**PRODUCT OVERVIEW**

Crystal Clear™ 200, 202, 204 and 206 are water white clear and made specifically for applications that require clarity. These rigid urethane casting resins differ only in working and demold times. Low viscosity ensures easy mixing and pouring. Crystal Clear™ resins cure at room temperature* with negligible shrinkage. Cured castings are UV Resistant and are not brittle. Vibrant colors and color effects are achieved by adding pigment dispersions. Applications include encapsulation, making prototype models, lenses, sculpture reproductions, decorative cast pieces, jewelry, prototype models, special effects and props. Crystal Clear™ 220 and 221 are harder, heat cured products that offer advantages over these room temp. cure products. A separate tech bulletin is available for Crystal Clear™ 220 and 221 at www.smooth-on.com.

**CAUTION: NOT FOR HOME USE. THIS PRODUCT IS FOR INDUSTRIAL USE ONLY.** Proper ventilation, A NIOSH Approved Respirator and Protective Clothing (gloves and long sleeves) are required to minimize the risk of inhalation and dermal sensitization. If breathing is affected or a dermal rash develops, immediately cease using this product and seek medical attention. Read SDS before using.

**TECHNICAL OVERVIEW**

<table>
<thead>
<tr>
<th>Crystal Clear™ 200</th>
<th>20 Min.</th>
<th>16 Hours</th>
<th>2,500 psi</th>
<th>73,200 psi</th>
<th>10%</th>
<th>10,650 psi*</th>
<th>200,000 psi</th>
<th>6,385 psi*</th>
<th>40,000 psi</th>
<th>0.001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystal Clear™ 202</td>
<td>9 Min.</td>
<td>90 Min.</td>
<td>3,500 psi</td>
<td>86,240 psi</td>
<td>10%</td>
<td>5,390 psi</td>
<td>183,200 psi</td>
<td>4,200 psi</td>
<td>44,000 psi</td>
<td>0.0125</td>
</tr>
<tr>
<td>Crystal Clear™ 204</td>
<td>2 Hours</td>
<td>48 Hours</td>
<td>3,500 psi</td>
<td>86,240 psi</td>
<td>10%</td>
<td>5,390 psi</td>
<td>183,200 psi</td>
<td>4,200 psi</td>
<td>44,000 psi</td>
<td>0.002</td>
</tr>
<tr>
<td>Crystal Clear™ 206</td>
<td>4.5 Hours</td>
<td>7 Days</td>
<td>2,500 psi</td>
<td>73,200 psi</td>
<td>10%</td>
<td>10,650 psi*</td>
<td>200,000 psi</td>
<td>6,385 psi*</td>
<td>40,000 psi</td>
<td>0.002</td>
</tr>
</tbody>
</table>

| Mix Ratio; 100A:90B by weight | | | | | | | | |
| Mixed Viscosity, cps; 600 (ASTM D-2393) | | | | | | | | |
| Specific Gravity, g/cc; 1.036 (ASTM D-1475) | | | | | | | | |
| Specific Volume, cu. in./lb.; 26.7 (ASTM D-1475) | | | | | | | | |
| Color; Clear | | | | | | | | |
| Shore D Hardness; 80 (ASTM D-2240) | | | | | | | | |
| Heat Deflection Temp; 120°F/50°C (ASTM D-648) | | | | | | | | |

**REFRACTIVE INDEXES**

- **Crystal Clear 200:** 1.49962 at 20°C 1.49894 at 25°C
- **Crystal Clear 202:** 1.49888 at 20°C 1.49893 at 25°C
- **Crystal Clear 204:** 1.49888 at 20°C 1.49830 at 25°C
- **Crystal Clear 206:** 1.49962 at 20°C 1.49894 at 25°C

**ELECTRICAL PROPERTIES**

- **Dielectric Strength:** 260 Volts/MIL (ASTM D-149)
- **Dielectric Constant:** 3.36 @77°/25°C at 100 Hz (ASTM D-150)
- **Dielectric Constant:** 3.34 @77°/25°C at 1 kHz (ASTM D-150)
- **Dissipation Factor:** 0.00 @77°/25°C at 100 Hz (ASTM D-150)
- **Dissipation Factor:** 0.01 @77°/25°C at 1 kHz (ASTM D-150)
- **Vol. Resistivity:** 1.4 x 1015 @77°/25°C ohm-cm (ASTM D-257)

**PROCESSING RECOMMENDATIONS**

**PREPARATION...Safety** Store and use at room temperature (73°F/23°C). These products have a limited shelf life and should be used as soon as possible. Environmental humidity should be as low as possible. Good room size ventilation is essential. Wear safety glasses, long sleeves and rubber gloves to minimize contamination risk. Wearing a NIOSH approved respirator will minimize inhalation of residual fumes. Use in a low humidity environment (below 50% RH). Mixing containers should have straight sides and a flat bottom. Mixing sticks should be flat and stiff with defined edges for scraping the sides and bottom of your mixing container.

**Selecting A Mold Rubber** - Pour into a urethane rubber mold (Vytaflex™ urethane – release agent required), tin cured silicone mold (Mold Max™ silicone) or Mold Star™ 15, 16 or 30 platinum cured silicone (not Mold Star™ 20T). Do not use other rubber mold products.

**If using Mold Max™ silicone:** to prevent cure inhibition, post-cure newly cured silicone mold for 8 hours at 150°F / 60°C and let cool prior to casting resin. If you are unsure about surface compatibility, a small scale trial casting should be made.

**For Best Results Before Pouring Crystal Clear™ Into Mold:** Pre-heat rubber mold at 212°F / 100°C for 4 hours. This will minimize chances of fish-eyeing, suck back, corner rounding, large bubbles, etc. in finished casting.

**PROCESSING RECOMMENDATIONS**

**SPECIAL EFFECTS AND PROPS** Crystal Clear™ 220 and 221 are harder, heat cured products that offer advantages over these room temp. cure products. A separate tech bulletin is available for Crystal Clear™ 220 and 221 at www.smooth-on.com.

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**Safety First!**

The Material Safety Data Sheet (MSDS) for this or any Smooth-On product should be read prior to use and is available upon request from Smooth-On. All Smooth-On products are safe to use if directions are read and followed carefully.

**Be careful.**

Part A is a modified aliphatic diisocyanate. Vapors, which can be significant if heated or sprayed, can cause severe irritation. Use only with adequate ventilation. Contact with skin and eyes may cause severe irritation. Flush eyes with water for 15 minutes and seek immediate medical attention. Remove from skin with waterless hand cleaner followed by soap and water. Refer to MSDS.

Part B is irritating to the eyes and skin. Avoid prolonged or repeated skin contact. Remove from skin with soap and water. If contaminated, flush eyes with water for 15 minutes and seek immediate medical attention. Use only with adequate ventilation.

Important: The information contained in this bulletin is considered accurate. However, no warranty is expressed or implied regarding the accuracy of the data, the results to be obtained from the use thereof, or that any such use will not infringe upon a patent. User shall determine the suitability of the product for the intended application and assume all risk and liability whatsoever in connection therewith.

For Best Results: Bubble elimination is best achieved by pressure casting. After pouring the mixed compound, the entire casting is irritating to the eyes and skin. It is recommended if performance of this material is in question.

**Casting Thickness & Cure Time** - The cure time and ultimate shrinkage of all Crystal Clear™ products will vary depending on mass concentration, thickness of the casting, mold configuration, etc. For example, a 200 gram mass of Crystal Clear™ 200 will cure faster if left to cure in a conical vessel (cup) versus a casting dispersed as a thin sheet measuring 3 centimeters square by 1 mm thick. This is due to the heat generated by the concentration of material in the cup versus heat that is dissipated from the sheet casting. Castings will resist yellowing when exposed to UV, but may darken over time.

- **Crystal Clear™ 200** is intended for a casting thickness ranging from ½” to 3” at a casting weight maximum of 16 lbs. (7.25 kgs.) Castings greater than 3” should be layer cast.
- **Crystal Clear™ 202** is intended for casting in thin sections. Developed for casting thicknesses of no more than ½”.
- **Crystal Clear™ 204** can be cast in thicknesses up to 6” at a casting weight maximum of 35 lbs. (15.88 kgs.).
- **Crystal Clear™ 206** is for castings greater than 6”. Crystal Clear™ 206 castings greater than 1/2” (1 cm) can be demolded after 48 hours and left to fully cure outside the mold. Castings less than 1/2” (1 cm) should be left to cure in the mold for 7 days.

**MEASURING & MIXING...**

Liquid urethanes are moisture sensitive and will absorb atmospheric moisture. Mixing tools and containers should be clean and made of metal or plastic. Materials should be stored and used in a warm environment (73°F / 23°C). Stir or shake Part B thoroughly before dispensing.

**Measuring** - Materials should be stored and used at room temperature (73°F / 23°C). The proper mixing ratio is 100A:90B by weight. You must use an accurate digital gram scale to weigh Parts A and B properly. Do not use an analog scale or attempt to measure components by volume. Dispense the required amount of Part A into a mixing container. Weigh out the appropriate amount of Part B and combine with Part A.

**Mixing** - Mix SLOWLY, but thoroughly, for at least 90 seconds making sure that you scrape the sides and bottom of your container several times. If coloring or filling Crystal Clear™ product, add filler or pigment dispersion to Part B and mix thoroughly before adding Part A.

Bubbles in the finished casting will be greatly reduced by vacuum degassing prior to pouring. Subject mixture to 29 inches of mercury in a suitable vacuum chamber until mixture rises, breaks and falls. Allow for 3 to 4 times volume expansion in mixing container.

**POURING, CURING & PERFORMANCE...**

**Pouring** - If casting Crystal Clear™ into a rubber mold, pour mixture in a single spot at the lowest point of the mold. If encapsulating an object, do not pour the mixture directly over the object. Let the mixture seek its level. A uniform flow will help minimize entrapped air.

**Call Us Anytime With Questions About Your Application**

Toll-free: (800) 381-1733  Fax: (610) 252-6200

The new www.smooth-on.com is loaded with information about mold making, casting and more.