

# The Part We Play

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Welcome to the very first edition of "The Part We Play" —

a newsletter dedicated by DSM Somos to the fast-paced world of rapid prototyping.



Jim Reitz  
DSM Somos  
Business Manager

For more than 10 years, all of Somos' resources have been devoted to producing materials on the leading edge of performance for the rapid prototyping market. From the

introduction of the first commercial Somos stereolithography resin in 1992 to today's introduction of Somos 9120, we have built our reputation on material innovation, the quality of our products and the dedicated support we give to our customers.

And our commitment is as strong as ever. Independent of any single equipment supplier, DSM Somos will continue to work with all the best-in-class suppliers to bring you top-performing materials and to promote the growth of solid imaging end-use markets. As part of DSM Desotech, we will utilize the resources of a global leader in UV curable technology to enhance our product development and provide world-class service to all regions. Finally, we will strive to remain your premier supplier of high-quality solid imaging resins.

**This is our goal... the part we play.**

## Introducing Somos® 9120: Reaching Out Into New Protofunctional™ Applications

*DSM Somos® introduces the latest in its 9100 Series of resins designed for creating stereolithography prototypes that function like production parts: Somos 9120. Designed for use with solid state laser equipped stereolithography machines, 9120 is the second of three resins scheduled to be released in the series.*

Somos 9100 Series resins are formulated to mimic polypropylene's tensile strength, elongation at yield and Young's modulus—providing enough durability for functional prototyping, but also the rigidity and robustness required to survive the RTV tooling process. Parts made with these resins exhibit superior performance as prototypes and patterns and, for the first time, can substitute for injection-molded parts in short-run production applications.

Extensive beta-testing of Somos 9120 has produced positive results. "With its wide process latitude and excellent toughness and flexibility, Somos 9120 is a winner," says beta tester Dave Flynn of Express Pattern in Buffalo Grove, IL.



"It's the most significant improvement in resins for the solid state laser platform since the introduction of epoxy resins for stereolithography." Other official beta testing sites included Scicon Technologies (Valencia, CA), Dynacept Corporation (Brewster, NY) and the U.S. Army (Aberdeen, MD).

Testing of the new resin also spanned the globe. Recognizing recent advances in solid state laser technology and expanding relationships with international stereolithography equipment manufacturers and distributors, DSM evaluated Somos 9120 in a product

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# Somos<sup>®</sup> 8110 Improves Aerospace Assembly Process



Historically, Northrop Grumman has used conventional and CNC machining for the complex assembly of critical aircraft components. Recently, however, that process was revolutionized through the creative use of a simple solid shape construction—using stereolithography with DSM Somos 8110 resin.

In order to reduce the errors and time-consuming process requirements of numerically-controlled machining, Northrop Grumman evaluated the use of stereolithography for creating what they now call a Rapid Manufactured Soft Tool (RMST). Used to accurately position drill holes on an aircraft, an RMST provides product installation process control in the intricate assembly of critical aircraft components.

The novel application not only improved cost efficiencies and process flow in fighter jet assembly, but it also won Northrop Grumman second runner-up honors recently in the annual 3D Systems parts fair contest.

Since an RMST needs to remain perpendicular to the changing aircraft bulkhead surface, the shapes of the tools are quite complex and challenge traditional tooling options. Stereolithography was an attractive alternative because it is a first-generation fabricator—utilizing output files from the original CAD-engineered drawings to directly manufacture the tool on a stereolithography machine.

Before utilizing the stereolithography process, Northrop Grumman needed to have their CAD drawings translated into second- or third-generation data in order to be used by the numerically controlled machining systems. This translation produced inaccuracies from the original data files, with the overall fabrication requiring a significant amount of time—a total of approximately 100 hours.

Stereolithography is able to cut that fabrication time to eight hours and simplify the tool flow process to three elements: modeling, generation and assembly. With close to 1,300 tool applications needed to construct one jet, efficiencies grow exponentially with every tool made.

Once Northrop Grumman had confirmed that stereolithography was ideal for creating these tools, the challenge was to design a tool that could effectively weather the production environment surrounding fighter jet assembly. Their solution was to abandon traditionally brittle

stereolithography materials and use DSM Somos<sup>®</sup> 8110 instead—which has three times the elongation at break of a non-flexible resin and can withstand the impact of numerous accidental droppings as well as normal wear and tear.

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Northrop Grumman engineers use RMSTs made from Somos 8110 in the assembly of fighter jets.

# Thinking of **adding Color** to your Stereolithography Materials?

Did you know that there's now an easy way to add color to your finished stereolithography parts?

The Fiebing Company (of Milwaukee, Wisconsin) makes alcohol-based leather dyes in 29 different colors that can penetrate the surfaces of parts made from DSM Somos 7100, 8100, and 9100 series resins.

To enhance the aesthetic appeal of your parts, all you need is the dye, some gloves, a stiff-bristled brush (a toothbrush would do), and some paper towels.

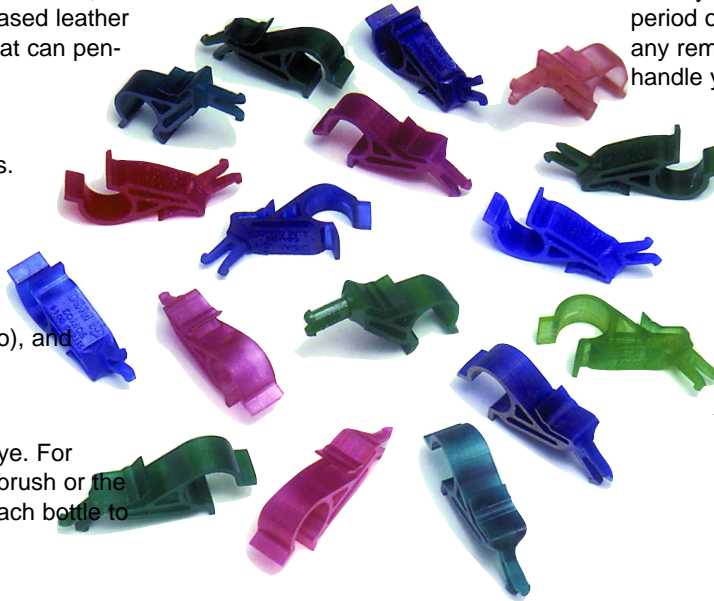
For a small part, simply dip your prototype into the dye. For bigger parts, you can use a brush or the applicator that comes with each bottle to apply the dye.

After applying dye to your part, remove excess by dabbing it with paper towels. Next, use the brush to uniformly spread the remaining dye.

The brush is also useful for spreading the dye into some of the smaller crevices and corners of the part.

Once your part has dried for a short period of time, use water to rinse off any remaining dye. You can then handle your newly colored part.

For more information about dyes for your stereolithography parts, contact the Fiebing Company at 1-800-558-1033 or visit their website at [www.fiebing.com](http://www.fiebing.com).



## **Somos® 9120**, continued from cover

optimization program that spanned operations in Belgium, Germany, Japan, Switzerland, the United Kingdom and the U.S.

Evaluations were made using 3D System Corporation's SLA-7000, SLA-5000 and SLA-3500; SLA 250 and SLA-500 machines modified with DPSS solid state laser upgrades; the European STEREOS machines; and Sony stereolithography equipment (sold in Japan by DMEC).

"We are very pleased with the unprecedented success of the 9120 beta testing—particularly reflected in material re-orders from test sites for use on other systems prior to the conclusion of the testing," says DSM Somos Business Manager Jim Reitz.

The final release of the Somos 9100 series—Somos 9110—will be optimized for use with the Helium Cadmium lasers (such as those found on the SLA-250) and is scheduled to be available during the beginning of the fourth quarter 2000.

Somos 9100 Series resins will be on display at several upcoming events, including: the BI-MU/SFORTEC Conference in Italy (October 3-8), the Time Compression Technologies conference in Wales (October 10-11) and the Euromold exhibition in Frankfurt, Germany (November 29 - December 2).

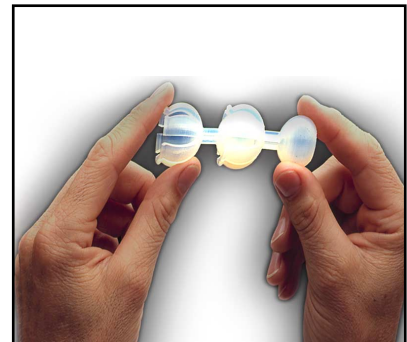
For more information on DSM Somos resins, visit our website at [www.dsmsomos.com](http://www.dsmsomos.com). Or, if you would like to receive samples of Somos 9100 Series prototypes, contact us today at (302) 328-5435 or [9100info@dsmsomos.com](mailto:9100info@dsmsomos.com)

**Somos® 8110**, continued from page 2

The final result of the RMST project for Northrop Grumman was a significantly improved tool development process with an overall 80% reduction in development time and a 92% reduction in cost. In addition, the manufacturing assembly process was dramatically improved with an overall 40% manufacturing labor savings and a 98% reduction in defects and repair costs.

"Stereolithography provided a new degree of freedom for Northrop Grumman in the highly complicated air

craft engineering environment," says Boris Fritz, Design Engineer for the company. "The SLA technology and advancements in available resin materials—in particular, the DSM Somos 8110 resin system—were integral in the success of this application."



**Kim Axiotis**  
Editor

*The Part We Play* is published by DSM Somos as an information resource for the rapid prototyping industry. Reader inquiries and suggestions for content are welcomed and should be directed to:

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## See You at the Show...!

DSM Somos will be exhibiting at the following trade shows during the remainder of this year. If you're also attending, be sure to stop by and visit with us.

SFORTEC: Italian Rapid Prototyping Show, October 3-8, 2000; Milan, Italy  
Time Compression Technologies, October 10-11, 2000; Cardiff, Wales  
Euromold, November 29-December 2, 2000; Frankfurt, Germany

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## Profile:

### Account Manager Matt Cantwell



In June of this year, DSM Somos brought Matt Cantwell on board as an account manager to assist customers with the use of (and conversion to) Somos products.

Matt has been involved in the RP industry for the past nine years. Since 1993, he has worked in project engineering, project management and department management at several service bureaus within the RP industry.

Prior to joining the service industry, Matt spent two years in an academic environment working in areas of RP, manufacturing, tooling and design. Matt holds a Bachelor Degree in Mechanical Engineering from the Stevens Institute of Technology and currently resides in the New York Hudson Valley with his "lovely wife" and "two bad dogs."