	55-60 MPa (8,000-8,700 psi)	70-80 MPa (10,000-11,500 psi)	50-65 MPa (7,250-9,450 psi)	50-65 MPa (7,250-9,450 psi)	50-65 MPa (7,250-9,450 psi)	50-60 MPa (7,250-8,700 psi)
Elongation at Break	25-40%	10-15%	15-25%	10-25%	10-25%	15-25%
Modulus of Elasticity	2,600-3,000 MPa (375,000-435,000 psi)	3,200-3,500 MPa (465,000-510,000 psi)	2,000-3,000 MPa (290,000-435,000 psi)	2,000-3,000 MPa (290,000-435,000 psi)	2,000-3,000 MPa (290,000-435,000 psi)	2,000-3,000 MPa (290,000-435,000 psi)
Flexural Strength	65-75 MPa (9,500-11,000 psi)	110-130 MPa (16,000-19,000 psi)	80-110 MPa (12,000-16,000 psi)	75-110 MPa (11,000-16,000 psi)	75-110 MPa (11,000-16,000 psi)	60-70 MPa (8,700-10,200 psi)
Flexural Modulus	1,700-2,200 MPa (245,000-320,000 psi)	3,100-3,500 MPa (450,000-510,000 psi)	2,700-3,300 MPa (390,000-480,000 psi)	2,200-3,200 MPa (320,000-465,000 psi)	2,200-3,200 MPa (320,000-465,000 psi)	1,900-2,500 MPa (265,000-365,000 psi)
HDT, °C @ 1.82 MPa	51-55 °C (124-131 °F)	55-57 °C (131-135 °F)	45-50 °C (113-122 °F)	45-50 °C (113-122 °F)	45-50 °C (113-122 °F)	45-50 °C (113-122 °F)
Izod Notched Impact	90-110 J/m (1.69-2.06 ft lb/in)	14-16 J/m (0.262-0.300 ft lb/inch)	20-30 J/m (0.375-0.562 ft lb/inch)	20-30 J/m (0.375-0.562 ft lb/inch)	20-30 J/m (0.375-0.562 ft lb/inch)	20-30 J/m (0.375-0.562 ft lb/inch)
Water Absorption	—	1.2-1.4%	1.5-2.2%	1.1-1.5%	1.1-1.5%	1.5-2.2%
Tg	47-53 °C (117-127 °F)	62-65 °C (144-149 °F)	48-50 °C (118-122 °F)	52-54 °C (126-129 °F)	52-54 °C (126-129 °F)	48-50 °C (118-122 °F)
Shore Hardness	85-87 Scale D	87-88 Scale D	83-86 Scale D	83-86 Scale D	83-86 Scale D	83-86 Scale D
Rockwell Hardness	67-69 Scale M	78-83 Scale M	73-76 Scale M	73-76 Scale M	73-76 Scale M	73-76 Scale M
Polymerized Density	1.17-1.18 g/cm³	1.17-1.18 g/cm³	1.18-1.19 g/cm³	1.18-1.19 g/cm³	1.17-1.18 g/cm³	1.18-1.19 g/cm³
Ash content	—	0.38-0.42%	0.01-0.02%	0.02-0.06%	0.23-0.26% (VeroGray, VeroWhitePlus), 0.01-0.02% (VeroBlackPlus, VeroMagentaV, VeroYellowV)	0.21-0.22%

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POLYJET MATERIAL SPECIFICATIONS

Materials	Simulated Polypropylene		Biocompatible
	Durus White RGD430	Rigur RGD450	MED610
Tensile Strength	20-30 MPa (2,900-4,350 psi)	40-45 MPa (5,800-6,500 psi)	50-65 MPa (7,300-9,400 psi)
Elongation at Break	40-50%	20-35%	10-25%
Modulus of Elasticity	1,000-1,200 MPa (145,000-175,000 psi)	1,700-2,100 MPa (246,000-305,000 psi)	—
Flexural Strength	30-40 MPa (4,350-5,800 psi)	52-59 MPa (7,500-8,500 psi)	—
Flexural Modulus	1,200-1,600 MPa (175,000-230,000 psi)	1,500-1,700 MPa (217,000-246,000 psi)	—
HDT, °C @ 1.82 MPa	32-34 °C (90-93 °F)	45-50 °C (113-122 °F)	40-50 °C (113-122 °F)
Izod Notched Impact	40-50 J/m (0.749-0.937 ft lb/inch)	30-35 J/m (0.561-0.656 ft lb/inch)	—
Water Absorption	1.5-1.9%	—	—
Tg	35-37 °C (95-99 °F)	48-52 °C (118-126 °F)	—
Shore Hardness	74-78 Scale D	80-84 Scale D	83-86 Scale D
Rockwell Hardness	—	58-62 Scale M	—
Polymerized Density	1.15-1.17 g/cm ³	1.20-1.21 g/cm ³	—
Ash content	0.10-0.12%	0.3-0.4%	—

Materials	Rubber-like			
	TangoBlack FLX973	TangoGray FLX950	Agilus30 FLX985 & Agilus30 FLX935	TangoBlackPlus FLX980 & TangoPlus FLX930
Tensile Strength	1.8-2.4 MPa (115-350 psi)	3.0-5.0 MPa (435-725 psi)	2.4-3.1 MPa (348-450 psi)	0.8-1.5 MPa (115-220 psi)
Elongation at Break	45-55%	45-55%	220-240%	170-220%
Modulus of Elasticity	—	—	—	—
Flexural Strength	—	—	—	—
Flexural Modulus	—	—	—	—
HDT, °C @ 1.82 MPa	—	—	—	—
Izod Notched Impact	—	—	—	—
Water Absorption	—	—	—	—
Tg	—	—	—	—
Shore Hardness	60-62 Scale A	73-77 Scale A	30-35 Scale A	26-28 Scale A
Rockwell Hardness	—	—	—	—
Polymerized Density	1.14-1.15 g/cm ³	1.16-1.17 g/cm ³	1.14-1.15 g/cm ³	1.12-1.13 g/cm ³
Ash content	—	—	—	—

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POLYJET MATERIAL SPECIFICATIONS

Materials	VeroFlex		
MECHANICAL PROPERTIES	TEST METHOD	IMPERIAL	METRIC
Tensile Strength	D-6338-03	6237 – 9282 psi	43 – 64 MPa
Elongation at Break	D-638-05	8 – 20%	8 – 20%
Modulus of Elasticity	D-638-04	137,786 – 232,060 psi	950 – 1600 MPa
Flexural Strength	D-790-03	6962 – 12,763 psi	48 – 88 MPa
Flexural Modulus	D-790-04	232,061 – 333,587 psi	1600 – 2300 MPa
Shore Hardness	D-2240	75-85 Scale D	75-85 Scale D
HDT, @ 0.45 MPa	D-648-06	108 – 122 °F	42 – 50 °C
Izod Notched Impact	D-256-06	0.375 – 0.562 Lb/in	20 – 30 J/m

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