

928 Motorsports LLC used functional SLS (Selective Laser Sintering) parts to complete their high-torque, Porsche 928 engine in an effort to enhance the air flow.



SLS Nylon 12 GF material was used to create the Porsche's intake runners. Here the SLS runner was attached to an actual engine cylinder head to test its heat resistance and strength.

SLS Allows 928 Motorsports to Improve Porsche 928 Performance

Solid Concepts assists 928 Motorsports in developing SLS intake runners for testing and final production to outperform stock runners in the Porsche 928 engine.

928 Motorsports LLC (Horicon, WI) designs, manufactures, and sells performance products for Porsche automobiles. Recently they were tasked with creating a new intake runner that would complete their high-torque racing motor, the last step of a total enhancement of air flow for the 32-valve Porsche 928 engine. Looking to out-perform the stock intake runners, create a useful design, and have the strength to handle boosted applications, 928 Motorsports did all design work and calculations necessary to get their runner prototype ready.

928 Motorsports turned to Solid Concepts to cost effectively manufacture their intake manifold runner. Solid Concepts' Project Engineers worked closely with 928 Motorsports to select the ideal process and material to

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– Carl Fausett of 928 Motorsports

meet the geometry's unique features and requirements. SLS (Selective Laser Sintering) was chosen for testing the intake runners, utilizing the excellent properties of Nylon 12 GF, a nylon material filled with glass beads to greatly enhance the physical properties of parts built with this material. SLS was chosen for its functionality and strength so the runner would not break when bolted to the engine, ensuring form and fit. This process allowed for changes to the intake runner to be made immediately and avoided the expense of tooling.

After preliminary testing had been finished and 928 Motorsports was satisfied with the fit and contours of the model, a final prototype was produced. The design

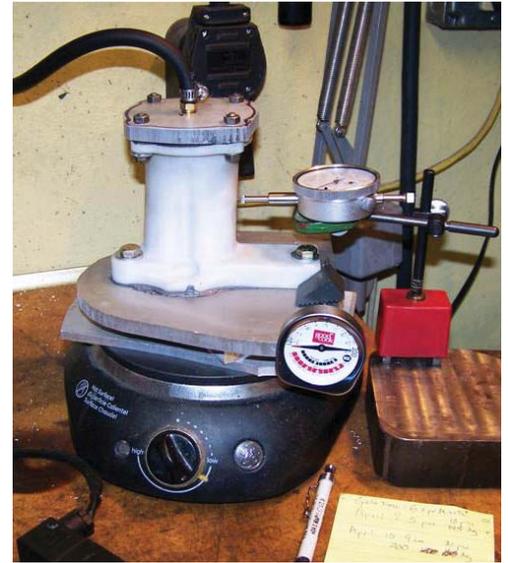
needed to confirm that the intake could experience up to 20 psi of boost pressure on the supercharged racecar. Solid Concepts then went to work on manufacturing a single intake runner for their destructive testing. They were able to apply 200°F and 20 pounds of pressure to the Nylon 12 GF intake runner. The pressure cycle was repeated 6 times a minute. 928 Motorsports needed to know how much of the nylons' strength would be lost because of the high temperatures. Additional testing involved raising the manifold pressures from 20 psi to 40 psi, the temp from 200°F to 220°F, and logging over 16,000 cycles. There were no measurable changes or failures. Carl Fausett of 928 Motorsports remarked that "the SLS single intake runner passed our heat and pressurization tests with flying colors."

The final tests proved that the runner could handle the under-hood temperatures and pressures it needed to succeed in the given application. Lastly, the engine was fitted with the SLS composite runners and taken to a dynamometer, where it remarkably produced more than 860 BHP.

SLS production began as a way to build prototypes early in the design cycle, but it is now being used to manufacture end-use parts such as this intake runner. SLS allows for parts that are durable, functional, heat and chemical resistant, and lightweight. Because of the structure of this geometry and the material used, this engine could fit under the hood of the Porsche thanks to the weight reduction and high heat resistance associated with SLS.

Solid Concepts Inc.

Solid Concepts Inc. is a supplier of rapid prototyping, direct digital manufacturing, tooling and production molding services. Capabilities in PolyJet, SLA, SLS, FDM, QuantumCast™ cast urethanes, CNC and Composite prototypes and short-run production parts. ISO 9001 and AS9100 certified.



During testing, 928 Motorsports applied 200°F and 20 pounds of pressure to the Nylon 12 GF intake runner. The SLS parts performed flawlessly and proved their stability in an under-hood environment.



With the help of Solid Concepts' SLS technology, 928 Motorsports experienced greater air flow for the 32-valve Porsche 928 engine.