3D Printer Headed for Space Station Is Ready for Launch

Made In Space’s 3D printer, customized for use in microgravity, has passed all NASA tests ahead of schedule and is ready to launch to the International Space Station in August 2014.

Mountain View, Calif. (PRWEB) June 12, 2014 -- Made In Space’s 3D printer, specially designed for use on the International Space Station (ISS), has passed final NASA certifications and testing ahead of schedule.

Due to the project meeting all milestones with minimal risk, the 3D Printer has been moved up to a launch on SpaceX CRS-4 in August 2014 instead of the originally slated SpaceX CRS-5.

The 3D printer was subjected to a series of tests at NASA’s Marshall Space Flight Center (MSFC) with the goal of verifying that the hardware met NASA safety and operational requirements for ISS use. These tests included Electromagnetic Interference (EMI), vibration, materials compliance, human factors, electrical, and ISS interface checks. NASA has certified that the hardware meets all necessary operational standards.

“NASA was able to provide key guidance on how to best comply with strenuous space certification, safety and operational requirements and Made In Space excelled at incorporating that insight into the design,” said Niki Werkheiser, the NASA 3D Print Project Manager. “As a result, the hardware passed testing with flying colors. Made In Space now has first-hand experience of the full ‘A-to-Z’ process for designing, building, and testing hardware for spaceflight.”

The first series of items intended to be 3D printed on the ISS were also tested and will serve as ground controls. The printer will create objects layer by layer using extrusion-based additive manufacturing techniques. Testing of the 3D printer in microgravity is part of the “3D Printing in Zero-G Technology Demonstration” project, a joint venture made possible by a Small Business Innovation Research (SBIR) Award between Made In Space, Inc. and NASA’s MSFC. This experiment is intended to validate the use of Additive Manufacturing, commonly referred to as 3D Printing, in space. This will be the first manufacturing device designed for off-planet use and is an essential technology required for future exploration endeavors.

“Years of research and development have taught us that there were many problems to solve to make Additive Manufacturing work reliably in microgravity. Now, having found viable solutions, we can welcome a great change — the ability to manufacture on-demand in space is going to be a paradigm shift for the way development, research, and exploration happen in space,” said Michael Snyder, Lead Engineer and Director of R&D for Made In Space.

Once installed in the Microgravity Science Glovebox (MSG) on the ISS, the printer is scheduled to print an initial set of 21 demonstration parts, including a series of test coupons, parts and tools, that will provide meaningful immediate data via downlinked high-definition video, but will also be returned to earth for detailed ground analyses. This first set of prints will serve to verify the printer and extrusion process in microgravity. The next phase will serve to demonstrate utilization of meaningful parts such as crew tools, payload ancillary hardware, and potential commercial applications such as cubesat components.

Once the demonstration is completed, Made In Space plans to follow with a permanent Additive Manufacturing Facility (AMF) on ISS which will incorporate the lessons learned from the technology demonstration and provide further capabilities such as additional material options and larger build volume.
“Passing the final tests and shipping the hardware are significant milestones, but they ultimately lead to an even more meaningful one – the capability for anyone on Earth to have the option of printing objects on the ISS. This is unprecedented access to space. If you want to 3D print in space, contact us now,” said Made In Space CEO Aaron Kemmer.

The ability to create necessary items on-demand will reduce the need to launch all parts and redundancies from Earth, saving time, money and payload space aboard rockets. The presence of a 3D printer onboard will also allow astronauts a tool to create solutions to unforeseen situations.

“The successful testing is a testament to the NASA and Made In Space teams working closely together as one to bring this to fruition,” said Werkheiser. “This has been an ideal collaboration that truly illustrates how leveraging the mutual strengths of the government and small business can lead to remarkable capabilities that would not otherwise be possible, particularly on such an ambitious schedule and budget.”

The AMF 3D printer will be fully available for use by researchers, businesses and individuals on Earth. Science and research timelines will become shorter and experiments more affordable for parties looking to utilize 3D printers aboard ISS.

“When we started Made In Space in 2010, we laid out a large, audacious vision for changing space exploration by bringing manufacturing to space,” said Jason Dunn, Chief Technology Officer for Made In Space. “We’ve systematically pursued that vision by testing 3D printing in microgravity on parabolic flights, designing a printer for those conditions, and, now, flying our 3D printer to the ISS. Passing these tests means that we’ve achieved another milestone. We’re nearing the culmination of the first stage of our larger vision.”

Made In Space invites the public to contribute their ideas about what should be printed in space – interested parties can visit www.madeinspace.us to contribute to the conversation.

About Made In Space
Founded in 2010 with the goal of enabling in-space manufacturing, Made In Space is radically impacting how we will perform space missions in the future. Made In Space’s team members and advisors include successful entrepreneurs (Aaron Kemmer, Jason Dunn, Mike Chen, Jason Lam, Alison Lewis), experienced space experts (three-time astronaut Dan Barry and Mission Lead Mike Snyder) and key 3D printing experts (Scott Summit, Gonzalo Martinez). Made In Space has partnered with top 3D printing companies to leverage this technology for use in space. The company’s Unique Innovation Lab has done over 20,000+ hours of testing of various 3D printing technologies, off-the-shelf and custom-built printers, and dozens of printer components.

For more information about Made In Space, visit: www.madeinspace.us
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Images: There are 6 images, the Made In Space logo, and a link to NASA provided b-roll footage available to you. The image references with caption descriptions are below.

[MIS_MissionPatch.jpg] The 3D Printing in Zero-G Experiment mission patch symbolizes the partnership
between Made In Space and NASA in bringing Additive Manufacturing to space.

[MIS_Printer_black.jpg] The Made In Space 3D printer will be the first manufacturing device ever used off Earth. It will be installed in the International Space Station to print a series of test items in 2014.

[MIS_Printer_lab.jpg] The Made In Space 3D printer will be the first manufacturing device ever used off Earth. It will be installed in the International Space Station to print a series of test items in 2014.

[MIS_PrintExample.jpg] The Made In Space 3D printer will use thermoplastics to create parts and tools as a test demonstration.


[NASA b-roll footage – listed as “3D printing”] http://www.nasa.gov/content/marshall-space-flight-center-b-roll-video-download/#.U5iVhpSwJfH
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