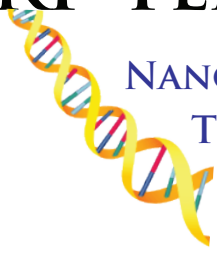


# RP TEMPERING™ TECHNOLOGY NEWS



NANO-COMPOSITE  
TECHNOLOGY

VOLUME 21

SOLID FREEFORM ADDITIVE TECHNOLOGY &  
PATENT PENDING ENGINEERING TECHNIQUE

JULY 2008

## SL Lighting Fixtures Withstand the Heat

Southern Lighting Corporation develops several lighting designs every year. In the past they made their prototypes with actual materials. This is costly and time consuming. Even though the SL and FDM materials were successful during this show, SLC still needs to make some of their higher end designs out of actual materials.

SLC recently took over 20 lighting designs made from SL and FDM materials to a trade show for actual display. Proto-Plasma-Rx™ was used to coat the lighting designs on the inside to protect the heat from warping the material. All of the tempered prototype lighting fixtures impressed customer after customer. SFF technology combined with RP Tempering™

Technologies allows SLC to show potential designs and make sales before they tool up for production. On another note, SLC spent less development monies on the designs that did not sell well.

Below are two pictures of some tempered SL lighting designs. These lighting fixtures were hung up, displayed and handled everyday by potential customers. Tempering also made them durable enough to last throughout the whole trade show.



## Distributors Benefit - Offering RP Tempering

RP Tempering™ Technologies are being accepted globally with distribution channels in Asia, Europe (Germany/Austria/France/UK/India), Spain, Switzerland, South Africa, Middle East, Russia, Korea, USA, Canada, Mexico, Asia, Australia and New Zealand.

Distributorships are still available in certain geographical locations. Sales and other opportunities continue to increase every month for RP Tempering™ and their distributors. Even RP Tempering™ end users, academic institutions, Government Agencies and OEM's are seeing many benefits from using and offering RP Tempering™ services. Distributors that sell RP Machines, Software, Support Services (Training & Maintenance), Peripherals Tools/Fixtures, and Consumable Materials/Resins/Powder are benefiting from adding RP Tempering™ to their products and services offered. Below is a general summary from a recent busi-

ness survey of RP Tempering™ Distributors and end users.

- RP Distributorship for machines, service contracts, consumable materials, peripheral services and software should consider adding RP Tempering™ Products to their business plan. PAR3 Technology, Inc., interviewed multiple RP Tempering™ distributorships ranging from ones that sell just material/resin/powders to one that sell RP systems and apparatus (SL, LS, FDM & Objet). RP Tempering™ Products and Services are proving to be a perfect compliment to their business plan. Some of the reported benefits are:

- o Selling RP Tempering™ Products is a perfect fit with the current consumable product sales. Consumables create a constant source of increased revenues at a good margin.

- o Selling RP Tempering™ Technology Support Services compliment the current services offered by the distributor. Increasing sales, minimal training and minimal investment add to the companies' profitability.

- o RP Tempering™ Products in

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a competitive situation has proven to be an excellent support mechanism for closing a sale on a system/machine or apparatus. In a potential sale situation where a competitive system is involved, RP Tempering™ enhancements have proven in multiple cases to help land the sale for a RP machine. If you sell the machine, you sell more consumable materials and services, all because of RP Tempering™.

- o Your end use customers that resell RP parts will benefit with increased application opportunities.

- o No capital equipment needed and low start-up investment for distributors and end users alike.

Par3/RP Tempering™ along with their distributors and end users are growing at a record pace in 2008. We are setting sales records for the 3rd year in a row. Anyone can leverage RP Tempering™ Products and Engineering Services. Individual sale representative companies are welcome to inquire about representing and selling RP Tempering™, Composite Tempering©, Engineering Services and Production Applications.

## Living Hinge Kit Demonstration - Step by Step Process

RP Tempering™ Products and Processes can offer even greater latitude in material properties. An end user sent us pictures demonstrating the actual application of the NEW Living Hinge Kit process and materials. RP Tempering™ is a process that enhances the properties of prototype parts. Single or multiple compounds applied using spray, dip or brush techniques can significantly improve the characteristics of models.

One way we explain to a potential first time end user how the coating part of our tempering application works is to reference/compare RP Tempering™ 2 and 3 part monomer science to a standard 2 part epoxy resin system.

For the sake of discussion, most people in this industry know how 2 part epoxies systems work. The 2 part epoxy system instructs you to mix the 2 epoxies together to start

their chemical reaction before you apply to the intended part surface. Applied epoxy systems usually take a while to cure/setup and generally need to be hand finished in some way to create a cosmetic surface. Epoxy mixtures like this are difficult to apply especially over large areas.

RP Tempering™ uses a 2 or 3 part monomer based mixture to achieve a great latitude of physical and typical property enhancements to include: Mechanical Properties, Thermal Properties, Environmental/Chemical Resistance Properties and Electrical Properties. In the case of the living hinge, we will use 3 different types of tempering monomers to achieve a long life cycle (~200 cycles) living hinge. This tempering process for the triple living hinge application pictured in this article should only take 10 minutes. Application brief:

**Step #1** - Apply 2 coats of Proto-Reinforcement© Infiltrate Coating on both sides of the living hinge area only.

**Step #2** - Apply 1 bead or line of RP Temper-

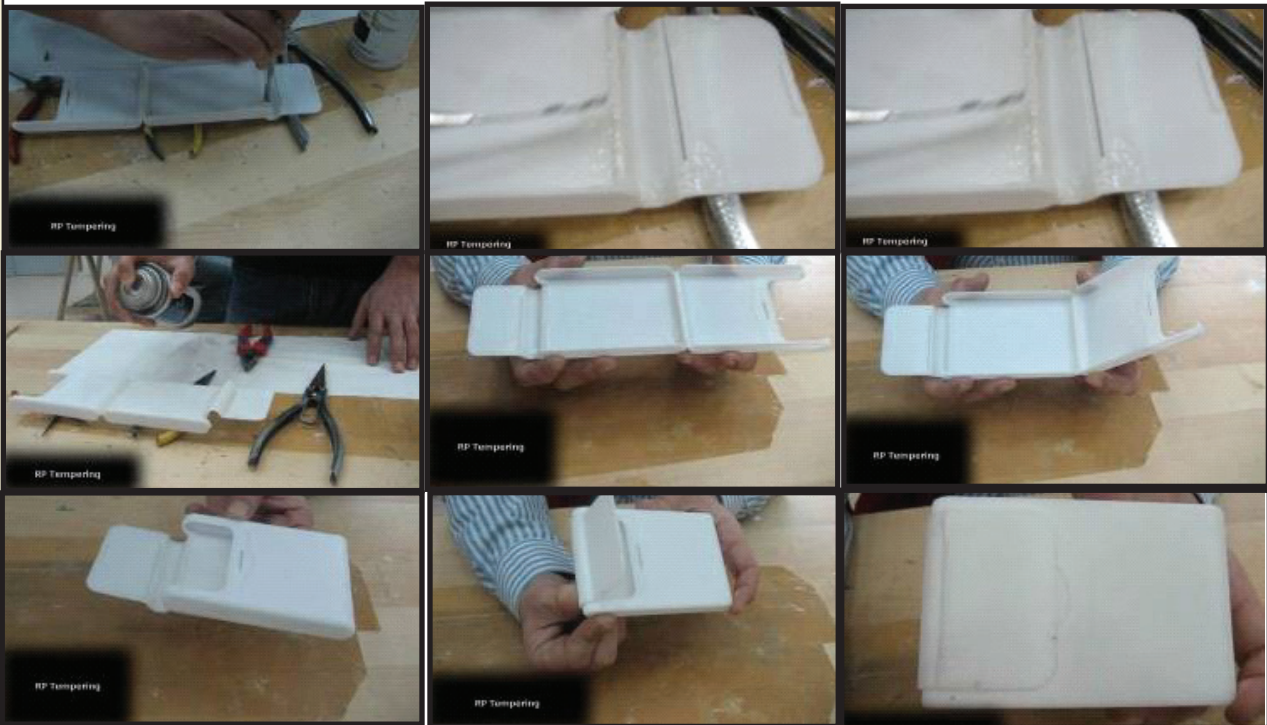
ing™ Compound in the center of the living hinge area on both sides. This will be applied over the top of the Proto-Reinforcement© Infiltrate Coating.

**Step #3** - Apply 2 to 3 coats of Proto-Plasma-Rx™ Spray over the living hinge area on both sides of the part and let dry.

Note: Each time you apply one tempering monomer over the other there is a chemical reaction happening. You will be able to touch and/or ship your part but the application takes 12 hours to fully cure.

**Step #4** - When you first bend/flex the living hinge area of the part, support the area with your finger on both side as much as possible. Next slowly bend the part in one direction until the part is fully flexed. Then slowly move the part open to the start position. After that you are good to open and close the part as often as you want and as fast as you want.

The RP Tempering™ materials will appear ugly when you first apply them but after they cure you will have a smooth surface and you do not have to hand finish the part.



## Tempered SL Parts Pass the Test Under-hood Automotive

Webb Industries, a tier two supplier to the automotive market, uses tempered SL materials for under-hood applications for fluid transfer and air transfer application testing. These parts, in most cases, will have to withstand over 120° F of consistent heat soak while fastened down to a

bracket underneath a car hood. These parts will see water, air, break fluid, and power steering fluid in hot and cold temperatures. The RP Tempering™ application process for most of these parts shown is to apply two coats of Proto-Reinforcement© Infiltrate Coating, one coat of RP Tempering™ Compound and 2 to 3 coats of Hi-temp Protoplax© Coating. When

finished, the thickness added to the parts is about .0012" thick.



## Customer Statements about RP Tempering™

"Don't ship an FDM part without Proto-Reinforcement® Infiltrate Coating on it. It will greatly enhance the ABS FDM part within seconds and for pennies! A very cost effective insurance policy at a price we can afford."

– Timothy Williams, Application Engineer

"We use RP Tempering™ Products on our SLA parts almost every day. When we first applied this technology, we made living hinges and a Frisbee out of SLA material. We fly the Frisbee and it is still not broken."

– Mike Jones, Operations Manager

"This ABS FDM living hinge part looks and works like a real living hinge injection molded out of polypropylene. We are applying this to a case that holds medical tools as an in use part. Our customer loved it because they did not have to purchase an expensive injection mold tool. Now they just buy ABS FDM parts from us."

– Rob, Engineer

"I cannot believe that RP Tempering™ can make an SLA living hinge bend like this? It only took a few minutes to apply and we achieved 150 plus bends."

– Bob Wood, Engineer

"We were going to lose a sale of a Dimension machine to a competitive RP/SFF technology because we could not make parts that would pass their primary application specifications. We went back to the customer with RP Tempering™ and met their specifications and sold the FDM machine. Thanks Par3."

– Jack, Owner

"RP Tempering™ helped us get an Aerospace account using standard GF SLS with your Fire Retardant Protoplass®. We passed all the UL94 Burn Test Criteria to include fume testing."

– Eric Shaw, Sales

## Nanotechnology Making Big Difference For Rapid Prototyping.

Independent research has been published about RP Tempering™ Technologies. This article was published by Engineering Live Magazine about DSM, 3D Systems and PAR3 Technology, Inc., for all of our advancements in using nano-technology to improve prototyping and SFF materials. It is a great compliment for Par3 to be mentioned and compared to these major OEM's for advancements in the industry.

They reviewed some of the rapid prototyping and rapid manufacturing materials that utilize nanotechnology. The following is an excerpt from the article about RP Tempering™.

It is also worth highlighting a novel technique that makes use of nanotechnology to modify the properties of parts built from conventional rapid prototyping and rapid manufacturing materials. RP Tempering™ is described as a solid freeform additive technology developed by Par3 Technology for use

with parts built using stereolithography, laser sintering, fused deposition modeling and 3D printing systems. Whereas parts built using these systems are normally relatively fragile, the RP Tempering technology enables toughness to be improved. In addition, Par3 has developed alternative treatments for enhancing electromagnetic shielding, flame retardance and chemical resistance.

As well as modifying a component's bulk characteristics, RP Tempering also enables living hinges to function, snap fits to be used numerous times, and self-tapping screws to be inserted into screw bosses. To use RP Tempering, the part has to be built with a series of tunnels and surface grooves, depending on the part's geometry. The tunnels are subsequently injected with the RP Tempering compound that contains multi-wall carbon nanotubes. Coating techniques are also used to apply RP Tempering compounds to the exterior and/or interior walls of the component. In Europe, the Temperman Initiative has been established to promote RP Tempering, which is available through a number of service bureaus.



The Temperman website has a series of short videos that illustrate very clearly the dramatic improvements that RP



Tempering can make to components.

## Contact Us:

### PAR3 Technology

[www.RPTempering.com](http://www.RPTempering.com)

[info@rptempering.com](mailto:info@rptempering.com)

[www.par3technology.com](http://www.par3technology.com)

[info@par3technology.com](mailto:info@par3technology.com)

931-528-8578