



# 204

## Sag-Resistant, Acrylic Adhesive for Metals and Plastics

### Description

Lord® 204 acrylic adhesive bonds a wide variety of prepared or unprepared metals and plastics. Lord 204 acrylic adhesive replaces welding, riveting and other mechanical fastening methods.

### Features and Benefits

**Bonds Unprepared Metal** - requires little or no substrate preparation.

**Fast Cure** - cures quickly at room temperature.

**Non-Sag Properties** - will not sag when applied to a vertical surface.

**Environmental and Chemical Resistance** - thermo-setting; resists dilute acids, alkalis, solvents, greases, oils, moisture, and weathering. Performs at temperatures from -40°C to 149°C (-40°F to 300°F). Excellent UV exposure resistance.

**Versatile** - bonds many different substrates. Can be used with both Mix-In and No-Mix accelerators. Insensitive to minor deviations from correct mix ratio.

**Table 1: Typical Properties\* of Lord 204 Acrylic Adhesive**

	Lord 204	Accelerator 4	Accelerator 17	Accelerator 19
Appearance	Off-white paste	Slightly hazy to clear amber liquid	Off-white to slightly yellow liquid	Off-white paste
Viscosity, cP Brookfield @ 25°C (77°F)	100,000 - 300,000 ( Spindle 7 at 20 rpm HAT)	10 ( Spindle 1 at 30 rpm LVT)	1,000 - 3,500 ( Spindle 3 at 12 rpm LVT)	150,000 - 450,000 (T-bar @ 10 rpm)
Density: lb/gal	8.5 - 8.7	10.2 - 10.4	9.7 - 10.1	11.9 - 12.9
Solvents	None	Methylene Chloride/ MIBK/Trichloroethylene	None	None
Flash Point (Closed Cup)	66°F (18°C)	>200°F (>93°C)	>200°F (>93°C)	>200°F (>93°C)
Working Time of Mix System at 24°C (75°F)	6 - 8 Minutes	—	—	—
Handleable Bonds at 25°C (77°F)	12 - 16 Minutes	—	—	—
90 Percent of Ultimate Strength	2 Hours	—	—	—
Full Properties	24 Hours	—	—	—
Mix Ratio by Volume	10 Parts	No-Mix	1 Part	5 Parts
Shelf Life from date of shipment, 25°C (77°F), unopened container	6 Months	6 Months	6 Months	6 Months

\*Data is typical and not to be used for specification purposes.

## Using Lord 204 Adhesive

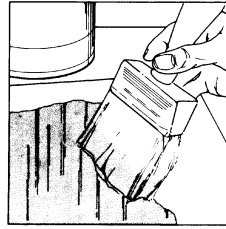
### Substrate Preparation

Metals should be free of grease, loose contamination or poorly adhering oxides. Normal amounts of mill oils and drawing compounds usually present no problems in adhesion. Some engineering plastics should be cleaned, primed or abraded for optimum performance, but this must be determined for each material.

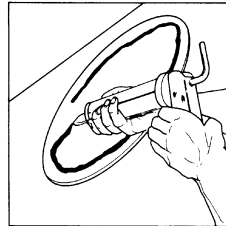
**No-Mix System** — Application may be made by spraying, rolling, or brushing Lord Accelerator 4 onto one or both surfaces. Optimum bond line thickness is 127 - 254 microns (5 - 10 mils) of acrylic adhesive. If the bond line is under 635 microns (25 mils) thick, application to one substrate is usually sufficient. For bond lines of 635 - 1270 microns (25 - 50 mils), both substrates should be coated. Adhesive may be applied as soon as the accelerator is dry, one to three minutes at 24°C (75°F) or up to several weeks thereafter. Parts stored after coating should be kept in a clean, dry area without exposure to ultraviolet light or temperatures in excess of 24°C (75°F).

Refer to Procedure I illustrations for easy-to-follow application instructions using the No-Mix system.

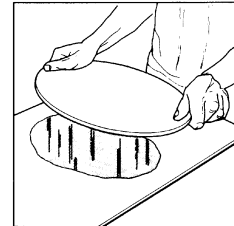
### Procedure I — No-Mix System



1. Apply accelerator.



2. Apply adhesive.



3. Assemble components.

## Performance Data

**Table 2: Typical Performance at Room Temperature Lord 204 Acrylic Adhesive\***

Substrate	psi	Failure
Cold Rolled Steel		
SAE 1010	4800	AM/C
Commercial Quality 1010	3200	AM/C
Drawing Quality Aluminum Killed 1008	3600	AM/C
Stainless Steel		
302	4000	AM/C
Galvanized Steel	1300	AM/C
Aluminum		
6061-T6	4200	AM/C
2024-T3 Alclad	3500	AM/C
5020-0	2000	AM/C
Copper	3500	AM/C
Brass SAE 72	2600	AM/C
Titanium	3200	AM/C
Magnesium	2000	AM/C
SMC (Polyester)	710	SB
ABS	900	SB
Plexiglas	900	SB
Noryl <sup>2</sup>	800	SB
Polycarbonate	1500	SB

\*Performance data are typical and not to be used for specification purposes.

Notes:

Metal 1/2" overlap, plastics 1" overlap., 10 mil glue line thickness, 24 hour layover before testing, ASTM D1002

SB - Stock Break AM/C - Adhesive to Metal/Cohesive psi - pounds per square inch

All substrates were solvent wiped before bonding.

<sup>2</sup>Accelerator 4 placed on both surfaces prior to bonding.

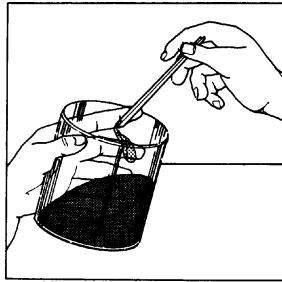
**Mix-In System** — Mix Lord 204 resin with the proper amount of Mix-In accelerator. Working time of the mixed system is approximately six to eight minutes at 24°C (75°F). A handleable bond will develop in 12 - 16 minutes.

Procedure II illustrates instructions for using the Mix-In system.

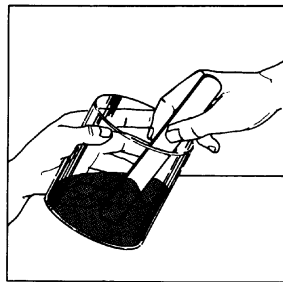
**Dispense Equipment** — Contact your Lord representative for recommended No-Mix and Mix-In dispense equipment. When using such equipment, all wetted parts must be made of stainless steel, and all hoses should be steel braided Teflon.

**Cure** — Adhesive cure will begin on contact with the accelerator. Although there is a safe working time of six to eight minutes, it is suggested that parts be joined immediately after adhesive application.

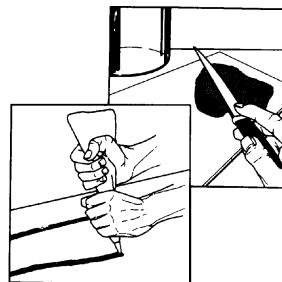
**Procedure II—Mix-In System**



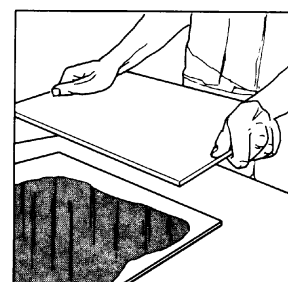
1. Pour accelerator into container containing adhesive.



2. Mix accelerator and adhesive.



3. Apply accelerator-adhesive mixture.



4. Assemble components.

**Table 3: Typical 1000 Hours Environmental Resistance of Lord 204 Acrylic Adhesive\***

Environment	Initial (psi)	Final (psi)	Percent Retention
<b>A. (52°C/125°F) Condensing Humidity</b>			
Commercial Quality 1010 CRS	3200	3000	94
Drawing Quality AK 1008 CRS	3200	3300	103
6061-T6 Aluminum	4500	3500	78
<b>B. 5 percent Salt Spray (35°C/95°F)</b>			
SAE 1010 CRS	5500	4200	76
5052-0 Aluminum	1800	1400	78
6061-T6 Aluminum	4600	3000	65
<b>C. Water Immersion (24°C/75°F)</b>			
SAE 1010 CRS	5500	6200	113
5182 Aluminum	2400	1900	79
6061-T6 Aluminum	4000	2800	70
<b>D. 5 percent Salt Solution Immersion (24°C/75°F)</b>			
SAE 1010 CRS	5500	5500	100
5182 Aluminum	2400	2100	88
6061-T6 Aluminum	4000	3100	78
<b>E. Gasoline Immersion (24°C/75°F)</b>			
SAE 1010 CRS	5500	6100	111
5182 Aluminum	2400	2300	96
6061-T6 Aluminum	4000	3600	90

\*Performance data are typical and not to be used for specification purposes.

Notes:

Parts allowed 24 hour layover prior to environmental exposure.

Bonds were made and tested according to ASTM D1002-77 using 0.063 inch metal stock except for the 5182 aluminum which was 0.040 inch thick.

A 0.010 inch thick glue line was used. All tests were run for 1000 hours.

Assemblies were not stressed during exposure to the aggressive environments.

**Table 4: Typical Results of Heat Aging on Lord 204 Acrylic Adhesive\***

	1 wk. at R.T. Tested at R.T.	1 wk. at 121°C (250°F) Tested at R.T.	1 wk. at 149°C (300°F) Tested at R.T.	1 wk. at 177°C (350°F) Tested at R.T.	30 days at 121°C (250°F) Tested at R.T.
Unprepared SAE 1010 CRS	5600 psi	6700 psi	4900 psi	2200 psi	4800 psi
Grit Blasted SAE 1010 CRS	6500 psi	6400 psi	5100 psi	2500 psi	6700 psi

\* Performance data are typical and not to be used for specification purposes.

Notes:

1. Accelerator 4 applied to both substrates.
2. 10 mil (0.010") glue line thickness
3. Test Method ASTM D1002

**Table 5: Typical Shear Strength of Lord 204 Acrylic Adhesive vs. Temperature\***

	Tested at Room Temperature	Tested at 93°C (93°F)	Tested at 149°C (300°F)
Nonprepared SAE 1010 CRS	5500 psi	3600 psi	700 psi
Grit Blasted SAE 1010 CRS	6700 psi	4000 psi	800 psi

\* Performance data are typical and not to be used for specification purposes.

Notes:

1. Accelerator 4 applied to both bond substrates.
2. Test method ASTM D1002
3. 10 mil (0.010") glue line thickness.

## Shipping and Storage

Ship and store Lord acrylic adhesives at lower than 27°C (80°F). Temperatures greater than 32°C (90°F) shorten the stability of Lord acrylic adhesive and accelerators. For maximum shelf life, store at 4°C - 10°C (40°F - 50°F).

## Cautionary Information

Before using this or any Lord product, refer to the Material Safety Data Sheet (MSDS) and label for safe use and handling instructions.

*For industrial/commercial use only.* Must be applied by trained personnel only. Not to be used in household applications. Not for consumer use.

Values stated in this bulletin represent typical values as not all tests are run on each lot of material produced. For formalized product specifications for specific product end uses, contact the Customer Service Department.

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