



REAL PARTS MEAN REAL POSSIBILITIES.

Real Advancements in additive fabrication

Fortus 3D Production Systems offer unparalleled versatility and capability to turn your CAD files into real parts. These parts are tough enough to be used as advanced conceptual models, functional prototypes, manufacturing tools and end-use parts. Engineers can produce a wide variety of products just by loading different files and materials. No traditional machining process can do that. And no other additive fabrication system delivers the same advanced performance and production-grade parts as a Fortus 3D Production System.

Nothing less than Real Parts

Whether it's a functional prototype or end-use part, everything a Fortus system produces is a Real Part. That's because they're built with the same durable thermoplastics as traditional injection-molded plastic parts. Only with Fortus systems can end-use thermoplastic parts be produced directly from CAD files without expensive tooling.

Meet the demands of Real Production

Fortus systems are as versatile and durable as the Real Parts they produce. They boast the largest build envelopes and material capacities in their class, delivering longer, uninterrupted build times, bigger parts and higher production run quantities than other additive fabrication systems. Plus, they are true production workhorses, delivering the high throughput, duty cycles and utilization rates that make direct digital manufacturing (DDM) not only possible, but practical.

Opening the way for Real Possibilities

Fortus 3D Production Systems can streamline processes from design through manufacturing, reducing costs and eliminating traditional barriers along the way. With Fortus, you can build CAD design, streamline production with custom fabrication and assembly tools and tooling masters, and eliminate tooling costs for short runs. Breakthrough designs, process innovations, just-in-time manufacturing — whatever you can imagine, Fortus can make it real.

Real Results.



Advanced prototypes:
For this and other sprinkler projects at Toro, Fortus systems help reduced product-development time by 283 weeks — and saved \$500,000.



Advanced manufacturing tools:
At BMW, costs for producing manufacturing tools dropped significantly when engineers started producing tools with Fortus systems.



Advanced end-use parts:
Klock Werks uses direct digital manufacturing to build custom motorcycle parts on their Fortus system, saving nearly \$13,000. FDM parts cost less than a quarter the price to injection mold or cast them.

FORTUS SYSTEMS OVERVIEW

FORTUS[®]
3D PRODUCTION SYSTEMS



	FORTUS 200mc™	FORTUS 360mc™	FORTUS 400mc™	FORTUS 900mc™
Build Envelope	8 x 8 x 12 in (203 x 203 x 203 mm)	Base envelope: 14 x 10 x 10 in (355 x 254 x 254 mm) Optional upgrade: 16 x 14 x 16 in (406 x 355 x 406 mm)	Base envelope: 14 x 10 x 10 in (355 x 254 x 254 mm) Optional upgrade: 16 x 14 x 16 in (406 x 355 x 406 mm)	36 x 24 x 36 in (914 x 610 x 914 mm)
System Size/Weight	27 x 34 x 41 inches (686 x 864 x 1041 mm) With crate: 370 lbs. (168 kg) Without crate: 282 lbs. (128 kg)	50.45 x 35.25 x 77.25 inches (1281 x 895.35 x 1962 mm) With crate: 1511 lbs. (687 kg) Without crate: 1309 lbs. (593 kg)	50.45 x 35.25 x 77.25 inches (1281 x 895.35 x 1962 mm) With crate: 1511 lbs. (687 kg) Without crate: 1309 lbs. (593 kg)	109.1 x 66.3 x 79.8 inches (2772 x 1683 x 2027 mm) With crate: 7247 lbs. (3287 kg) Without crate: 6325 lbs. (2869 kg)
Material Options	ABSplus™	ABS-M30 PC-ABS PC	ABS PC-ISO ABS-M30 PC ABS-M30i ULTEM* 9085 PC-ABS PPSF	ABS-M30 PC ABS-M30i ¹ ULTEM* 9085 ¹ PC-ABS ¹ PPSF PC-ISO ¹
Throughput Comparison²	1.0 x	1.7 x	2.0 x	2.1 x
Achievable Accuracy³	Parts are produced within: [± .010 inch] or [± .0020 inch/inch] whichever is greater [± .254 mm] or [± .0020 mm/mm] whichever is greater	Parts are produced within: [± .005 inch] or [± .0015 inch/inch] whichever is greater [± .127 mm] or [± .0015 mm/mm] whichever is greater ⁴	Parts are produced within: [± .005 inch] or [± .0015 inch/inch] whichever is greater [± .127 mm] or [± .0015 mm/mm] whichever is greater ⁴	Parts are produced within: [± .0035 inch] or [± .0015 inch/inch] whichever is greater [± .089 mm] or [± .0015 mm/mm] whichever is greater ⁵
Software	<p>Insight™ Insight software prepares 3D digital part files (output as an STL) to be manufactured on an Fortus system by automatically slicing and generating support structures and material extrusion paths in a single push of a button. If necessary, users can override Insight's defaults to manually edit parameters that control the look, strength and precision of parts as well as the time, throughput, expense and efficiency of the FDM process.</p> <p>Control Center™ Control Center is the software that communicates between the user workstation(s) and the Fortus system(s), managing jobs and monitoring the production status of Fortus systems. This software application provides the control to maximize efficiency, throughput and utilization while minimizing response time. Control Center is included with Insight software.</p> <p>FDM TEAM™ FDM TEAM optional advanced software that is designed for the management and control of multi-user and/or multi-system Fortus operations. A client/server application, FDM TEAM enables planning, scheduling, monitoring and reporting when managing a multiple-Fortus-system enterprise. FDM TEAM is sold as a separate software package.</p>			

¹ABS-M30i, PC-ABS, PC-ISO, and ULTEM* 9085 will be available Q3 2009 for Fortus 900mc.

²Throughput comparison of a part that takes an average of 60 minutes to build on a Fortus 200mc. Comparison derived from building a suite of parts on each system varying from small thin-walled to large bulky parts, all built in .010" (.254mm) slice, solid build style and basic supports. Relative throughput may vary based upon geometry, slice height, build mode and support style.

³Accuracy is geometry dependent. Achievable accuracy specification derived from statistical data at 95% dimensional yield.

⁴See Fortus 360mc/400mc accuracy study white paper for more information.

⁵See Fortus 900mc accuracy study white paper for more information.

FORTUS MATERIALS OVERVIEW

Fortus 3D Production Systems use a variety of production-grade thermoplastics to manufacture Real Parts™ direct from digital data. Fortus thermoplastics are environmentally stable, so overall shape and part accuracy don't change with ambient conditions over time, unlike the resins and powders in competitive processes. Materials are easy to change on Fortus systems, with no mess or complicated processes. When combined with Fortus systems, Fortus thermoplastics give you production quality thermoplastic parts that are ideal for concept modeling, functional prototyping, manufacturing tools, or end-use parts.



Material:	ABSplus	ABSi	ABS-M30	ABS-M30i	PC-ABS	PC-ISO	PC	ULTEM* 9085	PPSF
System Availability	Fortus 200mc	Fortus 400mc	Fortus 360mc Fortus 400mc Fortus 900mc	Fortus 400mc Fortus 900mc ²	Fortus 360mc Fortus 400mc Fortus 900mc ²	Fortus 400mc Fortus 900mc ²	Fortus 360mc Fortus 400mc Fortus 900mc	Fortus 400mc Fortus 900mc ²	Fortus 400mc Fortus 900mc
Layer Thickness:									
0.013 inch (0.330 mm)		X	X	X	X	X	X	X ⁴	X ⁴
0.010 inch (0.254 mm)	X	X	X	X	X	X	X	X	X
0.007 inch (0.178 mm)	X	X	X	X	X	X	X		
0.005 inch (0.127 mm)		X	X ¹	X ¹	X ¹				
Support Structure	Soluble	Soluble	Soluble	Soluble	Soluble	BASS	BASS	BASS	BASS
Available Colors	<ul style="list-style-type: none"> □ Ivory ■ Black ■ Dark Grey ■ Red ■ Blue ■ Olive Green ■ Nectarine ■ Fluorescent Yellow 	<ul style="list-style-type: none"> ■ Translucent Natural ■ Translucent Amber ■ Translucent Red 	<ul style="list-style-type: none"> □ Ivory □ White ■ Black ■ Dark Grey ■ Red ■ Blue 	<ul style="list-style-type: none"> □ Ivory 	<ul style="list-style-type: none"> ■ Black 	<ul style="list-style-type: none"> □ White ■ Translucent Natural 	<ul style="list-style-type: none"> □ White 	<ul style="list-style-type: none"> ■ Tan 	<ul style="list-style-type: none"> ■ Tan
Tensile Strength³	5,200 psi (36 MPa)	5,400 psi (37 MPa)	5,200 psi (36 MPa)	5,200 psi (36 MPa)	5,900 psi (41 MPa)	8,265 psi (57 MPa)	9,800 psi (68 MPa)	10,390 psi (71.64 MPa)	8,000 psi (55 MPa)
Tensile Elongation³	4.0%	4.4%	4.0%	4.0%	6.0%	4.3%	4.8%	5.9%	3.0%
Flexural Stress	7,604 psi (52 MPa)	8,980 psi (62 MPa)	8,800 psi (61 MPa)	8,800 psi (61 MPa)	9,800 psi (68 MPa)	13,089 psi (90 MPa)	15,100 psi (104 MPa)	16,700 psi (115.1 MPa)	15,900 psi (110 MPa)
IZOD Impact, notched	1.8 ft-lb/in (96 J/m)	1.8 ft-lb/in (96 J/m)	2.6 ft-lb/in (139 J/m)	2.6 ft-lb/in (139 J/m)	3.7 ft-lb/in (196 J/m)	1.6 ft-lb/in (86 J/m)	1.0 ft-lb/in (53 J/m)	2.0 ft-lb/in (106 J/m)	1.1 ft-lb/in (58.73 J/m)
Heat Deflection	204°F (96°C)	188°F (87°C)	204°F (96°C)	204°F (96°C)	230°F (110°C)	271°F (133°C)	280°F (138°C)	333°F (167°C)	372°F (189°C)
Unique Properties	Variety of color options	Translucent material	Variety of color options	ISO 10993 USP Class VI ⁵	Highest impact resistance	ISO 10993 USP Class VI ⁵	Highest tensile strength	Flame, smoke, toxicity (FST) certified	Highest heat and chemical resistance

¹0.005 inch (0.127 mm) layer thickness not available for ABS-M30, ABS-M30i, and PC-ABS for Fortus 900mc.

²ABS-M30i, PC-ABS, PC-ISO, and ULTEM* 9085 will be available Q3 2009 for Fortus 900mc.

³See individual material spec sheets for testing details.

⁴0.013 inch (0.330 mm) layer thickness not available for Fortus 900mc for PPSF and ULTEM* 9085.

⁵It is the responsibility of the finished device manufacturer to determine the suitability of all the component parts and materials used in their finished products.

FORTUS MATERIALS OVERVIEW

Material	Highlights
 <p>ABSplus (acrylonitrile butadiene styrene)</p>	<ul style="list-style-type: none"> Environmentally stable - no appreciable warpage, shrinkage or moisture absorption 40 percent stronger than standard Stratasys ABS material Available in a variety of colors
 <p>ABS-M30 (acrylonitrile butadiene styrene)</p>	<ul style="list-style-type: none"> Up to 70 percent stronger than standard Stratasys ABS material Greater tensile, impact, and flexural strength than standard Stratasys ABS Layer bonding is significantly stronger for a more durable part than standard Stratasys ABS Versatile Material: Good for form, fit and functional applications
 <p>ABS-M30i (acrylonitrile butadiene styrene)</p>	<ul style="list-style-type: none"> Biocompatible (ISO 10993 USP Class VI)¹ material Ideal material for medical, pharmaceutical and food packaging industries Sterilizable using gamma radiation or ethylene oxide (EtO) sterilization methods Best fit for applications requiring good strength and sterilization
 <p>ABSi</p>	<ul style="list-style-type: none"> Translucent material Ideal for automotive tail lens applications Good blend of mechanical and aesthetic properties Available in translucent natural, red and amber colors
 <p>PC-ABS (polycarbonate-acrylonitrile butadiene styrene)</p>	<ul style="list-style-type: none"> Most desirable properties of both PC and ABS materials Superior mechanical properties and heat resistance of PC Excellent feature definition and surface appeal of ABS Highest impact strength
 <p>PC (polycarbonate)</p>	<ul style="list-style-type: none"> Most widely used industrial thermoplastic Accurate, durable, and stable for strong parts Superior mechanical properties and heat resistant High tensile strength and can handle high temperatures
 <p>PC-ISO</p>	<ul style="list-style-type: none"> Biocompatible (ISO 10993 USP Class VI)¹ material Ideal material for medical, pharmaceutical and food packaging industries Sterilizable using gamma radiation or ethylene oxide (EtO) sterilization methods Best fit for applications requiring higher strength and sterilization
 <p>ULTEM* 9085</p>	<ul style="list-style-type: none"> FST (flame, smoke, toxicity) certified thermoplastic High heat and chemical resistant Ideal for commercial transportation applications in airplanes, buses, trains, boats, etc. Highest tensile and flexural strength
 <p>PPSF/PPSU (polyphenylsulfone)</p>	<ul style="list-style-type: none"> Highest heat and chemical resistance of all Fortus materials Mechanically superior material, greatest strength Sterilizable via steam autoclave, EtO, plasma, chemical, and radiation sterilization Ideal for applications in caustic and high heat environments

¹ It is the responsibility of the finished device manufacturer to determine the suitability of all the component parts and materials used in their finished products.

For more information about Fortus systems, materials and applications, call **888.480.3548** or visit **www.fortus.com**

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