TECHNICAL DATA SHEET
UR6000 Black

11/09/2018

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

DESCRIPTION:

Resinlab® UR6000 Black is a lower cost two-part flame retardant urethane suitable for potting and encapsulation of electronic devices. It was formulated to a 4:1 by volume ratio for ease of use in automatic mixing equipment and is available in both bulk and cartridge format. This low viscosity formulation gels in less than 30 minutes at a volume of 150 mL and reaches full cure within 72 hours at room temperature. Higher temperatures will accelerate cure.

UR6000 Black is recognized under the Component Recognition Program of Underwriters Laboratories Inc., (File# E186034) for UL Standard 94. UR6000 Black qualifies for a vertical burn rating of V-0 at 3mm thickness. It has good adhesion to multiple substrates and moderate thermal conductivity.

This formula contains soft, low-abrasion fillers which can separate over time, although they have good resistance to hard settling.

TYPICAL PROPERTIES:

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

Property:	*Value:*	*Test Method or Source:*
Color	Black	Visual
Mix Ratio **By weight** **By volume**	Part A to Part B 5.03 to 1 4 to 1	Calculated
Cure Schedule	72 hours @ 25 °C 2 hours @ 65°C 0.5 hours @100 °C	
Viscosity – Part A **Viscosity – Part B** **Viscosity - Mixed**	18,000 cps 400 cps 5,000 cps	Rheometer parallel plate 25mm@1/s 455300006291
Specific Gravity – Part A **Specific Gravity – Part B** **Specific Gravity - Mixed**	1.55 1.23 1.48	Calculated
Pot Life, defined as the time it takes for initial mixed viscosity to double	4 minutes	Rheometer parallel plate 25mm@1/s 455300006291
Gel Time	25 minutes/150cc sample	455300005339/Gardco Gel Timer
Glass Transition Temperature/Tg	27 °C	453560822409 by DSC
Hardness	70 Shore D	455300006287/ASTM D2240
Water Absorption	0.1% after 24 hours	457561824543/ASTM D570
Peak Exotherm	35 °C after 20 minutes for 40mL sample	455300005593 by Type K thermocouple
Tensile Properties: **Strength** **Elongation** **Modulus**	 1,500 psi 30% 12,000 psi	455300006285/ASTM D638
Lap Shear Strength (0.010” bond line) **Al to Al** **Steel to Steel** **Polycarbonate to Polycarbonate**	 1,200 psi 1,050 psi 475 psi	455300005642/ASTM D1002

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Acrylic to Acrylic	250 psi	
PVC to PVC	500 psi	
ABS to ABS	300 psi	
Compressive Properties:		455300006265/ASTM D695
Strength	14,000 psi	
Modulus	33,000 psi	
Flame Resistance	UL Certified. V-0 @ 3mm thickness.	UL94V (File# E186034)
Thermal Conductivity by LFA	0.50 W / (m*K)	453560822409/ASTM E1461
Coefficient of Thermal Expansion by TMA	65 ppm / °C Below Tg 160 ppm / °C Above Tg	455300005340/ASTM E831 TMA, 5 °C/min
Surface Resistivity	1.69 x 10^{16} ohm/sq (@ 23 %RH)	455300006612/ASTM D257
Volume Resistivity	1.40 x 10^{15} ohm-cm (@ 18 °C)	
Dielectric Constant / Dissipation Factor		455300006513/ASTM D150
@ 100 Hz	4.0, 0.03	
@ 100 kHz	3.7, 0.02	
AC Dielectric Strength	384 V/mil (15.1 kV/mm)	ASTM D149, Method A, tested in oil
Temperature Range	-40 to 120 °C**	

* Asterisk denotes values considered typical to associated resin systems or extrapolated from other test results.
** 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. A power mixer is suggested such as a 500-1000 rpm device with a mix paddle sufficient to turn material and disperse any filler. 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.

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.

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SHELF LIFE AND STORAGE:

3 months DOP at 5 °C in cartridges that are foil bagged and desiccant packed.
Store horizontally.
6 months at 25 °C bulk. Specialty packaging may be less.

This system is prone to settling due to high filler content. Inventory should be rotated on a FIFO (first in, first out) basis.
Bulk containers should be inverted every two to three weeks to reduce the accumulation of the flame retardant fillers on the bottom of the containers.

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.