Asano Uses Geomagic Software to Drive Innovation

Geomagic® Design X™ delivers greater modeling and design functionality; Geomagic® Control X™ leads to part inspection that's two to three times faster

The "Makatao" carbon fiber-reinforced thermo-plastic Mini F1 car exhibited at Hannover Messe 2015.

When it comes to design and quality assurance innovation, companies tend to fall into two categories: those that wait until the last moment to adopt new technologies so they won't be left behind, and those that are always at the forefront, aiming at continuous improvement.

Asano Co., Ltd., a Japanese metal-processing manufacturer serving the automotive and motorcycle industries, is clearly the second type of company, adopting 3D scanning technologies that have had a profound effect on its design and quality assurance processes.

Design work has been transformed by reverse engineering using Geomagic Design X software, and quality assurance from the speed and accuracy of Geomagic Control X software. Both products come from 3D Systems.

A business mainstay

Asano designs and manufactures a wide range of prototype sheet metal parts, metal molds, jigs, machinery and other parts. The company is known for its use of leading-edge technologies for projects such as reducing automotive weight through the use of carbon fiber-reinforced thermo-plastics (CFRTP).

CHALLENGE:
Faster, better design of sheet metal products and eliminating time-consuming problems with shape measurement during testing.

SOLUTION:
3D Systems Geomagic Design X reverse engineering software and Geomagic Control X metrology software.

RESULTS:

- Ability to quickly capture existing shape data accelerates design and enables greater innovation.
- Two to three times faster parts inspection.
- Dramatic reduction in the number of trial prototypes and greater mold accuracy.

Mr. Akio Kishi, Director, Management Promotion Office, Asano Co., Inc.

Mr. Hiroshi Imai, Section Manager, Gunma Quality Assurance Section, Metals Division No. 1

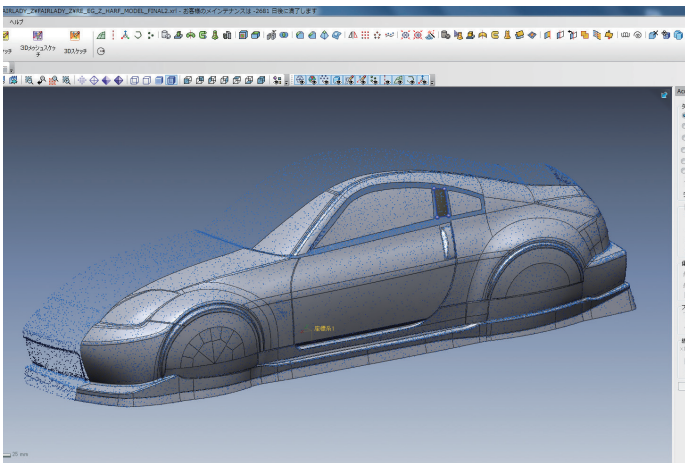
Mr. Norimichi Abe, Leader of the General Control Group for CAD Machine Processing

Mr. Tetsuya Matsumoto, Gunma Quality Assurance Section, Metals Division No. 1

Mr. Norimichi Abe, Group Leader of Asano's General Control Group for CAD Machine Processing, began experimenting with 3D capture devices and Geomagic Design X nearly 10 years ago. Mr. Abe now considers reverse engineering a mainstay of Asano's business. He estimates that the company has completed more than 200 projects using 3D scanning and Geomagic Design X.

Geomagic Design X is designed from the ground up to convert 3D scan data into high-quality feature-based CAD models. It provides everything needed to capture geometry for objects of all sizes and create manufacturing-ready designs, including automatic and guided solid model extraction, exact surface fitting to organic 3D scans, mesh editing and point cloud processing.

"Geomagic Design X is the best reverse engineering software available, providing a great balance of features and an ability to handle huge point clouds with ease," says Mr. Abe. "It goes beyond powerful feature-based modeling to offer the flexibility of a variety of modeling methods, including automatic surface creation. This makes it the ideal tool for a wide range of modeling challenges."

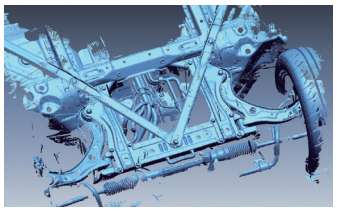


Asano used Geomagic Design X to create a feature-based solid model from the scan of a radio-controlled car body.

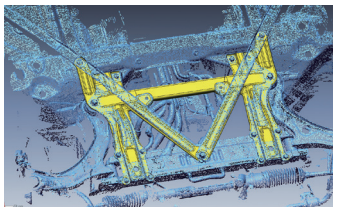
Integrating design for greater stability

A recent project for Spoon Inc., a Japanese company that provides tuning kits and specialized parts for Honda racing and street cars, exemplifies Asano's expert use of 3D scanning technologies.

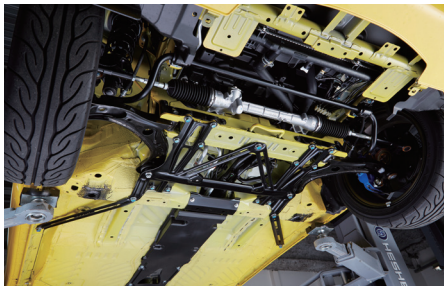
The project involved designing a new plate for the front underbody of a Honda S660 sports car. The original part suffered from torsion during hard braking and rolling. The plate was designed originally as part of the complex base assembly of the car, which would have made it very time-consuming to redesign from scratch.



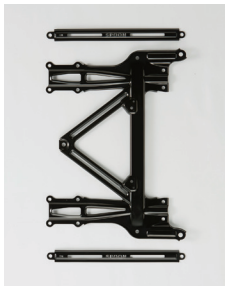
3D scan of the front underbody of a Honda S660.



Modeling of the new plate design on top of the point cloud from a front underbody scan of a Honda S660.



The new Honda S660 plate redesigned by Asano installed in the front underbody of a Honda S660.



The new Honda S660 plate redesigned by Asano to provide greater stability.

Instead of going back to the drawing board, Asano scanned the front underbody surface of the S660. Geomagic Design X was then used to process the scan data and design a new precision plate that could be mounted in place of the original.

"The redesigned plate could be attached to the car simply, without any processing, and it was so precise that the undercover could be mounted without alterations," says Mr. Abe.

The redesigned plate provided greater stability, according to Mr. Abe, based on the fact that the suspension and body were integrated into a single box like a sub-frame.

Getting it right the first time

Beyond point capture and processing, Geomagic Control X has evolved into a central tool for the efforts of Asano's Quality Assurance Section to reduce the number of trial sheets for its prototypes and to produce an accurate mold on the first attempt.

"We are aggressively pursuing various new testing methods that are faster and more precise than the ones we've used in the past," says Mr. Hiroshi Imai, Section Chief for Quality Assurance at Asano's Gunma Plant.

Geomagic Control X enables manufacturers to take precise measurements of parts from 3D scanners and accurately compare them to digital reference data for first-article inspection and other metrology applications. The software instantly generates 3D reports of measurements, tolerances and deviations.

Asano uses 3D scanning and Geomagic Control X to speed the parts testing process and gain more accurate data on deviations from the original design.

"During trial production it is important to grasp the entire shape and surfaces of sheet metal parts," says Mr. Tetsuya Matsumoto, who is in charge of testing in the Asano Quality Assurance Section. "Before we began using Geomagic Control X, if the results weren't good enough when we pressed the prototypes and measured them with a laser, it was difficult to determine whether it was a problem with the shape or with the laser. This wasted a considerable amount of time."

Two to three times faster

Because of the time and effort required for capturing and processing data, Asano could only do product feature testing for mass-produced products.

"Except for the mass-produced products, the only testing methods available to us were to check the surface by 3D measurement to designate and measure arbitrary points on the surface," says Mr. Matsumoto. "This made it difficult to grasp the entire shape. Immense time and labor were spent on clarifying product features."

With an accurate 3D scanning device and Geomagic Control X, Mr. Matsumoto says that Asano can now grasp the cause of deviations at a glance.

"Our testing is two to three times faster than in the past, and we can aim for much higher manufacturing efficiency."

Adopting new technologies such as reverse engineering and 3D metrology is an ongoing process at Asano, something that is baked into the company's DNA.

"We anticipate needs and take up any and every challenge," says Mr. Akio Kishi, Director of Asano's Management Promotion Office. "This stance is one of our company's core strengths."

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