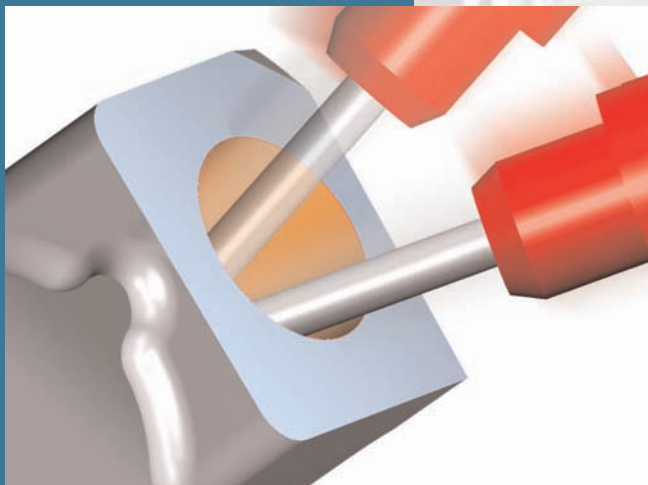


S&S Cycle Company

S&S Cycle Stays on the Fast Track with Mastercam

"The only thing we regret about Mastercam is that we didn't find it sooner."

— **Barry Peterson**
Senior Prototype Coordinator,
S&S Cycle – Viola, Wisconsin



In 1952 George Smith dominated speed motorcycle racing in the Chicago area. Since there was no high performance aftermarket industry at that time, George was forced to design and manufacture parts for his racing machines himself. The demand for the parts he created led him to found the company S&S Cycle in 1958. The company soon became the world's most prestigious manufacturer of aftermarket "go fast" motorcycle engine parts and is presently located in Viola, Wisconsin.

S&S Cycle knows that taking advantage of new technologies is key to staying ahead of the competition. They started using Mastercam in January 2002, and have relied on Mike Mattera of ShopWare, Inc. to keep them up-to-date on the most cutting-edge developments in machining technology. As Barry Peterson, Senior Prototype Coordinator at S&S Cycle puts it, "the only thing we regret about Mastercam is that we didn't find it sooner."

"Everybody in racing is looking for an edge," Peterson says. "And our new relationship with Mastercam allows us to consider more solutions than we ever imagined possible." One of the main reasons S&S was looking for good CAM software was to improve surface machining. "We like the selection of finish and roughing options Mastercam offers.

This feature alone proves that CNC Software is a company that listens, and uses a lot of customer input in the development of their offerings."

Mastercam has also exceeded the shop's expectations with its 5-axis capabilities. S&S is highly involved in racing, and the track is the lab. Exceptional performance in a race leads to better products for the mass market, but because of the stringent rules in stock car and cycle racing, vehicles can only use parts that are available to the general public.

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S&S Cycle relies on Mastercam's sophisticated 5-axis machining to perfect the fine interior detail of their cylinder head ports.

Mastercam's flexibility gives S&S Cycle the advantage of producing a single prototype that can be easily adapted to the production line. For example, they designed a prototype for a cylinder head for the high performance Harley-Davidson racing program. The product was machined from a solid 11½ inch round aluminum billet. It was a tough job with the tightest precision requirements. In a high-performance cylinder head, a good port shape is the key to making power. The ease of programming in Mastercam got the project off to a good start. For a cylinder head like this, creative undercutting is what separates the NHRA champions from the average street racer. S&S roughs with a ¾ inch ball tip and finishes with a "mini-master" ½ inch ball tip. Mastercam's fine tool axis control allows machinists to reach the "tricky" spots in the port and still maintain tool clearance.

Mastercam facilitates another key element in the overall process. S&S uses Fadal software to digitize the sophisticated port shapes. That data is imported into Mastercam to create surfaces, which are used to create toolpaths. S&S Cycle also relies on Mastercam's ability to import and export different types of files. The engineers design 2D drawings and 3D surface models and then save the files in IGES or DWG format, which move easily into Mastercam.

In 4- and 5-axis machining it is important to be able to machine the part from many sides. Peterson adds, "Mastercam makes it easy to machine at different A and B index positions. The toolpath is programmed at the proper plane, and the post processor puts it into the correct index positions in the G-code program."

"We love our business," says Peterson. "Racing is very demanding. Sometimes we make improvements that seem miniscule, but actually make a huge difference. What we are really doing is creating muscle for American motorcycle manufacturers, enabling domestic brands to beat the daily challenge of the global competitors."

S&S Cycle has an impressive success record, on and off the track. They were named Wisconsin Manufacturer of the Year in 1998. They have been active participants in setting the important land speed records. They have contributed to the success of champions throughout the racing world. Best of all, they've given the public a better ride. And their newest tool toward continued success is the power of Mastercam and the ingenuity of ShopWare, Inc.

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