

SABIC Innovative Plastics, Specialty Film & Sheet

Lexan F2500 sheet Product Introduction

Sharing our futures

Sharing Our Futures

SABIC is a \$40.6 billion industry leader that is:

One of the largest producers of:

- Polyethylene, Polypropylene, Polycarbonate, glycols, methanol, MTBE, fertilizers and steel

A global resource with:

- SABIC operations in 40+ countries
- 45+ state-of-the-art manufacturing facilities
- 31,000+ employees

Recognized and admired as a:

- Fortune 500 and Fortune Most Admired Company
- 2006 Platts Petrochemical Company of the Year

Committed to SABIC Innovative Plastics' business, global operations and talented employees



A Path of Commitment and Growth

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Our Heritage of Innovation Has Changed the Industry



- **We have been manufacturing plastics since 1935**
- **Our company created:**
 - Polycarbonate (Lexan* resin) in 1953
 - PPO (Noryl* resin) in 1961
 - PEI (Ultem* resin) in 1985
 - Amorphous Thermoplastic Polyimide (Extem* resin) in 2006
- **Since 1950, we have over 5,000 patents issued and in force**

A changing world demands innovative products

Voluntary compliance to environmental standards tighter than RoHS is driving demand for "ECO" compliant FR films

- ❑ Apple Br,Cl<900ppm, Br+Cl<1500ppm
- ❑ Dell Br<1000ppm
- ❑ Sony PBB, PBDE N.D., including DecaBDE
- ❑ Acer Br<1000ppm

RoHS – Restricted of Hazardous Substances

OEMs published compliance dead-lines		
	<u>2009</u>	<u>2010</u>
	<ul style="list-style-type: none"> • Hewlett-Packard • LG Phillips • Lenovo • Toshiba • Dell 	<ul style="list-style-type: none"> • Inventec • Quanta • Delta • Liteon • Hipro
		<ul style="list-style-type: none"> • Asus • Acer • Samsung • Sony • NEC

Various ECO-FR Labels

- Voluntary measures introduced in 1970s
 - ↳ customer's conscientious decision
- >25 eco-labels worldwide



DIN/VDE
0472 part 815



Total Cl + Br < 0.2%, or Br < 0.4%
Total F < 0.1%



No Br, Cl
Allows PTFE as polymer or as additive



Blue Angel
No Br, Cl
Fluor-organic additives < 0.5% (e.g. PTFE)



EU flower
EU Directive on WEEE. RoHS - June 2006
Restriction of PBB and PBDE. Cl, Br < 900 ppm

LEXAN F2500 sheet

Optically Clear Sheet, Polished/Polished Surface

- Standard Gauges 2.0 – 6.0 mm
- Standard Sizes 1250 x 2050, 2050 x 3050 mm
- Available in Natural (11255) and Custom Colors
- Patent Pending Technology

Properties

- Flame Retardancy
- HWI, HAI
- CTI
- GWFI
- Impact resistance
- Light Transmission

Benefits

- UL 94 V0 at 2.0 mm
- UL 746A: 44 sec
- IEC 112/3: 200V
- IEC 60695-2-13: 960C
- Ductile
- ASTM D1003: 90%

**Complies with environmental friendly flame retardant (ECO-FR)
DIN/VDE 0472 part 815 norm**



0472 part 815

LEXAN F2500 sheet

Potential Applications:

- Electrical cabinet glazing
- LCD TV bezels
- LED micro lenses
- LED lamp covers



LEXAN F2500 Properties

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Lexan® F2500 Sheet

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Product Datasheet

Description

Lexan® F2500 sheet is a transparent Polycarbonate sheet which is Eco FR according to the VDE norm passing V0 at 2.0mm. In addition to good flammability performance, it offers excellent impact resistance, high optical quality, good stiffness and strength and ease of processing, making it an excellent candidate for a wide variety of applications in the electrical, electronic and transportation.

Typical Property Values*

Property	Test Method	Unit	Value
Physical			
Density	ISO 1183	g/cm ³	1.20
Water absorption, Equilibrium	ISO 62	%	0.35
Mechanical			
Tensile strength,	ISO 527	MPa	65
Tensile modulus	ISO 527	MPa	2000
Tensile elongation, yield	ISO 527	%	6
Tensile elongation, break		%	110
Flexural strength, yield	ISO 178	MPa	115
Flexural modulus	ISO 178	MPa	2350
Izod Notched Impact 23 °C	ISO 180/1A	kJ/m ²	40
-30 °C		kJ/m ²	37
-Gardner Impact 23°C	ISO 179/1A	kJ/m ²	>40
Thermal			
Vicat Softening Temp, Rate B/ 120	ISO 306	°C	145
Heat Deflection temperature 0.45 MPa	ISO 75/Be	°C	138
Thermal conductivity	ASTM C 177	W/m°C	0.2
Ball Pressure Test 75 °C	IEC 335-1	Pass	
Ball Pressure Test 125 °C	IEC 335-1	Pass	
Mold shrinkage	ISO 527	%	0.5-0.7
Thermal expansion	ASTM D696	1/ °C	7.10*
Electrical			
Hot Wire Ignition	UL 746A	sec	44
High Voltage Arc Tracking Rate	UL 746A	mm/s	5.2
High Ampere Arc Ign. Surface	UL 746A		44
Comparative Tracking Index,	IEC 112/3	V	200
Volume Resistivity	IEC 93	Ohm.cm	>10 ¹³
Surface Resistivity	IEC 93	Ohm	>10 ¹³
Dielectric Strength	IEC60243-1	kV/mm	27
Relative permittivity	IEC60250	SOHz	2.7
Flammability			
Limited Oxygen Index	ISO 4589	%	34
Glow Wire Test, 960 °C	IEC695-2-12	Pass	
UL94 V0 2.0mm	IEC695-11-10	pass V0 2 mm	
Optical			
Light Transmission	ASTM D1003	%	90
Taber Abrasion, CS10F, 500g, 100 cycles	ASTM D1044	% Haze	36

* These property values have been derived from Lexan® resin data for the material used to produce this sheet product.

* Trademarks of SABIC Innovative Plastics IP BV

Lexan®

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Lexan® F2500 Sheet

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Product Datasheet

Processing

Lexan® F2500 sheet is ideally suited to thermoforming. It offers high, deep draw ratios, equal wall thickness distribution, and it can be formed into complex shapes using standard thermoforming equipment. Sandwich type heating systems give the best results. Lexan F2500 sheet has a forming temperature range of 185 - 205°C. When forming, a draft angle of at least 3° should be allowed, and post mold shrinkage of 0.5 - 1.0% taken into account.

Pre-drying

It is important to ensure that Lexan F2500 sheets are free of moisture prior to thermoforming. A hot air circulating oven set at 120°C is recommended. Pre-drying times vary from 3-24 hours, depending on sheet thickness.

Assembling

Parts made from Lexan F2500 sheet can be assembled with plastics, metals, rubber and other materials using many types of adhesive bonding, welding and mechanical fastening techniques. Since some of these materials can cause environmental stress cracking, please consult SABIC Innovative Plastics for advice on specific applications.

Painting

For either functional or decorative reasons it may be necessary to apply finish to Lexan F2500 sheets or vacuum formed parts. The product is ideally suited for use with a wide variety of modern decoration techniques. A list of approved paint systems and suppliers is available upon request.

Chemical Resistance

Lexan F2500 sheet has sufficient resistance to most mineral oils, greases, aliphatic hydrocarbons and acids under low or moderate stress levels. In applications where the Lexan F2500 sheet will come into contact with aggressive chemicals, specific (application related) testing is always advised. Effective painting systems can improve chemical resistance.

Product Availability

Product code: Lexan F2500 Sheet
Standard size: 1250 x 2050mm
Gauges: 1.5 to 6.0 mm
Textures: Polished/Polished
Colors: Clear 11255
Other colors/sizes are available by special request.

Lexan® Tough
Polycarbonate Sheet Virtually
Unbreakable

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Latest update SABIC (02/2011)

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Official UL Yellow card F2500

Top of Form

Component - Plastics E 103380

SABIC INNOVATIVE PLASTICS B V
 SHEET & FILM PRODUCTS - EUROPE, PLASTICSLAAN 1, BERGEN OP ZOOM 4612 PX NL


F2500
Polycarbonate (PC), "Lexan", furnished as sheets

Color	Min Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
NC	2.0	V-0	2	1	80	80	80

Comparative Tracking Index (CTI): - Dimensional Stability (%): -
 High-Voltage Arc Tracking Rate (HVTR): - High Volt, Low Current Arc Resis (D495): -
 Dielectric Strength (kV/mm): - Volume Resistivity (10¹⁴ ohm-cm): -

NOTE - Material designations may be suffixed by any combination of letters and/or numbers.

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 1988-06-06 
 Last Revised: 2010-12-03 Underwriters Laboratories Inc®

IEC and ISO Test Methods

Test Name	Test Method	Units	Thickness Tested (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	2.0	V-0 (NC)
Glow-Wire Flammability (GWFI)	IEC 60695-2-12	C	2.0	960
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	C	-	-
IEC Comparative Tracking Index	IEC 60112	Volts (Max)	3.0	CTI200
IEC Ball Pressure	IEC 60695-10-2	C	-	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	C	-	-
ISO Tensile Strength	ISO 527-2	MPa	-	-
ISO Flexural Strength	ISO 178	MPa	-	-
ISO Tensile Impact	ISO 8256	kJ/m ²	-	-
ISO Izod Impact	ISO 180	kJ/m ²	-	-
ISO Charpy Impact	ISO 179-2	kJ/m ²	-	-

Underwriters Laboratories Inc®

- UL V0 at 2.0 mm.
- GWT : 960 oC
- HAI / HWI /CTI

F2500 is our best UL V0 grade

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