

LORD® 850 and 852 Toughened Structural Acrylic Adhesives with LORD Accelerator 25GB

Technical Data Sheet

LORD® 850 and 852 acrylic adhesives in combination with LORD Accelerator 25GB can be used to replace welding, brazing, riveting and other mechanical fastening methods. These toughened structural adhesives perform particularly well in low-temperature environments and applications that are subject to high impact, high peel loads or high fatigue. LORD 850 and 852 adhesives provide a range of working times to accommodate a wide variety of process requirements.

LORD 850 and 852 adhesives, when mixed with LORD Accelerator 25GB, create adhesive systems that bond a wide variety of prepared or unprepared metals and some engineered plastics. These adhesive systems are specifically formulated to provide the highest impact and peel strengths available in a room temperature curing adhesive with exceptional cohesive failure mode.

LORD Accelerator 25GB allows precise control of the adhesive bondline thickness due to its content of glass beads. For further detailed information, refer to the LORD Accelerator 25GB data sheet.

Features and Benefits:

Versatile – bonds a wide range of unprepared metals with minimal substrate preparation, as well as polymer composite substrates such as FRP.

Durable – provides high strength for high-end structural bonding applications; 100% elongation improves impact strength and fatigue resistance.

Temperature Resistant – performs at temperatures from -40°F to +300°F (-40°C to +149°C); tolerates e-coat bake with cohesive failure at 338°F (170°C).

Note: Based on test results, LORD 850/25GB adhesive system exhibits post bake/powder coating temperature resistance up to 400°F (204°C) for 90 minutes. Customer specific substrates should always be evaluated for specific application performance.

Environmentally Resistant – resists dilute acids, alkalis, solvents, greases, oils, moisture, salt spray and weathering; provides excellent resistance to indirect UV exposure.

Non-Sag - remains in position when applied on vertical or overhead surfaces, allowing for greater process flexibility.

Application:

Surface Preparation – Remove grease, loose contamination or poorly adhering oxides from metal surfaces. Normal amounts of mill oils and drawing compounds usually do not present a problem in adhesion. Most plastics require a simple cleaning before bonding. Some may require abrading for optimum performance.

Mixing – Mix LORD 850 or 852 adhesive with the proper amount of LORD Accelerator 25GB. Handheld cartridges will automatically dispense the correct volumetric ratio of each component. Even color distribution visually indicates a thorough mix. Once mixed, the adhesive cures rapidly.

Typical Properties*

| | 850 | 852 |
|---|----------------------------|----------------------------|
| Appearance | Amber Paste | Amber Paste |
| Viscosity, cP @ 77°F (25°C) Brookfield | 150,000 - 550,000 | 150,000 - 550,000 |
| Density lb/gal (kg/m ³) | 8.00 - 8.30 (959 - 995) | 8.00 - 8.30 (959 - 995) |
| Flash Point, °F (°C) | 59 (15) | 59 (15) |

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



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Applying – Apply adhesive using handheld cartridges or automatic meter/mix/dispense equipment.

- Handheld Cartridges
 1. Load the cartridge into the applicator gun and remove the end caps.
 2. Level the plungers by expelling a small amount of material to ensure both sides are level.
 3. Attach mixing tip and expel a mixer’s length of adhesive.
 4. Apply adhesive to substrate and mate the parts within the working time of the adhesive. Clamp in position until adhesive reaches handling strength.

Do not re-expose adhesive to air once parts are mated. Mated parts should be repositioned by sliding to achieve proper alignment.

- Meter/Mix/Dispense Equipment
Contact your Parker LORD representative if assistance is needed using this equipment.

Curing – Cure begins immediately once adhesive and accelerator are mixed. Time to handling strength is dependent on adhesive used. Complete cure requires 2-5 hours at room temperature. Mating surfaces must be held in contact during the entire curing process.

Cure rate can be accelerated by applying modest heat [$<150^{\circ}\text{F}$ ($<66^{\circ}\text{C}$)]. Customer should evaluate adhesive strength and quality through a functional trial of their intended application process. Consult with Parker LORD application engineer for recommended maximum temperature dependent on chosen adhesive cure speed.

Cleanup – Clean equipment and tools prior to the adhesive cure with solvents such as isopropyl alcohol, acetone or methyl ethyl ketone (MEK). Once adhesive is cured, heat the adhesive to 400°F (204°C) or above to soften the adhesive. This allows the parts to be separated and the adhesive to be more easily removed.

Shelf Life/Storage:

Shelf life is six months when stored below 77°F (25°C) in original, unopened container. Storage temperatures of $40\text{-}50^{\circ}\text{F}$ ($4\text{-}10^{\circ}\text{C}$) are recommended. If stored cold, allow product to return to room temperature before using. Protect from exposure to direct sunlight.

LORD 850 and 852 adhesives are flammable. Do not store or use near heat, sparks or open flame.

Typical Properties* of Adhesive Mixed with Recommended Accelerator

| | 850/25GB | 852/25GB |
|--|-----------|-----------|
| Mix Ratio by Volume, Adhesive to Accelerator | 10:1 | 10:1 |
| Solids Content, % | 100 | 100 |
| Working Time, minutes @ 75°F (24°C) | 6-10 | 20-25 |
| Time to Handling Strength, minutes @ 75°F (24°C) 50 psi Shear | 18-24 | 50-70 |
| Full Cure Time, hours @ 75°F (24°C) | 2** | 5 |
| Mixed Appearance | Red Paste | Red Paste |

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**Reaches 90% of its full strength after 1 hour.

Typical Cured Properties* - LORD Adhesive/LORD Accelerator 25GB

| | 850 | 852 |
|---|---------------|---------------|
| Hardness Shore D | 66 | 67 |
| Tensile Strength at Break, psi (MPa) ASTM D638, modified | 2610 (18.0) | 2683 (18.5) |
| Elongation, % ASTM D638, modified | 100 | 100 |
| Young’s Modulus, psi (MPa) ASTM D638, modified | 105,000 (724) | 125,000 (862) |
| Glass Transition Temperature (Tg), $^{\circ}\text{F}$ ($^{\circ}\text{C}$) ASTM E1640-99, by DMA | 176 (80) | 178 (81) |

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Cautionary Information:

Before using this or any Parker LORD product, refer to the Safety Data Sheet (SDS) 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.

Bond Performance* – LORD 850 Adhesive/LORD Accelerator 25GB

| Substrates | Aluminum to Aluminum | EZG to EZG | CRS to CRS |
|---|----------------------|-------------|-------------|
| Lap Shear @ Room Temperature, psi (MPa) | 2617 (18.1) | 2081 (14.4) | 2885 (19.9) |
| Failure Mode | C | C | C |
| Lap Shear @ 180°F (82°C), psi (MPa) | 1044 (7.2) | 1075 (7.4) | 1157 (8.0) |
| Failure Mode | C | C | C |
| Lap Shear @ -30°F (-34°C), psi (MPa) | 3183 (22.0) | 2568 (17.7) | 4017 (27.7) |
| Failure Mode | TLC | TLC | TLC |
| Lap Shear after 14 days @ 95°F (38°C), 95% RH, psi (MPa) | 2584 (17.8) | 2046 (14.1) | 2790 (19.2) |
| Failure Mode | C | C | C |
| Lap Shear after 500 hours Salt Spray Exposure, psi (MPa) ASTM B117 | 2157 (14.9) | 1482 (10.2) | 1908 (13.2) |
| Failure Mode | C/A | C/A | C/A |
| T-Peel @ Room Temperature, pli (N/cm) | 26 (46) | 45 (79) | 45 (79) |
| Failure Mode | C | C | C |

| Substrate | Surface Treatment |
|---|-------------------|
| Aluminum, 0.032" thick 6061T6 | IPA Wipe |
| Electrogalvanized Steel (EZG), 0.032" thick | IPA Wipe |
| Cold Rolled Steel (CRS), 0.032" thick | IPA Wipe |

| Bonded Parameters | Bond Area | Film Thickness | Cure | Mix Ratio |
|-------------------------------|-----------|----------------|------------|----------------|
| Metal Lap Shears (ASTM D1002) | 1.0"x0.5" | 0.010" | 24 hr @ RT | 10:1 by Volume |
| T-Peel (ASTM D1876 modified) | 1.0"x3.0" | 0.010" | 24 hr @ RT | 10:1 by Volume |

| Failure Mode Definition | Abbreviation |
|-----------------------------|--------------|
| Adhesive Failure | A |
| Cohesive Failure | C |
| Thin Layer Cohesive Failure | TLC |

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Bond Performance* – LORD 852 Adhesive/LORD Accelerator 25GB

| Substrates | Aluminum to Aluminum | EZG to EZG | CRS to CRS |
|---|-----------------------------|-------------------|-------------------|
| Lap Shear @ Room Temperature, psi (MPa) | 2880 (19.9) | 2115 (14.6) | 2975 (20.5) |
| Failure Mode | C | C | C |
| Lap Shear @ 180°F (82°C), psi (MPa) | 1089 (7.5) | 1090 (7.5) | 1320 (9.1) |
| Failure Mode | C | C | C |
| Lap Shear @ -30°F (-34°C), psi (MPa) | 3380 (23.3) | 2627 (18.1) | 4236 (29.2) |
| Failure Mode | TLC | TLC | TLC |
| Lap Shear after 14 days @ 95°F (38°C), 95% RH, psi (MPa) | 2752 (19.0) | 2016 (13.9) | 2826 (19.5) |
| Failure Mode | C | C | C |
| Lap Shear after 500 hours Salt Spray Exposure, psi (MPa) ASTM B117 | 2022 (13.9) | 1780 (12.3) | 1807 (12.5) |
| Failure Mode | C/A | C/A | C/A |
| T-Peel @ Room Temperature, pli (N/cm) | 26 (46) | 47 (82) | 49 (86) |
| Failure Mode | C | C | C |

| Substrate | Surface Treatment |
|---|--------------------------|
| Aluminum, 0.032" thick 6061T6 | IPA Wipe |
| Electrogalvanized Steel (EZG), 0.032" thick | IPA Wipe |
| Cold Rolled Steel (CRS), 0.032" thick | IPA Wipe |

| Bonded Parameters | Bond Area | Film Thickness | Cure | Mix Ratio |
|-------------------------------|------------------|-----------------------|-------------|------------------|
| Metal Lap Shears (ASTM D1002) | 1.0"x0.5" | 0.010" | 24 hr @ RT | 10:1 by Volume |
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| Failure Mode Definition | Abbreviation |
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| Adhesive Failure | A |
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OD DS4302 02/20 Rev.4



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