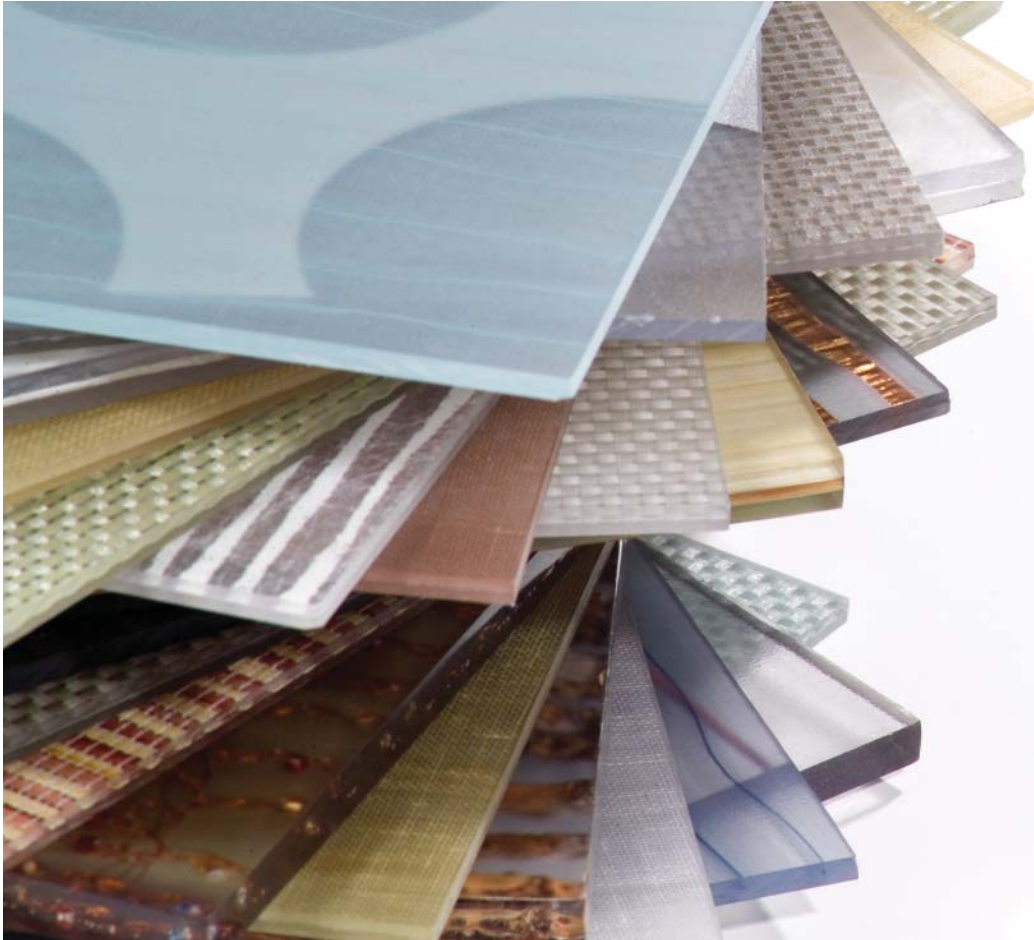
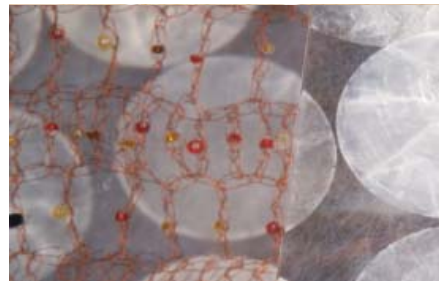
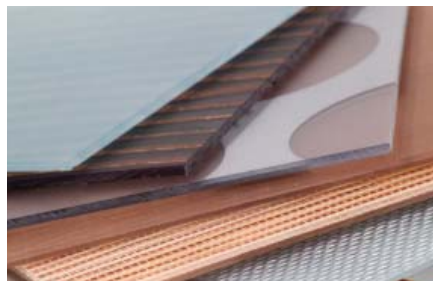


# 3form® ecoresin™

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3form® ecoresin™ is a dynamic panel system. The choices of ecoresin panels are as diverse as your imagination. By allowing you to custom-select the color, pattern, texture, interlayer and finish of your material, ecoresin transforms into the perfect medium for your architectural application.



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For more information, please visit [3-form.com](http://3-form.com) or call **800.726.0126**

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## Product Description

Ecoresin is a dynamic panel system. Options offered by ecoresin panels are as diverse as your imagination. By allowing you to custom-select the color, pattern, texture, interlayer and finish of your material, ecoresin transforms into the perfect medium for your architectural application.

An award-winning 3form product line, ecoresin has the added benefits of being made from a specially-formulated co-polyester resin which is both environmentally responsible and high-performing. ecoresin has been engineered to incorporate 40% post-industrial re-grind content, without compromising its overall physical properties. From a recycle stand-point, ecoresin is also compatible with one of the largest post-consumer recycle streams, and is GREENGUARD Indoor Air Quality Certified®.

## FEATURES AND BENEFITS

- Produced on a individual order basis, allowing for creative design and product selection (minimum order quantity – ONE sheet!)

- Post-formable into virtually any shape or size for eye-catching installations

- Enables qualification for LEED credits for building sustainability

- Very tough, allowing for easy fabrication and maximum installed durability

- Extremely versatile which enables designers to achieve full design potential

- Lightweight, half the density of glass, which makes for easier installation and reduces structural support requirements

- Excellent chemical resistance which reduces potential harm incurred by cleaning agents

- ecoresin is GREENGUARD Indoor Air Quality Certified®

## AVAILABLE COLORS

- Available in a variety of standard colors

- Custom colors also available

## TEXTURES/PATTERNS/FINISHES

The ecoresin collection includes a wide range of textures and patterns from our Organics, Moderna, Play, Texture, Color, and Graphic sub-collections.

Each item in the ecoresin collection comes standard with both a front and back finish. Additionally, 3form provides the option of substituting between 8 standard finishes. In most cases, you can even pick different front and back finishes. Finishes include:

- Liquid Silver - Smooth, silver, mirror-like finish on the backing of a panel

- Markerboard Plus - Shiny, patent leather look which allows the ecoresin surface to be used as a Dry Erase Board

- Patent - Shiny, high gloss finish

- Patina - Non-glare, slightly frosted, worn-look finish

Pixel - Micro-grid look, creates moiré when applied to both sides, cannot be used in pieces > 1/2"  
 Sandstone - Grainy texture, slightly frosted look  
 Stucco - Pebble-like finish  
 Supermatte - MicroGrain texture, frosted look  
 Topo - Larger pebble-like finish  
 Opaque White Backer  
 Vision Plus

## PANEL SIZES AND TOLERANCES

3form ecoresin panels are offered in 4' x 8' (1.2 m x 2.4 m) and 4' x 10' (1.2 m x 3 m). All dimensions and squareness (standard with custom) are subject to a 1/16" (1.5 mm) tolerance. 5' x 10' (1.5 m x 1.3 m) is also available though some restrictions apply.

Ecoresin is available in gauges from 1/16 inch to 1 inch.

## All 'Solo' Sheets

NOMINAL GAUGE	MINIMUM ALLOWANCE GAUGE	MAXIMUM ALLOWANCE GAUGE
1/16" (0.0625")	0.050	0.070
1/8" (0.125")	0.104	0.132
3/16" (0.1875")	0.168	0.192
1/4" (0.250")	0.212	0.260
3/8" (0.375")	0.324	0.384
1/2" (0.500")	0.436	0.508
3/4" (0.750")	0.648	0.768
1" (1.000")	0.850	1.060

## Non 'Solo' product sheets

NOMINAL THICKNESS	MINIMUM ALLOWANCE GAUGE	MAXIMUM ALLOWANCE GAUGE
1/8" (0.125")	0.098	0.138
3/16" (0.1875")	0.155	0.205
1/4" (0.250")	0.196	0.306
3/8" (0.375")	0.304	0.434
1/2" (0.500")	0.412	0.562
3/4" (0.750")	0.618	0.798
1" (1.000")	0.850	1.090

Sheet tolerance readings are based on an average of several on measurements along both long edges of each panel. These measurements are taken 2-3 inches (50-75 mm) from the edges of the panel.

## Specifications

### FLAMMABILITY & SMOKE TEST RESULTS – BUILDING CODE APPROVALS

ecoresin panels (a polyester-based material), have been independently tested and meet the criteria for approved interior finishes and “light transmitting” resin materials as described in the 2003 International Building Code<sup>®</sup>.

TEST	3FORM ECORESIN	RESULT
ASTM D 2843 Smoke Density	71.6%	PASS Less than 75
ASTM D 635 Flame Spread	Self extinguishing	PASS CC1
ASTM D 1929 Self-ignition Temperature	716°F	PASS Greater than 650°F
ASTM E84-03		
Flame Spread, 1/4" to 1" thickness	65	Class B: 26-75
Smoke generated	425	<450
ASTM E84-03		
Flame Spread, 1" thickness	20	Class A: 0-25
Smoke generated	250	<450
NFPA 286, 1/4" thickness	Pass	Class A

### PANEL WEIGHT

THICKNESS (INCHES)	WEIGHT FLUX (LB/FT <sup>2</sup> )
1/16" (1.5 mm)	0.4 lb/ft <sup>2</sup> (2.0 kg/m <sup>2</sup> )
1/8" (3 mm)	0.8 lb/ft <sup>2</sup> (4.0 kg/m <sup>2</sup> )
3/16" (4.5 mm)	1.2 lb/ft <sup>2</sup> (6.1 kg/m <sup>2</sup> )
1/4" (6 mm)	1.7 lb/ft <sup>2</sup> (8.1 kg/m <sup>2</sup> )
3/8" (9.5 mm)	2.5 lb/ft <sup>2</sup> (12.2 kg/m <sup>2</sup> )
1/2" (12.5 mm)	3.3 lb/ft <sup>2</sup> (16.1 kg/m <sup>2</sup> )
3/4" (19 mm)	5.0 lb/ft <sup>2</sup> (24.4 kg/m <sup>2</sup> )
1.0" (25 mm)	6.6 lb/ft <sup>2</sup> (32.2 kg/m <sup>2</sup> )

### EXPANSION/CONTRACTION ALLOWANCES

Like all resin products, 3form ecoresin will expand and contract nominally with fluctuations in temperature. The following formula provides allowances that should be made in framed or fitted applications:

$$\text{Longest length of panel (inches)} \times \text{temperature change of the sheet (°F)} \times 0.00004 = \text{Amount of Linear Expansion/Contraction (inches)}$$

Example:

A 48" x 96" panel that experiences a 50°F temperature change will expand/contract:  
96 inches x 50 degrees x 0.00004 in/in °F = 0.192 inches (expansion)

Installers should take extra precautions if installation is occurring before the HVAC systems are operational. Allowances should also be made in the following situations:

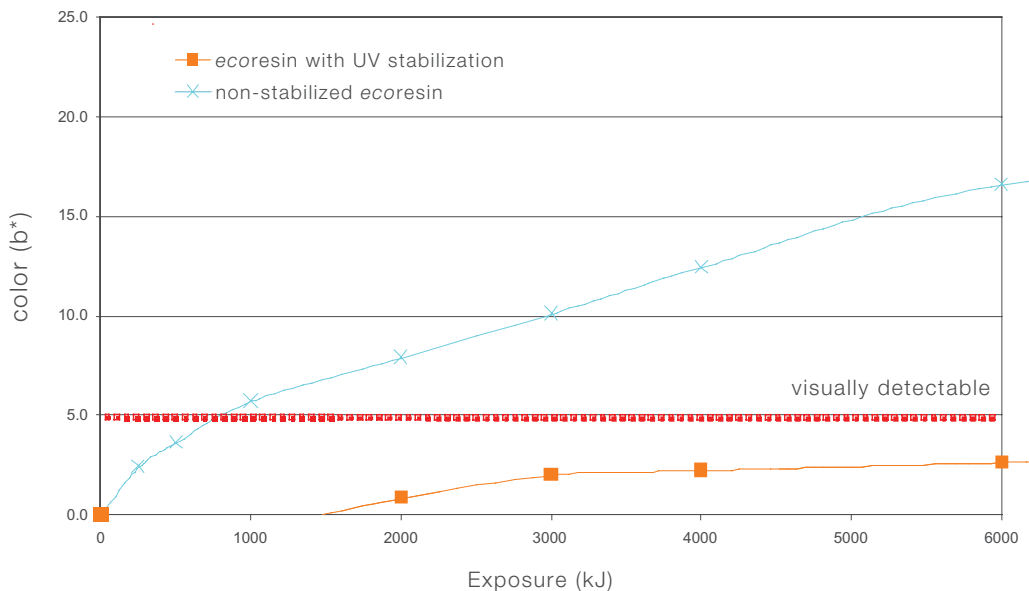
- Fastening points
- Holes for standoffs and other hardware
- Meeting points for multiple sheets of 3form ecoresin

## ULTRAVIOLET EXPOSURE PERFORMANCE

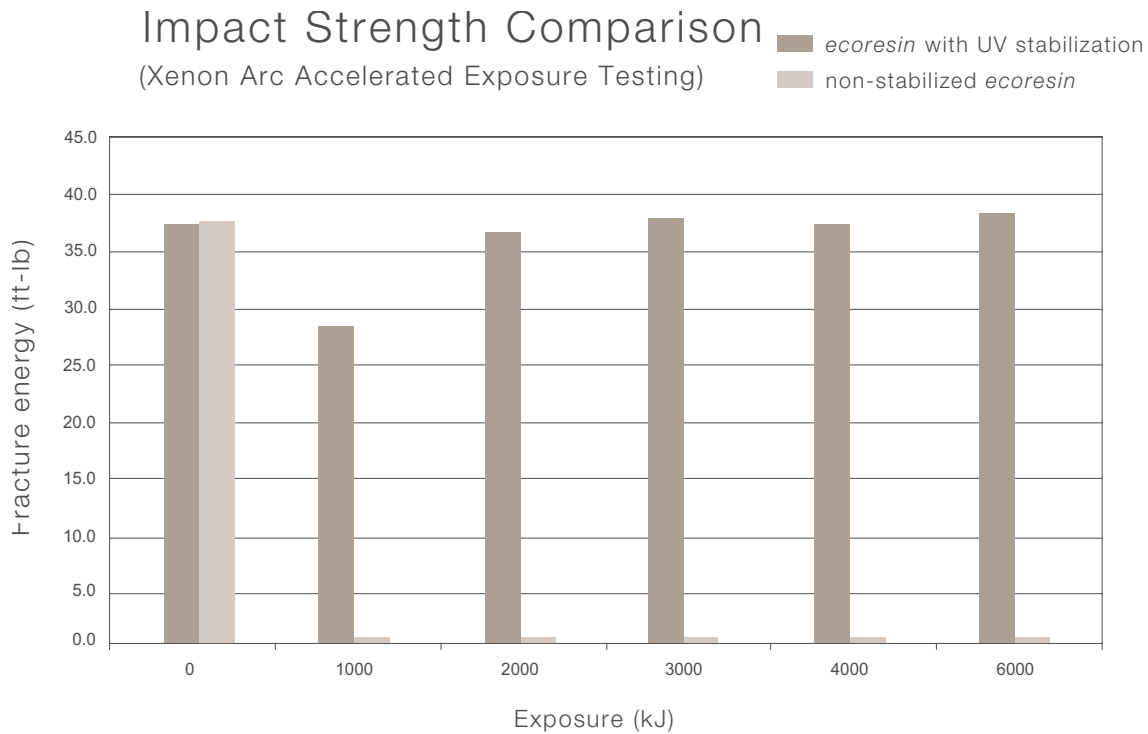
UV stabilizers, when incorporated with 3form ecoresin panels, have proven to be very effective in maintaining the integrity of the panels with extended exposure to UV radiation. The following charts provide an overview of the effectiveness of UV stabilizers that are incorporated with 3form ecoresin panels. Following 6,000 kJ of exposure (representing approximately 10-years outdoor Florida exposure) it is shown that the 3form ecoresin with UV stabilization exhibits excellent performance. The following chart demonstrates that the b\* shift remains below the 5 b\* visual threshold (and shows a leveling change over time).

### Color Stability

(Xenon Arc Accelerated Exposure Testing)



Additionally, as demonstrated in the following chart, ecoresin panels maintain tremendous physical integrity when produced with UV stabilization technology.



## DEFLECTION

3form ecoresin will exhibit different amounts of deflection given a variety of factors: fastening techniques, loads, gauges and panel dimensions to list a few. Your 3form Representative can assist you with general deflection guidelines for your application. If your application has specific engineering requirements, please contact the 3form Product Technology team for additional direction.

## HEAT FORMING/COLD BENDING

ecoresin can be cold bent for simple bends and curved areas. As a rule, a minimum radius of 100 times thickness is acceptable for ecoresin (will depend on innerlayer material).

### ECORESIN THICKNESS

1/16" (1.5 mm)  
 1/8" (3 mm)  
 3/16" (4.5 mm)  
 1/4" (6 mm)

### MINIMUM COLD BEND RADII

7" (178 mm)  
 12" (305 mm)  
 19" (483 mm)  
 25" (635 mm)

# 3form<sup>®</sup> ecoresin

3/8" (9.5 mm)	37" (940 mm)
1/2" (12.5 mm)	50" (1270 mm)
3/4" (19 mm)	75" (1905 mm)
1" (25 mm)	100" (2540 mm)

Because of its low thermoforming temperature, *ecoresin* is easy to strip heat and line bend. Remove protective masking from area to be bent. Using a line heat device, regulate the heat to a temperature that allows *ecoresin* to reach 250°F-300°F (138°C -160°C). Thicker gauge requires a longer period of time to allow heat penetration. Place sheet over heat source at bend area. Allow heat to soften material; time depends on gauge, 1/8" (3 mm) typically requires 2 minutes. Remove from heat and make desired bend, and place in wood or fabric-covered aluminum fixture to cool.

- Always strip heat a sample piece first
- Avoid drafty rooms which can cause uneven heating and cooling
- Be sure to cover forming fixtures with soft fabric to avoid scratching *ecoresin*
- Bending *ecoresin* when it is too cold results in a highly-stressed, weakened material
- Thicker gauges (over 1/8") may require heating on both sides by turning the sheet over periodically
- Always bend the sheet with the heated side forming the outside radius

## EDGE FINISHING

Edges of 3form *ecoresin* panels are able to be machined or routed into a variety of different forms. In addition to a straight edge, edges may accept beveling, rounding, etc. Additional finishing, such as sanding or polishing, can also be provided to some edges.

## REFINISHING

*ecoresin* finishes such as patent can have blemishes polished out; however, the majority of 3form products have a surface finish that would be ruined by buffing. "Stucco" is our most durable finish. This finish is recommended for any high-traffic areas.

## Selected Mechanical and Physical Properties for 3form *ecoresin*

				TYPICAL VALUE							
				UNITS		0.060" (2 MM)		0.118" (3 MM)		0.236" (6 MM)	
PROPERTY	CONDITIONS	ASTM METHOD	SI	U.S. CUSTOMARY	SI	U.S. CUSTOMARY	SI	U.S. CUSTOMARY	SI	U.S. CUSTOMARY	
<b>GENERAL</b>											
Density	23° C (73° F)	D 1505	kg/m <sup>3</sup>	g/cm <sup>3</sup>	1,270	1.27	1,270	1.27	1,270	1.27	
Water Absorption	23° C (73° F), 24h immersion	D 570	%	%	0.3	0.3	0.2	0.2	0.1	0.1	
Heat Deflection Temperature	@66psi	D648	°C	°F	—	—	73.3	164	—	—	

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					TYPICAL VALUE					
			UNITS		0.060" (2 MM)		0.118" (3 MM)		0.236" (6 MM)	
PROPERTY*	CONDITIONS	ASTM METHOD	SI	U.S. CUSTOMARY	SI	U.S. CUSTOMARY	SI	U.S. CUSTOMARY	SI	U.S. CUSTOMARY
<b>MECHANICAL</b>										
Tensile Stress @ Yield	50 mm/min (2 in./min)	D 638	MPa	psi	53	7,700	53	7,700	53	7,700
Tensile Stress @ Break	50 mm/min (2 in./min)	D 638	MPa	psi	31	4,500	26	3,800	26	3,800
Elongation @ Yield	50 mm/min (2 in./min)	D 638	%	%	4.7	4.7	4.8	4.8	5.0	5.0
Elongation @ Break	50 mm/min (2 in./min)	D 638	%	%	210	210	50	50	40	40
Tensile Modulus	5.0 mm/min (0.2 in./min)	D 638	MPa	psi	—	—	2,200	320,000	—	—
Flexural Modulus	1.27 mm/min (0.05 in./min)	D 790	MPa	psi	2,200	320,000	2,100	310,000	2,000	290,000
Flexural Strength	1.27 mm/min (0.05 in./min)	D 790	MPa	psi	71	10,300	77	11,200	83	12,000
Rockwell Hardness	—	D 785	R Scale	R Scale	104	104	115	115	117	117
Safety Glazing	75°F 23.8°C	ANSI 97.1	does not break		—	—	PASS		—	—
Izod Impact Strength, Notched	23°C (73°F)	D 256	J/m	ft-lbf/in.	—	—	88	1.7	62	1.2
	0°C (32°F)	D 256	J/m	ft-lbf/in.	—	—	66	1.2	—	—
	-30°C (-22°F)	D 256	J/m	ft-lbf/in.	—	—	39	0.7	—	—
Impact Strength, Unnotched	23°C (73°F)	D 4812	J/m	ft-lbf/in.	—	—	NB**	NB**	NB**	NB**
	0°C (32°F)	D 4812	J/m	ft-lbf/in.	—	—	NBB	NBB	—	—
	-30°C (-22°F)	D 4812	J/m	ft-lbf/in.	—	—	NBB	NBB	—	—
Impact Resistance—Puncture, Energy @ Max. Load	23°C (73°F)	D 3763	J	ft-lbf	21	15	33	24	71	53
	0°C (32°F)	D 3763	J	ft-lbf	25	18	40	30	93	69
	-10°C (14°F)	D 3763	J	ft-lbf	26	19	42	31	96	71
	-20°C (-4°F)	D 3763	J	ft-lbf	28	21	43	32	>100	>74
	-30°C (-22°F)	D 3763	J	ft-lbf	25	18	47	34	>100	>74

\* Unless noted otherwise, all tests are run @ 23°C (73°F) and 50% relative humidity, using specimens machined from extruded sheeting with a thickness as indicated.

\*\*Nonbreak as defined in ASTM D 4812 using specimens having a thickness as indicated. Properties reported here are typical of average lots. 3form makes no representation that the material in any particular shipment will conform exactly to the values given.

## SOUND TRANSMISSION CLASS (STC) VALUES FOR VARIOUS GAUGES OF ECORESIN

Measurement protocol: ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

For more information, please visit [3-form.com](http://3-form.com) or call 800.726.0126

## ECORESIN THICKNESS      STC VALUES

1/8" (0.118")	25
3/16" (0.177")	29
1/4" (0.236")	31
3/8" (0.354")	34
1/2" (0.500")	34
1" (1.00")	39

## CHEMICAL RESISTANCE OF 3FORM ECORESIN TO SELECT COMPOUNDS

The following table provides indicative performance of the chemical resistance characteristics of ecoresin tensile bars, the material from which ecoresin panels are produced.

Polymer materials are affected by chemicals in different ways. Factors that initiate a change in performance or appearance when exposed to chemicals can be attributed to fabrication methods, exposure conditions, concentration of chemical substances or exposure duration of certain substances. Such factors can even influence the final affect on substances that 3form ecoresin is considered "Resistant" to by this method. Further details are explained below:

**Fabrication:** Stresses generated from sanding, grinding, drilling, polishing, machining, sawing and/or forming (hot or cold).

**Exposure:** Exposure duration, stresses imparted during the application life-cycle due to loads, temperature changes, heat, environments, etc.

**Application of chemicals:** Application from contact, rubbing, wiping, spraying, soaking, etc. Also having an affect is the relative concentration of the chemical in question.

The following data is based on complete immersion of ecoresin tensile bars in the chemical or reagent shown. Samples remained immersed and were stored at 23°C (73°F) for a period of one year. Following the test period the samples were removed from immersion, weighed and measured. This table represents the changes in weight, thickness and appearance of the immersed samples over the testing period.

REAGENT	% CHANGE		APPEARANCE AFTER EXPOSURE
	WEIGHT	THICKNESS	
Acetic Acid, 5%	<1	<1	Very slight yellowing
Acetic Acid, conc.	19	18	Discolored, swollen
Acetone	16	23	Discolored (brown), swollen, rubber-like
Ammonium Hydroxide, conc.	-29	-20	Turned white, outside crumbling off
Ammonium Hydroxide, 10%	4	4	Discolored (pink), surface has blisters

REAGENT	% CHANGE		APPEARANCE AFTER EXPOSURE
	WEIGHT	THICKNESS	
Antifreeze, Automotive Ethylene Glycol Type	<1	<1	No change
Benzene	34	43	Discolored, rubber-like
Brake Fluid, DOT3	2	2	No change
Brake Fluid	6	6	Turned yellow, surface attacked, flaking off
Carbon Tetrachloride	27	18	Discolored, swollen
Chromic Acid, 40%	<1	<1	Slightly discolored
Citric Acid, 10%	<1	<1	Slight yellowing
Cottonseed Oil	<1	<1	Very slight yellowing
Deionized Water	<1	<1	Slight yellowing
Detergent, Alconox (0.25%)	<1	<1	Slight yellowing
Di (2-Ethylhexyl) Phthalate	<1	<1	Very slight yellowing
Dibutyl Sebacate	<1	1	Slight yellowing
Diesel Fuel	<1	2	Discolored
Dimethyl Formamide	22	39	Badly discolored and distorted
Ethanol, 50%	<1	<1	Slight yellowing
Ethanol, 100%	<1	<1	Very slight yellowing
Ethyl Acetate	20	24	Badly discolored and swollen, softened
Ethylene Dichloride	—	—	Completely deteriorated after 1 week
Gasohol, 10% Ethanol	9	8	Cloudy, slight yellowing
Gasohol, 10% Methanol	11	10	Cloudy, yellowed
Gasoline, Base for Gasohol	6	6	Slight yellowing
Gasoline, Premium Unleaded	2	3	Discolored
Gasoline, Regular	<1	<1	Slight yellowing
Gasoline, Regular Unleaded	2	2	Discolored
Grease, Automotive	<1	<1	No change
Hand Cleaner, Waterless Jergens SBS30	<1	2	No change
Hexane	<1	<1	Slight yellowing
Hydrochloric Acid, conc.	1	<1	Badly discolored, blisters under surface
Hydrochloric Acid, 10%	<1	<1	Slight yellowing
Hydrogen Peroxide, 3%	<1	<1	Slight yellowing
Hydrogen Peroxide, 28%	<1	<1	Slight yellowing
Isooctane	<1	<1	Very slight yellowing

REAGENT	% CHANGE		APPEARANCE AFTER EXPOSURE
	WEIGHT	THICKNESS	
Kerosene	<1	<1	Very slight yellowing
Lacquer Thinner	7	6	Cloudy, white
Methyl Alcohol	<1	<1	Very slight yellowing, crazing
Mineral Oil	<1	<1	Very slight yellowing
Motor Oil	<1	<1	No change
Nitric Acid, conc.	—	—	Completely deteriorated after 1 wk.
Nitric Acid, 10%	<1	<1	Slight yellowing
Nitric Acid, 40%	1	<1	Turned white
Oleic Acid, 83%	<1	<1	Very slight yellowing
Olive Oil	<1	<1	Very slight yellowing
Penetrating Oil, Liquid Wrench #1	10	11	Discolored
Phenol, 5%	13	14	Turned black
Silicone Spray Lubricant	67	34	White, swollen
Soap Solution, 1%	<1	<1	Slight yellowing
Sodium Carbonate, 2%	<1	<1	Slight yellowing
Sodium Carbonate, 20%	<1	<1	Slight yellowing
Sodium Chloride, 10%	<1	<1	Slight yellowing
Sodium Hydroxide, 1%	<1	<1	Slight yellowing
Sodium Hydroxide, 10%	8	6	Slight yellowing
Sodium Hypochlorite, 3.5%	<1	<1	Slight yellowing
Sulfuric Acid, conc.	—	—	Completely deteriorated after 1 wk.
Sulfuric Acid, 3%	<1	<1	Slight yellowing
Sulfuric Acid, 30%	<1	<1	Slight yellowing
Tapping Oil	<1	1	No change
Toluene	26	31	Turned white, softened
Transformer Oil	<1	<1	Very slight yellowing
Transmission Fluid, Auto	<1	<1	No change
Turpentine	<1	<1	Slight yellowing

## Cleaning Instructions

3form ecoresin, like all thermoplastic resin materials, should be cleaned periodically. A regular, seasonal cleaning program will dramatically help prevent noticeable weathering and dirt build-up.

Rinse the sheets with lukewarm water. Remove dust and dirt from ecoresin with a soft cloth or sponge and a solution of mild soap and/or liquid detergent in water. A 50:50 solution of isopropyl alcohol and water also works well. Rinse thoroughly with lukewarm water.

Always use a soft, damp cloth to blot dry. Rubbing with a dry cloth can scratch the material and create a static charge. Never use scrapers or squeegees on ecoresin. Also avoid scouring compounds, gasoline, benzene, acetone, carbon tetrachloride, certain deicing fluids, gasoline, lacquer thinner or other strong solvents.



Do not:

- Use a squeegee
- Strong solvents, highly alkaline or abrasive cleaning agents
- Clean in hot sun or elevated temperatures
- Rub with a dry cloth

## PRESSURE WASHING

Pressure washing can also be an effective way to remove miscellaneous debris from surfaces of 3form ecoresin installations that are in exterior or hard-to-reach places.

Pre-soak panels with a light water spray to loosen and remove incidental surface debris.

It is recommended that the water pressure for cleaning ecoresin panels be 1,500 psi or less. 3form ecoresin is a tough material but can be damaged if high pressure is concentrated in a single position too long. Use a gradual sweeping motion over the application. Never concentrate water spray in a single position. Pressure nozzle should never be positioned closer than 8" (203 mm) from the panel surface.

Test a portion of the sheet first before spraying. If test piece shows any sign of material fatigue, abrasion or delamination – discontinue pressure washing and proceed with manual cleaning instructions as described above.

Coated or painted parts are not suitable for pressure washing as finish may be stripped off. Pressure washing is not suitable for ecoresin panels that have been edge sealed. If using detergent, use mild detergents only. Rinse sheet with light water spray after washing.

Do not:

- Concentrate spray in single position
- Use more than 1,500 psi pressure
- Position pressure nozzle closer than 8" (203 mm) from panel
- Proceed with pressure washing if test piece shows detrimental effects to panel
- Pressure wash ecoresin panels that have been painted or coated to maintain coating integrity
- Pressure wash ecoresin panels with sealed edges to ensure edge seals remain in tact

If debris or dirt is not removed by pressure washing attempt to clean with manual procedures described in preceding section.

Important: If a cleaning material is found to be incompatible in a short-term test, it will usually be found to be incompatible in the field. The converse, however, is not always true. Favorable performance is no guarantee that actual end-use conditions have been duplicated. Therefore, these results should be used as a guide only and it is recommended that the user test the products under actual end-use conditions.

For additional information about 3form ecoresin please contact 3form @ 801.649.2500