

## Optimizing the Working Life of SL Resins

Because stereolithography resins are chemically reactive systems, it's only natural that certain less-than-desirable reactions can affect these materials over time. The same attributes that produce desirable cure characteristics when exposed to a well-focused UV laser can produce unwanted reactions when exposed to stray light.

Stray light reactions initiate additional reactions in the vat and lead over time to viscosity creep, which affects build reliability and consistency and adds to operating costs in resin loss due to impaired drainage off the part.

Resins are formulated for anticipated use conditions, including no stray light exposure and frequent refills of "fresh" resin. The following additional recommendations can help optimize the working life of your resin.

- **Perform proper machine maintenance regularly.** Dirty mirrors interrupt or distort the laser light, creating stray light.

- **Remove crashed builds from your vat as quickly as possible.** Debris from a crashed build falls off the platform and slowly sinks to the vat bottom. These pieces of partially cured resin help "activate" surrounding resin.

- **Consider your build style:** Some build styles, such as those used for investment casting, have hollow voids throughout the part that isolate pockets of partially initiated resin from the vat during the build.

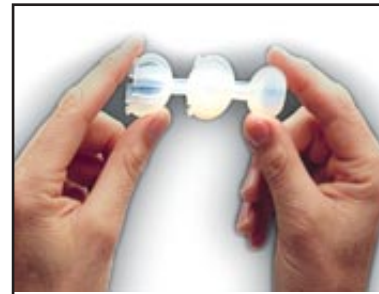
- **Monitor refill rates.** The rate at which new resin is added affects the level of "fresh" stabilizer circulated through the vat.

- **Monitor vats going into/out of storage** when multiple vats are in use. Stabilizer is depleted on storage.

- **Record vat viscosity weekly.** This simple check facilitates early intervention. Contact your resin supplier immediately if a viscosity increase is detected.

### Ask About Somos FD Stabilizer™

If an upward trend in vat viscosity is noticed, Somos FD Stabilizer™ can be added to the vat at the recommendation of your Somos tech service specialist. This insoluble scavenger neutralizes any free acid located in the vat that can contribute to viscosity creep. Because it is an insoluble material, this stabilizer does not represent "resin reformulation." Somos FD Stabilizer is patented and recommended for use in Somos SL resins only.



*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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# DSM Somos®

Published by DSM Somos for the Solid Imaging Industry

# The Part We Play

Quarter 1, 2005

## Exciting New DSM Somos® Materials for 2005!



## Somos ULM™ 17220: Stretching SL Possibilities!

DSM Somos' new elastomeric material, **U(ltra)L(ow)M(odulus)** 17220, is stretching the possibilities for SL applications, with a low durometer and high elongation at break that make it ideal for prototyping elastomeric and rubber parts.

ULM 17220 brings the benefits of stereolithography to applications traditionally reserved for laser sintering (SLS) or silicone molding. Now in beta testing, the material is pigmented black and features a Shore A of approximately 80 and tensile elongation over 100%.

Paul Bordner, VP of Operations at Laser Reproductions, states, "Unlike other competing materials, Somos ULM 17220 offers excellent detail. Our customers are also excited by the other properties offered by ULM. We recently completed a project for a major home decorations company and it was exactly what they needed in order to obtain their customer feedback."

Other major applications for Somos ULM 17220 are anticipated in the transportation sector, where elastomeric parts are used extensively.



## Somos 12920 Precision HT™: Elevating Aesthetics & Heat Resistance

Building on the success of Somos 12120, the introduction of Somos 12920 Precision HT delivers the look of production injection molding plastic with the highest Heat Deflection Temperature (HDT) currently available in an unreinforced commercial SL material. With an elongation at break of 4%, it is similar to time-tested general purpose epoxy hybrid systems such as Somos 7120.

Somos 12920's properties make it ideal for tooling applications

and other applications where a combination of stiffness and elevated temperature performance is required. The material also offers excellent accuracy and water resistance.

With an aesthetically pleasing grey color, Somos 12920 Precision HT is expected to have broad appeal, complimenting the transparent Somos 12120 resin.



# New From DSM Somos® in 2005!

## Somos FR 16120: Fire Retardant Material Expands SL Market Potential



DSM Somos is excited to now offer the industry's first flame retardant stereolithography material for use in general purpose applications: Somos FR 16120.

Flame retardant materials inhibit or even suppress the combustion process. Somos FR 16120 carries a UL 94 V-0 rating, which describes self-extinguishing material behavior in a small-scale laboratory test. It is a common flammability standard for plastic production parts.

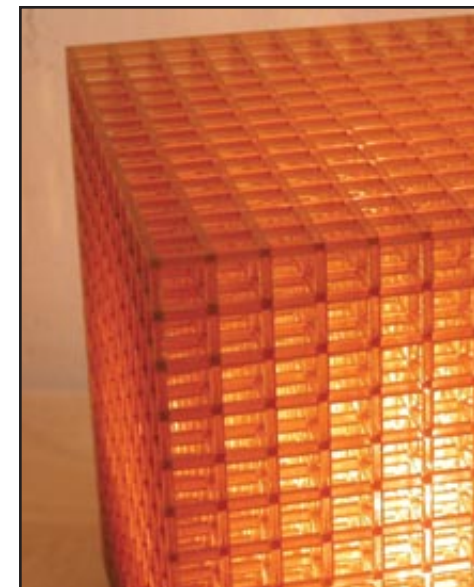
Properties of Somos FR 16120 are similar to 94 V-0 rated polyurethane structural foam systems currently used for production parts in business and medical equipment housings, lawn and garden, transportation and electrical housings.

"The goal of this development is a step wise approach to rapid manufacturing applications," says Somos Marketing & Sales Manager Ty Bacon. "New applications will undoubtedly open up to SL users as a result."

UL classification of a part can vary based on the size and thickness of the part. For this reason, feedback early in the design phase is important. Mike Rufo, President of Design Prototyping Technologies, describes an experience by one of his customers who was developing a high-speed color printer where internal temperatures get very hot.

"Our customer designed the part with a wall thickness of 0.08 inches only to realize that the UL required a wall thickness of 0.25 inches. This is an easy change to make in the design process, but costly if discovered during final review of a completed project."

Somos FR 16120 has been developed for both prototyping and rapid manufacturing use. The general purpose properties of the material allow it to be easily used in a variety applications, and help to bridge the gap from prototyping to manufacturing.



Above: The introduction of Somos FR 16120 is good news for design firms like Freedom Of Creation. Based in Europe, Freedom of Creation's innovative designer lamps are made out of stereolithography material itself. Applications such as these are driving rapid prototyping into the rapid manufacturing arena.

## New Somos HeCd Resins: A Fresh Look!

Stereolithography machines using Helium Cadmium (HeCd) laser systems once dominated SL equipment sales. Today, though solid state laser systems have taken the lead due to several advantages, 3D System's SLA-250 and other similar systems still play an important role in creating stereolithography parts.

To better serve the needs of the market, DSM Somos has optimized a collection of resins for use on HeCd systems, with special attention paid to part aesthetics. Commercial sales of these materials are scheduled for mid-2005.

**Somos HeCd Flex :** A general purpose material that mimics the properties of polypropylene. This resin is ideal for use in applications where parts need to bend without breaking. Properties are similar to Somos 9110 with the aesthetic updated to "production plastic" white.

**Somos HeCd Ultra GP:** Mimicking the behavior of ABS, this material is an excellent choice for



creating products that need to look and act similar to production-grade thermoplastics. This resin is clear with a light, glass-like green tint.

**Somos HeCd Pattern HT:** This is a high-temperature-resistant material with inherent accuracy and water resistance. It is well suited for creating patterns for tooling applications, as well as other applications which require stiffness and elevated temperature properties.