



product  
information

**3200 SERIES**  
ACRYLIC URETHANE  
AIR DRY ENAMEL

**Cardinal's 3200 series** is a single component water reducible polyurethane modified acrylic coating. This product contains less than 1 pound, of VOC per gallon, and will satisfy the strict requirements of national and regional air quality regulations. The 3200 series is specifically designed for the electronic business machine and enclosure market. It can be applied as a low gloss smooth or textured finish on molded plastics, pretreated steel and aluminum substrates. The 3200 series provides a durable finish while minimizing health and safety risks commonly associated with two component solvent based polyurethane products. This coating is classified as "exact match finish: industrial" by CARB (California Air resources Board) and meets current limits for this category as well as the final limits that took effect on Dec. 31, 1999.

**Typical Uses:**

- Plastic Components
- Electronic Components
- Consumer Electronics
- Business Machines
- Touch up

**Benefits:**

- Low VOC and HAPS free coating.
- Free of heavy metals.
- Gloss stability
- Single component, no mixing.
- RoHS / WEEE compliant

**Cured Film Properties:**

Testing conducted on 3203-10 semi-gloss white at 1.5 mils DFT (Dry Film Thickness) over 20 gauge Bonderite 1000® test panel, force dried 30 min. at 180°F then air dried for 14 days.

TEST	METHOD	PARAMETERS	RESULT
Impact:	ASTM D2794	Direct Reverse	160 in. lbs. 160 in. lbs.
Flexibility:	ASTM D1737	1/8" mandrel	No cracking
Hardness:	ASTM D3363	Pencil	F - H
Abrasion:	ASTM D4060	CS-17 wheels, 1kg, 1000 cycles	Less than 75 mg loss
Salt Spray:	ASTM B117	100 hrs. 95° 5% salt solution	No blistering; less than 1/8 inch creepage from scribe
Chemical & Stain Resistance:	ASTM D1308 30 min. spot	A – 0.1N HCl, coffee, 30 wt. oil, Ivory® Liquid dish soap, tap water, gasoline, vegetable oil, Cascade®, WD-40®, ammonia, Liquid Paper®, Clorox®.	
Air dried for 21 days before tests.	A: No effect B: Slight dulling C: Moderate effect D: Severe deterioration	B – 409 Cleaner®, MEK, Fantastic®, butyl cellosolve, lemon juice, isopropyl alcohol. C – Butyl carbitol. D – Mustard, 70% IPA, Anti-static cleaner.	

**Surface Preparation and Priming:** The most important steps in a successful coating process are cleaning, pretreatment and priming. The following is a brief outline of some basics for unpainted substrates. It is not intended to be all-inclusive. The proper preparation of various substrates will require specific attention.

**Cleaning the substrate:** All surfaces to be coated must be free of dirt, grease, oil, oxidation, mill scale, and all other contaminants. The surface must be thoroughly dry before painting.

FOR INDUSTRIAL USE ONLY  
NOT FOR RESIDENTIAL USE

**Type:** Urethane Acrylic Polymer

**Components:** One

**Colors:** Full color range and metallics.

**Gloss:** High, Semi and flat

**Coverage:** At 1 mil DFT

550 ft<sup>2</sup>/gal at 100% transfer efficiency (TE)

355 ft<sup>2</sup>/gal at 65% transfer efficiency

Calculation: 1604 ft<sup>2</sup>/gal x % volume solids x TE ÷ DFT

**VOC :** (as supplied)

159 grams/liter (1.33 lbs/gal) less water.

62 grams/liter (0.51 lbs/gal) including water.

**Volume Solids:** 35% - 37%

**Flash Point:** >212° F TCC

**SHELF LIFE:** 6 months from date of manufacture in factory sealed container.

**Application:** See surface preparation and priming section. This material is designed for spray application. Brushing or rolling are not recommended.

**Texturing:** Apply smooth base coat and air dry 10-15 min. Apply texture by lowering air pressure, to spatter paint on the base coat. The lower the air pressure, the larger the texture.

**Thinning:** Ready for spray. Mix well. If thinning is necessary, use water, 1% - 5% by volume. Avoid over thinning.

**Viscosity:** 50 - 60 seconds, #3 Zahn cup at 78° F.

**Recommended DFT:** 1.0 – 2.0 mils

**Cure:** Air Dry

Force Dry

Tack free 15 min.

Flash off 10 – 15 min.

Dry to handle 2 hrs.

Bake cycles:

Full cure 7 – 10 days

30 min. at 140°F

20 min. at 160°F

10 min. at 180°F

(At 1.5 mils dry film thickness, 78° F, 50% RH)

**Application Equipment:** Electrostatic or high volume low pressure (HVLP) spray guns.

CAUTION: Electrostatic equipment requires proper isolation for waterborne use.

Fluid and air hoses should be a minimum of 3/8" for fluid and 5/16" for air.

**EQUIPMENT CLEAN-UP:** Warm water. Water should always be used for primary cleaning. If something stronger is needed exempt solvents can be used for secondary cleaning, air quality regulations, in your area may have limited the allowable emissions from cleaning operations.

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**Steel** — A phosphate chemical conversion coating is highly recommended. When this is not possible, a vinyl acid wash pretreatment primer, Cardinal's 4860 series is recommended.

**Aluminum** — A chemical conversion coating is highly recommended. When this is not possible, Cardinal's 4860 pretreatment primer is recommended.

**Plastic** — All mold release agents should be completely removed. Cardinal's 3600 series low cure enamel is compatible with a variety of plastics, however, since there are numerous formulations of plastic, a trial sample should be painted and tested prior to production.

For more information on your application, contact Cardinal.

**Primer Selection:**

PRODUCT NO.	DESCRIPTION	FUNCTION
3660	W/B Primer Surfacer	Some filling properties
3760	W/B Plastic Primer	Adhesion and some filling for plastic.
3860	W/B Anti-corrosion	Corrosion inhibiting

**Related Products:**

PRODUCT NO.	DESCRIPTION / FUNCTION
SB-11	Slow waterbase co-solvent
SB-09	Medium waterbase co-solvent, coalescing agent
AMON	Raises pH of paint
A-60	Flash rust additive

**Trouble Shooting:**

PROBLEM	CAUSE	REMEDY
Too thin / low viscosity	Over reduced. pH too low (evaporation from open container).	Contact Cardinal representative
Dry spray	High atmospheric temperature. Over atomization Gun to part distance	Add SB-30 or SB-11 at rate of 1 oz./gal. Decrease air pressure. Decrease gun to part distance
Flash rusting	Cold and/or humid weather. Cold substrate. Over reduced.	Warm paint and parts to 70° - 80°F. SB-09 at 1 oz./gal may help.
Mudcracking	Over reduced Film build too high.	SB-09 at 1 oz./gal may help. Lower film build.
Craters	Contamination of substrate, application equipment or environment.	Find and eliminate source of contamination.
Poor adhesion	Improper surface preparation. Film too thin to coalesce properly.	See surface preparation section. Increase film build.

**Product Identification**

**3 2 0 6 - 2 6 0 8 1** (example)  
 \_\_\_\_\_ Color number  
 \_\_\_\_\_ Gloss: flat or semi-gloss - 0° to 60° gloss  
 \_\_\_\_\_ Special: eg., 2 = metallic; 3 = hammer; 4 = texture; 6 = primer; 7 = clear  
 \_\_\_\_\_ Product type

**Product Limitations:**

- AVOID FREEZING — Product contains water.
- Optimum film properties depend on force cure.
- See Cure section

**Safety:** Contains organic solvents. Use with adequate ventilation - do not breath vapors or spray mists. If component TLVs are exceeded, a NIOSH approved air supplied respirator is advised. See MSDS for TLV information. Keep from heat, sparks or open flame. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.

**First Aid:**

*Eye contact*, flush immediately with plenty of water for at least 15 minutes, seek medical attention.  
*Skin contact*, wash thoroughly with soap and water for 5 minutes.  
*If swallowed*, do not induce vomiting, seek medical attention immediately.  
*Inhalation*, remove to fresh air.

