



Product Data Sheet

Lexan® SG305 Sheet for signs

Introduction

GE Structured Products range of Lexan® sheet sign grades SG305 offers significant advantages over many other sign materials in terms of design freedom, fire performance and weathering properties. It also combines high impact resistance with optical clarity that provides excellent protection against vandalism, ensuring a positive corporate image. Lexan SG305 is available in clear and opal white sheet with a matte finish on the outside surface for reduced reflection and glare. Lexan SG305 has proprietary UV protected surfaces giving excellent durability to outdoor weathering.

Product Range

Lexan SG305 sheet is available on economical spools as well as sheet, making it easy to cut non standard sizes.

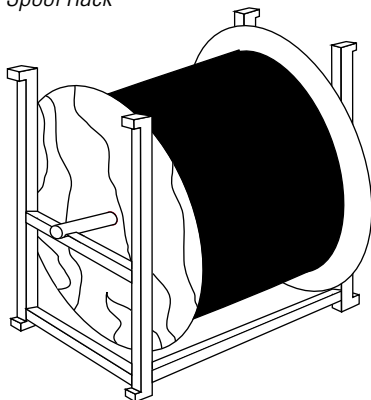
Sheet Availability

Gauges	Size (mm)	Standard colours
2, 3, 4, 5, 6	2050 x 3050	Clear 112, 82943

Spool Availability

Gauge (mm)	Width (mm) (full web (mm))	Length (m)	Weight (kg)
2	1250	250	750
3	(1300)	167	750
4		125	750
2	2050	152	748
3	(2150)	100	738
4		76	748

Spool Rack



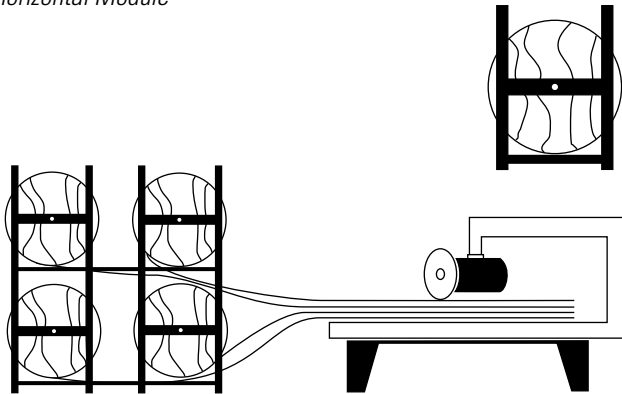
Spool handling and storing

A spool handling frame which holds a full spool of Lexan sheet roll stock, greatly simplifies storage and handling. Spools can be used in either vertical or horizontal position.

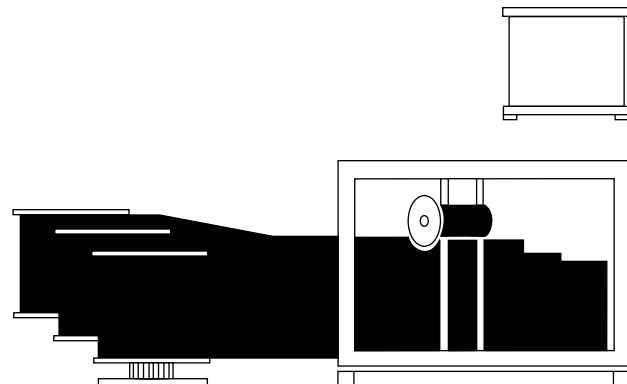
Spool handling and storing

Material	Flange diameter (mm)	Core diameter (mm)	Sheet width (mm)	Core width (mm)	Outer width (mm)	Weight (Kgs)
wood	1400	1000	1250	1440	1568	235
			2050	2230	2358	320

Horizontal Module



Vertical Module



Light transmission

		Light transmission in % *
Sheet thickness	Colour no.	Lexan SG305
2 - 6	112	85%
2 - 6	82943	25%

* Typical values only
Light transmission values may vary by + or - 5%

Lexan SG305 is essential opaque to all wave lengths below 385 nanometers. This useful shielding property prevent discolouration of posters placed behind the Lexan sheet, second surface graphics and lacquers applied to the reverse side.

UV protection

With a proprietary UV resistant surface treatment on both sides SG305 withstands prolonged exposure to harsh sunlight. The superior UV protected surface treatment is not affected by forming and fabricating, and Lexan SG305 sheet is therefore backed by a 10 years warranty* against yellowing, loss of light transmission and breakage.

*see warranty for details

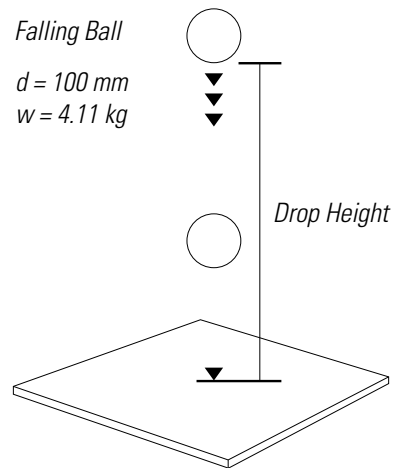
Impact strength

Using SG305, signs can be installed in areas of high vandalism. Even at sub zero temperatures or high summer temperatures Lexan sheet maintains its high impact resistance, without shattering or breaking.

Steel ball impact test

Lexan sheet products meet the highest impact performance required by the European Norm prEN356 for security glazing.

A steel ball of 4.11 kgs with a diameter of 100 mm is dropped freely from a max. height of 9 mtr. onto the Lexan sheet specimen. The steel ball must impact the Lexan sheet 9 times. The material fulfills the requirements of the test if all impacts do not cause penetration by the steel ball.



Temperature resistancy

In areas with intense sun radiation, heat build up of the sign material can be considerable, especially at high absorbing dark tinted sign faces. Such conditions do not harm the Lexan sign material nor lead to unacceptable permanent deformation of the sign face since Lexan sheet retain 85% of its room temperature stiffness at 82°C, and has a continuous use temperature of 100°C according UL 746 B. At the other hand of the scale the minimum continuous use temperature has been set as -40°C but lower temperatures is possible since the embrittlement temperature is as low as -110°C.

Fire performance

Lexan SG305 has good fire behaviour characteristics. Lexan sheet does not contribute significantly to the spread of fire or to the generation of toxic gases.

For details please contact your local sales office.

Cutting and drilling

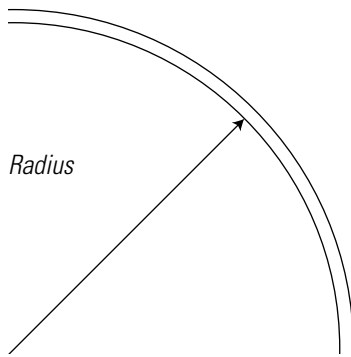
Lexan sign grades can be cut and sawn easily and accurately using standard workshop equipment. Circular saws, band saws, jig saws and common hacksaws, all with fine toothed panel blades, can be used. Standard high speed steel twist drills or carbide tipped drills can be used for drilling Lexan sheet products. The sheet must be always securely clamped to avoid rough cut edge by undesirable vibration and the masking should be left on the sheet to prevent surface damage by scratching.

Design freedom

Cold Curving

Cold curving of Lexan sheet sign grades are acceptable for shapes having a radius of 175 times the material thickness or greater.

Lexan sheet thickness	minimum allowable radius in mm
2 mm	350
3 mm	525
4 mm	700
5 mm	875
6 mm	1050



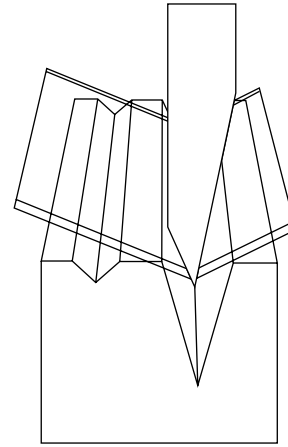
Cold line bending

Cold line bending of Lexan SG305 is possible since Lexan sheet products are very ductile.

Recommendations for cold line bending

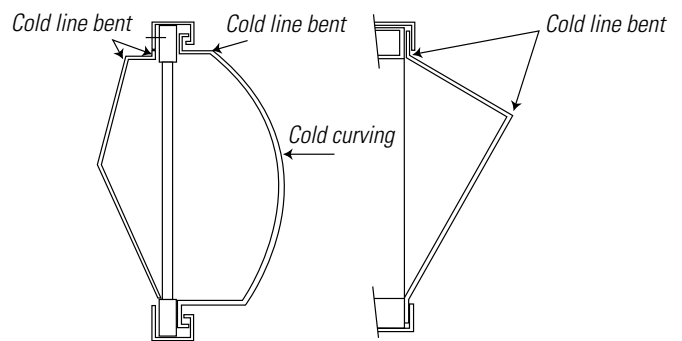
- Use hydraulic bend equipment
- The protective masking should be left during bending process
- Angle maximum 90°
- Use sharp tool edges
- Bending operation should be performed quickly
- Lexan SG305 can be bent with the textured surface either in compression or tension.
- Overbending is required to achieve the desired angle
- Smooth and notch free edge of Lexan sheet to avoid side cracking
- Allow sufficient time for sheet stress relaxation (1-2 days)

For more details please consult SPE Technical Department



Design Possibilities by curving and line bending

Attractive and cost effective signs in 2D shapes by cold curving or cold line bending of Lexan SG305 sheet is possible without the need of special tools.



Thermoforming

It is necessary to dry Lexan SG305 sheet prior to thermoforming e.g. vacuumforming in a hot circulating oven at 125°C during 3 up to 24 hours depending on sheet thickness (see table below). Thermoforming without pre-drying could cause air bubbles in the sheet. Lexan sheet can be easily thermoformed with sharp detail on any conventional forming equipment which is equipped with its own sandwich type of heating devices. Normal processing temperatures are between 175 and 200°C. A variety of materials can be used for moulds including wood for small series of production and more durable material is required e.g. metal filled polyester, epoxies, aluminium or metal for large production runs. Screenprinted Lexan sheet before thermoforming is possible using high heat resistance silk screen inks.

For detailed information please consult our Forming, Fabricating and Finishing brochure.

Drying times

Gauge (mm)	hrs (125°C)
2	3
3	4
4	10
5	16
6	24

Determining sheet thickness

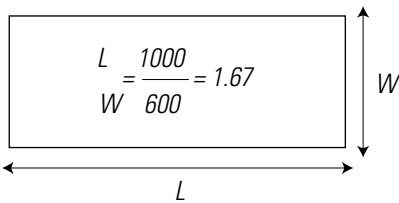
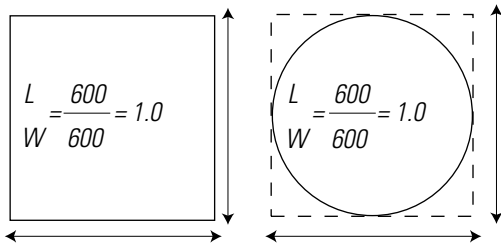
Flat Lexan sheet sign faces

Three factors determine the thickness of sheet for flat, unbraced sign construction

- 1) Ratio sheet length/sheet width (aspect ratio)
- 2) Sheet fixation to sign structural members
- 3) Wind loading

The recommendations in the below mentioned table are based on a four sides bolted or clamped, with a minimum edge engagement of 25 mm, Lexan sheet up to a wind load of 1800 N/m².

Sheet thickness	Max. allowable sheet width (short sheet side in mm)			
	1:1	1:<1.5	1:<2	1:>2
2 mm	550	500	450	400
3 mm	750	690	630	575
4 mm	950	900	840	750
5 mm	1050	1000	950	900
6 mm	1250	1180	1100	1000
		Aspect ratio		



Formed Lexan sheet sign faces

Wind load, face shape amount of embossing/debossing and size are the major factors that determine required sheet thickness. The table below is applicable for thermoformed Lexan sheet with formed flat pan faces, 65 mm deep, four sides bolted or clamped, with a minimum edge engagement of 25 mm, up to a win load of 1800 N/m²



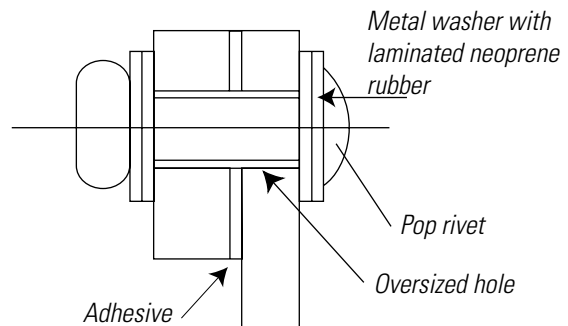
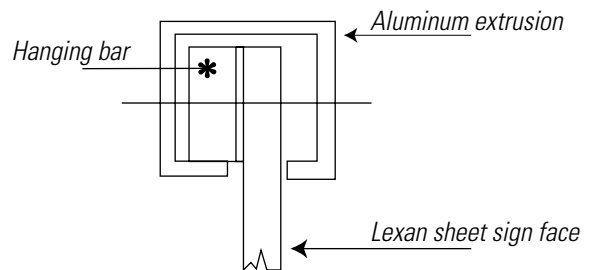
Taking into consideration both wind pressure and wind suction the following table has been developed, based on test data derived from loading tests, to provide suggested minimum thickness of Lexan sheet.

Short side in mm	Minimum sheet thickness
<500	2mm
<800	3 mm
<1000	4 mm
<1200	5 mm
<1400	6 mm

Assemblies

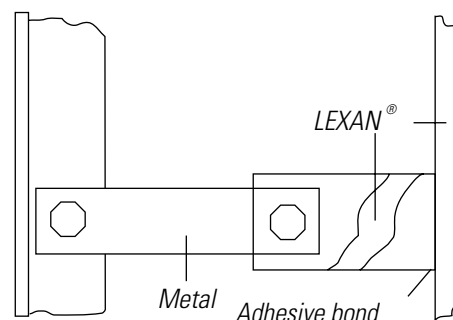
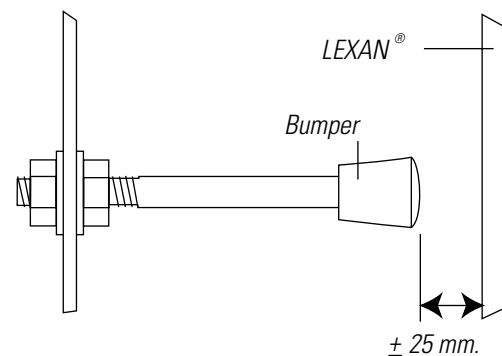
Hangers

When designing large flat faced Lexan sheet signs it is advisable, to overcome the tendency of large faces to sag, to install the sheet with hanging bars as indicated on the drawing. The bottom side of the sheet may not rest on the platform of the sign structural members. Hangers for Lexan sheet sign faces are made by fastening continuous strips of Lexan sheet or non - continuous strips of aluminum along the top edge of the face.



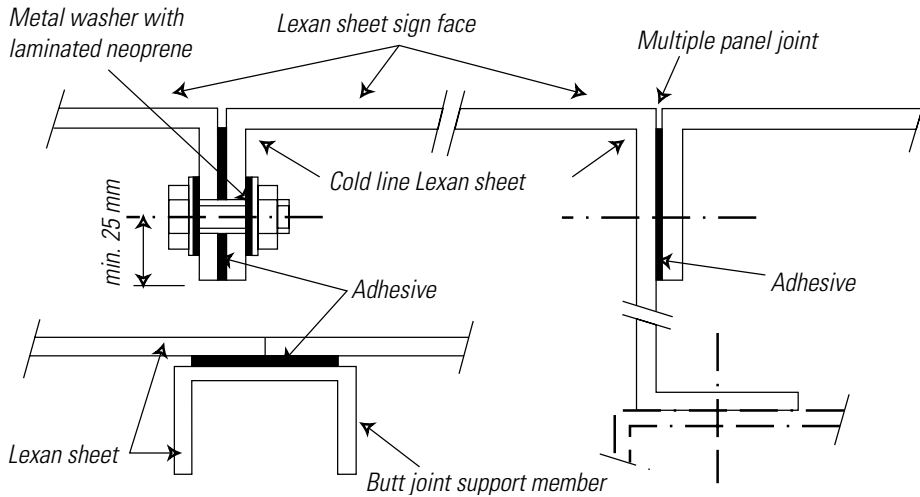
Internal Support

Bumpers are rubber tipped studs positioned behind a sign face to prevent excessive deflection of sign faces which may cause lamp breakage. To prevent shadowing the bumpers are positioned 25 mm from the sign face and fixed to the structural framework of the sign. Support pads can be attached to Lexan sheet sign faces using an approved adhesive bounding system. Support pads fixed to the structural framework of the sign are usually spaced in a uniform grid pattern over the sign.



Mechanical fasteners

Use only non-rusting fasteners such as aluminum pop-rivets or stainless steel bolts both with back up washers laminated with neoprene rubber. In all cases avoid direct metal/Lexan contact and pre-drill lexan sheet with holes that are approx. 3 mm oversized. When two or more Lexan sheet panels are joined use cold line bent returns for joining the panels and fastening the returns to minimize shadow effect and increase structural rigidity.



Adhesives/tapes

The use of adhesives and tapes to bond similar and dissimilar materials is now universal and offers a technique that is one of the most efficient and economical methods of joining components. The choice of adhesive or tape type is vast, as are the application area. It is vitally important therefore to select the adhesive or tape carefully, ensuring its compatibility with the material being used and the working environment.

Recommended Adhesives

Adhesive Type	Product Name	Joins Lexan® sheet to:	1/2 part System	Supplier	Comments
Epoxy	Scotch Weld® DP 110	Metals, Plastics Rubbers	2 part	3M Company	Fast curing, flexible epoxy with high shear strength
Epoxy	Scotch Weld® DP 190	Plastics	2 part	3M Company	Very flexible epoxy with high shear strength
Polyurethane	Bison Pur	Plastics, Metals, Wood	2 part	Perfecta	
Polyurethane	Plio-grip 6000	Plastics, Metals, Wood	2 part	Good Year	Flexible, very short pot life (10 min.)
Hot Melt	Jet Melt 3736 Jet Melt 3764	Plastics, Wood Plastics, Wood	1 part	3M Company	Good heat resistance, Oil and water resistant
Hot Melt	Macromelt XS6335	Plastics, Metal	1 part Glass, Ceramics	Henkel	Clear
Silicone	*SilprulR SCS2000	Lexan® uncoated Lexan® Exell® D Building Materials	1 part	GE Silicones	Excellent adhesion UV and weather resistant, flexible
Silicone	•SEA 210	Plastics, Glass	2 part	GE Silicones	Fast Cure
Tapes	Scotchtape	Plastics, Glass		3M Company	Double sided
		VHB Range	Metals		Pressure sensitive
Tapes	Fas Tape	Metals/Plastic		Fasson	Double coated
Tapes PS-18			Velcro	Hook and loop tape	
Tapes	SR 321			Multifoil	PE Foam, 2 sides
	SW 321				PE Foam, 2 sides

Decorating

Painting

Lexan sheet can be painted without surface treatment other than cleaning. Provided certain basic recommendations are followed, most technique used to apply paint to other materials, can be used for Lexan sign sheet products. Paint systems for Lexan sheet are readily available as standard items from various manufactures. Use only recommended paint.

Cut and spray painting

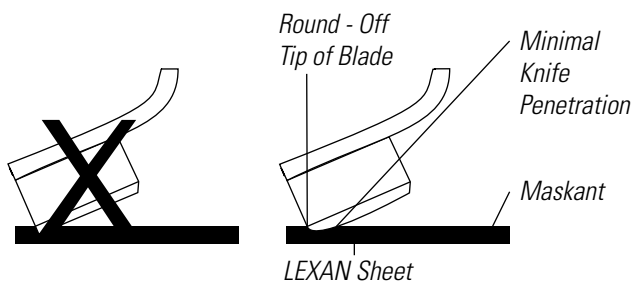
When employing cut and spray techniques, take care to avoid deep cuts in the Lexan sheet surface when cutting through the masking layer.

Painting Systems for LexanR sheet

Supplier	Paints	Thinner	Comments
AKZO	Autocryl	-	2K Acrylic
Coatings	01-69004 Class 45	06-302007	Primer/2K/PUR Top coat/2K/PUR
Diegel	PA 21	24896	1K Flex. acrylic
Schaepman	C1 F57	VOA 462	Acrylic
	C1 W28	Water	Acrylic/water based
	C4 P212	VOA421/H4P4	2K Acrylic
Herberts	R 47633	-	2 K Primer
		41605	11098
Basecoat			
BMW metallic	R 4790	-	2K Clearcoat
		R 4780	-
2K One layer system			
Becker	TH 130 DJ-331-5176	NT19	2K Top coat
		ET-134	1K Primer
(flexible)			
	TC 132	-	2K Clear coat
HSH	Interplan 1000		1K Water-based
Morton	L446	U987	1K Acrylic System

NB Form information regarding application techniques and property values please contact the relevant paint supplier.

Tool for Cutting spray Maskant



Screen printing process

Silk screen printing is a well established process that offers a wide variety of options for a decorative finish. We recommend to use the approved screen printing inks for Lexan sheet, see table.

Silk Screen Inks for Lexan® sheet

Supplier	Inks
Sericol	Seritec TH Polyplast PY Plastipure PP
Wiederhold	HG/PK/PK-Jet
Visprox	TCI 8700/STR 5700/ TCP 9900
Diegel	HV/Z
Gibbon Inks & Coating Ltd.	Malercryl Polyvin/ Marlerstryrene
Coates	Vynaglaze/Vynafresh/ Touchkey
Pröll	Jet 200/Thermo-Jet/ Noriprint PS
Marabu	Marastar SR/Maraplast D

Heat resistant silk screen inks, for prescreening flat Lexan sheet before thermoforming, are available from various manufacturers listed in the table.

Translucent films

Translucent vinyl films can be applied to Lexan SG305 sheet. This easy way of decorating save time and no special equipment is required. However when exposed to high temperature, the moisture in the sheet can sometimes cause bubbling beneath the films after application. To help minimize this, lexan sheet can be surface-predried in an air circulating oven for at least one hour at a minimum of 70°C. Apply the vinyl immediately after drying following the manufacturers guidelines. Supplier of films for Lexan sheet are: 3M Company and Fasson It is recommended to test films for chemical compatibility with Lexan sheet.

Anti-static treatment/cleaning

In common with all insulating materials Lexan sheet tends to build up a static charge. it is often necessary to clean and discharge surface prior to thermoforming, painting or screen printing. Special anti-static formulations are available which reduce the static charge.

Anti-static Products for Lexan® sheet

Company/Supplier	Product/Brand Name
American Cyanamid Co.	Cyastat SN50
AKZO Chemicals	No. 03643
Morton	S154

The use of liquid anti-static solutions can influence the bonding strength of the paint or inks. The risk can be overcome by washing with a chamois and water. Cleaning prior to thermoforming Lexan sheet it is recommended that dust is blow off with anionising air gun.

Cleaning and Maintenance

Large sign faces can be cleaned by a high pressure water and/or steam cleaner. Small sign faces can be cleaned with luke warm water with a solution of household detergent, using a soft cloth or sponge. Do not use a abrasive or highly alkaline cleaners and never scrape the sheet with squeegees, razor blades or other sharp instruments.

Chemical Resistance

Taking into account the complexity of chemical compatibility, all chemicals which come into contact with Lexan sheet should be tested. For sign products the most common materials are adhesives, paints, inks, vinyl films and cleaning. Consult our Technical Service Centre in the case of doubt about the chemical compatibility of a product which is not mentioned in one of the tables.

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