

LEXAN™ THERMOCLEAR™
MULTIWALL POLYCARBONATE SHEET
TECHNICAL MANUAL



INDEX

PRODUCT AVAILABILITY	5
LEXAN™ Polycarbonate Resin	5
LEXAN MULTIWALL SHEET	5
LEXAN THERMOCLEAR-PLUS™ Sheet	5
LEXAN THERMOCLEAR SUNXP™ Sheet	5
LEXAN THERMOCLEAR Easyclean Sheet	5
LEXAN THERMOCLEAR Dripgard Sheet	5
LEXAN THERMOCLEAR Solar Control IR Sheet	5
LEXAN THERMOCLEAR Solar Control Sheet	6
LEXAN THERMOCLEAR Venetian Sheet	6
LEXAN THERMOCLICK Sheet	6
LEXAN MULTIWALL SHEET STRUCTURES	7
LEXAN MULTIWALL SHEET DESCRIPTIONS	11
PROPERTY PROFILE	12
LEXAN THERMOCLEAR LT2UV Sheet	12
LEXAN THERMOCLEAR Venetian Sheet	14
LEXAN THERMOCLEAR Solar Control Sheet	14
LEXAN THERMOPANEL Sheet	14
LEXAN THERMOCLICK Sheet	14
Typical Properties for LEXAN Polycarbonate	15
MECHANICAL PROPERTIES	16
Impact Strength	16
Hail Resistance	16
PHYSICAL PROPERTIES	17
Light Transmission	17
SOLAR CONTROL PROPERTIES	18
Temperature Increase Inside the Building	18
Solar Control	18
Solar Heat Gain	18
Typical Properties for LEXAN THERMOCLEAR Solar Control IR (2UVIR) Sheet	19
OUTDOOR WEATHERING PERFORMANCE	20
UV Protection	20
Typical Values of THERMOCLEAR Sheet	20
VARIOUS PROPERTIES	21
Temperature Resistance	21
Dimensional Stability	21
Continuous Use Temperature/UL Ratings	21
Fire Performance	21
Weight Factors	21
Sound Insulation	21/22

INDEX

THERMAL PROPERTIES	22
Thermal Insulation	22
Overglazing	23
Double LEXAN Multiwall Sheet Units	23
Energy Loss Calculations	23
Cold Radiation	24
CLEANING RECCOMENDATIONS	25
CONDENSATION/CHEMICAL RESISTANCE	26
Condensation	26
Chemical Resistance	26
GENERAL GUIDELINES	27
Storage	27
Handling	27
Sawing	27
Drilling	27
INSTALLATION	28
Installation	28
Thermal Expansion Allowance	28
LEXAN Multiwall Sheet Edge Clamping Conditions	28
Dry Glazing Systems	29
Wet Glazing Systems	29
SEALING GUIDELINES	30
Edge Sealing	30
Sealing Tape	30
Standard Glazing Conditions	30/31
Specific Glazing Conditions	31
WIND AND SNOW LOADING	32
Dynamic Wind Pressure	32
Pressure Coefficient	32
Snow Loading	32
Computer Aided Sheet Engineering	32
SHEET THICKNESS CRITERIA	33
Support Conditions	33
Safety Factor	33
Sloped Roofing	33
FLAT GLAZING SHEET THICKNESS	34
CURVED GLAZING SHEET THICKNESS	38
SHEET GLAZING GUIDELINES	42

Specialty Film & Sheet

SABIC's Specialty Film and Sheet business - part of the Innovative Plastics strategic business unit - is a leading supplier of high performance engineering sheet products, serving customers around the world in a broad spectrum of applications. Our virtually unbreakable, light-weight, fire resistant LEXAN™ sheet portfolio made with Polycarbonate (PC) technology includes many structures, ranging from solid, multiwall and corrugated sheet. The company has integrated extrusion processes, surface texturing and coating technologies to provide value added solutions across a wide variety of industries. A well-established brand name for over 40 years, LEXAN™ THERMOCLEAR™ multiwall sheet is amongst the most extensive portfolio on the market today, offering hundreds of combinations of structures, coatings, colors and finishes.

At SABIC, we are dedicated to meet our customers' ever changing needs with our high performance LEXAN sheet portfolio. Our material solutions and services help our customers to reduce their system costs, create innovative designs and environmentally responsible materials. SABIC's ongoing investment in world-class technologies demonstrates our commitment to helping our customer's technical requirements, application development needs and business goals. Our product portfolio is backed by advanced technical support and application development services around the world to meet our customers' global specification needs with local supply.

SABIC ranks among the world's top petrochemical companies, and is a global market leader in the production of polyethylene, polypropylene, advanced thermoplastics, glycols, methanol and fertilizers. SABIC operates in more than 40 countries across the world with 33,000 employees worldwide. It has significant research resources with 18 dedicated technology and innovation facilities in Saudi Arabia, the USA, the Netherlands, Spain, India and China.

LEXAN™ Resin

LEXAN™ resin is a polycarbonate which is a unique engineering thermoplastic that combines a high level of mechanical, optical and thermal properties. The versatility of this material makes it a suitable candidate for many engineering applications. When extruded in sheet form, due to its excellent optical and impact properties, this material can be an excellent candidate for a wide range of glazing applications. SABIC has developed a multiwall polycarbonate sheet portfolio, called LEXAN™ THERMOCLEAR™ sheet, which can provide an outstanding balance of light weight, high impact strength and stiffness, excellent thermal insulation, UV and flame resistance and long-term light transmission for variety of applications.

Typical applications include:

- DIY / Home Construction
- Greenhouses
- Interior Applications
- Large Architectural Projects
- Pool Covers
- Rooflights & Skylights
- Soundwalls
- Storm Protection
- Verandas & Conservatories
- Vertical Glazing
- Wall Cladding

LEXAN™ THERMOCLEAR™ Multiwall Sheet Portfolio

LEXAN™ THERMOCLEAR-PLUS™ sheet (LT2UV)

LEXAN THERMOCLEAR-PLUS Sheet features an unique 2 side proprietary surface treatment designed to protect the Sheet against the degrading effects of ultra-violet radiation in natural sunlight. Available from 4.5 mm thickness, easy to cut and install sheets are treated with proprietary UV protection on both sides to help ensure long-term optical quality and high light transmission against outdoor weathering and minimize installation mistake costs.

LEXAN THERMOCLEAR SUNXP™ sheet (LT2XP)

LEXAN THERMOCLEAR SUNXP sheet offers an unique two side proprietary surface treatment which provides almost total resistance against degradation caused by UV radiation in sunlight. The LEXAN THERMOCLEAR SUNXP sheet range offer a 15 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 an innovative proprietary technology that allows Lexan sheet to be easily cleaned with rainwater, resulting in significant cost savings. The hydrophobic coating on the outside surface of the sheet reduces the surface tension of polycarbonate and increases the contact angle of water to the sheet which causes larger droplets to form and wash away dirt as the droplets roll down from the sheet. LEXAN THERMOCLEAR Easyclean sheet comes with standard two side UV protection but can be combined with Drippgard coating on the inner side of the sheet. Drippgard coating is on the inside and reduces the formation of condensation droplets to prevent loss of light transmission.

LEXAN THERMOCLEAR Drippgard sheet (LTD)

LEXAN THERMOCLEAR Drippgard sheet 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. It also helps prevent reduction of light transmission due to condensation water droplets. It can be an excellent material choice for roof glazing 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 an innovative nano 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 multiwall sheet offers: high light transmission combined with low solar transmission. Available in various structures (2/3/5/6/9 walls, X structures), this product comes with UV protection on both sides and can offer long-term weathering resistance and high impact strength.

LEXAN THERMOCLEAR Solar Control sheet (LTC-SC)

LEXAN THERMOCLEAR Solar Control sheet features in addition to standard LEXAN THERMOCLEAR sheet properties, a specially developed surface treatment on the inside 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 sheet features white stripes which are screen printed on one side which should be always installed facing inwards. This product comes with a UV protection on the outside surface which is clearly identified and this surface should be installed facing outwards. Although the screen printed white stripes are mainly intended for additional decorative purposes, it provides a shadow effect which improves the comfort level inside the building. The ink-printing of the striping is done on a solvent free basis, this to protect the environment. We recommend using this product only in closed verandas, as under moisture conditions the ink can fade out.

LEXAN THERMOCLICK™ sheet

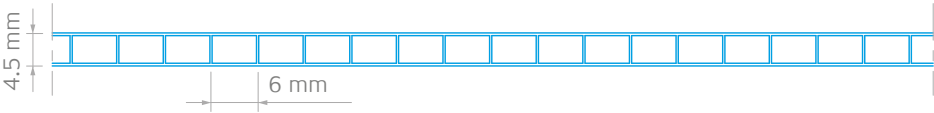
LEXAN THERMOCLICK sheet is an X-structured multiwall polycarbonate panel with an interconnecting system which eliminates the need for vertical profiles, thereby saving costs and enhancing aesthetics. It is an excellent candidate to create flush profile-free facades in different colors and effects. Combined with the ease of installation, this product is 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:

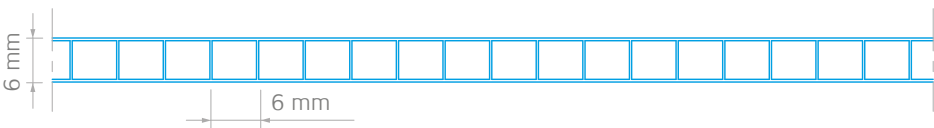
- Industrial sidewalls
- Commercial sidewalls greenhouses
- Railway/metro station
- Interior decoration



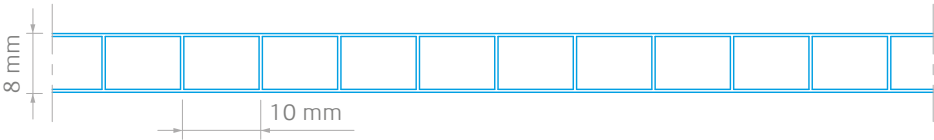
452RS10 structure



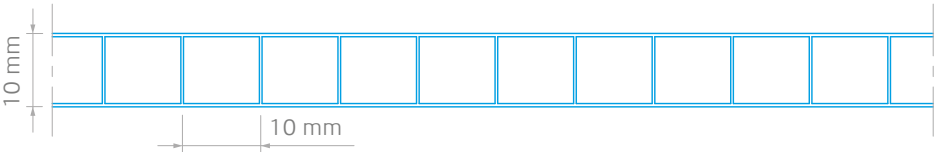
62RS13 structure



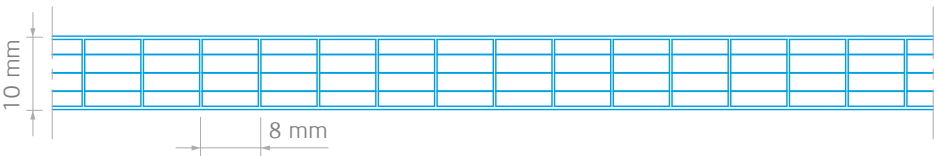
82RS15 structure



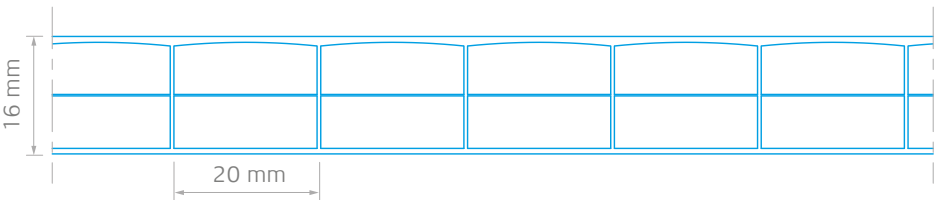
102RS17 structure

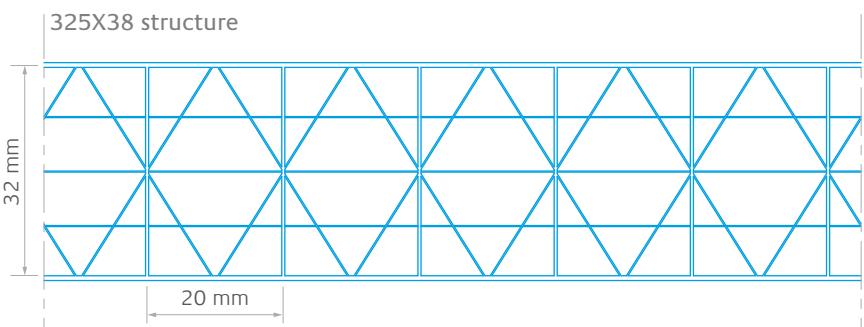
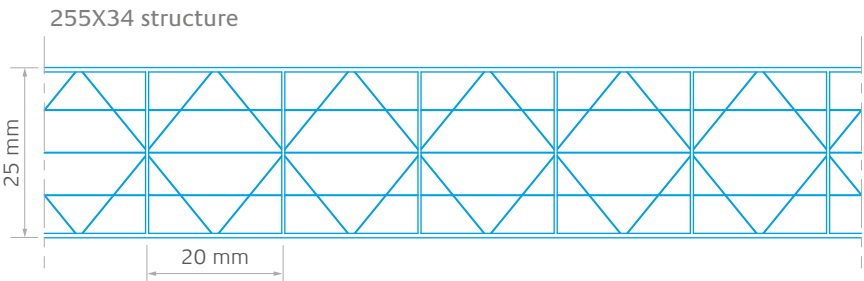
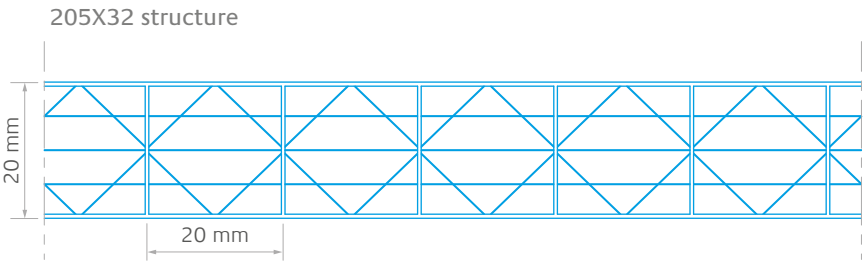
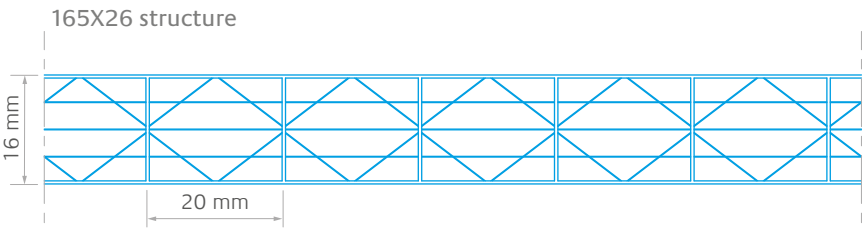


105R175 structure

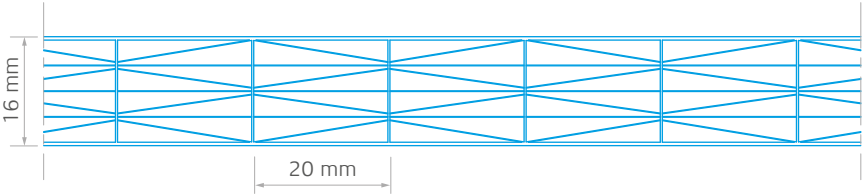


163TS27 structure

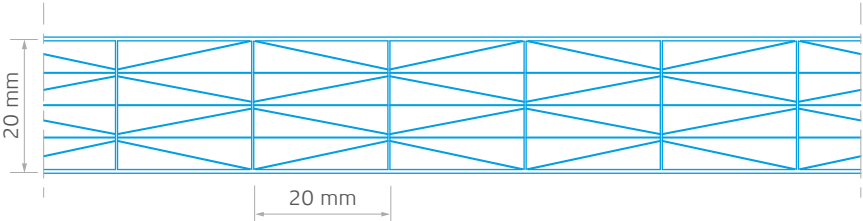




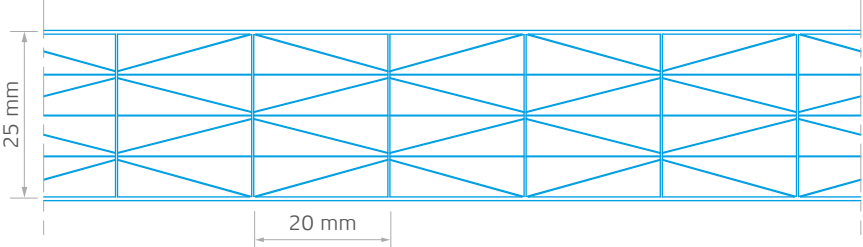
169X25 structure



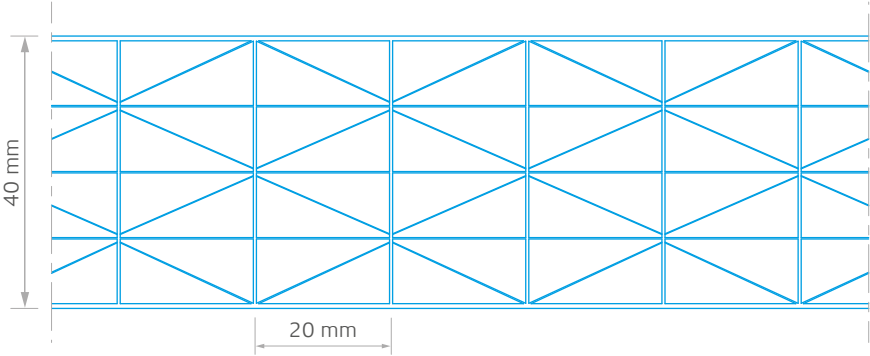
209X28 structure



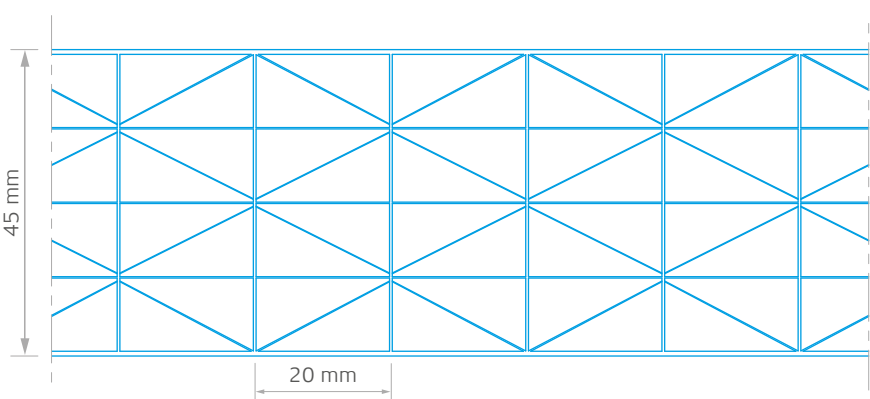
259X30 structure



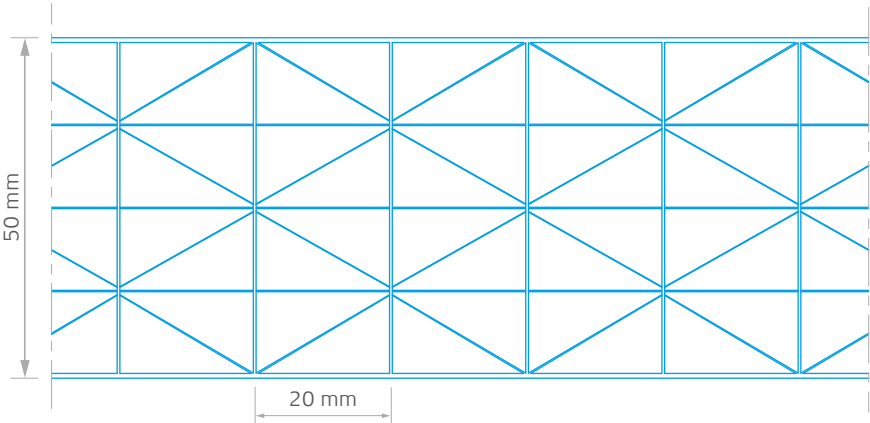
409X43 structure



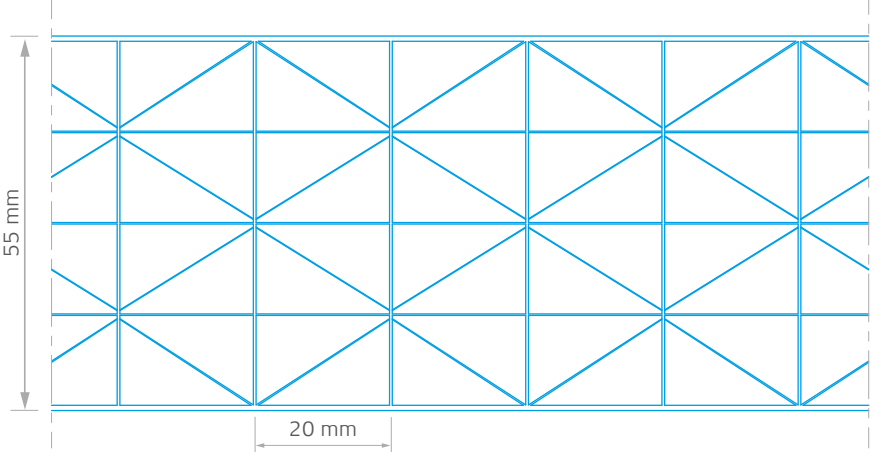
459X45 structure



509X48 structure



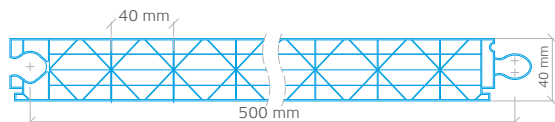
559X50 (LT2UV55S)



LEXAN THERMOCLICK sheet

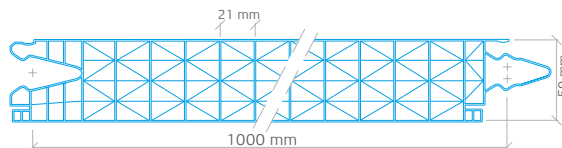
LTC404X4000 (4.0kg/m²)

LEXAN THERMOCLICK sheet 40mm is an impact resistant, energy-saving multiwall sheet with profiled tongue and groove connection, including a groove for double sided tie on the inside. This inter-connecting system eliminates the need for vertical profiles, thereby saving costs and enhancing aesthetics.



LTC509X (5.15kg/m²)

The new LEXAN THERMOCLICK sheet 50mm is a unique, 9 wall product with a specially designed V-joint connection: joint cover on the outside and a groove for double sided tie on the inside. It offers a superb U-value of 1.0 W/m² K leading to energy saving.



LEXAN THERMOPANEL sheet

LEXAN THERMOPANEL sheet, is an impact resistant, energy saving multiwall sheet with side wings which can be optimally matched to various existing metal sandwich panels. Due to its light weight and excellent fit with various existing metal sandwich panels, LEXAN THERMOPANEL sheet is a simple, fast and easy to install glazing product.

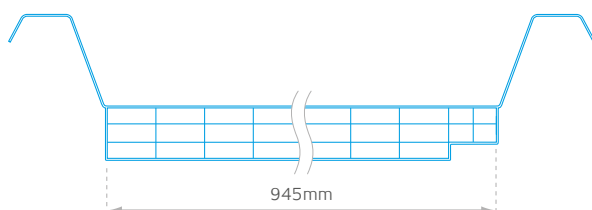
Available in widths from 945 mm to 1150 mm, LEXAN THERMOPANEL sheet comes in two different sheet configurations and a range of different side wings, which offer an optimal match with existing metal sandwich panels.

LEXAN THERMOPANEL sheet offers:

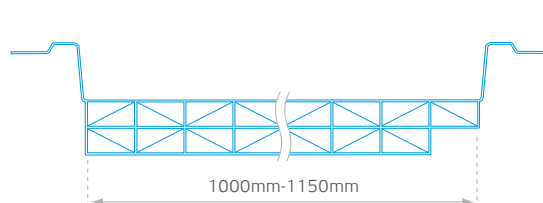
- Excellent thermal insulation
- UV protected surface
- Long-term weather resistance
- High impact strength
- Extremely high stiffness
- Simple, easy and fast installation

For more information please look into our technical manual dedicated to THERMOCLICK & THERMOPANEL sheet

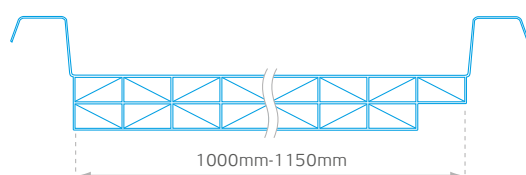
LTP30E4RS3600



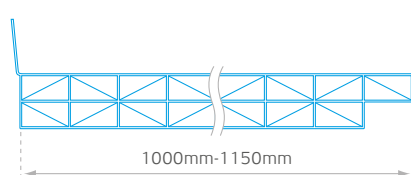
LTP30G3X3600



LTP30F3X3600



LTP30L3X3600



PROPERTY PROFILE

LEXAN multiwall sheet Products

Typical property values for:

LEXAN THERMOCLEAR-PLUS sheet	(LT2UV)	10 yr limited written warranty
LEXAN THERMOCLEAR Drippgard sheet	(LTD)	10 yr limited written warranty
LEXAN THERMOCLEAR Easyclean sheet	(LTE)	10 yr limited written warranty
LEXAN THERMOCLEAR SUNXP sheet	(LT2XP)	15 yr limited written warranty
LEXAN THERMOCLICK sheet	(LTC)	10 yr limited written warranty
LEXAN THERMOPANEL sheet	(LTP)	10 yr limited written warranty

Table 01: LEXAN multiwall sheet Product Selector

Product	Grade name	Structure	Gauge (mm)	Weight (kg/m ²)	U-value * (W/m ² K)	Rib distance (mm)	Standard colors
LEXAN THERMOCLEAR LT2UV sheet (10 yr limited written warranty) 2 side UV PLUS coating Clear color# = 112 Opal color# = WH7A092X Bronze color# = 515055	LT2UV452RS10	2-Wall Rectangular	4,5	1,00	3,86	6,30	112-WH7A092X-515055
	LT2UV62RS13	2-Wall Rectangular	6	1,30	3,56	6,30	112-WH7A092X-515055
	LT2UV82RS15	2-Wall Rectangular	8	1,50	3,26	10,70	112-WH7A092X-515055
	LT2UV102RS17	2-Wall Rectangular	10	1,70	3,02	10,70	112-WH7A092X-515055
	LT2UV105R175	5-Wall Rectangular	10	1,75	2,48	8,00	112-WH7A092X-515055
	LT2UV163TS27	3-Wall Tunnel	16	2,70	2,27	20,00	112-WH7A092X-515055
	LT2UV165X26	5-Wall X-structure	16	2,60	1,88	20,00	112-WH7A092X-515055
	LT2UV169X	9-Wall X-structure	16	2,50	1,77	20,00	112-WH7A092X-515055
	LT2UV209X	9-Wall X-structure	20	2,80	1,59	20,00	112-WH7A092X-515055
	LT2UV205X32	5-Wall X-structure	20	3,20	1,69	20,00	112-WH7A092X-515055
	LT2UV259X	9-Wall X-structure	25	3,00	1,40	20,00	112-WH7A092X-515055
	LT2UV255X34	5-Wall X-structure	25	3,40	1,51	20,00	112-WH7A092X-515055
	LT2UV325X38	5-Wall X-structure	32	3,80	1,32	20,00	112-WH7A092X-515055
	LT2UV409X43	9-Wall X-structure	40	4,30	1,10	20,00	112-WH7A092X
	LT2UV459X45	9-Wall X-structure	45	4,50	1,04	20,00	112-WH7A092X
	LT2UV509X48	9-Wall X-structure	50	4,80	0,99	20,00	112-WH7A092X
	LT2UV55S	9-Wall X-structure	55	5,00	0,90	20,00	112-WH7A092X

Please check with your SABIC representative when non standard combinations are required for alternatives.

* U-values based on SABIC calculated values according ISO 10077

** LT (Light transmission) and TST (Total Solar Transmission) measurements according ISO 9050
TST divided by 100 equals Solar Heat Gain Coefficient (SHGC) or g-value.

*** 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.

									Available lengths (mm)	
	LT 112 (%)##	TST 112 (%)##	DST 112 (%)	SC 112 (%)###	LT WH7A092X (%)	TST WH7A092X (%)	DSTWH7A092X (%)	SCWH7A092X (%)	Standard width (mm)	
	83	83		0,95	67	70		0,80	1200-2100	3000-13000
	82	82	76	0,94	66	69	63	0,79	1200-2100	3000-13000
	81	82	77	0,94	64	68	62	0,78	1200-2100	3000-13000
	81	80	76	0,92	64	68	62	0,78	1200-2100	3000-13000
	65	65	61	0,75	60	59	58	0,68	1200-2100	3000-13000
	74	78	70	0,90	63	69	60	0,79	980-1200-2100	3000-13000
	59	58		0,67	51	52			1200-2100	3000-13000
	54	54	51	0,62	47	49	45	0,56	980-1200-2095	3000-13000
	53	53	50	0,61	47	50	46	0,57	980-1200-2095	3000-13000
	58	66		0,76	50	51			1200	3000-13000
	51	52	49	0,60	44	47	42	0,54	980-1200-2095	3000-13000
	57	65		0,75	49	54			1200	3000-13000
	55	65	54	0,60	48	48	46	0,55	1200	3000-13000
	51	52	49	0,60	43	48	42	0,55	1200	3000-13000
	50	52	48	0,60	42	47	42	0,54	1200	3000-13000
	50	52	48	0,60	40	47	40	0,54	1200	3000-13000
	51	52			31	43			1200	3000-13000

PROPERTY PROFILE

Table 02: LEXAN multiwall sheet Systems Product Selector

Product	Grade name	Structure	Gauge (mm)	Weight (kg/m ²)	U-value # (W/m ² K)	Available colors	LT 112 (%) #	TST 112 (%) #	Available lengths (mm)
LEXAN THERMOCLEAR sheet Solar Printed 10yr limited written warranty	LTC3TS27SC	3-Wall Tunnel	16	2,70	2,27	112	60	60	3000-7000
	LTC5X38SC	5-Wall X structure	32	3,80	1,32	112	47	50	3000-7000
LEXAN THERMOCLEAR sheet Venetian Printed 10yr limited written warranty	LTC2RS13VENS	2-Wall Rectangular	6	1,30	3,56	112	49	59	3000-7000
	LTC2RS17VENS	2-Wall Rectangular	10	1,70	3,02	112	46	56	3000-7000
	LTC3TS27VENS	3-Wall Tunnel	16	2,70	2,27	112	41	54	3000-7000
	LTC9X28VENS	9-Wall X Structure	20	2,80	1,59	112			3000-7000
	LTC5X34VENS	5-Wall X structure	25	3,40	1,51	112			3000-7000
	LTC5X38VENS	5-Wall X structure	32	3,80	1,32	112	36	52	3000-7000

Please check with your SABIC representative when non standard combinations are required for alternatives.

U-values based on SABIC calculated values according ISO 10077

LT (Light transmission) and TST (Total Solar Transmission) measurements according ISO 9050

TST divided by 100 equals Solar Heat Gain Coefficient (SHGC) or g-value.

Table 03: LEXAN multiwall sheet Systems Product Selector

Product	Grade name	Structure	Gauge (mm)	Weight (kg/m ²)	U-value # (W/m ² K)	Rib distance (mm)	LT 112 (%) #	LT WH7A092X (%) #	Available width (mm)	Available lengths (mm)
LEXAN THERMOCLICK LTC sheet Top side UV co-extrusion (10 yr limited written warranty) Standard colors: Clear = 112 / Opal White = WH7A092X Blue = BL6C024T / Purple = VT5C010T Green = GN7C018T / Red = RD7C005T Orange = OR6C012T / Yellow = YW9C007T	LTC404x4000	4-Wall X-structure	40	4,00	1,27	20,00	59	50	500	3000-13000
	LTC509X	9-Wall X-structure	50	5,15	1,00	21,00	47	37	1000	3000-13000
LEXAN THERMOPANEL LTP sheet Top side UV co-extrusion (10 yr limited written warranty) Standard colors: Clear = 112 / Opal White = WH7A092X	LTP30E4RS36	4-Wall Rectangular	30	3,6	1,58	20	67	52	945	3000-13000
	LTP30F3X36	3-Wall X-structure	30	3,6	1,57	25	70	67	1000	3000-13000
	LTP30G3X36	3-Wall X-structure	30	3,6	1,57	25	70	67	1150	3000-13000
	LTP30L3X36	3-Wall X-structure	30	3,6	1,57	25	70	67	1000 1100 1150	3000-13000

Please check with your SABIC representative when non standard combinations are required for alternatives.

U-values based on SABIC calculated values according ISO 10077

LT (Light transmission) and TST (Total Solar Transmission) measurements according ISO 9050

TST divided by 100 equals Solar Heat Gain Coefficient (SHGC) or g-value.

PROPERTY PROFILE

Table 04: Typical properties for LEXAN Polycarbonate Resin

Property Physical	Test method	Unit	Value
Density	ISO 1183	g/cm ³	1,20
Water absorption, 50% RH / 23°C	ISO62	%	0,15
Water absorption, saturation / 23°C	ISO 62	%	0,35
Mechanical			
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
Thermal			
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
Electrical			
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 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.

For more information concerning our THERMOCLICK and THERMOPANEL please check out our dedicated technical manuals.

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 provides outstanding impact performance even in severe weather such as windstorm, hail-stones, snowstorms and ice formation. Virtually unbreakable LEXAN THERMOCLEAR sheet is able withstand harsh weathering conditions as well as to the subsequent temperature change to sunny conditions without breaking or buckling.

An independent research organization, TNO Science & Industry, tested the properties of Lexan Thermoclear multiwall sheet for simulated hail-stone storm of varying diameters. As a result the material showed no 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 21 m/s. Under these conditions materials such as glass and acrylic fail.

While glass and the acrylic showed brittle characteristics when they failed the test, LEXAN THERMOCLEAR sheet showed ductile behavior. The ball left only indentations after impact and the THERMOCLEAR sheet showed no breakage (See fig. 01).

SABIC offers a standard Ten Years Written Limited Warranty on LEXAN THERMOCLEAR sheet covering loss of strength or impact due to weathering. For more details please consult SABIC.

Figure 01: Represents material failure at this speed

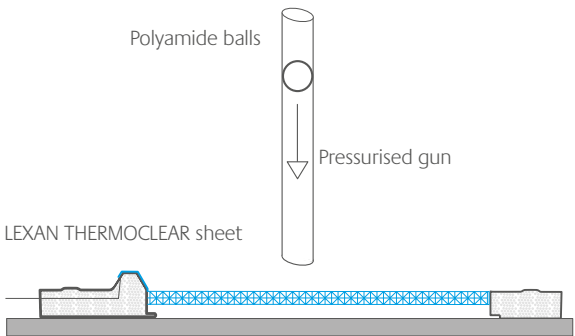


Table 05: Hail Simulation Test Results

Material	Ball diameter 20mm
Equilibrium velocity of hail stones in practice	21 m/s
Acrylic multiwall 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

PHYSICAL PROPERTIES

Light Transmission

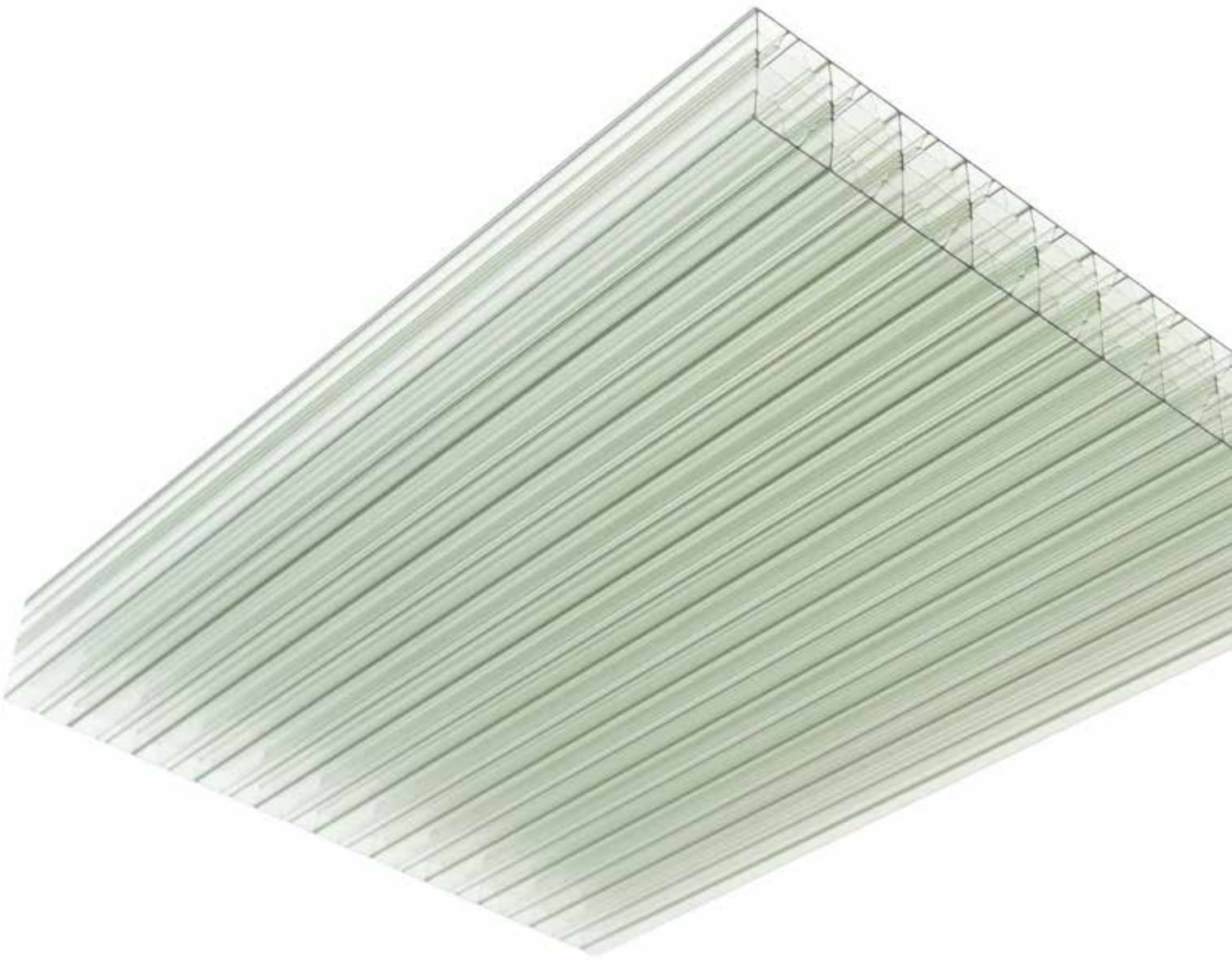
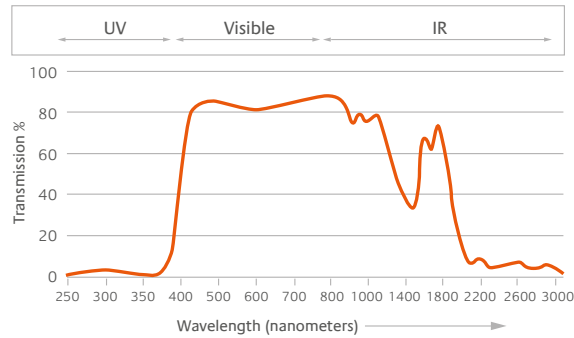
The wavelength of the sun affecting a thermoclear sheet material ranges from 280 up to 2140 nanometers. This optical window is divided into the following sections:

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 Graph 01, 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.

Graph 01: 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 sheet.

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.

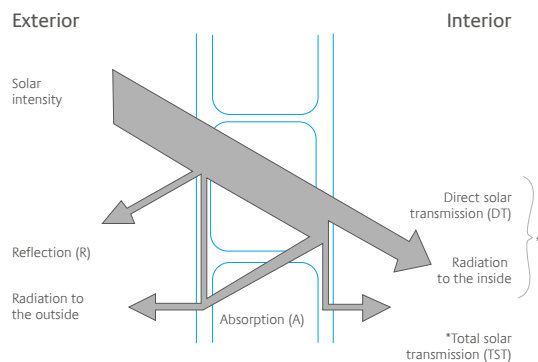
The specially tinted sheet, such as LEXAN THERMOCLEAR Venetian sheet and LEXAN THERMOCLEAR Solar Control sheet, cuts down the brightness of sunlight to a pleasing level and can reduce air conditioning costs in the summer.

Unlike many other solar control products, LEXAN THERMOCLEAR Solar Control IR (SCIR) sheet does not block or reflect sun light but it absorbs the spectrum of the light which creates solar transmission. LEXAN THERMOCLEAR SC/IR Sheet is an excellent candidate for those applications where there is a need for high light transmission together with a low solar transmission.

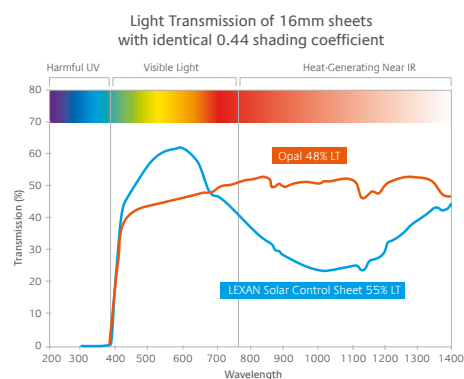
Solar Heat Gain

The solar radiation reaching the sheet is reflected, absorbed and transmitted, as shown in graph 02. 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 06 lists the solar control properties of the LEXAN THERMOCLEAR sheet product range and LEXAN THERMOCLEAR Venetian sheet products.

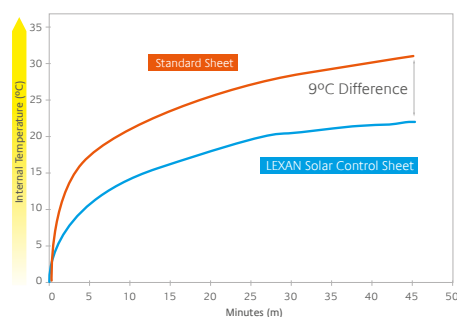
Figure 02



Graph 02



Internal Temperature Reduction - Comparison



SOLAR CONTROL PROPERTIES

Table 06: Typical properties for LEXAN THERMOCLEAR Solar Control IR (2UVIR) sheet

Product	Grade name	Structure	Gauge (mm)	Weight (kg/m ²)	U-value # (W/m ² K)	LT GN8B038T (%)	DST GN8B038T (%)
LEXAN THERMOCLEAR sheet Solar Control Infra Red (10yr limited written warranty) Standard color: SCIR Green = GN8B038T Other colors: SCIR Blue = BL8B089T SCIR Grey = GY5B422T	2UVIR62R13	2-Wall Rectangular	6	1,30	3,56	66	47
	2UVIR82R15	2-Wall Rectangular	8	1,50	3,26	65	47
	2UVIR102R17	2-Wall Rectangular	10	1,70	3,02	65	45
	2UVIR105R175	5-Wall Rectangular	10	1,75	2,48	48	34
	2UVIR163T27	3-Wall Tunnel	16	2,70	2,27	55	36
	2UVIR165X26	5-Wall X-structure	16	2,60	1,88		
	2UVIR169X25	9-Wall X-structure	16	2,50	1,77	38	25
	2UVIR209X28	9-Wall X-structure	20	2,80	1,59	37	25
	2UVIR205X32	5-Wall X-structure	20	3,20	1,69		
	2UVIR259X30	9-Wall X-structure	25	3,00	1,40	36	23
	2UVIR255X34	5-Wall X-structure	25	3,40	1,51	38	25
	2UVIR325X38	5-Wall X-structure	32	3,80	1,32	36	23
	2UVIR409X43	9-Wall X-structure	40	4,30	1,10	33	20
	2UVIR459X45	9-Wall X-structure	45	4,50	1,04	33	20
	2UVIR509X48	9-Wall X-structure	50	4,80	0,99	31	18
	2UVIR55S	9-Wall X-structure	55	5,00	0,90		

Table 06: Typical properties for LEXAN THERMOCLEAR Solar Control IR (2UVIR) sheet (continued)

Grade name	TST ## GN8B038T (%)	LT ## BL8B089T (%)	DST ### BL8B089T (%)	TST ## BL8B089T (%)	LT ## GY5B422T (%)	DST ### GY5B422T (%)	TST ## GY5B422T (%)	Shading coefficient GN(%)	Shading coefficient BL(%)	Shading coefficient GY(%)
2UVIR62R13	60							0,69		
2UVIR82R15	61							0,70		
2UVIR102R17	60	52	44	58	20	22	42	0,69	0,67	0,48
2UVIR105R175	48							0,56		
2UVIR163T27	52	36	32	49				0,60	0,56	
2UVIR165X26										
2UVIR169X25	39							0,45		
2UVIR209X28	39							0,45		
2UVIR205X32		24	20	37					0,43	
2UVIR259X30	37							0,42		
2UVIR255X34	44							0,51		
2UVIR325X38	42	20	16	35	12	11	30	0,49	0,40	0,34
2UVIR409X43	35							0,40		
2UVIR459X45	35							0,40		
2UVIR509X48	34							0,39		
2UVIR55S										

U-values based on SABIC calculated values according ISO 10077

LT (Light Transmission) and TST (Total Solar Transmission) measurements acc. ISO 9050.

DST measured according to EN410

OUTDOOR WEATHERING PERFORMANCES

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.

Standard 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 by using high intensity Xenon lamps to simulate natural sunlight. Together with UV filters and programmable rain and heat cycles, the test is able to simulate natural conditions.

Accelerated weathering tests have been carried out on LEXAN THERMOCLEAR sheet by SABIC. 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 12,000 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 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 Sales Office for more details.

The Europe's first stadium with a sliding roof, Amsterdam Arena in The Netherlands, was constructed from transparent LEXAN THERMOCLEAR sheet. An independent research organization, TNO Science & Industry, tested the properties of LEXAN THERMOCLEAR multiwall sheet from the roof of the Amsterdam Arena stadium after 15 years and found no significant change. The minimal loss in light transmission of 1.5 percent and small increase in yellowness index of 1.1 point met the product warranty. This TNO report is available on request.



VARIOUS PROPERTIES

Temperature Resistance

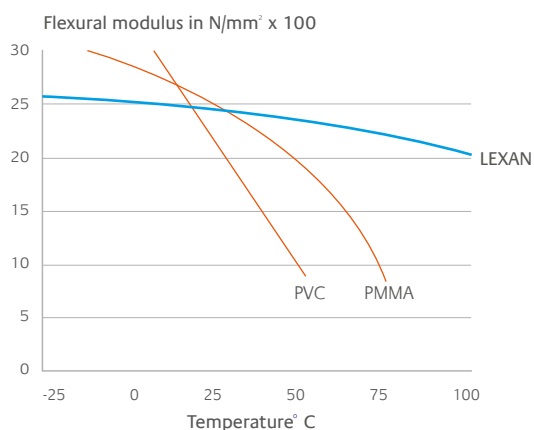
The heat build-up of glazing materials can be seen as a function of the solar energy absorption of the glazing material and the solar intensity.

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.

Graph 03: Dimensional stability. Flexural modulus in $\text{N/mm}^2 \times 100$



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 07 outlines the UL-continuous use temperatures of typical thermoplastic glazing materials.

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.

Table 07: 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

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 Service Centre or authorised dealer.

Weight Factors

LEXAN THERMOCLEAR sheet is an excellent 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 08: Weight

Product	Thickness (mm)	Weight (kg/m²)
LEXAN THERMOCLEAR sheet	4.5	1.00
	6	1.30
	8	1.50
	10	1.70 - 1.75
	16	2.50 - 2.70
	20	2.80 - 3.20
	25	3.00 - 3.40
	32	3.80
	40	4.30
	45	4.50
	50	4.80
	55	5.00
LEXAN THERMOCLICK sheet	40	4.00
	50	5.15
LEXAN THERMOPANEL sheet	30	3.60

VARIOUS PROPERTIES / THERMAL PROPERTIES

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 09.

Thermal Insulation

The multiwall 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 $W/m^2 K$.

Table 09: Sound Reduction Values

Product	Thickness (mm)	Weight	Structure	Sound Reduction (dB)
LEXAN THERMOCLEAR sheet	4.5	1	2RS	15
	6	1,3	2RS	17
	8	1,5	2RS	17
	10	1,7	2RS	18
	10	1,75	5RS	19
	16	2,7	3TS	18
	20	2,8	9X	18
	25	3,4	5X	21
	32	3,8	5X	21
	40	4,3	9X	22
	45	4,5	9X	22
	50	4,8	9X	22
	55	5	9X	22
LEXAN THERMOCLICK sheet	40	4	4X	21
	50	5,15	9X	21
LEXAN THERMOPANEL sheet	30		4RS	21

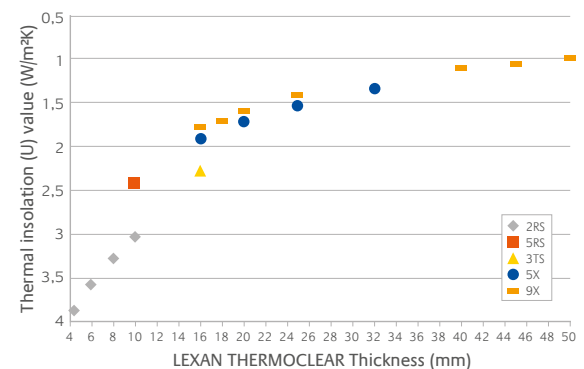
Sound reduction measurements against valid norm: EN ISO 10140-2:2010

Table 10: Material U-values ($W/m^2 K$)

Product	Thickness (mm)	U-value ($W/m^2 K$)
LEXAN THERMOCLEAR sheet	4.5 (2RS)	3.86
	6 (2RS)	3.56
	8 (2RS)	3.26
	10 (2RS)	3.02
	10 (5RS)	2.48
	16 (3TS)	2.27
	16 (5X)	1.88
	16 (9X)	1.77
	20 (5X)	1.69
	20 (9X)	1.59
	25 (5X)	1.51
	25 (9X)	1.40
	32 (5X)	1.32
	40 (9X)	1.10
	45 (9X)	1.04
	50 (9X)	0.99
	55 (9X)	0.90
LEXAN THERMOCLICK sheet	40 (4X)	1.27
	50 (9X)	1.00
LEXAN THERMOPANEL sheet	30 E (4RS/3.6)	1.58
	30 F,G,L (3X/3.6)	1.57

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

Graph 04



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 multiwall sheet.

Double LEXAN multiwall sheet Units

Extremely low U-values can be obtained by double-glazed multiwall 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 m³ of gas per m² of glazing area will be obtained by decreasing the U-value by 0.1 W/m² K.

Table 13 shows the minimum and maximum amount of savings of fuel consumption per m² 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/m² K

10 mm LEXAN THERMOCLEAR sheet, U-value - 3.0 W/m² K

U-value difference: 5.8 - 3.0 = 2.8 W/m² K. As shown in Table 12, the minimum and maximum amount of annual fuel savings per m² glazing area are:

25.2 - 36.4 litres of oil

28 - 42 m³ of gas

Graph 05

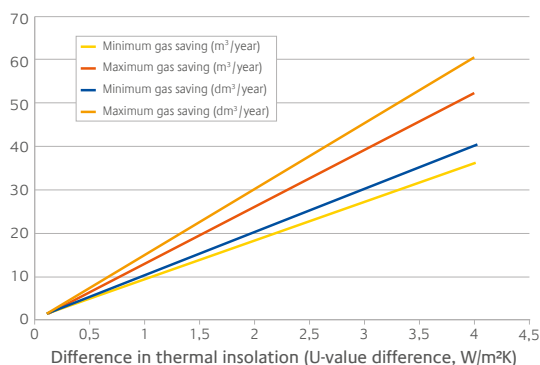


Table 11: Material U-values (W/m² K)

Glass Thickness (mm)	Air space (mm)	THERMOCLEAR sheet Thickness (mm)	U-value (W/m ² 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 multiwall sheet.

Table 12: Overglazing

THERMOCLEAR sheet outside	Air gap (mm)	THERMOCLEAR sheet inside	U-value (W/m ² 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

Table 13: Annual savings

U-value difference (W/m ² K)	Annual saving per m ² glazing area	
	Oil (Litres)	Gas (m ³)
0.1	0.9 - 1.3	1.00 - 1.50
0.2	1.8 - 2.6	2.0 - 3.0
0.3	2.7 - 3.9	3.0 - 4.5
0.4	3.6 - 5.2	4.0 - 6.0
0.5	4.5 - 6.5	5.0 - 7.5
0.6	5.4 - 7.8	6.0 - 9.0
0.7	6.3 - 9.1	7.0 - 10.5
0.8	7.2 - 10.4	8.0 - 12.0
0.9	8.1 - 11.7	9.0 - 13.5
1	9.0 - 13.0	10.0 - 15.0
1.2	10.8 - 15.6	12.0 - 18.0
1.4	12.6 - 18.2	14.0 - 21.0
1.6	14.4 - 20.8	16.0 - 24.0
1.8	16.2 - 23.4	18.0 - 27.0
2.0	18.0 - 26.0	20.0 - 30.0
2.2	19.8 - 28.6	22.0 - 33.0
2.4	21.6 - 31.2	24.0 - 36.0
2.6	23.4 - 33.8	26.0 - 39.0
2.8	25.2 - 36.4	28.0 - 42.0
3.0	27.0 - 39.0	30.0 - 45.0
3.2	28.8 - 41.6	32.0 - 48.0
3.4	30.6 - 44.2	34.0 - 51.0
3.6	32.4 - 46.8	36.0 - 54.0
3.8	34.2 - 49.4	38.0 - 57.0
4.0	36.0 - 52.0	40.0 - 60.0

Note:

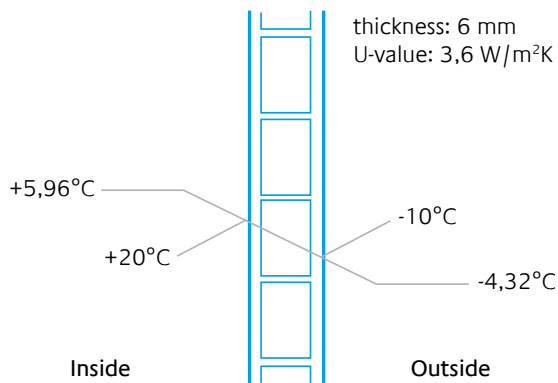
The exact amount of annual fuel savings is strongly dependent upon the building type, location and regional environmental conditions. Local authority engineering departments usually have official data relating to average temperature differences throughout the year.

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. 03 presents an example of the temperature profile through 6 mm LEXAN THERMOCLEAR sheet when the outside temperature is -10°C and the inside building temperature is $+20^{\circ}\text{C}$.

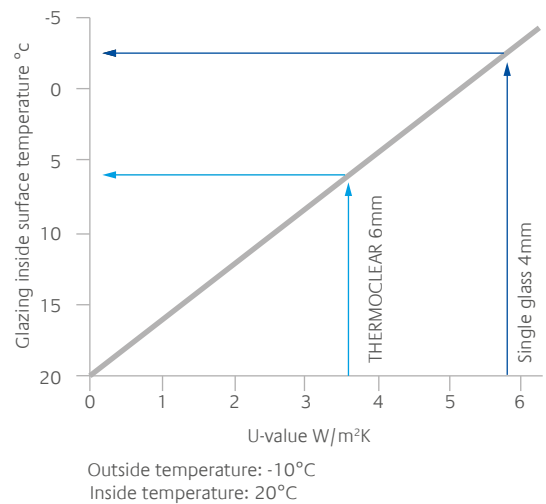
Figure 03: Temperature process through LEXAN THERMOCLEAR sheet at low outside temperature.



The multiwall 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.

Graph 06 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.

Graph 06: 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 multiwall 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 sheet in direct sunlight or at high temperatures as this can lead to staining.
- For all mentioned chemicals consult the manufacturer's Material Safety Data sheet (MSDS) for proper safety precautions.

Additional Important Considerations for multiwall, Corrugated and Sign sheet:

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

Amsterdam Arena in Amsterdam, the Netherlands is Europe's first stadium with a sliding roof, made from LEXAN™ THERMOCLEAR™ transparent sheet. 20.000 m² - The sliding roof was necessary to allow events to be staged regardless of the weather.



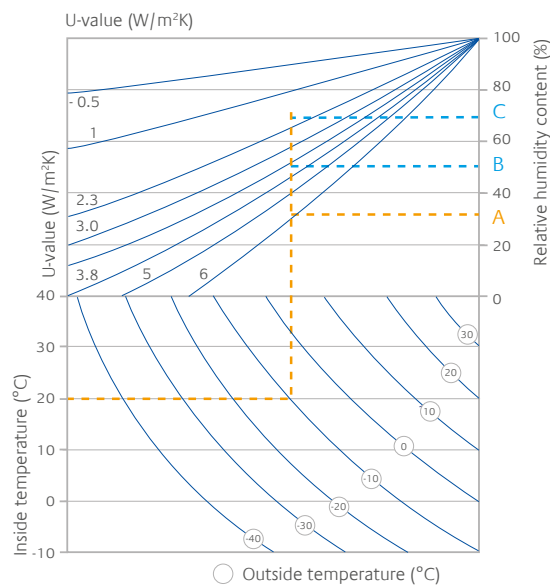
Condensation

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 Dripgard 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.

Graph 07 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 Dripgard sheet.

Graph 07: Condensation Prediction Chart showing the relationships between internal and external temperatures, relative humidity and the U-value



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

Condensation will occur on:

- A Glass U-value 5.8 w/m² K at a humidity content of: 32%
- B LTC 6 mm U-value 3.56 W/m² K at a humidity content of: 50%
- C LTC 20 mm U-value 1.8 W/m² 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 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 Chloroprene, RZ4-35-81	Helvoet
EPDM 4330, 4431, 5530, 5531	Vredestein
EPDM 3300/670, 64470	Phoenix

* more grades available

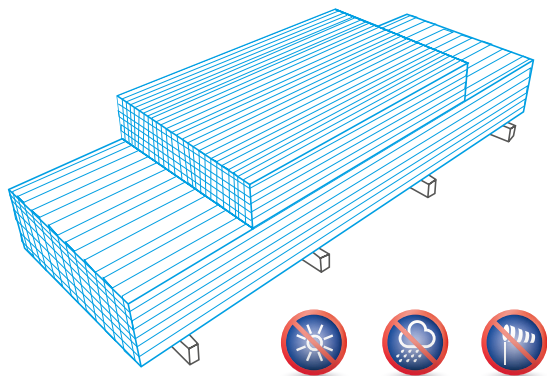
In case of doubt about any aspect of the chemical compatibility of the LEXAN THERMOCLEAR sheet range, always consult your nearest SABIC Sales Office for further advice.

GENERAL GUIDELINES

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.

Figure 04



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) sheet and Dripgard masking have a blue print, LEXAN THERMOCLEAR-PLUS (2UV) sheet 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 transportation tape on them.
- 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.

Swimming Pool Shelter with LEXAN™ THERMOCLEAR™ transparent sheet



INSTALLATION

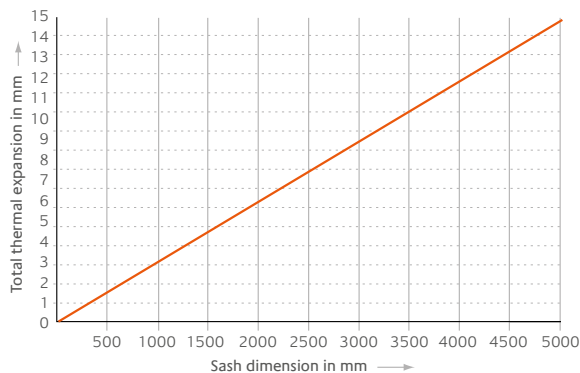
Installation

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.

Graph 08: This shows Thermal Expansion Allowance at various sash dimensions



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.

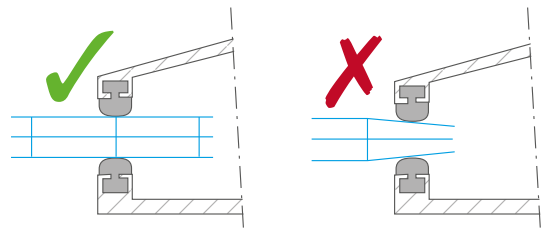
Sheet Edge Clamping Conditions

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. 05 and 06).

Figure 05 and 06: Indicates correct installation when clamping the sheet in a profile

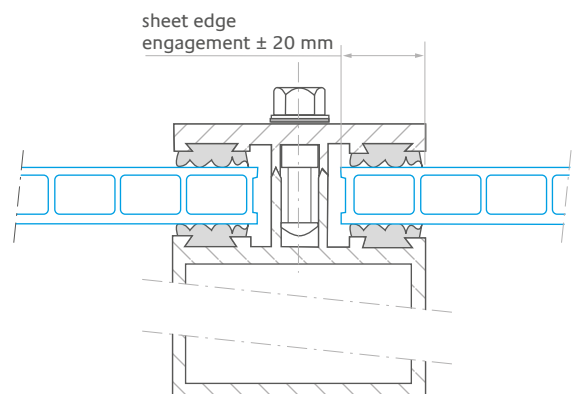
Figure 05



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 ≥ 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.

Figure 06



Dry Glazing Systems

This section 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 excellent 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. 07 and 08).

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.

Figure 07, 08, 09 and 10:
Different installation profile examples

Figure 07

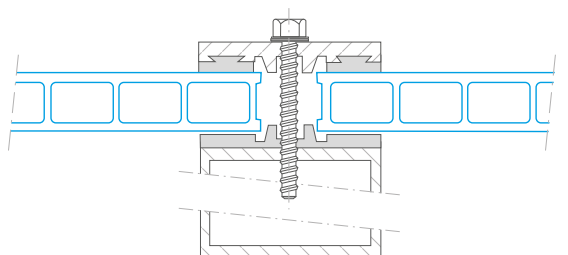
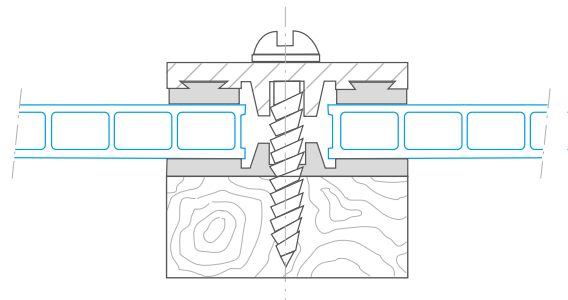


Figure 09



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. 09 and 10).

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 to 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 15, Table 04 for suitable sealant.

Figure 08

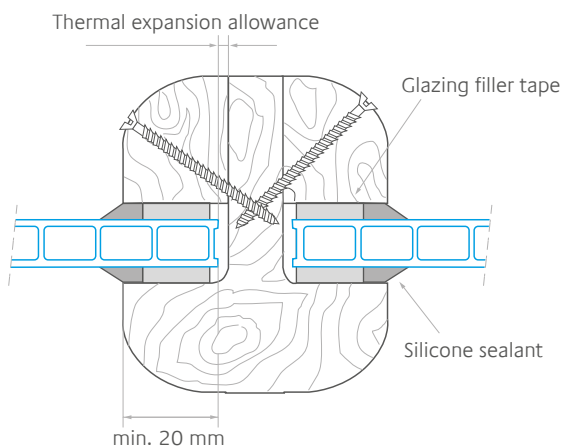
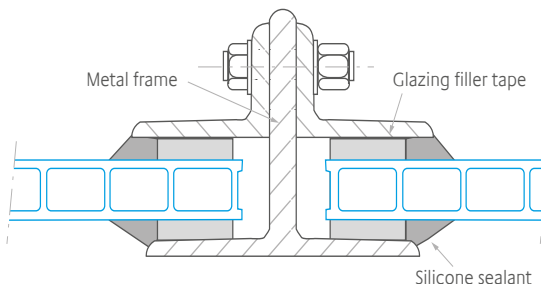


Figure 10



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. 11 and 12).

An additional 'U' profile can be installed to cover the perforated bottom tape and to facilitate condensation drainage (See fig. 15 and 16).

Figure 11

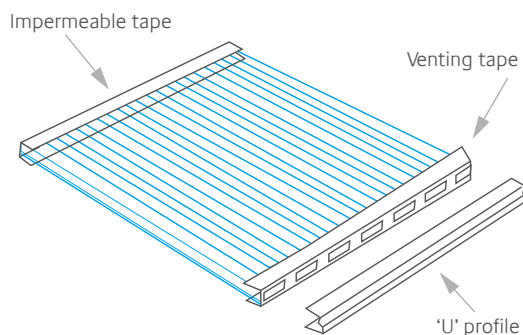
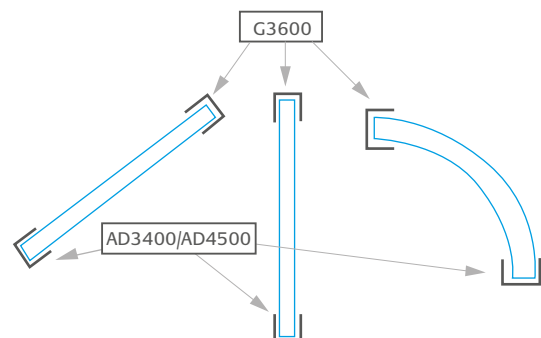


Figure 12



SEALING GUIDELINES

In semicircular barrel vaults both channel ends should be sealed with perforated filter tape e.g. multifoil AD 3400 (See fig. 13).

Care should be taken to provide a clearance between both the sheet edges and the sash platform to allow for condensation drainage (See fig. 14 and 15). 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. 16). 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 stadium – metro/railway station roofing, etc)

Figure 13

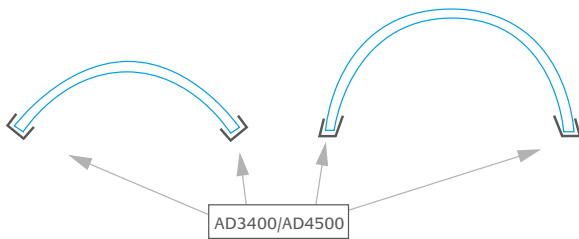


Figure 16: Impermeable tape on both sides

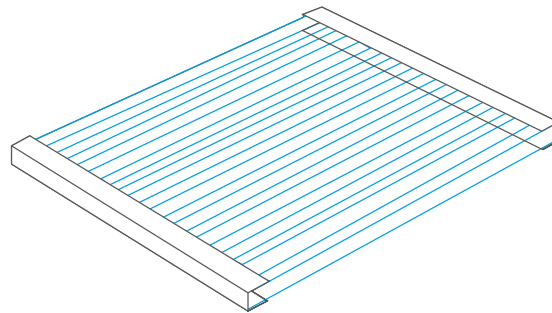


Figure 14

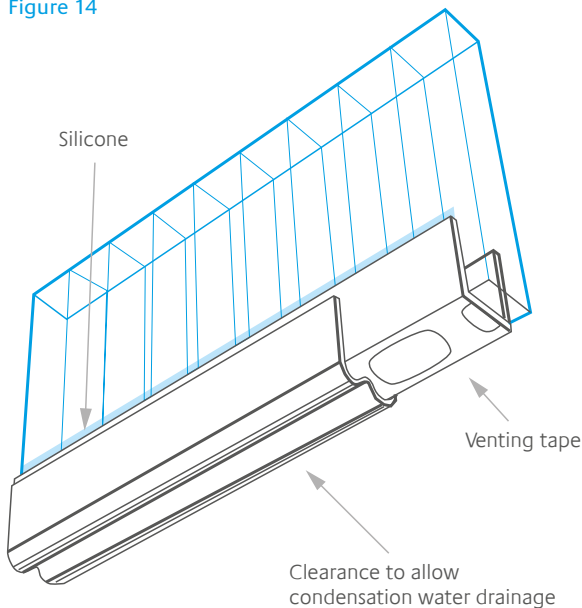
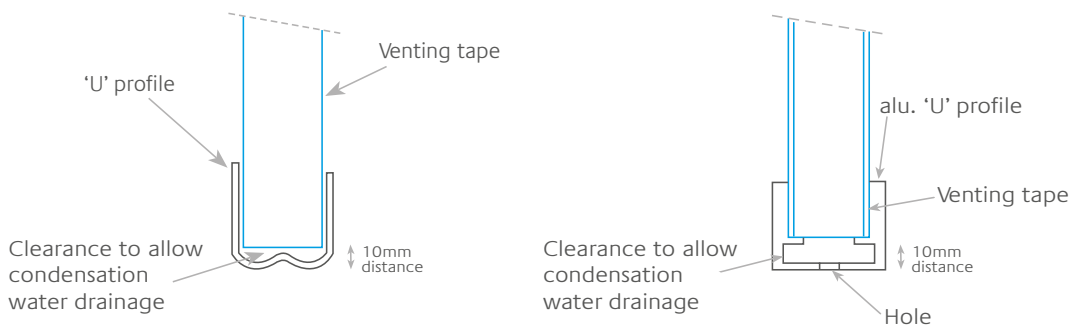


Figure 15



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 (km/h)	Wind pressure (N/m^2)
10	36	61
15	54	138
20	72	245
25	90	383
30	108	552
35	126	751
40	144	981
45	162	1240
50	180	1530
55	198	1850
60	216	2210
65	234	2590

For glazing projects with an unusual loading condition, please contact your local SABIC 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 17: The wind pressure created through the wind speed on a building surface

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. Determining 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 2.0-8.0 kg/m^2 per cmh.

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

Computer Aided Sheet Engineering

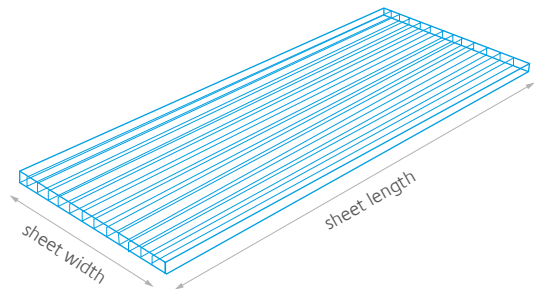
A computer aided design programme has been developed especially for large glazing projects, or projects with an uncommon shape or unusual loading conditions.

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 Technical Service Centre for further advice.

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.

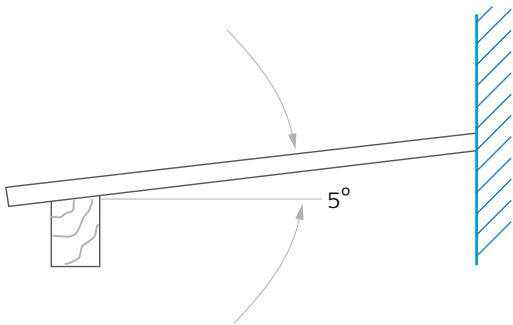
Figure 16



Sloped roofing

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

Figure 18

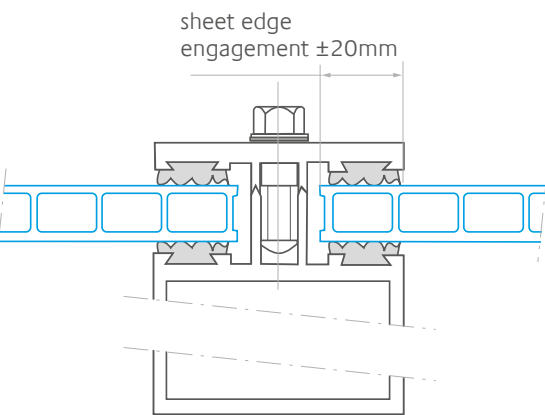


Safety Factor

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.

Note: The values indicated in the Tables are applicable for a LEXAN THERMOCLEAR sheet edge engagement in the glazing frame of at least 20 mm.

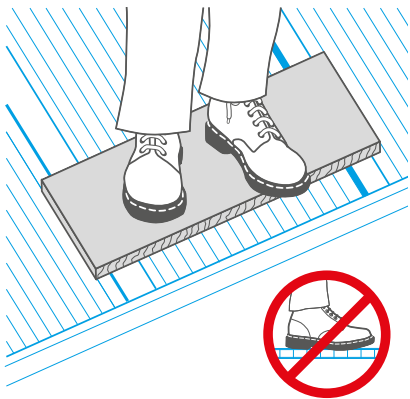
Figure 17



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.

Figure 19



FLAT GLAZING SHEET THICKNESS

The deflection characteristics in this particular configuration are dependent upon the ratio of the support bar spacing a:b (See fig. 20).

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 18, 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

Figure 20

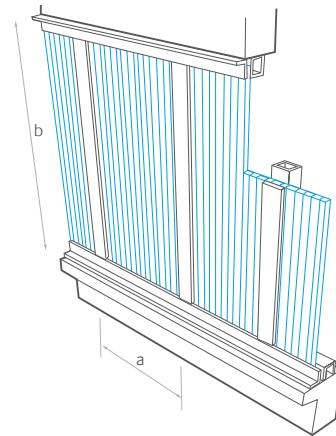


Table 18: Centre to Centre Distance (mm) of glazing profiles (shortest side (a))

	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
Loading in N/m ²	600			800			1000			1200		
LT2UV452RS10	850	690	450				900	780	530			
LT2UV62RS13	1050	920	610	950	850	570	1075	940	610	1020	900	570
LT2UV82RS15	1250	1100	720	1150	1020	655	1280	950	670	1215	920	620
LT2UV102RS17	1500	1150	815	1375	1070	730	1425	1050	750	1375	980	700
LT2UV105RS175	1600	1200	850	1500	1100	800	1500	1210	880	1450	1120	810
LT2UV163TS27	1700	1420	1100	1600	1310	980	1900	1450	980	1800	1350	950
LT2UV165X26	2100 [#]	1700	1100	2100 [#]	1600	1050	2100 [#]	1650	1300	2100 [#]	1450	1200
LT2UV169X	2095 [#]	1390	1080	2000	1280	980	1850	1180	890	1740	1090	820
LT2UV205X32	2100	1800	1250	2100	1650	1200	2100	1550	1150	200	1400	1100
LT2UV209X	2095 [#]	1490	1140	2000	1390	1040	1880	1290	940	1770	1190	890
LT2UV255X34	2100 [#]	1850	1500	2100 [#]	1750	1400	2100 [#]	1650	1300	2100 [#]	1450	1200
LT2UV259X	2095 [#]	1570	1180	2000	1450	1080	1900	1380	980	1800	1280	900
LT2UV325X38	2100 [#]	1900	1600	2100 [#]	1800	1500	2100 [#]	1700	1400	2100 [#]	1600	1350
LT2UV409X43	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 [#]
LT2UV509X48	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]
LT2UV555	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]

[#] centre to centre distance = maximum sheet width

Table 18: Centre to Centre Distance (mm) of glazing profiles (shortest side (a)) Continued

	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
Loading in N/m ²	1400			1600			1800			2000		
LT2UV452RS10												
LT2UV62RS13												
LT2UV82RS15	970	830	535	930	780	510						
LT2UV102RS17	1160	850	585	1110	800	545	1070	760	520			
LT2UV105RS175	1300	950	650	1200	900	600	1100	850	550	1000	800	500
LT2UV163TS27	1400	1060	750	1300	1000	700	1250	950	665	1200	900	620
LT2UV165X26	1700	1200	900	1600	1100	850	1500	1000	800	1400	950	750
LT2UV169X	1640	1020	750	1540	950	690	1440	890	660	1340	830	630
LT2UV205X32	1900	1300	1050	1800	1200	1000	1700	1070	980	1500	1020	920
LT2UV209X	1670	1090	840	1570	1040	760	1470	990	710	1370	890	680
LT2UV255X34	2100 [#]	1350	1150	1900	1280	1100	1800	1150	1050	1650	1100	1000
LT2UV259X	1700	1180	850	1600	1100	790	1500	1050	730	1400	980	680
LT2UV325X38	2100 [#]	1500	1300	2100 [#]	1400	1250	2000	1300	1150	1900	1200	1100
LT2UV409X43	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 [#]
LT2UV509X48	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]
LT2UV555	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]

[#] centre to centre distance = maximum sheet width

FLAT GLAZING SHEET THICKNESS

Example I

Window size: width 800 mm
length: 1200 mm
(Ratio a:b = 1 : 1.5)
Loading: 1600 N/m²
Required sheet type: LT2UV10/2RS17

Example II

Window size: width 1100 mm
length 3000 mm
(Ratio a:b = 1 : >1.5)
Loading: 600 N/m²
Required sheet type: LTUV16/3TS27

Figure 21

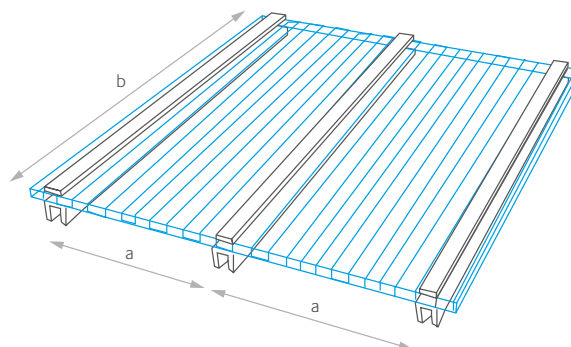


Table 19: Centre to Centre Distance (mm) of glazing profiles "a"; glazing profiles parallel with the rib structure

	centre to centre distance (mm)							
Loading in N/m ²	600	800	1000	1200	1400	1600	1800	2000
LT2UV62RS13	570	530						
LT2UV82RS15	655	610	570	535	510			
LT2UV102RS17	730	670	620	585	545	520		
LT2UV105RS175	850	800	750	700	650	600	550	
LT2UV163TS27	1100	980	880	810	750	700	665	620
LT2UV165X26	1100	1050	980	950	900	850	800	750
LT2UV169X	1080	980	890	820	750	690	660	630
LT2UV205X32	1600	1400	1250	1150	1050	1000	950	900
LT2UV209X	1140	1040	940	890	840	760	710	680
LT2UV255X34	1700	1500	1350	1250	1175	1100	1050	1000
LT2UV259X	1180	1080	980	900	850	790	730	680
LT2UV325X38	1800	1600	1450	1350	1250	1200	1150	1100
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 [#]
LT2UV55S	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]	1200 [#]

[#] centre to centre distance = maximum sheet width

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.

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, watertight 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.

Figure 22

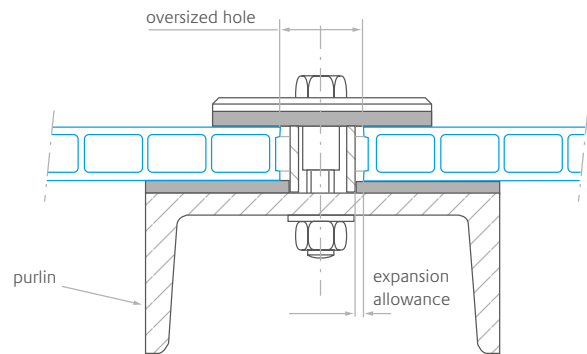


Figure 23

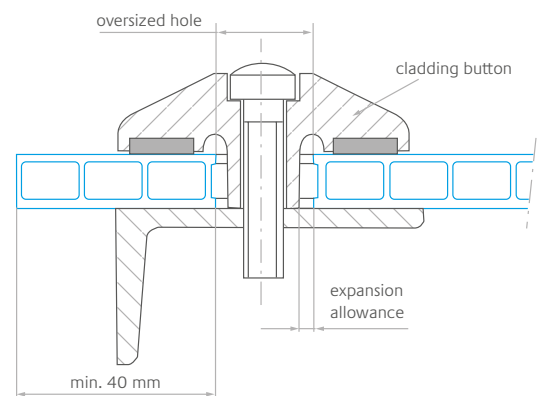
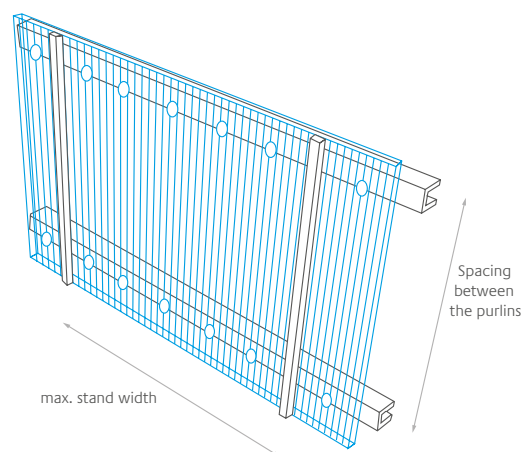


Figure 24



FLAT GLAZING SHEET THICKNESS

Table 20: Centre to centre distance of purlins in mm; glazing profiles 90° to rib structure

	centre to centre distance (mm)							
Loading in N/m ²	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
LT2UV102RS17	1010	930	875	830	790	760	730	710
LT2UV105RS175	1010	930	875	830	790	760	730	730
LT2UV163TS27	1450	1325	1240	1180	1130	1085	1050	1000
LT2UV165X26	1350	1225	1140	1080	1050	985	950	900
LT2UV169X	1450	1325	1240	1180	1130	1085	1050	1000

centre to centre distance = maximum sheet width

Rooflight Office Building. Roof is made of LEXAN™ THERMOCLEAR 16 mm sheet in Opal White colour.



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.

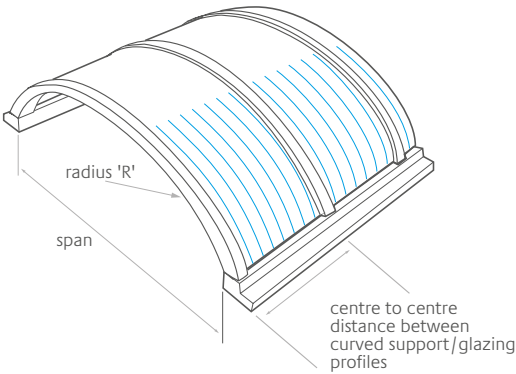
The loading characteristics given in Table 22 are based upon curved glazing applications clamped on all four edges. The Table shows linear buckling load values, (calculated with a safety factor of 2.0), against installation radii for different sheet widths. Sheet length 'L' needs to be greater than sheet 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 21: Minimum radius values

LEXAN THERMOCLEAR sheet thickness	Min. Radius (mm)
6	900
8	1200
10	1500
16	2400

Note on cold curved applications:
Although the LEXAN THERMOCLEAR-PLUS 9 Wall sheet can be cold curved in the thicknesses 16-18 and 20mm at a radius of 150 times the thickness of the sheet, there might appear a optical distortion of the internal layers. This optical distortion will have no negative influence on the mechanical performance of the product provided that the guidelines for cold curved applications in this data sheet are correctly followed.

Figure 25



CURVED GLAZING SHEET THICKNESS

Table 22: Examples of centre to centre distance (mm) curved glazing profiles

LT2UV62RS13								
Loading in N/m ²	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
900	2100	2100	1750	1450	1250	1100	1000	960
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 ²	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
1200	2100	2100	1900	1500	1300	1100	1000	900
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 ²	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
1500	2100	2100	1700	1500	1300	1150	1000	900
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

Table 22: Centre to centre distance (mm) curved glazing profiles (continued)

LT2UV105RS175								
Loading in N/m ²	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
5250	800	700	700	700	700	700	700	700

LT2UV163TS27								
Loading in N/m ²	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

LT2UV165X26								
Loading in N/m ²	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
2400	2100*	2100*	2100*	2100*	2100*	1800	1500	1200
2800	2100*	2100*	2100*	2100*	1800	1500	1250	1150
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

* centre to centre distance = maximum sheet width

CURVED GLAZING SHEET THICKNESS

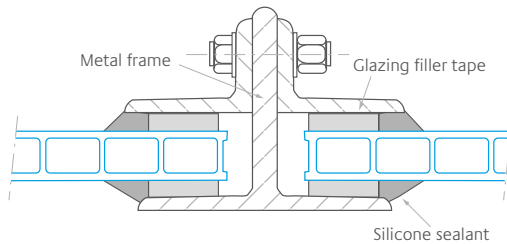
Table 22: Centre to centre distance (mm) curved glazing profiles (continued)

LT2UV169X(25)								
Loading in N/m ²	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
2800	2095	1920	1580	1330	1150	1020	920	830
3000	2095	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	
3800	1670	1300	1040	890	750			
4000	1560	1200	960	810				
4200	1460	1120	880					
4400	1360	1040						
4600	1300	980						
4800	1200							
5000	1100							
5200								
5400								
5600								

LT2UV205X32								
Loading in N/m ²	600	800	1000	1200	1400	1600	1800	2000
Radius "R" (mm)	centre to centre distance (mm) curved glazing profiles							
3700	1200	1200	1200	1200	1200	1200	1200	1200
3900	1200	1200	1200	1200	1200	1200	1200	1200
4100	1200	1200	1200	1200	1200	1200	1200	1150
4300	1200	1200	1200	1200	1200	1200	1150	1100
4500	1200	1200	1200	1200	1200	1150	1100	1050
4700	1200	1200	1200	1200	1150	1100	1050	1000
4900	1200	1200	1200	1150	1100	1050	1000	950
5100	1200	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

Figure 26

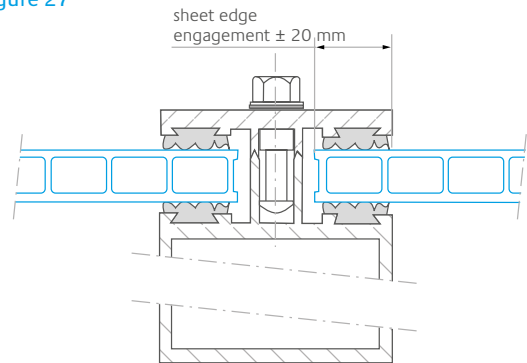


Do's

- Clean the window frame. Remove old putty or broken glass, if necessary.
- Measure the sheet edge engagement area (± 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.

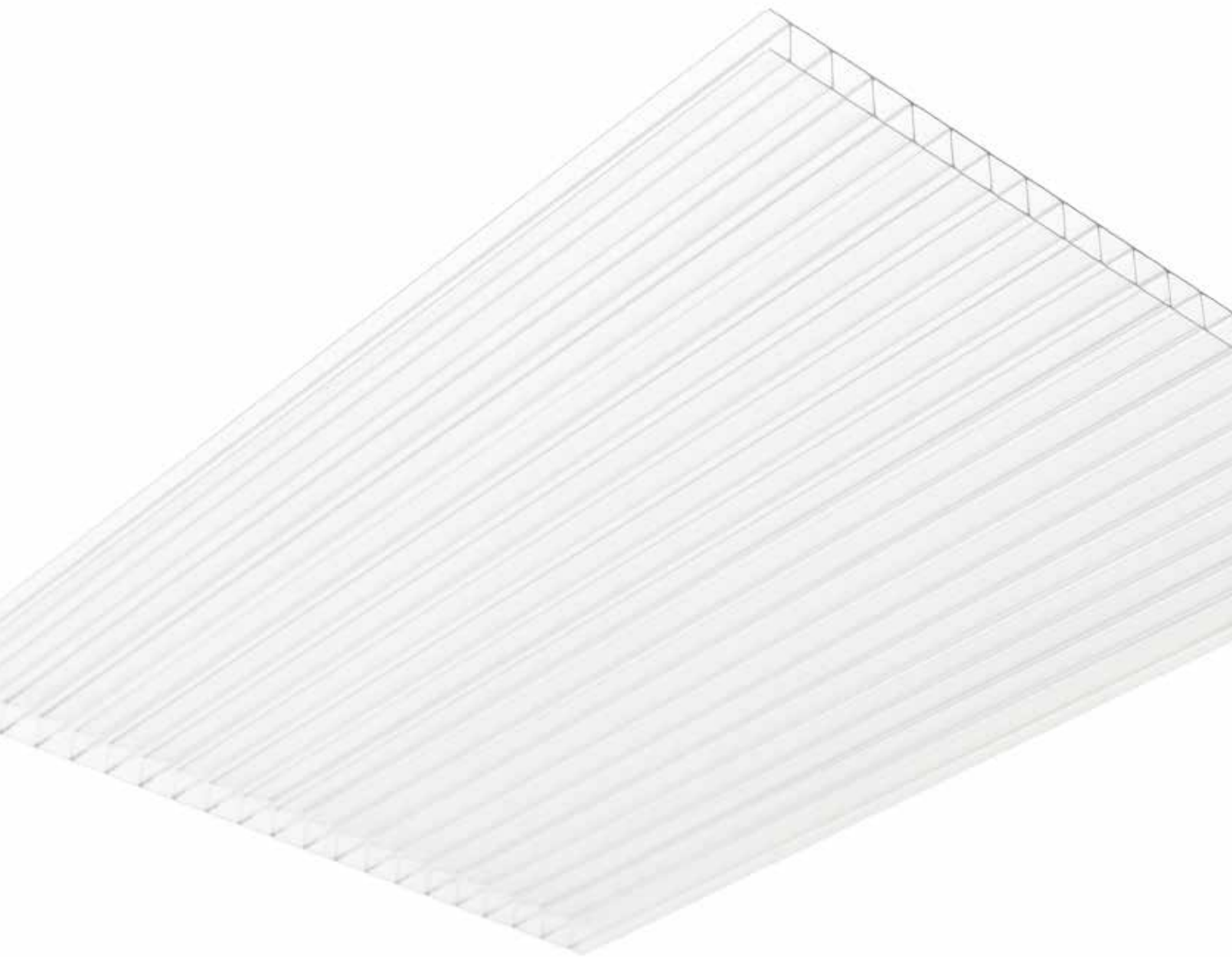
Dry Glazing

Figure 27



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.



This LEXAN multiwall Technical Manual only refers to our standard portfolio.
For unlisted requests or questions please contact your local agent at SABIC.

CONTACT US

Middle East and Africa

Global Headquarters
PO Box 5101
Riyadh 11422
Saudi Arabia
T +966 (0) 1 225 8000
F +966 (0) 1 225 9000
E info@sabic.com

Americas

Specialty Film & Sheet
1 Plastics Avenue
Pittsfield, MA 01201
USA
T 800 323 3783 (toll free)
T +1 413 448-6655
F (888) 443 2033
E sales.spinside@sabic-ip.com

Europe

Specialty Film & Sheet
Plasticslaan 1
4612 PX
Bergen op Zoom
The Netherlands
T +31 (0)164 293678
F +31 (0)164 293272
E sfs.info@sabic.com

Asia Pacific

Specialty Film & Sheet
2550 Xiupu Road
Pudong
201319 Shanghai
China
T +86 21 3222 4500
F +86 21 6289 8998
E sfs.info@sabic.com

DISCLAIMER: THE MATERIALS, PRODUCTS AND SERVICES OF SAUDI BASIC INDUSTRIES CORPORATION (SABIC) OR ITS SUBSIDIARIES OR AFFILIATES ("SELLER") ARE SOLD SUBJECT TO SELLER'S STANDARD CONDITIONS OF SALE, WHICH ARE AVAILABLE UPON REQUEST. INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS DOCUMENT ARE GIVEN IN GOOD FAITH. HOWEVER, SELLER MAKES NO EXPRESS OR IMPLIED REPRESENTATION, WARRANTY OR GUARANTEE (i) THAT ANY RESULTS DESCRIBED IN THIS DOCUMENT WILL BE OBTAINED UNDER END-USE CONDITIONS, OR (ii) AS TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN OR APPLICATION INCORPORATING SELLER'S MATERIALS, PRODUCTS, SERVICES OR RECOMMENDATIONS. UNLESS OTHERWISE PROVIDED IN SELLER'S STANDARD CONDITIONS OF SALE, SELLER SHALL NOT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS MATERIALS, PRODUCTS, SERVICES OR RECOMMENDATIONS DESCRIBED IN THIS DOCUMENT. Each user is responsible for making its own determination as to the suitability of Seller's materials, products, services or recommendations for the user's particular use through appropriate end-use and other testing and analysis. Nothing in any document or oral statement shall be deemed to alter or waive any provision of Seller's Standard Conditions of Sale or this Disclaimer, unless it is specifically agreed to in a writing signed by Seller. Statements by Seller concerning a possible use of any material, product, service or design do not, are not intended to, and should not be construed to grant any license under any patent or other intellectual property right of Seller or as a recommendation for the use of any material, product, service or design in a manner that infringes any patent or other intellectual property right.

Unless otherwise noted, SABIC and brands marked with TM are trademarks of SABIC or its subsidiaries or affiliates. Any brands, products or services of other companies referenced in this document are the trademarks, service marks and/or trade names of their respective holders.
© 2016 Copyright SABIC. All rights reserved.