

Origin One Steers NISMO Racing Towards Production 3D Printing Solutions

Stratasys Origin One flexible production capability produces end-use parts for Nissan's Super GT racing team.

NISMO, which is Nissan's specialized motorsports team, is steeped in racing history with nearly 40 years of proven success. The team competes in the supremely popular Super GT circuit in Japan. Super GT garners millions of viewers who appreciate the challenge of tight tracks and high-performance 4-cylinder engines. Innovation has been central to this program from its inception and the latest car models incorporate numerous production methods and advanced materials. In a business that moves quickly and where seconds count, the flexible production capabilities of the Origin One 3D printer matched the needs of the NISMO team when it counted most. The new GT500 car is a substantial re-design and the NISMO team left nothing to chance. The confidence in the end-use parts printed on the Origin One has expanded the use of these parts from one car to four different cars that NISMO races.

Having won 11 driver's championships since 1994, the NISMO team knows a thing or two about speed and they know that every second is an advantage. This is true both on the track and on their engineering teams. Already a user of many 3D printing technologies, the NISMO team, recently required production parts from the Stratasys Origin One platform that were really "hands-on."



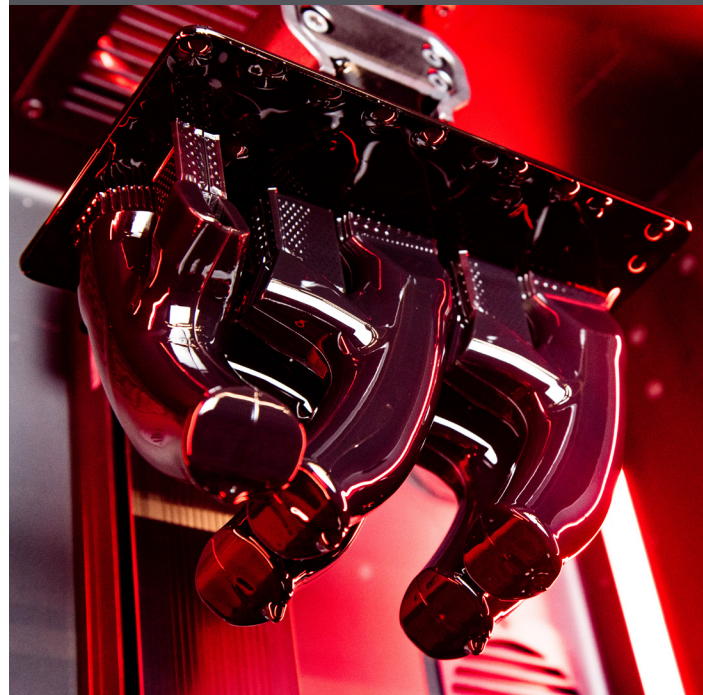
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The Origin One has helped us accelerate the speed of our development and has expanded our design freedom. The technology has given us a great advantage in our process.”

Taisuke Shibayama

NMC NISMO General Manager of Vehicle Development Department





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Innovation at NISMO's fingertips.

Race team looks beyond conventional manufacturing.

The NISMO team has been working quietly on their new GT500 Super GT Car for the last few years. The car underwent a comprehensive re-design focusing on increased performance, light weighting and leveraged many innovative technologies to finalize the updated model. The engineers were stuck on a few critical parts of their race car, parts of the “yoke” steering wheel. Engineers knew the parts had to meet exacting standards and have a precision feel.

NISMO engineers were challenged by two aspects of the current yoke design: the driving handles and the gaskets that cover the buttons on the yoke control panel. Drivers had given feedback that the typical handle parts were not as comfortable as they should be and didn't provide the right “feel”

for long term use. Yoke handles had traditionally been CNC milled and then covered with leather. Drivers wanted more “rubber-like” feel to the handles and hoped for a long-term solution that could keep them comfortable for the entirety of the 450km endurance races.

While the handles are all about feel and function, the buttons on the yoke control panel had issues with durability. Engineers on the NISMO team recognized that many buttons were wearing down with the repeated use cycles faced in a racing environment. The team envisioned a supportive gasket, but the cost of traditional compression or rubber injection mold tooling was prohibitive to produce this small part in low quantities.

Origin One helps take **flexible production to the track.**



Origin One: Best in class materials for top tier racing team.

Innovation is at the core of what the NISMO team does in the development process and their investment in 3D printing methodologies are a testament to that fact. To get a handle on this solution, the NISMO engineers considered a few 3D printing processes and material options, but results were varied. For the yoke handles they required a solution that provided both durability and, more importantly, the correct shore and “rubberized feel” that the drivers preferred. The button gaskets needed to be resilient and stand up to the rigors of repeated use.

The Stratasys Japan application team recommended the Origin One platform due to

its wide variety of functional materials. When the NISMO team saw the accuracy of the Origin One printed parts, they realized that end-use 3D printing for the GT500 race car was now possible. Both the handles and gasket were produced using IND 402, an elastomeric, rubber-like material that featured good tear strength and high durability. IND 402 offered high resilience and shock dampening characteristics to the yoke, giving drivers more precision control where it matters most. One material was able to solve two different problems, saving the team critical time needed to focus on other design and testing needs. NISMO now had a comfortable and durable solution in the hands of their drivers testing the new GT500 race car.

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The elastomer materials we produced with Origin One, were a great benefit to our team. The comfort of the handles and durability of IND 402 was a good fit for our needs and we realized the evolution of the new technology.”

Taisuke Shibayama

NMC NISMO General Manager of Vehicle Development Department



3D printed parts for the future of racing

When NISMO needed a quick solution for end-use parts, the Origin One met their requirements for speed, material choice and part quality. With a production time of just 15 hours, the NISMO team was able to put 3D printed parts into the hands of their drivers who provided instant feedback. The speed of the Origin One shortened a months-long iteration process to just days. The part performance has given the NISMO team more ideas about incorporating the 3D printing

technology into other areas of their car. In the competitive racing world, success is related to the skill of the driver and the ability of the engineering team to build cars who push the limits. The NISMO engineering team, empowered with the capabilities of the Stratasys Origin One, pushed the limits of what was possible and created 3D printed parts that will help steer the team towards success for years to come.



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