Powder Coating after Bonding with LORD® Acrylic Adhesives

The LORD® 400, Maxlok™, and 800 series acrylic adhesives have excellent heat resistance characteristics up to 400°F (204°C), thus reducing the concern of possible degradation of the cured adhesive during the high heat associated with the powder coating process. (LORD heat resistance data available, 400°F [204°C] up to 90 minutes.) Table 1 illustrates the resistance of the LORD acrylic adhesives.

LORD acrylic adhesives will not degrade at the higher temperatures associated with powder coating, however the hot tear strengths will be very low causing the assembly to possibly sag and slide apart especially if the assemblies are heavy. The lower strength values make it essential that the assembly is properly fixtured or placed to avoid slippage of the bonded pieces.

Spot welds or other type of mechanical fixturing are frequently used in the industry to aid in holding the assembly in place. The area to be bonded can also be masked off prior to powder coating with bonding done after the process.

The integrity of the bond will remain unchanged after powder coating, and greater strength is often seen after exposure to heat once the assembly(s) has been returned to ambient temperature.

Table 1 - Strength Values Recorded after Powder Coating

Lap Shear Strength	Product	Shear Stress, psi (MPa)	Test Failure Mode
Initial	*Competitor A*	*2911 (20.1)*	*TLC/A*
	LORD 850/25GB	*2721 (18.8)*	*TLC*
	LORD 810/20GB	*1728 (11.9)*	*CF*
	Maxlok MX/T6	*2884 (19.9)*	*TLC*
	LORD 406/19GB	*2597 (17.9)*	*TLC*
After 30 min. @ 400°F (204°C) Postbake	*Competitor A*	*2294 (15.8)*	*SB/A*
	LORD 850/25GB	*2777 (19.1)*	*TLC*
	LORD 810/20GB	*2646 (18.2)*	*TLC*
	Maxlok MX/T6	*2842 (19.6)*	*TLC/A*
	LORD 406/19GB	*2871 (19.8)*	*SB/TLC*
After 60 min. @ 400°F (204°C) Postbake	*Competitor A*	*1619 (11.2)*	*A/SB/TLC*
	LORD 850/25GB	*2756 (19.0)*	*TLC*
	LORD 810/20GB	*2665 (18.4)*	*TLC*
	Maxlok MX/T6	*2847 (19.6)*	*TLC/A/SB*
	LORD 406/19GB	*2840 (19.6)*	*SB/TLC*
After 90 min. @ 400°F (204°C) Postbake	*Competitor A*	*767 (5.3)*	*A*
	LORD 850/25GB	*2740 (18.9)*	*TLC*
	LORD 810/20GB	*2630 (18.1)*	*TLC*
	Maxlok MX/T6	*2819 (19.4)*	*TLC/A*
	LORD 406/19GB	*2826 (19.5)*	*SB/TLC*

Stock break in 900 lbs-f range were excluded as anomalies.

A = Adhesive Failure

CF = Cohesive Failure

SB = Stock Break

TLC = Thin Layer Cohesive Failure

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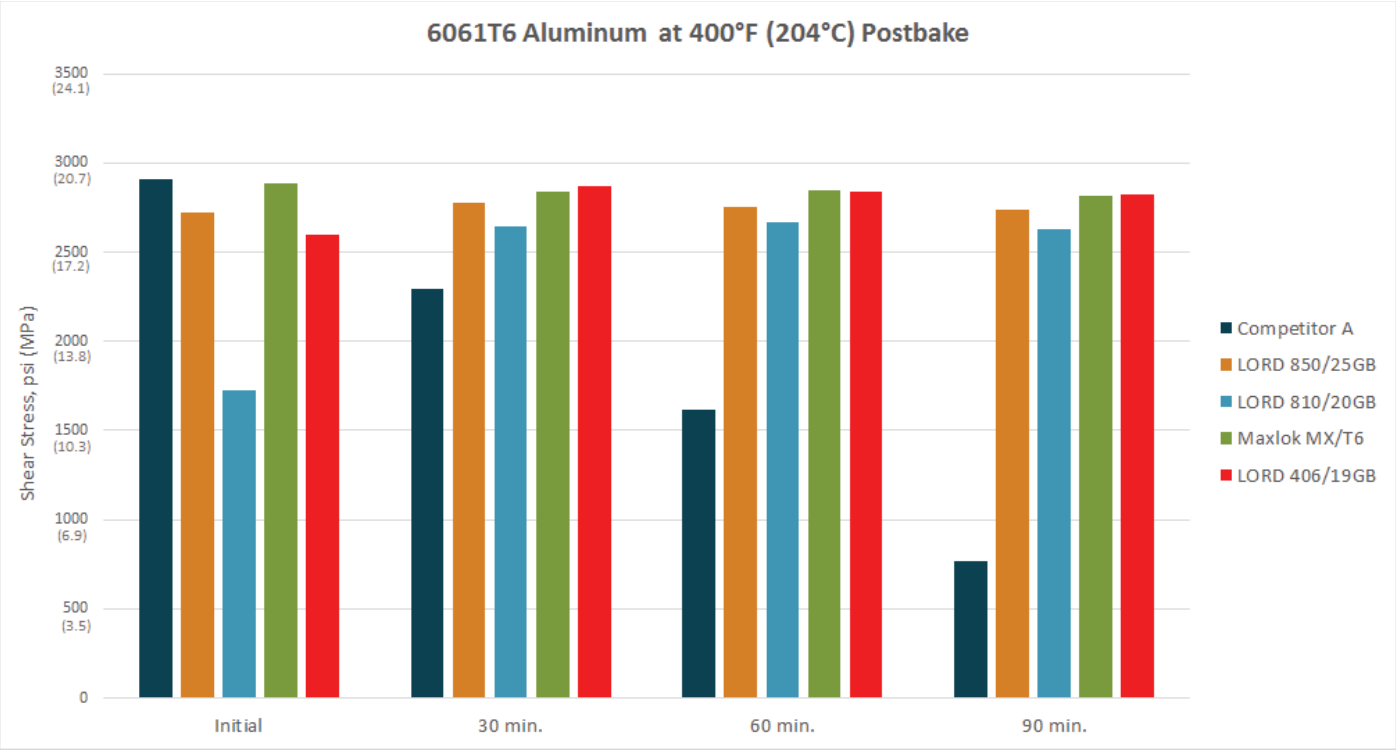
The graph below provides an outline of the capabilities of LORD acrylic adhesives when subjected to elevated temperatures.

Shear Stress verses Temperature of LORD Acrylic Adhesives



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