

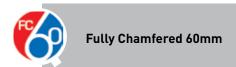
TECHNICAL GUIDE ISUUE 10

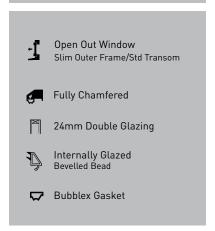


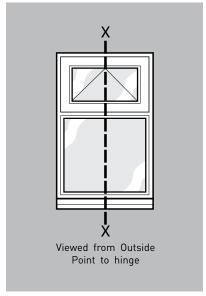




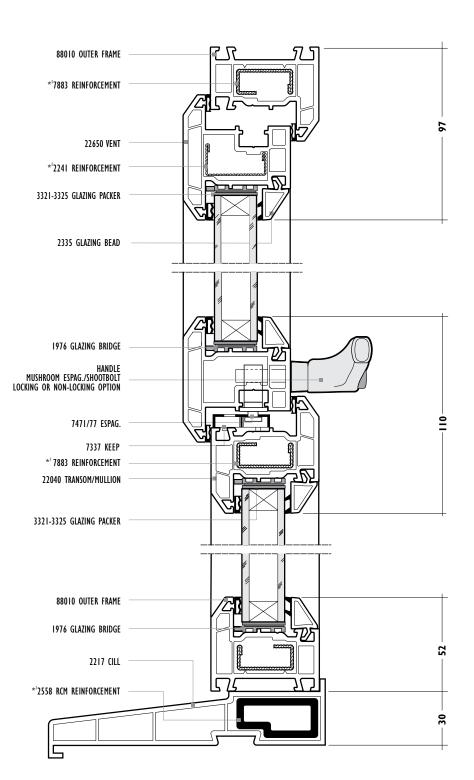




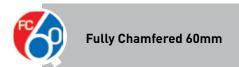


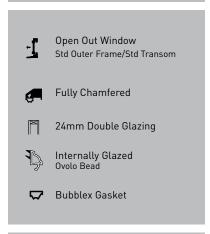


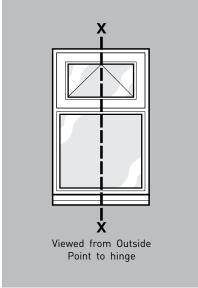
*¹ Note: All reinforcement shown are for diagratical purposes only.



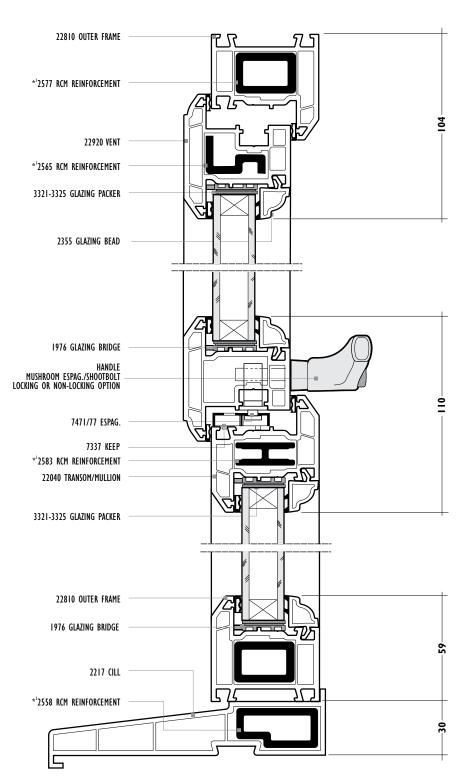






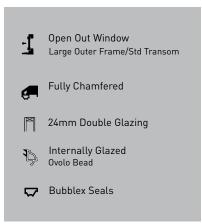


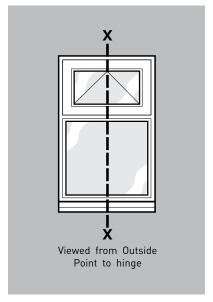
*¹ Note: All reinforcement shown are for diagratical purposes only.



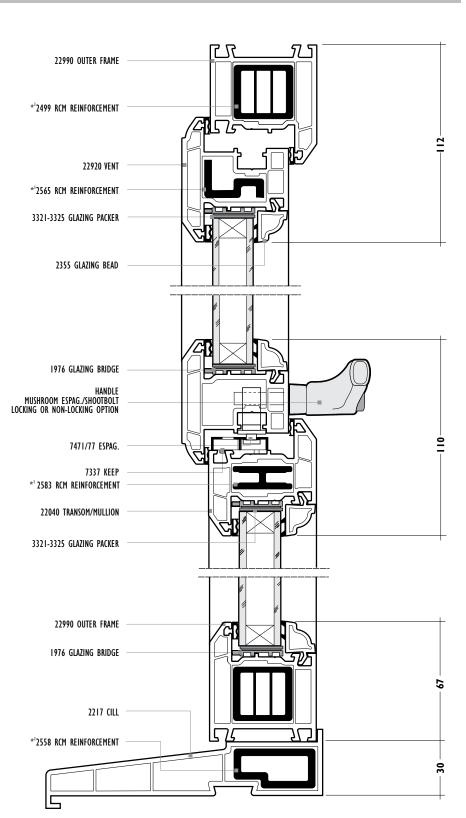






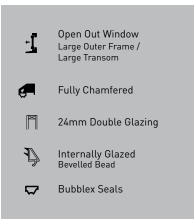


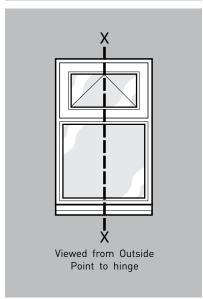
*^I Note: All reinforcement shown are for diagratical purposes only.



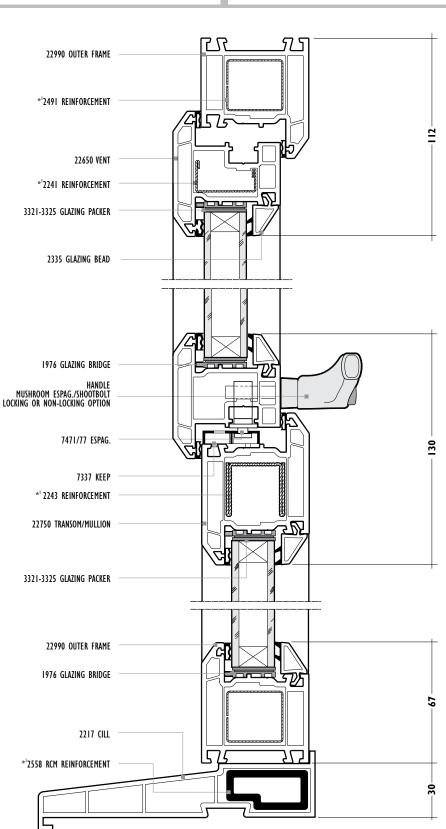




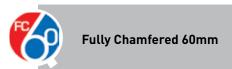


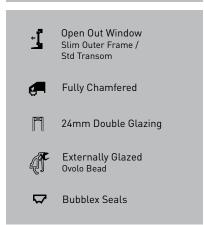


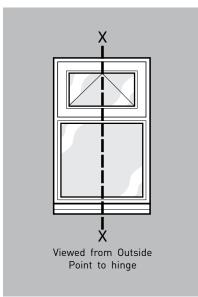
*^I Note: All reinforcement shown are for diagratical purposes only.



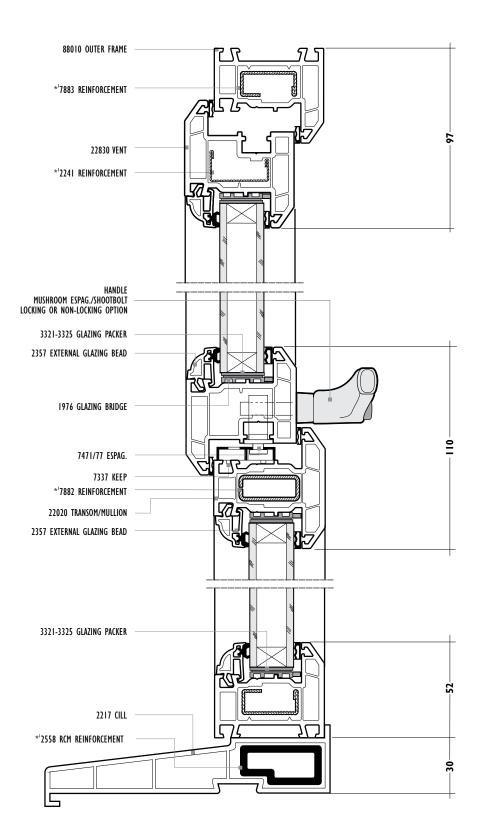






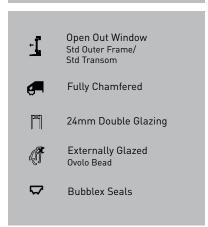


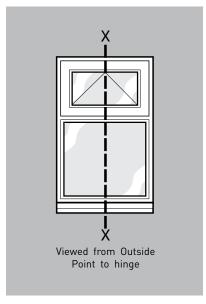
*^I Note: All reinforcement shown are for diagratical purposes only.



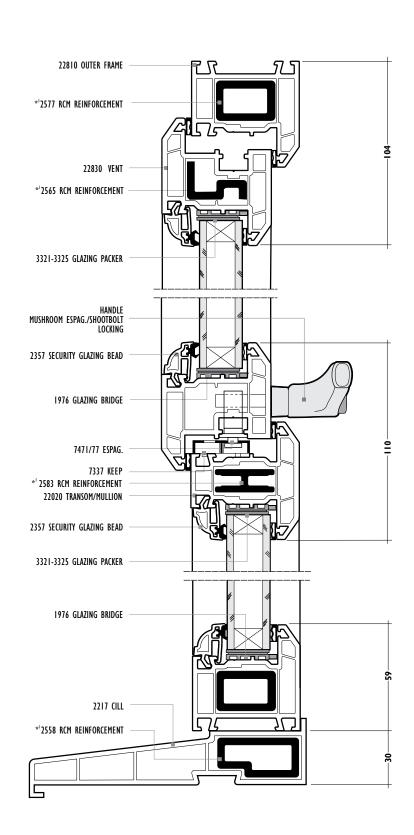








*^I Note: All reinforcement shown are for diagratical purposes only.



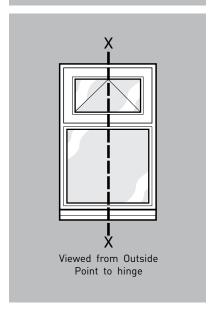


 CATEGORY
 DESCRIPTION
 STYLE

 PRODUCT
 ASSEMBLIES
 CASEMENT WINDOW

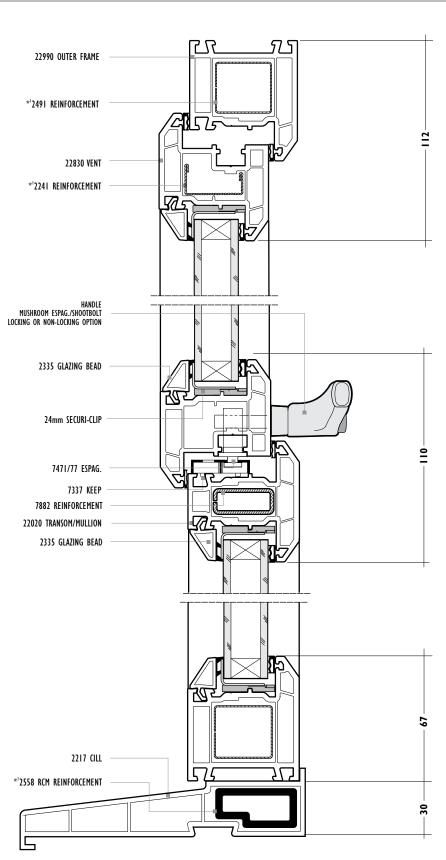






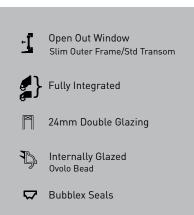
*^I Note: All reinforcement shown are for diagratical purposes only.

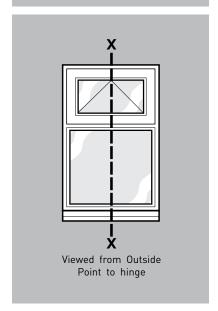
*****PNote: Detail shows 1822E gasket - on occasions where there are variances due to tolerance build up, alternative gaskets are supplied, i.e. 1808E If glass too tight, 1971 if glass too loose



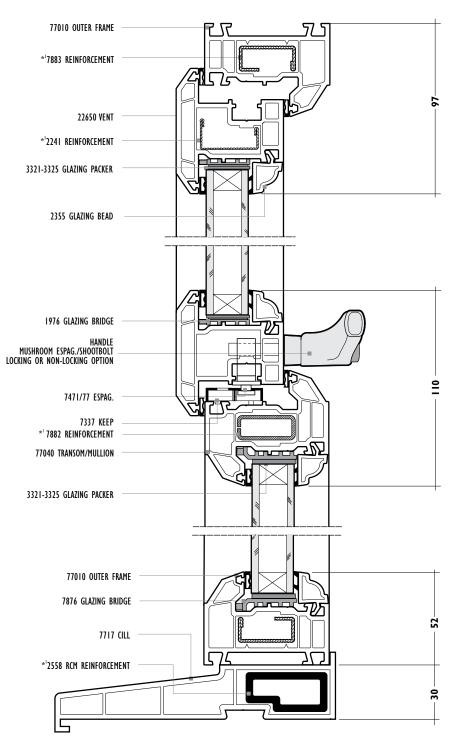






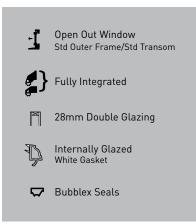


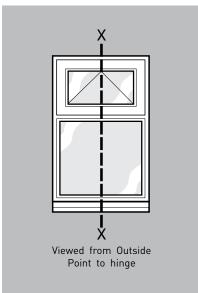
*¹ Note: All reinforcement shown are for diagratical purposes only.



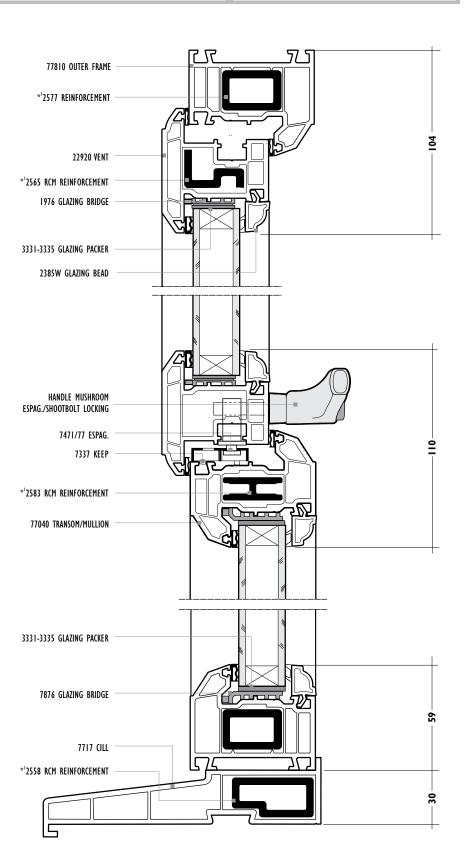






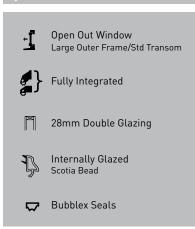


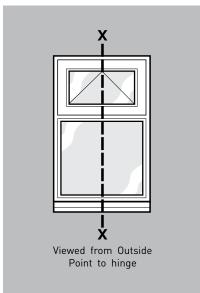
*^I Note: All reinforcement shown are for diagratical purposes only.



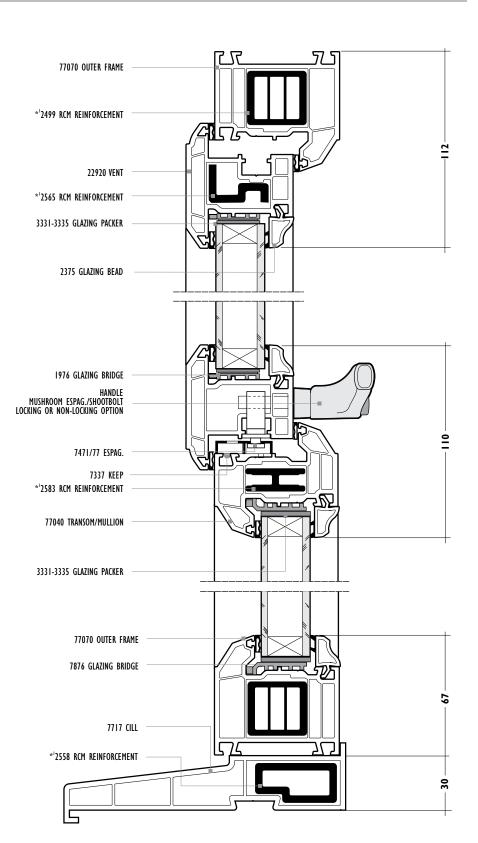








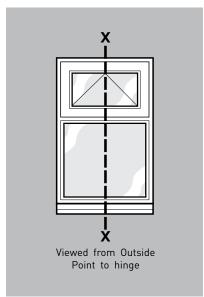
*^I Note: All reinforcement shown are for diagratical purposes only.



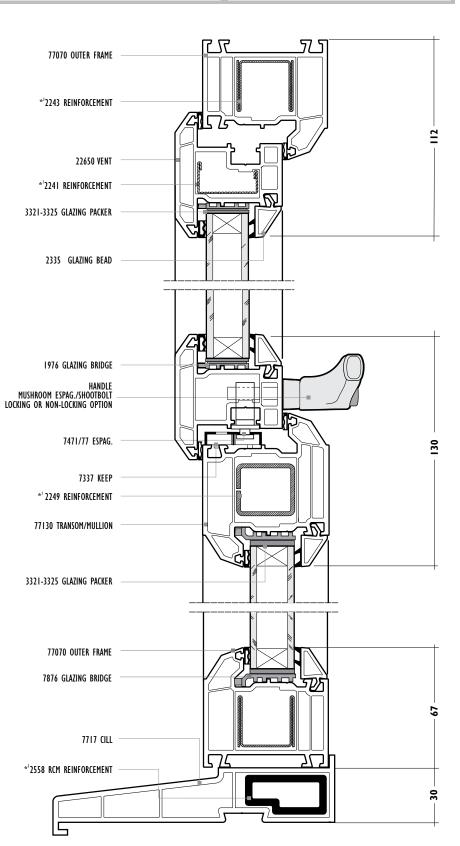






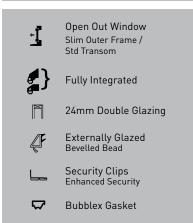


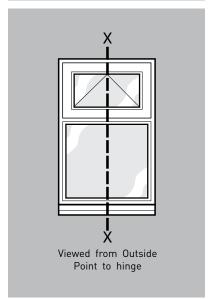
*¹ Note: All reinforcement shown are for diagratical purposes only.



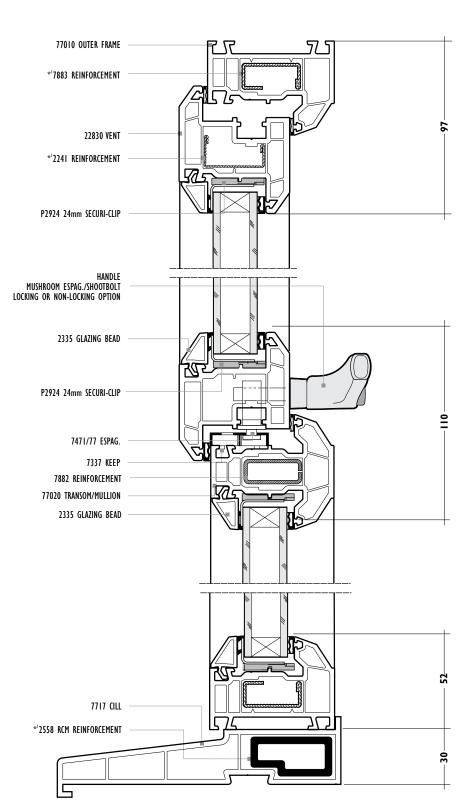






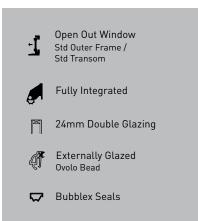


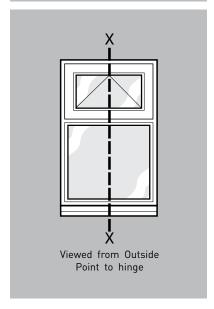
*^I Note: All reinforcement shown are for diagratical purposes only.



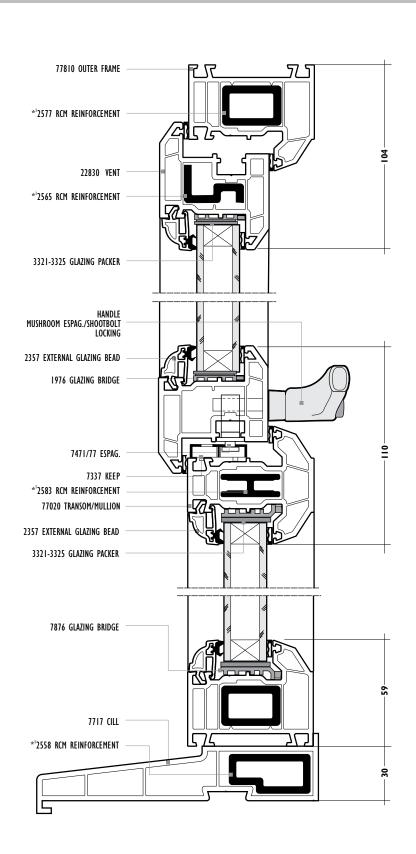






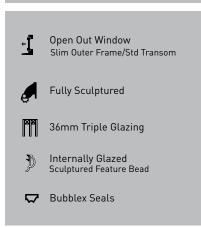


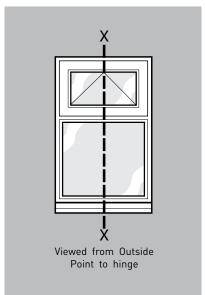
*¹ Note: All reinforcement shown are for diagratical purposes only.



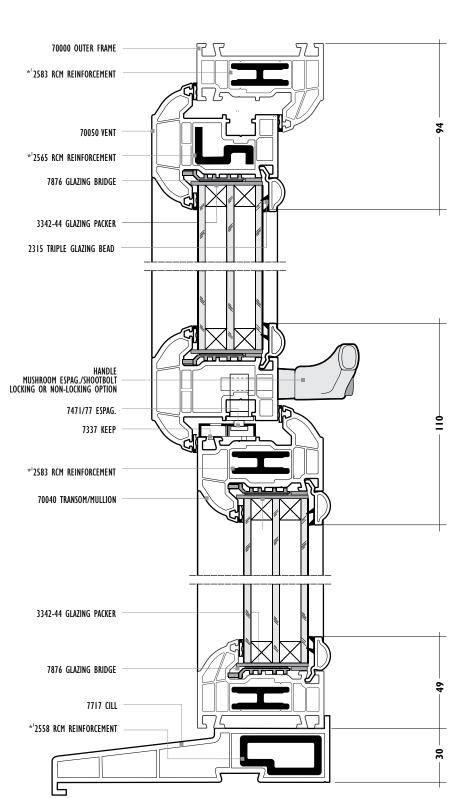






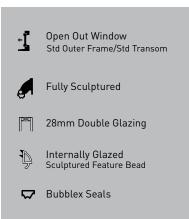


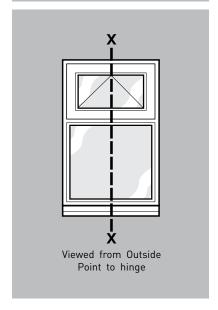
*^I Note: All reinforcement shown are for diagratical purposes only.



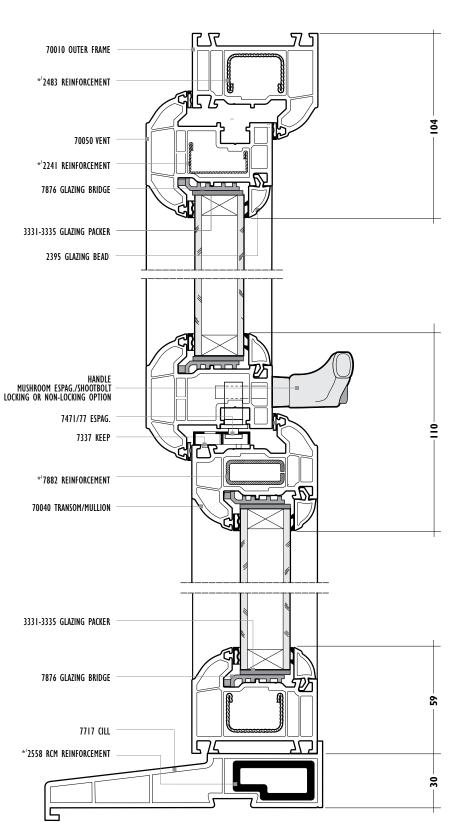






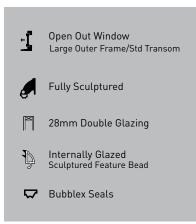


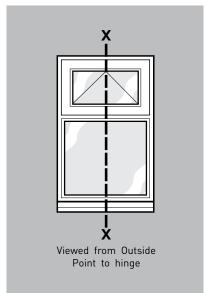
*^I Note: All reinforcement shown are for diagratical purposes only.



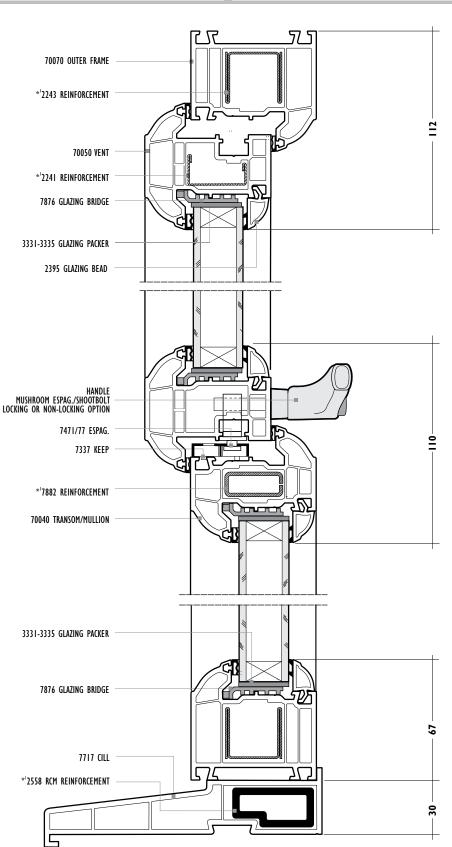






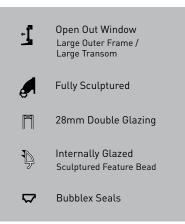


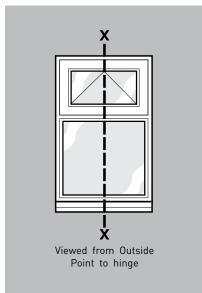
*^I Note: All reinforcement shown are for diagratical purposes only.



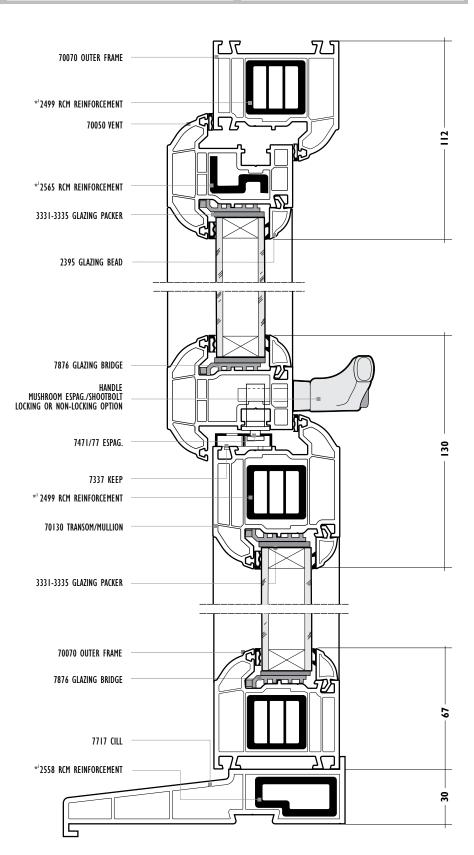








*¹ Note: All reinforcement shown are for diagratical purposes only.





WINDOW STYLES

Tilt-Turn Window

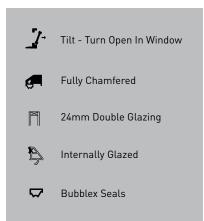


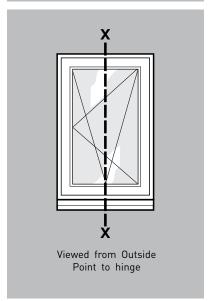
Fully Chamfered 60mm Open-In Tilt-Turn Window Internal Glazing



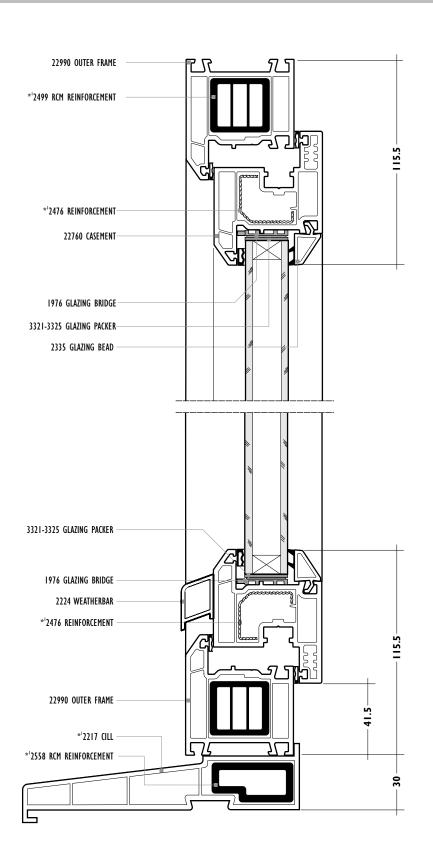
CATEGORY DESCRIPTION STYLE
PRODUCT ASSEMBLIES TILT-TURN WINDOW







*^I Note: All reinforcement shown are for diagratical purposes only.

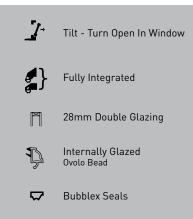


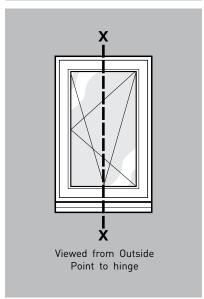
Fully Integrated 70mm Open-in Tilt-Turn Window Internal Glazing



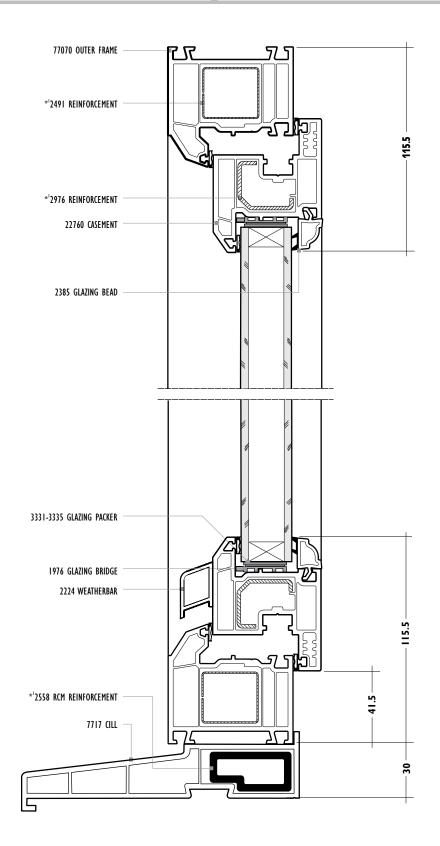
CATEGORY DESCRIPTION STYLE
PRODUCT ASSEMBLIES TILT-TURN WINDOW







*¹ Note: All reinforcement shown are for diagratical purposes only.



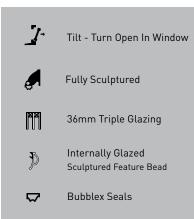
Fully Sculptured 70mm Open-in Tilt-Turn Window Internal Glazing

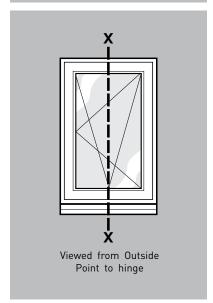


 CATEGORY
 DESCRIPTION
 STYLE

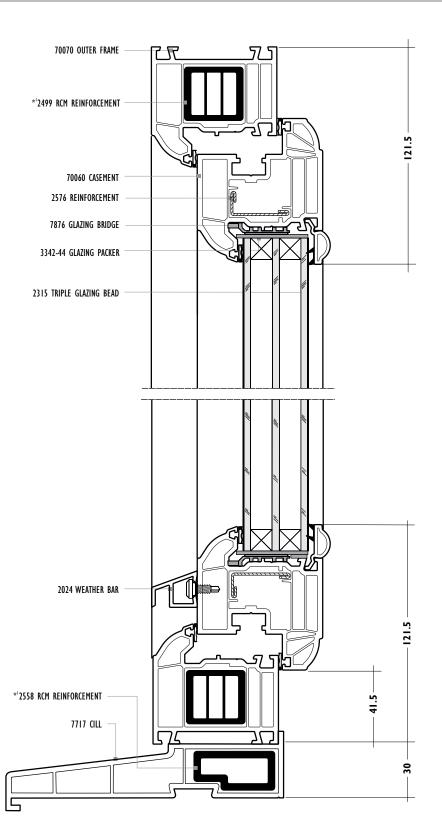
 PRODUCT
 ASSEMBLIES
 TILT-TURN WINDOW







*^I Note: All reinforcement shown are for diagratical purposes only.





window styles Fully Reversible Window



Fully Reversible 70mm Window Internal Glazing



CATEGORY DESCRIPTION STYLE
PRODUCT ASSEMBLIES FULLY REVERSIBLE WINDOW

Fully Reversible 70mm BIO2 OUTER FRAME BXIO2 RCM Fully Reversible **B93 HEAD DRIP** Window Fully Reversible BI30 SASH * BR130S REINFORCEMENT 28mm Double Glazing BM03 GLAZING BRIDGE Internally Glazed Ovolo Bead 3331-3335 GLAZING PACKER **B60 GLAZING BEAD** * BRI3IS REINFORCEMENT HANDLE (ESPAG. LOCKING) S9293-S9298 RAIL ESPAG S9299 RAIL ESPAG STRIKER OPTIONAL TRIPLE SEAL POSITION * BRII6S REINFORCEMENT BII7 TRANSOM/MULLION Viewed from Outside Point to hinge *1 Note: All reinforcement shown are for diagratical purposes only. 3331-3335 GLAZING PACKER (As required) **BO2 OUTERFRAME** *1BR06S REINFORCEMENT 7717 CILL *12558 RCM REINFORCEMENT



DOOR STYLES

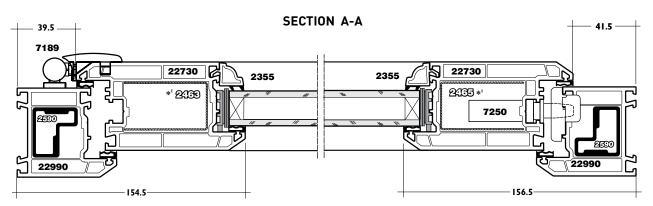
Residential Door

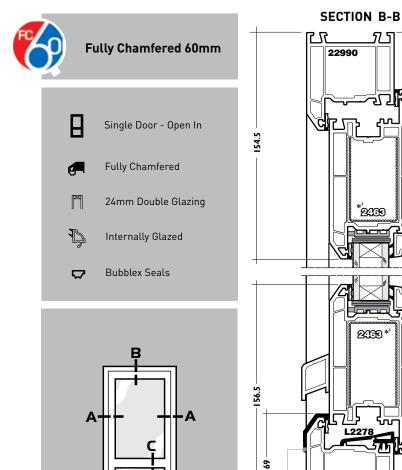


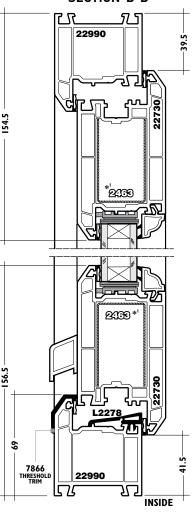
Fully Chamfered 60mm Single Door (Open-In) Internal Glazing

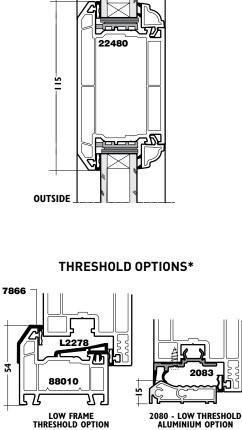


CATEGORY	DESCRIPTION	STYLE
PRODUCT	ASSEMBLIES	RESIDENTIAL DOOR









MIDRAIL SECTION C-C

All dimensions are nominal. DO NOT SCALE TD-02-0030-1-3\10-13

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L2901 - MEDIUM THRESHOLD PVC-U OPTION

2902 - MEDIUM THRESHOLD ALUMINIUM OPTION

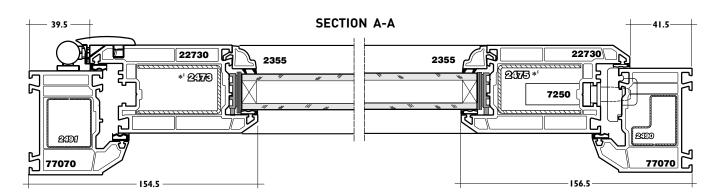
* Note: LOW THRESHOLDS - THESE WILL NOT PROVIDE THE SAME WEATHERING PERFORMANCE AS FULL FRAME THRESHOLDS.

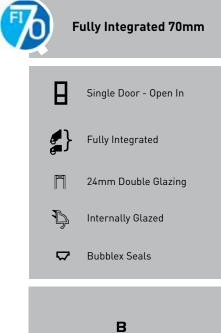
*'Note: Standard Reinforcing shown.

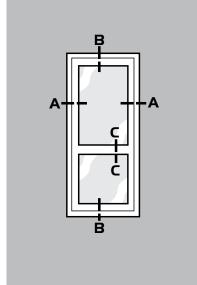
Fully Integrated 70mm Single Door (Open-In) Internal Glazing

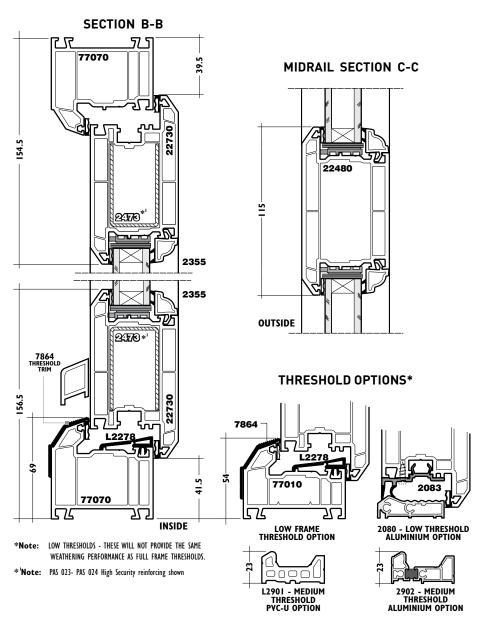


CATEGORY	DESCRIPTION	STYLE
PRODUCT	ASSEMBLIES	RESIDENTIAL DOOR



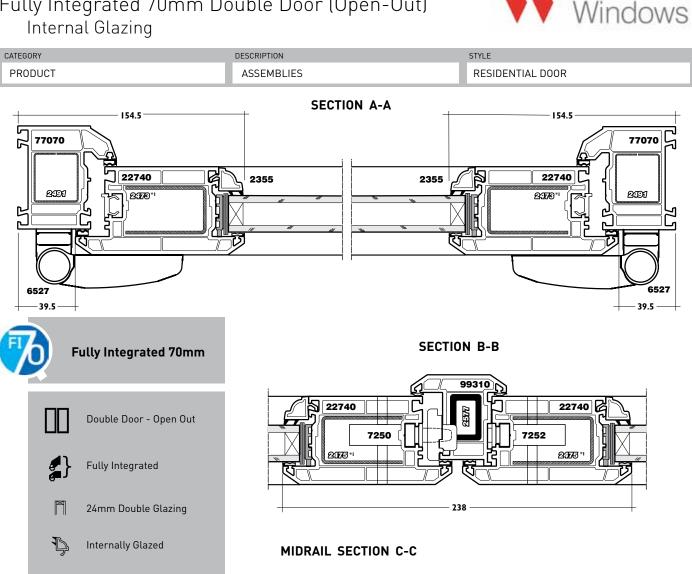


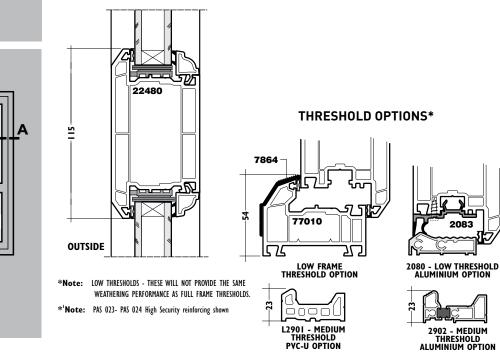


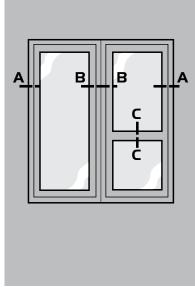


Fully Integrated 70mm Double Door (Open-Out) Internal Glazing







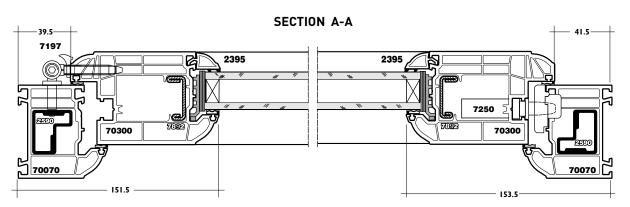


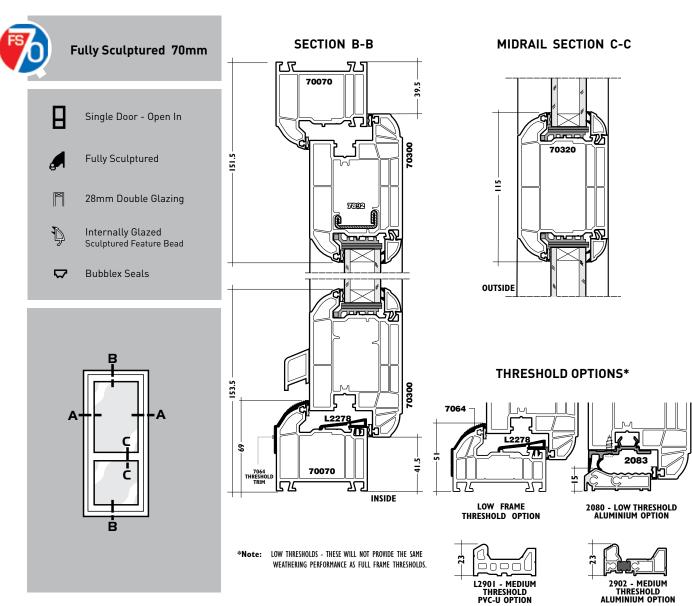
Bubblex Seals

Fully Sculptured 70mm Single Door (Open-In) Internal Glazing



CATEGORY	DESCRIPTION	STYLE
PRODUCT	ASSEMBLIES	RESIDENTIAL DOOR





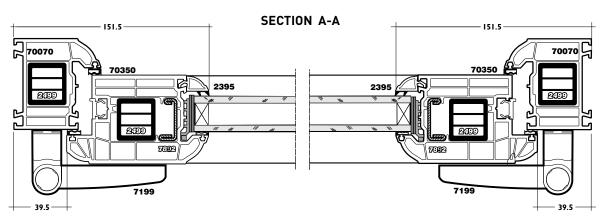
All dimensions are nominal. DO NOT SCALE TD-02-0036-1-3\10-13

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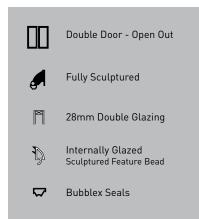
Fully Sculptured 70mm Double Door (Open-Out) Internal Glazing

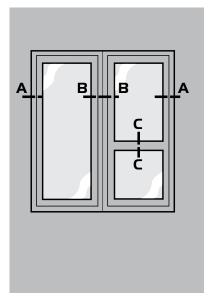




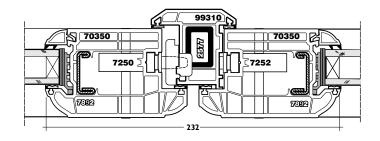




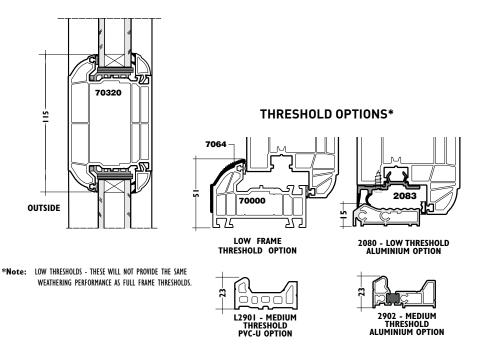




SECTION B-B



MIDRAIL SECTION C-C



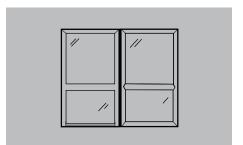
All dimensions are nominal. DO NOT SCALE TD-02-0039-1-3\10-13

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Doors with Side Screens Coupled Side Screen







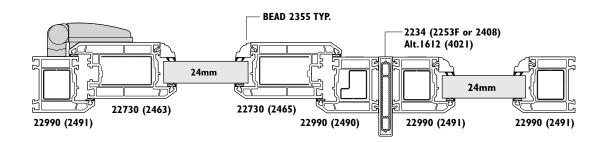
Notes: Reinforcements shown in brackets.

Glazing packing as per single door assemblies.

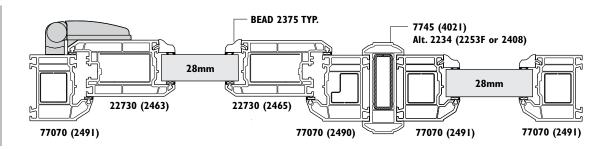
Hardware not shown for clarity, see other assemblies for

details.

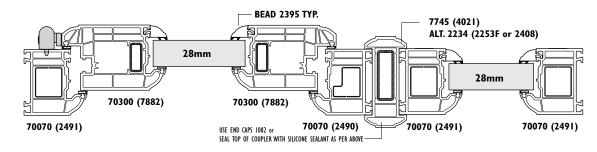








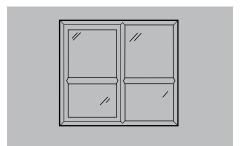




Doors with Side Screens Common Mullion Frame







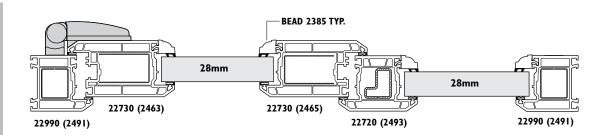
Notes: Reinforcements shown in brackets.

Glazing packing as per single door assemblies.

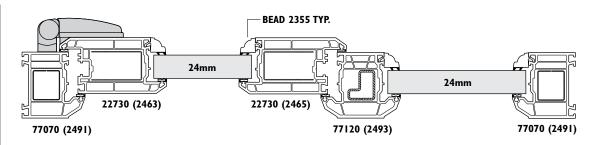
Hardware not shown for clarity, see other assemblies for

details.

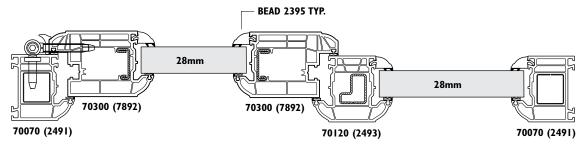














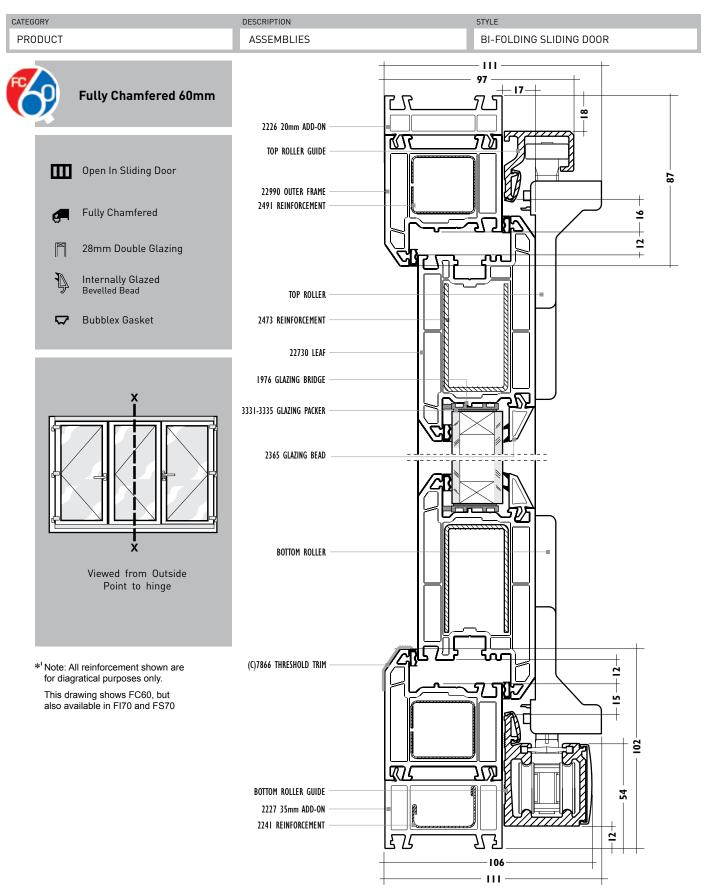
DOOR STYLES

Bi-Folding Sliding Door



Fully Chamfered 60mm Open-in Sliding Door Vertical Sections



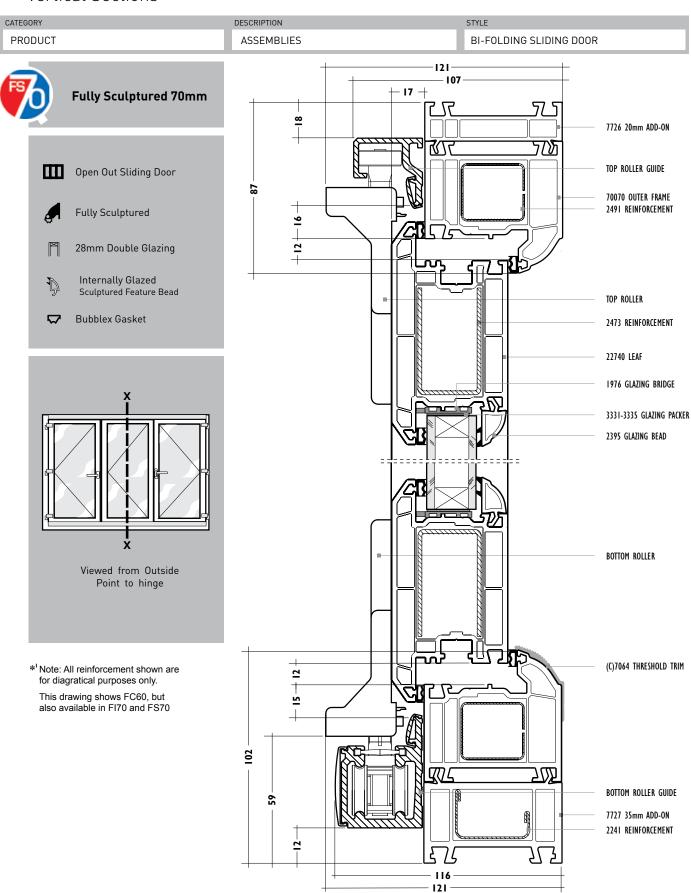


All dimensions are nominal. DO NOT SCALE TD-02-0069-1-1\10-13

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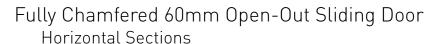
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Fully Chamfered 60mm Open-In Sliding Door Horizontal Sections



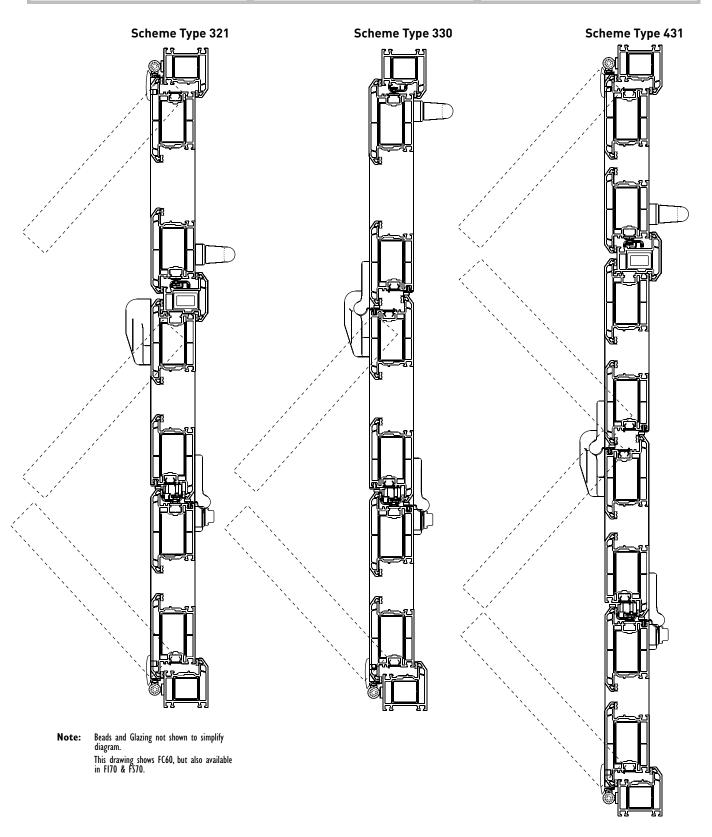
CATEGORY	DESCRIPTION	STYLE
PRODUCT	ASSEMBLIES	BI-FOLDING SLIDING DOOR

Scheme Type 321 Scheme Type 330 Scheme Type 431 Beads and Glazing not shown to simplify This drawing shows FC60, but also available in FI70 & FS70.





CATEGORY	DESCRIPTION	STYLE	
PRODUCT	ASSEMBLIES	BI-FOLDING SLIDING DOOR	



All dimensions are nominal. DO NOT SCALE TD-02-0072-1-0\06-11

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DOOR STYLES

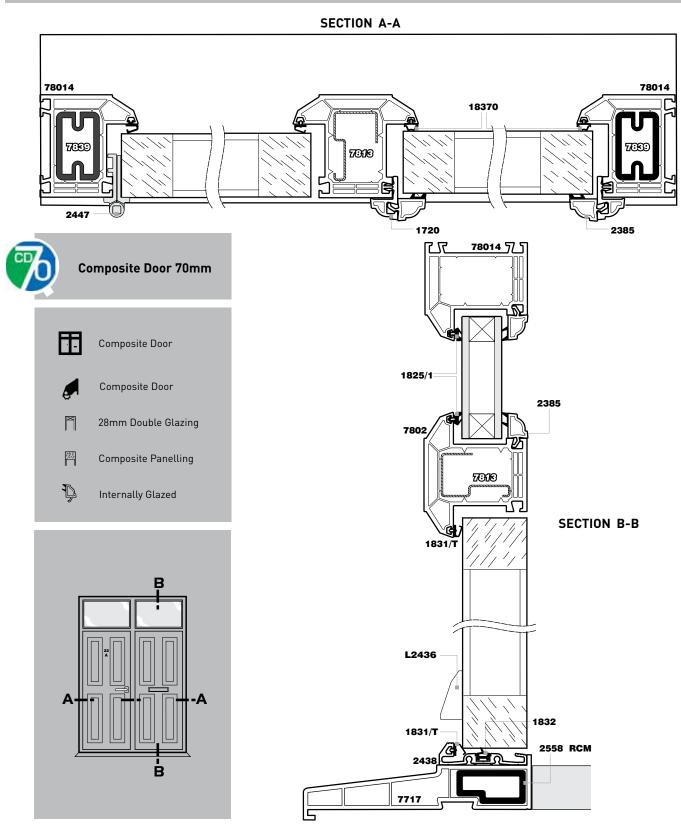
Composite Door



70mm Composite Door Frame System With Slab Side Panel Arrangement



CATEGORY	DESCRIPTION	STYLE	
PRODUCT	ASSEMBLIES	COMPOSITE DOOR	





DOOR STYLES

In-line Sliding Patio Door



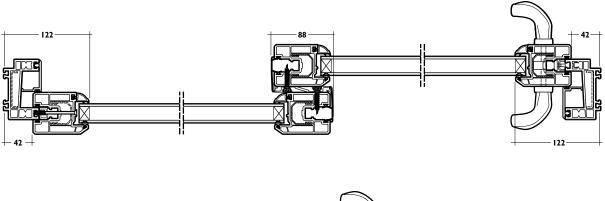
In-line Patio Door System

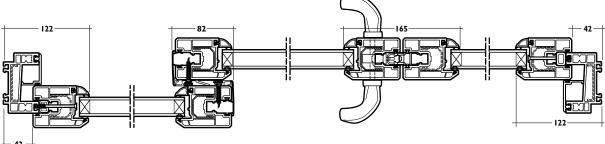


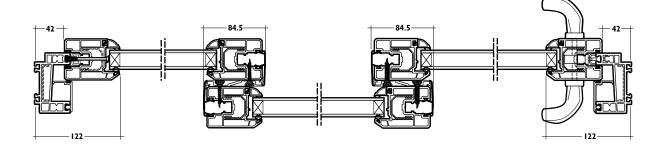
Horizontal Sections - 86mm Outer Frame, 28mm Double Glazing

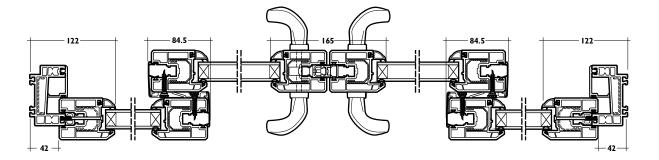
CATEGORY DESCRIPTION STYLE
PRODUCT ASSEMBLIES IN-LINE PATIO DOOR









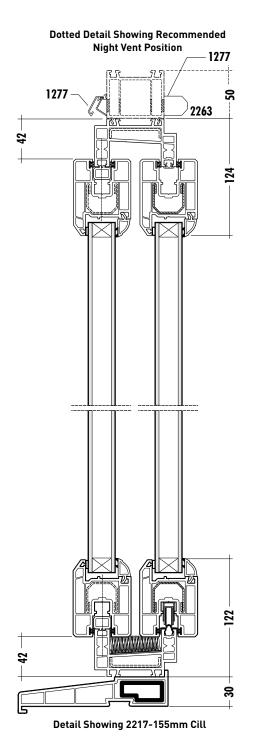


In-line Patio Door System

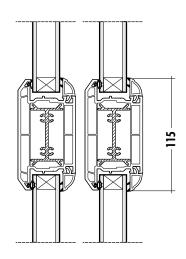
Vertical Sections - 86mm Outer Frame, 28mm Double Glazing

CATEGORY	DESCRIPTION	STYLE
PRODUCT	ASSEMBLIES	IN-LINE PATIO DOOR

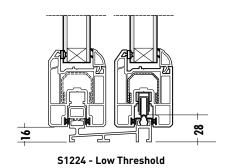


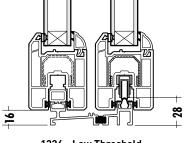


MIDRAIL SECTION



LOW ALUMINIUM THRESHOLD





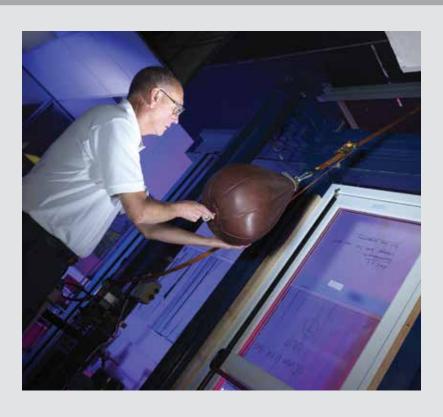
1334 - Low Threshold Thermally Broken Option

All dimensions are nominal. DO NOT SCALE TD-02-0047-1-3\10-13

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Performance



Weather Performance



CATEGORY	DESCRIPTION
PRODUCT CHARACTERISTICS	PERFORMANCE

Acceptable levels of window performance are vital to achieve required standards, eliminate costly corrective action, maintain customer confidence and uphold the reputation of the manufacturing company.

Profile and reinforcement choice, window size and configuration will all effect window performance.

The product variations are innumerable and therefore it is impossible to provide predictable performance results.

Standards require that doors and windows meet the specification of BS6375 Part 1, for Air Permeability, Water tightness and Wind Resistance, as shown in the following chart.

	DESIGN WIND PRESSURE		
TEST	1200Pa.	1600Pa.	2000Pa.
AIR PERMEABILITY	200Pa.	300Pa.	300Pa.
WATERTIGHTNESS	100Pa.	200Pa.	200Pa.
WIND RESISTANCE	1200Pa.	1600Pa.	2000Pa.

The units tested shall avoid air and water leakage and resist wind pressures, measured in pascals, for the tests listed and to the values indicated under the three wind pressure categories.

Fabricators/Specifiers are invited to contact the Technical Department for advice, where special wind pressure categories are specified, unusual difficulties may be experienced, or where installation in exposed locations can be expected to be subjected to above average climatic conditions.

The information on Wind Pressure, found within this section, is presented in simplified form and is only intended for guidance.

For detailed information covering all aspect of Wind Loading, Window Performance and Testing etc, refer to the current issue of the following BSI publications.

- (A) BS6375 : Part 1
 Performance of Windows
 Part 1 Classification of Weathertightness
- (B) BS6399 Loading for Buildings (Formerly CP3) Part 1 Code of Practice for dead and imposed loads Part 2 Code of Practice for windloads Part 3 Code of Practice for imposed roof loads
- (C) BS5368 : Method of Testing Windows Part 1 Air Permeability Test Part 2 Watertightness Test Part 3 Wind Resistance Test

Weather Performance



CATEG	GORY	DESCRIPTION
PRO	ODUCT CHARACTERISTICS	PERFORMANCE

WATER TIGHTNESS TO BS 5368 Part 2: 1986 (EN 86)

Test Pressure Pa	Duration of Pressure (min.)	Exposure category (Pa)			
0	15			_	1
50	5	1200			
100	5		1600		
150	5			2000	Special
200	5				op co.u.t
300	5				
400	5				
500	5			_	J

WIND RESISTANCE TO BS 5368 Part 3: 1985 (EN 77)

Test Pressure Pa	Duration of Pressure (min.)	Exposure category	
1200	3x3 pos. 3x3 neg	1200	
1600	3x3 pos. 3x3 neg	1600 2000	
2000	3x3 pos. 3x3 neg		pecial
2400	3x3 pos. 3x3 neg		

The normal maximum permissable deflection for a window with insulating glass units is the length (L) of the mullion/transom divided by (L/175) to a maximum of 16mm. For the insulating glass units it is recommended that the maximum deflection is restricted to 8mm.

For very large windows, e.g. Floor to ceiling glazed screens such as those found in schools and flats, it may be preferable to specify a smaller maximum deflection such as L/250 to provide greater stiffness to the structure. For curtain walling always use L/250.

EXPOSURES CATEGORIES FOR DOMESTIC SINGLE DOORS & SINGLE DOOR ASSEMBLIES BSI PAS 023-1: 1999

Exposure Category Pa	Air Permability Pa	Water Tightness Pa	Wind Resistence Pa
800 U	No requirement	No requirement	800
800 X	Up to 200 (graph A)	50	800
800	Up to 200	100	800
Over 800	Up to 300 (graph B)	200	Equal to the actual design wind pressure

Wind Loads



CATEGORY	DESCRIPTION
PRODUCT CHARACTERISTICS	PERFORMANCE

The maximum Wind Pressure Pascals (Pa) to which an installed unit may be subjected is dependent upon the following:-

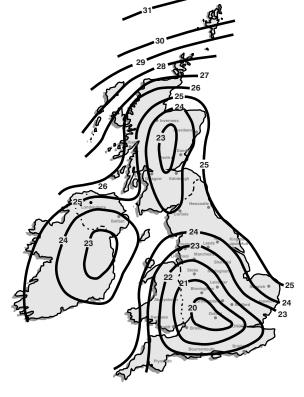
- (a) The maximum Wind Speed likely to be experienced at the geographical location of the site.
- (b) The Ground Roughness Category. i.e. The amount of obstruction which will interrupt the air flow.
- (c) The Height above ground.

Note 1.

Wind Speeds in excess of 120mph may be experienced on exposed headlands and islands in Northern & Western coastal regions.

Height Note:

For building heights above 10m refer to BS Publication BS 6399.



GROUND ROUGHNESS CHART - WIND PRESSURE (Pa)

D . W	B	CAT. A	CAT. B	CAT. C	CAT. D	CAT. E
Basic Wind Speed (m/s)	Building Height	Open country less than 10km from open sea	Open country more than 10km from open sea	Town areas less than 2km from open sea	Town areas bet. 2km and 10km from open sea	Town areas more than 10km from open sea
	<5m	801	726	645	410	389
20	5m - 10m	932	881	821	698	662
21	<5m	883	800	710	452	429
21	5m - 10m	1028	97 I	905	770	730
22	<5m	970	876	780	496	471
22	5m - 10m	1128	1066	993	844	801
23	<5m	1059	959	852	542	514
23	5m - 10m	1233	1165	1086	923	875
24	<5m	1154	1044	928	590	560
24	5m - 10m	1342	1268	1182	1005	954
25	<5m	1252	1134	1007	640	608
25	5m - 10m	1457	1376	1282	1090	1034
	<5m	1354	1226	1090	692	658
26	5m - 10m	1575	1488	1387	1179	1119
27	<5m	1460	1322	1174	746	709
27	5m - 10m	1699	1605	1495	1272	1206
**	<5m	1570	1422	1263	803	762
28	5m - 10m	1827	1726	1608	1368	1298
	<5m	1684	1525	1355	862	818
29	5m - 10m	1960	1851	1726	1467	1392
20	<5m	1802	1632	1450	922	875
30	5m - 10m	2098	1982	1846	1570	1490
21	<5m	1925	1742	1549	984	935
31	5m - 10m	2240	2116	1971	1677	1590
30 31	5m - 10m <5m	2098 1925	1982 1742	1846 1549	1570 984	1490 935

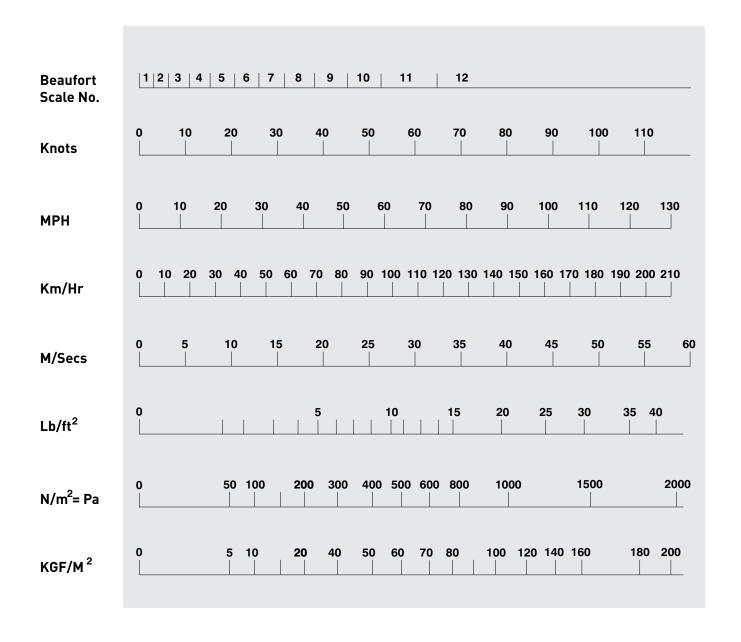
NOTE:- This table is based upon a maximum wind speed likely to be exceeded only once in 50 years, measured at 3m, 5m & 10m above the ground and a Pressure Coefficient of 1.2

Wind Pressure, Wind Speed and Wind Load Comparison Table



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS PERFORMANCE

This table is useful for comparing Miles per Hour, Newtons per Metre Squared/Pascals and The Beaufort Scale.



Wind Loads

Wrekin Windows

Method for Determining the Structural Suitability of Windows

CATEGORY	DESCRIPTION
PRODUCT CHARACTERISTICS	PERFORMANCE

EXAMPLE:-

A 10m HIGH BUILDING IN THE MANCHESTER AREA, LOCATED ON THE OUTSKIRTS OF THE CITY CENTRE.

- 1. Determine Wind Pressure for project location, refer to prevous Wind Load page. Example 875 Pa.
- 2. Determine Mullion and/or Transom length. Example from Fig 1 = **2600 mm**.
- 3. Calculate Load Width, shown as shaded area's in diagrams opposite. Example from Fig 1 = **1200 mm**.
- 4. Calculate the Load Width Factor by dividing Load Width by Mullion or Transom length. Example from Fig 1:-

Mullion Factor =
$$\frac{\text{Mullion Load Width}}{\text{Mullion Length}} = \frac{1200}{2600} = 0.46$$

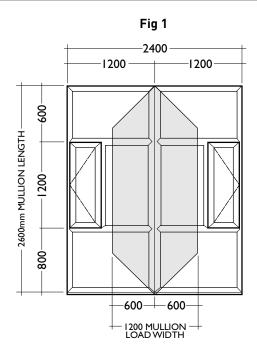
- 5. From Table 1 on page 61, determine the maximum Ixx value for a Wind Pressure of 1000 Pa and a Mullion length of 2600 mm = **49.6**.
- 6. To find the required Ixx value multiply the figure from table 1 by the Mullion Factor. Note: If Mullion Factor is greater than 1, use Ixx figures stated in table 1. Example:- $49.6 \times 0.46 = 22.82 \text{ cm}^4$
- 7. Refer to **Reinforcement Options** pages to determine the appropriate steel component for construction.

Wind Loads



Method for Determining the Structural Suitability of Windows

CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS PERFORMANCE



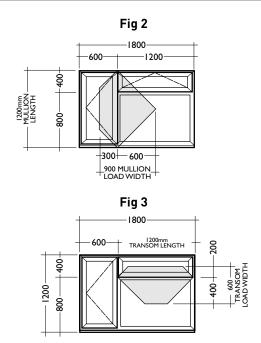


Table 1 (below): Shows the the maximum moment of inertia Ixx (cm 4) required by a steel reinforcement to withstand windload.

											М	UL	LIO	N O	R 1	ΓRΑ	NS	ОМ	LE	NG	тн	(M)	1)									
		1000mm	1100mm	1200mm	1300mm	1400mm	1500mm	1600mm	1700mm	1800mm	1900mm	2000mm	2100mm	2200mm	2300mm	2400mm	2500mm	2600mm	2700mm	2800mm	2900mm	3000mm	3100mm	3200mm	3300mm	3400mm	3500mm	3600mm	3700mm	3800mm	3900mm	4000mm
	600 Pa	0.6	1.0	1.4	1.9	2.5	3.3	4.3	5.4	6.8	8.5	10.4	12.7	15.3	18.2	21.6	25.4	29.8	34.6	40.0	46.0	52.7	60. I	68.3	77.2	87.0	97.7	109	122	136	151	167
	800 Pa	0.9	1.3	1.8	2.5	3.3	4.4	5.7	7.3	9.1	11.3	13.9	16.9	20.3	24.3	28.8	33.9	39.7	46.I	53.4	61.4	70.3	80.2	91.0	103	116	130	146	163	181	201	222
Pa)	1000 Pa	1.0	1.6	2.2	3.1	4.2	5.5	7.1	9.1	11.4	14.1	17.4	21.1	25.4	30.4	36.0	42.4	49.6	57.7	66.7	76.7	87.9	100	114	129	145	163	182	203	226	251	278
	1200 Pa	1.3	1.9	2.7	3.7	5.0	6.6	8.5	10.9	13.7	17.0	20.8	25.3	30.5	36.4	43.2	50.9	59.5	69.2	80.0	92. I	106	120	137	154	174	195	219	244	272	301	333
(PASCALS	1400 Pa	1.5	2.2	3. I	4.3	5.8	7.7	10.0	12.7	16.0	19.8	24.3	29.5	35.6	42.5	50.4	59.4	69.4	80.7	93.4	108	123	140	159	180	203	228	255	285	317	351	389
	1600 Pa	1.7	2.5	3.6	5.0	6.7	8.8	11.4	14.5	18.2	22.6	27.8	33.7	40.7	48.6	57.6	67.8	79.3	92.3	107	123	141	160	182	206	232	261	292	325	362	402	444
PRESSURE	1800 Pa	2.0	2.8	4.0	5.6	7.5	9.9	12.8	16.3	20.5	25.4	31.2	38.0	45.7	54.7	64.8	76.3	89.2	104	120	138	158	180	205	232	261	294	328	366	407	452	500
RES	2000 Pa	2.2	3.2	4.5	6.2	8.3	11.0	14.2	18.1	22.8	28.3	34.7	42.2	50.8	60.7	72.0	84.8	99.2	115	133	153	176	200	228	257	290	326	365	407	453	502	556
	2200 Pa	2.4	3.5	5.0	6.8	9.2	12.0	15.6	20.0	25.0	31.1	38.2	46.4	56.0	66.8	79.2	93.2	109	127	147	169	193	223	250	283	319	358	401	447	498	552	611
WIND	2400 Pa	2.6	3.8	5.4	7.4	10.0	13.2	17.1	21.7	27.3	34.0	41.7	50.6	61.0	72.9	86.4	102	119	138	160	184	211	241	273	309	348	391	437	488	543	603	667
	2600 Pa	2.8	4.1	5.9	8.0	10.8	14.3	18.5	23.6	29.6	36.8	45.I	54.9	66.I	79.0	93.6	110	129	150	173	199	228	261	296	335	377	423	474	529	588	653	722
	2800 Pa	3.0	4.4	6.3	8.7	11.7	15.4	19.9	25.4	31.9	39.6	48.6	59. I	71.2	85.0	101	119	139	161	187	215	246	281	319	360	406	456	510	569	634	703	778

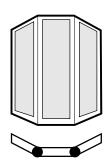
Note:- If aluminium reinforcementor low rise curtain wall lxx values are used is required multiply the above figures by a factor of 3.

Bay Window Plans Indicating Structural Support Positions

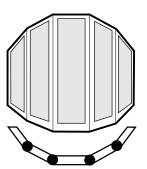


CATEGORY DESCRIPTION PRODUCT CHARACTERISTICS PERFORMANCE

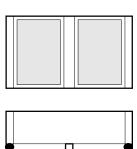
3 SIDED SPLAY BAY



5 SIDED SPLAY BAY

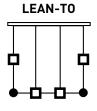


90° SQUARE BAY

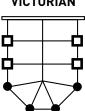


- **Minimum Position Of Structural Supports**
- Additional / Optional Position Of Structural Supports (Dependant upon Width of Bay)

Conservatory Roof Plans Indicating Structural Mullion Position Options



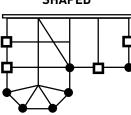
VICTORIAN



EDWARDIAN



SHAPED



- **Minimum Position Of Structural Supports**
- Additional / Optional Position Of Structural Mullions (Dependant upon Length and/or Width of Conservatory)

Bay and Conservatory Structural Notes:-

When designing a bay or conservatory ensure that the roof weight is distributed evenly through the structural supports.

Supports should be spaced at approx. 2m intervals. This may increase depending upon the strength of the eaves beam used.

Load bearing kits or packers should be used at support positions to ensure that the weight is transferred from the eaves beam to the base structure correctly.

Ensure that the correct combination of post and/or poles are used to support the calculated roof weight.

Conservatories with a floor area exceeding 30 sq/m should be constructed using a portal frame to aid structural stability.

Ensure that the reinforcements used are adequate to withstand the expected wind loading and/or deadloads.

Reinforce outer frames adjacent to coupling sections, bay posts and poles.

Fully reinforce all dark surfaced profiles such as woodgrain finished windows.

All products should be reinforced to the guidelines stated within this document as a minimum standard.

Coupling arrangements should be fixed with coupling studs or appropriate fixing screws at a maximum pitch or 600mm and at 150mm from each end.

Load Bearing Capacities



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS PERFORMANCE

LOAD BEARING CAPACITIES (Kg per pole/post)

			STRUCTUR	AL COMPON	ENT (S) = ST	EEL (A) = A	LUMINIUM	
		3997 (S) BAY POLE	4021 (S) COUPLING	3987 (A) BAY POLE	4004 (S) 90° POST	2410 (A) 90° POST	2044 (A) 2051 (A) 135° POST	2045 (A) 2052 (A) 150° POST
	800	5140	4980	1850	6520	2440	2936	2593
	900	4980	4870	1770	6380	2340	2847	2515
Ξ	1000	4540	4760	1660	6240	2250	2758	2436
Σ	1100	4340	4650	1580	6100	2200	2624	2318
IE J	1200	3830	4510	1500	5910	2110	2535	2239
Ē	1300	3590	4330	1420	5680	2060	2446	2043
Ĭ.	1400	3120	4120	1260	5400	1970	2091	1847
ECI	1500	2880	3940	1180	5160	1870	1875	1656
臣	1600	2530	3720	1060	4880	1830	1696	1498
E Z	1700	2370	3470	940	4550	1730	1517	1340
NO O	1800	2130	3260	830	4130	1690	1383	1222
O M	1900	1970	3040	750	3850	1590	1294	1064
AL C	2000	1730	2830	710	3660	1500	1071	946
Ë.	2100	1580	2680	630	3330	1400	982	867
STRUCTURAL COMPONENT EFFECTIVE LENGTH (MM)	2200	1460	2430	590	3140	1360	892	788
STR	2300	1340	2250	550	2860	1220	848	749
	2400	1260	2110	510	2670	1080	803	709
	2500	1180	1930	470	2440	980		

Example: Steel Bay Post 3997, 2100mm high, will support a weight of 1580 Kg (per pole)

Conversions:- To convert Kg to Tonnes / 1000 e.g. 1580 Kg / 1000 = 1.58 Tonne

To convert Kg to Newtons \times 9.81 e.g. 1580 Kg \times 9.81 = 15,499 Newtons

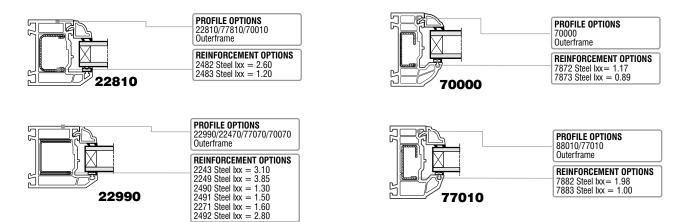
The effective length of a bay pole is determined by the type of fixings at it's ends. If the pole is effectively held in position at both ends, but is not restrained in the centre, then the effective length equals the actual length of the pole. If however, the bay pole is restrained at the centre, for example by means of adjacent windows, then the effective length is only 70% of the actual length of the bay pole.

Reinforcement Options & Ixx Values

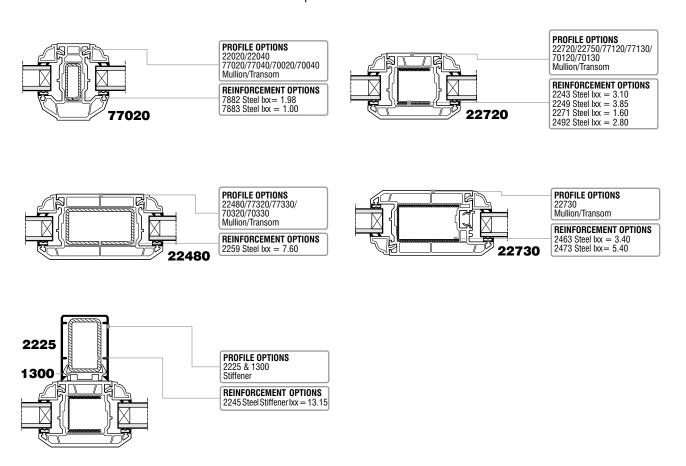


CATEGORY	DESCRIPTION
PRODUCT CHARACTERISTICS	PERFORMANCE

Outer Frame Reinforcement Options & Ixx Values



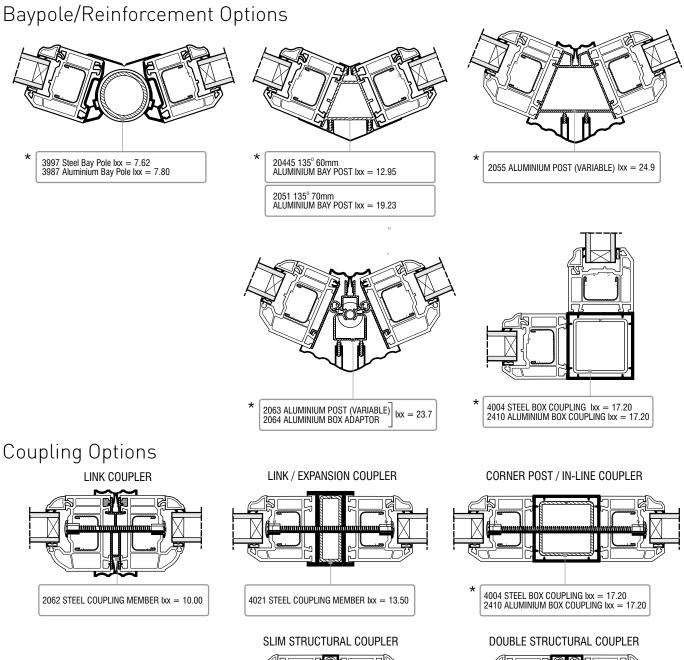
Mullion/Transom Reinforcement Options & Ixx Values

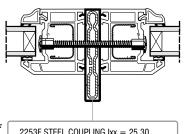


Reinforcement Options & Ixx Values

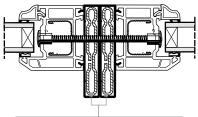


CATEGORY	DESCRIPTION
PRODUCT CHARACTERISTICS	PERFORMANCE





2253F STEEL COUPLING lxx = 25.30 2408 ALUMINUM COUPLING lxx = 17.00



2 X 2253F STEEL COUPLING lxx =50.60 2 X 2408 ALUMINUM COUPLING lxx =34.00

*Note: Aluminium coupling box sections on bay pole Ixx values must be divided by a factor of 3 to give a comprehensive strength value.

PVC-U & Fire



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS PERFORMANCE

In recent years the media have projected the image that all plastics ignite readily and then burn furiously. Whilst this carries some degree of truth it is clearly not true for all plastics materials. Burning PVC, for example rapidly forms a surface char that inhibits further combustion.

It is also claimed, quite correctly, that burning plastics generate toxic gases and fumes. However almost any material which burns will give off toxic gases and fumes similar in nature to those arising from plastics materials, of greater significance is the rate at which they are generated.

The major toxic constituent of the gases, and the one causing most fire deaths, is carbon monoxide. This is produced not only when most plastics burn but also when wood, wool, cotton and practically every other naturally occurring combustible material is alight, particularly when the oxygen supply is restricted as it so often is in fully developed fire situations.

A fundamental misunderstanding surrounding the subject of toxicity and fire is the belief that toxicity equates to toxic hazard. Many hold that just because a material gives off toxic fumes when burning then it must present a serious hazard. This is not necessarily true. Fire safety experts agree that the toxicity of the combustion products alone is insufficient to define the toxic hazard associated with a burning material. Obviously the presence of a material which is difficult to ignite will reduce the probability of a fire starting and hence present a lower risk of toxic emission than one which ignites easily. Similarly the relative toxicity of the combustion products of each material may become of little importance once relative burning rates are taken into account.

The best way to reduce the toxic hazard in fires, as well, as the general hazard, is to reduce the risk of the fire starting in the first place and, if it has already commenced, to reduce its rate of growth.

This objective can be achieved by several means. Reducing the number of potential ignition sources is an obvious first step, but more directly the ignitability of a building's contents can be reduced as can their rate of combustion if a fire does start. If there is no fire then there is no toxic hazard. If a fire starts but then burns slowly, its slow spread and slow build-up of toxic fumes permits a longer escape time and reduces both the toxic hazard and the overall fire hazard.

PVC, its compounds and the products made from them, in general score highly on both counts. Unplasticised PVC, as for example used in window frames, is extremely difficult to ignite. Even in a large fire situation it will burn very slowly and will not sustain combustion once the ignition source has been removed or has gone out.

Window Frames - The use of PVC-U in window frame construction has long since been well established in Germany and is now a rapidly growing application in Britain. UK Building Regulations do not stipulate any fire performance standards for the materials used in window frames. Whilst no degree of fire resistance as defined by BS476 Parts 20 - 23 can be achieved by PVC-U window units, work carried out at the Fire Research Station has shown the fire performance of PVC is equivalent to that of traditional wood frames under the conditions of test [BS476-7 and BS476-12].

Summary of PVC Combustion Properties



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS PERFORMANCE

IGNITABILITY

PVC is very difficult to ignite using common ignition sources

HEAT RELEASE

Burning materials release heat and the rate of release affects the severity of the fire; this, in association with ignitability, largely determines the rate of frame spread. Both the rate of heat release and the total heat of combustion of PVC are significantly lower than those of other common thermoplastics.

SPREAD OF FLAME AND RESISTANCE TO STANDARD COMBUSTION

PVC has limited spread of flame characteristics and achieves high classification in national building fire tests. PVC tends to form a protective carbonaceous layer (or char). This insulates the material below and excludes the oxygen necessary for combustion. The hydrogen chloride emitted acts as a combustion inhibitor.

SMOKE DENSITY

Smoke densities are similar to wood under smouldering conditions but greater under flaming conditions.

CORROSIVITY OF COMBUSTION GASES

Metallic materials may suffer from some corrosion by hydrogen chloride but restoration is normally possible. Fears of the effects on structural elements of buildings have been shown to be unfounded.

TOXICITY OF COMBUSTION GASES

Although hydrogen chloride is a main gaseous product of the combustion of PVC the toxic potency of the combustion gases of PVC is similar to and certainly not significantly worse than those from many natural and synthetic materials.

The build up of toxic fumes will be slow when compared with rapidly burning materials of a similar toxic potency.

OVERALL

Resistance to ignition and how well flame is supported and spread are the most significant properties which contribute to fire safety. PVC is particularly good in this respect and this is recognised in the UK Building Regulations.

The toxic potency of PVC decomposition products is similar to that of most other materials.

Overall therefore PVC is a widely acceptable material which does not represent a greater fire hazard than other synthetic or natural organic materials.

Condensation - Cause & Effect



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS PERFORMANCE

Condensation is a relatively new phenomenon resulting mainly from changes in lifestyle and our desire to keep heating costs as low as possible.

Condensation is related to the way we heat, ventilate and insulate our homes. In days gone by, most homes had one or two chimneys; allowing up to four air changes per hour. Doors and windows were generally less well fitting than they are today. This natural ventilation was the very process which prevented condensation.

To cope with increased fuel costs came the trend to insulate. This resulted in loft insulation, cavity wall insulation and double glazing.

However, it is also a fact that energy-efficient homes are more likely to suffer condensation –

because anything that keeps warm air in will also keep fresh air out, creating the ideal conditions for condensation to form.

Before we tackle the problem, we have to understand exactly what condensation is, then find the best way to deal with it.

Condensation is merely the air's natural moisture content settling on cool surfaces. The amount of moisture in the air is called relative humidity. If the humidity level rises above 70% mould and mildew will be encouraged to grow.

Astonishingly, the average family created up to 20 pints of moisture every day, simply by washing, cooking and breathing. This moisture must go somewhere and be dealt with to avoid condensation.

WHAT IS CONDENSATION?

Condensation is water vapour suspended in air.

WHERE DOES MOST WATER VAPOUR COME FROM?

The most common sources of water vapour are cooking, drying clothes on radiators, washing up, in-house plants, moisture in newly-built properties and extensions and from the breath we exhale.

Due to the thermal currents within a house, condensation can occur in a number of places, usually at cold spots, i.e. an unheated room or a conservatory without any form of adequate heating.

WHERE CAN CONDENSATION OCCUR?

Condensation forming on the room side surface of a sealed unit indicated a high water vapour content present and that the temperature of the room side glass surface is inadequate. Condensation within the airspace of the sealed unit indicated the unit has broken down.

STATEMENT:

'I did not have condensation before my new windows were installed. There must be something wrong with them.'

This is a common assumption but, unfortunately, it is also incorrect. Windows cannot and will not produce any water. This 'water' is produced by our normal living activities. Therefore we, the householder, have created the problem.

HOW DO I KNOW IF I HAVE CONDENSATION?

Condensation will take many forms, the most common being steaming windows and puddles of water on the windowsills. In extreme cases, dark spots of mould will appear around the windows, wall coverings and mastic seals throughout the house.

If you have a non-condensing tumble dryer, make sure it is properly vented to the outside of your home. Remember, tumble dryers can create 16 pints of water vapour during one cycle.

HOW CAN DOUBLE GLAZING HELP?

Sealed unit replacement windows act as an insulator which will reduce heat loss which under normal circumstances, would be conducted from the inside of the room to the outside. Please remember that sealed units act as an insulator and are not a source of heat, therefore all rooms should be adequately heated – especially conservatories. The likelihood of condensation forming on a warm surface is therefore reduced.

Condensation - Combatting



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS PERFORMANCE

HOW DO I REDUCE CONDENSATION?

Condensation can be controlled by providing natural ventilation to change air on a regular basis and by maintaining an even temperature. This is achieved through ventilation units which are controlled by humidistats, an airbrick, or by opening a window. Please remember that an airbrick must be open to achieve good results. An effective way of controlling condensation would be to install a dehumidifier. This cost would be avoided if the problem is one of ventilation, by installing an airbrick thereby creating ventilation or controlling those causes of moisture, that result in a build-up of moisture in the air.

BREATHING

Two sleeping adults exude two pints of moisture in eight hours, which is absorbed as water vapour by the atmosphere.

NEW PROPERTY

The bricks, timber, concrete and other materials in an average three bedroom house absorb 1,500 gallons of water. The same principle will apply to a conservatory base and the construction materials used. As with any new building work, please allow a period of drying out to ensure problems are not encountered in the future.

DOUBLE GLAZING CANNOT CAUSE CONDENSATION

By acting as a heat barrier and providing an inner pane which is considerably warmer that the outer pane, the likelihood of condensation forming is reduced.

CONCLUSION

Condensation is a result of the build-up of moisture caused by our normal lifestyle and the continual improvement and modernisation of our homes.

Replacement windows cannot produce condensation. Double glazing will act as an insulator if there is sufficient heat within the house in the beginning. Therefore it is wise to attempt to control the amount of water vapour displaced within the household and to provide controlled ventilation to dispel this moisture before the problem arises.

BATHROOMS & KITHCENS

Prevent water vapour finding its way into the other rooms of your house by closing the adjoining door and leaving a window open after cooking or showering to allow a change of air. Extractor fans and cooker hoods work well for this purpose.

If you find dark mould spots forming, treat the affected areas immediately with a solution of household bleach or Milton fluid. This will kill the mould spores and prevent them from spreading to other areas. All new houses with improved insulation and replacement windows are likely to trap moisture build-up. This can be identified and dealt with, as long as all the rooms are heated throughout the house, and the air is changed on a regular basis.

REMEMBER IT IS FAR EASIER TO TREAT THE CAUSE THAN THE EFFECT

Condensation



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS PERFORMANCE

Moisture proofing serves the general comfort of human beings and provides protection against structural damage. Apart from the fact that dampness from the outside must be prevented, the actual use of a building can cause condensation to occur on the inner surfaces or in the interior of a structure. When thermally insulating a structure, one must always take care that moisture proof materials on the warm side and moisture-pervious materials on the cold side are fitted.

RELATIVE AIR HUMIDITY is the ratio expressed as a percentage of the quantity of evaporated water in kilogrammes contained in the air at temperature t, to the maximum possible quantity of evaporation at the same temperature. For example at 20°C atmospheric temperature, the air is saturated at - 17.3g/m³ absolute humidity (= 100% relative humidity)

TEMPERATURE OF DEW POINT t. If the point of absolute humidity reaches saturation point while the temperature is falling, the dew-fall begins to take place. The following factors influence the formation of condensation on the inner surface on aluminium or PVC-U windows.

- The Inner Surface temperature this is dependent on the difference between the outside temperature and room temperature, the thermal resistance of the profiles fitted, and of the glass pane and wall connection, the shape of the profile, the actual interior and exterior heat transmission coefficients (movements of air, surface design, thermal radiation).
- 2) The relative air humidity on the room.

Room Air - Temperature	Max Humidity			oling of t ative air				ne forma	tion						
°C		30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%
-20	0.90	-	10.7	9.10	8.00	7.00	6.00	5.20	4.40	3.70	3.00	2.40	1.70	1.10	0.60
-15	1.40	12.4	10.9	9.60	8.40	7.40	6.40	5.50	4.60	3.80	3.10	2.40	1.80	1.10	0.60
-10	2.14	12.9	11.3	9.90	8.70	7.60	6.50	5.60	4.70	3.90	3.20	2.50	1.80	1.20	0.60
-8	2.54	13.1	11.5	10.1	8.80	7.70	6.60	5.70	4.80	4.00	3.20	2.50	1.90	1.20	0.60
-6	2.99	13.3	11.7	10.2	8.90	7.80	6.80	5.80	4.90	4.10	3.30	2.60	1.90	1.20	0.60
-4	3.51	13.5	11.8	10.4	9.10	7.90	6.90	5.90	5.00	4.20	3.40	2.60	1.90	1.20	0.60
-2	4.13	13.7	12.0	10.5	9.20	8.10	7.00	6.00	5.10	4.20	3.40	2.60	1.90	1.30	0.60
0	4.80	13.8	12.2	10.7	9.40	8.20	7.10	6.00	5.10	4.30	3.40	2.70	2.00	1.30	0.70
2	5.60	14.3	12.6	11.1	9.70	8.50	7.40	6.40	5.40	4.60	3.70	3.00	2.20	1.50	0.70
4	6.40	14.7	13.0	11.5	10.1	8.80	7.70	6.70	5.80	4.90	4.00	3.20	2.30	1.50	0.70
6	7.30	15.1	13.4	11.8	10.4	9.20	8.10	7.10	6.10	5.10	4.10	3.20	2.30	1.50	0.70
8	8.30	15.6	13.8	12.2	10.8	9.60	8.40	7.30	6.20	5.10	4.20	3.20	2.40	1.60	0.80
10	9.40	16.0	14.2	12.6	11.2	9.90	8.60	7.40	6.30	5.20	4.20	3.30	2.40	1.60	0.80
12	10.7	16.4	14.6	13.1	11.6	10.1	8.80	7.50	6.40	5.30	4.30	3.40	2.50	1.60	0.80
14	12.1	16.9	15.1	13.4	11.7	10.3	8.90	7.60	6.50	5.40	4.40	3.40	2.50	1.60	0.80
16	13.9	17.4	15.5	13.6	11.9	10.4	9.00	7.80	6.60	5.50	4.40	3.50	2.50	1.70	0.80
18	15.4	17.8	15.7	13.8	12.1	10.6	9.20	7.90	6.70	5.60	4.50	3.50	2.60	1.70	0.80
20	17.3	18.1	15.9	14.0	12.3	10.7	9.30	8.00	6.80	5.60	4.60	3.60	2.60	1.70	0.80
22	19.4	18.4	16.2	14.2	12.5	10.9	9.50	8.10	6.90	5.70	4.60	3.60	2.60	1.70	0.90
24	21.8	18.6	16.4	14.4	12.7	11.1	9.60	8.30	7.00	5.80	4.70	3.70	2.70	1.80	0.90
26	24.4	18.9	16.7	14.7	12.9	11.2	9.70	8.40	7.10	5.90	4.80	3.70	2.70	1.80	0.90
28	27.2	19.2	16.9	14.9	13.0	11.4	9.90	8.50	7.20	6.00	4.90	3.80	2.80	1.80	0.90
30	30.3	19.5	17.1	15.1	13.2	11.6	10.0	8.60	7.30	6.10	4.90	3.80	2.80	1.80	0.90
35	39.4	20.2	17.8	15.6	13.7	12.0	10.4	8.90	7.60	6.30	5.10	4.00	2.90	1.90	0.90
40	50.7	20.9	18.4	16.2	14.2	12.4	10.8	9.30	7.90	6.50	5.30	4.10	3.00	2.00	1.00
45	64.5	21.6	19.0	16.8	14.7	12.9	11.2	9.60	8.10	6.80	5.50	4.30	3.10	2.00	1.00
50	82.3	22.4	19.7	17.4	15.2	13.3	11.6	9.90	8.40	7.00	5.70	4.40	3.20	2.10	1.00

Guide to Sound Reduction Windows



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS PERFORMANCE

TYPICAL OUTSIDE NOISE LEVEL	INSIDE NOISE LEV NOT TO BE EXCEED		RECOMMENDED DBA VALUE OF WINDOW	SUGGESTED GLAZING
60 dBA = Normal living and environment noise. Conversation at 1m distance	Bedroom, children's room	25-30 dBA	30-34 dBA	24mm DG unit
	Living room, play room	30-35 dBA	25-29 dBA	24mm DG unit
	Kitchen, utility room	35-40 dBA	Up to 24 dBA	24mm DG unit
	Office, hall, reception	40-50 dBA	Up to 24 dBA	24mm DG unit
70 dBA = Noisy environment and traffic sound. Cars at 5m distance	Bedroom, children's room	25-30 dBA	40-44 dBA	44-47 dB unit
	Living room, play room	30-35 dBA	36-39 dBA	40-42 dB unit
	Kitchen, utility room	35-40 dBA	30-34 dBA	24mm DG unit
	Office, hall, reception	40-50 dBA	25-29 dBA	24mm DG unit
80 dBA = Street noise during heavy traffic. Main road continous traffic.	Bedroom, children's room	25-30 dBA	45-49 dBA	Double window
	Living room, play room	30-35 dBA	45-49 dBA	Double window
	Kitchen, utility room	35-40 dBA	40-44 dBA	44-47 dB unit
	Office, hall, reception	40-50 dBA	30-34 dBA	24mm DG unit
Over 80 dBA =	Bedroom, children's room Living room, play room Kitchen, utility room Office, hall, reception	25-30 dBA	Over 50 dBA	Double window
Very heavy traffic		30-35 dBA	Over 50 dBA	Double window
noise, car horns,		35-40 dBA	45-49 dBA	Double window
factory noise.		40-50 dBA	35-39 dBA	40-42 dB unit

FURTHER INFORMATION CAN BE OBTAINED FROM BS 5821:1984 AND BS 8233:1967

^{*} Note: There are various types of sealed unit glazing that can be used for sound reduction. These include units with thicker glass, laminated glass, special glass and gas filled units. It is necessary to ascertain from the glass supplier the overall thickness and weight of the sound reduction unit and check that it is suitable for the proposed window and fittings.

Thermal Performance



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS PERFORMANCE

U-VALUES

A U-Value measures the rate at which heat is lost though a material with the lower the U-Value, the lower the amount of energy wasted. U-Values are measured in watts per square metre degrees Kelvin - this is abbreviated to W/m²k.

WINDOW ENERGY RATINGS (WER)

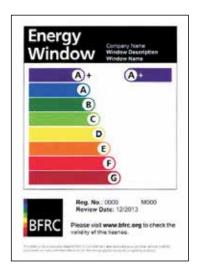
A Window Energy Rating (WER) is a more balanced way of quantifying the energy loss across a window. It takes account of not only the heat loss from inside to outside via the material and through weather seals, but also the heat gain from outside to inside due to solar heating effects.

Energy Ratings are expressed in units of Kilowatt hour per square metre per year (KWh/m²/year).

Below is an example of a BFRC (British Fenestration Rating Council) Window Energy Rating label, similar schemes are available from BSI and Certass.

WERs are allocated a band typically from A+ to G depending on the thermal performance of the window, with A+ being the best and G being the worst performing window.

To Comply with Building Regulations (England & Wales), from October 2010, windows need to meet a min. U-Value of 1.6W/m²k or Window Energy Rating C. Scotland require an Area Weighted average of 1.6W/m²k.



DOOR SET ENERGY RATINGS

A DSER is a way of quantifying the heat loss across a door set. Unlike windows where the Window Energy Rating is based on a standard style of Window, Doors are classed into two groups, Pedestrian Doors and Glass Doors.

Pedestrian Doors do not take into account heat gain from solar heating effects, whereas Glass Doors (e.g. French, Bi-Fold & Patio) do take this into account due to the percentage of glass within them.

To Comply with Building Regulations (England & Wales), from October 2010, Doors are required to meet a min. U Value of 1.8W/m²K (1.6W/m²K Area weighted in Scotland).

DSERs are not currently a compliance route for Building Regulations.

U-COMPLY



The U-ComplyN calculator allows you to demonstrate compliance on any number of window and door specifications. As well as eliminating the significant costs in testing different specifications of windows and doors, you can also use U-ComplyN to demonstrate compliance with the new regulations. U-ComplyN has been independently audited by BSI, BFRC and CERTASS therefore allowing fabricators to show compliance with Document 'L' of the Building Regulations using either U-values or WERs/DSERs.

BSI have also given U-ComplyN its European Notified Body Approval, therefore Window/Door U Values can be used by Fabricators/Installers for their CE Marking Declaration of Thermal Transmittance.



Building Regulations



Document B

Windows - Fire Safety & Means of Escape



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS BUILDING REGULATIONS

DWELLING HOUSES - FLOORS NOT MORE THAN 4.5M ABOVE GROUND LEVEL

Windows shall be designed and installed to provide appropriate means of escape in case of fire from the building to a place of safety outside the building. Windows shall be capable of being used for escape safely and effectively at all times.

PERFORMANCE

The safety requirement will be met if there are sufficient number of escape routes and suitable located to enable persons to escape to a place of safety in the event of fire.

SATISFYING THE REQUIREMENTS

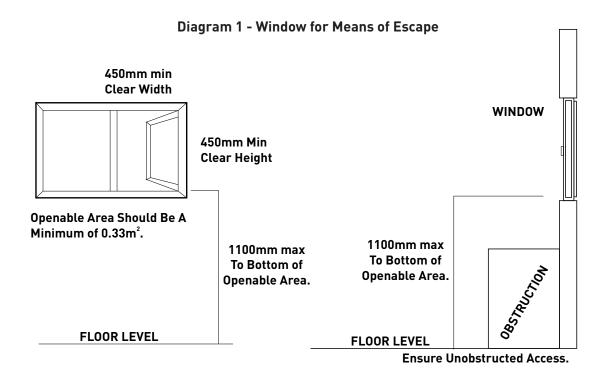
On the ground storey all habitable rooms, except for kitchens, should either open directly onto a hall leading to the entrance or other suitable exit or be provided with a window or door.

On the upper storey(s) all habitable rooms, except for kitchens, of a house served by only one stairway should be provided with a window or external door.

EMERGENCY EGRESS WINDOWS & EXTERNAL DOORS (ref. Document 'B').

Any window provided for emergency egress purposes and any external door provided for escape should comply with the following conditions.

- 1. The window should have an unobstructed openable area that is at least 0.33m² and at least 450mm high and 450mm wide (the route through the window may be at an angle rather than straight through). The bottom of the openable area should be not more than 1100mm above the floor.
- 2.. The window or door should enable the person escaping to reach a place free of danger from fire. This is a matter of judgement in each case, but in general a courtyard or back garden from which there is no exit other than through other buildings would have to be at least as deep as the dwelling is high to be acceptable.



Document E Sound Performance



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS BUILDING REGULATIONS

Glass has a very low sound absorption coefficient. However, with regard to the acoustic use of glass in buildings, sound transmission is by far the most significant and quantifies how much of the incident sound energy appears on the opposite side of the glass or window. Among the factors that affect the overall acoustic performance, which are not all independent, are the following:-

A. SINGLE GLAZING:

- 1. Glass thickness, or mass per unit area;
- 2. Coincidence effect;
- 3. Closure or sealing;
- 4. Edge conditions;
- 5. Lamination;
- 6. Pane dimensions;

B. MULTIPLE GLAZING. FACTORS ARE AS FOR SINGLE GLAZING, PLUS:

- 1. Amount of pane separation;
- 2. Lining the reveals;
- 3. Difference in thickness of panes;
- 4. Non-parallel panes;
- 5. Mechanical separation.

These effects are not all of the same magnitude, and some are operative only over a narrow band of frequencies, whilst others can affect the whole of the frequency range.

SINGLE GLAZING

Theoretically, sound insulation should increase by 6dB per doubling of glass thickness, but this is not achieved in practice owing to interference by resonance effects. As the mass increases, the frequency at which coincidence effects manifest themselves will be lower.

The average sound insulation for different glass thicknesses is given overleaf. Values for specific frequencies, in general, can be obtained from the manufacturers.

The benefits of sound damping can be obtained by the use of laminated glass, which improves the insulation at the coincidence frequency and at higher frequencies. At other frequencies, there is little improvement over ordinary, monolithic glass of the same thickness.

DOUBLE GLAZING

Sound insulation increases with increase in pane separation, but, in general, beyond 200mm the incremental increase is small.

dB: SINGLE GLAZED PERFORMANCE:

Mean Centre Frequency of Third Octave Band (100Hz to 3150Hz)

4mm	6mm	6mm LAMINATED	8mm	10mm	12mm LAMINATED	12mm/14mm
25dB	27dB	29dB	29dB	30dB	31dB	34dB

dB: DOUBLE GLAZED PERFORMANCE:

Mean Centre Frequency of Third Octave Band (100Hz to 3150Hz).

6 x 12 x 6	10 x 12 x 6	nominal laminated x 12 x 4
29dB	31dB	32dB

Document F Ventilation



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS BUILDING REGULATIONS

MEETING THE REQUIREMENTS FOR NEW BUILD DWELLINGS

Trickle Ventilators

Dwellings that are designed to be ventilated by the use of background ventilation and extraction fans can be constructed as follows:-

- 1) Extract fans to be fitted to all "wet rooms" i.e. Kitchens & Bathrooms
- 2) The overall background ventilation for the building can be taken from the table below, this will be dependent upon the overall floor area and number of bedrooms..
- 3) There needs to be a minimum of 5000mm² equivalent area in habitable rooms and 2500mm² in non-habitable rooms.

If other methods of building ventilation are to be installed, guidance should be sought on how much trickle ventilation is required in the building as a whole or in individual rooms.

Purge Ventilation (Opening Windows or Doors)

Purge ventilation provision is required in each habitable room i.e. Bedrooms and lounges. It should also be applied to kitchens and bathrooms where possible.

The required opening area of a window or door is relative to the room floor area and is dictated by it's opening angle. Windows and doors opening beyond 30° must achieve 1/20th of the floor area. Windows opening less than 30° must achieve 1/10th of the floor area. Windows fitted with restrictors will be limited to less than 30° opening.

If a room contains more than one openable window, the areas of all the parts may be added to achieve the required proportion of the floor area. The required proportion of the floor area is determined by the opening angle of the largest window in the room.

If a room only contains doors, the areas of all the parts may be added to achieve at least 1/20th of the floor area. If a room contains a combination of doors and windows, the areas of all the opening parts may be added together to achieve 1/20th of the floor area.

Total Floor	Number of bedrooms										
Area (m²)	1	2	3	4	5						
< 50	25,000	35,000	45,000								
50 - 60	25,000	30,000	40,000								
60 - 70	30,000	30,000	35,000	45,000	55,000						
70 - 80	35,000	35,000	35,000		ŕ						
80 - 90	40,000	40,000	40,000								
90 - 100	45,000	45,000	45,000								
> 100	Ac	dd 5,000 for ev	ery additional '	10m² floor area	1						

All figures shown are mm² EA unless otherwise stated

Document F Ventilation



CATEGORY DESCRIPTION

PRODUCT CHARACTERISTICS BUILDING REGULATIONS

MEETING THE REQUIREMENTS FOR EXISTING DWELLINGS

Trickle Ventilators

To comply with Document F, <u>ALL REPLACEMENT WINDOWS</u> should include trickle ventilators, alternatively an equivalent background ventilation opening should be provided in the same room.

In all cases the ventilation opening should not smaller than was originally provided and should be controllable.

Where no ventilation opening is provided the following minimum sizes should be adopted:-

Habitable rooms i.e.

Bedrooms, lounges - 5000mm² equivalent area.

Wet rooms i.e.

Kitchens, Bathrooms - 2500mm² equivalent area.

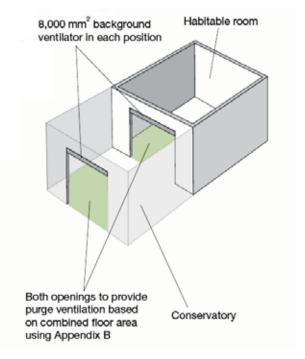
Purge Ventilation (Opening Windows or Doors)

In all cases the opening window sizes or the overall purge ventilation to any room should not have a worse level of compliance than before the commencement of work.

Although not a legal requirement, PROFILE22 recommend that wherever possible the purge ventilation rate should achieve at least 1/10th of the room floor area.

Consideration to Fire Egress, Security, Safety and Cleaning should be made and wherever possible meet the relevant Building Regulation requirement.

ADDITION OF A CONSERVATORY TO AN EXISTING DWELLING



(The guidance applies to conservatories with a floor area over 30m²)

Regardless of the ventilation provisions in the existing room follow the guidance in the diagram.

Document K

Protection from Collision with Open Windows



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS BUILDING REGULATIONS

Provision shall be made to prevent people moving in or about the building from colliding with open windows, skylights or ventilators.

PERFORMANCE

The safety requirement will be met if windows, skylights, and ventilators can be left open without danger of people colliding with them. This could be achieved by either:

- 1) Installing windows etc so that projecting parts are kept away from people moving in and around the building.
- 2) By Installing features which guide people moving in or about the building away from any open window, skylight or ventilator.

SATISFYING THE REQUIREMENTS

Parts of windows, skylights and ventilators that project either internally or externally more than about 100mm into spaces which are used by people moving in or about the building should be either:

- 1) Not less than 2m above the ground or floor when in any fixed position.
- 2) Marked by a feature such as a barrier or rail about 1100mm high to prevent people walking into the projecting part (See Diagram 1).
- 3) Marked by provision of surfaces with strong tactile differences, or by suitable landscaping features, so that people are guided away from them (See Diagram 2).

Note:- Windows may be limited to the 100mm opening size by the use of restrictors.

DIAGRAM 1 MARKING BY BARRIER

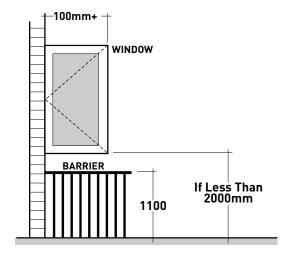
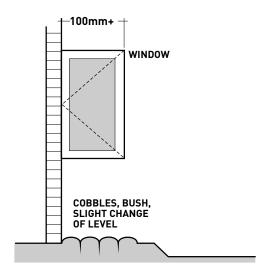


DIAGRAM 2 MARKING BY SURFACE



EXCEPTIONS

In special cases, such as spaces used only for maintenance purposes, greater care can be expected by those gaining access and it would be reasonable that less demanding provisions could satisfy the requirements. In area's which are used infrequently, provisions such as signs or marking of the projecting part to make it easier to see will satisfy the requirements.

Document K

Protection Against Impact from and Trapping by Doors

CATEGORY DESCRIPTION

PRODUCT CHARACTERISTICS

BUILDING REGULATIONS

- 1) Provision shall be made to prevent any door or gate:
 - a) Which slide or open upwards falling onto any person; and
 - b) Which is powered, from trapping any person
- 2) Provision shall be made for powered doors and gates to be opened in the event of power failure.
- 3) Provision shall be made to ensure a clear view of the space on either side of a swing door or gate.

PERFORMANCE

The safety requirement will be met if measures are taken to prevent the opening and closing of doors and gates presenting a safety hazard.

SATISFYING THE REQUIREMENTS

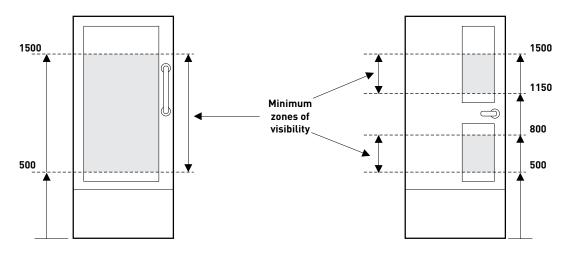
Provision of features such as the following will satisfy the requirement:

1) Unless it can be argued otherwise in the Access Statement, e.g. for reasons of security, door leaves and side panels wider than 450mm, have vision panels towards the leading edge of the door whose vertical dimensions include at least the minimum zone, or zones, of visibility between 500mm and 1500mm from the floor, if necessary interrupted between 800mm and 1150mm above the floor, e.g. to accomodate an intermediate horizontal rail (see Diagram 1).

- 2) Sliding doors and gates should have a stop or other effective means to prevent them coming off the end of the track. They should also have a retaining rail to prevent them falling should the suspension system fail or the rollers leave the track
- 3) Upward opening doors and gates should be fitted with a device to stop them falling in a way that could cause injury.
- 4) Power operated doors and gates should have:
 - a) Safety features to prevent injury to people who are stuck or trapped (such as a pressure sensitive door edge which operates the power switch).
 - b) A readily identifiable and accessible stop switch.
 - c) Provision for manual or automatic opening in the event of a power failure where and when necessary for health or safety.
- 5) Thresholds are preferably level or if raised, should have a total height of no more than 15mm.

(Document M (Revised 2004) Buildings other than dwellings).

DIAGRAM 1 DOORS WITH VISION PANELS



Document L (Document J - Scotland) Thermal Performance



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS BUILDING REGULATIONS

The new revised regulations are effective from 6th April 2006 and they affect the installation of windows, doors and conservatories. It will continue to be a mandatory requirement for all replacement windows and doors in England and Wales to demonstrate energy efficiency. That is achieved by using either one of two specific methods; U-Value or Window Energy Rating (WER) to demostrate compliance.

Document L is a requirement in England and Wales. Scotland and Northern Ireland have similar regulations. In Scotland the equivalent is the Regulation J and in Northern Ireland it is known as Part L.

WINDOWS

Under the new regulations, windows fitted in an existing dwelling has to achieve a specific energy rating known as a U-Value, of 2.0W/m²k or alternatively they have to achieve a minimal Window Energy Rating (WER) of 'E' in or to comply. If the products are being fitted into an extension to a property they are required to achieve a slightly different value, either a U-Value of 1.8W/m²k or a WER of 'D'. Some listed or historic buildings may be exempt, they need to show an energy saving but in a way that doesn't affect the character of the building.

DOORS

Doors featuring more than 50% glazing, that are fitted into a property extension or into an existing building as a replacement require a U-Value of 2.2W/m²k and all other doors should boast a U-Value of 3.0W/m²k.

CONSERVATORIES

The requirements for windows in conservatories that have a floor area greater them 30m^2 are identical to those required of replacement windows, they must achieve either a U-Value of $2.0\text{W/m}^2\text{k}$ or a WER of 'E'. If the floor area within your conservatory less than 30m^2 , then it is exempt from this requirement.

NEW BUILD - DWELLINGS

Within a new build property, compliance is demonstrated by the total CO2 emmission of a dwelling (Dwelling Emission Rate - (DER)) being no greater than the predicted Target Emission Rate (TER). This basically means that the dwelling and its components are assessed using a procedure that looks at all elements including the heat loss through windows and the heat gained through solar effects. It is the housebuilder's responsibility to ensure the property as a whole complies.

NON-DWELLINGS

Non-dwellings and commercial buildings have to comply with similar target energy efficient ratings, whilst considering the floor space in certain buildings.

Document M Wheel Chair Access



CATEGORY	DESCRIPTION
PRODUCT CHARACTERISTICS	BUILDING REGULATIONS

ACCESS INTO BUILDINGS

The effective clear width through a single door or one leaf of a double door, is in accordance with that referred to in table (i) and (ii) below, and the rules for measurement are in accordance with diagram (1) and (2) below. Thresholds are preferably level or if raised, should have a total height of no more than 15mm. (Document M, Revised 2004).

BUILDINGS OTHER THAN DWELLINGS (DOCUMENT M1/M2)

Table (i) Minimum effective clear widths of doors - Non Dwelling

Direction and width of approach	New Buildings (mm)	Existing Buildings (mm)
aight-on (without a turn oblique approach)	800	750
right angles to an access route east 1500mm wide	800	750
right angles to an access route east 1200mm wide	825	775
ernal doors to buildings ed by the general public	1000	775

For specific guidance on the effective clear widths of doors in sports accommodation, refer to 'Access for Disabled People'.

DWELLINGS (DOCUMENT M1)

Table (ii) Minimum effective clear widths of doors - Dwelling

New Buildings (mm)	Existing Buildings (mm)
775	775

DIAGRAM 1 EFFECTIVE CLEAR WIDTH MEASUREMENT-NON DWELLING

The effective clear width is the width of the opening measured at right angles to the wall in which the door is situated from the outside of the door stop on the door closing side to any obstruction on the hinge side, whether this be projecting door opening furniture, a weather board, the door, or the door stop.

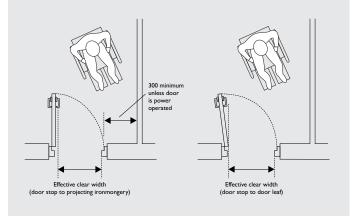
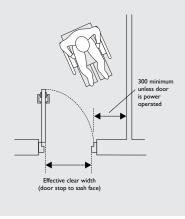


DIAGRAM 2 EFFECTIVE CLEAR WIDTH MEASUREMENT -DWELLING

For dwellings, the clear opening width is taken from the face of the door stop on the latch side to the face of the door when open at 90° .



Document N Windows - Safe Opening & Closing



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS BUILDING REGULATIONS

SAFE OPENING AND CLOSING OF WINDOWS

Windows, skylights and ventilators which can be opened by people in or about the building shall be so constructed or equipped that they may be opened, closed or adjusted safely.

PERFORMANCE

The safety requirement will be met if windows, skylights, and ventilators which open, can be operated safely.

SATISFYING THE REQUIREMENTS

The following notes outline some ways of complying with the requirements.

LOCATION OF CONTROLS

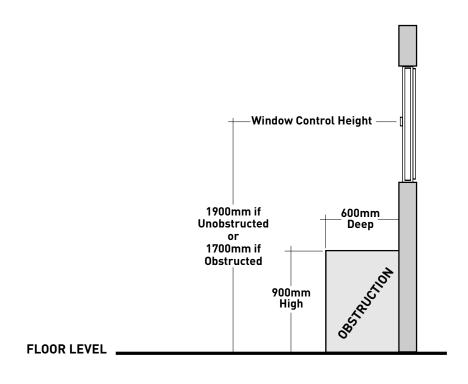
1) Where controls can be reached without leaning over an obstruction they should not be more than 1.9m above the floor or other permanent stable surface provided to give access. Small recesses, such as window reveals, should be ignored.

- 2) Where there is an obstruction the control should be lower, e.g. not more than 1.7m where there is a 600mm deep obstruction (including any recess) not more than 900mm high. (See Diagram 1).
- 3) Where controls cannot be positioned within the safe reach from a permanent stable surface, a safe means of remote operation, such as a manual or electrical system should be provided.

PREVENTION OF FALLS

Where there is a danger of the operator or other person falling through the window above ground floor level, suitable opening limiters should be fitted or guarding should be provided.

DIAGRAM 1 HEIGHT OF WINDOW CONTROLS



All dimensions are nominal. DO NOT SCALE TD-06-0007-1-0\06-08

Document N

Windows - Safe Access for Cleaning



CATEGORY

PRODUCT CHARACTERISTICS

BUILDING REGULATIONS

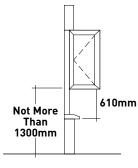
SAFE ACCESS FOR CLEANING WINDOWS

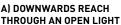
Provision shall be made for windows or glazed surfaces to be safely accessible for cleaning.

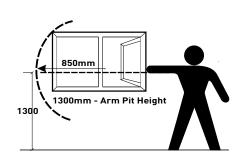
PERFORMANCE

The safety requirement will be met if provision is made for safe means of access for cleaning both sides of glazed surfaces where there is a danger of falling more than two metres.

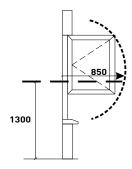
DIAGRAM 1 - SAFE REACHES FOR CLEANING







B) SIDE REACH THROUGH AN OPENING LIGHT



C) REACH FOR CLEANING AN OPEN CASEMENT WITH REFLEX HINGES

SATISFYING THE REQUIREMENTS

Where glazed surfaces cannot be cleaned safely by a person standing on the ground, a floor, or other permanent stable surface, the requirement should be satisfied by provisions such as the following:

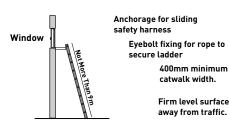
- 1) Provision of windows of a size and design that allow the outside surface to be cleaned safely from inside the building (see Diagram 1). Windows which reverse for cleaning should be fitted with a mechanism which holds the window in the reversed position. Additional guidance is given in BS 8213: Part 1 Windows, doors and rooflights.
- 2) Provision of an adequate area of firm level surface, in a safe place, to allow use of portable ladders not more than 9m long (measured from the ground to the upper support). Where ladders up to 6m long will be used, normal soil will provide a suitable standing surface (see Diagram 2); Where ladders over 6m long will be used suitable tying or fixing points should be provided (see Diagram 3).
- 3) Provision of walkways at least 400mm wide, either with guarding at least 1100mm high, or with anchorages for sliding safety harnesses (see Diagram 3).
- 4) Provision for access equipment such as suspended cradles or travelling ladders, with attachments for safety harnesses.

- 5) Provision of suitable anchorage points for safety harnesses or abseiling hooks.
- 6) Only in circumstances where other means cannot be used, space for scaffolding towers should be provided, and located so that glazed surfaces can be cleaned.

DIAGRAM 2 LADDERS NOT MORE THAN 6m LONG



DIAGRAM 3 LADDERS NOT MORE THAN 9m LONG



Adequate area of firm level surface

Document N Use of Safety Glass

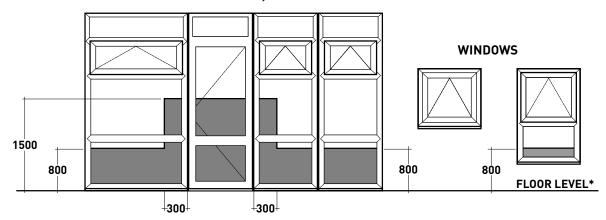


CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS BUILDING REGULATIONS

The following locations may be considered 'critical' in terms of safety;

- 1) Between finished floor level and 800mm above that level in internal and external walls and partitions (see diagram).
- 2) Between finished floor level and 1500mm above that level in a door or in a side panel (see diagram).
- 3) Area's of high public traffic, these may include: A) Corridors and assembly area's.
 - B) Any area where children gather or play.
 - C) Vulnerable situations e.g. Landings, balconies, stairways and at the bottom of stairs.
- 4) Buildings or part of buildings where the planned activity generates a special risk.

DOORS & SIDE PANELS, SCREENS



Satisfying the Requirements

GLAZING IN DOORS

Glazing in doors which is wholly or partially within 1500mm from floor level shall be: Minimum Class C to BS 6206 and marked accordingly. If the smaller dimension of the pane is greater than 900mm it shall be: Minimum Class B to BS 6206 and marked accordingly.

LOW LEVEL GLAZING

Glazing which is wholly or partially within 800mm of the floor level shall be: Minimum Class C to BS 6206 and marked accordingly. 900mm it shall be: Minimum Class B to BS 6206 and marked accordingly.

GLAZING ADJACENT TO DOORS

Glazing which is wholly or partially within 300mm of the edge of a door and which is wholly or partially within 1500mm from floor level shall be: Minimum Class C to BS 6206 and marked accordingly. If the smaller dimension of the pane is greater than 900mm it shall be: Minimum Class B to BS 6206 and marked accordingly.

Note:- Floor level includes areas above ground level regularly stood on i.e. baths.





Maximum Glass Sizes



CATEGORY	DESCRIPTION	
PRODUCT CHARACTERISTICS	GLASS	

CLEAR GLASS

(Annealed, Toughened or Laminated) is obtainable in very large sizes, but the maximum width or height should not exceed 2500mm.

The maximum glass area is dependent on the type of glazing and the situation of the installation:-

The table below is extracted from BS6262 and is based on a Design Wind Pressure of 1200 pa

SAFETY GLASS

All glazing must conform to BS6262 'British Standard Code of Practice for GLAZING for BUILDINGS'.

The following basic information on safety glazing is provided for general guidance only.

Annealed Glass = Float, polished plate and patterned glass.

Safety Glass = Toughened or laminated glass.

GLAZING OPTIONS							
THICKNESS ANNEALED LAMINATED TOUGHENED							
4mm	2m²	N/A	3m²				
6mm	5m²	4.5m²	7m²				
4+4	4m²	N/A	6m²				
6+6	10m²	9m²	7m²				

PATTERNED GLASS

Should not exceed a maximum size of 1320mm x 2140mm

Glass Weight

Single Glaze 4mm thick = 10 Kg/m^2

 $6 \text{mm thick} = 15 \text{ Kg/m}^2$

Double Glaze $4-16-4 = 20 \text{ Kg/m}^2$

 $4-20-4 = 20 \text{ Kg/m}^2$ $6-12-6 = 30 \text{ Kg/m}^2$

HANDLING

It should be noted that large units are more prone to damage, due to the difficulty of handling and access limitations (size and weight), probably requiring additional personnel, both in factory and on site.

Safety Glass & Safe Breakage



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS GLASS

TOUGHENED GLASS is produced by subjecting annealed glass to a process of heating and rapid cooling which can increase its strength to four or five times that of annealed glass. However, the wind loading (deflection) will be identical to that of annealed glass.

It should be pointed out that toughened glass is a finished product, and as such cannot be cut or drilled. All such work on the glass must be carried out prior to toughening.

On fracturing, toughened glass will disintegrate into small particles which are unlikely to cause cutting and piercing injuries, which could occur with fractured annealed glass.

LAMINATED GLASS is produced by combining two or more panes of glass with layers of polyvinylbutyral (p.v.b.), or with resin interlayers.

The performance varies with the number and types of glass and interlayers to achieve safety, security, bullet, blast and fire resistance etc.

Laminated glass can be cut to size and supplied from stock by the supplier.

When fractured, the pieces of glass are held together by the interlayers and the danger of injuries are minimised.

WINDOWS

Safety glass must be used for glazing windows that are wholly or partially within 800mm from floor level and other risk areas, such as stairways and landings etc.

In domestic applications, provided the area of the double glazed unit does not exceed 2.5m², then annealed glass may be used. If the area of the glass exceeds 2.5m² then safety glass must be specified.

DOORS

It is recommended that safety glass, either toughened or laminated, is used in Residential and Patio doors and side panels.

The information provided is the minimum standard recommended, based on a domestic situation where few people use the area. These standards are not applicable for public or commercial buildings. When choosing the glazing of risk areas, the following criteria should be considered. These include the type of people using the building and its function. For example, special consideration should be given to areas where young children play or where elderly or infirm people could fall against a window (landing, bottom of stairs etc). Under these circumstances safety glass should be specified.

Where safety glass is required, it is recommended that toughened glass is used as the standard safety glass and laminated glass only supplied when specified.

If any doubt is experienced when considering glass choice for a particular application, you are strongly advised to seek advice from your glass supplier.

Safe Breakage

Safe breakage is defined in:-

BS 6206: 1981 Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings: clause 5.3

And is based on an impact test which requires the result of the impact to be limited to creating:

- 1) Small clear opening only, with a limit to the size of the detached particles.
- 2) Disintegration with small detached particles.
- 3) Breakage resulting in separate pieces that are not sharp or pointed.

Impact Performance & Breakage Characteristics



Impact Performance

Glass and plastic materials, which are intended for use as safety glazing materials in critical locations in buildings where human impact can occur, should be classified according to their performance when subjected to a series of pendulum tests.

The impact test utilises a lead shot-filled leather bag weighing 45kg dropped like a pendulum from different heights.

Details of the impact tests are given in BS 6206: 1981 'Specification for Impact Performance Requirements for Flat Safety Glass and Safety Plastics for use in buildings'.

There are three safety glazing classifications: A (the highest), B, and C (the lowest).

- ☐ Toughened Glass would always obtain a Class A classification.
- □ Laminated Glass with a PVB (polyvinylbutyral) or CIP (cast-in-place) interlayer would normally achieve at least a Class B classification depending on the glass and interlayer thickness.
- ☐ Wired glass such obtain a Class C classification.

Glasses meeting these requirements and intended for use as safety glasses must be permanently marked as conforming to BS 6206.

Please contact your glass supplier for clarification of glass classification

Breakage Characteristics

To agssist designers and specifiers in selecting the most appropriate glazing, the breakage characteristics of the following materials are described.

ANNEALED GLASS

Annealed glass is the basic glass (e.g. float, patterned) from which the other glasses referred to in this annex are processed. If the annealed glass is broken and pieces are displaced, the resulting glass edges will be sharp.

WIRED GLASS

If wired glass is broken and the pieces are held together by wires, penetration is unlikely. However, if the wires are broken and the material is penetrated, the resulting glass edges will be sharp.

LAMINATED GLASS

The breakage characteristics will be similar to those of the types of glass used in its construction, but the pieces will remain substantially adhered to the interlayer. Depending on the type and thickness of the interlayer, the broken glass is unlikely to be penetrated.

TOUGHENED (TEMPERED) GLASS

Thermally toughened soda-lime glass is difficult to break, but if broken it fragments into small, relatively harmless pieces.

HEAT STRENGTHENED GLASS

If heat strengthened glass is broken the resulting edges will be sharp.

PLASTICS COVERED ANNEALED GLASS

This is annealed glass covered with specially formulated organic materials (e.g. thin applied films) intended to hold the glass together after breakage. If broken it will be difficult to penetrate provided that the covering is applied in accordance with the manufacturer's recommendations.

IF IN DOUBT, CONTACT YOUR GLASS SUPPLIER FOR ADVICE AND GUIDANCE ON ALL ASPECTS OF GLASS AND GLAZING.



Manifestation of Glazing & Exceptions

PRODUCT CHARACTERISTICS

DESCRIPTION

GLASS

Manifestation of Glazing

Large areas of transparent glazing used to subdivide a building may not be immediately apparent, particularly under certain lighting conditions. People in passage in or about the building may not be aware of the glazing and may collide with it. The glazed areas referred to include large uninterrupted areas of transparent glazing which form, or are part of, the internal or external walls and doors of shops, showrooms, offices, public and other non-domestic buildings.

Permanent manifestation is only required when other means of indicating the presence of the glazing are not present.

When manifestation is required it should be of a sufficient size to be immediately obvious and should be positioned between 600 and 1500mm above floor level and preferably be permanent and durable.

Exceptions

There are some exceptions to the requirements for safety glass, these are based on the robustness of annealed glass:

- 1) Panes having the smaller dimension less than 250mm and of area less than 0.5m² may be minimum 6mm thick glass not complying with BS 6206.
- Panes forming parts of fronts (but not other locations) to shops, showrooms, offices, factories and public buildings, supported on all edges, may be of equivalent robustness not complying with BS 6206. Annealed glass size limitations are as follows:
 8mm glass must not exceed 1100 x 1100mm.
 10mm glass must not exceed 2250 x 2250mm.
 12mm glass must not exceed 3000 x 4500mm.
 15mm glass (and thicker) no limit.

Glass Packing



CATEGORY	DESCRIPTION
PRODUCT CHARACTERISTICS	GLASS

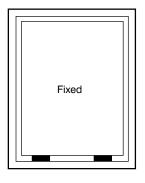
Most types of glazing may be specified for PROFILE22 windows and doors. Except for casement windows the glass and glazing beads will generally be fitted on the room side for ease of installation and security. Casement windows, however, may be specified with either external or internal beads.

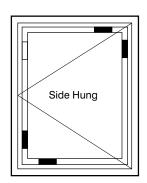
Where external glazing beads are specified, usually for reasons of aesthetics, in ground floor or accessible locations, additional glazing security should be specified in the form of security beads or security glazing clips.

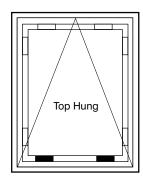
Most windows and doors have either 24mm or 28mm glazing, but other thicknesses can be accommodated.

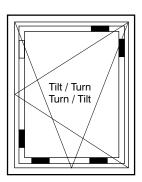
GLASS PACKING

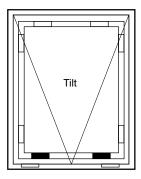
For perfect functioning of a window or door the correct procedures have to be observed. The glass must be carefully packed in the frame with dedicated bridging packers (Part number 1976/7876) and glazing packers (Part number 3321-3344). The diagrams below show the correct locations for the positioning the packers in various types of frame.

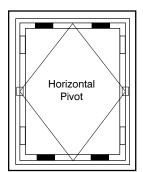


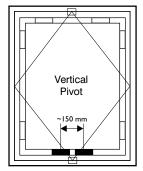




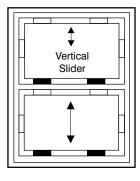


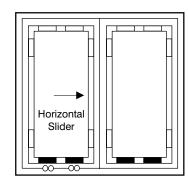












- Glazing Packers (including Bridging Packers)
- ☐ Glazing Bridging Packer (1976 (60), 7876 (70))

ALL GLAZING MUST CONFORM TO BS 6262



Maximum Size Limits



Maximum Size Limits Window Sash



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS MAXIMUM SIZE LIMITS

MAXIMUM & MINIMUM SASH SIZES

STYLE	LOCKING	REMARKS		SIZE (mm)		SIZE (mm)
TOP HUNG	GEARBOX ESPAG.		220	276	WIDTH 1235	HEIGHT 1235
H	SHOOTBOLT (MK I)		355	316	1235	1235
w	SHOOTBOLT (MK II)		435	316	1235	1235
SIDE HUNG	GEARBOX ESPAG.		376	220	735	1335
H	SHOOTBOLT (MK I)		416	355	735	1335
₩	SHOOTBOLT (MK II)		416	435	735	1335
TILT BEFORE TURN	TBT MECHANISM	TBT frame width must not exceed 1.5 x height	330	520	1530	2250
w i	PZ LOCKING TBT	& sash weight must not exceed 100Kgs.	330	1760	1530	2190
FULLY REVERSIBLE	GEARBOX ESPAG.	PN HINGES	250	505	1500	1500
W W	GEARBOX ESPAG.	YALE HINGES (GRORUD)	250	491	1500	1500

 ${\tt NOTE:-} \ \, {\tt For} \ \, {\tt recommended} \ \, {\tt Egress} \ \, {\tt sizes} \ \, {\tt for} \ \, {\tt replacement} \ \, {\tt windows}, \, {\tt refer} \ \, {\tt to} \ \, {\tt the} \ \, {\tt Building} \ \, {\tt Regulations} \ \, {\tt section}, \, {\tt Document} \ \, {\tt B} \ \, {\tt in} \ \, {\tt this} \ \, {\tt guide}.$

The maximum sash sizes are based upon standard hardware, with standard double glazed sealed units using a combination of 4mm or 6mm glass.

Where units specified use thicker glass the additional weight will $% \left(1\right) =\left(1\right) \left(1\right) +\left(1\right) \left(1\right)$ affect the recommended maximum size.

*WEIGHT CAPACITY

 $\label{thm:maximum} \mbox{Maximum height and width in certain circumstances may exceed the friction hinge weight capacity. Please refer to our Technical Department for advice.$

All dimensions are nominal. DO NOT SCALE TD-08-0001-1-3\10-13

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Maximum Size Limits Window Outer Frame



CATEGORY	DESCRIPTION
PRODUCT CHARACTERISTICS	MAXIMUM SIZE LIMITS

MINIMUM & MAXIMUM OUTER FRAME SIZES

CTVLE	OUTER FRAME	DEMARKS	MIN. FRAM	E SIZE (mm)	MAX. FRAN	ME SIZE (mm)
STYLE	PROFILE	REMARKS	WIDTH	HEIGHT	WIDTH	HEIGHT
	88010 22810 77010 77810 70000 70010		220	220	2500	2500
FIXED LIGHT H	22990 77070 70070		250	250	3000	3000
	22470		280	280	3030	3030

All dimensions are nominal. DO NOT SCALE TD-08-0002-1-2 $\0$ 6-11

All information in this publication is provided for guidance only and is given in good faith. As it is company policy to continually improve products, methods and materials, changes of specification may be made from time to time without prior notice. This statement does not affect your statutory rights. ©PROFILE22

Maximum Size Limits Doors Leaf & Slim French Door Leaf



CATEGORY DESCRIPTION PRODUCT CHARACTERISTICS MAXIMUM SIZE LIMITS

MINIMUM & MAXIMUM DOOR LEAF SIZES

STYLE	LOCKING	REMARKS	MIN. LEAF	SIZE (mm)	MAX. LEAF	SIZE (mm)
SIILE	LOCKINO	KEMAKKS	WIDTH	HEIGHT	WIDTH	HEIGHT
SINGLE DOOR H	SAFEWARE 3+ SAFEWARE 7 & SAFEWARE 7+ SAFEWARE 8 & SAFEWARE 8+	PVC-U LEAF PROFILE* ³ 22730, 22740, 70300, 70350	619* ¹	1835	919	2151
DOUBLE DOOR H W W	SAFEWARE 3+ SAFEWARE 7 & SAFEWARE 7+ SAFEWARE 8 & SAFEWARE 8+	PVC-U LEAF PROFILE* ³ 22730, 22740, 70300, 70350	457*²	1835	919	2151

^{*1} Note:- This dimension is a practical minimum, but may be reduced at the discretion of the fabricator
*2 Note:- On minimal double door outerframe widths (1000-1400mm) fabricators should be aware of the aesthetic affect of the small glass area and large profile mass

^{*3} Note:- For all composite leaf min/max sizes please refer to the composite door leaf manufacturer.

Maximum Size Limits Patio Door Sizes



CATEGORY	DESCRIPTION	
PRODUCT CHARACTERISTICS	MAXIMUM SIZE LIMITS	

PATIO DOOR SIZES

	0/FRAME	0	UTERFR	AME SIZE	S		LEAF	SIZES	
STYLE	PROFILE	MINI	MUM	MAX	IMUM	MINI	MUM	MAX	IMUM
		WIDTH	HEIGHT	WIDTH	HEIGHT	WIDTH	HEIGHT	WIDTH	HEIGHT
TILT & SLIDE	22990 77070 70070	1475	1763	3000	2500	760	1660	1523	2397
L or R Hand Leaf	22470	1505	1773	3000	2500	760	1660	1508	2387
TILT & SLIDE	22990 77070 70070	2107	1763	4000	2500	760	1660	1391	2397
Central Leaf (L or R Sliding)	22470	2137	1773	4000	2500	760	1660	1381	2387
TILT & SLIDE	22990 77070 70070	2269	1763	4000	2500	760	1660	1337	2397
Twin Sliding Leaves	22470	2299	1773	4000	2500	760	1660	1327	2387

Note 1. TILT & SLIDE. Frame sizes include 2226, 7726 Add-on profile at Cill [77070, 22990, 70070]

Note 2. TILT & SLIDE. Maximum Leaf weight = 150 Kgs.

IN-LINE SLIDER O X O	1574	2046	3004	2360	785	1960	1500	2274	
IN-LINE SLIDER o x o	2370	2046	4 515	2360	785	1960	1500	2274	3 PATIO DOOR
IN-LINE SLIDER x o x	2286	2046	4431	2360	785	1960	1500	2274	INLINE SLIDING PATIO DOOR
IN-LINE SLIDER o x x o	3076	2046	5936	2360	785	1960	1500	2274	

Maximum Size Limits Notes, Multi-lights & Reinforcements



PRODUCT CHARACTERISTICS

MAXIMUM SIZE LIMITS

Notes

The dimensions stated on the charts on the previous pages, are the recommended Minimum/Maximum sizes for the relevant product. If windows/doors are required to be fabricated outside of these limits, please consult the Technical Department.

RULES FOR COMPOSITE WINDOWS

- 1. Any opening or fixed light in a frame must conform to the sizes stated in the charts on the previous pages.
- 2. On crucifix frames with mullions and transoms that span the total width and height, the smallest dimension (width or height) must be reinforced continuously to achieve optimum performance.

Multi-lights & Reinforcements

The following charts indicates the recommended maximum white profile overall sizes for multilight frames (Open-out and TBT Windows), together with their appropriate steel reinforcement.

Where applicable, the maximum overall sizes with their relevant steels are indicated to conform to the British Standards Kitemark (BS7412).

If BS categories are required, the reader is recommended to note carefully the spans and steels stated adjacent to the kitemark symbols.

BS KITEMARK COMPLIANCE

The reader should be aware that the manufacture of a product within the maximum overall sizes stated, and reinforced where required with the recommended steels, does not signify that the product automatically complies with BS Kitemark provisions.

To conform to BS Kitemark requirements the following criteria must be met.

- a. The manufacturing company must be approved to BS EN ISO 9000-2000, or alternatively operate a system which conforms to those standards.
- b. The product must be fitted with a sealed unit manufactured to **BS EN 1279 (Formerly BS 5713)** and manufactured with current legislation.
- c. The quality of hardware, weatherseals and gaskets fitted, must conform to approved levels, using parts as recommended by PROFILE 22.
- d. The product must not exceed the maximum overall sizes for stated profiles.
- e. Where required, the profiles must be reinforced with the recommended steels.

If the reader is in any doubt regarding conformity with BS Kitemark requirements, they are invited to contact the Technical Department for advice.

The information on the following page applies to white profile only. If surface coated (woodgrain) profile is required all members must be reinforced with the recommended steel, regardless of length.

Note that the specification values stated are subject to change without notice.

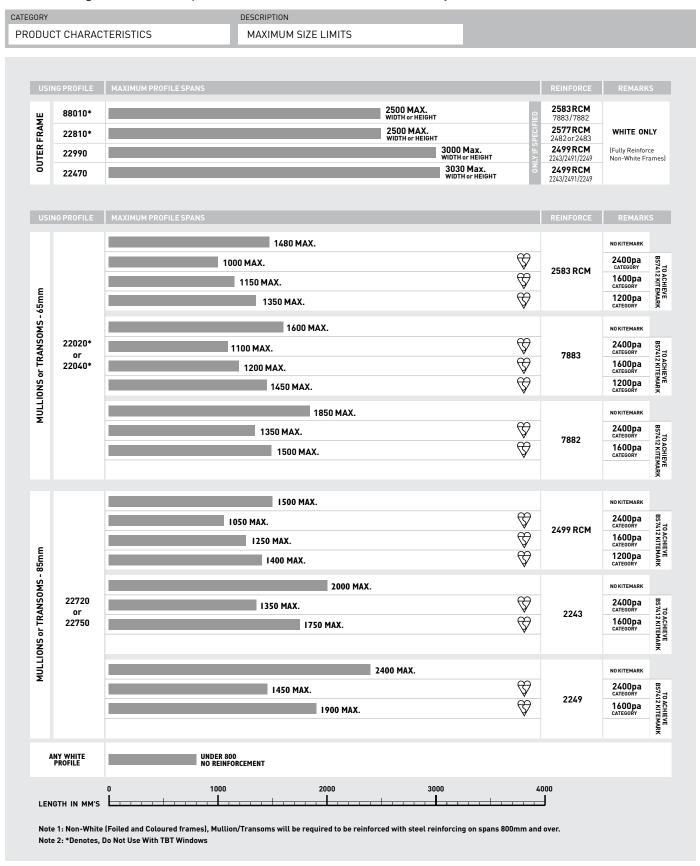
The above information is provided for general guidance only.

Note:- 'Span' indicates the maximum overall dimension over the outerframe. For 'Mullions' & 'Transoms' the 'Span' includes the frame section adjacent to each end of the member.

Product Characteristics



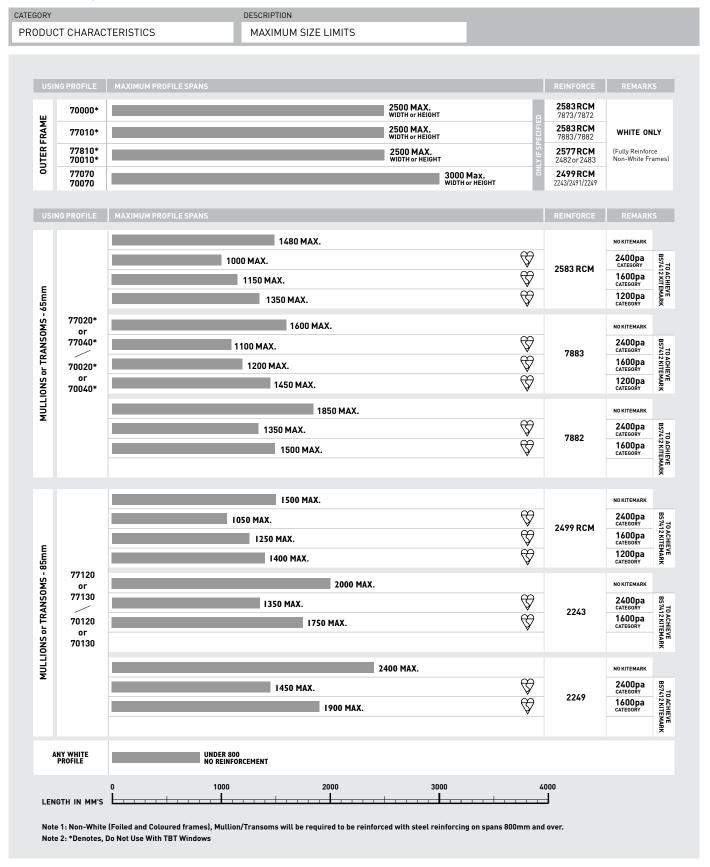
Multi-light Frames (Open-out & TBT Windows) 60mm Systems



Product Characteristics



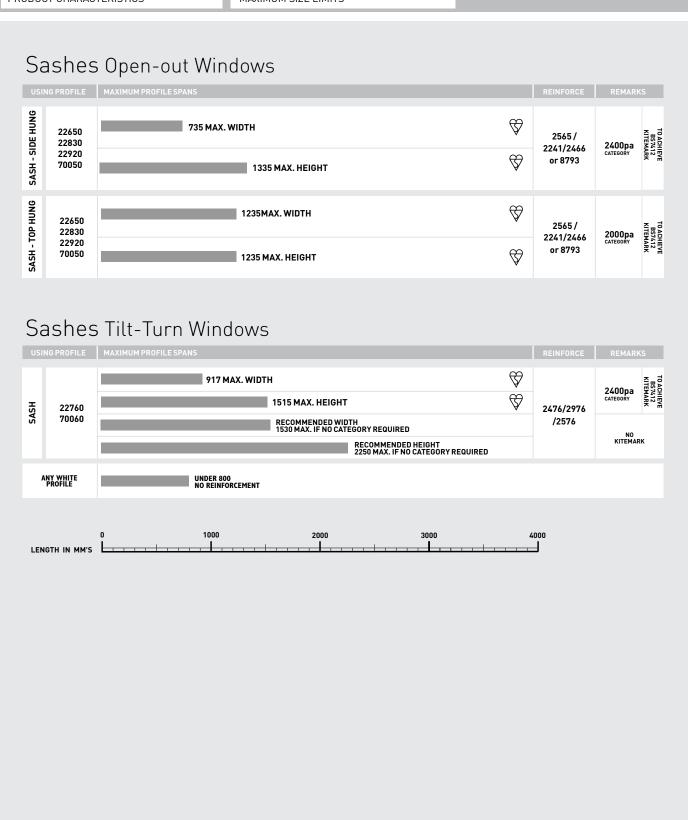
Multi-light Frames (Open-out & TBT Windows) 70mm Systems



Product Characteristics Sashes (Open-out Windows & Tilt-Turn Windows)









Product Care



Product Care

General Maintenance: Open Out Windows



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS PRODUCT CARE

ALL PRODUCTS

Maintenance & Lubrication

1. Handles

Clean and lightly oil external moving parts annually.

2. Cleaning of Frames

To remove atmospheric grime, clean every four months with soap and water.

Check drain holes are free from obstruction. If blocked, remove obstruction and flush through with water to ensure correct drainage.

3. Mastic Seal

Check mastic seal, if any signs of cracking or shrinkage are found, remove and replace with new.

4. Recommended Lubricants

Castrol Everyman, E.R. Howard 3 in 1 oil, or equivalent.

Use petroleum jelly for all keeps.

5. Service and Maintenance Booklet

This is available for distribution to Tenants and Householders, advising full requirements for Service and Maintenance of PVC-U Window & Door products.

OPEN OUT WINDOWS

1. Maintenance & Lubrication

To attain optimum performance, the hinges will require periodical maintenance and lubrication. The hinges, pivots, sliding shoe and track should be kept free of dirt, debris and obstructions at all times. At time of installation, lubricate all pivot points with light machine oil and wipe away excess. (One drop per pivot is sufficient).

Annually, clean any dirt or debris from the hinges. Apply lubrication as described above.

Check the tightness and security of all fixing screws and rivets.

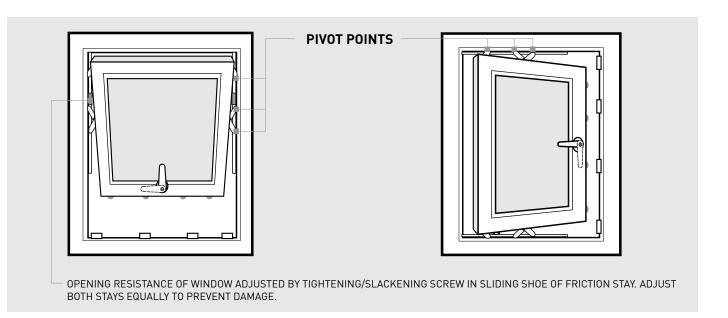
2. Espagnolettes/Shootbolt

Keep sliding mechanisms free from dirt and lubricate annually.

To achieve optimum weathering performance, adjust the locking cams by using a 4mm Allen key.

Product installation should reflect the recommendations laid down in

BS 8213-4:2007 CODE OF PRACTICE FOR THE SURVEY AND INSTALLATION OF WINDOWS AND EXTERNAL DOORSETS



Product Care General Maintenance: Tilt-Turn Windows



Ì	CATEGORY	DESCRIPTION
	PRODUCT CHARACTERISTICS	PRODUCT CARE

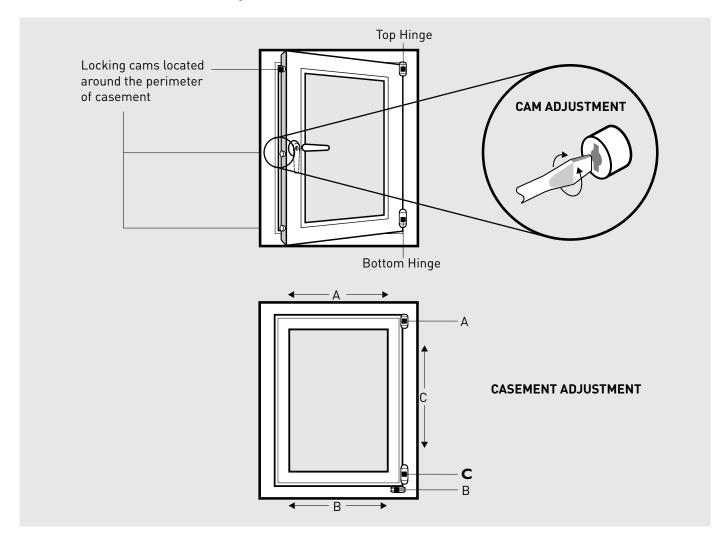
1. Maintenance & Lubrication

To attain optimum performance, hinges and locking points should be kept free from dirt and will require annual lubrication.

2. Adjustment

The casement may be adjusted as follows:-

- A. Open casement to expose adjusting screw on end of scissor for horizontal adjustment at top, using 4mm Allen key.
- B. Adjust bottom horizontally, using 4mm Allen key to adjust floating hinge pin.
- C. Adjust vertically using 4mm Allen key on vertical screw in Bottom Hinge.



Product Care General Maintenance: Top Swing Windows



CATEGORY DESCRIPTION
PRODUCT CHARACTERISTICS PRODUCT CARE

FULLY REVERSIBLE WINDOWS

Maintenance & Lubrication

1. Pivot Hinges

Keep hinges free of dirt and lubricate annually.

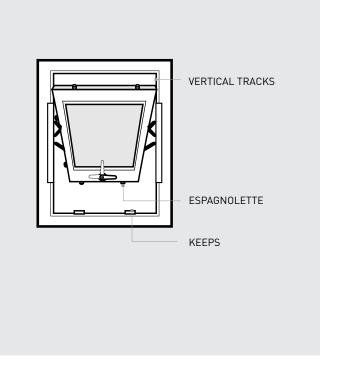
2. Vertical Tracks

Lubricate with silicone grease annually.

3. Espagnolette

Keep mechanism and keeps free of dirt and lubricate annually.

To achieve optimum weathering performance adjust the locking cams by using a 4mm Allen key.



Product Care General Maintenance: Residential Doors



CATEGORY	DESCRIPTION
PRODUCT CHARACTERISTICS	PRODUCT CARE

Maintenance & Lubrication

1. Adjustment of Springlatch & Hookbolts

To achieve optimum weathering and acceptable handle operation, adjust the striker plates of the keeps to suit.

2. Adjustment of Springlatch, Centre Deadbolt & Cams

To achieve optimum weathering and acceptable handle operation, adjust the centrelock keep to suit. The roller cams may be adjusted by using a flat bladed screwdriver or a 4mm Allen key.

3. Springlatch, Deadbolts, Cams & Keeps

Clean and lightly grease external moving parts and frame keeps annually

4. Hinges

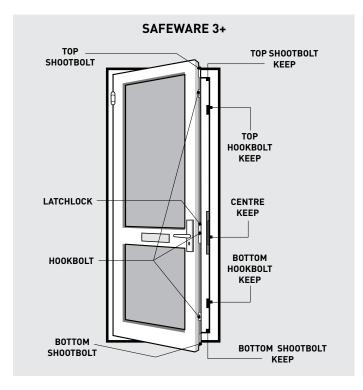
Clean and lightly oil hinge pins annually.

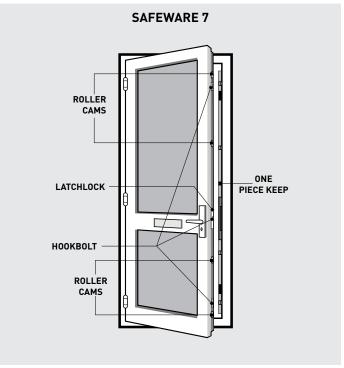
5. Letterbox

Lightly oil springs on inside and outside flap annually.

6. Cylinder

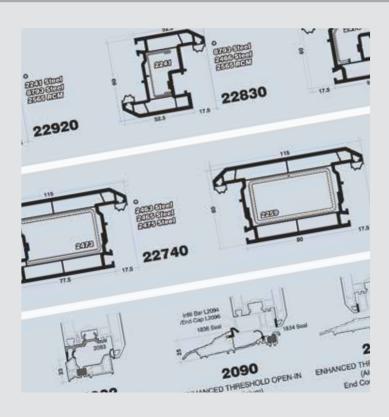
DO NOT ATTEMPT TO LUBRICATE LOCKING CYLINDER





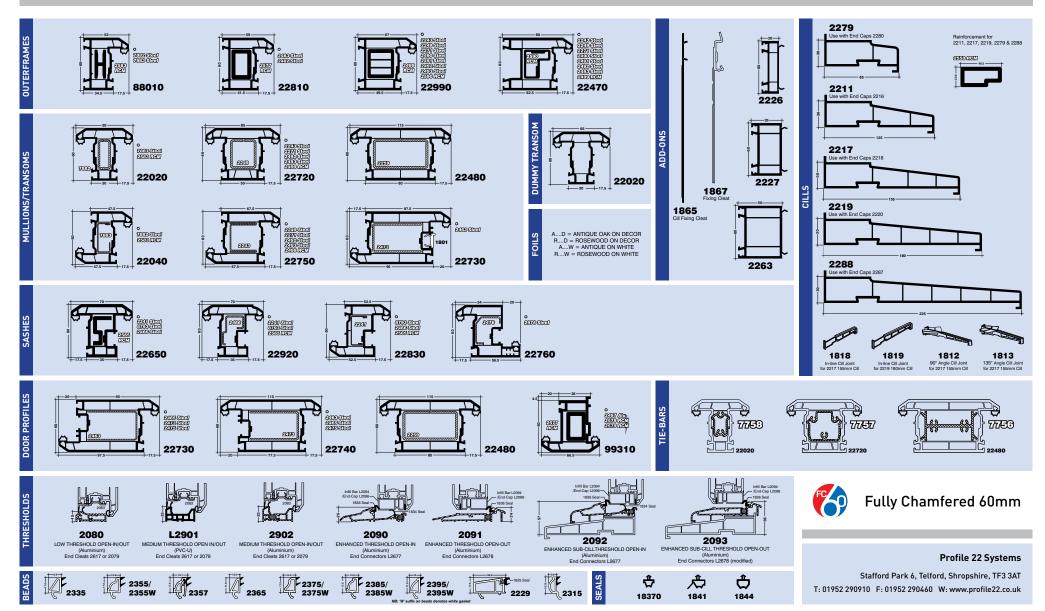


Profile Charts



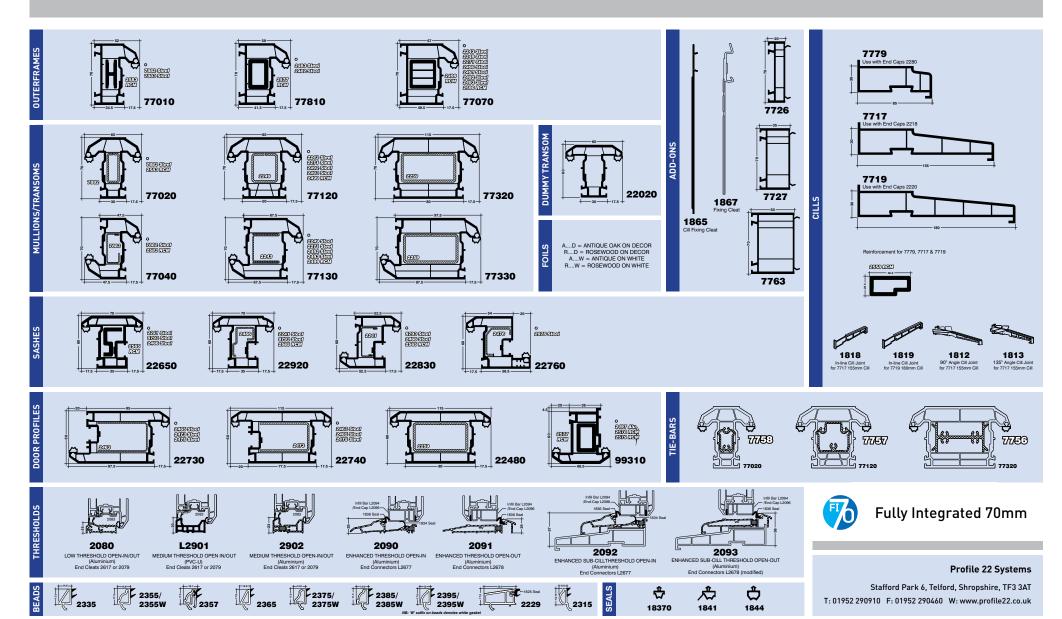
FC60 Profile Chart





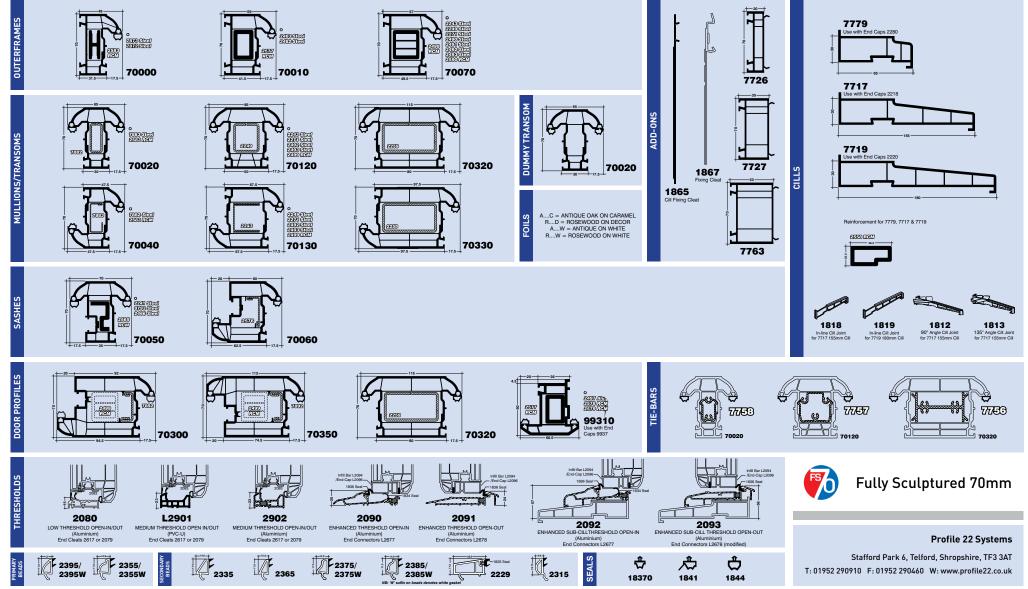
FI70 Profile Chart





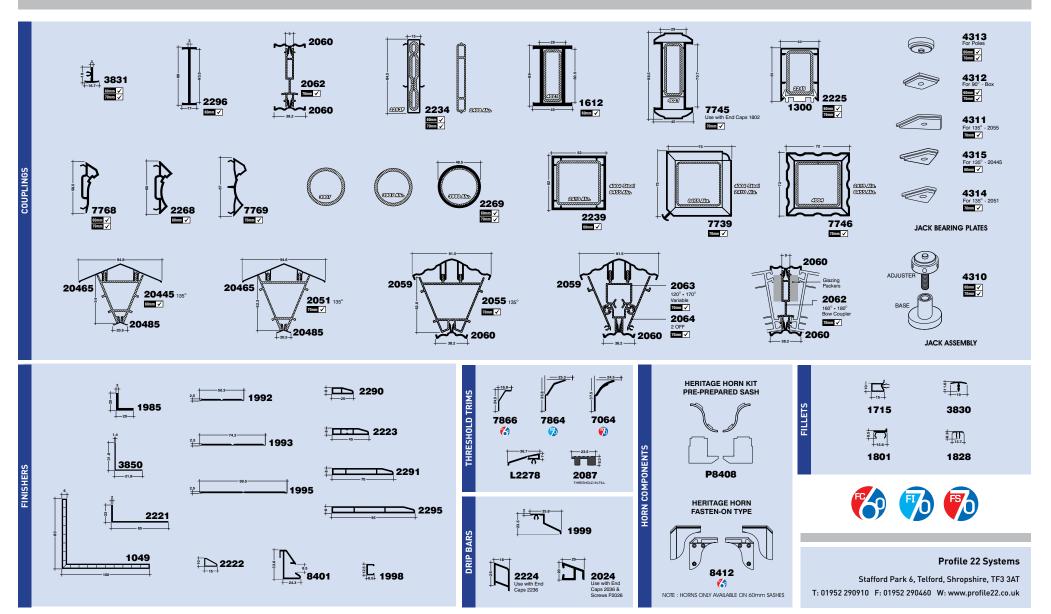
FS70 Profile Chart





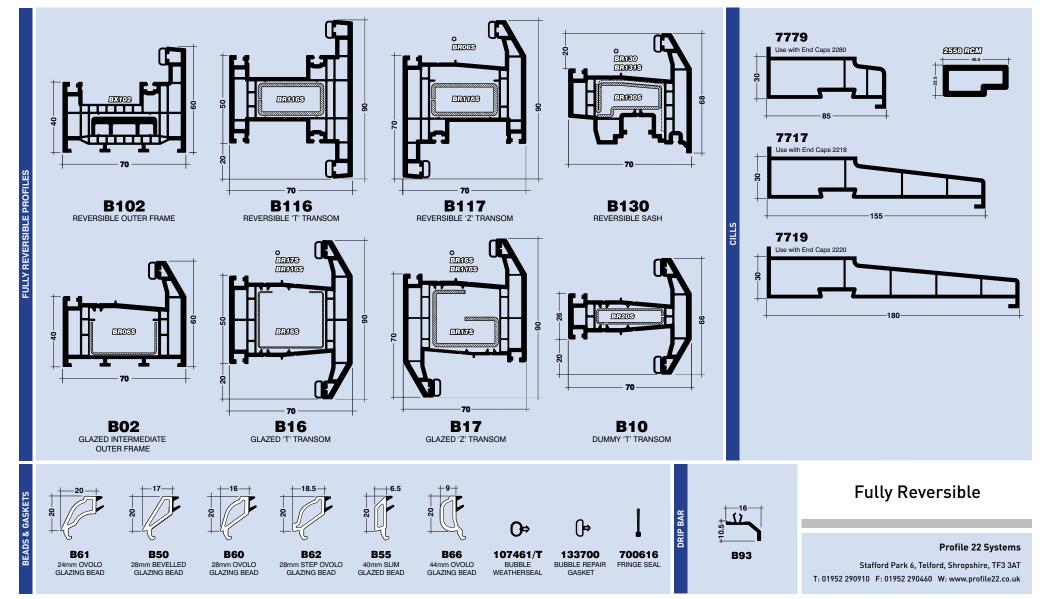
Ancillary Profile Chart





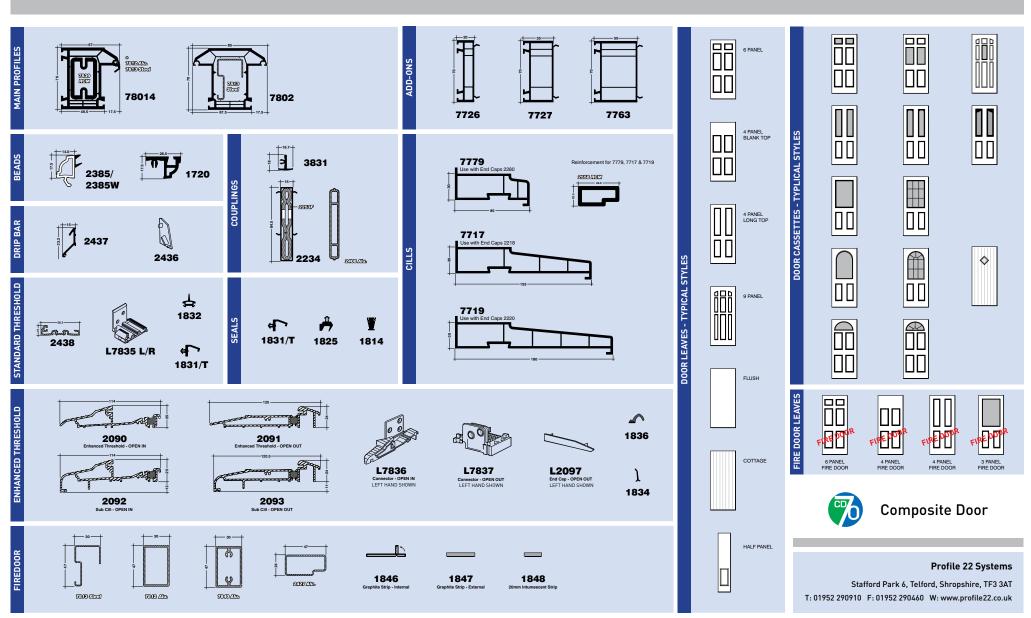
Fully Reversible Profile Chart





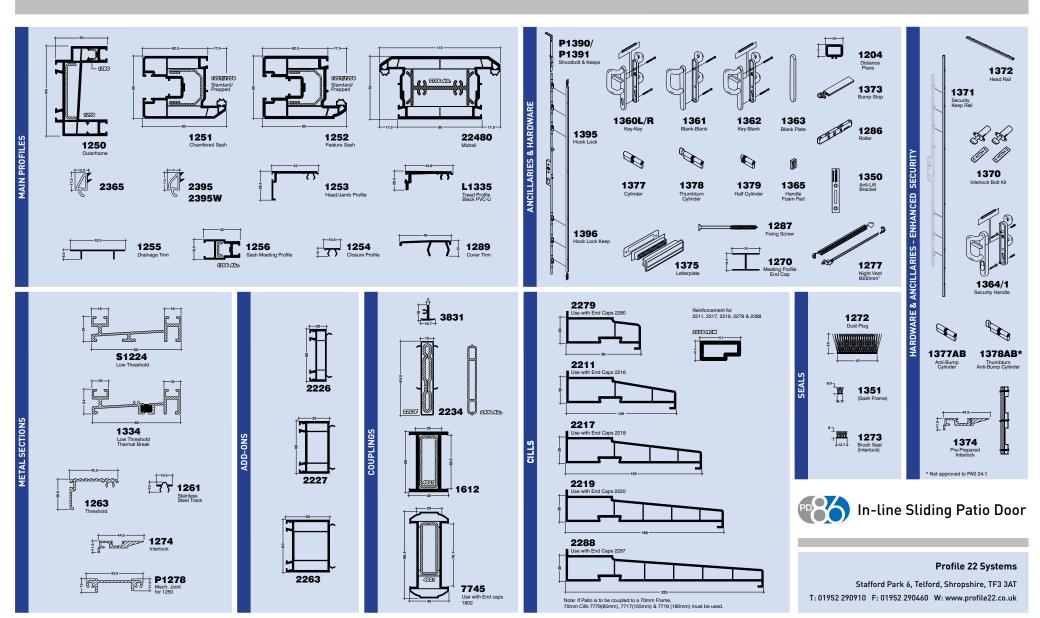
Composite Door Profile Chart





PD86 In-Line Sliding Patio Door Profile Chart







General Information



Frame Weight Calculator



CATEGORY	DESCRIPTION
REFERENCE	GENERAL INFORMATION

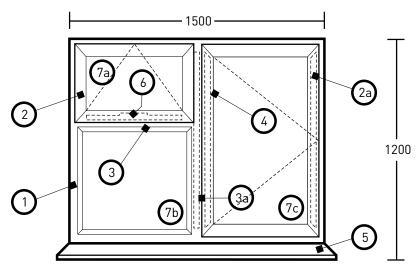
CASEMENT WINDOWS, TBT, RESI-DOORS, FULLY REVERSIBLE WINDOWS AND IN-LINE PATIO DOORS

The following pages include weight/metre charts for profiles, standard reinforcing, heavy-duty reinforcing, hardware and glass in kilogrammes per square metre respectively.

The weights are approximate and for guide purposes only, calculated on the heaviest variables.

FOR WEIGHTS OF PRODUCTS NOT LISTED REFER TO THE PROFILE 22 TECHNICAL DEPARTMENT.

Using the chart for casement windows the following example shows how to calculate the weight of an internally beaded casement window, reinforced to standard guide lines:



ELEMENT	COMPONENT TYPE	QTY. (M)		WEIGHT (Kg/m)		TOTAL WEIGHT (Kg)
1	Outerframe (59mm) Unreinforced	5.37	X	1.27	=	6.82
2	Sash (70mm) Unreinforced	3.58	Χ	1.40	=	5.01
(2) (2a)	Sash (70mm) RCM Reinforced	2.21	Χ	1.75	=	3.87
3	Transom (65mm) Unreinforced	0.79	Χ	1.29	=	1.02
(3a)	Mullion (65mm) RCM Reinforced	1.19	Χ	1.62	=	1.93
4	Bead	7.61	Χ	0.20	=	1.52
5	Cill (155mm) Unreinforced	1.60	Χ	1.63	=	2.61
<u>(6)</u>	Hardware (2sashes @ 2kg/Sash)	2	Χ	2	=	4.00
(7a)	Glass (24mm DG) 596x246	0.15	X	20	=	3.00
<u>7</u> b	686x706	0.48	Χ	20	=	9.60
7 c	596x989	0.59	Χ	20	=	11.80
	Total Weight + 5% (Rounded Up)					54Kg

Frame Weight Calculator



CATEGORY	DESCRIPTION
REFERENCE	GENERAL INFORMATION

				MAX WEIGH	T (Kg/metre)	
DBOE!! E	PROFIL	E SIZE		REINFOR	CEMENT	
PROFILE	WIDTH	DEPTH	NONE	RCM*1	STD STEEL*1	H/DUTY STEEL*2
Outer Frame	49mm 52mm 59mm 67mm 80mm		1.12 1.14 1.27 1.37 1.43	1.49 1.48 1.79 1.98 2.04	1.61 1.64 1.79 2.11 2.17	2.35 2.41 2.77 3.49 3.55
Transom/Mullion (Reinforce over 800mm long)	65mm 85mm 115mm		1.29 1.58 1.96	1.62 2.19 n/a	1.79 2.82 5.38	2.56 3.70 n/a
Casement/Vent	70mm		1.40	1.75	1.86	n/a
TBT/Sash	74mm 80mm		1.29 1.60	n/a n/a	1.89 2.13	n/a n/a
Door Sash	112mm 115mm		2.08 1.84	n/a n/a	3.35 3.14	n/a 3.94
Floating Mullion			1.13	1.65	1.64*3	n/a
Bead			0.20	n/a	n/a	n/a
Cill		85mm 125mm 155mm 180mm 225mm	1.07 1.30 1.63 1.86 2.16	1.76 1.99 2.32 2.55 2.85	n/a n/a n/a n/a n/a	n/a n/a n/a n/a n/a
Low Threshold	15-23mm		1.00	n/a	n/a	n/a
Add-ons	20mm 35mm 50mm		0.67 0.87 1.06	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a

HARDWARE	
Casement/Vent	2Kgs
ТВТ	4.5Kgs
Door	6Kgs

- *1 Reinforce all coloured (foiled) profiles.
- $\ensuremath{\star^2}$ Heavy duty reinforcing for high wind load structural calculations.
- *3 Aluminium reinforcing.

Note:

RCM Reinforcing not suitable for woodgrain transom/mullions over 800mm.

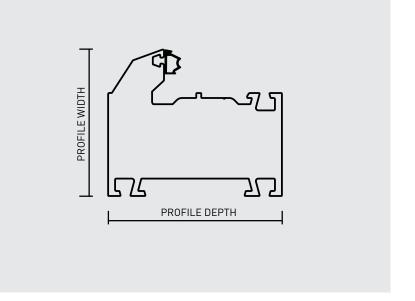
Frame Weight Calculator - Glass



CATEGORY	DESCRIPTION
REFERENCE	GENERAL INFORMATION

*GLASS

SINGLE GLAZE	WEIGHT KG/M ²
4mm	10
6mm	15
10mm	25
DOUBLE GLAZE	WEIGHT KG/M ²
4 x 16 x 4	20
4 x 20 x 4	20
6 x 12 x 6	30
TRIPLE GLAZE	WEIGHT KG/M ²
4 x 12 x 4 x 12 x 4	30



Add 5% for leaded units or Georgian grids.

^{*} Formula for calculation of glass weights = 2.5Kg/m² for 1mm thickness of glass.

Frame Weight Calculator -Fully Reversible Windows



CATEGORY DESCRIPTION
REFERENCE GENERAL INFORMATION

	MAX. WEIGH	T (Kg/Metre)
	REINFOR	CEMENT
PROFILE	NONE	STANDARD
OUTER FRAME - REVERSIBLE	1.37	1.66*
OUTER FRAME - GLAZED	1.29	1.84
'T' TRANSOM - REVERSIBLE	1.77	3.33
'T' TRANSOM - GLAZED	1.65	3.21
'Z' TRANSOM - REVERSIBLE	1.67	3.23
'Z' TRANSOM - GLAZED	1.64	3.42
DUMMY TRANSOM	1.24	1.90
SASH	1.38	2.73
BEAD	0.20	N/A
CILL & ADD-ONS	Refer to Pre	evious Chart

^{*}RCM Reinforcing

HARDWARE : OVERALL SASH F	IEIGHT (Kg/Sash)
Up to 840mm	3.5
841mm+	5

Frame Weight Calculator - In-line Patio Doors



CATEGORY DESCRIPTION

REFERENCE GENERAL INFORMATION

	UNREINFORCED KG/M	STANDARD REINFORCING KG/M
OUTERFRAME JAMB/MULLION	1.58 White Profiles	2.36
OUTERFRAME CILL FRAME	1.70 White Profiles	2.48
SASH - HEAD, CILL, LOCK JAMB	n/a Reinforced as Standard	2.89
SASH - INTERLOCK	n/a Reinforced as Standard	3.50
SASH MEETING STILES - 3&4 PANE	n/a Reinforced as Standard	3.11
CILL	Refer to Previous	Chart
HARDWARE		
2&3 PANE 4 PANE	3Kgs 4Kgs	

Glossary of Standards PVC-U Extruded Hollow Profiles



CATEGORY DESCRIPTION

REFERENCE GENERAL INFORMATION

Lead Standard: BS EN 12608 (formerly BS7413)

NORMATIVE REFERENCES:

EN 477, Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors - Determination of the resistance to impact of main profiles by falling mass

EN 478, Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors - Appearance after exposure at 150 °G - Test method.

EN 479, Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors - Determination of heat reversion.

EN 513, Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors - Determination of the resistance to artificial weathering.

EN 514, Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors - Determination of the strength of welded corners and T-joints.

EN ISO 105 - A01: 1995, Textiles - Tests for colourfastness - Part A01: General principles of testing (ISO 105A01: 1994).

EN ISO 178, Plastics - Determination of flexural properties (ISO 178:1993).

EN ISO 179-2 Plastics - Determination of Charpy impact properties - Part 2: Instrumented impact test (ISO 179-2: 1997).

EN ISO 306, Plastics - Thermoplastic materials - Determination of Vicat softening temperature (VST) (ISO 306:1994).

EN ISO 8256, Plastics - Determination of tensile-impact strength (ISO 8256:1990, including Technical Corrigendum 1:1991).

EN ISO 1163-2: 1999, Plastics - Unplasticized poly(vinylchloride) (PVC-U) moulding and extrusion materials - Part 2: Preparation of test specimens and determination of properties (ISO 1163-2: 1995).

Glossary of Standards Window Fabrication



CATEGORY DESCRIPTION
REFERENCE GENERAL INFORMATION

Lead Standard: BS 7412

GLASS

BS 952-1Glass for glazing - Part 1: Classification

BS 952-2 Glass for glazing - Part 2: Terminology for work on glass

BS 6262 Code of practice for glazing for buildings

BS 5713 (BS EN 1279) Specification for hermetically sealed flat double-glazing units

REINFORCEMENT

BPF 323/1 COP for the reinforcement of high impact modified PVC-U windows and doors

BS EN 10142 Specification for continuously hot-dip zinc coated low carbon steel sheet and strip for cold forming: Technical delivery conditions

BS EN 10088-2 Stainless Steels - Part 2: Technical delivery conditions for sheet/plate and strip for general purposes

BS EN 515 Aluminium and aluminium alloys. Wrought products. Temper designs

BS EN 573-3 Aluminium and aluminium alloys. Chemical composition and form of wrought products - Part 3: Chemical composition

BS EN 573-4 Aluminium and aluminium alloys. Chemical composition and form of wrought products - Part 4: Forms of products

BS EN 755 Aluminium and aluminium alloys. Extruded rod/bar, tube and profiles

BS EN 12020-1 Aluminium and aluminium alloys - Extruded precision profiles - Part 1: Technical conditions for inspection and delivery

BS EN 12020-2 Aluminium and aluminium alloys - Extruded precision profiles - Part 2: Tolerances on dimension and form

GLAZING GASKETS & WEATHERSTRIPS

BPF 345/2 Materials for gaskets and weather strips for windows, doors, conservatories and curtain walling - Specification and performance requirements

WINDOW HARDWARE (EXCEPT FASTENINGS)

BS EN 1670 Corrosion resistance **BS EN 1SO 4042** Fasteners - Electroplated coatings

WINDOW FASTENINGS

BPF W363/1 Guidelines for the selection and application of fasteners for the manufacture of plastic windows and door sets

INFILL PANELS

BPF 355/1 Infill panels for doors and windows

SURVEY AND INSTALLATION

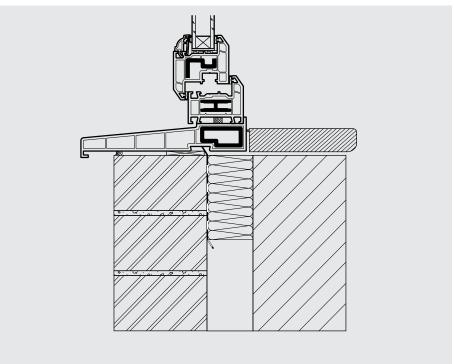
BS 8213-4: 2007 Code of practice for the survey and installation of Windows and External Doorsets



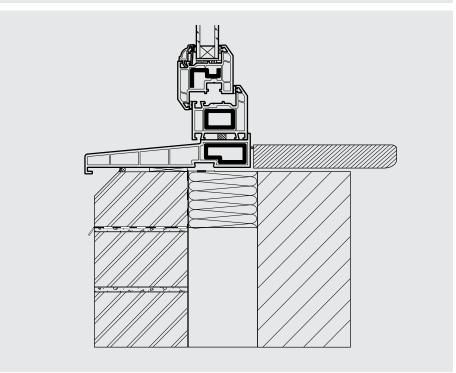
CATEGORY	DESCRIPTION
REFERENCE	BULDING DETAILS

1

- Brick and block construction
- PVC-U cill detail
- 50mm cavity



- Brick and block construction
- PVC-U cill detail
- 75mm cavity

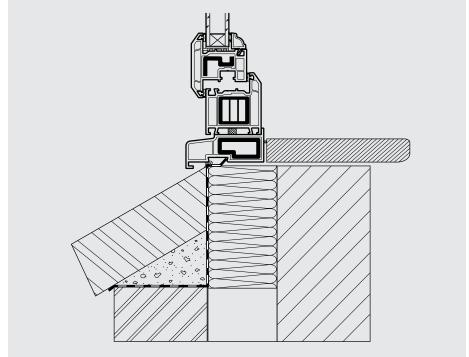




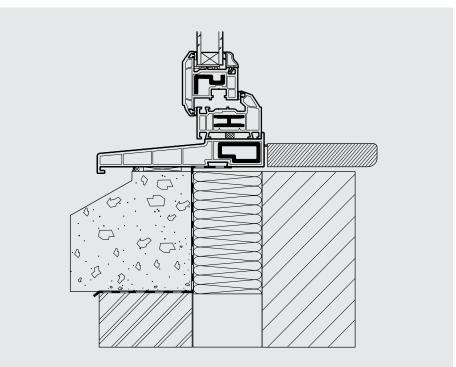
CATEGORY	DESCRIPTION
REFERENCE	BULDING DETAILS

3

- Brick and block construction
- Brick cill detail
- 75mm cavity



- Brick and block construction
- Stone cill detail
- 75mm cavity

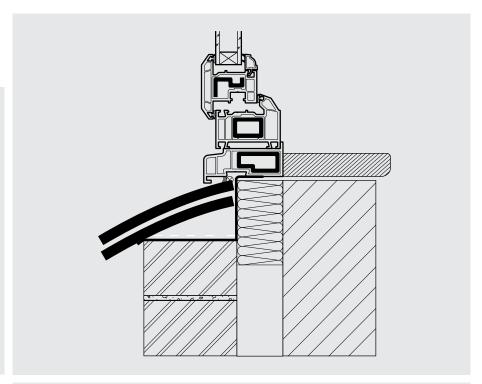




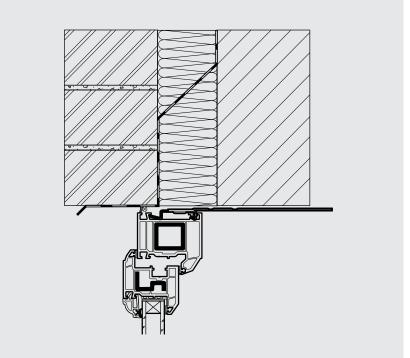
CATEGORY	DESCRIPTION
REFERENCE	BULDING DETAILS

5

- Brick and block construction
- Tile cill detail
- 50mm cavity



- Brick and block construction
- Head detail
- 75mm cavity

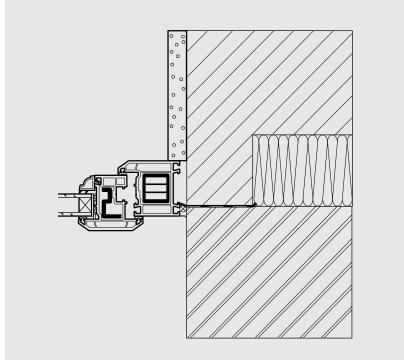




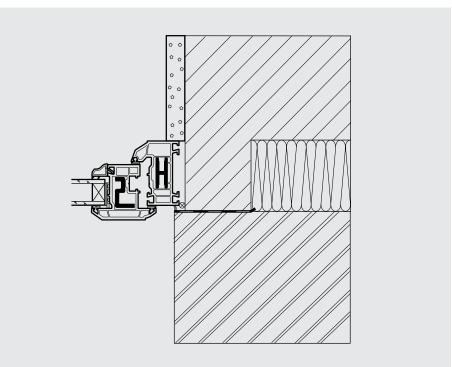
CATEGORY	DESCRIPTION
REFERENCE	BULDING DETAILS

7

- Brick and block construction
- Jamb detail with flush reveal
- 75mm cavity



- Brick and block construction
- Jamb detail with check reveal
- 75mm cavity

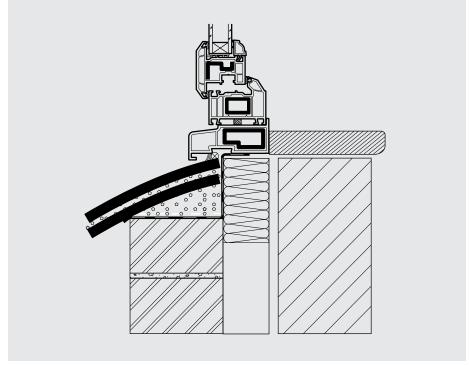




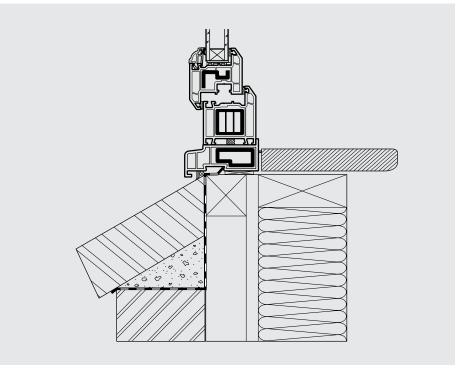
CATEGORY	DESCRIPTION
REFERENCE	BULDING DETAILS

9

- Timber frame construction
- PVC-U cill detail
- 50mm cavity



- Timber frame construction
- Brick cill detail
- 50mm cavity

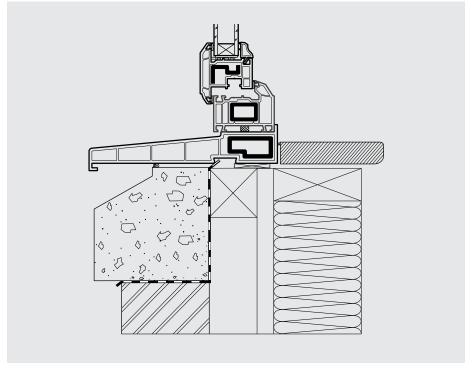




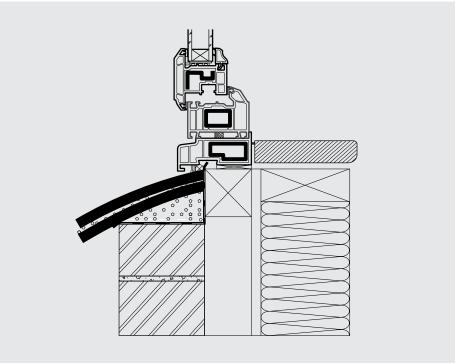
CATEGORY	DESCRIPTION
REFERENCE	BULDING DETAILS

11

- Timber frame construction
- Stone cill detail
- 50mm cavity



- Timber frame construction
- Tile cill detail
- 50mm cavity

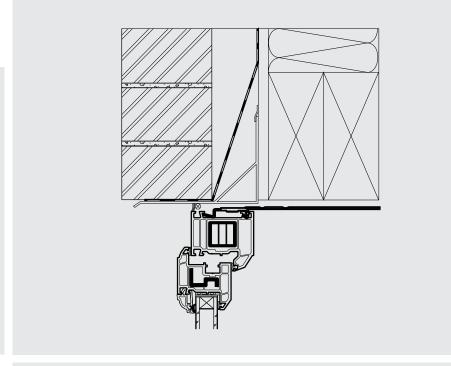




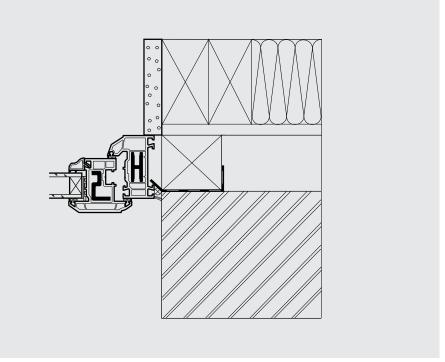
CATEGORY	DESCRIPTION
REFERENCE	BULDING DETAILS

13

- Timber frame construction
- Head detail
- 50mm cavity



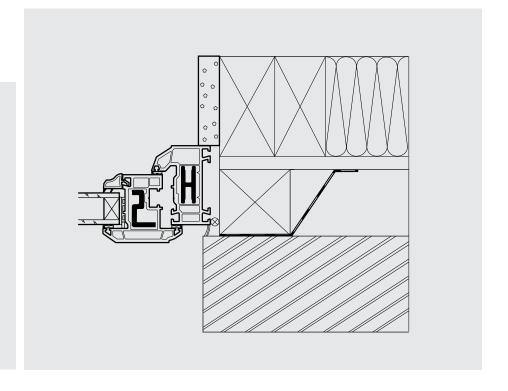
- Timber frame construction
- Jamb detail with flush reveal
- 50mm cavity





CATEGORY	DESCRIPTION
REFERENCE	BULDING DETAILS

- Timber frame construction
- Jamb detail with check reveal
- 50mm cavity





Unit D1-D4, Stafford Park 4, Telford, Shropshire, TF3 3BA



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