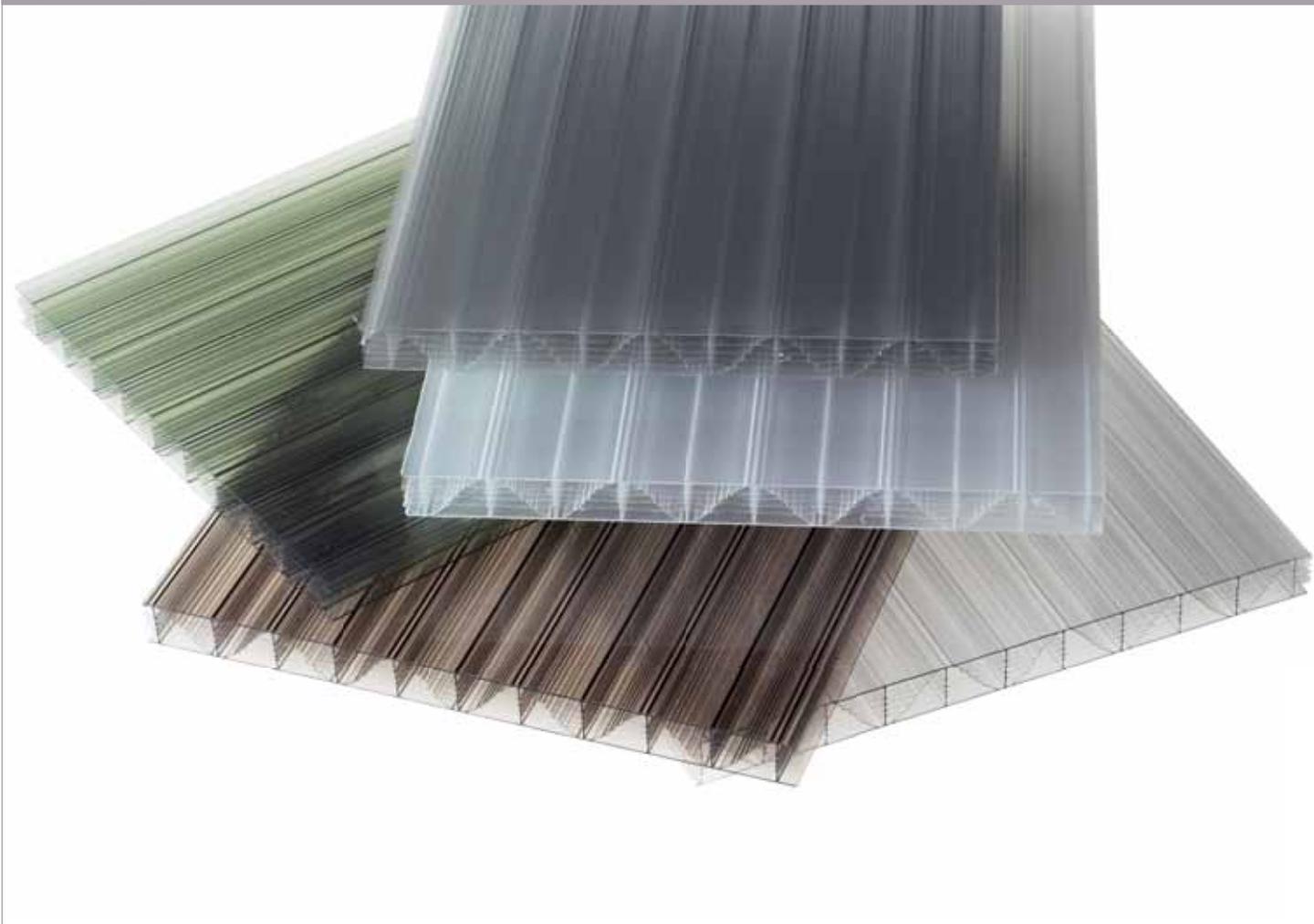


Specialty Film & Sheet



# Lexan\*Thermoclear\* multi-wall

Polycarbonate sheets and systems technical manual



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Lexan\* polycarbonate is a unique engineering thermoplastic which combines a high level of mechanical, optical and thermal properties. The versatility of this material makes it suitable for many engineering applications. When extruded in sheet form, its optical and impact properties in particular render this material an ideal candidate for a wide range of glazing applications. SABIC Innovative Plastics has developed a whole range of products to suit the most demanding of these application needs.

Typical applications include:

- Industrial roofs and sidewalls
- Commercial greenhouses
- Sunroom, swimming pool and conservatory roofing
- Shopping center roofing
- Railway/Metro station
- Football stadium roofing
- Rooflights

### **Lexan multi-wall sheet Lexan Thermoclear\* Plus sheet (LT2UV)**

Lexan Thermoclear Plus sheet features as of 4.5mm thickness a unique 2 side proprietary surface treatment designed to protect the sheet against the degrading effects of ultra-violet radiation in natural sunlight. 2 sides UV protected surfaces offers advantage in economical cutting the sheet in desired shapes and installation mistakes are minimized since both sheet surfaces may be faced outwards.

### **Lexan Thermoclear SunXP sheet (LT2XP)**

Lexan Thermoclear SunXP sheet offers next to remarkable impact strength, high light transmission, light weight, long term weather resistance and, due to the multi-wall construction, outstanding thermal insulation properties an even more unique 2 side proprietary surface treatment which provides almost total resistance against degradation caused by UV radiation in sunlight. The entire Lexan Thermoclear SunXP sheet range carries a **Fifteen Year Limited Written Warranty** against discoloration, loss of light transmission and/or loss of strength due to weathering.

### **Lexan Thermoclear Easyclean sheet (LTE)**

Lexan Thermoclear Easyclean sheet makes use of a new and innovative technology platform of self cleaning properties. The extraordinary hydrophobic coating on the outside surface reduces the surface tension of polycarbonate and increases the contact angle of water to the sheet this causes larger

droplets to form and wash away dirt as the droplets roll down the sheet.

Lexan Thermoclear Easyclean comes standard with a unique 2 side UV proprietary surface treatment but can be combined with Drippgard property on the inner side of the sheet forming a unique combination of having a Thermoclear sheet with self cleaning properties on the out side and a surface treatment on the inside which reduces the formation of condensation droplets to prevent loss of light transmission.

### **Lexan Thermoclear Drippgard® sheet (LTD)**

Lexan Thermoclear Drippgard sheet, in addition to the extraordinary properties of standard 2 side UV resistant Lexan Thermoclear sheet, also features a specially developed coating on the inner surface which reduces the formation of condensation droplets. This property is particularly important in helping to prevent crop spoilage in commercial greenhouses, by falling condensation droplets. There is no reduction in light transmission due to condensation water droplets. It is the ideal roof glazing material in any application where water drops are unacceptable. For instance: greenhouses/ verandas/sunrooms/ swimming pool enclosures/ industrial roof glazing.

### **Lexan Thermoclear Solar Control IR\* sheet (2UVIR)**

Lexan Thermoclear Solar Control IR sheet makes use of a new and innovative technology platform of solar energy absorption. The Lexan Thermoclear Solar Control IR sheets are transparent with a green (GN), blue (BL) or grey (GY) tint, which blocks near-Infrared light but lets in high levels of visible light. Lexan Solar Control IR multi wall sheet offers: high light transmission combined with low solar transmission, 2 sides unique UV protection, various structures (2/3/5/6/9 walls, X structures), long-term weathering resistance and high impact strength.

### Lexan® Thermoclear® Solar Control sheet (LTC-SC)

Lexan Thermoclear Solar Control sheet features in addition to the extraordinary properties of standard Lexan Thermoclear sheet, a unique and specially developed Solar Control Coating at the non UV protected side of the sheet which reduces the heat build-up beneath the sheet. Despite the reduction of the heat build-up a high light transmission will remain. The excellent properties result in an agreeable comfort level inside the building.

### Lexan Thermoclear Venetian sheet (LTC-VEN)

Lexan Thermoclear Venetian grades are members of the Lexan Thermoclear sheet range of high quality, multi-wall polycarbonate glazing sheets extruded from Lexan resin. LTC Venetian is a multi-wall sheet which has been screen printed with white stripes on the non UV coated side. The white striped side should always be installed facing inwards, the other side, clearly identified as protected against UV, being installed facing outwards. Although the screen printed white stripes are mainly intended for additional decorative purposes, the belonging shadow effect results in an improved comfort level inside the building.

### Lexan Thermoclick® sheet

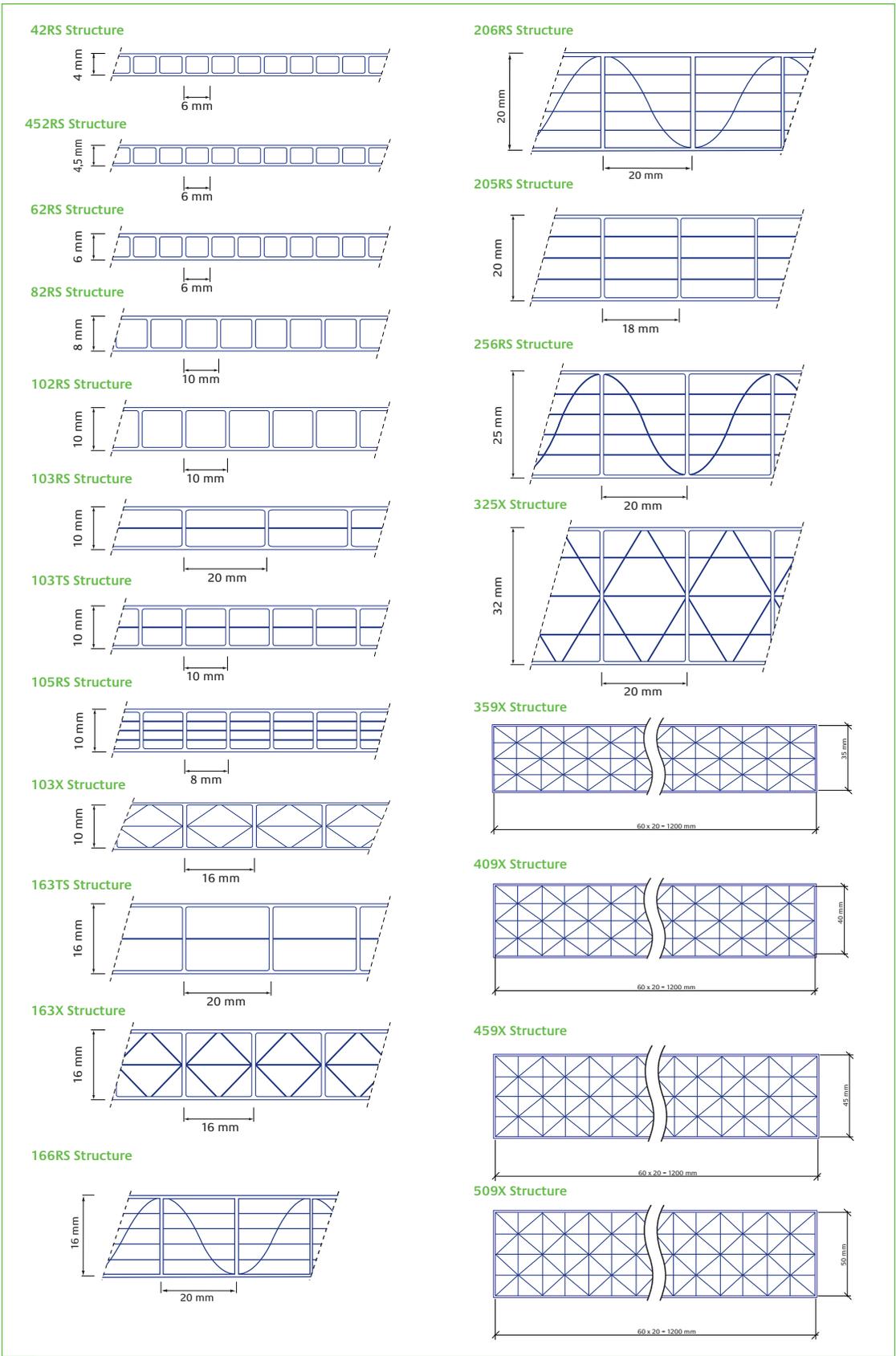
Lexan Thermoclick sheet is an X-structured multi wall polycarbonate panel with profiled tongue and groove connections. This inter-connecting system eliminates the need for vertical profiles, thereby saving costs and enhancing aesthetics. It is an ideal product to create flush profile-free facades in different colors and effects, this combined with the ease of installation and the variety in colors in particular render this panel highly suitable for facades and wall cladding. Lexan Thermoclick sheet has a one side proprietary surface treatment designed to protect the sheet against the degrading effects of ultra-violet radiation in natural sunlight.

Typical applications include:

- Industrial Sidewalls
- Commercial Side walls Greenhouses
- Railway/Metro Station
- Interior decoration



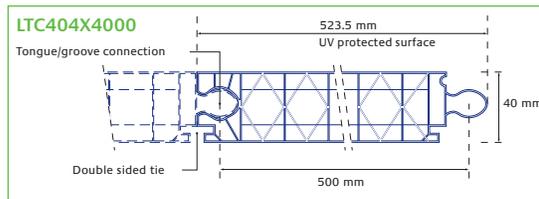
Lexan® multi-wall sheet structures:



## Product availability

### Lexan\* Thermoclick\* sheet

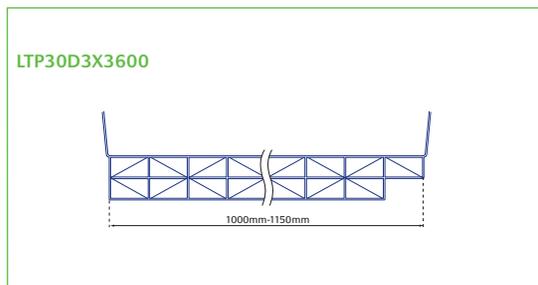
Lexan Thermoclick sheet system is an impact resistant, energy-saving multi-wall sheet with profiled tongue and groove connection, joint cover on the outside and groove for double sided tie on the inside.



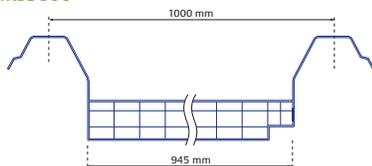
2

### Lexan Thermopanel\* sheet

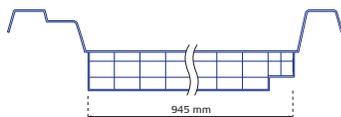
Lexan Thermopanel sheet is an impact resistant, energy saving multi-wall transparent sheet with calibrated multi form side wings matching any insulating corrugated metal panel. Its optical and impact properties in particular render this panel a strong candidate as roofglazing for insulated corrugated metal industrial buildings.



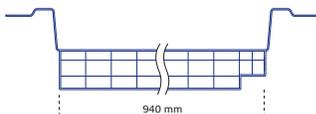
**LTP30A4RS3600**



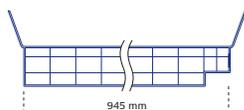
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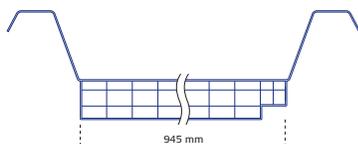
**LTP30C4RS3600**



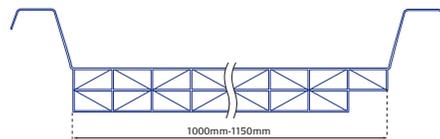
**LTP30D4RS3600**



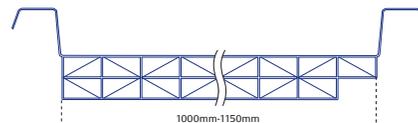
**LTP30E4RS3600**



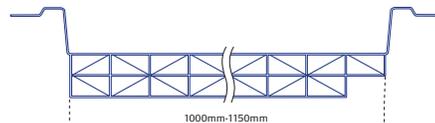
**LTP30E3X3600**



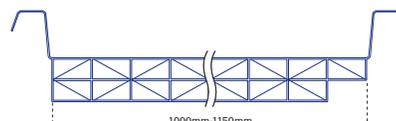
**LTP30F3X3600**



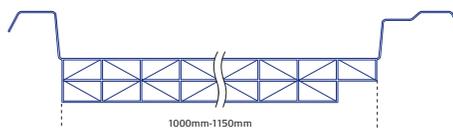
**LTP30G3X3600**



**LTP30T3X3600**



**LTP30V3X3600**



3

Description

**Lexan Thermoclear\* /Drippard®/Plus sheet**  
**LTC(D)(2UV)10(2)(3)(5)(6)(9)(RS)(TS)(X)17**

**LTC(D)(2UV)** LTC = Lexan Thermoclear sheet  
 LTD = Lexan Thermoclear Drippard sheet  
 LT2UV = Lexan Thermoclear sheet 2-sides U.V. protected

**10** sheet thickness in mm

**(2)(3)(5)(6)(9)** 2 = double wall  
 3 = triple wall  
 5 = five wall  
 6 = six wall  
 9 = nine wall

**(RS)(TS)(X)** RS = Rectangular structure  
 TS = Tunnel structure  
 X = X structure

**17** 17 = 1.7 kg/m



**Lexan Thermoclear Venetian/Solar Control sheet**  
**LTC 32(2)(3)(5)(6)(9)(RS)(TS)(X)38(VENS)(SC)**

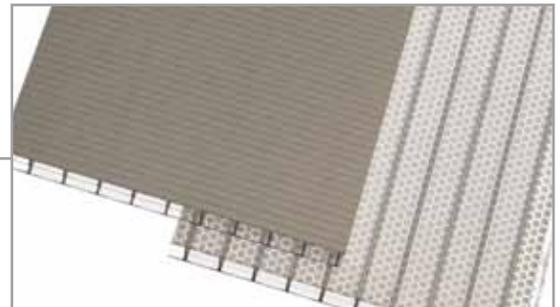
**32** Sheet thickness in mm

**(2)(3)(5)(6)** 2 = double wall  
 3 = triple wall  
 5 = five wall  
 6 = six wall

**(RS)(TS)(X)** RS = Rectangular structure  
 TS = Tunnel structure  
 X = X structure

**38** 38 = 3.8 kg/m

**(VENS)(SC)** VENS = Venetian white stripes printed  
 SC = Solar Control coated



**Lexan Thermoclick\* sheet**  
**LTC40(4)(X)(4000)**

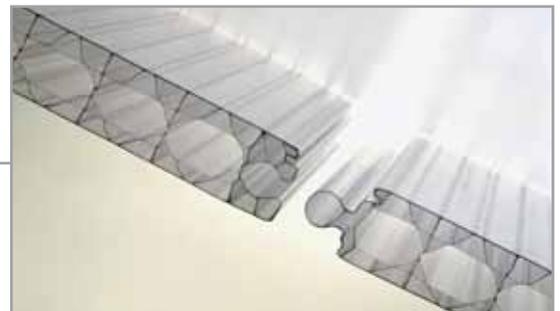
**LTC** LTC = Lexan Thermoclear sheet

**40** sheet thickness in mm

**(4)** 4 = four wall

**(X)** X = X structure

**(4000)** weight in g/m



**Lexan Thermopanel\* sheet**

**LTP30(A)(B)(C)(D)(A)(B)(C)(D)(E)(F)(G)(T)(V)4RS(4000)(3600)**

**LTP** LTC = Lexan Thermopanel sheet

**30** sheet thickness in mm

**(A)(B)(C)(D)** A, B, C, D = type of corrugation

**(E)(F)(G)(T)(V)** E, F, G, T, V = Type of wing configuration

**(3x)(4RS)** 4 = Four wall  
 RS = Rectangular structure

**(4000)(3600)** weight in g/m



**Lexan Thermoclear Solar control IR\***  
**2UV(IR)16(2)(3)(5)(6)(9)6RS(27)**

**2UV(IR)** 2UV (IR) = Lexan Thermoclear Solar Control IR

**16** sheet thickness in mm

**(2)(3)(5)(6)(9)** 2 = double wall  
 3 = triple wall  
 5 = five wall  
 6 = six wall  
 9 = nine wall

**6RS** 6 = Four wall  
 RS = Rectangular structure

**27** 27 = 2.7 kg/m



## Property availability

**Table 1: Standard Lexan® Thermoclear® sheet products**

Product code	Standard sheet width in mm.									
	500	945	980	1000	1050	1100	1150	1200	1250	2100
<b>Lexan Thermoclear Plus sheet</b>										
LT2UV452RS10									X	X
LT2UV62RS13									X	X
LT2UV82RS15									X	X
LT2UV83TS17									X	X
LT2UV102RS17									X	X
LT2UV103RS19										X
LT2UV103TS17					X				X	X
LT2UV103TS20									X	X
LT2UV105R175									X	X
LT2UV163TS27									X	X
LT2UV163X29			X		X				X	X
LT2UV163TS28			X		X			X	X	X
LT2UV163X28			X						X	X
LT2UV206RS30			X						X	X
LT2UV205RS33									X	
LT2UV205X32			X						X	X
LT2UV256RS35			X						X	X
LT2UV325X38									X	
LT2UV359X40								X		
LT2UV409X43								X		
LT2UV459X45								X		
LT2UV509X48								X		
Standard sheet lengths: 6000-7000mm										
<b>Lexan Thermoclear SunXP sheet</b>										
LT2XP452RS10									X	X
LT2XP62RS13									X	X
LT2XP82RS15									X	X
LT2XP83TS17									X	X
LT2XP102RS17									X	X
LT2XP103RS19										X
LT2XP103TS17									X	X
LT2XP103TS20									X	X
LT2XP103X20			X		X			X		X
LT2XP105R175									X	X
LT2XP163TS27			X		X			X	X	X
LT2XP163TS28			X		X				X	X
LT2XP163X29			X		X			X		X
LT2XP166RS27			X						X	X
LT2XP205RS33			X						X	X
LT2XP205X32									X	
LT2XP206RS30			X						X	X
LT2XP256RS35			X						X	X
LT2XP325X38									X	
LT2XP359X40								X		
LT2XP409X43								X		
LT2XP459X45								X		
LT2XP509X48								X		
Standard sheet lengths: 6000-7000 mm										

## Property availability

Continued Table 1: Standard Lexan® Thermoclear® sheet products

Product code	Standard sheet width in mm.									
	500	945	980	1000	1050	1100	1150	1200	1250	2100
<b>Lexan Thermoclear Easyclean sheet</b>										
LTE452RS1000									X	X
LTE62RS13									X	X
LTE82RS15									X	X
LTE83TS17									X	X
LTE102RS17									X	X
LTE103RS19										X
LTE103TS17									X	X
LTE103TS20									X	X
LTE103X20			X		X			X		X
LTE105R175									X	X
LTE163TS27			X		X			X	X	X
LTE163TS28			X		X			X	X	X
LTE163X29			X		X			X		X
LTE166RS27			X						X	X
LTE205RS33			X						X	X
LTE205X32									X	
LTE206RS35			X						X	X
LTE256RS35			X						X	X
LTE325X38									X	
LTE359X40								X		
LTE409X43								X		
LTE459X45								X		
LTE509X48								X		
Standard sheet lengths: 6000-7000 mm										
<b>Lexan Thermoclear Drippgard® sheet</b>										
LTD62RS13										X
LTD82RS15										X
LTD102RS17									X	X
LTD103TS17										X
LTD103RS19										X
LTD163TS28			X						X	X
LTD163X29								X		X
LTD205RS33									X	X
LTD256RS35									X	X
Standard sheet lengths: 6000-7000 mm										

Continued Table 1: Standard Lexan® Thermoclear® sheet products

Product code	Standard sheet width in mm.									
	500	945	980	1000	1050	1100	1150	1200	1250	2100
<b>Lexan Thermoclear Solar Control IR* sheet</b>										
2UVIR62RS13									X	X
2UVIR82RS15									X	X
2UVIR102RS17									X	X
2UVIR105R175									X	X
2UVIR163TS27			X		X			X	X	X
2UVIR163X29			X		X			X		X
2UVIR166RS27			X						X	X
2UVIR205RS33			X						X	X
2UVIR205X32									X	
2UVIR325X38									X	
2UVIR359x40								X		
2UVIR409x43								X		
2UVIR459x45								X		
2UVIR509X48								X		
Standard sheet lengths: 6000-7000 mm										
<b>Lexan Thermoclear Solar Control sheet</b>										
LTC62RS13 SC										2100x6000
LTC102RS17 SC									1250x6000	2100x6000
LTC163TS27 SC			980x6000						1250x6000	2100x6000
LTC205RS33 SC			980x6000						1250x6000	
LTC256RS35 SC										2100x6000
									1250x3500	
LTC325X38 SC									1250x4000	
									1250x4500	
									1250x6000	
<b>Lexan Thermoclear Venetian sheet</b>										
LTC62RS13 VENS										2100x6000
LTC102RS17 VENS									1250x6000	2100x6000
LTC163TS27 VENS			980x6000						1250x6000	2100x6000
LTC205RS33 VENS			980x6000						1250x6000	
LTC256RS35 VENS										2100x6000
									1250x3500	
LTC325X38 VENS									1250x4000	
									1250x4500	
									1250x6000	
<b>Lexan Thermoclick* sheet</b>										
LTC404x4000	X									
Standard sheet length: 6000-7000 mm										
<b>Lexan Thermopanel* sheet</b>										
LTP30(A,B,C,D,E)4RS3600		X								
LTP30(A,B,C,D,E,F,G,T,V)3X3600				X	X	X	X			
Standard sheet lengths: 6000-7000 mm										
<b>Lexan Thermoclear sheet</b>										
LTC42RS800										X
Standard sheet length: 6000-7000 mm										

## Lexan\* multi-wall sheet products

Typical property values for:

Lexan Thermoclear\* Plus (LT2UV)

Lexan Thermoclear sheet (LTC)

Lexan Thermoclear Dripgard® (LTD)

Lexan Thermoclear Easyclean (LTE)

Lexan Thermoclear Sun XP (LT2XP)

**Table 2: Lexan Thermoclear sheet product selection**

walls	grade name	gauge (mm)	weight (kg/m <sup>2</sup> )	rib distance (mm)	ISO # U-value (W/m <sup>2</sup> ·K) 10077	** LT clear 112 (%)	** LT opal white WH7A092X (%)	*** TST clear 112 (%)	*** TST opal white WH7A092X (%)
2-wall	LTC42RS800	4	0,8	6	3,96	83	67	83	70
	LT2UV452RS10	4,5	1,0	6	3,86	83	67	83	70
	LT2UV62RS13	6	1,3	6	3,56	82	66	82	69
	LT2UV82RS15	8	1,5	10	3,26	81	64	82	68
	LT2UV102RS17	10	1,7	10	3,02	81	64	80	68
3-wall	LT2UV83TS17	8	1,7	10	2,92	73	61	75	66
	LT2UV103TS17	10	1,7	10	2,68	73	61	75	66
	LT2UV103RS19	10	1,9	20	2,69	74	63	78	69
	LT2UV163TS27	16	2,7	20	2,27	74	63	78	69
X-structure 3-wall	LT2UV103X20	10	2,0	16	2,62	71	62	71	67
	LT2UV163X28	16	2,8	16	2,10	67	60	71	64
5-wall	LT2UV105R175	10	1,75	8	2,39	65	60	65	59
	LT2UV205RS33	20	3,3	18	1,77	64	55	71	60
6-wall	LT2UV166RS27	16	2,7	20	1,84	61	52	64	60
	LT2UV206RS30	20	3,0	20	1,61	61	50	64	61
	LT2UV256RS35	25	3,5	20	1,45	58	49	66	63
X-structure 5-wall	LT2UV205X32	20	3,2	20	1,69	58	50	66	51
	LT2UV255X34	25	3,4	20	1,51	57	49	65	54
	LT2UV325X38	32	3,8	20	1,32	55	48	65	48
Double X-structure 9-wall	LT2UV359X40	35	4,0	20	1,19	51	44	53	49
	LT2UV409X43	40	4,3	20	1,10	51	43	52	48
	LT2UV459X45	45	4,5	20	1,04	50	42	52	47
	LT2UV509X48	50	4,8	20	0,99	50	40	52	47
Thermoclick* X-structure 4 wall	LTC404X4000	40	4,0	40	1,41	59	50	64	57
Thermopanel* 4-wall	LTP30(A,B,C,D,E)4RS36	30	3,6	20	1,9	68	62	68	68
Thermopanel X-structure 3-wall	LTP30 (A,B,C,D,E,F,G,V)T3X36	30	3,6	20	1,55	67	63	70	67

\* U-values based on SABIC-IP calculated values according ISO 10077 (EN673)

\*\*\* LT (Light Transmission) measurements according ISO 9050 (EN 410) on 600x600 mm samples

TST (Total Solar Transmission) measurements according ISO 9050 (EN 410) on 600x600 mm samples

**Table 3: Typical properties for Lexan\* Thermoclear\* Venetian (LTC VEN) sheet**

Sheet thickness mm	10	16	20	25	32
Structure	2RS	3TS	5RS	6RS	5X
Weight kg/m <sup>2</sup>	1,7	2,7/2,8	3,3	3,5	3,8
Clear code 112					
Light transmission**%	46	41	40	38	36
Total solar transmission %	49	43	41	39	38
Shading coefficient	0,65	0,62	0,60	0,65	0,52
U-value W/m <sup>2</sup> K	3,02	2,27	1,77	1,45	1,32
Sound insulation dB	19	21	22	23	24
Hail impact test bullet 20 mm Velocity m/sec	>21	>21	>21	>21	>21

•U-values based on SABIC-IP calculated values according ISO 10077 (EN673)

\*\*LT (Light Transmission) measurements according ISO 9050 (EN 410) on 600x600 mm samples

#TST (Total Solar Transmission) measurements according ISO 9050 (EN 410) on 600x600 mm samples

\*Shading Coefficient (SC): The ratio of the total solar radiation transmitted by a given material to that transmitted by normal 3 mm glass, whose light transmission is 87%.  $SC = \%TST/87$ ."

**Table 3a: Typical properties for Lexan Thermoclear Solar Control (LTC SC) sheet**

Sheet thickness mm	10	16	16	20	25	32
Structure	2RS	3TS	3X	5RS	6RS	5X
Weight kg/m <sup>2</sup>	1,7	2,8	2,9	3,3	3,5	3,8
Clear code 112 + SC						
Light transmission**%	66	60	56	53	48	47
Total solar transmission %	54	50	46	44	41	39
Shading coefficient	0,72	0,69	0,68	0,61	0,67	0,58
U-value W/m <sup>2</sup> K	3,02	2,27	2,10	1,77	1,45	1,32
Sound insulation dB	19	21	21	22	23	24
Hail impact test bullet 20 mm Velocity m/sec	>21	>21	>21	>21	>21	>21

•U-values based on SABIC-IP calculated values according ISO 10077 (EN673)

\*\*LT (Light Transmission) measurements according ISO 9050 (EN 410) on 600x600 mm samples

#TST (Total Solar Transmission) measurements according ISO 9050 (EN 410) on 600x600 mm samples

\*Shading Coefficient (SC): The ratio of the total solar radiation transmitted by a given material to that transmitted by normal 3 mm glass, whose light transmission is 87%.  $SC = \%TST/87$ ."

**Table 3b: Typical properties for Lexan Thermoclear Solar Control IR\* (2UVIR) sheet (Green color)**

Sheet thickness mm	10	16	16	20	25	32
Structure	5RS	3TS	3X	5RS	6RS	5X
Weight kg/m <sup>2</sup>	1,75	2,7	2,9	3,3	3,5	3,8
Green code GN8B038T						
Light transmission**%	48	55	46	46	41	36
Total solar transmission %	34	36	29	29	26	23
Shading coefficient	0,56	0,60	0,52	0,53	0,50	0,49
U-value W/m <sup>2</sup> K	2,39	2,27	2,10	1,77	1,45	1,32
Sound insulation dB	20	21	22	22	23	24
Hail impact test bullet 20 mm Velocity m/sec	>21	>21	>21	>21	>21	>21

•U-values based on SABIC-IP calculated values according ISO 10077 (EN673)

\*\*LT (Light Transmission) measurements according ISO 9050 (EN 410) on 600x600 mm samples

#TST (Total Solar Transmission) measurements according ISO 9050 (EN 410) on 600x600 mm samples

\*Shading Coefficient (SC): The ratio of the total solar radiation transmitted by a given material to that transmitted by normal 3 mm glass, whose light transmission is 87%.  $SC = \%TST/87$ ."

**Table 4: Typical properties for Lexan\* polycarbonate Sheet**

Property physical	Test method	Unit	Value
<b>Density</b>	<b>ISO 1183</b>	<b>g/cm<sup>3</sup></b>	<b>1,20</b>
Water absorption, 50% RH / 23°C	ISO62	%	0,15
Water absorption, saturation / 23°C	ISO 62	%	0,35
<b>Mechanical</b>			
Tensile stress at yield 50mm/min	ISO 527	MPa	60
Tensile stress at break 50mm/min	ISO 527	MPa	70
Tensile strain at yield 50mm/min	ISO 527	%	6
Tensile strain at break 50mm/min	ISO 527	%	120
Tensile modulus 2mm/min	ISO 527	MPa	2300
Flexural stress at yield 2mm/min	ISO 178	MPa	90
Flexural stress at break 2mm/min	ISO 178	MPa	2300
Hardness H358/30 95	ISO 2039/1	MPa	95
<b>Thermal</b>			
Vicat softening temperature, rate B/120	ISO 306	°C	145
HTD/Ae, 1.8 MPa edgew. 120*1*04/ sp=100	ISO 75	°C	127
Thermal conductivity	ISO 8302	W/m.°C	0,2
Coeff. of lin. Therm. Exp.extr. 23-80°C	ISO 11359-2	1/°C	7.00 E-05
<b>Electrical</b>			
Volume resistivity	IEC 60093	Ohm.cm	10 E15

These property values have been derived from Lexan resin data for the material used to produce this sheet product. Variation within normal tolerances are possible for various colors. These typical values are not intended for specification purposes. If minimum certifiable properties are required please contact your local SABIC Innovative Plastics, Specialty Film & sheet representative. All values are measured at least after 48 hours storage at 23°C/50% relative humidity. All properties are measured on injection molded samples. All samples are prepared according ISO 294.



## Mechanical properties

### Impact strength

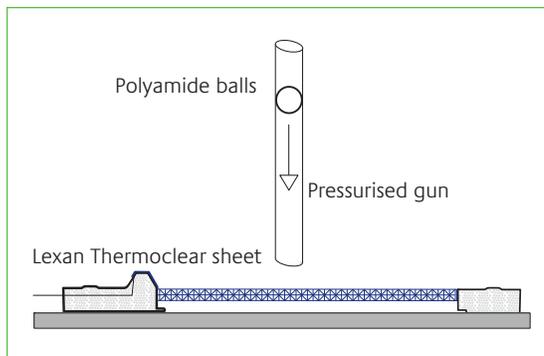
Lexan® Thermoclear® sheet has outstanding impact performance over a wide temperature range, -40°C to +120°C, and also after prolonged outdoor exposure.

### Hail resistance

As a roof glazing material Lexan Thermoclear sheet is subject to extremes of weather; storms, hail-stones, wind, snowfalls and ice formation. Under these conditions, the product is virtually unbreakable and is able to withstand the subsequent temperature change to sunny conditions without breaking or buckling.

In a test developed by the Dutch Testing Institute TNO, samples of Lexan Thermoclear sheet have been subjected to simulated hail-stones of varying diameters without significant damage.

A test sample is clamped into a metal frame and polyamide balls of varying diameters are fired at the surface of the sample using a pressurized airgun.



In practice, hail-stones with a diameter of 20 mm can reach a terminal velocity of around 21 m/s. Under these conditions materials such as glass and acrylic fail.

4. Represents material failure at this speed

It should be noted that when the glass and the acrylic are tested their failure characteristics are typically brittle, whilst the Lexan Thermoclear showed ductile behaviour: upon impact the ball will leave indentations but the sheet will not break (See fig. 4).

SABIC Innovative Plastics offers a Ten Years Written Limited Warranty on Lexan Thermoclear sheet covering loss of strength or impact due to weathering.

**Table 5: Hail simulation test results**

Material	Ball diameter
	20 mm
Acrylic multi-wall sheet t=16 mm	7-14 m/s
Float glass t=4 mm	10 m/s
Lexan Thermoclear sheet t=10 mm	>21 m/s
Lexan Thermoclear sheet t=16 mm	>21 m/s
Equilibrium velocity of hail stones in practice	21 m/s

## Physical properties

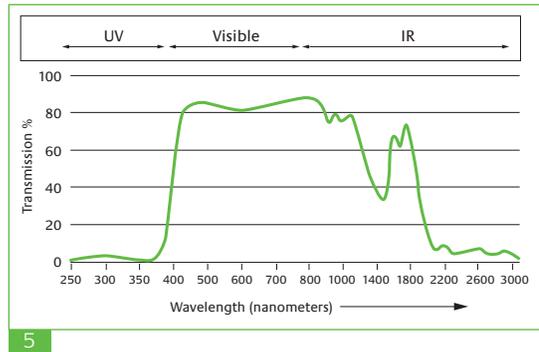
### Light transmission

The sunlight which reaches the surface of the earth has a wavelength that ranges between 295 – 2140 nanometres (10E-9 metres). This optical window is divided into the following sections:

UV-B Middle ultraviolet region	280 – 315 nm
UV-A Near ultraviolet region	315 – 380 nm
Visible light region	380 – 780 nm
Near infra-red region	780 – 1400 nm
Middle infra-red region	1400 – 3000 nm

As shown in fig. 5, Lexan\* Thermoclear\* sheet has the highest transmission in the visible light.

Despite transmitting visible light very well, Lexan Thermoclear sheet is almost opaque to radiation in the UV and far infra-red region. This useful shielding property can prevent discolouration of sensitive materials such as fabrics or other organic materials placed under or behind Lexan Thermoclear sheet glazing in, for example, a factory warehouse, museum or shopping centre.



5. Light transmission spectrum of Lexan Thermoclear sheet



# Solar control properties

## Temperature increase inside the building

Sunlight entering the building heats the air both directly and through absorption by the framework, furniture, etc., and is released as infra-red energy. In combination with the insulating properties of Lexan\* Thermoclear\* sheet, this prevents heat escaping faster than it is created causing a temperature increase – the so-called 'greenhouse effect'. The temperature can be controlled by venting, often in combination with specially tinted Lexan Thermoclear sheet, by Lexan Thermoclear Venetian Grades and Lexan Thermoclear Solar Control SC/IR\*.

## Solar control

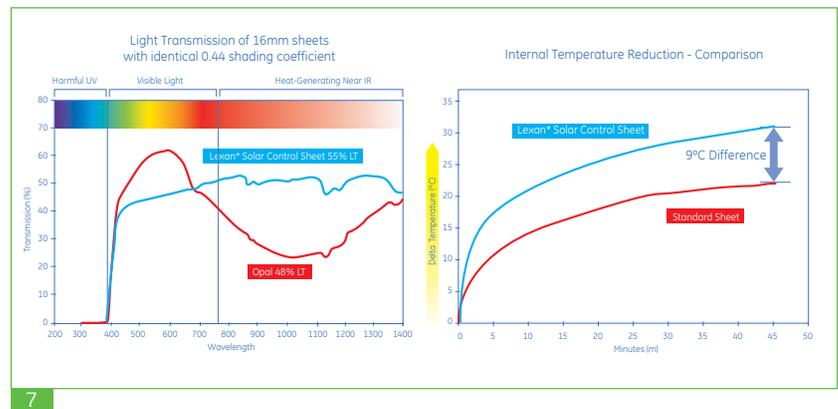
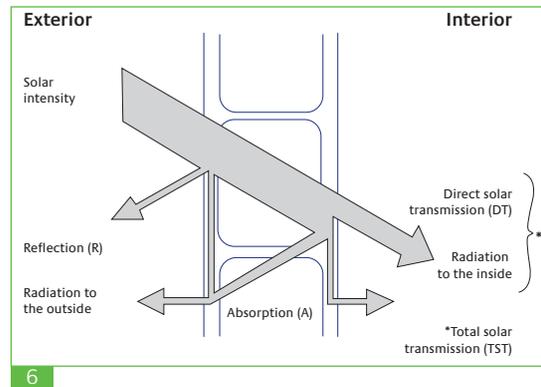
Transparent grades of Lexan Thermoclear sheet have excellent light transmission, between 38 and 83% depending upon thickness. However, for buildings in hot climates or with south facing aspects, Lexan Thermoclear sheet is available in translucent grades of bronze, grey, blue, green, opal white, Lexan Thermoclear Solar Control sheet and Lexan Thermoclear Venetian sheet with screen printed white stripes on the non UV protected side. These grades significantly reduce solar heat build-up, helping to maintain comfortable interior temperatures.

The specially tinted sheet, Lexan Thermoclear Venetian sheet and Lexan Thermoclear Solar Control sheet cuts down the brightness of sunlight to a pleasing level and reduces air conditioning costs in the summer.

Lexan Thermoclear Solar Control IR (SCIR) sheet does not significantly, like most other solar control products, block or reflect sun light but absorbs that part of the light spectrum which create solar transmission. Lexan Thermoclear SC/IR is an excellent candidate for those applications where there is a need for high light transmission together with a low solar transmission.

## Solar heat gain

The solar radiation reaching the sheet is reflected, absorbed and transmitted, as shown in fig. 6. The greatest proportion is transmitted and the total solar transmission (TST) is the sum of the direct transmission (DT) and the inwardly released part of the absorbed energy (A). Table 6 lists the solar control properties of the Lexan Thermoclear sheet range and Lexan Thermoclear Venetian products.



**Table 6: Total solar transmission\* in % Solar Control IR (LTC-IR)**

Structure	Grade name	gauge (mm)	weight (kg/m <sup>2</sup> )	rib distance (mm)	ISO 10077 U value*(W/m <sup>2</sup> K)	LT** SC IR Green (%)	LT** SC IR Blue (%)	LT** SC IR Grey (%)	TST# SC IR Green (%)	TST# SC IR Blue (%)	TST# SC IR Grey (%)	SC‡ SC IR Green (%)	SC‡ SC IR Blue (%)	SC‡ SC IR Grey (%)
2-wall	2UVIR6/2RS13	6	1,3	6	3,56	66			60			0,69		
	2UVIR8/2RS15	8	1,5	10	3,26	65			61			0,70		
3-wall	2UVIR10/2RS17	10	1,7	10	3,02	65	52	20	60	58	42	0,69	0,67	0,48
	2UVIR16/3TS27	16	2,7	20	2,27	55	36		52	49		0,60	0,56	
3-wall X-structure	2UVIR16/3X29	16	2,9	16	2,10	46	29	22	45	32	30	0,52	0,37	0,34
5-wall	2UVIR10/5RS175	10	1,75	8	2,39	48			48			0,56		
	2UVIR20/5RS33	25	3,3	18	1,77	46			46			0,53		
5-wall X-structure	2UVIR20/5X32	25	3,2	20	1,69		24			37			0,51	
	2UVIR32/5X38	32	3,8	20	1,32	36	20	12	42	35	30	0,49	0,40	0,34
6-wall	2UVIR16/6RS27	16	2,7	20	1,84	42			45			0,52		

\*U-values based on SABIC-IP calculated values according ISO 10077 (EN673)

\*\*LT (Light Transmission) measurements according ISO 9050 (EN 410) on 600x600 mm samples

#TST (Total Solar Transmission) measurements according ISO 9050 (EN 410) on 600x600 mm samples

‡Shading Coefficient (SC): The ratio of the total solar radiation transmitted by a given material to that transmitted by normal 3 mm glass, whose light transmission is 87%. SC=%TST/87.\*

## Outdoor weathering performance

### UV protection

Solar radiation has a particularly harmful effect upon polymeric materials initiating degradation by causing superficial surface crazing. These crazes become sites for further erosion from water, dust, chemicals, etc. The degree to which these conditions affect the polymer depend largely upon environmental parameters such as geographical location, altitude, seasonal variations, etc.

Lexan\* Thermoclear\* sheet has on one or both sides a unique proprietary UV-protected surface, giving excellent resistance to outdoor weathering. This unique protection ensures long-term optical quality under intensive UV exposure, and maintains the superior toughness of the polycarbonate material in comparison to other thermoplastic glazing.

### Typical values of Thermoclear sheet

Research into the long-term effects of weathering on glazing materials is basically focused upon measuring product performance through material property changes, typically mechanical strength, impact resistance, colour retention, transparency, etc.

Under ISO 4892, a test has been developed using high intensity Xenon lamps to simulate natural sunlight. Together with UV filters and programmable rain cycles, the test is able to simulate natural conditions.

Accelerated weathering tests have been carried out on Lexan Thermoclear sheet by SABIC Innovative Plastics. Using in-house Xenon 1200 apparatus, these tests were carried out according to ISO 4892. However, even tougher demands were placed on the material by removing the UV filter for 1/6 of the cycle.

Placed within this environment, Lexan Thermoclear sheet was exposed to 5,000 hours. Experience with the Xenon test equipment indicates that this relates to 15 years natural exposure in a moderate European climate. Following the test the optical properties of light transmission and yellowness index were measured and compared with an un-aged sample.

### Warranty

SABIC Innovative Plastics offers a Ten Year Written Limited Warranty on Lexan Thermoclear sheet covering discolouration, loss of light transmission and loss of impact strength due to weathering as more specifically defined in such warranty. Please consult your local distributor or SABIC Innovative Plastics Sales Office for more details.



## Various properties

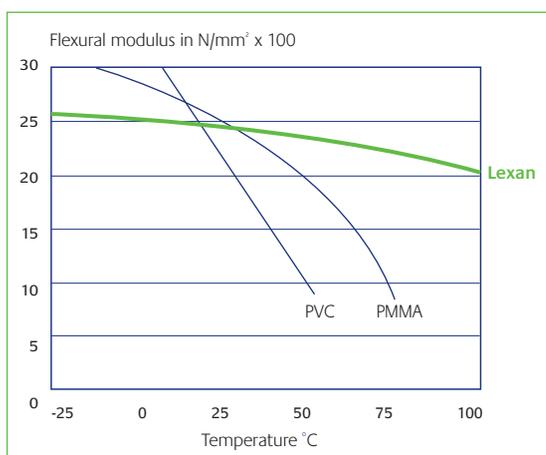
### Temperature resistance

The heat build-up of glazing materials can be seen as a function of the solar energy absorption of the glazing material and the solar intensity.

In areas with intense sun radiation, and when high energy absorbing tinted glazing is installed, heat build-up of the glazing can be considerable. Calculations and actual measurements on installed Lexan\* Thermoclear\* sheet in several projects throughout Europe have shown that sheet surface temperatures of 100°C can exist.

### Dimensional stability

Lexan Thermoclear sheet is characterised by its excellent retention of impact strength and stiffness at elevated temperatures, even over an extended period. Lexan Thermoclear sheet retains 85% of its room temperature flexural modulus at 80°C.



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### Continuous use temperature

#### UL ratings

The U.S.A. Underwriters Laboratories continuous-use temperature rating can be considered as a reliable indicator of a thermoplastic's long-term high temperature performance. The most important properties of the thermoplastic are tested at various temperatures. Test results are extrapolated over a period of 10 years and no property may lose more than 50% of its original value. Table 7 outlines the UL-continuous use temperatures of typical thermoplastic glazing materials.

**Table 7: UL temperature ratings UL746B**

Underwriters Laboratories		
	Continuous-use temperature rating	Softening temperature
Lexan polycarbonate	100°C	145°C
Acrylic	50°C	100°C
PVC	50°C	70°C

Lexan Thermoclear sheet has a continuous-use temperature of 100°C. At the other end of the scale the minimum continuous-use temperature has been set at -40°C. However, using Lexan Thermoclear sheet at lower temperatures is possible since the embrittlement temperature is as low as -110°C.

### Fire performance

Lexan Thermoclear sheet has good fire behaviour characteristics, and receives high ratings in several major European fire performance tests including EN13501. More detailed information is available from your local SABIC Innovative Plastics Service Centre or authorised dealer.

### Weight factors

Lexan Thermoclear sheet is an ideal replacement for the more traditional glazing materials. It is safe and easy to handle, cut and install and is virtually unbreakable. Its light weight offers significant savings in terms of transportation, handling and installation. When compared with 6 mm wired glass, 10 mm Lexan Thermoclear sheet offers weight savings of more than 85%.

Lexan Thermoclear sheet has shown in many applications that its lightness and ease of handling have contributed to significant savings in overall installation costs.

**Table 8: Weight**

Lexan Thermoclear sheet	Thickness mm	Weight kg/m <sup>2</sup>
	4	0.8
	4.5	1.0
	6	1.3
	8	1.5
	10	1.7 - 2.0
	16	2.7 - 2.9
	20	3.0 - 3.3
	25	3.4 - 3.5
	32	3.8
	35	4,0
	40	4,3
	45	4,5
	50	4,8
Lexan Thermoclick* sheet		
	40	4,0
Lexan Thermopanel* sheet		
	30	3,6

### Sound insulation

The sound insulation characteristics of a material are largely pre-determined by its stiffness, mass and physical construction. In accordance with DIN 52210-75, the maximum obtainable sound transmission class for a particular thickness of Lexan Thermoclear sheet is listed in Table 9.

8. Dimensional stability.  
Flexural modulus in  
N/mm<sup>2</sup> x100

**Table 9: Sound reduction values**

Lexan* Thermoclear* sheet	Thickness mm	Sound Reduction dB
	4	15
	4.5	16
	6	18
	8	18
	10	19
	16	21
	20	22
	25	23
	32	23
	35	24
	40	25
	45	26
	50	26
Lexan Thermoclick* sheet		
	40	21
Lexan Thermopanel* sheet		
	30	22

Sound reduction values based on SABIC-IP calculated values according to DIN 52210-75

### Thermal insulation

The multi-wall structure of Lexan Thermoclear sheet offers significant advantages where thermal insulation is a major consideration. The hollow form provides excellent insulation characteristics with heat losses significantly lower than mono-wall glazing materials. Heat loss is normally referred to as the U-value, which is the amount of energy transmitted through a material per square metre of glazing area and per degree temperature difference. It is expressed in terms of W/m<sup>2</sup>K.

**Table 10: Material U-values (W/m<sup>2</sup>K)**

Lexan Thermoclear sheet	Thickness mm	U-value
	4.5 (2RS)	3,96
	6 (2RS)	3,56
	8 (2RS)	3,26
	10 (2RS)	3,02
	10 (3RS)	2,69
	10 (3TS)	2,68
	10 (3X)	2,62
	10 (5RS)	2,39
	16 (3TS)	2,27
	16 (3X)	2,10
	16 (6RS)	1,84
	20 (5X)	1,77
	20 (5RS)	1,69
	20 (6RS)	1,61
	25 (5X)	1,51
	25 (6RS)	1,45
	32 (5X)	1,32
	35 (9X)	1,19
	40 (9X)	1,10
	45 (9X)	1,03
	50 (9X)	0,99
Lexan Thermoclick sheet		
	40 (4X)	1,41
Lexan Thermopanel sheet		
	30 A,B,C,D (4RS/3.6)	1.90
	30 A,B,C,D,F,G,V,T (3X/3.6)	1.74

U-values based on SABIC-IP calculated values according to ISO 10077 (EN673)

### Overglazing

Installing Lexan\* Thermoclear\* sheet in front or behind the existing glazed window provides additional energy savings. For effective insulation, the best results are obtained when leaving a 20-50 mm air gap between the existing glazing and the Lexan multi-wall sheet.

### Double Lexan multi-wall sheet units

Extremely low U-values can be obtained by double-glazed multi-wall Lexan sheet units. A combination of Lexan Thermoclear sheet outside and Lexan Thermoclear sheet inside, with an air gap of 20-50 mm will dramatically reduce the heat loss factor in applications such as curved and pitched roof lights.

### Energy loss calculations

The need to reduce energy consumption, and therefore energy costs, is one of the highest priorities in any business today. Substantial savings of more than 50% are possible when installing Lexan Thermoclear sheet instead of mono-layer glass. When calculating according to the guidelines given in the DIN standard 4701, an average annual saving of between 0.9 - 1.3 litres of oil or 1.0 - 1.5 m<sup>3</sup> of gas per m<sup>2</sup> of glazing area will be obtained by decreasing the U-value by 0.1 W/m<sup>2</sup>K.

Table 13 shows the minimum and maximum amount of savings of fuel consumption per m<sup>2</sup> glazing area when the U-value is decreased by varying amounts.

#### Calculation example

Annual fuel saving when glass is replaced by Lexan Thermoclear sheet.

#### Data:

4 mm glass, U-value - 5.8 W/m<sup>2</sup>K

10 mm Lexan Thermoclear sheet, U-value - 3.0 W/m<sup>2</sup>K

U-value difference: 5.8 - 3.0 = 2.8 W/m<sup>2</sup>K. As shown in Table 12, the minimum and maximum amount of annual fuel savings per m<sup>2</sup> glazing area are:

25.2 – 36.4 litres of oil  
28 – 42 m<sup>3</sup> of gas

**Table 11: Overglazing**

Glass Thickness mm	Air space mm	Thermoclear sheet Thickness mm	U-value W/m <sup>2</sup> K
4	20-50	6(2RS)	2.17
4	20-50	8(2RS)	2.09
4	20-50	10(2RS)	1.97
4	20-50	16(3TS)	1.69

Installing Lexan Thermoclear sheet in front or behind the existing glazed window provides additional energy savings. For effective insulation, the best results are obtained when leaving a 20-50 mm air gap between the existing glazing and the Lexan multi-wall sheet.

**Table 12: Double Lexan multi-wall sheet units**

Thermoclear sheet outside	Air gap mm	Thermoclear sheet inside	U-value W/m <sup>2</sup> K
6(2RS)	20-50	4.5(2RS)	1.83
8(2RS)	20-50	4.5(2RS)	1.78
10(2RS)	20-50	6(2RS)	1.61
16(3TS)	20-50	6(2RS)	1.42
16(3TS)	20-50	8(2RS)	1.39
20(5RS)	20-50	6(2RS)	1.19
20(5RS)	20-50	8(2RS)	1.16

**Table 13**

U-value difference W/m <sup>2</sup> K	Annual saving per m <sup>2</sup> glazing area	
	Oil - Litres	Gas - m <sup>3</sup>
0.1	0.9-1.3	1-1.5
0.2	1.8-2.6	2-3
0.3	2.7-3.9	3-4.5
0.4	3.6-5.2	4-6.0
0.5	4.5-6.5	5-7.5
0.6	5.4-7.8	6-9.0
0.7	6.3-9.1	7-10.5
0.8	7.2-10.4	8-12
0.9	8.1-11.7	9-13.5
1	9-13	10-15
1.2	10.8-15.6	12-18
1.4	12.6-18.2	14-21
1.6	14.4-20.8	16-24
1.8	16.2-23.4	18-27
2.0	18-26	20-30
2.2	19.8-28.6	22-33
2.4	21.6-31.2	24-36
2.6	23.4-33.8	26-39
2.8	25.2-36.4	28-42
3.0	27-39	30-45
3.2	28.8-41.6	32-48
3.4	30.6-44.2	34-51
3.6	32.4-46.8	36-54
3.8	34.2-49.4	38-57
4.0	36-52	40-60

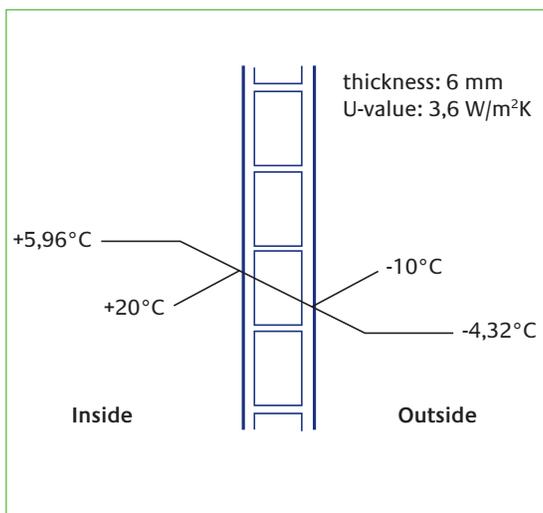
#### Note:

The exact amount of annual fuel savings is strongly dependent upon the building type, location and regional environmental conditions. Local authority engineering departments usually have official data relating to average temperature differences throughout the year.

## Cold radiation

The excellent insulation properties of Lexan\* Thermoclear\* sheet will also contribute to a reduction in the radiation of cold into the building. The lower the U-value, the higher the inner sheet surface temperature will be maintained during the winter season.

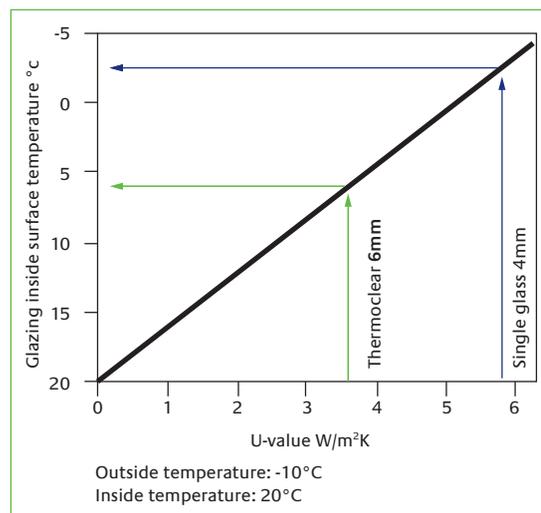
Fig. 9 presents an example of the temperature profile through 6 mm Lexan Thermoclear sheet when the outside temperature is  $-10^{\circ}\text{C}$  and the inside building temperature is  $+20^{\circ}\text{C}$ .



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The multi-wall construction creates an air space which results in a moderate sheet surface temperature. Under the conditions indicated, the inner sheet surface temperature remains far above zero so that there is no cold radiation to the inside of the building.

Fig. 10 compares Lexan Thermoclear sheet with single glazed glass under the same conditions. The inside glass surface temperature is well below zero, which means that cold radiation will negatively influence the overall building temperature and will affect the comfort level near the windows.



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9. Temperature process through Lexan Thermoclear sheet at low outside temperature.

10. Comparison of Lexan Thermoclear sheet with single glazed glass under the same conditions.

## Lexan\* sheet cleaning recommendations

These cleaning recommendations apply to all Lexan polycarbonate sheet products, including, but not limited to, Lexan solid sheet and signs, Lexan coated Margard\* sheet and Lexan multi-wall sheet. Periodic cleaning using correct procedures can help to prolong service life. For cleaning, it is recommended that the following instructions be adhered to:

### Cleaning procedure for small areas – manual

1. Gently wash sheet with a solution of mild soap and lukewarm water, using a soft, grid-free cloth or sponge to loosen any dirt or grime.
2. Fresh paint splashes, grease and smeared glazing compounds can be removed easily before drying by rubbing lightly with a soft cloth using petroleum ether (BP65), hexane or heptane. Afterwards, wash the sheet using mild soap and lukewarm water.
3. Scratches and minor abrasions can be minimized by using a mild automobile polish. We suggest that a test be made on a small area of Lexan sheet with the polish selected and that the polish manufacturer's instructions be followed, prior to using the polish on the entire sheet.
4. Finally, thoroughly rinse with clean water to remove any cleaner residue and dry the surface with a soft cloth to prevent water spotting.

### Cleaning procedure for large areas - automated

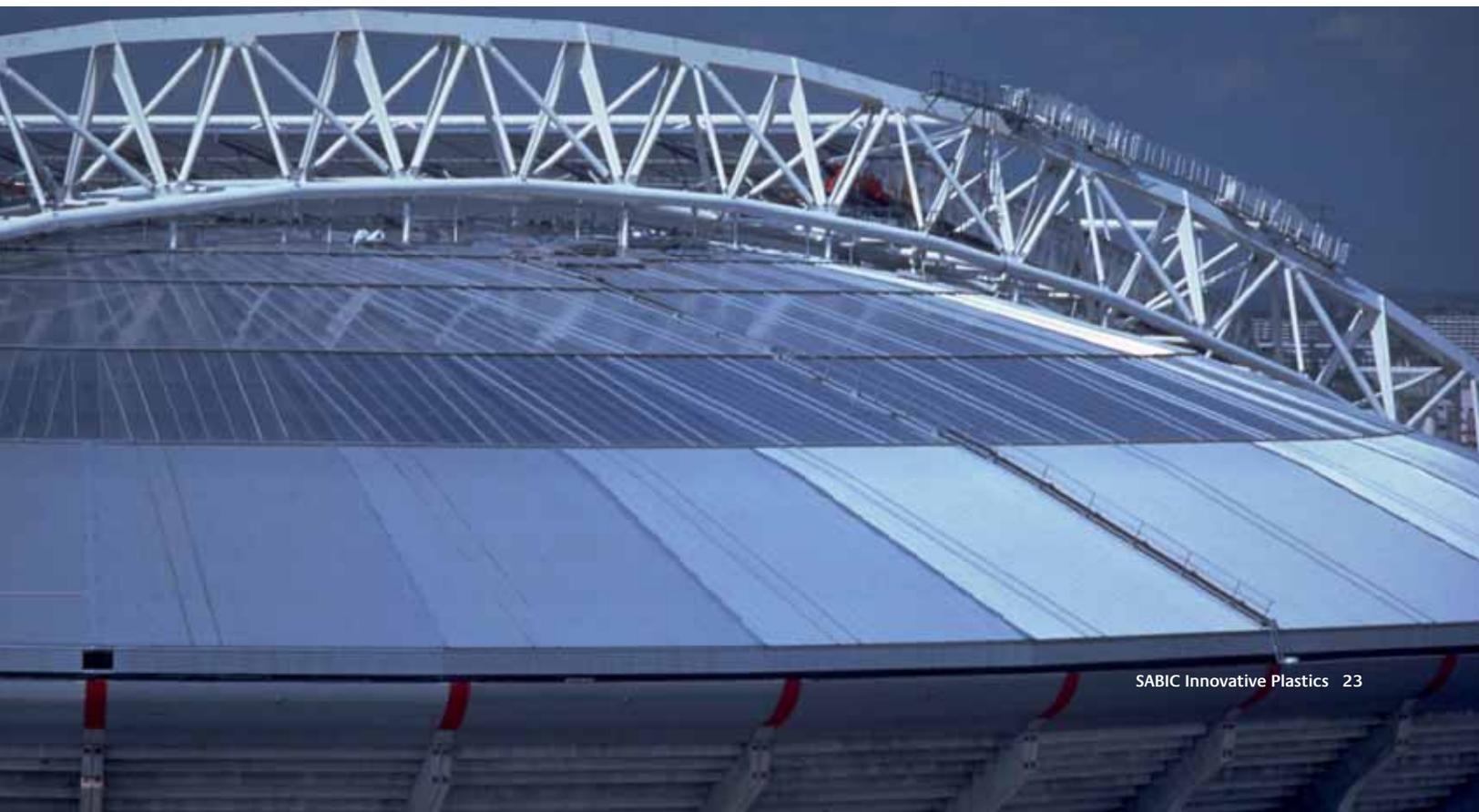
1. Clean the surface using a high-pressure water cleaner (max. 100bar or 1,450psi) and/or a steam cleaner. We suggest that a test be made on a small area, prior to cleaning the entire sheet.
2. Use of additives to the water and/or steam should be avoided.

### Other important instructions for all Lexan sheets:

- Never use abrasive or highly alkaline cleaner on Lexan polycarbonate materials.
- Never use aromatic or halogenated solvents like toluene, benzene, gasoline, acetone or carbon tetrachloride on Lexan polycarbonate materials.
- Use of incompatible cleaning materials with Lexan sheet can cause structural and/or surface damage.
- Contact with harsh solvents such as methyl ethyl ketone (MEK) or hydrochloric acid can result in surface degradation and possible crazing of Lexan sheet.
- Never scrub with brushes, steel wool or other abrasive materials.
- Never use squeegees, razorblades or other sharp instruments to remove deposits or spots.
- Do not clean Lexan polycarbonate in direct sunlight or at high temperatures as this can lead to staining.
- For all mentioned chemicals consult the manufacturer's material safety datasheet (MSDS) for proper safety precautions.

### Additional important considerations for multi-wall, corrugated and sign sheet:

- Cleaners and solvents generally recommended for use on polycarbonate are not necessarily compatible with the UV-protected surfaces of Lexan multi-wall, corrugated and sign polycarbonate materials.
- Do not use alcohols on the UV-protected surfaces of Lexan sheet.
- Never clean the Drippgard® surface of Lexan multi-wall and corrugated sheets.



## Condensation

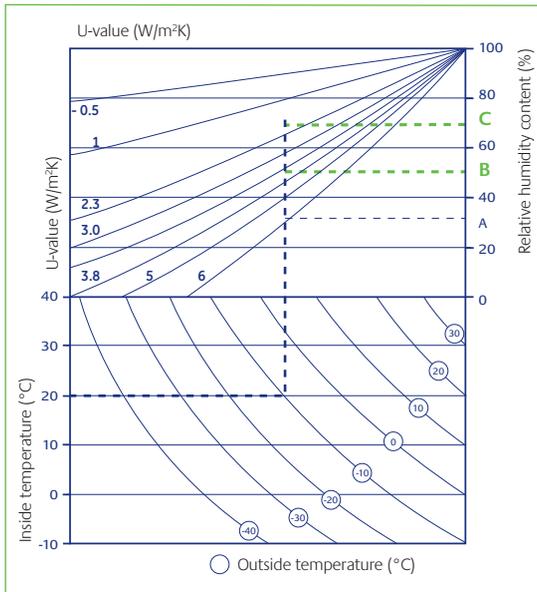
Condensation is formed when moisture in the atmosphere changes back to water as it comes into contact with a surface at a temperature below the 'dewpoint' of the surrounding air.

Water droplets on the surface of the glazing reduce light transmission, and, if they fall, can spoil plants or damage sensitive goods and equipment underneath. Lexan\* Thermoclear\* Drippard® sheet has a special one-sided coating that inhibits the formation of condensation droplets. The coating lowers the surface tension and the droplets form a thin layer of water over the whole surface of the sheet.

When the sheet is correctly installed, this thin, transparent water film runs off the sheet surface into the profile drainage system without falling to the ground and without affecting the light transmission values of the glazing.

Fig. 11 shows a typical condensation prediction chart showing the relationships between internal and external temperatures, relative humidity and the U-value. The dotted lines on the chart illustrate clearly how glass with a high U-value is more prone to condensation than Lexan Thermoclear Drippard sheet.

Example:



Inside temperature: 20°C  
Outside temperature: -10°C

Condensation will occur on:

- A Glass U-value 5.8 w/m<sup>2</sup>K at a humidity content of: 32%
- B LTC 6 mm U-value 3.56 w/m<sup>2</sup>K at a humidity content of: 50%
- C LTC 20 mm U-value 1.8 w/m<sup>2</sup>K at a humidity content of: 68%

## Chemical resistance

Lexan Thermoclear sheet has been successfully used in combination with many building materials and glazing compounds. Taking into account the complexity of chemical compatibility, all chemicals which come into contact with polycarbonate should always be tested in the particular application. For sheet products, the most common materials are sealants, gaskets and the various cleaning media. Chemical compatibility testing is an ongoing process at SABIC Innovative Plastics and many standard products have already been tested. A complete list of recommended cleaners, gaskets and sealants is available upon request. However, a shortened list of some of the more common compounds is shown below.

When using glazing compounds it is essential that the sealant system accepts a certain amount of movement to allow for thermal expansion, without loss of adhesion to the frame or sheet. Momentive Silicones' sealants are generally recommended for use with Lexan Thermoclear sheet, see Table 14. It is strongly advised when using other sealing compounds to check compatibility before use.

Table 14: Recommended sealants

Sealant	Supplier
Silpruf	Momentive
MultiSil	Momentive

Compatible Neoprene, EPT or EPDM rubbers with an approximate Shore Hardness of the A65 are recommended, and compatibility reports for different rubber types are available upon request.

Table 15: Recommended gasket systems

Gasket Type*	Supplier
EPDM Chloropene, RZ4-35-81	Helvoet
EPDM 4330, 4431, 5530, 5531	Vredestein
EPDM 3300/670, 64470	Phoenix

\* more grades available

In case of doubt about any aspect of the chemical compatibility of the Lexan Thermoclear sheet range, always consult your nearest SABIC Innovative Plastics Sales Office for further advice.

11. Condensation prediction chart showing the relationships between internal and external temperatures, relative humidity and the U-value

### Storage

Lexan® Thermoclear® sheet should be stored and protected against atmospheric influences like sun, rain, etc. Lexan Thermoclear sheets of the same length should be stacked together horizontally or, if different lengths, graded with the longest sheet at the bottom of the stack in order to avoid unsupported overhangs. The stacks should be supported on timber bearers and should not be placed where they can be walked on or driven into.

### Handling

As with all glazing materials, care should be exercised when handling and transporting Lexan Thermoclear sheet in order to prevent scratches and damage to sheet edges. Each sheet is packaged as follows to minimise the risk of these problems:

- The top face is covered with printed masking. Lexan Thermoclear (1UV) and Dripgard® masking have a blue print, Lexan Thermoclear Plus (2UV) has a red print, Lexan SunXP and Easyclean have a green printed masking.
- The bottom face has a neutral masking.
- The edges of the sheets have colored tape on them, blue for Lexan Thermoclear (1UV), yellow for Lexan Thermoclear Plus (2UV), green for Dripgard®, purple for Easyclean and red tape for SunXP.
- The sheet should be kept in their packaging until immediately prior to installation.

### Sawing

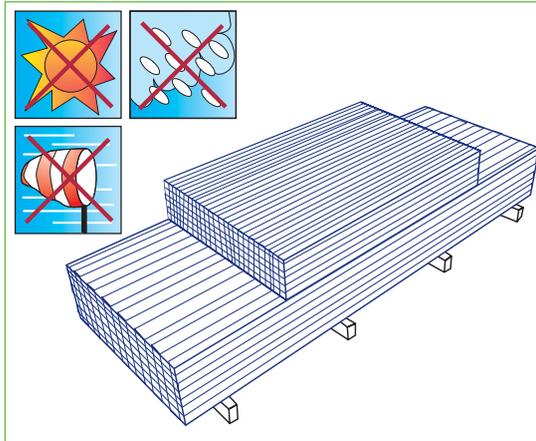
Lexan Thermoclear sheet can be cut easily and accurately with standard workshop equipment. This includes common circular, hand and hacksaws. Saw dust should be blown out of the channels using dry compressed air. Circular saws should have fine-toothed panel blades. When hand or power

hacksaws are used, the sheet should be clamped to the worktable to avoid undesirable vibration. To avoid scratching the surface do not remove the protective masking. When finished the edges of the Lexan Thermoclear sheet should be free of notches and swarf build-up.

With the smaller wall section Lexan Thermoclear sheet, (up to 10 mm), it is possible to cut the sheet with a knife. However, it is important that the knife is sharp.

### Drilling

Holes can be drilled by a power drill using standard high speed steel twist drills or drills with an angular wedged bit. When drilling, support should be given immediately beneath the drill to avoid vibration. Very clean holes are easily obtained. The use of liquid cooling media is not recommended.



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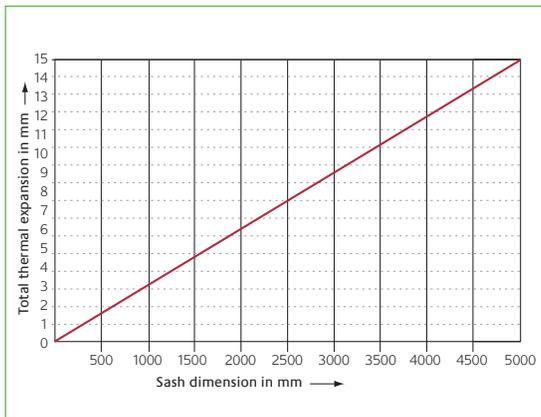


## Installation

Glazing with Lexan® Thermoclear® sheet should be considered a finishing operation and seen as the final step in the completion of an application.

## Thermal expansion allowance

Since Lexan Thermoclear sheet has a greater coefficient of linear thermal expansion than that of traditional glazing materials, care should be taken to allow for free expansion of the sheet to prevent bowing and internal thermal stress.



13

Allowance for thermal expansion must be made for both the length and the width of the Lexan Thermoclear sheet. The recommended allowances for various sheet dimensions are outlined in the graph.

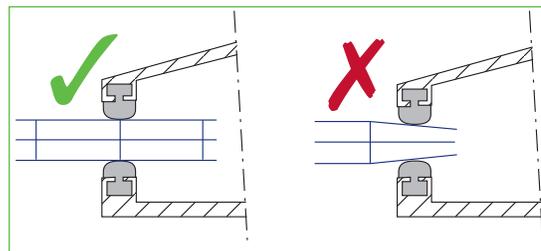
The sheet must be trimmed to allow for at least as much as the indicated thermal expansion.

In general: Thermal expansion of the sheet is approximately 3 mm per linear metre at a delta of 50°C.

## Sheet edge clamping conditions

The following recommendations apply to installations involving both flat glazing, i.e. vertical, horizontal or inclined, and curved glazing. It is extremely important when installing Lexan Thermoclear sheet that the edges are correctly clamped, whether the application involves wet or dry glazing conditions.

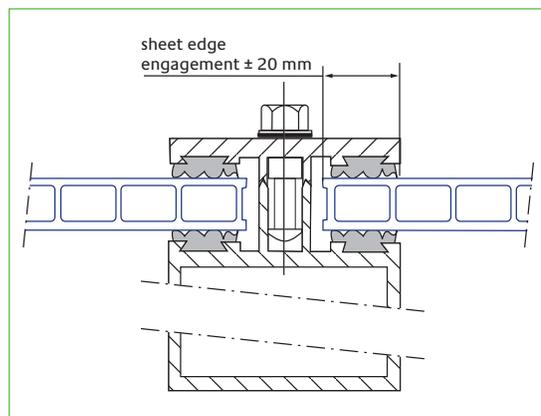
A cover plate, or glazing bead, with rubber gaskets or silicone sealant, hold the sheet in place and create a water-tight seal. In both cases there must be sufficient clearance to allow for thermal expansion of the sheet. It is also important that the edge of the sheet is engaged for a minimum of 20 mm into the glazing frame with at least one rib located in the clamping area. See fig. 14 and 15.



14

In general the total rebate depth for each profile should include a minimum of 20 mm sheet edge engagement and an allowance for thermal expansion.

# Due to the rib geometry of Lexan Thermoclear sheet, at a thickness of  $\geq 16$  mm, additional precautions should be taken. In this case it is important that the sheet is cut such that at least one rib is located in the centre of the rebate.



15

13. This figure shows thermal expansion allowance at various sash dimensions

14, 15. Indicates correct# installation when clamping the sheet in a profile

### Dry glazing systems

This selection illustrates some glazing proposals using commercially available profiles which have proven to be successful in combination with Lexan\* Thermoclear\* sheet. Situations may occur where sheet expansion exceeds sealant limitations and, often for aesthetic reasons, this type of 'dry' glazing system provides an ideal solution.

The advantage of dry systems is that the rubber gaskets snap-fit into the glazing strips which then allow free movement of the sheet during expansion and contraction. See fig.16 and 17.

### WARNING!

**Do not use PVC gaskets.**

Due to the migration of additives from soft PVC, the Lexan Thermoclear sheet can be chemically affected resulting in surface cracks or even sheet breakage.

A wide range of easy to use glazing bars and fixing accessories, designed specifically for glazing Lexan Thermoclear sheet, is available from most of the approved Lexan Thermoclear sheet distributors and specialised installers.

### Wet glazing systems

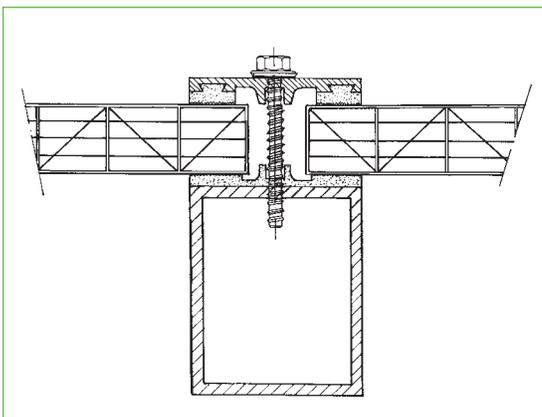
This type of installation system is mainly used in small domestic type applications, car ports, warehouses, conservatories and other glass replacement situations.

With standard metal profiles or wooden sections, in combination with glazing tapes and glazing compounds, many different configurations are possible. See fig.18 and 19.

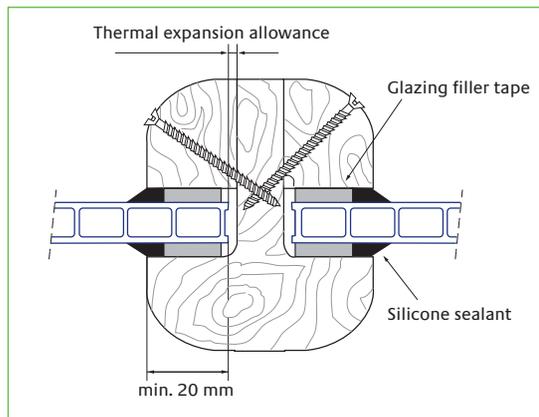
When using glazing compounds it is essential that the sealant system accepts a certain amount of movement, to allow for thermal expansion, without loss of adhesion to the frame or sheet. Silicone sealants are generally recommended for use with Lexan Thermoclear sheet, but it is strongly advised when using sealing compounds to check compatibility before use.

Care should be taken not to use amine nor benzamide curing silicone sealants, which are not compatible with Lexan sheet and result in crazing, particularly when stress is involved. See page 17, Table 5, for suitable sealant.

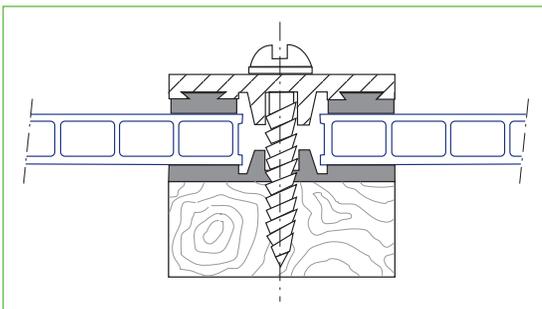
16-17-18-19. Different installation profile examples



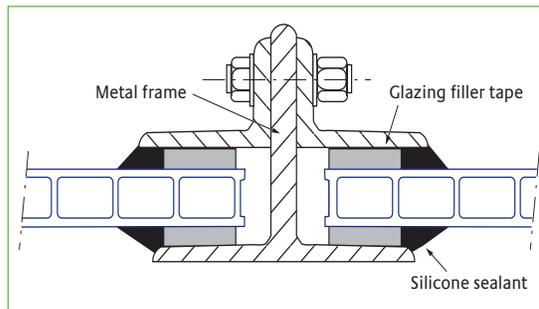
16



18



17



19

### Edge sealing

In all cases Lexan\* Thermoclear\* sheet should be mounted with the ribs running downwards to assist condensation water drainage. Algae growth, in the form of a green deposit inside the sheet channels, may occasionally be a problem. It is the result of permanent condensation inside the channels due to particular temperature conditions.

Since moisture build-up and dust/insect contamination inside the channels can be a major problem, one of the most important aspects of installation is edge sealing, particularly of the open-ended channels. There are several techniques that can be adopted to significantly reduce contamination, the choice depending largely on the prevailing environmental conditions.

### Sealing tape

It should be noted that the tape delivered on Thermoclear sheet is for protection, during transportation and storage, only and is not an impermeable sealing/ installation tape. This tape should be replaced prior to installation with a tape as described below.

Before taping, approximately 50 mm of the masking should be removed from all sheet edges. The remaining masking should be removed only when installation is completed.

- The tape should have good weathering resistance, without loss of long-term adhesion or mechanical strength.
- The tape should have good resistance to tearing and other damage during installation and handling.
- In close co-operation with the company Multifoil, an anti-dust impermeable tape G3600 and an anti-dust venting tape AD3400/AD4500 have been developed. Multifoil will provide within Europe a 10 Year Guarantee on the operation of the tapes.

### MULTIFOIL B.V.

Laanakkerweg 12  
4131 PA Vianen  
The Netherlands  
tel. +31 347 366 717  
fax. +31 347 366 718

### Sealing guidelines

The following Guidelines are recommended to minimise sealing and contamination problems:

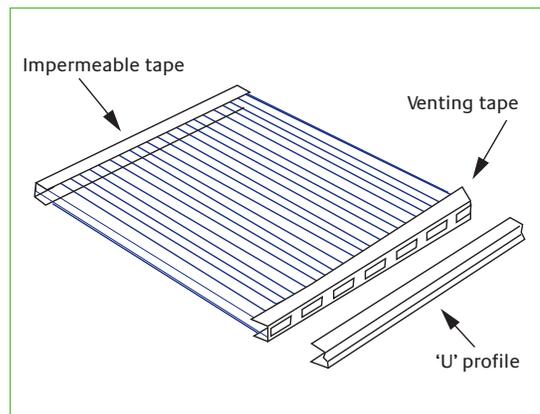
- Ensure that all sheet edges are smooth and rounded before applying the tape.
- All channels should be blown free of dust before sealing.
- Ensure tape is completely covered by glazing profiles, flashings, end closures, etc. No tape should be left exposed when installation is complete.
- Replace any damaged tape before final installation.
- Recommended sealing tapes for glazing Lexan Thermoclear sheet are available from most approved Lexan Thermoclear distributors and specialised installers.

### Standard glazing conditions

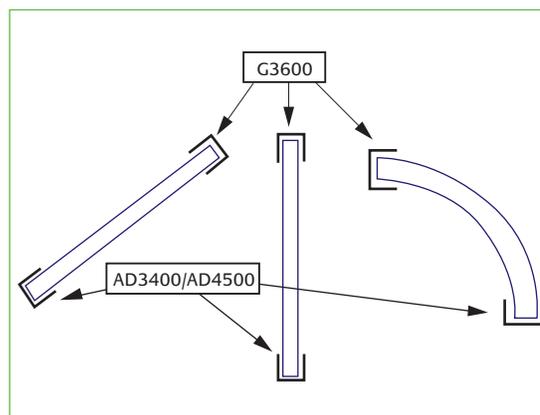
In standard glazing conditions, the top end channels are sealed with an impermeable tape and the bottom end channels are sealed with a perforated filter tape.

See fig. 20 and 21.

An additional 'U' profile can be installed to cover the perforated bottom tape and to facilitate condensation drainage. (See fig. 24 and 25).



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In semicircular barrel vaults both channel ends should be sealed with perforated filter tape e.g. Multifoil AD 3400. See fig. 22.

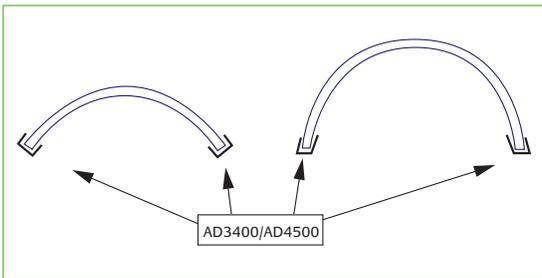
Care should be taken to provide a clearance between both the sheet edges and the sash platform to allow for condensation drainage. See fig. 23 and 24. In general the total rebate depth for each profile should include a minimum of 20 mm sheet edge engagement and an allowance for thermal expansion.

### Specific glazing conditions

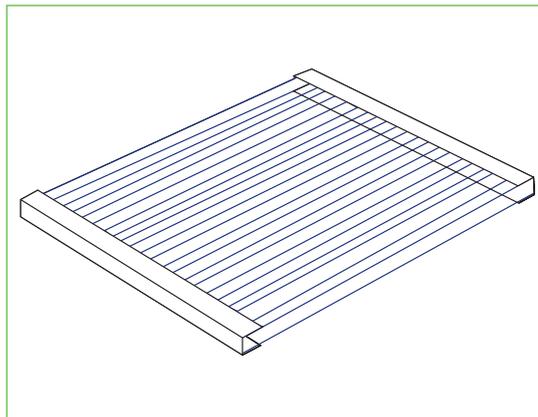
In certain environments, it is recommended that both channel ends are sealed with an impermeable tape. See fig. 25. These environments include:

- Extremely dusty environments (sawmills – welding-stations, etc)
- Low humidity/dry conditions (shopping centres – warehouses, etc)
- Limited temperature difference between the interior and exterior (football stadia – metro/railway station roofing, etc)

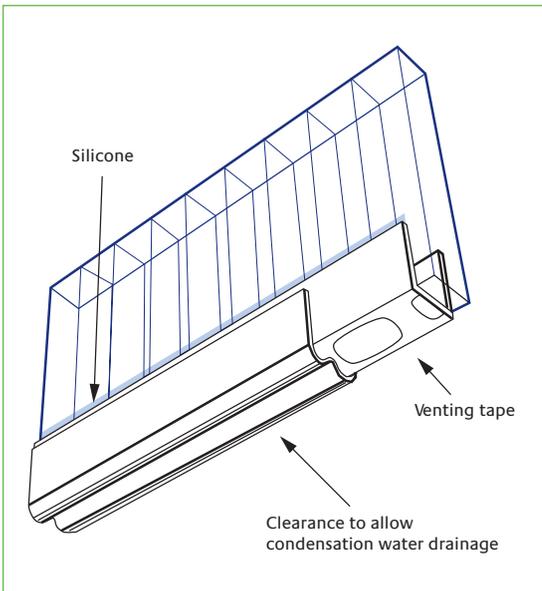
### 25. Impermeable tape on both sides



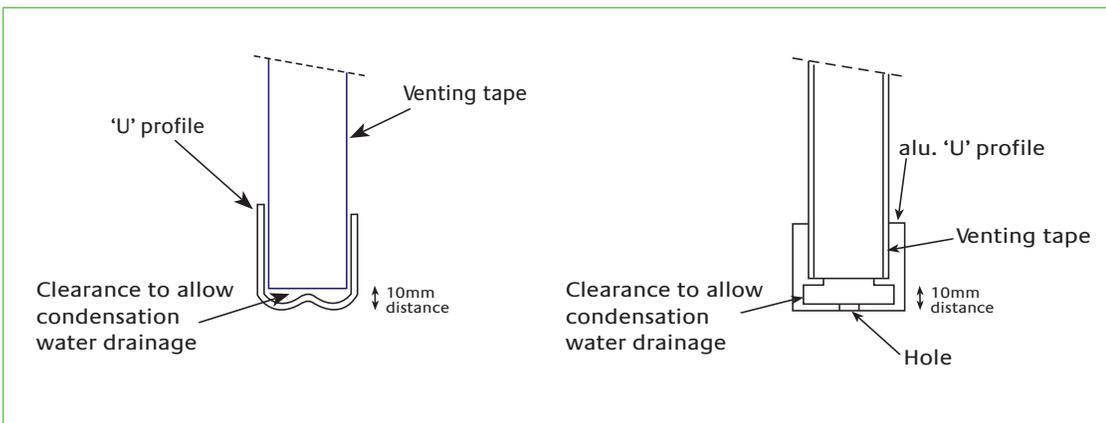
22



25



23



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## Wind and snow loading

### Dynamic wind pressure

The wind speed is used to determine the actual loading upon the glazing panels. In mathematical terms, the pressure loading is calculated by multiplying the square of the design wind speed by 0.613.

$$q = KV^2$$

where  $q$  = dynamic wind pressure in  $N/m^2$   
 $K = 0.613$   
 $V$  = design wind speed in metres/second

**Table 16: Values of  $q$  in SI units ( $N/m^2$ )**

wind speed m/s	wind pressure $N/m^2$
10	61
15	138
20	245
25	383
30	552
35	751
40	981
45	1240
50	1530
55	1850
60	2210
65	2590

For glazing projects with an unusual loading condition, please contact your local SABIC Innovative Plastics Sales Office

### The Beaufort scale transforms wind into static pressure:

Wind	light	moderate	strong	storm
Speed (km/h)	20	40-60	80-100	120-140
Speed (m/sec)	6	11-17	22-28	33-39
Static pressure ( $N/m^2$ )	20	80-170	300-480	680-950

**Table 16a:**

Height of building m	wind speed m/s	wind pressure $N/m^2$
0 – 8	28,3	500
8 – 20	35,8	800
20 – 100	42	1100
> 100	45,6	1300

### Pressure coefficient

To allow for local fluctuations in the acceleration/ deceleration of the wind by building or glazing geometry, it is necessary to include an appropriate pressure coefficient.

Determine pressure coefficients requires knowledge of:

- Form and type of building
- Height of glazing
- Shape of glazing e.g.
  - Flat vertical
  - Inclined roofing
  - Curved glazing

The wind loading is obtained by multiplying the dynamic wind pressure by the pressure coefficient. The total wind loading can be positive indicating a wind pressure force or negative indicating a wind suction load. Detailed pressure coefficient values can be found in the appropriate national building norms.

### Snow loading

Snow loading on roof glazing can be considered equivalent to a vertically, uniformly distributed load, acting per  $m^2$  of the horizontal projection of the glazing. A roof made of Lexan\* Thermoclear\* sheet does not permit immediate melting of the snow, due to its excellent thermal insulation, and therefore the load produced by the snow must be carefully taken into consideration.

Snow-indicative weights per centimetre of height

fresh snowfall - 0.8-1.9  $kg/m^2$  per cmh.  
 wet snowfall - 2-8  $kg/m^2$  per cmh.

Snow loading factors can be obtained from the appropriate local building norm.

### Computer aided sheet engineering

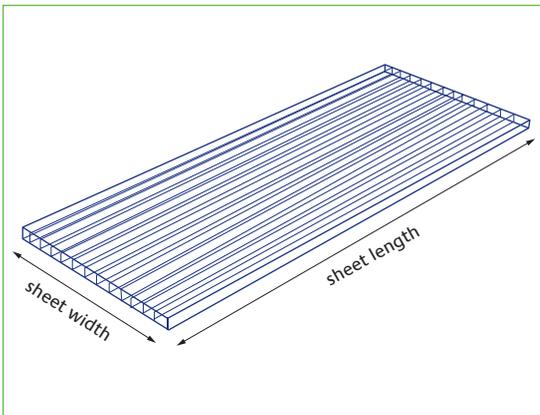
A computer aided design programme has been developed especially for large glazing projects, or projects with an uncommon shape or unusual loading conditions. The programme creates the finite element model of a particular glazing design, applies the specified loads and edge conditions and runs the deflection analysis. Consult your nearest SABIC Innovative Plastics Technical Service Centre for further advice.

## Sheet thickness guidelines

### Support conditions

#### Note

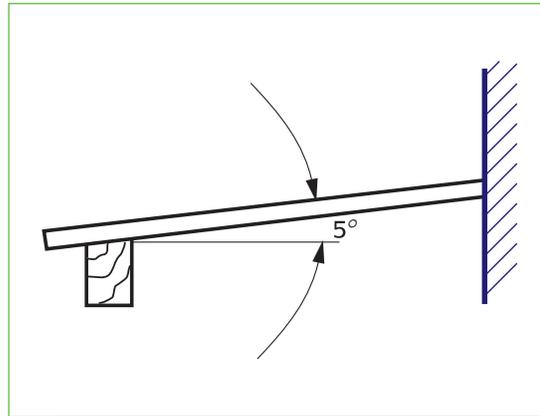
Regardless of the support configuration selected, the sheet should always be installed so that the rib structure channels are sloping downwards. Sheet "width" is the dimension perpendicular to the rib structure, "length" the dimension parallel.



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### Sloped roofing

For sloped glazing applications a minimum slope of 5° (9 cm/m sheet length) is advised to allow for rainwater drainage.

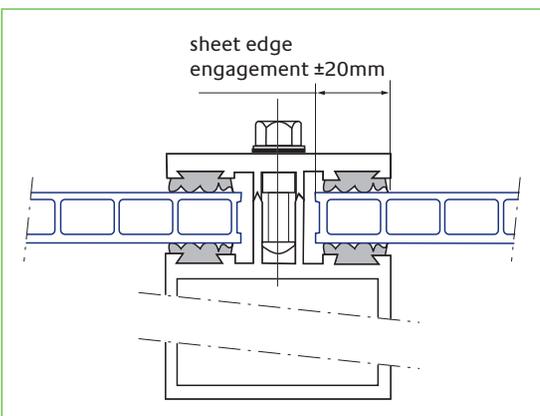


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### Safety factor

Tables 17, 18 and 19 indicate the maximum allowable sheet size at a specified loading which results in an acceptable sheet deflection behaviour without the risk of sheet buckling or pop-out effect calculated with a safety factor of 1.5.

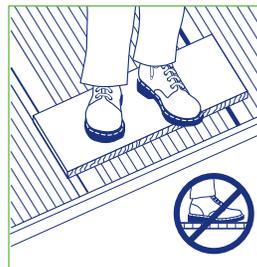
N.B. The values indicated in the Tables are applicable for a Lexan Thermoclear sheet edge engagement in the glazing frame of at least 20 mm.



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### Site safety

On roof constructions Lexan\* Thermoclear\* sheet should not be used to support a person's weight during installation or cleaning. A temporary wooden beam or other device, supported by the roof members, should always be used.



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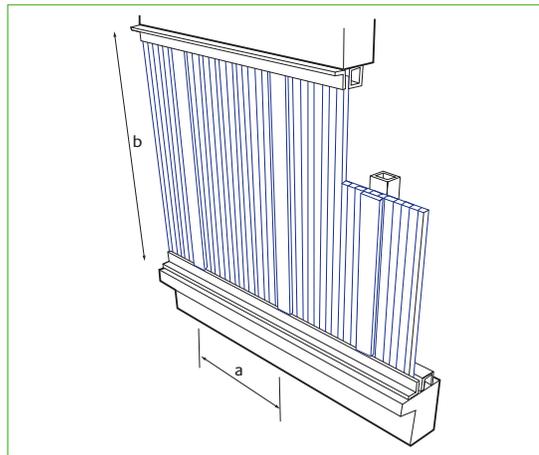
## Flat glazing sheet thickness

The deflection characteristics in this particular configuration are dependent upon the ratio of the support bar spacing a:b, see Figure 30.

In practice “a” represents the centre to centre distance of glazing profiles on the short glazing side i.e. the width of sheet.

“b” represents the centre to centre distance of glazing profiles on the long glazing side i.e. length of sheet.

Table 17 indicates the maximum allowable short glazing side of three different ratios of glazing bar spacing.



**Ratio sheet width “a”: sheet length “b” 1:1**  
**Ratio sheet width “a”: sheet length “b” 1:<1.5**  
**Ratio sheet width “a”: sheet length “b” 1:>1.5**

**Table 17: Centre to centre distance (mm) of glazing profiles (shortest side (a))**

	Ratio sheet width: sheet length																							
	1:1	1:<1.5	1:>1.5	1:1	1:<1.5	1:>1.5	1:1	1:<1.5	1:>1.5	1:1	1:<1.5	1:>1.5	1:1	1:<1.5	1:>1.5									
Loading in N/m <sup>2</sup>	600			800			1000			1200			1400			1600			1800			2000		
LT2UV452RS10	690	850	450																					
LT2UV62RS13	1050	920	610	950	850	570	900	780	530															
LT2UV82RS15	1250	1100	720	1150	1020	655	1075	940	610	1020	900	570	970	830	535	930	780	510						
LT2UV102RS17	1500	1150	815	1375	1070	730	1280	950	670	1215	920	620	1160	850	585	1110	800	545	1070	760	520			
LT2UV103RS19	1470	1110	800	1355	1035	730	1265	935	675	1205	895	625	1150	830	575	1105	780	540	1065	745	510			
LT2UV103X20	1800	1250	900	1700	1180	870	1600	1120	810	1520	1050	750	1450	1000	720	1350	950	700	1300	900	660	1200	850	620
LT2UV103T20	1540	1310	890	1410	1250	810	1320	1150	750	1250	1060	700	1200	980	660	1150	920	630	1110	860	610	1070	810	585
LT2UV105RS175	1600	1200	850	1500	1100	800	1425	1050	750	1375	980	700	1300	950	650	1200	900	600	1100	850	550	1000	800	500
LT2UV163TS27	1700	1420	1100	1600	1310	980	1500	1210	880	1450	1120	810	1400	1060	750	1300	1000	700	1250	950	665	1200	900	620
LT2UV163TS28	2100*	1420	1100	1950	1310	980	1825	1210	880	1725	1120	810	1650	1060	750	1550	1000	700	1475	950	665	1250	900	620
LT2UV163X29	2100*	1700	1200	2100*	1600	1150	1900	1450	1100	1800	1350	1050	1700	1200	1000	1600	1100	950	1500	1000	900	1400	950	850
LT2UV166RS27	1800	1400	1150	1700	1350	1050	1600	1220	980	1500	1150	950	1420	1100	900	1300	1050	880	1200	1000	850	1100	950	800
LT2UV205RS33	2100*	1600	1200	2100*	1500	1150	2000	1400	1050	1900	1300	980	1700	1200	900	1600	1150	850	1500	1050	800	1400	1000	750
LT2UV205X32	1250*	1250*	1250*	1250*	1250*	1200	1250*	1250*	1150	1250*	1250*	1100	1250*	1250*	1050	1250*	1250*	1000	1250*	1250*	980	1250*	1250*	920
LT2UV206RS30	1250*	1250*	1250*	1250*	1200*	1150*	1250*	1250*	1150*	1250*	1200*	1100*	1250*	1150*	1000*	1250*	1100*	980*	1200*	980*	900*	1150*	950*	850*
LT2UV255X34	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1200	1250*	1250*	1100	1250*	1250*	1000
LT2UV256RS35	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1200	1250*	1250*	1150	1250*	1250*	1100	1250*	1250*	1050	1250*	1250*	1000	1250*	1250*	950
LT2UV325X38	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1250*	1200	1250*	1250*	1100
LT2UV359X40	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*
LT2UV409X43	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*
LT2UV459X45	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*
LT2UV509X48	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*	1200*

\* centre to centre distance = maximum sheet width

### Example I

Window size: width 800 mm  
length: 1200 mm  
(Ratio a:b = 1 : 1.5)  
Loading: 1600 N/m<sup>2</sup>  
Required sheet type: LT2UV10/2RS17

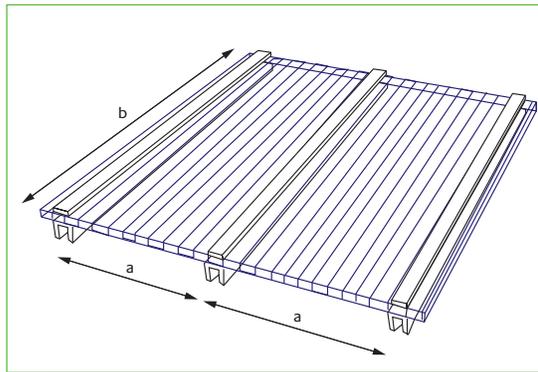
### Example II

Window size: width 1100 mm  
length 3000 mm  
(Ratio a:b = 1 : >1.5)  
Loading: 600 N/m<sup>2</sup>  
Required sheet type: LT2UV16/3TS28 or LTUV16/  
3TS27

**Two sides clamped, glazing bars parallel with rib structure**

a = centre to centre distance of glazing profiles  
 b = sheet length

The major factor determining the sheet deflection behaviour is the distance “a” between the centre points of two adjacent supports. Since any length of sheet can be selected, the measurement “b” does not influence the overall deflection performance.



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**Table 18: Centre to centre distance (mm) of glazing profiles “a”; glazing profiles parallel with the rib structure**

	centre to centre distance (mm)							
Loading in Nm <sup>2</sup>	600	800	1000	1200	1400	1600	1800	2000
LT2UV62RS13	570	530						
LT2UV82RS15	655	61	570	535	510			
LT2UV102RS17	730	670	620	585	545	520		
LT2UV103RS19	800	730	675	625	575	540	510	
LT2UV103X20	900	870	810	750	720	700	660	640
LT2UV103T20	890	810	750	700	660	630	610	585
LT2UV105RS175	850	800	750	700	650	600	550	
LT2UV163TS27	1100	980	880	810	750	700	665	620
LT2UV163TS28	1100	980	880	810	750	700	665	620
LT2UV163X29	1200	1150	1100	1050	1000	950	900	850
LT2UV166RS27	1150	1050	980	950	900	880	850	800
LT2UV205RS33	1200	1160	1070	980	920	860	810	770
LT2UV205X32	1250#	1250#	1250#	1150	1050	1000	950	900
LT2UV206RS30	1250	1200	1100	1050	1000	950	900	800
LT2UV255X34	1250#	1250#	1250#	1250#	1175	1100	1050	1000
LT2UV256RS35	1250#	1250#	1200	1150	1100	1050	1000	950
LT2UV325X38	1250#	1250#	1250#	1250#	1250#	1200	1150	1100
LT2UV359X40	1200#	1200#	1200#	1200#	1200#	1200#	1200#	1200#
LT2UV409X43	1200#	1200#	1200#	1200#	1200#	1200#	1200#	1200#
LT2UV459X45	1200#	1200#	1200#	1200#	1200#	1200#	1200#	1200#
LT2UV509X48	1200#	1200#	1200#	1200#	1200#	1200#	1200#	1200#

# centre to centre distance = maximum sheet width

## Flat glazing sheet thickness

In this situation, the major factor influencing deflection behaviour is the purlin spacing. The sheet width has no influence on the deflection behaviour of the sheet when exposed to loading. This means that any sheet width up to the maximum standard width can be selected.

In the case of vertical glazing, should a greater span width be required, a standard polycarbonate "H" profile is sufficient to join two sheets together to form a sound, water-tight joint. No additional vertical glazing support bars are necessary. In the case of sloped glazing, a support/glazing profile is recommended to join two sheets together, not only for a watertight joint, but also to avoid excessive sheet deflection already caused by the sheet's own weight.

Fastening Lexan® Thermoclear® sheet to the intermediate purlins using conventional nuts, bolts and washers is possible. However, all joints and clamping areas require support in the form of compatible rubber washers to distribute the clamping force over as wide an area as possible. To facilitate this, large metal washers laminated with compatible rubber and assembled with spacing collars should be used. Bolts should not be tightened so that the force permanently deforms the sheet or restricts its natural expansion and contraction. An alternative method of assembly involves a specially designed polyamide "cladding button" which is available at any authorised Lexan Thermoclear sheet distributor. The button is designed so that the compatible rubber gasket is an integral part of the bolt which has a large head to distribute the clamping forces.

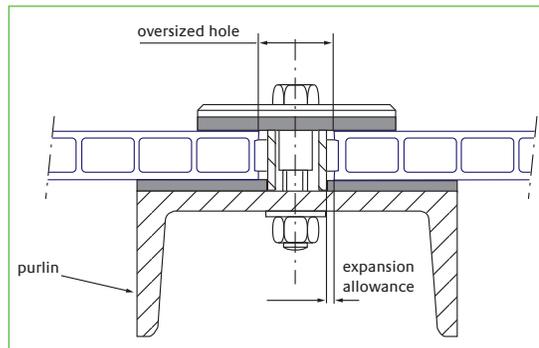
When using any type of bolt assembly it is important to remember that the spacing between the hole and the sheet edge should be at least 40 mm.

### Note

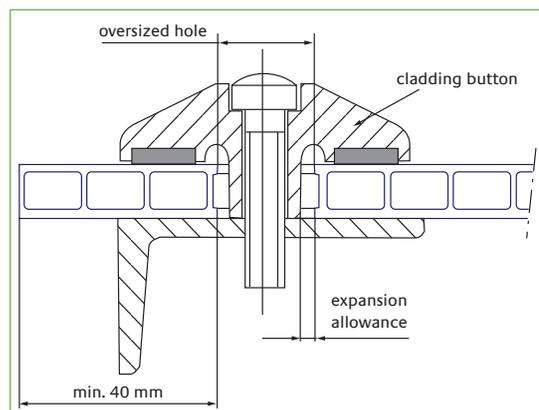
When applying the glazing method described above, the following points must be taken into consideration.

- Penetration of water and dust between the "H" profile and the sheet surface may create streaks. By applying a recommended silicone sealant this penetration can be restricted.
- It is extremely difficult to obtain a watertight connection between the washer or button and the Lexan Thermoclear sheet surface.
- Water and dust can easily penetrate into the bolted sheet channel which consequently results in algae growth or cobweb formation.

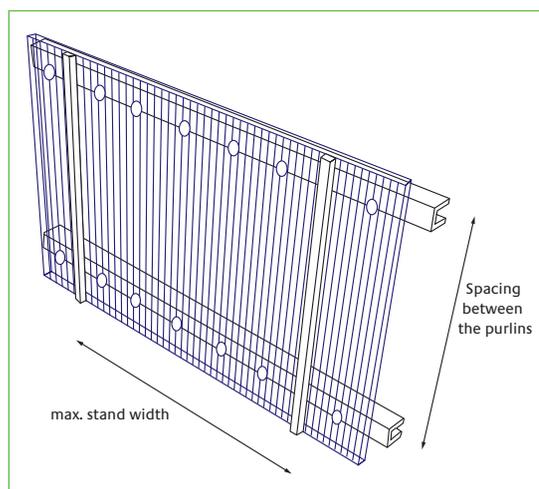
Consider this glazing system as suitable only when appearance is of minor importance.



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**Table 19: Centre to centre distance of purlins in mm; glazing profiles 90° to rib structure**

centre to centre distance (mm)								
Loading in Nm <sup>2</sup>	600	800	1000	1200	1400	1600	1800	2000
LT2UV452RS10	500							
LT2UV62RS13	690	630	590	570	540	520	500	480
LT2UV82RS15	830	760	720	680	650	630	600	580
LT2UV103RS19	900	910	855	800	770	740	710	
LT2UV103X19	1010	930	875	830	790	760	730	710
LT2UV102RS17	1010	930	875	830	790	760	730	710
LT2UV103T20	1010	930	875	830	790	760	730	730
LT2UV105RS175	1010	930	875	830	790	760	730	730
LT2UV163TS27	1450	1325	1240	1180	1130	1085	1050	1000
LT2UV163TS28	1450	1325	1240	1180	1130	1085	1050	1000
LT2UV163X29	1450	1325	1240	1180	1130	1085	1050	1000
LT2UV166RS27	1450	1325	1240	1180	1130	1085	1050	1000
LT2UV205RS33	1550	1440	1350	1275	1220	1175	1140	1100
LT2UV206RS30	1550	1440	1350	1275	1220	1175	1140	1100
LT2UV255X34	1675	1525	1435	1360	1290	1290	1200	1150
LT2UV256RS35	1675	1525	1435	1360	1290	1250	1200	1150
LT2UV329X38	2000	1850	1700	1600	1500	1450	1400	1350
LT2UV359X40	2000	1900	1800	1700	1600	1500	1450	1400
LT2UV409X43	2100	2000	1900	1800	1700	1600	1550	1500
LT2UV459X45	2300	2200	2100	2000	1900	1800	1700	1600
LT2UV509X48	2400	2300	2200	2100	2000	1900	1800	1700



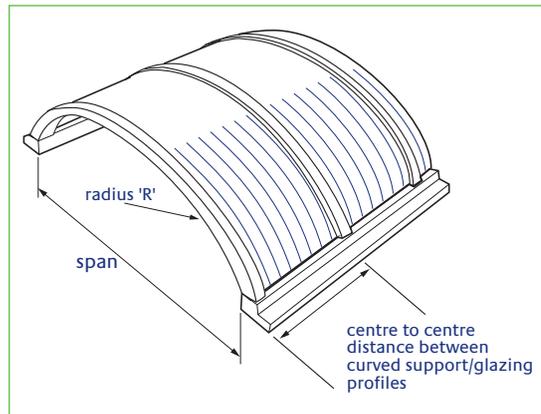
## Curved glazing sheet thickness

Lexan\* Thermoclear\* sheet can be successfully cold-curved over curved support glazing profiles, to suit many glazing applications, e.g. domes, roof-lights, etc. Providing the radius is not below the minimum recommended value, then the introduced stress by cold-curving will not have any adverse effect upon the mechanical performance of the sheet. Sheets must always be bent longitudinally, never across the width of the sheet.

The loading characteristics given in Table 21 are based upon curved glazing applications clamped on all four edges. The Table shows linear buckling load values, (calculated with a safety factor of 2.0), against installation radii for different sheet widths. sheet length 'L' needs to be greater than sheet width 'W' to facilitate curvature; in practice, a ratio of 1:2 or less is never contemplated because of the practicalities of installation geometry.

**Table 20: Minimum radius values**

Lexan Thermoclear sheet thickness	Min. Radius in mm
6	1050
8	1400
10	1750
16	2800
20	3500
25	4375



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**Table 21: Centre to centre distance (mm) curved glazing profiles**

LT2UV62RS13								
Loading in N/m <sup>2</sup>	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
1050	2100	1800	1500	1250	1070	960	860	750
1200	1900	1500	1250	1000	900	800	700	600
1300	1700	1400	1100	900	790	700	630	570
1400	1600	1200	960	830	720	630	570	500
1500	1450	1100	900	750	660	570	500	450
1600	1350	1000	820	680	600	500	450	450
1700	1250	930	760	650	530	450	450	450
1800	1150	860	700	620	450	450	450	450
1900	1050	800	640	580	450	450	450	450
2000	920	750	600	530	450	450	450	450
2100	850	700	550	470	450	450	450	450
2200	800	670	500	450	450	450	450	450
2300	750	600	450	450	450	450	450	450
2400	700	550	450	450	450	450	450	450
2500	650	550	450	450	450	450	450	450
2600	650	500	450	450	450	450	450	450
2700	650	500	450	450	450	450	450	450

LT2UV82RS15								
Loading in N/m <sup>2</sup>	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
1400	2100	1900	1700	1300	1100	1000	870	780
1500	2000	1700	1350	1160	1000	880	800	720
1600	1950	1650	1270	1060	920	810	720	660
1700	1830	1510	1180	990	860	760	670	600
1800	1710	1370	1090	920	800	710	620	550
1900	1600	1230	1000	840	730	650	580	550
2000	1480	1150	920	780	680	600	550	550
2100	1380	1070	870	730	640	550	550	550
2200	1320	980	820	700	600	550	550	550
2300	1220	930	770	660	550	550	550	550
2400	1150	880	700	600	550	550	550	550
2500	1100	830	650	550	550	550	550	550
2600	1020	750	600	550	550	550	550	550
2700	950	700	600	550	550	550	550	550
2800	870	700	600	550	550	550	550	550

LT2UV102RS17								
Loading in N/m <sup>2</sup>	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
1750	2100	1930	1530	1320	1140	1000	900	800
1900	2100	1680	1380	1160	1020	880	800	720
2000	2000	1600	1280	1080	930	830	750	680
2100	1900	1470	1200	1010	870	770	700	600
2200	1820	1390	1120	950	820	780	650	560
2300	1700	1300	1060	890	780	690	620	560
2400	1600	1230	1000	840	740	630	620	560
2500	1530	1150	950	800	700	630	620	560
2600	1450	1070	900	750	660	630	620	560
2700	1380	980	860	700	660	630	620	560
2800	1280	930	820	700	660	630	620	560
2900	1220	900	790	700	660	630	620	560
3000	1160	880	750	700	660	630	620	560
3200	1080	830	750	700	660	630	620	560
3400	1000	830	750	700	660	630	620	560

## Curved glazing sheet thickness

Continued Table 21: Centre to centre distance (mm) curved glazing profiles

LT2UV103X20								
Loading in N/m <sup>2</sup>	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
1750	1850	1600	1500	1400	1350	1300	1200	1100
2000	1725	1500	1400	1350	1300	1250	115	1050
2250	1625	1450	1350	1300	1250	1200	100	1000
2500	1525	1400	1300	1250	1200	1100	100	900
2750	1450	1350	1250	1200	1100	1000	900	800
3000	1375	1300	1200	1100	1000	900	800	700
3250	1300	1250	1100	1000	900	800	700	700
3500	1250	1200	1000	900	800	700	700	700
3750	1200	1175	900	800	700	700	700	700
4000	1150	1050	800	700	700	700	700	700
4250	1100	900	700	700	700	700	700	700
4500	1000	800	700	700	700	700	700	700
4750	900	700	700	700	700	700	700	700
5000	800	700	700	700	700	700	700	700
5250	800	700	700	700	700	700	700	700

LT2UV105RS175								
Loading in N/m <sup>2</sup>	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
1750	2100	1930	1530	1320	1140	1000	900	800
1900	2100	1680	1380	1160	1020	880	800	720
2000	2000	1600	1280	1080	930	830	750	680
2100	1900	1470	1200	1010	870	770	700	600
2200	1820	1390	1120	950	820	780	650	560
2300	1700	1300	1060	890	780	690	620	560
2400	1600	1230	1000	840	740	630	620	560
2500	1530	1150	950	800	700	630	620	560
2600	1450	1070	900	750	660	630	620	560
2700	1380	980	860	700	660	630	620	560
2800	1280	930	820	700	660	630	620	560
2900	1220	900	790	700	660	630	620	560
3000	1160	880	750	700	660	630	620	560
3200	1080	830	750	700	660	630	620	560

LT2UV163TS28								
Loading in N/m <sup>2</sup>	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
2800	2100	1920	1580	1330	1150	1020	920	830
3000	2100	1780	1450	1210	1060	940	840	760
3200	2050	1620	1320	1110	970	860	760	690
3400	1920	1480	1210	1030	890	780	700	620
3600	1780	1400	1120	950	830	700	665	620
3800	1670	1300	1040	890	750	700	665	620
4000	1560	1200	960	810	750	700	665	620
4200	1460	1120	880	810	750	700	665	620
4400	1360	1040	880	810	750	700	665	620
4600	1300	980	880	810	750	700	665	620
4800	1200	980	880	810	750	700	665	620
5000	1100	980	880	810	750	700	665	620
5200	1100	980	880	810	750	700	665	620
5400	1100	980	880	810	750	700	665	620
5600	1100	980	880	810	750	700	665	620

Continued Table 21: Centre to centre distance (mm) curved glazing profiles

LT2UV163X29								
Loading in N/m <sup>2</sup>	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
3200	2100	2100	2100	1850	1550	1400	1250	1100
3400	2040	2000	1900	1650	1450	1300	1200	1050
3600	1980	1900	1850	1550	1350	1200	1100	950
3800	1920	1800	1700	1450	1250	1120	1000	950
4000	1850	1700	1600	1350	1200	1050	950	950
4200	1790	1600	1500	1275	1150	1000	950	950
4400	1740	1500	1400	1200	1100	950	950	950
4600	1700	1400	1300	1140	1050	950	950	950
4800	1650	1300	1200	1100	1000	950	950	950
5000	1600	1200	1150	1050	950	950	950	950
5200	1550	1100	100	950	950	950	950	950
5400	1400	1050	950	950	950	950	950	950
5600	1300	1000	950	950	950	950	950	950
5800	1200	950	950	950	950	950	950	950
6000	1200	950	950	950	950	950	950	950

LT2UV166RS29								
Loading in N/m <sup>2</sup>	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
2800	2100	2100	1950	1660	1400	1270	1150	1050
3000	2100	2100	1800	1500	1320	1150	1050	950
3200	2100	2000	1650	1350	1200	1060	950	900
3400	2100	1850	1500	1280	1100	1000	900	900
3600	2000	1720	1400	1170	1020	950	900	900
3800	1950	1600	1300	1100	950	900	900	900
4000	1800	1500	1200	1000	900	900	900	900
4200	1700	1400	1100	950	900	900	900	900
4400	1600	1300	1000	900	900	900	900	900
4600	1500	1200	900	900	900	900	900	900
4800	1400	1100	900	900	900	900	900	900
5000	1250	1000	900	900	900	900	900	900
5200	1100	900	900	900	900	900	900	900
5400	1100	900	900	900	900	900	900	900
5600	1100	900	900	900	900	900	900	900

LT2UV205RS33								
Loading in N/m <sup>2</sup>	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
3600	1850	1500	1300	1200	1100	1000	900	850
3700	1800	1450	1250	1150	1050	950	855	810
3800	1750	1400	1200	1100	1000	900	810	770
3900	1710	1360	1175	1075	975	880	810	770
4000	1675	1325	1150	1050	950	860	810	770
4100	1640	1300	1110	1120	920	860	810	770
4200	1600	1275	1075	980	920	860	810	770
4300	1550	1230	1035	980	920	860	810	770
4400	1500	1200	1000	980	920	860	810	770
4500	1450	1180	950	980	920	860	810	770
4600	1400	1160	950	980	920	860	810	770
4700	1350	1130	950	980	920	860	810	770
4800	1300	1050	950	980	920	860	810	770
4900	1250	980	950	980	920	860	810	770
5000	1200	980	950	980	920	860	810	770

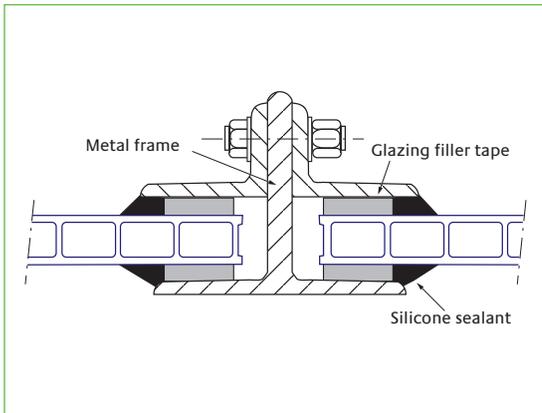
## Curved glazing sheet thickness

Continued Table 21: Centre to centre distance (mm) curved glazing profiles

LT2UV205X33								
Loading in N/m <sup>2</sup>	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
3700	1250	1250	1250	1250	1250	1250	1250	1250
3900	1250	1250	1250	1250	1250	1250	1250	1200
4100	1250	1250	1250	1250	1250	1250	1200	1150
4300	1250	1250	1250	1250	1250	1200	1150	1100
4500	1250	1250	1250	1250	1200	1150	1100	1050
4700	1250	1250	1250	1200	1150	1100	1050	1000
4900	1250	1250	1200	1150	1100	1050	1000	950
5100	1250	1200	1150	1100	1050	1000	950	950
6300	1200	1150	1100	1050	1000	950	950	950
5500	1150	1100	1050	1000	950	950	950	950
5700	1100	1050	1000	950	950	950	950	950
5900	1050	1000	950	950	950	950	950	950
6100	1000	950	950	950	950	950	950	950
6300	950	950	950	950	950	950	950	950



### Wet glazing

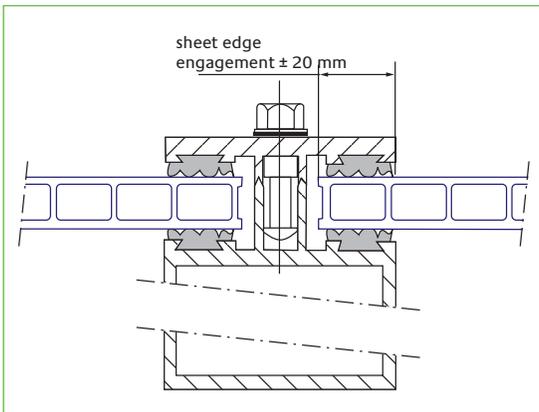


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### Do's

- Clean the window frame. Remove old putty or broken glass, if necessary.
- Measure the sheet edge engagement area ( $\pm 20$  mm) and internal window frame dimensions, i.e. the space into which the Lexan\* Thermoclear\* sheet will be fitted.
- Calculate the sheet size, allowing clearance for thermal expansion (3 mm per linear metre).
- Select the right thickness to fulfil loading requirements, U-value, etc.
- Clamp the Lexan Thermoclear sheet to a support table to avoid vibration and rough cutting.
- Cut the sheet to the required size, using a standard electric circular or jig saw.
- Blow away saw dust build-up in the channels with dry compressed air.
- Remove any sharp edges and irregularities from the sheet.
- Peel back approximately 50 mm of the masking film from all edges of the cut sheet on both sides.
- Carefully select the sealing tape appropriate to the glazing application.
- Seal the top and the bottom sheet channels with impermeable and/or venting tape, f.i. Multifoil G3600 / AD 3400 / AD4500.  
Please refer to the processing instructions provided by the sealing tape supplier.
- In case of venting tape, and to allow condensation drainage, apply an alu closure profile with drainage possibilities or apply some single sided self adhesive glazing tape as distance holder between the venting holes.
- For wet glazing apply single sided self adhesive glazing tape or rubber profile to both window frame and bead.
- For dry glazing, snap-fit compatible neoprene rubber gaskets in place in the support profile as well as in the clamping cover profile.
- Insert the Lexan Thermoclear sheet into the window frame.
- Lexan Thermoclear sheet must always be installed with the ribs running vertically. The UV protected surface should always face outwards.
- Fix the window bead or the clamping cover profile in place.
- For wet glazing apply an approved silicone sealing compound, such as Silglaze/Silpruf between the sheet and the window frame/bead.
- Remove all masking film immediately after installation.
- Clean the window carefully with warm soapy water and with a soft cellulose sponge or woollen cloth.

### Dry glazing



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### Don'ts

- Do not use plasticised soft PVC or incompatible rubber sealing tapes or gaskets.
- Do not use Amine, Benzamide or Methoxy based sealants.
- Do not use abrasive or highly alkaline cleaners.
- Never scrape Lexan\* Thermoclear\* sheet with squeegees, razor blades or other sharp instruments.
- Do not walk on Lexan Thermoclear sheet at any time.
- Do not install Lexan Thermoclear sheet with damaged tapes.
- Do not clean Lexan Thermoclear sheet in hot sun or at elevated temperatures.
- Benzene, gasoline, acetone, carbon tetrachloride or butyl cellosolve should never be used on Lexan Thermoclear sheet.



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