

LAB-GRADE CHEMICAL RESISTANCE TEST

Evaluation

After 24-hour exposure, exposed areas were washed with water, then a detergent solution and finally with isopropyl alcohol. Materials were then rinsed with distilled water and dried with a cloth. Samples are numerically rated as follows:

1. **No Effect** - No detectable change in the material surface.
2. **Good** - Slight detectable change in color or gloss but no change in function or life of the surface.
3. **Fair** - Slight surface etching or severer staining. Clearly discernible change in color or gloss but no significant impairment of surface life or function.
4. **Poor** - Pitting, cratering or erosion of the surface. Obvious and significant deterioration. Objectionable change in appearance due to dis-coloration.

DURCON EPOXY RESIN

Chemical Tested	Method	Black Onyx
Amyl Acetone	A	0
Ethyl Acetate	A	0
Acetic Acid 98%	B	0
Acetone	A	1
Acid Dichromate 5%	B	0
Butyl Alcohol	A	0
Ethyl Alcohol	A	0
Methyl Alcohol	A	1
Ammonium Hydroxide, 28%	B	0
Benzene	A	1
Carbon Tetrachloride	A	0
Chloroform	A	1
Chromic Acid 60%	B	2
Cresol	A	0
Dichloro Acetic Acid	A	0
Dimethylformamide	A	0
Dioxane	A	0
Ethyl Ether	A	0
Formaldehyde 37%	A	0
Formic Acid 90%	B	0
Furfural	A	1
Gasoline	A	0
Hydrochloric Acid 37%	B	0
Hydrofluoric Acid 48%	B	2
Hydrogen Peroxide 28%	B	0
Tincture of Iodine	B	0
Methyl Ethyl Ketone	A	0
Methylene Chloride	A	0
Mono Chlorobenzene	A	0
Napthalene	A	0
Nitric Acid 20%	B	0
Nitric Acid 30%	B	1
Nitric Acid 70%	B	1
Phenol 90%	A	0
Phosphoric Acid 85%	B	1
Silver Nitrate, Saturated	B	0
Sodium Hydroxide 10%	B	1
Sodium Hydroxide 20%	B	1
Sodium Hydroxide 40%	B	1
Sodium Hydroxide Flake	B	1
Sodium Sulfide, Saturated	B	2
Sulfuric Acid 25%	B	1
Sulfuric Acid 85%	B	2
Sulfuric Acid 96%	B	3
Sulfuric Acid 85%, and Nitric Acid 70%, equal parts	B	3
Toluene	A	1
Trichlorethylene	A	0
Xylene	A	0
Zinc Chloride, Saturated	B	0

CHEMICAL RESISTANT SPC BY DURCON®

Chemical Tested	Method	Carbon Black
Amyl Acetone	A	0
Ethyl Acetate	A	0
Acetic Acid 98%	B	0
Acetone	A	0
Acid Dichromate 5%	B	1
Butyl Alcohol	A	0
Ethyl Alcohol	A	0
Methyl Alcohol	A	0
Ammonium Hydroxide, 28%	B	1
Benzene	A	0
Carbon Tetrachloride	A	0
Chloroform	A	0
Chromic Acid 60%	B	1
Cresol	A	1
Dichloro Acetic Acid	A	1
Dimethylformamide	A	0
Dioxane	A	0
Ethyl Ether	A	0
Formaldehyde 37%	A	0
Formic Acid 90%	B	1
Furfural	A	0
Gasoline	A	0
Hydrochloric Acid 37%	B	0
Hydrofluoric Acid 48%	B	1
Hydrogen Peroxide 28%	B	0
Tincture of Iodine	B	1
Methyl Ethyl Ketone	A	1
Methylene Chloride	A	0
Mono Chlorobenzene	A	1
Napthalene	A	0
Nitric Acid 20%	B	0
Nitric Acid 30%	B	0
Nitric Acid 70%	B	0
Phenol 90%	A	1
Phosphoric Acid 85%	B	0
Silver Nitrate, Saturated	B	0
Sodium Hydroxide 10%	B	0
Sodium Hydroxide 20%	B	0
Sodium Hydroxide 40%	B	0
Sodium Hydroxide Flake	B	0
Sodium Sulfide, Saturated	B	0
Sulfuric Acid 25%	B	0
Sulfuric Acid 85%	B	0
Sulfuric Acid 96%	B	0
Sulfuric Acid 85%, and Nitric Acid 70%, equal parts	B	0
Toluene	A	0
Trichlorethylene	A	0
Xylene	A	0
Zinc Chloride, Saturated	B	0

Flame Test Results

ASTM E-84 Flame Spread and Smoke Development Fire Testing

This test characterizes the relative rate at which flame will spread as the subject material burns. This test method is often referred to as the "Tunnel Test" because the test chamber is a nominal 25-foot-long by 20-inch wide chamber.

The Life Safety Code and International Building Code limit finishes for interior walls and ceilings to materials in three classes, with A being the lowest flame spread and C being the highest:

Class	Flame Spread Index
A/1	0-25
B/2	26-75
C/3	76-200

Durcon Epoxy Resin (Self Extinguishing)

- Class A/1 Fire Rating
- Flame Spread: 0-25
- Smoke Development: 0-25

Chemical Resistant SPC by Durcon

- Class B/2 Fire Rating
- Flame Spread: 26-75
- Smoke Development: 0-450

Physical Test Results

Durcon Lab-grade Epoxy Resin

Test	ASTM	Imperial	Metric
Rockwell Hardness	D785-08	109 [M scale]	109 [M scale]
Linear Thermal Expansion	D696-03*	1.37 x 10 ⁻⁵ [in/in °F]	2.46 x 10 ⁻⁵ [mm/mm °C]
Burning Characteristics Sample as Received	D3801-00*	30 Seconds Max. Burning Time	30 Seconds Max. Burning Time
Burning Characteristics Sample Heat Aged	D3801-00*	41 Seconds Max. Burning Time	41 Seconds Max. Burning Time
Water Absorption	D570-98*	0.008 [% after 24hrs]	0.008 [% after 24hrs]
Density	D792-00	133 [lb/ft ³]	2.13 [g/cm ³]
Compressive Strength	D695-02	33.5 [kpsi]	231 [MPa]
Heat Distortion Temperature	D648-07	380 [°F]	193 [°C]
Fire Resistance - Smoke Developed Index	E84-06*	8.71 [in]	221.2 [mm]
Flexural Strength	D790-07	14.9 [kpsi]	103 [MPa]

SPC PHYSICAL TEST RESULTS

EN Rating Scale

- Rating 5** No visible change
- Rating 4** Slight change of gloss and/or color, only visible at certain viewing angles
- Rating 3** Moderate change of gloss and/or color
- Rating 2** Marked change of gloss and/or color
- Rating 1** Blistering and/or delamination

Chemical Resistant SPC

Test	Test Method	Unit		Chemical Resistant SPC
Resistance to Surface Wear	EN 438-2:10	Revolutions (min)	Initial Point/Wear Value	≤ 350/≥ 500
Resistance to Impact	EN 438-2:21	Indentation Diameter (mm)		0.4
		Cracks or Scoring		No
Resistance to Scratch	EN 438-2:25	Rating (Based on Load)		5
Resistance to Dry Heat (160°C/320°F)	EN 438-2:16	Appearance	Rating (min)	5
Resistance to Wet Heat (100°C/212°F)	EN 12721	Appearance	Rating (min)	5
Resistance to Immersion in Boiling Water	EN 438-2:12	Mass Increase (%max)	t ≥ 6mm	0.4
		Thickness Increase (%max)	t ≥ 6mm	1.9
		Appearance	Rating (min)	5
Dimensional Stability in Elevated Temperature	EN 438-2:17	Percentage	Longitudinal (parallel)	0.05
			Transversial (perpendicular)	0.05
Resistance to Staining	EN 438-2:26	Appearance Rating (min)	Acetone	5
			NaOH	5
			Hydrogen Peroxide (H ₂ O ₂ 3%)	5
Resistance to Color Change	ASTM G53/EN 438-2:27	Rating (Grey Wool Scale)		5
		Rating (Blue Wool Scale)		> 6
Resistance to Water Vapor	EN 438-2:14	Appearance	Rating (min)	≥ 4
Resistance to Cigarette Burns	EN 438-2:30	Appearance	Rating(min)	5
Resistance to Crazing	EN 438-2:24	Appearance	Grade(min)	5
Modulus of Elasticity	ASTM 638-08 EN ISO 178	MPa (psi)		≥ 1.85e6
Flexural Strength	ASTM 790-08 EN ISO 178	MPa (psi)		≥ 2.87e4
Tensile Strength	ASTM 638-08 EN ISO 527-2	MPa (psi)		≥ 2.71e4
Density	ASTM 792-08 EN ISO 1183	Density	lbs/ft ³	≥ 86.15
Porosity	N/A	Appearance		Nonporous surfaces and edges
Surface Burning Characteristics	ASTM E-84 UL 723	Classification	Class	B/2
		Flame Spread Index	FSI	0-55
		Smoke Development Index	SDI	0-450