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Hiten Sonpal / iRobot



CASE STUDY

Automated Innovation

IROBOT CLEANS UP WITH SUP706

iRobot is a leader in designing and building robots that empower people to do more in their daily lives. Widely known for robots that keep floors, pools and gutters squeaky clean, iRobot has sold more than 15 million home robots, including the Roomba and Braava Mopping Robot.

Advancing New Ideas

iRobot is also an industry pioneer in advancing robotics and fueling breakthrough research and innovation. Equipped with outstanding resources, iRobot develops new products at a blistering pace with the help of both FDM® and PolyJet™ technologies. By adding SUP706 soluble support to their workflow, these experts in automated home cleaning can now capitalize on a more automated, efficient product design process.

“Our strategy is to fail fast, learn and then quickly succeed,” said Scott Burnett, mechanical competency lead for iRobot. “Marketers, designers and engineers continually propose product improvements. The mechanical engineering team builds and tests prototypes to evaluate the ideas. While many prototypes don’t succeed, the lessons learned lead to new ideas and new prototypes, and eventually new products.”

Developing and evaluating cutting-edge products like the Roomba 980 Vacuuming Robot, which uses cloud and mapping technology to clean an entire level of a home, requires prototypes with many detailed, highly accurate parts. iRobot 3D prints large structural parts using FDM and smaller parts with PolyJet, a technology that enables iRobot to meet precise material requirements and build multi-material parts such as vacuum cleaner ducts that require both hard plastic and rubbery sections.

More Time For More Prototypes

In the past, iRobot technicians invested considerable time and effort in removing support material from parts produced on a PolyJet system. They used a pressure washer to remove the bulk of the support material, and tackled the rest by hand with dental instruments. Often technicians were unable to remove a small amount of residue, leaving the parts with a waxy feel.

Since switching to SUP706 soluble support, iRobot’s prototyping process improved greatly. Technicians no longer need to remove support material by hand one part at a time. Although they still use a pressure washer to remove the bulk of the support material, technicians can then submerge a batch of parts in an alkaline solution inside the Stratasys support removal system. After a few hours, any remaining support material dissolves away — no dental instruments necessary.

SUP706 soluble support requires much less time on the part of technicians, giving the team more time to produce a substantially higher volume of parts. The workflow improvement is particularly great for smaller parts, because the alkaline bath completely removes any leftover support material, and the small parts end up feeling just like production parts.



Multi-material Roomba prototype parts 3D printed with PolyJet technology.



Roomba 980



Roomba 980 in action

“The new soluble support SUP706 material has greatly reduced time and labor in our workflow process,” said Hiten Sonpal, head of mechanical engineering, industrial design and user experience for iRobot. “Removing support material from small parts used to require one dedicated staff member per day. Now the hands-on labor needed to remove support material is down to just a few minutes. We can build more prototypes faster, which helps us reduce the time required to bring innovative products to market.”



Roomba 980 automatically docks at its charging station when battery power is low.

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