# *eleset™ UR6060 Clear Technical Data Sheet*

11/08/2018

N109 W13300 ELLSWORTH DRIVE GERMANTOWN, WI 53022
262-253-5900 FAX 262-253-5919

## DESCRIPTION:

*ResinLab® eleset™ UR6060* Clear is a clear, colorless two-part polyurethane that will cure at room temperature. This formula is designed for use in cartridges and molding using the Moldman Systems™ equipment. It is commonly used for LED encapsulation, along with other high quality castings.

This product has been formulated to provide excellent long-term non-yellowing UV stability, high transparency and water white clarity. It has a low viscosity and is easy to mix and process.

eleset™ UR6060 Clear is suitable for use in medical device assembly. It has been tested and is proven non-toxic per ISO 10993-5. Manufacturers should test their own finished product for biocompatibility. Certificates of compliance are available upon request.

eleset™ UR6060 Clear was formulated to a 1A:1B volume mix ratio for use in side-by-side cartridges and meter/mix and dispense equipment. eleset™ UR6060 Clear will reach full cure at room temperature within 36 hours. Cure time can be accelerated by the application of heat. Two hours at 60 °C is sufficient to fully cure this product.

This formula has been processed on Moldman Systems™ Mix on Demand Molding™ equipment. A cycle time of less than one minute can be achieved with a mold temperature of 120 °C. The mold temperature should not exceed 150 °C. Temperatures lower than 120 °C can be utilized but the cycle time will be increased.

## TYPICAL PROPERTIES:

All properties given are at 25 °C unless otherwise noted.

| *Property:* | *Value:* | *Test Method or Source:* |
|---|---|---|
| **Color** | Clear, Colorless | Visual |
| **Mix Ratio**<br>**By weight**<br>**By volume** | Part A to Part B<br>0.96 to 1<br>1 to 1 | Calculated |
| **Mix On Demand Molding™ Cure Schedule** | 45 seconds at 120 °C<br>Please note that in molding applications, cycle time is highly dependent on volume, mold temperature, and geometry. | |
| **Cure Schedule** | 6 hours at room temperature<br>Full cure within 36 hours<br>2 hours @60 °C | |
| **Viscosity – Part A**<br>**Viscosity – Part B**<br>**Viscosity - Mixed** | 650 cps<br>700 cps<br>1,050 cps | Rheometer parallel plate 25mm@1/s<br>455300006291 |
| **Specific Gravity – Part A**<br>**Specific Gravity – Part B**<br>**Specific Gravity - Mixed** | 1.08<br>1.13<br>1.10 | Calculated |
| **Pot Life, defined as the time it takes for initial mixed viscosity to double** | 15 minutes | Rheometer parallel plate 25mm@1/s<br>455300006291 |
| **Gel Time** | 15-20 minutes/100cc sample | 455300005339/Gardco Hot Pot Gel Timer |

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| | | |
|---|---|---|
| **Glass Transition Temperature/Tg** | -2 °C | 453560822409 by DSC |
| **Hardness** | 80 Shore A | 455300006287/ASTM D2240 |
| **Water Absorption** | 0.21% after 24 hours | 457561824543/ASTM D570 |
| **Peak Exotherm** | 96.5 °C after 25 minutes for 40mL sample | 455300005593 by Type K thermocouple |
| **Tensile Properties:** | | 455300006285/ASTM D638 |
| **Strength** | 400 psi | |
| **Elongation** | 25% | |
| **Modulus** | 1,500 psi | |
| **Lap Shear Strength** | | 455300005642/ASTM D1002 |
| **0.010" bond line Al to Al** | 400 psi | |
| **Thermal Conductivity by LFA** | <0.20 W / (m.K) | 453560822409/ASTM E1461 |
| **Coefficient of Thermal Expansion by TMA** | 88 ppm/ °C below Tg<br>203 ppm/ °C above Tg | 455300005340 /ASTM E831<br>TMA, 5 °C/min |
| **Transmittance** | 93.4% @ 6mm | ASTM D1003, Procedure A |
| **Refractive Index** | 1.504 | ASTM D542, 589nm |
| **Surface Resistivity** | $1.71 \times 10^{16}$ ohm/sq (@ 23 %RH) | 455300006612/ASTM D257 |
| **Volume Resistivity** | $1.70 \times 10^{15}$ ohm-cm (@ 18 °C) | |
| **Dielectric Constant / Dissipation Factor** | | 455300006513/ASTM D150 |
| **@ 100 Hz** | 6.3, 0.2 | |
| **@ 100 kHz** | 4.1, 0.05 | |
| **AC Dielectric Strength** | 449 V/mil (17.7 kV/mm) | ASTM D149, Method A, tested in oil |
| **Biocompatibility**<br>**Biological Evaluation of Medical Devices** | Passes ISO 10993-5 | MEM Elution Test |
| **Service Temperature Range**** | -40 to 120 °C** | |

* Asterisk denotes values considered typical to associated resin systems or extrapolated from other test results.
**Service Temperature rating is based on average design requirements and is not intended as a guarantee of suitability for all applications operating at that temperature.
*** This TDS contains values that have been updated. The values reported in this technical data sheet are typical values of the product, and are highly dependent on test conditions and methodology. We actively seek the most precise and accurate ways to measure and interpret performance of our products, and to update estimated values with measured values. The formula has not been revised or changed in any way. Although the values on paper have changed, you can expect the same performance of the product.

## INSTRUCTIONS:

1. Bring both components to room temperature prior to mixing.

2. Cartridge format: Mixer should be attached keeping the cartridge vertical and any air pocket purged this way. After the mixer contains material, the mixer tip can be dropped to dispense pre-bleed amount. Attach a new static mixer with each cartridge, then pre-bleed the first 3 inches of dispensed material or until a uniform color is obtained. Maintain adequate velocity during dispensing to ensure complete mixing.

3. Bulk format: weigh and mix parts A and B accurately and thoroughly, scraping sides of container often. Do not pour from mixing container, transfer to a new container as residual unmixed material may cause a tacky spot on the surface of the casting. Maintain adequate velocity during dispensing to ensure complete mixing.

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4. Allow to cure undisturbed until product is fully gelled or tack-free to the touch.
5. Clean up uncured resin with suitable organic solvent such as MEK, acetone or other organic solvent.

## MIX ON DEMAND MOLDING™ INSTRUCTIONS:

1. Bring both components to room temperature prior to mixing.
2. Cartridge format: A static mixer is needed in the Moldman® 2050 static mixer assembly to mix the system. Check that the Nordson EFD system is properly pressurizing cartridges to feed material into the machine.
3. Bulk format: Mix part A and part B if there are any signs of settling or separation. Attach bulk dispense system to feed material into the machine.
4. Provide an adequate cycle time based on the chosen processing temperature to allow the material to cure within the mold.
5. Clean up uncured resin with suitable organic solvent such as MEK, acetone or other organic solvent.

## SHELF LIFE AND STORAGE:

6 months at 25 °C Bulk.
12 months at 25 °C in cartridges that are foil bagged and desiccant packed.

Isocyanates are sensitive to moisture and should be kept in their original container or in a volume tank under dry nitrogen blanketing. Many isocyanates are prone to dimerization, the formation of a white precipitate. Products with minor amounts of this precipitate normally cure to full properties. Storage at 20 +/- 5 °C (60 °F to 86 °F) is recommended to ensure full shelf life.