CARBIT®
COATING SOLUTIONS

PRODUCT DATA SHEET
CARBITHANE 12 SERIES
GLOSS

CARBITHANE 12 SERIES GLOSS ACRYLIC POLYURETHANE is an aliphatic acrylic polyurethane, two component high gloss coating. 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. Applications include diesel locomotives, trucks, trailers, bridges, pipelines, chemical plants, water towers, offshore platforms, windows and doors, outdoor signs, and playground 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. Handle 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.
5. May be used for brushing with CARBITHANE 12C1 Polyurethane Brush and Texture Catalyst.

Appearance and Color:
1. High initial gloss can be lowered with 505-17 Flattening Paste.
2. CARBITHANE Color Card has 203 standard colors.
3. Full range of designer and custom colors with CARBITHANE Intermix System.

Safety:
1. CARBITHANE 12 Series is free of lead and heavy metals.
2. CARBITHANE 12CO and 12C1 Catalysts do not contain Toluene Diisocyanate (TDI).

Application
Add catalyst to CARBITHANE 12 Series and stir thoroughly. Add reducer as required. 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 (high volume, low pressure) airless, air-assisted airless, and electrostatic means.

Conventional Spray: Binks 95 Gun, 66x66SK. air: 35 psi. fp: 10-15 psi. HVLP Spray: DeVilbiss 531-46-FF(.055) needle. air: 55 psi. fp: 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 needle. air: 45-50 psi. fp: 10-15 psi. CARBITHANE 12 Series as applied measures .70 ±.05 megaohms.

Mixing
Spray: Reduce three parts CARBITHANE 12 Series Polyurethane to one part CARBITHANE 12 CO Polyurethane Catalyst. Add one half part of T64 Polyurethane Fast Reducer, or more as required. Monitor viscosity to avoid over thinning. May be used immediately after mixing. No induction time is required.
Brush or Roll: Mix 6:1 with 12C1 Brushing Catalyst. Add 1 oz. CARBITHANE 505-38 Polyurethane Debubbler per gallon and T36 Polyurethane Slow Reducer, as required.

Gloss Adjustments
The gloss of CARBITHANE 12 Series can be lowered by intermixing CARBITHANE 505-17 Flattening Paste with CARBITHANE 12 Series Polyurethane after it has been catalyzed and before reduction. The following table lists what gloss range can be expected when different amounts of 505-17 Flattening Paste are added to a catalyzed gallon of CARBITHANE 12 Series Polyurethane.

Qty of Flattening Paste	Gloss at 60°
1 pint	40-60 Units
1 quart	15-30 Units
2 quarts	2-5 Units

Apply at the rate of 1.25-1.5 mils DFT.
Film thicknesses above this range will increase gloss. Film thicknesses below this range will lower gloss. Wait at least 24 hours before measuring final gloss.

Clears
Gloss can be changed by top coating with 1 of 5 CARBITHANE Clears. Allow 4 hours dry minimum before top coating for correct gloss.

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.
12W1 Gloss White catalyzed with 12CO Polyurethane Catalyst reduced with T-64 Polyurethane Fast Reducer.
Mixing ratio: 3:1:0.5, 1.2 mils DFT.
Set to touch: 10 minutes.
To handle: 105 minutes.
Recoat: When tack free. Abrade surface after seven days.
To pack: Overnight.
Force dry: 20 min. at 180°F; 30 minutes at 150°F. 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 Oxide Universal Primer
3W2 White Universal Primer
> 3.5 lbs/gal VOC
23R2 Red Oxide Epoxy Primer
3E11 Gray Universal Primer
3R17 Red Univeral Primer
Epoxy Primer: 23R2 Red Oxide Epoxy Primer with V-196 Catalyst.

Primers on ferrous metal surfaces increase corrosion protection of the substrate but are not required on many DTM (direct-to-metal) applications. Use 23R2 Epoxy Primer for highly corrosive conditions.
Galvanized Steel, Aluminum: 5G1 Green Wash Primer with 5C1 Catalyst.
Plastic and Wood: Consult Carbit Sales Department for recommendations.

Clean up: Clean equipment after use with T-64 Polyurethane Fast Reducer.

Typical Properties

12W1 Gloss White as packaged, and catalyzed and reduced at 3:1:0.5 at normal temperatures. Product Number/Color: 12 Series/ Color Chart, and as specified.

Gloss (60°)Head):	90 units, minimum.
Solids by Weight:	49.4% catalyzed and reduced.
Solids by Volume:	34.3% catalyzed and reduced.
Wt/Gal:	10.91 lbs.packaged
VOC:	4.6 lbs/gal. catalyzed and reduced.
Viscosity #2 Zahn cup:	35 sec ± 2 sec. catalyzed and reduced.
Pot Life:	8 hours catalyzed and reduced.
Pot Life Accelerated:	4 hours, 2 oz. 505-16 accelerator per gal.
Flash Point - Seta:	45°F packaged.
Shelf Life:	1 year packaged, room temperature.
Packaging:	55 gal, 5 gal, 1gal
Theo. Spreading rate at 1 mil DFT:	743 sq.ft/gal, packaged. 612 sq.ft/gal, catalyzed and reduced.
Recommended Film Thickness:	1.25-1.5 mils dry, 3.6-4.0 mils wet.
Recommended Spreading Rate:	408-489 sq.ft/gal. When computing working coverage, allow for application losses, irregular surfaces, etc.

Performance Tests

The following tests were conducted on Bonderite 1000 panels spray coated with 12W1 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 DE.

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: 160 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. Panels aged at room temperature for two weeks. No film degradation in 200 double rubs with the following solvents: Lacquer Thinner, Acetone, Xylene, MEK, Gasoline.

11. Acid and Alkali Resistance. Panels aged at room temperature for two weeks. Spot test method under watch glass-24 hrs duration. The following solutions had no effect: 5% Hydrochloric Acid, 5% Nitric Acid, 5% Sulphuric Acid, 5% Acetic 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 12 Series MUST BE CATALYZED at recommended mixing ratios for each catalyst. For Spray: 3:1 with 12CO. For Brush: 6:1 with 12C1. 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 12 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 12 Series coated parts in air-tight plastic bags until the parts are fully cured.

8. CARBITHANE 12 Series may form small blisters if immersed in water before fully cured.

9. Some of CARBITHANE 12 Series brighter reds, yellows, and oranges may require a primer for improved hiding.

Toxicity

CARBITHANE 12 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.