CARBIT®
COATING SOLUTIONS

PRODUCT DATA SHEET
CARBITHANE 11 SERIES
LOW V0C - GLOSS

***CARBITHANE* 11 SERIES LOW VOC GLOSS ACRYLIC POLYURETHANE**
is an aliphatic acrylic polyurethane, two component high gloss coating. VOC compliant. It is designed for interior and exterior exposures where long term durability and high performance are required. It contains an ultraviolet (UV) inhibitor for additional protection. It is suitable as a product finish or maintenance coating for metal, plastic, wood, and other related surfaces. It is recommended for metal fabrication and equipment that require long coating service. Typical applications are gear housings, transportation equipment, (including rail, truck and barge) pipeliners, chemical plants, water towers, offshore platforms, outdoor signage and material handling equipment.

Product Features

Durability:
1. High impact, mar, and abrasion resistance.
2. Extremely hard, yet flexible film.
3. Excellent adhesion over many substrates.

Resistance to Severe Exposures:
1. Excellent gloss retention and UV resistance.
2. Excellent chemical and corrosion resistance.
3. Excellent humidity and water resistance.
4. Excellent resistance to lubricating and cutting oils.

Handling Advantages:
1. Quick dry. Handles in minutes.
2. Air dry or force dry, cures to baked-on hardness.
3. No induction time after catalyst added.
4. 505-16 Polyurethane Accelerator may be added to decrease dry time.

Appearance and Color:
1. High gloss finish in an unlimited number of colors.
2. *CARBITHANE* Color Card has 203 standard colors.
3. Full range of OEM, Munsell, RAL, and designer colors with Carbithane Intermix System.

Safety and VOC:
1. *CARBITHANE* 11 Series is free of lead and heavy metals.
2. *CARBITHANE* 11 Series, catalyzed VOC<2.9 lbs/gal, 349 g/l

Application

Add catalyst to *CARBITHANE* 11 Series and stir thoroughly. Add reducer as recommended. Apply when the air, product and surface temperatures are above 50°F (10°C) and at least 5°F (3°C) above the dew point.
Spray: Apply by conventional, HVLP, airless, air-assisted airless, and electrostatic means.
Conventional Spray: Binks 95 Gun, 66x66SK. air: 35 psi. fp: 10-15 psi.
HVLP Spray: Binks Mach 1, 93 Fluid Nozzle (.055) air: 55 psi (70:10-15 psi)
Air-Assisted Airless: Kremlin AIRMIX. .015 tip. air: 25-30 psi. fp: 400 psi.
Airless Spray: Tip: .011"-.013". Tip Pressure: 1200-1500 psi.
Electrostatic Spray: Graco Pro 3500. 177-033 Air Cap .055 fluid nozzle. air: 45-50 psi. fp: 10-15 psi. *CARBITHANE* 11 Series as applied measures .22 ±.05 megaohms.

Mixing

Spray: Mix three parts *CARBITHANE* 11 Series Polyurethane to one part *CARBITHANE* 11C2 Polyurethane Catalyst. Add .5 part (approx 10%) T76 Low VOC Reducer or more as required. May be used immediately after mixing. No induction time is required.
Brush or Roll: Mix 3 parts *CARBITHANE* 11 Series with one part of 11C2 Polyurethane Catalyst. No reducer is required.

Color and Hiding:
Apply at the rate of 1.25-1.5 mils DFT for accurate color matching over most substrates. Darker surfaces and more transparent colors may require additional dry film thicknesses for color accuracy.

Preparation (Metal)

Surface must be free of dust, dirt, grease, oil, rust, mill scale, soap residue, and other surface contaminants. Remove surface contaminants by mechanical and/or chemical means. Steam cleaning, high pressure hot water detergent cleaning, and
phosphate stage cleaning and surface preparation are common methods. Water-based detergent cleaners must be thoroughly rinsed to remove soap residue. SSPC-SP1 Solvent Cleaning, if used should utilize a solvent cleaner that meets the requirements of OSHA 29 CFR 1910.107 and has a flash point above 100°F (38°C). T-43 Solvent Cleaner is recommended. If corrosion is present, remove in accordance with SSPC-SP6 Commercial Blast Cleaning. For additional corrosion protection, use a primer listed below and follow its preparation guidelines.

Preparation (Plastic)

Airborne contaminants and film residue on most surfaces can be removed with a solution of 50% water, 50% Isopropyl alcohol. Some adhesives may require special surface cleaners or removers. Follow substrate manufacturer's recommendation for surface preparation.

Cure Schedule: Spray

Normal temperature: 77°F (25°C), 50% R.H.
11W1 Gloss White catalyzed with 11C2 Polyurethane Catalyst reduced with T-76 Low VOC Reducer.
Mixing ratio: 3:1:0.5, 1.2 mils DFT.
Set to touch: 20 minutes.
To handle: 1 hr.
Recoat: When tack free. Abrade surface after seven days.
To pack: Overnight.
Force dry: 20 min. at 180°F; 30 minutes at 150°. Allow 10 minutes for solvent flash off.

Accelerated Cure
2 oz. of 505-16 accelerator to catalyzed gallon. Drying rates will increase with lower ambient temperature, increased humidity, lower part temperature, lower coating temperature, increased part metal mass, increased line speed of force dry oven and increased film thickness.

Primers

Iron and Steel: <3.5 lbs./gal VOC
3E19 Gray Universal Primer
3R25 Red Universal Primer
3W2 White Universal Primer
Primers on ferrous metal surfaces increase corrosion protection of the substrate but are not required on many DTM (direct-to-metal) applications. Use 22R1 Red Low VOC Epoxy Primer for highly corrosive conditions.

Galvanized Steel, Aluminum: 305A1 Waterborne Wash Primer 5G1 Green Wash Primer with 5C1 Catalyst.

Plastic and Wood: Consult Carbit Sales Department for recommendations.

Clean up: Clean equipment after use with T-76 Low VOC Epoxy Reducer, T83 Lacquer Thinner or T-8 Acetone.

Typical Properties

11W1 Gloss White as packaged, and catalyzed 3:1 with 11C2 at normal temperatures: 77°F (25°C), 50% R.H.

Product Number/Color:	11 Series/ Color Chart, and as specified.
Gloss (60°Head):	90 units, minimum.
Solids by Weight:	58% catalyzed.
Solids by Volume:	42% catalyzed.
Wt/Gal:	11.7 lbs.packaged
VOC:	2.9 lbs/gal. catalyzed.
Viscosity #3 Zahn cup:	18 sec. catalyzed and reduced (3:1:0.5)
Pot Life:	8 hours catalyzed and reduced.

Pot Life Accelerated: (Time to double initial viscosity.)	4 hours, 2 oz. 505-16 accelerator per gal.
Flash Point - Seta:	40°F packaged.
Shelf Life:	1 year packaged, room temperature.
Packaging:	5 gal, 1gal
Theo. Spreading rate at 1 mil DFT:	541 sq. ft/gal, catalyzed and reduced 3:1:0.5.
Recommended Film Thickness Normal Exposure:	1.2-1.5 mils dry. 3.7-4.5 mills wet.
Recommended Spreading Rate:	433-356 sq.ft/gal.
Recommended Film Thickness Extreme Exposure:	2.5-3.0 mils dry. 6.0-7.1 mils wet
Recommended: Spreading Rate:	267-226 sq.ft/gal When computing

working coverage allow for application losses, irregularsurfaces, etc.

Performance Tests

The following tests were conducted on Bonderite 1000 panels spray coated with 11W1 White Gloss Polyurethane 1.25-1.5mils DFT, and aged for nine days at 77°F (25°C) at 50% RH. Tests meeting ASTM Standards are noted.

1. **Salt Spray.** ASTM B117, 2000 hrs. unscribed area. No corrosion. With a prime coat of 3E19 Universal Gray Primer, 1.5mils DFT. 2000 hrs; less than 1/16" creepage from scribe.

2. **100% Relative Humidity.** ASTM D2247. 1000 hrs. No blisters.

3. **Ultraviolet Accelerated Weathering.** ASTM G53, UVB-340nm lamps. Test cycle: 8 hrs. UV/4hrs. CON 2500 hrs, 85% of original gloss retained. UVB-313nm lamps.

Test cycle: same, 2500 hrs, 74% of original gloss remaining. Color change < 1.0 Δ E.

4. **Florida Environment Exposure-45° Facing South.**
3 yrs exposure: 90% of original gloss.

5. **Abrasion Resistance-Taber Abraser.** ASTM D4060. CS-17 wheel, 1000g load: 1000 cycles < 90mg loss.

6. **Impact Resistance.** ASTM 2794. Direct impact: 160 inch-pounds. Indirect impact: 120 inch-pounds.

7. **Pencil Hardness.** ASTM D3363: >2H

8. **Cross-hatch Tape Adhesion.** ASTM D3359 Method B, 5B (100% adhesion).

9. **Flexibility.** ASTM D522: 1/8" conical mandrel bend.

10. **Solvent Resistance.** No film degradation in 100 double rubs with the following solvents: Lacquer Thinner, Acetone, Xylene, MEK, Gasoline.

11. **Acid and Alkali Resistance.** Spot test method under watch glass-24 hrs duration. The following solutions had no effect: 5% Hydrochloric Acid, 5% Sulphuric Acid, 5% Ammonium Hydroxide.

12. **Oil and Stain Resistance.** ASTM D1308, Panels immersed in lubricating oil for 72 hrs at 100°C-105°C and 200 hrs at room temperature: No effect. Panel spot tested, covered watch glass for 24 hrs with food coloring. Wiped clean with soap and water. No staining.

13. **Water Immersion.** Panels aged for thirty days at room temperature. 1000 hours. No effect.

Product Limitations

1. *CARBITHANE* Acrylic Polyurethane 11 Series MUST BE CATALYZED at the recommended mixing ratio. For Spray: 3:1 with 11C2 Polyurethane Catalyst. Do not vary ratios as product performance could be affected. Slight over or under catalyzation will not seriously affect performance.

2. Heat and accelerators shorten pot life. If used, plural component spraying systems are recommended. Do not pump catalyzed material through recirculating systems since this will result in additional heat build-up and potential hardening in the fluid lines.

3. Dip, flo-coat, tumbling, and other applications that require long material open times are not recommended.

4. Protect *CARBITHANE* Polyurethane catalysts and reducers from moisture. Gaseous reaction may occur. Store indoors.

5. Do not mix *CARBITHANE* 11 Series products with any other polyurethane products, catalysts, additives or reducers. Lacquer thinner and alcohol containing solvent blends are not to be used for reduction.

6. Plastic applications should be tested on individual substrates to ensure product performance prior to use. When coating plastic surfaces, the cure temperature of the coating must not exceed the heat distortion temperature of the plastic.

7. Do not package *CARBITHANE* 11 Series coated parts in air-tight plastic bags until the parts are fully cured.

8. CARBITHANE 11 Series may form small blisters if immersed in water before fully cured.

9. Some of *CARBITHANE* 11 Series brighter reds, yellows, and oranges may require a primer for improved hiding.

Toxicity

CARBITHANE 11 Series Polyurethanes are free of lead and heavy metals.
Note: To the best of our knowledge, the technical data contained in this data sheet are accurate at the date of issuance and are subject to change without prior notice. No warranty is expressed or implied since customer methods of application are unknown to us and beyond our control.

Safety

This product must be mixed with a *CARBITHANE* catalyst containing isocyanates. DO NOT BREATHE VAPOR OR SPRAY MIST. INDIVIDUALS WITH LUNG OR BREATHING PROBLEMS OR PRIOR REACTION TO ISOCYANATES MUST NOT BE EXPOSED TO VAPOR OR SPRAY MIST. If overspray is present, wear an air-purifying, positive pressure respirator (NIOSH/MSHA) approved for isocyanate mist environments. If unavailable, wear a combination organic vapor and particulate respirator (NIOSH/MSHA) approved. Avoid contact with eyes, skin, and clothing. Wear appropriate eye and skin protection. VAPOR AND LIQUID ARE FLAMMABLE. VAPOR IS HARMFUL AND MAY AFFECT THE BRAIN AND CENTRAL NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE, OR NAUSEA. Keep away from heat, sparks, and flame. Use with adequate ventilation.

First Aid: Eye Contact: Flush with water for 15 minutes; get medical attention. Skin Contact: Wash with soap and water. If Swallowed: Get medical attention immediately. If Inhaled: If affected, remove to fresh air. Restore breathing. Get medical attention immediately.
Delayed effects of long term exposure: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Overexposure may result in upper respiratory tract irritation with central nervous system (CNS) depression. Overexposure may damage the lungs, liver, kidneys, and cause dermatitis of the skin.
Spill and Waste: Contain spill and remove with inert absorbent. Dispose of in accordance with local, state, and federal regulations. Consult Product MSDS for additional safety and health information.