

## RP TEMPERING PROCESS BENEFITS AND EXAMPLES

### Overview

RP tempering is a proprietary process of infiltrates and coatings used in conjunction with prototype parts to improve their mechanical characteristics. They are available in multiple formulations all with specific functions each perform. Below is a list of some the characteristics that RB tempering can improve.

- 3-point Flex Strength
- Torque
- Impact Strength
- Heat Resistance
- Heat Deflection
- Flex Modulus Control
- EMI Shielding
- RFI Shielding
- Flame Retardancy
- Chemical Resistance

### RP Tempering Products Available

#### Conductemp

The part is initially coating with a proprietary infiltrate. This infiltrate can be applied to only certain areas with the help of a stencil or mask. This base coat is .0002" thick and will adhere to most RP materials. Next the select coating can be applied; the available coatings are Copper, Gold, Silver, and Aluminum. This material can be used to shield EMI fields or to conduct electricity amongst many other applications. Below is a picture depicting a high temperature test one prototype is coated with conductemp and the other is not. In a part that is not the PC deformation as well as bubbling on the tip of one of the ends.



## Hi temp protoplast spray

First the proprietary infiltrate coating as a base coating on the part, you can then apply the hi temp coating. This coating contains a micro blend of plasticizers, alumina, ceramics, and other inhibitors. The compound comes in clear and black. Below is a table listing the new mechanical properties of SLA and SLS materials tested.

Test	ASTM	SLA	SLA	SLA	SLS	SLS	SLA
		11120	12110	14120	PA	GF	Nylon 11
Heat Deflection 1.81 Mpa	648	375°F	490°F	405°F	440°F	440°F	550°F
Heat resistant	648	750°F	900°F	750°F	850°F	990°F	1000°F
T/G	D149	250°F	n/a	250°F	n/a	n/a	n/a
Melting Point	DSC	275°F	270°F	325°F	240°F	250°F	270°F
Coefficient of Thermal Expansion	D696	n/a	6.7E-05 in/in/F	n/a	6.7E-05 in/in/F	6.7E-05 in/in/F	6.7E-05 in/in/F

## Sample of RP Tempering

Depicted below are two sample case studies of be RP tempering infiltrate without any additional coatings.

### Functional Egg Carton

Specifics:

- 0.040" wall thickness
- Living hinge 145° Hinge
- Still Functional After 50 Cycles



## Flip top living Hinge

Specification

Application – Medical

- 3 areas of living hinge
- 100+ cycles without failure

