

# 3D Systems Builds Better 3D Printers with Geomagic Control X

Additive manufacturing leader uses professional metrology software to inspect supplier parts before assembly and avoid costly errors and delays

3D Systems has spent its 30-year history enabling its customers to optimize their designs, transform their workflows, bring innovative products to market and drive new business models. And the company benefits from the very same 3D technology solutions in its own business. Case in point: when it came time to launch the ProX® SLS 6100 3D printer, 3D Systems turned to its in-house Geomagic software group and trusted partner Hexagon Manufacturing Intelligence to ensure that the printers matched the high quality of their design.

**CHALLENGE:**

Find and fix out-of-spec components from suppliers before they cause expensive manufacturing problems and delay delivery of new 3D printers.

**SOLUTION:**

Deploy the AICON MoveInspect XR8 optical CMM along with Geomagic® Control X™ software so the manufacturing team can inspect parts from suppliers with minimal training and time commitment.

**RESULTS:**

- Fast, thorough inspection of large components completed in under an hour
- Identify and address quality concerns prior to product assembly
- Avoid manufacturing issues that would cost tens of thousands of dollars to correct
- Allow more stakeholders to contribute to continuous quality improvement without disrupting other responsibilities

*3D Systems program manager Bryan Rough inspects a ProX® SLS 6100 3D printer frame using the AICON MoveInspect XR8 optical CMM and Geomagic® Control X™ software.*



## Quality Components Make Quality Products

The ProX SLS 6100 is a precision industrial 3D printer that must meet exacting specifications to ensure it builds production-quality parts accurately and reliably, 24 hours a day, 7 days a week. Achieving this quality requires meeting stringent dimensional tolerances, starting from the very beginning with the welded steel frame that serves as the foundation of the 3000+ lb (1360+ kg) industrial 3D printer. The frames of the ProX SLS 6100 are manufactured by a specialty supplier based on designs provided by 3D Systems, and are then delivered to 3D Systems' manufacturing facility in Rock Hill, South Carolina, where the printers are assembled.

To ensure all products are developed and delivered at the highest standard with continual improvement, the entire organization contributes to quality control. Bryan Rough, Manufacturing Program Manager for 3D Systems, supports the ProX SLS 6100 manufacturing process, including inspecting components like the printers' frames. "We need to know that everything about this new product meets engineering specifications, and works exceedingly well in the field," said Rough. "We have several critical flatness and parallelism requirements, and we need to make sure we are delivering on our commitment to quality at every turn."

## Saving Time and Money with 3D Inspection

According to Rough, if a frame is out of tolerance and the issue is not discovered prior to assembly, it could lead to manufacturing errors that cost tens of thousands of dollars to correct -- not to mention delay the delivery of printers to customers. Rough's requirements are clear: to quickly inspect the large, heavy frames of the ProX SLS 6100 directly on the factory floor with minimal time commitment. "This is a very important step, but it is also just one aspect of my job, so I don't have time to become an expert at using complex inspection tools. I need an inspection system that I can pick up a couple times a week, get the measurements I need, generate a report, and move on to my other projects. Geomagic® Control X™ is perfect for that."

Together with an AICON MoveInspect XR8 portable optical CMM from Hexagon Manufacturing Intelligence, Geomagic Control X allows Rough and his teammates to measure flatness, parallelism, perpendicularity, and other Geometric Dimensions & Tolerances (GD&T) right on the factory floor. Best of all, it takes less than an hour to set up, take measurements, and generate a complete inspection report for each ProX SLS 6100 frame.

"The MoveInspect XR8 is ideal for measuring these large welded frames because I can use the wireless probe anywhere in a large measurement volume. I don't have to worry about line-of-sight issues because of the XR8's dynamic referencing capability that lets me move the device wherever I need to without realigning it," said Rough. The software also makes things easy, and was intuitive to learn and incorporate into the manufacturing process. "Control X is very straightforward to use," says Rough. "I had a half day of training on Control X months before the first printer frame was ready, and when it came time to pick up the software again, I was able to start and finish my first inspection the very same day." Rough says this is a big distinction from other metrology software he has used in the past. "Other inspection software I've used has been far more complicated and there's no way I could have picked those up as quickly as I learned Control X."

## Flexible and Easy 3D Inspection with LiveInspect

Rough uses the 3D CAD files of the frame to define exactly what he needs to measure in Control X. The software then automatically plans a measurement routine and connects directly to the MoveInspect XR8. All Rough or his teammates need to do is walk up to the frame and follow the on-screen and spoken prompts from Control X to take measurements where needed using the XR8's MI.Probe, in a process called LiveInspect. When necessary, they can take other measurements too. Unlike a script-based inspection routine, the LiveInspect process is flexible so users can measure whatever they need to and add it to the inspection report with a couple of clicks.

"We're now able to be proactive rather than reactive when it comes to quality because we can see problems before they happen," said Rough. "Using the MoveInspect XR8 with Control X enables us to meet 3D Systems' elevated standards of quality for our customers every time, and it's been extremely helpful to the introduction of the new ProX SLS 6100."

3D Systems' use of Control X for its own quality control is another example of how simple, intuitive inspection software helps companies ensure quality everywhere by empowering more people to measure more things in more places. Learn more about [Geomagic Control X](#) today.



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