



HYBRID TECHNICAL SUMMARY

General Specifications

Hybrid powders provide an economical alternative to epoxies that are an excellent general purpose interior coating. Designed for decorative end service applications where exterior durability is not a requirement, hybrid chemistries will chalk and fade upon exposure to ultraviolet rays because of the epoxy component. However, the polyester component contributes to better resistance to yellowing upon overbake than typical epoxy chemistries.

Hybrid powders can be formulated to provide superior charging capabilities, first-pass transfer efficiency, and Faraday cage area penetration. Some Alesta® hybrids have food-contact utility (FDA), and have many formal recognitions from Underwriters Laboratories, Caterpillar®, and computer companies.

Typical Performance Properties

Physical performance results were measured using 24-gauge Bonderite 1000 Parcolene® 60 steel panels with 1.5-2.0 mils of a high gloss formulation. Heavier ware require longer cure times or higher temperatures. Low gloss or textured finishes may require longer cure times. Physical properties typically decrease with decreasing gloss. Since results are formulation dependent, product specific testing is recommended.

Typical Film Thickness

1.5-6.0 mils

Cure Schedules

F-cure

20 minutes at 350°F
15 minutes at 375°F
10 minutes at 400°F
8 minutes at 425°F

L-cure

20 minutes at 275°F
15 minutes at 300°F
10 minutes at 325°F
8 minutes at 350°F

Overbake Stability

A hybrid powder will withstand twice the recommended cure time without discoloration.

Adhesion (ASTM D-3359, Method B)

Using pressure sensitive tape, no coating is lifted or removed between 1/8" cross-hatch scribes. (Rating = 5B).

Pencil Hardness (ASTM D-3363)

Using Eagle Turquoise pencil leads, surface hardness ranges from H to 2H.

Impact Resistance (Modified ASTM D-2794)

Using a falling weight impact tester, the film surface withstands up to 160 inch lbs. of direct and reverse impact.

Flexibility, Mandrel (Modified ASTM D-522)

The film surface withstands a 180° bend over a 1/8" diameter with no loss of adhesion or surface cracking.

Abrasion Resistance (Modified ASTM D-4060)

Coating weight loss after 1,000 cycles of Taber abraser equipped with CS-10 wheels loaded to 1 kg per wheel is approximately 40-60 mg.



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Corrosion and Chemical Performance Properties

Salt Spray Resistance (ASTM B-117)

Scribed Bonderite 1000 steel panels in a 5% salt fog at 95°F and 100% relative humidity, exhibit no undercutting, rusting, or blistering of the film after 500 hours of exposure. After 1,000 hours, there is less than 1/16" undercutting. No effect is shown on Alodine 1200 aluminum panels.

Chemical and Solvent Resistance

After ambient temperature immersion in the listed solvent or reagent, the following results were reported for hybrid formulations. *Verification of resistance properties should be made for each chemical proposed for use with a specific coating, as results can vary greatly depending on formulation. Specific test results or additional testing can be acquired upon request.

SOLUTION	1 MONTH	3 MONTHS	6 MONTHS	12 MONTHS
0.1% Chlorine	No Effect	No Effect	No Effect	No Effect
Anti-Freeze (50% Ethylene Glycol)	No Effect	No Effect	No Effect	No Effect
87 Octane Unleaded Gasoline	No Effect	Dulls, Softens	Dulls, Softens	Dulls, Softens
15% Hydrochloric Acid	No Effect	No Effect	*No Effect Dulls Textures	*No Effect Discolors, Dulls Textures
40% Hydrochloric Acid	No Effect	*No Effect Discolors, Dulls Textures	*No Effect Discolors, Dulls Textures	*No Effect Discolors, Dulls Textures
15% Sulfuric Acid	*No Effect Oxidizes Metallics	*No Effect Oxidizes Metallics	*No Effect Test Terminated on Metallics	No Effect
40% Sulfuric Acid	*No Effect Oxidizes Metallics	*No Effect Oxidizes Metallics	*No Effect Test Terminated on Metallics	No Effect
Isopropyl Alcohol	No Effect	Dulls, Softens	Dulls, Softens	Dulls, Softens
Acetone	Dulls, Softens - 1 hour		Test Terminated - 1 hour	
Methyl Ethyl Ketone	Dulls, Softens - 1 hour		Test Terminated - 1 hour	
Brake Fluid D.O.T. Type 3	Dulls, Softens - 1 hour		Test Terminated - 1 week to 1 month	
Dow Oven Cleaner	Dulls, Swells		Test Terminated - 1 to 3 months	

**Since hybrid formulations may contain ingredients which enhance or detract from chemical resistance, performance has been summarized in general terms for this chemistry. This chart is intended as a general guide for chemical resistance.*

Axalta Coating Systems
Powder Coatings North America
9800 Genard Rd.
Houston, TX 77041
Ph. 1.800.247.3886

Axalta.us/powder

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