

## Product Description

3form 100 Percent is an exciting, design-driven material family with minimal environmental impact. Made entirely from post-consumer recycled High Density Polyethylene (HDPE), it is household waste transformed into highly-designed, engineered panels. As its name suggests, this high performance, durable, and playfully colorful material is created by fusing pieces of 100% post-consumer HDPE. 3form 100 Percent is yet another example of cutting edge design combined with advanced materials technology to create a durable material that is brilliantly unique.

HDPE is a remarkably useful material that each of us comes into contact with everyday. Bottles made from HDPE have excellent properties and are ideal for transforming into durable, higher-value products. HDPE's great chemical resistance also allows it to be used as containers for household detergents and industrial chemicals. Unlike other 3form materials, 100 Percent is opaque, and brings a new set of features and benefits to the 3form material family.

### FEATURES AND BENEFITS

- Produced from 100% post-consumer waste—creating minimal environmental impact, and delivering a message of environmental concern and stewardship
- UV stable – suitable for exterior applications
- Easy to fabricate – requires no complicated or special tooling or techniques
- Excellent chemical resistance – cleaning is easy and simple
- Offered with wearable yet refined textures
- Non-toxic – ideal for a multitude of different environments
- NSF 51 Splash Zone rated
- Greenguard® Indoor Air Quality certified

### AVAILABLE COLORS\*

3form 100 Percent Blend and LineUp each include four color collections in unique patterns, providing high design interest and flexibility. 100 Percent Base is comprised of two sophisticated colors in a contemporary, neutral color palette.

LINEUP	BLEND	BASE
<b>Beach</b> <b>Husk</b> <b>Stream</b> <b>Turf</b>	<b>Cut Grass</b> <b>Orange Slice</b> <b>Night Sky</b> <b>Snowmelt</b>	<b>Nordic</b> <b>Putty</b>

\*Due to the recycled nature of 3form 100 Percent, slight panel-to-panel color variances can be expected.

### TEXTURES/PATTERNS/FINISHES\*

#### LINEUP

3form 100 Percent LineUp is a double-sided product and comes standard with the 3form Sandstone finish - a more durable finish with a subtle texture.

LineUp is available in two standard patterns:

- Latitude - colors run parallel to the 48" direction.
- Longitude - colors run parallel to the 96" direction.

Linear patterns in 100 Percent LineUp have a skew and straightness tolerance of 1/4" over 48". Note that because the linear pattern is not consistent from panel to panel, end-matching multiple panels of LineUp is not possible.

#### BLEND

3form 100 Percent Blend is a single-sided product and comes standard with the 3form Sandstone finish.

#### BASE

3form 100 Percent Base is a dual-sided product and comes standard with a finish similar to that of 3form Sandstone.

\*As a result of the manufacturing process, material flow may cause minimal "smearing" of the surface of the 100 Percent Blend and LineUp panels.

### PANEL SIZES AND TOLERANCES

3form 100 Percent Base and LineUp panels are offered in 4' x 8' (1.2 m x 2.4 m). Blend panels are offered in 44" x 112" (1.1 m x 2.8 m). All dimensions and squareness are subject to a tolerance of +/- 1/4" (6.3 mm).

## LINEUP

NOMINAL THICKNESS GAUGE	MINIMUM ALLOWANCE GAUGE	MAXIMUM ALLOWANCE GAUGE
1/4" (6.4 mm)	0.250" (6.4 mm)	0.290" (7.4 mm)

## BLEND

NOMINAL THICKNESS GAUGE	MINIMUM ALLOWANCE GAUGE	MAXIMUM ALLOWANCE GAUGE
1" (25.4 mm)	0.900" (22.8 mm)	1.100" (27.9 mm)

## BASE

NOMINAL THICKNESS GAUGE	MINIMUM ALLOWANCE GAUGE	MAXIMUM ALLOWANCE GAUGE
3/8 (9.5 mm)	0.337" (8.5 mm)	0.413" (10.4 mm)
1" (25.4 mm)	0.900" (22.8 mm)	1.100" (27.9 mm)

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

## FLATNESS TOLERANCE

3form 100 Percent panels shall not have distortion in the form of a wrinkle, twist or scallop along the perimeter of the sheet. Overall warp extending across the sheet is permitted to a maximum of 0.25" (6.3 mm) for each 48" (1.2 m) or fraction thereof. Panel is to be measured when laying horizontally under its own weight on a flat continuous surface.

## Specifications

### FLAMMABILITY & SMOKE TEST RESULTS –

#### BUILDING CODE APPROVALS

TEST	3FORM 100 PERCENT	RESULT
ASTM D 635 Flame Spread	11.8 mm/min	PASS CC2
ASTM E 84-03 Flame Spread (1") Smoke generated (1")	40 250	Class B: 26-75 <450

## PANEL WEIGHT

THICKNESS	WEIGHT FLUX
1/4" (6.4 mm)	1.4 lb/ft <sup>2</sup> (7.5 kg/m <sup>2</sup> )
3/8" (9.5 mm)	1.7 lb/ft <sup>2</sup> (8.5 kg/m <sup>2</sup> )
1" (25.4 mm)	4.9 lb/ft <sup>2</sup> (23.9 kg/m <sup>2</sup> )

## EXPANSION/CONTRACTION ALLOWANCES

Like all resin products, 3form 100 Percent will expand and contract nominally with fluctuations in temperature. The following formula provides allowances that should be made in framed or fitted applications:

- Longest length of panel (inches) x temperature change of the sheet (°F) x 0.00007 = Amount of Linear Expansion/Contraction (inches)

### EXAMPLE:

- A 44" x 112" panel that experiences a 50°F temperature change will expand/contract: 112 inches x 50 degrees x 0.00007 in/in °F = 0.39 inches

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
- Channel depths in frames
- Holes for standoffs and other hardware
- Meeting points for multiple sheets of 3form 100 Percent

## EXTERIOR PERFORMANCE

UV stabilizers are incorporated into 3form 100 Percent, making it a suitable material for exterior applications.

## USAGE LIMITATIONS

The abrasion resistance of HDPE is lower than other resin materials. While the Sandstone surface texture will hide minor scuffing and scratching, 100 Percent should not be specified for severe applications that require high levels of abrasion resistance.

For exterior applications, 3form 100 Percent MUST be fully supported when installed in a horizontal orientation. Due to its dark color, Night Sky should not be specified for exterior applications.

## DEFLECTION

3form 100 Percent will exhibit different amounts of deflection given a variety of factors: fastening techniques, loads, gauges and panel dimensions to list a few. The 3form Technical Help desk can assist you with general deflection guidelines for your application using the 100 Percent Deflection Charts technical white paper. If your application has specific engineering requirements, please contact the 3form Product Technology team for additional direction.

## HEAT FORMING/COLD BENDING

3form 100 Percent can be cold bent to accommodate simple bends and curves. Minimum cold bend radius for 100 Percent is 200 times thickness.

PANEL THICKNESS	MINIMUM COLD BEND RADIUS
1/4" (6.4 mm)	50" (1270 mm)
3/8" (9.5 mm)	75" (1905 mm)
1" (25.4 mm)	200" (5080 mm)

Note that 3form 100 Percent cannot be heat formed without affecting the surface finish.

## EDGE FINISHING

Edges of 3form 100 Percent panels are able to be machined or routed into a variety of different forms. In addition to a straight edge, edges may accept beveling, chamfering, bull-nosing, rounding, etc. Additional edge finishing, such as sanding or polishing, can also be provided to some edges.

## REFINISHING

Due to the textured finishes, 3form 100 Percent surfaces cannot be sanded, polished or refinished.

Do not flame polish 3form 100 Percent. This will result in burning and/or charring of the material.

## Selected Mechanical and Physical Properties for 3form 100 Percent

PROPERTY*	ASTM METHOD	TYPICAL VALUE	
		SI	U.S.
<b>GENERAL</b>			
Density	D 792 @ 23° C (73° F)	0.955 g/cm <sup>3</sup>	60.0 lbs/ft <sup>3</sup>
Water Absorption	D 570 @ 23° C (73° F), 24h immersion	<0.3%	<0.3%
<b>MECHANICAL</b>			
Tensile Stress @ Yield	D 638 @ 2 in./min (50 mm/min)	28 MPa	4,000 psi
Elongation @ Break	D 638 @ 2 in./min (50 mm/min)	>600%	>600%
Flexural Modulus	D 790 @ 0.05 in./min (1.27 mm/min)	1,378 MPa	200,000 psi
Rockwell Hardness	D 785		M 67
<b>THERMAL</b>			
Maximum Continuous Use Temperature		71°C	160°F
Deflection Temperature	D 648 @ 0.455 MPa (66 psi)	80°C	176°F
Brittleness Temperature	D 746	<-84°C	<-120°F
Flame Spread Rate	D 635	< 25 mm/min	< 1 in/min
Coefficient of Linear Thermal Expansion (-30° to 23°C)	E 831	1.3x10 <sup>-4</sup> mm/mm/°C	7x10 <sup>-5</sup> in/in/°F

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

## Chemical Resistance of 3form 100 Percent to Select Compounds

### 7 DAY FULL IMMERSION TESTING @ 73°F (23°C)

Polymer materials are affected by chemicals in different ways. Changes in performance or appearance can be attributed to fabrication methods, exposure conditions, concentration of chemical substances or exposure duration. Such factors can even influence the final effect of substances that 3form 100 Percent is considered "Resistant" to under test conditions. 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 effect is the relative concentration of the chemical in question.

The following data is based on complete immersion of 100 Percent in the chemical or reagent shown. Samples remained immersed and were stored at 73°F (23°C) for a period of 7 days. Following the test period the samples were removed from immersion and inspected.

The following table provides indicative performance of the chemical resistance characteristics of HDPE, the material from which 100 Percent panels are produced. The following codes are used to describe the chemical resistance characteristics:

#### R = RESISTANT

3form 100 Percent is able to withstand the identified compound for long exposure periods. (7 days, full immersion)

#### LR = LIMITED RESISTANCE

3form 100 Percent is only resistant in contact with this compound for short periods at room temperature. It is advised that the effect of the substance be further tested in your particular application.

#### NR = NOT RESISTANT

3form 100 Percent is not resistant to the compound. The material will swell, craze, haze, dissolve or experience some physical change when exposed to this substance.

REAGENT	RESULT	REAGENT	RESULT
Acetaldehyde	LR	Acetamide, Sat.	R
Acetic Acid, 50%	R	Acetic Anhydride	N
Acetone	R	Acetonitrile	R
Acrylonitrile	R	Adipic Acid	R
Alinine	R	Allyl Alcohol	R
Aluminum Hydroxide	R	Aluminum Salts	R
Amino Acids	R	Ammonia	R
Ammonium Acetate, Sat.	R	Ammonium Glycolate	R
Amonium Hydroxide, 30%	R	Ammonium Oxalate	R
n-Amyl Acetate	LR	Amyl Chloride	NR
Aniline	LR	Benzaldehyde	R
Benzene	LR	Benzoic Acid, Sat.	R
Benzyl Acetate	R	Benzyl Alcohol	NR
Bromine	NR	Butadiene	NR
Butyl Chloride	NR	n-Butyl Acetate	LR
n-Butyl Alcohol	R	Butyric Acid	NR
Calcium Hydroxide	R	Carbon Disulfide	NR
Carbon Tetrachloride	LR	Cellosolve Acetate	R
Chlorobenzene	NR	Chlorine, 10% in air	LR
Chloroacetic Acid	R	Chromic Acid, 50%	R
Citric Acid	R	Cyclohexane	NR
Diacetone Alcohol	R	Diethyl Benzene	NR
Diethyl Ether	NR	Diethyl Ketone	LR
Diethylene Glycol	R	Dimethylsulfoxide	R
Dipropylene Glycol	R	Ether	NR
Ethyl Acetate	R	Ethyl Alcohol	R
Ethylene Chloride	NR	Ethylene Glycol	R
Flourine	NR	Formaldehyde	R
Formic Acid, 100%	R	Gasoline	LR
Glycerine	R	Hexane	LR
Hydrochloric Acid, 35%	R	Hydrofluoric Acid	R
Hydrogen Peroxide	R	Isobutyl Alcohol	R
Isopropyl Alcohol	R	Isopropyl Ether	NR
Jet Fuel	NR	Kerosene	LR
Lacuer Thinner	NR	Methyl Ethyl Ketone	R
Methylene Chloride	LR	Mineral Spirits	NR
Nitric Acid, 1-10%	R	Nitric Acid, 50%	NR
Perchloric Acid	NR	Phosphoric Acid, 85%	R
Pine Oil	LR	Propionic Acid	LR
Propylene Glycol	R	Sallylic Acid	R
Silicone Oil	R	Sodium Hydroxide, 100%	R
Sodium HypoChlorite, 15%	R	Sulphuric Acid, 1-60%	R
Sulphuric Acid, 98%	LR	Toluene	LR
Turpentine	LR	Urea	R
Xylene	LR		

## Cleaning Instructions

---

3form 100 Percent, like all thermoplastic resin materials, should be cleaned periodically. A regular or seasonal cleaning program will dramatically help prevent noticeable dirt build-up.

Rinse the sheets with lukewarm water. Remove dust and dirt from 100 Percent with a soft cloth or sponge and a solution of mild soap and/or liquid detergent in water. 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 100 Percent. Avoid aggressive compounds such as solvents or industrial chemicals.

### **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 100 Percent 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 100 Percent panels be 1,500 psi or less. 3form 100 Percent 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. The pressure nozzle should never be positioned lower than 8" (203 mm) from the panel surface.

Always 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. (If using detergent, use mild detergents only. Rinse sheet with light water spray after washing.)

### **DO NOT:**

- Concentrate spray in a single location.
- Use more than 1,500 psi pressure.

### **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 more information, please visit [3-form.com](http://3-form.com) or call 877-649-2670.