

Powder Coating after Bonding with LORD® 400 Series Acrylic Adhesives

The LORD® 400 series acrylic adhesives have excellent heat resistance characteristics up to 400°F (204°C), reducing the concern of possible degradation of the cured adhesive due to heat during the powder coating process. (There is data for heat resistance at 400°F [204°C] up to 100 hours.) However, it is important to keep in mind that at these higher temperatures, the hot tear strength is very low (refer to Graph A).

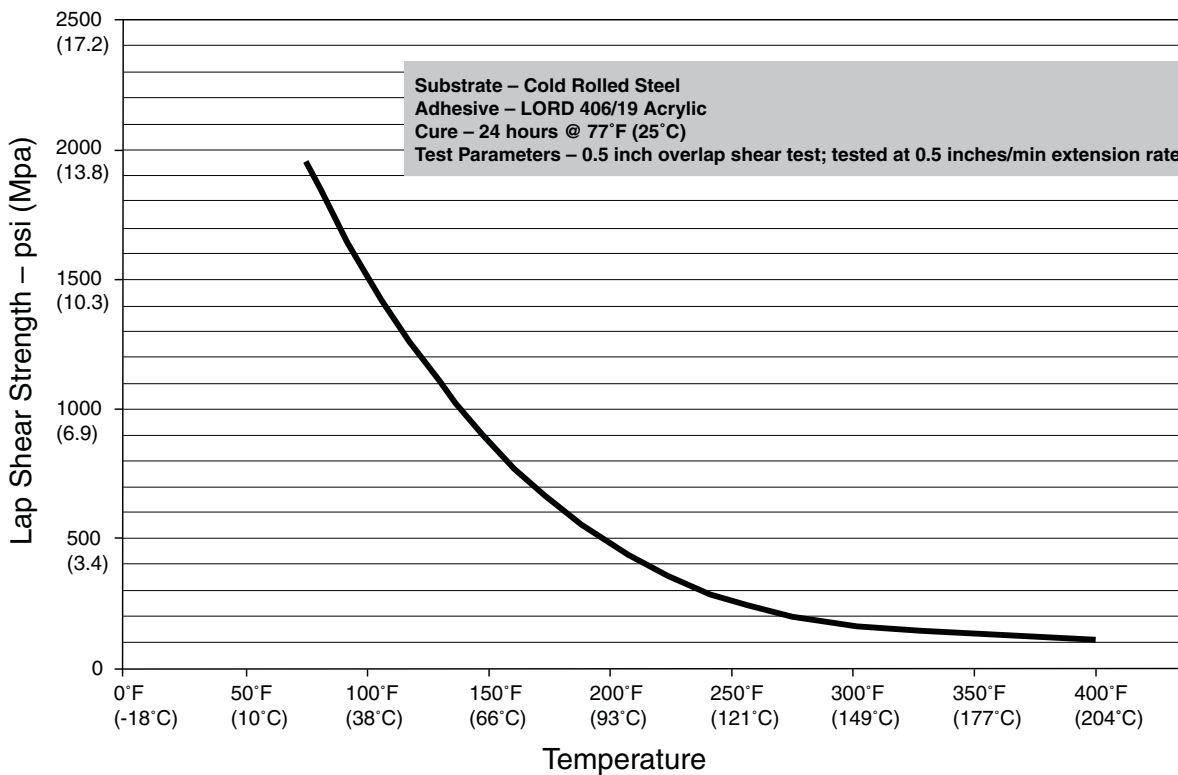
The lower strength values make it essential that the assembly is properly fixtured or placed to avoid slippage of the bonded pieces, especially if they are heavy in nature. Spot welds are frequently used in the industry to hold the assembly in place.

The integrity of the bond will remain unchanged, and in fact increase, once the assemblies have returned to room temperature.

The tables provided outline the capabilities of the LORD 400 series acrylic adhesives when subjected to elevated temperatures.



Graph A - Elevated Lap Shear Strength for LORD 400 Series Acrylic Adhesives



LORD TECHNICAL TIPS

Table 1 data was obtained from 1"x4" (25.4x101.6 mm) coupon samples of 1010 CRS bonded with LORD 406/19 adhesive system per ASTM D1002 and exposed to 400°F (204°C) for both 2 hours and 100 hours respectively. The samples were allowed to cool down to room temperature before being subjected to lap shear testing.

Table 1 - Strength Values Recorded after Powder Coating

Temperature Exposure	Test Strength - psi (MPa)	Failure Mode
Room Temperature	1774 (12.2)	80% Adhesive / 20% Cohesive
	1802 (12.4)	100% Adhesive
	1988 (13.7)	90% Cohesive / 10% Adhesive
2 hr @ 400°F* (204°C)	2470 (17.0)	100% Cohesive
	1638 (11.3)	80% Adhesive / 20% Cohesive
	2456 (16.9)	100% Cohesive
100 hr @ 400°F** (204°C)	1458 (10.1)	100% Adhesive
	1968 (13.6)	100% Adhesive
	1118 (7.7)	100% Adhesive

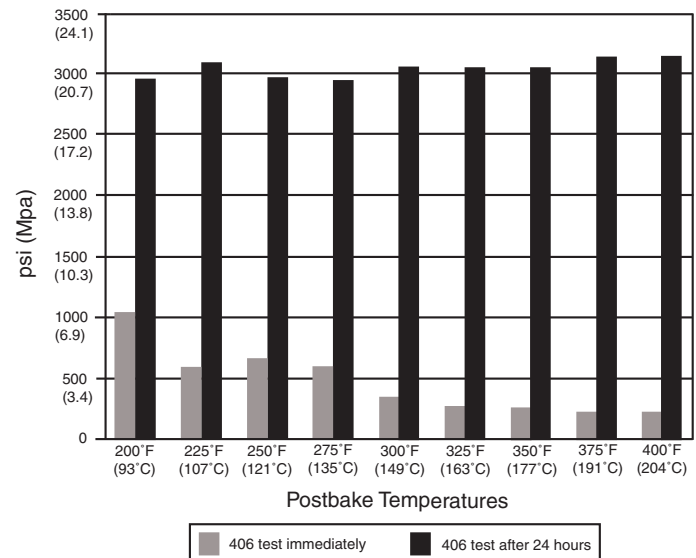
* Adhesive turned orangish in color.

**Adhesive turned brown (LORD 406/19 adhesive system).

A frequently asked question is “Why does the adhesive look orange/tan in color after exposure to heat instead of the light green we are accustomed to seeing after normal room temperature cure?” This color change can typically occur because of the higher temperatures seen during typical painting and E-coat processes. The integrity of the bond after either one of these processes should remain unchanged, and in fact increase, once the assemblies have returned back to room temperature.

Table 2 depicts lap shear test results for LORD 406/19 adhesive system on 1010 CRS. Samples were exposed to each of the temperatures shown for 30 minutes.

Table 2 - Postbake Resistance of LORD 406/19 Adhesive System



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