



Product Data Sheet

Lexan® Exell® D FR Sheet

Description

Lexan® Exell® D FR sheet is a transparent polycarbonate sheet with proprietary UV protection on both sides offering excellent weathering properties. With its excellent impact resistance it is ideally suited to a wide variety of building and construction applications.

Lexan ExellD FR sheet can be easily cold formed into gentle curves which make it ideal for skylights, covered walkways, barrel vaults etc. Lexan Exell DFR is thermoformable and can be thermoformed into the desired geometry whilst retaining the UV resistant coating specially developed for weather resistant applications.

Product Range

Lexan ExellD FR sheet is normally manufactured in the standard sizes listed below. Deliveries from stock or cut to size can be ordered via our customer service organisation.

Standard gauge in mm 2 - 3 - 4 - 5 - 8		
Standard sizes:	Masking:	Standard colours:
1250 x 2050 mm	Top side: Coex. opal white PE/	clear code 112
2050 x 3050 mm	purple print	
2050 x 6050 mm	Bottom side: Coex. transparent foil	

Light Transmission

Transparent Lexan ExellD FR sheet have excellent light transmission, between 84 and 87%. However for buildings in hot climates or with south facing aspects, Lexan ExellD FR is available in translucent bronze, grey and opal white. Lexan ExellD FR is essential opaque to all wave lengths below 385 nanometers. This useful shielding property can prevent discoloration of sensitive materials placed under or behind Lexan Exell DFR sheet.

UV Protection

Lexan ExellD FR sheet has proprietary UV protected surfaces, giving excellent durability to outdoor weathering. This superior UV resistance and toughness of Lexan ExellD FR sheet is backed by a 10 years limited warranty against yellowing, loss of light transmission and breakage.



Lexan Exell DFR sheet Colour Number	light transmission* %	solar reflection %	solar absorption %	direct solar transmission %	total solar transmission %	shading coefficient
Transparent 112	87	9	9	82	84	0.97

* Typical value only. Light transmission value may vary by plus or minus 5%.

Sound Reduction

Installing Lexan ExellD FR into single or in overglazing with glass meets the acoustic requirements for today's glazing.

Acoustic insulation DIN 52210-75 Rw (dB)		Double glazing with glass		
Thickness (mm)	Lexan ExellD FR sheet Rw in dB	Air Space in mm	Glass (mm)	Rw in dB of combination
4	27	85	6	39
5	28	85	6	40
6	29	85	6	42
8	31	85	6	44

Thermal Insulation

When using Lexan ExellD FR as single or in combination with glass considerable energy cost savings can be achieved by preventing excessive heat loss. Lexan ExellD FR as internal or external glazing can improve the burglary resistance. Lexan Exell DFR as external installations can protect against vandalism.

K-values W/M ² •K		Double Glazing with glass		
Thickness (mm)	Lexan ExellD FR sheet W/m ² •K	Air Space in mm	Thickness glass in mm	K-values combination W/m ² •K
4	5.33	20-60	4	2.77
5	5.21	20-60	4	2.73
6	5.09	20-60	5	2.72
8	4.84	20-60	4	2.70

Fire Performance

French Norm NF P92-505 M2 Classification are available for ExellD FR transparent grades with thickness 2, 3, 4, 5, 8mm .

Chemical Resistance

Lexan ExellD FR sheet has sufficient resistance to most chemical substances encountered in normal building materials. Most common building materials are sealants, gaskets and the various cleaning media. Silicone sealants and neoprene or EPDM gaskets are generally recommended for use with Lexan ExellD FR sheet. It is strongly advised that when using glazing compounds or cleaning media to check compatibility before use.

Norm prEN356

Steel Ball Impact test

Lexan ExellD FR meets the highest impact performance required by the European Norm prEN356 for security glazing. A steel ball of 4.11 kg with a diameter of 100 mm is dropped freely from different heights onto the glazing specimen. The steel ball must impact the specimen 3 times. Lexan Exell DFR reached the highest standard required by the test at a thickness of 5 mm and above.

Category of resistance	Drop Height in mm	Total number of strikes	Code designation for category of resistance	Impact energy per stroke
P1A	1500	3 in a triangle	EN 356 P1A	62 Joule
P2A	3000	3 in a triangle	EN 356 P2A	123 Joule
P3A	6000	3 in a triangle	EN 356 P3A	247 Joule
P4A	9000	3 in a triangle	EN 356 P4A	370 Joule
P5A	9000	3x3 in a triangle	EN 356 P5A	370 Joule

Cutting and Sawing

Lexan ExellD FR can be cut and sawn easily and accurately using standard workshop equipment. The sheet must always be securely clamped to avoid undesirable vibration and rough cut edges. The protective masking should be left on the sheet to prevent scratching and other surface damage.

Design Freedom

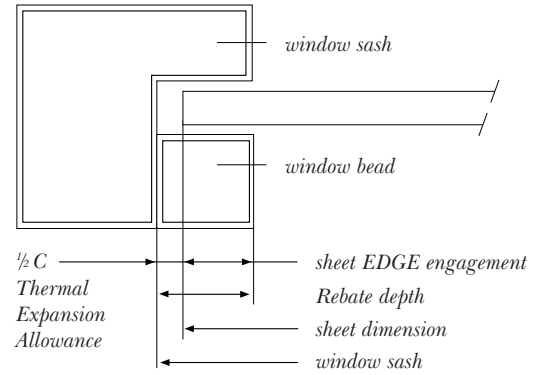
Lexan ExellD FR sheet can be easily cold formed into gentle curves of 175 times the sheet thickness. It can also be cold line bent under an angle of a maximum of 90 using hydraulic workshop equipment. Lexan ExellD FR is a thermoformed sheet which can be thermoformed into the desired geometry whilst retaining the UV resistance.

Thermal Expansion Allowance

Since Lexan ExellD FR sheet has a larger linear thermal coefficient of expansion than of the glazing profiles commonly used, care should be taken to allow free expansion of the sheet to avoid bowing. In general: Thermal expansion of the sheet is approximately 3 mm per linear meter.

Thermal Expansion/Sheet edge engagement		
Sash Dimensions (A+B) (mm)	Trim Sheet by C (mm)	Sheet edge engagement (mm)
300	1	6
300	1	6
300 - 600	1 - 2	6 - 9
600 - 900	2 - 3	9 - 12
900 - 1200	3 - 4	12 - 15
1200 - 1500	4 - 5	15 - 18
1500 - 1800	5 - 6	18 - 20
1800 - 2100	6 - 7	20

For window sizes exceeding 2000 mm, sheet edge engagement of around 20 mm is sufficient.



Wet glazing

Lexan ExellD FR can be glazed using normal standard metal or wooden window frames in combination with glazing tapes and elastomeric glazing compounds e.g. silicone sealant.

Dry glazing

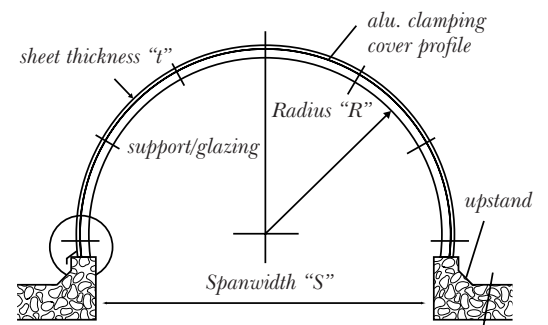
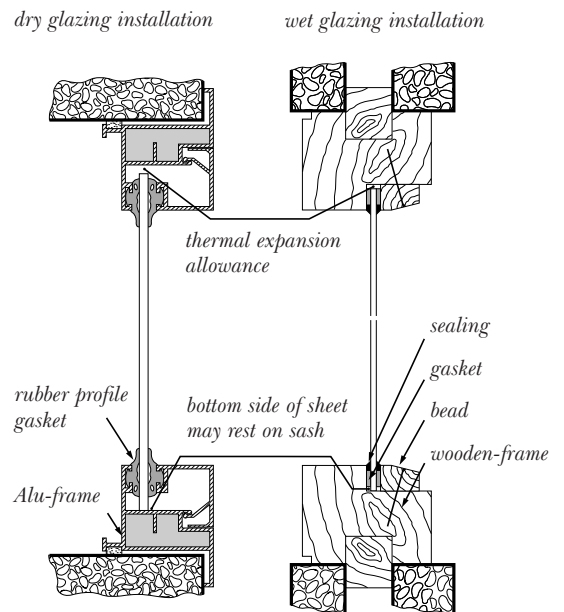
The advantage of dry glazing is that the rubber gaskets snap fit into the glazing bars which allows free movement of the sheet during expansion and contraction.

Sheet thickness selection

Lexan Exell DFR thickness in mm	Shortest sheet side (Ratio sheet width/sheet length 1:>2) Center to center distance glazing profiles in mm.						
	400	375	450	425	400	490	470
3	550	490	575	550	510	575	550
4	675	625	680	650	600	675	650
5	800	725	825	780	730	800	775
6	1150	1000	1100	1050	1000	1100	1050
8							
Loading in n/m ²	600	800	1000	1200	1400	1600	1800

Curved glazing

Lexan ExellD FR thickness in mm	Minimum allowable Radius in mm
3	525
4	700
5	875
6	1050
8	1400

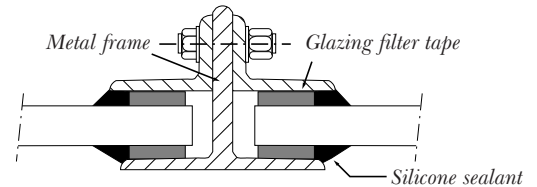


Radius in meters

		2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	
Lexan® Sheet thickness in mm	3	0.48	0.40										600
	4	0.97	0.85	0.75	0.68	0.6	0.55						
	5	1.68	1.45	1.3	1.15	1.03	0.95	0.88	0.8	0.74	0.68	0.63	
	6		2.05	2.0	1.8	1.6	1.46	1.34	1.24	1.14	1.05	1.0	
	8										2.05	1.9	
	3												800
	4	0.75	0.65	0.58	0.53								
	5	1.26	1.1	0.98	0.88	0.8	0.73	0.67	0.6	0.56			
	6	1.95	1.72	1.52	1.36	1.22	1.12	1.02	0.95	0.87	0.8	0.75	
	8					2.05	2.0	1.85	1.72	1.6	1.5	1.4	
	3												1000
	4	0.6	0.53										
	5	1.02	0.9	0.8	0.72	0.65	0.6						
	6	1.58	1.37	1.22	1.1	1.0	0.9	0.8	0.77	0.7			
	8				2.05	1.95	1.8	1.63	1.5	1.4	1.3	1.2	
	3												1200
4	0.5												
5	0.86	0.76	0.67	0.6									
6	1.32	1.16	1.03	0.93	0.85	0.77	0.7						
8			2.05	1.85	1.66	1.5	1.38	1.28	1.17	1.1	1.02		
		<i>Distance between curved profiles in meters</i>											

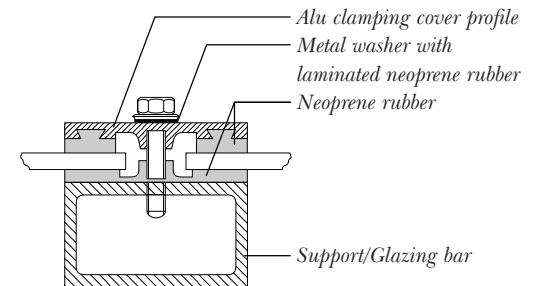
Lexan® Sheet curved glazing using standard metal profiles

This type of installation system is mainly used in small domestic type applications, car ports, warehouses, conservatories and other glass replacement situations.



Lexan Sheet curved glazing using patented glazing systems

There are many patented glazing systems commercially available. Many of these systems have already proved to be suitable for curved constructions in combination with Lexan® sheet.



Cleaning

For small areas wash sheet with a solution of mild soap and lukewarm water, using a soft cloth or sponge. For larger areas clean surface with a high pressure water and/or steam cleaner. Do not use abrasive cleaners or detergents or sharp instruments which may scratch.