



3form® *Chroma* offers unique aesthetics and performance for both horizontal surfaces and lighting applications. The product clarity offers designers the ability to create beautiful edge-lit pieces. Available in thick gauge formats, 3form *Chroma* utilizes advanced coloring technology to take color to new “sights.”



Product Description

3form *Chroma* offers unique aesthetics and performance for both horizontal surfaces and lighting applications. The product clarity offers designers the ability to create beautiful edge-lit and back-lit pieces. Available in thick-gauge formats, 3form *Chroma* is colored with 3form color infusion and 3form applied coating technologies to take color to new “sights”.

3form *Chroma* is produced from cast polymethyl methacrylate (PMMA) resin that offers excellent optical clarity. The material is available in thick-gauge formats that results in rigid panels suitable for many horizontal applications.

FEATURES AND BENEFITS

- Surface is able to be completely refinished to maintain product “newness”
- Maximum optical edge quality and light transmission – great for edge lighting
- Excellent rigidity for providing sturdiness in horizontal applications
- Qualifies for 3form Reclaim - keeping end-of-life material out of landfills

AVAILABLE COLORS*

REFINED

Concord
Atlantic
Moss
Blush
Eggplant
Valley Mist
Olive
Rosé
Mole Negro
Camel
Smoke Grey
Mineral
Titanium*
Ghost*
Ivory*

BOLD

Colbalt
Midnight
Violet
Marigold
Sea
Grass
Boysenberry
Cranberry
Rasberry
Pool
Vitamin C
Mai Tai

TEXTURES

Renewable matte – one side
Renewable matte – both sides (used with clear *Chroma*)

*Colors only available with 3form applied coatings.
Custom colors available. Contact your 3form representative for custom color submissions guidelines.

CHROMA COLORING: COLOR INFUSION VS. APPLIED COLOR COATINGS

3form *Chroma* is a highly functional material that brings impact when color is introduced. To achieve very unique color and aesthetics, 3form incorporates two different coloring technologies: infusion and applied coatings.

3form color infusion is an advanced technology that impregnates the polymer matrix with water soluble colorants. The result is a deep (~250 microns), consistent color that handles wear and tear and maintains remarkable color uniformity. The only limitation of the *Chroma* color infusion technology is that its use is limited to interior applications.

3form applied coating technology is an alternate method used to achieve brilliant opaque colors on 3form *Chroma*. The 3form applied coating technology was developed for exterior *Chroma* applications. An important development forethought was made to conscientiously invoke a coating technology that is low in volatile organic compound (VOC) content to have minimal environmental impact. Further, the pigments used are non-toxic and contain no heavy metals. The applied coating technology rests on the second surface of the material and must be handled carefully when exposed in high contact surfaces such as transaction counters.

PANEL SIZES AND TOLERANCES

All dimensions and squareness (standard or custom) are subject to a 3 mm (+/- 1/8") tolerance.

Gauge tolerances are an inherent part of working with resin. Given the unique casting process for 3form *Chroma*, a given gauge is subject to a +/- 10% thickness tolerance. If your application requires a tighter gauge tolerance, please notify your 3form Representative.

PANEL SIZE TABLE*	
NOMINAL GAUGE	SIZE(S)**
12 mm (1/2")	1,2 m x 2,4 m (4' x 8'), 1,2 m x 3 m (4' x 10')
25 mm (1")	0,6 m x 2,4 m (2' x 8')*, 1,2 m x 2,4 m (4' x 8'), 1,2 m x 3 m (4' x 10')
50 mm (2")	0,6 m x 2,4 m (2' x 8')*, 1,2 m x 2,4 m (4' x 8')

* 50 mm (2") wide format available with applied coating technology only.

** 50 mm (2") wide format is additionally subject to a 6 mm (+0 / -1/4") cut tolerance on 0,6 m width (2').

Specifications

FLAMMABILITY & SMOKE TEST RESULTS

NOTE: At this moment European tests results are not available.

PANEL WEIGHT AT VARIOUS GAUGES

THICKNESS	WEIGHT FLUX
12 mm (1/2")	15,1 kg/m ² (3.1 lb/ft ²)
25 mm (1")	30,2 kg/m ² (6.2 lb/ft ²)
50 mm (2")	60,5 kg/m ² (12.4 lb/ft ²)

EXPANSION/CONTRACTION ALLOWANCES

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

$$\text{Longest length of panel (mm)} \times \text{temperature change of the sheet (}^{\circ}\text{C} \times 1,8 + 32) \times 0,00004 = \text{Amount of Linear Expansion/contraction (mm)}$$

Example:

A 1219mm x 2438 mm panel that experiences a 10°C temperature change will expand/contract: $2438 \text{ mm} \times (10 \text{ degrees} \times 1,8 + 32) \times 0.00004 = 4,876 \text{ mm}$

Or in inches and °F:

Longest length of panel (inches) x temperature change of the sheet (°F) x 0.00004 = Amount of Linear Expansion/contraction (inches)

Example:

A 48" x 96" panel that experiences a 50°F temperature change will expand/contract: $96 \text{ inches} \times 50 \text{ degrees} \times 0.00004 = 0.192 \text{ inches}$

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
- Holes for standoffs and other hardware
- Meeting points for multiple sheets of 3form *Chroma*

EXTERIOR EXPOSURE PERFORMANCE

Though 3form *Chroma* was designed for use in interior applications, it is an excellent choice for exterior applications when incorporated with 3form applied color coating technology. All *Chroma* colors produced with our applied coloring technology are UV stable. Should your application be for exterior use, please notify your 3form sales representative.

DEFLECTION

3form *Chroma* 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 3form Product Management for additional direction.

HEAT FORMING

3form *Chroma* can be heated and formed to produce simple or even complex curves and shapes. The minimum inner radius for a heat formed shape should not be less than 3 times the sheet thickness. The optimal forming temperature ranges from 150°–165°C (300°–330°F).

COLD BENDING

Though 3form *Chroma* is commonly used in flat or heat curved applications, the polymeric nature of the material allows a minimal amount of cold bending for a given panel. Cold bending is not possible on 25 mm (1") and 50 mm (2") gauges. The table below shows the minimum suggested radius for 3form *Chroma* at a given gauge:

THICKNESS	MINIMUM BEND RADIUS
12 mm (0.500")	5715 mm (225")

EDGE FINISHING

Edges of 3form *Chroma* 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.

ETCHING

3form *Chroma* may be etched with two different finishing options to produce patterns, text, or anything imaginable. The finishing options are a polished etched surface and etching with a renewable matte finish. There are some limitations to the etching process; they are listed below.

ONLY 12 mm–50 mm (1/2"–2") *Chroma* may be etched.

POLISHED ETCHING

- Limited to 3 mm (1/8") deep
- Etch must be greater than 12 mm (1/2") wide

RENEWABLE MATTE ETCHING

- Maximum etching depth is 50% of panel gauge
- Etch must be greater than 50 mm (2") wide

REFINISHING

One of the unique benefits of 3form *Chroma* is its ability to be refinished. If 3form *Chroma* needs to be refinished for any reason, the panels may be renewed by sanding. Begin by dry sanding with a course grit paper (100 or 150 grit) to remove blemishes/scratches. Continue sanding with gradually finer grit papers until the surface is smooth and level and the blemish/scratches are removed. Complete the refinishing process by sanding with a 220 grit paper to attain a matte finish. Only the primary surface (non-colored side) is refinishable.

Even finer grit papers may be used to attain a satin or semi-polished appearance. With papers greater than 400 grit, wet sanding (with water) should be employed.

Be sure to keep sanders in motion at all times when refinishing surfaces or edges. Only use light pressure with power sanders in order to maintain evenness and avoid overheating of the sheet surface.

Select Physical Properties

MECHANICAL	ASTM METHOD	TYPICAL VALUES	
		US CUSTOM	METRIC
specific gravity	D792	1.19	759 kg/cm ³
tensile strength	D638	10,000 psi	
elongation at rupture	D638	4.0%	
modulus of elasticity	D638	450,000 psi	28.1x10 ³ kg/cm ²
flexural strength (rupture)	D790	16,000 psi	1123 kg/cm ²
compressive strength (yield)	D695	17,500 psi	1230 kg/cm ²
compressive deformation (4000 psi (281 kg/cm ²), 122°F (50° C), 24 hours)	D621	≤0.85%	
shear ultimate strength	D732	10,000 psi	703 kg/cm ²
impact strength (charpy method)	D256		
	notched	2.1 lbf*in/in	0.4 kgf*cm/cm
	un-notched	107 lbf*in/in	20 kgf*cm/cm
izod notched impact strength	D256	≤0.25 ft-lb/in	≤13.3 J/m
rockwell hardness	D785	M-103	
barcol hardness	D2583	49	
residual shrinkage (internal strain)	D702	2%	
optical			
refractive index	D542	1.49	
light transmission (total)	D1003	92%	
haze	D1003	<1%	
thermal			
forming temperature		300–330°F	149–157°C
deflection temperature (264 psi [18.6 kg/cm ²])	D648	99°C	210°F
vicat softening point	D1525	239°F	115°C
max continuous use temp		200°F	66°C
coefficient of thermal conductivity (k-factor)	cenco-fitch	1.3 btu/(hr)ft ² (°F)	0.19 w/m ² K

NOTE: At this moment European tests results are not available.

MECHANICAL	ASTM METHOD	US CUSTOM	VALUE	METRIC	VALUE
coefficient of thermal expansion	D696	°F	10-5(in/in/°F)	°C	10-5(mm/mm/°C)
		-40	2.9	-40	5.22
		-20	3.0	-29	5.40
		0	3.2	-18	5.76
		+20	3.4	-1	6.12
		+40	3.7	+4	6.66
		+60	4.0	+16	7.20
		+80	4.3	+27	7.74
		+100	4.7	+38	8.46
		+120	5.1	+49	9.18
		+140	5.4	+60	9.72

NOTE: At this moment European tests results are not available.

Chemical Resistance of 3form Chroma to Select Compounds

The following table provides indicative performance of the chemical resistance characteristics of clear 3form *Chroma* panels. The following codes are used to describe the chemical resistance characteristics:

R = RESISTANT

Indication that 3form *Chroma* is able to withstand the identified compound for long exposure periods up to 49°C (120°F). (7days, Full immersion)

LR = LIMITED RESISTANCE

3form *Chroma* is only able to resist affect when in contact with this compound for short periods at room temperature. It is advised that further determination of the affect of the substance in your particular application be further tested.

N = NOT RESISTANT

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

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 *Chroma* 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.

CHEMICAL	CODE	CHEMICAL	CODE
acetic acid (5%)	R	ammonium hydrozide (conc.)	R
acetic acid (glacial)	N	aniline	N
acetic anhydride	LR	battery Acid	R
acetone	N	benzaldehyde	N
acrylic paints and lacquers	LR	benzene	N
ammonia (aqueous solution)	R	bituminous emulsion	N
ammonium chloride (saturated)	R	bromine	N
ammonium hydroxide (10%) ¹⁴	R	butanol	LR
butyl acetate	N	glycol	R
calcium chloride (saturated)	R	heptane	R
calcium hypochlorite	R	hexane	R
carbon tetrachloride	N	hot bitumen	LR
cement	R	hydrochloric acid	R
chlorine water	LR	hydrofluoric acid (40%)	N
chloroform	N	hydrogen peroxide (3%)	R
chromic acid (40%)	N	hydrogen peroxide (28%)	N
citric acid (10%)	R	iso octane	R
cottonseed oil (edible)	R	isopropyl alcohol	N
detergent solution	R	kerosene	R
diesel oil	R	lacquer thinner	N
diethyl ether	N	lactic acid (80%)	LR
dimethyl formamide	N	methane	R
dioctyle formamide	N	methyl alcohol (50%)	LR
ethyl acetate	N	methyl alcohol (100%)	N
ethyl alcohol (50%)	LR	methyl ethyl ketone (MEK)	N
ethyl alcohol (95%)	N	methylene chloride	N
ethyl dichloride	N	mineral oil	R
ethylene glycol	R	mortar	R
2-ethylhexyl sebacate	R	motor fuel (benzene-free)	R

formaldehyde (40%)	R	motor fuel (with benzene)	N
formic acid (2%)	R	muriatic acid (20%)	R
formic acid (40%)	LR	nitric acid (10%)	R
gasoline (regular, leaded)	LR	nitric acid (40%)	LR
glycerine	R	nitric acid (conc.)	N
glycerol	R	oil paints (pure)	R
olive oil	R	sodium hydroxide (60%)	R
oxygen	R	stearic acid	R
ozone	R	sulfuric acid (3%)	R
phenol solution (5%)	N	sulfuric acid (30%)	R
phosphoric acid (10%)	R	sulfuric acid (conc.)	N
plaster of paris	R	thinners (general)	N
soap solution (ivory)	R	toluene	N
sodium carbonate (2%)	R	trichloroethylene	N
sodium carbonate (20%)	R	turpentine	LR
sodium chloride (10%)	R	urine	R
sodium hydroxide (1%)	R	water (distilled)	R
sodium hydroxide (10%)	R	xylene	N

Cleaning Instructions

3form *Chroma*, like all thermoplastic materials should be cleaned periodically. A regular cleaning program will help to maintain the aesthetics and life of the material.

Rinse or wipe the sheet with lukewarm water. Remove dust and dirt from 3form *Chroma* with a damp, soft cloth or sponge and a solution of mild soap and/or liquid detergent in water. Rinse or wipe the 3form *Chroma* again thoroughly with lukewarm water. After all cleaning steps, be sure to 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 3form *Chroma*. Also avoid scouring compounds, gasoline, benzene, acetone, carbon tetrachloride, certain deicing fluids, lacquer thinner or other strong solvents.

DO:

- Use warm water, mild detergent and a soft cloth or chamois
- Rinse surface thoroughly after cleaning with lukewarm water
- Blot dry with slightly damp, soft cloth or chamois

DO NOT:

- Use squeegees or scrapers as they may scratch the sheet
- Use scouring compounds or solvents such as: acetone, gasoline, benzene, carbon tetrachloride, or lacquer thinner to clean the sheet.
- Use abrasives or highline alkaline cleaners
- Use a dry cloth or a cloth of synthetic fiber such as rayon or polyester as they may scratch the sheet.

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.