

Technical Information about ImagoPrints™

This document pertains only to the collection of ImagoPrints, which includes the patterns Altered Lines, Pixelated and Ikat Blocks. For all other Imago patterns, please refer to the current Imago Technical Information document.

KnollTextiles introduces the next generation of Imago™, the award-winning hard surface material, made through encapsulating fabric in a high-performance resin. Unlike its progenitor, however, the new ImagoPrints employs overlapping graphic imagery to achieve a unique lenticular effect.

ImagoPrints provides a new platform for designers to use depth, texture, color and pattern in sheets of high performance translucent thermoplastic.

Using General Electric's well-known high-performance LEXAN® polycarbonate sheet as its core, ImagoPrints patterns are fused, through a layering technique, to each side of the LEXAN sheet. The durable exterior coating on both sides resists scratching and damage from most chemicals.

At half the weight of glass, ImagoPrints offers excellent performance attributes combining the outstanding properties of GE's LEXAN and very high strength across a wide range of temperatures. Imago Prints is available in six standard gauges from 1/16" to 1/2" thick.

For more information on LEXAN, please visit the website: www.gestructuredproducts.com or www.gelexan.com. You may also contact your local KnollTextiles representative, or KnollTextiles Customer Service at 866.565.KTKT or knolltextiles@knoll.com.

As with any material, the fabricator should thoroughly test the specified Imago for use in the project's application.

Material Properties

The following material properties are dependent on sheet thickness:

- **Weight:** lbs/48" x 96" sheet

Sheet Thickness (gauge):

1/16"	1/8"	3/16"	1/4"	3/8"	1/2"
13lbs	24lbs	36lbs	47lbs	74lbs	100lbs

- **Impact Strength:** Un-Notched (23° C) ASTM D4812 Nonbreak (ft-lbs/in)
(-20° C) ASTM D4812 Nonbreak (ft-lbs/in)

Note: ImagoPrints material did not shatter or fracture during this strength test. Under imposition of extreme weight /pressure impact, ImagoPrints, instead, exhibited varying levels of elongation/distortion. This does not mean that ImagoPrints cannot be fractured under any conditions (e.g., hit on a corner by forklift).

ASTM D3763 – Dynatup High Speed Puncture Impact Test

- 1/6" = 12 ft/lb
- 1/8" = 45 ft/lb
- 1/4" = 99 ft/lb
- 3/8" & 1/2" = exceeds limits of machine

• **Radii Minimum for Cold Bending:**

Sheet Thickness (gauge):			
1/16"	1/8"	3/16"	1/4"
6.25"	12.5"	18.75"	25"

Note: ImagoPrints sheets which are bent under non-heat molding conditions should be held in channels or another appropriate system for restraint. The memory in the ImagoPrints sheets will naturally cause it to flatten without such appropriate restraint. Cold bending sheets above 1/4" presents practical fabrication difficulty.

- **Structural Use:** ImagoPrints is not recommended for use in structural applications inconsistent with its impact strength, flex modulus, and other properties. Contact KnollTextiles if you have questions regarding a specific application.

- **Custom Size:** Imago is available in a 4x10' sheet as a custom order.

- **Thickness:** Gauges below 1/8" are not generally recommended for horizontal work surfaces (refer to Flex Modulus section)

- **Tolerance:**

<i>Gauge:</i>			
1/16"	.060		+/-10%
1/8"	.118		+/-5%
3/16"	.177		+/-5%
1/4"	.236		+/-5%
3/8"	.375		+/-5%
1/2"	.500		+/-5%

<i>Dimensions:</i>			
Width	-1/4"		+/-3/4"
Length	-1/4"		+/-1"

<i>Squareness:</i>			
For sheets up to 8'		.250"	(max)
For sheets over 8'		.500"	(max)

The following material properties are not as dependent on sheet thickness; they include:

- **Heat Resistance:** Avoid prolonged exposure to 250°F+ temperatures to avoid softening
- **Water Resistance:** Edges can be exposed to water without damaging ImagoPrints
- **Thermal Expansion:** Coefficient of Thermal Expansion ASTM D696 = 3.75×10^{-5} (in/in/°F)
- **UV Resistance:** No visual effect at 3,000 hrs using 351 QUV bulb

- **Light Transmission:**

Product	% Range (varied by color)
Pixelated	70-80%
Altered Lines	45-55%
Ikats Blocks	15-45% (dark areas)
	80-90% (light areas)

Note: Results vary by pattern/color combination

- **Chemical Resistance:** ImagoPrints may be exposed to many chemical substances, without damage, including 30% sulfuric acid, 20% hydrochloric acid, 10% nitric acid, 10% citric acid and ethyl alcohol. *However, Benzene, Acetone, Toluene, highly alkaline cleaners, or abrasive substances should never be used.*
- **Cleaning:** Most substances can be easily cleaned from ImagoPrints, with a variety of commercial cleaning products, including Windex, Fantastik, Formula 409, isopropyl alcohol and bleach solution. Markers, however, should be avoided, as commercial inks may stain. *Do not clean in hot sun or at elevated temperatures.*
- **General Notes:** Corners of ImagoPrints sheets may be chipped if sheets are dropped, or otherwise subjected to abusive handling. Never scrape with razor blades or other sharp instruments.
Please note which side is the face of ImagoPrints. Sheets of ImagoPrints are generally shipped with a protective “peel coat,” or mask on both sides.
- **MSDS:** Available upon request: 866.565.5858 or knolltextiles.com
- **Specification Writing:** AIA Masterspec: Section 08840 Plastic Glazing: Information from this Imago Technical Information guide may be inserted in 08840, based on usage of material.

• **Flex Data:** ImagoPrints Flex Modulus

Plate deflection due to its own weight

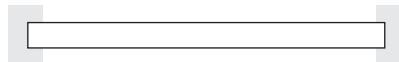
Simply supported on all four edges



Sheet Size (in)	Sheet Thickness	Center Deflection (in)
24 x 48	1/16"	0.427" (27/64")
24 x 48	1/8"	0.233" (15/64")
24 x 48	3/16"	0.120" (8/64")
24 x 48	1/4"	0.069" (4/64")
24 x 48	3/8"	0.030" (2/64")
24 x 48	1/2"	0.017" (1/64")
48 x 96	1/16"	1.380" (1 - 24/64")
48 x 96	1/8"	1.100" (1 - 8/64")
48 x 96	3/16"	.940" (60/64")
48 x 96	1/4"	.760" (48/64")
48 x 96	3/8"	.456" (29/64")
48 x 96	1/2"	.274" (18/64")

Plate deflection due to its own weight

Clamped on all four edges



Sheet Size (in)	Sheet Thickness	Center Deflection (in)
24 x 48	1/16"	0.094" (6/64")
24 x 48	1/8"	0.062" (4/64")
24 x 48	3/16"	0.030" (2/64")
24 x 48	1/4"	0.017" (1/64")
24 x 48	3/8"	0.008" (1/64")
24 x 48	1/2"	0.004" (0/64")
48 x 96	1/16"	0.308" (20/64")
48 x 96	1/8"	0.278" (18/64")
48 x 96	3/16"	0.249" (16/64")
48 x 96	1/4"	0.207" (13/64")
48 x 96	3/8"	0.119" (8/64")
48 x 96	1/2"	0.069" (4/64")

Concentrated load on center • Clamped on all four edges



Sheet Size (in)	Gauge	Center Load (lb)	Center Deflection
48 x 96	1/16"	0.1	0.145" (9/64")
48 x 96	1/8"	0.1	0.026" (2/64")
48 x 96	3/16"	0.1	0.008" (1/64")
48 x 96	1/4"	0.1	0.004" (0/64")
48 x 96	3/8"	0.1	0.001" (0/64")
48 x 96	1/2"	0.1	0.000" (0/64")
48 x 96	1/16"	3.0	0.265" (17/64")
48 x 96	1/8"	3.0	0.075" (5/64")
48 x 96	3/16"	3.0	0.024" (2/64")
48 x 96	1/4"	3.0	0.011" (1/64")
48 x 96	3/8"	3.0	0.004" (0/64")
48 x 96	1/2"	3.0	0.002" (0/64")
48 x 96	1/16"	25.0	1.906" (1 - 58/64")
48 x 96	1/8"	25.0	1.255" (1 - 16/64")
48 x 96	3/16"	25.0	0.862" (55/64")
48 x 96	1/4"	25.0	0.608" (39/64")
48 x 96	3/8"	25.0	0.317" (20/64")
48 x 96	1/2"	25.0	0.169" (11/64")
48 x 96	1/16"	100.0	2.900" (2 - 58/64")
48 x 96	1/8"	100.0	2.340" (2 - 22/64")
48 x 96	3/16"	100.0	1.760" (1 - 49/64")
48 x 96	1/4"	100.0	1.380" (1 - 24/64")
48 x 96	3/8"	100.0	0.900" (58/64")
48 x 96	1/2"	100.0	0.590" (38/64")
24 x 48	1/16"	0.1	0.053" (3/64")
24 x 48	1/8"	0.1	0.007" (0/64")
24 x 48	3/16"	0.1	0.002" (0/64")
24 x 48	1/4"	0.1	0.001" (0/64")
24 x 48	3/8"	0.1	0.000" (0/64")
24 x 48	1/2"	0.1	0.000" (0/64")
24 x 48	1/16"	3.0	0.132" (8/64")
24 x 48	1/8"	3.0	0.030" (2/64")
24 x 48	3/16"	3.0	0.010" (1/64")
24 x 48	1/4"	3.0	0.004" (0/64")
24 x 48	3/8"	3.0	0.001" (0/64")
24 x 48	1/2"	3.0	0.000" (0/64")
24 x 48	1/16"	25.0	1.165" (1 - 11/64")
24 x 48	1/8"	25.0	0.643" (41/64")
24 x 48	3/16"	25.0	0.417" (27/64")
24 x 48	1/4"	25.0	0.238" (15/64")
24 x 48	3/8"	25.0	0.097" (6/64")
24 x 48	1/2"	25.0	0.047" (3/64")
24 x 48	1/16"	100.0	1.688" (1 - 44/64")
24 x 48	1/8"	100.0	1.300" (1 - 19/64")
24 x 48	3/16"	100.0	0.905" (58/64")
24 x 48	1/4"	100.0	0.656" (42/64")
24 x 48	3/8"	100.0	0.357" (23/64")
24 x 48	1/2"	100.0	0.188" (12/64")

Building Code Compliance: Flammability and Smoke

ImagoPrints meets the performance requirements established by the United States model building codes for light-transmitting plastics. The provisions of these codes provide adequate regulation for most applications of light-transmitting plastics.

NFPA 101 (section 6-5.3) refers use of light-transmitting plastics for interior applications to authorities and organizations having local jurisdiction. Such authorities and organizations typically adopt the U.S. Model Building Codes, which are supported by the organizations listed below:

- Building Officials and Code Administrators International (BOCA)
- International Conference of Building Officials (ICBO)
- Southern Building Code Congress International (SBCCI)

These organizations have united under the International Code Compliance (ICC) umbrella. Lighttransmitting plastics usually melt, burn, and smoke more readily than glass, metals, or wood. As a result, for such materials, there are three specific ASTM tests, evaluation of which forms the basis for a plastic material to become recognized by ICC. These three ASTM tests are required in the 2000 International Building Codes (IBC), upon which the ICC relies for material compliance.

ImagoPrints Flammability/Smoke Test Results:

Test	Result	Data
ASTM D2843 Smoke Density Rating	Pass	53% density vs. 75% maximum allowable
ASTM D635 Combustion Rating	Pass	CC-1 rating
ASTM D1929 Self-Ignition Temperature	Pass	1002°F ignition vs. 650°F minimum

Having passed the required tests, ImagoPrints is under consideration for formal ICC certification as a light-transmitting plastic.

Note: ASTM E84 / UL723 tests do not accurately characterize the flame and smoke performance of light-transmitting plastics. These tests, virtually identical in methodology and criteria, measure the Flame Spread Index and Smoke Density of a material relative to red oak in ceiling position. Both standards recognize the problem with thermoplastic materials that soften and melt before burning, unlike wood. Materials that fall to the floor of the 12" high tunnel may contribute to ceiling burning which is unrealistic in actual installations. Because of this, the smoke generation may become artificially high in these test conditions.

The combination ASTM D635 and ASTM D2843 tests also measure the flame spread and smoke density of a material, but these tests (see above) are designed specifically for plastics.

UL723/Surface Burning Characteristics	Class A	Flame Spread	0 vs. 25 max
ASTM E84		Smoke Generation	20 vs. 450 max*

* In accordance with convention for testing light-transmitting plastics, this data was collected while sample remained in the original test fixture position. Results do not include material that ignited on the furnace floor, for reasons noted above, and were measured at the greatest length intended for use (8 feet). Smoke Generation results would be significantly improved, 0 (instead of the 20 above), if measured at the point of material ignition on the floor.

UL94 is a vertical flame test of light-transmitting plastics for use in electrical appliances. ImagoPrints at 1/8" gauge complies with a HB rating on this test and 1/4" complies with a V-0 rating.

If used as 15% or more of the surface area of a major component core (typically, a panel) of an electrified office furnishing system, ImagoPrints, under UL 1286, sections 18.1 and 18.2, should be marked with a label indicating a smoke development index exceeding 450. This is consistent with labeling of other decorative plastics, such as acrylic, on such systems. This section of UL 1286 requires the use of the test measurement protocol, which does not recognize the inherently different characteristics of thermoplastics (discussed above).

A possible restriction of ImagoPrints for use when classified as a light diffusing system (typically suspended from the ceiling) exists in the 2000 IBC section 2606.7, where in non-approved automatic sprinkler systems, usage of plastics may not exceed 25% of the aggregate area of the ceiling in which the panels are installed.

The statements, technical information and recommendations contained herein are believed to be accurate as of the date indicated. Properties reported herein are typical of average lots. KnollTextiles makes no representations that the Imago in any particular shipment will conform exactly to the values shown. KnollTextiles expressly disclaims any and all liability as to any results obtained or arising from any use of Imago or reliance on this information. No warranty is made of the fitness for use of Imago, and nothing herein waives any of the Seller's conditions of sale.