POWDER COATING AFTER BONDING WITH LORD® ACRYLIC ADHESIVES

Technical Tips

The LORD® 400, Maxlok®, and 800S 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. (Parker 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 850S/25GB	2721 (18.8)	TLC
	LORD 810S/20GB	1728 (11.9)	CF
	Maxlok MX/T6S	2884 (19.9)	TLC
	LORD 406/19GB	2597 (17.9)	TLC
After 30 minutes @ 400°F (204°C) Postbake	Competitor A	2294 (15.8)	SB/A
	LORD 850S/25GB	2777 (19.1)	TLC
	LORD 810S/20GB	2646 (18.2)	TLC
	Maxlok MX/T6S	2842 (19.6)	TLC/A
	LORD 406/19GB	2871 (19.8)	SB/TLC
After 60 minutes @ 400°F (204°C) Postbake	Competitor A	1619 (11.2)	A/SB/TLC
	LORD 850S/25GB	2756 (19.0)	TLC
	LORD 810S/20GB	2665 (18.4)	TLC
	Maxlok MX/T6S	2847 (19.6)	TLC/A/SB
	LORD 406/19GB	2840 (19.6)	SB/TLC
After 90 minutes @ 400°F (204°C) Postbake	Competitor A	767 (5.3)	A
	LORD 850S/25GB	2740 (18.9)	TLC
	LORD 810S/20GB	2630 (18.1)	TLC
	Maxlok MX/T6S	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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Figure 1 provides an outline of the capabilities of LORD acrylic adhesives when subjected to elevated temperatures.

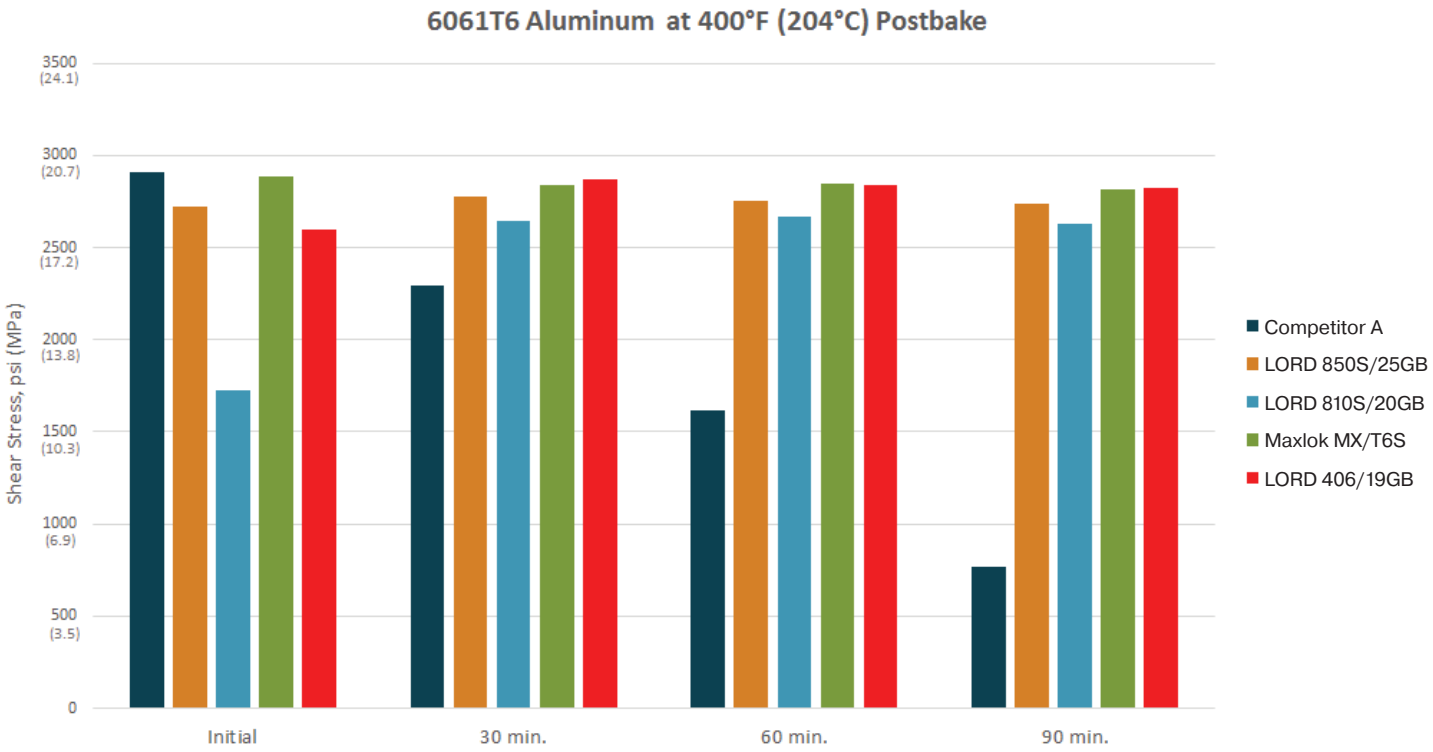

Figure 1. Shear Stress verses Temperature of LORD Acrylic Adhesives

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