

# Saphir casement frame

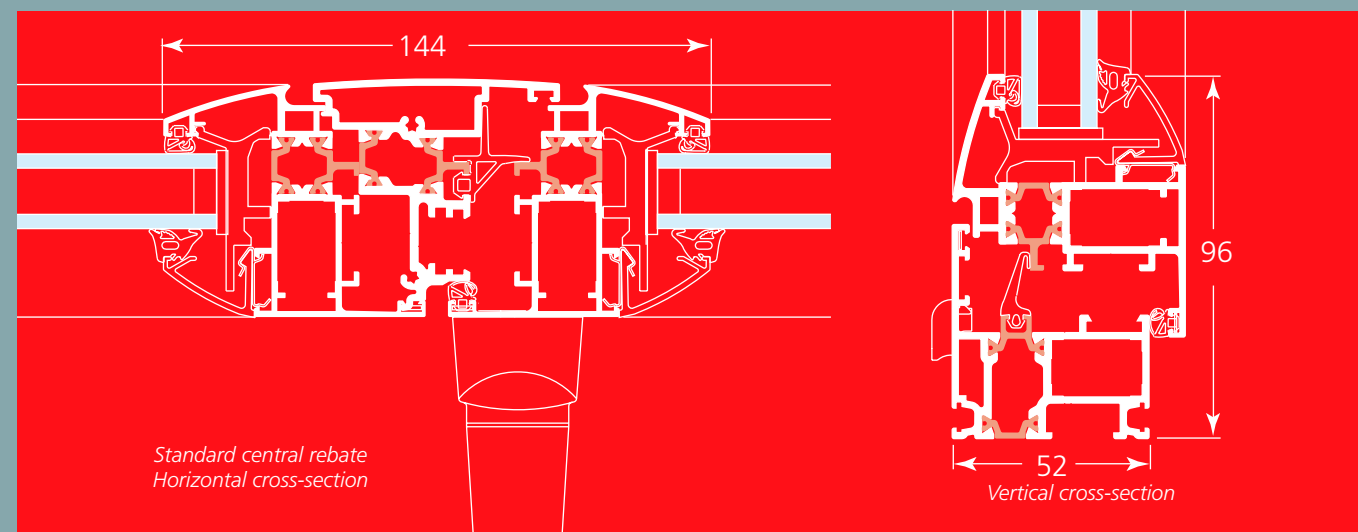
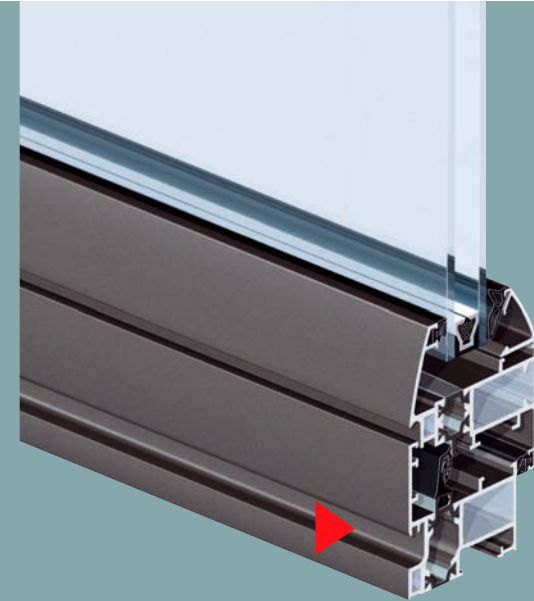
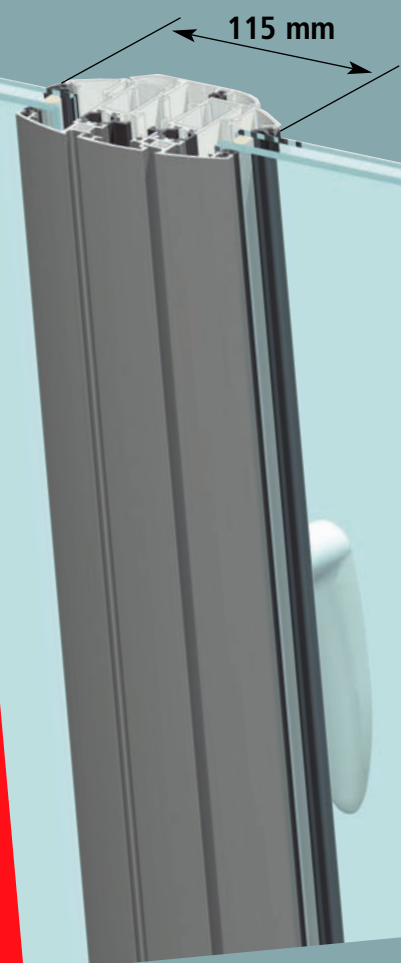
A range of products  
combining sturdiness,  
comfortable use and  
elegance.

- Delays break-in by over three minutes. Combination of laminated glass and specific closing system for a frame with reinforced security, tested by CNPP (French National Centre for prevention and Protection).

Architect : D. La Cascade

## Robust and harmonious

- Specific solutions for reinforced anti-break-in security.
- Sections and accessories designed for large dimension frames.
- Up to 130 kg for tilt-and-turn frames.
- Glazing up to 35 mm for high-performance glass panels.



## Refined look

- Flush fixed and sash frames.
- Rounded sash and central rebate sections.
- Concealed drainage on windows and compositions.
- Top and bottom rebate caps in aluminium, in the same colour as the frames.
- Discreet glazing gaskets with reduced flashing.

## High-quality standard

- NF French Standard label for sections with thermal break (French CSTB-approved thermal break).
- Thermal insulation : in accordance with RT2000, values calculated as per CSTB-validated Th-bât 2001 regulations.
- Air, water and windproof in accordance with European standards.
- Acoustics : up to 35 dB (RA, tr).

## Locks and handles a comprehensive offer

- Ergonomic handle with invisible mounting points.
- Tilt-and-turn frame with tilt function first.



### "Eclat" option

- (FXI Thermal break frames only)
- Rounded central rebate. 115 mm slim sight lines for 2-leaf inward opening frame.
  - Handle centred on the rebate.

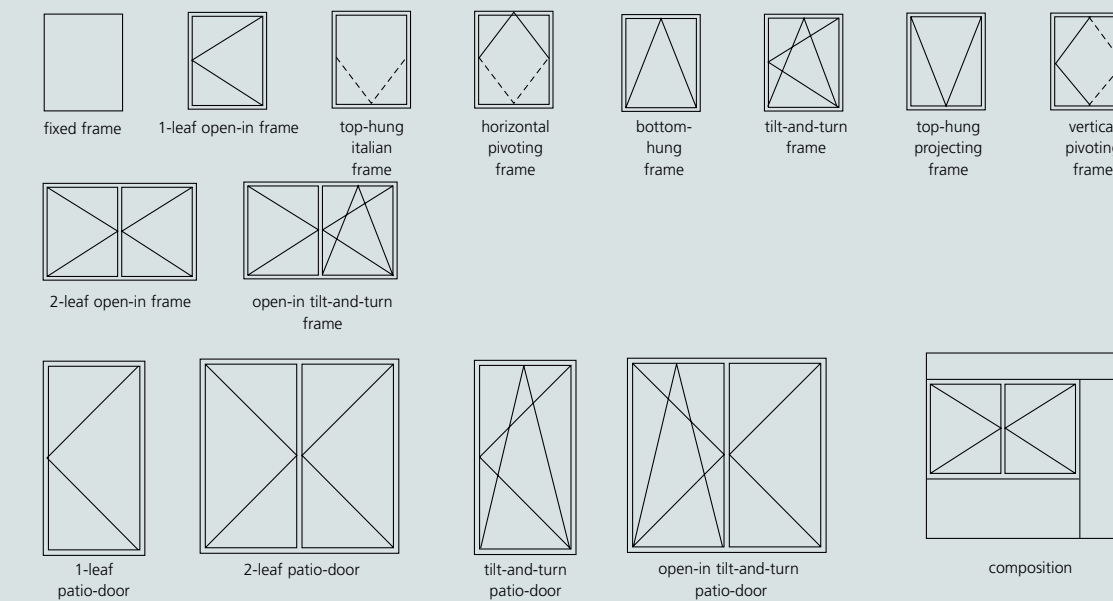


### "Tradition" option

- Old-style espagnolette handle.
- Hinge with decorative caps.
- Moulded inner cap.

## APPLICATIONS

(with or without thermal break)

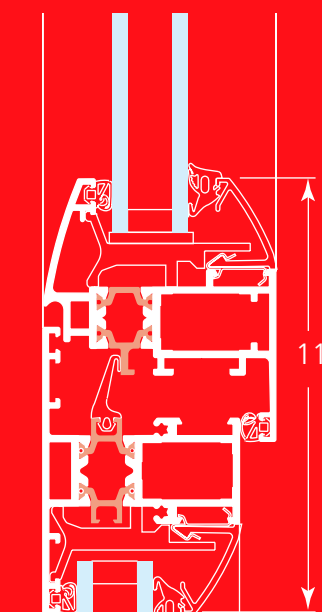


## Horizontal and vertical pivoting windows : optimal performance

- Large dimensions (W = 2.50 x H = 2.20 m). Maximum weight 200 kg.
- Invisible pivot set concealed in the section rabbet.
- Robustness : tested to 20,000 opening cycles.
- Safety : pivot action can be blocked and stopped at all angles (built-in brake system).



Vertical cross-section : opening frame on fixed light, concealed drainage



## Integration and links

- Mullions make it possible to create all types of both simple and complex composite frames.
- Total coordination with Saphir doors and sliding windows.
- Invisible drainage of transoms (patented system).





Architects : J.P. Lafargue et Ch. Lapassade  
Photograph : X. Boymond



Photograph : Photo ISO Studio



Architect : M. Hagelauer - Photographie : J. Ch. Balot



Architect : M. Cathary - Photograph : Photo ISO Studio

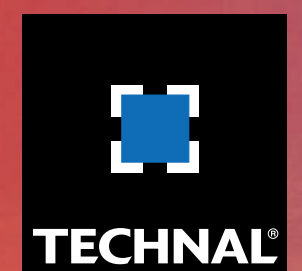


Photograph : Photo ISO Studio

# Saphir casement frame

Side-hung windows and patio-  
doors, traditional or thermally  
improved 52 mm module.

découvertes



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# Saphir

52mm - module standard

# FX

and thermally-improved

# FXi

casement windows

décolorvertes

# TECHNICAL

F E A T U R E S

## Description of FX, FXi frames

### Fixed frame

- 3-chambered, 52mm thermally-broken hollow sections for FXi and 52mm, two-chambered hollow sections for FX.
- Mitre-cut assembly using self-locating cleats to ensure alignment of flanges or pin or crimp cleats.
- Flush rebate cleats.
- Same 5 to 35mm glazing as sash frames.
- EPDM marine-quality continuous gaskets with low fin.
- Square-cut straight glazing beads or mitre-cut rounded beads.
- Drainage via oblong slots with storm-proof deflector.

### Options:

- Concealed drainage in fixed frame groove.
- Concealed drainage in bottom/top fixed light transom, with patented water spout.
- Fixed/sub-frame.
- Fixed frame with built-in trim.
- Fixed frame without groove.

### Sash

- 60mm, three-chambered thermally-broken hollow sections for FXi and 60mm, two-chambered sections for FX with flush external face.
- Mitre-cut assembly using self-locating cleats to ensure alignment of flanges or pin or crimp cleats.
- Bracket in external tube (FXi).
- Flush rebate cleats.
- Same 5 to 35mm glazing as fixed frames.
- EPDM marine-quality continuous gaskets with low fin.
- Square-cut straight glazing beads or mitre-cut rounded beads.
- Drainage via concealed oblong holes.
- Aluminium plug for 2-leaf window in same colour as sections (patent).
- Rounded central rebate.
- Same patio-door and window sashes.

### Alternatives:

- "Image" version with rounded sash sections on inside (FXi only).

- "Eclat" version with rounded central rebate and 115mm slim sight lines (FXi only).
- Patio-door sash with lock.

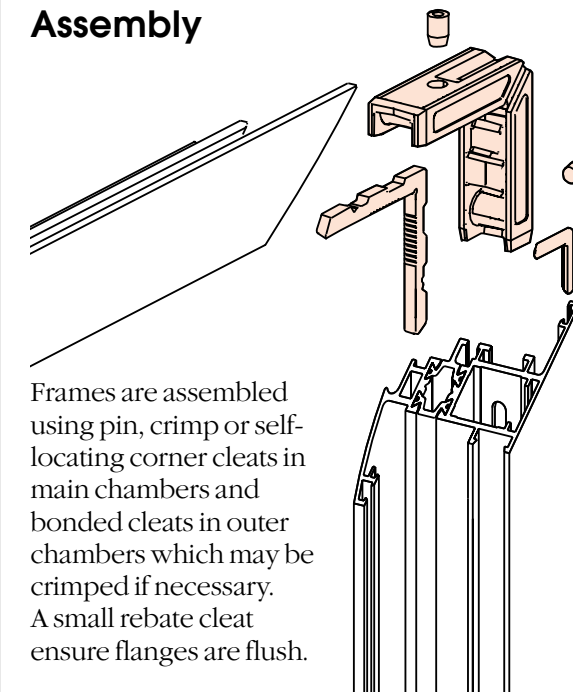
### Accessories

- Aluminium or zamak alloy accessories.
- Adjustable aluminium hinges with polyamide bushings and stainless-steel pins.
- Tilt-and-turn hardware for 90kg sashes and 130kg sash option.
- Same internal appearance for tilt-and-turn and inward-opening hardware on 2-leaf frames.
- Technal design handle and sash fastener.
- Stainless steel screws.
- 1- or 3-point locks with lever in groove for patio-doors.

### Alternatives:

- Lever handle with 7mm square, mortised espagnolette and escutcheon plate (43mm).
- For "Image" version, patented pivot system replacing hinges (on FXi inward-opening frames only).

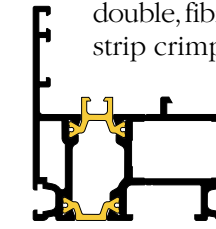
## Assembly



Frames are assembled using pin, crimp or self-locating corner cleats in main chambers and bonded cleats in outer chambers which may be crimped if necessary. A small rebate cleat ensure flanges are flush.

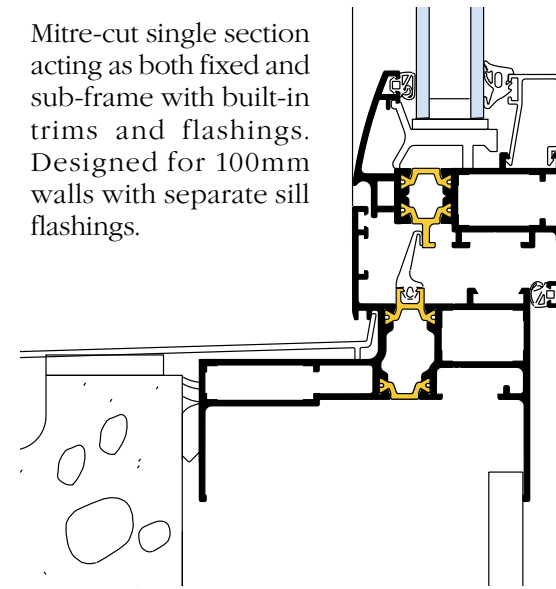
## Thermal break

The thermal bridge is provided by a double, fibre-glass reinforced, polyamide strip crimped onto the aluminium sections. These strips are flush-mounted to avoid water retention. Air gap: 9mm.

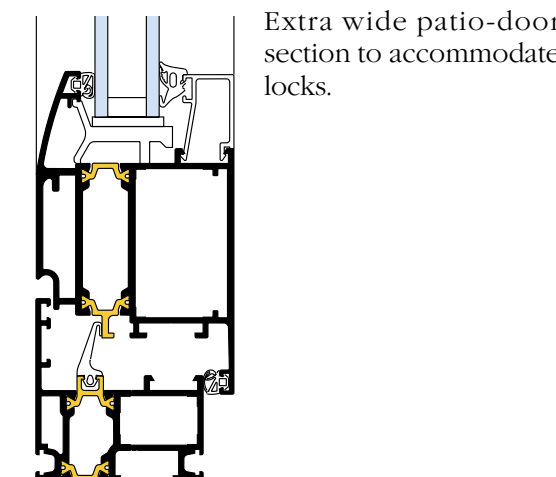


## Fixed/sub-frame

Mitre-cut single section acting as both fixed and sub-frame with built-in trims and flashings. Designed for 100mm walls with separate sill flashings.

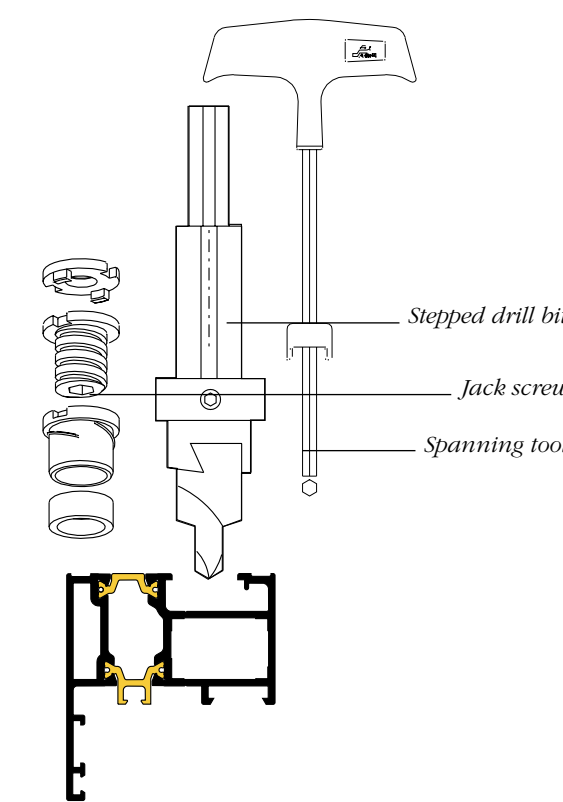


## Patio-door with lock



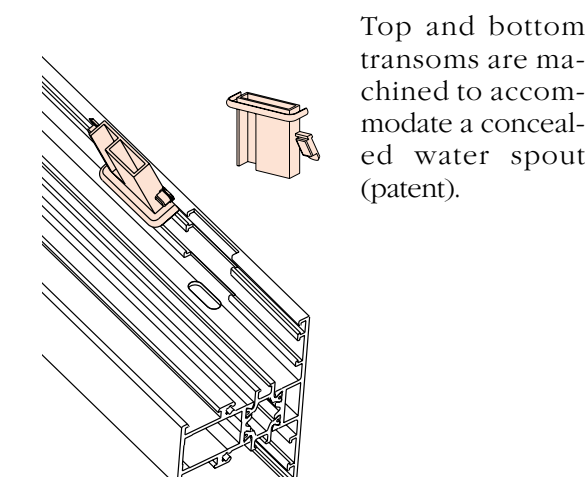
Extra wide patio-door section to accommodate locks.

## Jack screws



New jack screw design for installing frames. After drilling the section web with a stepped drill, the jack screw is fitted by means of a spanning tool and adjusted from the inside.

## Drainage system



Top and bottom transoms are machined to accommodate a concealed water spout (patent).

# PERFORMANCE RATINGS

## FX

### Air, water and wind performance (A E V)

Application	H x W (mm)	Classification
2-leaf window	1600x1600	A3 EE VE
1-leaf tilt-and-turn	1600x1200	A3 EE VE
Bottom-hung	800x1625	A3 EE VE
2-leaf patio-door	2150x1600	A3 EE V2

### Acoustic performance

Application	Glazing	Acoustic attenuation index	
		Road noise	
2-leaf window 1400x1400	4-12/4	30	33
	35/20	33	33

## FXi

### Air, water and wind performance (A E V)

Application	H x W (mm)	Classification
2-leaf window	1600x1600	A3 EE VE
1-leaf tilt-and-turn window	1600x1200	A3 EE VE
Bottom-hung	800x1625	A3 EE VE
Image 1-leaf patio-door	2150x1000	A3 EE VE
2-leaf patio-door	2150x1600	A3 EE V2
Eclat 2-leaf patio-door	2150x1600	A3 EE V2

### Acoustic performance

Application	Glazing	R (road) dB(A)	R (pink) dB(A)	R (W) dB	
				30	34
2-leaf window 1480x1460	climalit 35-20 40-31	4/12/4	30	33	34
		4/12/10	34	37	37
		9/12/10	38	39	40
1-leaf T&T window 1480x1230	climalit 35-20 40-31	4/12/4	30	32	33
		4/12/10	35	37	37
		9/12/10	39	41	42

### Thermal performance

Values from Technical Appraisal 6/98-1223 calculated using Tb-K 97 rules

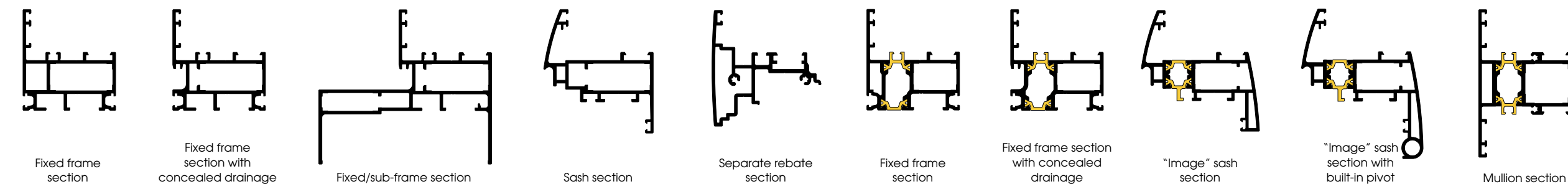
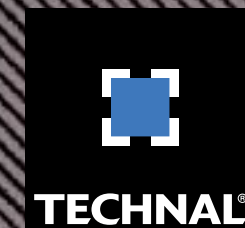
Application	Emissivity	Air gap	K central pane	Kn window	Average day/night U-value (K)				Solar factor S (window on inside wall)
					No shutter	Very high permeability shutter	Average permeability shutter	Low permeability shutter	
Fixed light 1.20 x 1.40m	Std	12	2.85	3.05	2.70	2.60	2.34	2.19	0.50
					2.12	2.06	1.87	1.79	0.46
					1.48	1.45	1.35	1.34	0.36
1-leaf window 1.20 x 1.40m or 1-leaf patio-door 0.90 x 2.15m	Std	12	2.85	3.15	2.78	2.68	2.41	2.25	0.45
					2.20	2.12	2.00	1.90	0.41
					1.72	1.68	1.54	1.51	0.33
2-leaf patio-door 1.40 x 2.15m	Std	12	2.85	3.10	2.74	2.64	2.38	2.22	0.43
					2.20	2.12	2.01	1.90	0.40
					1.76	1.71	1.57	1.53	0.32

Glazing should be in compliance with the addendum dated May 1998 of DTU 39.

## TOOLS ... DOCUMENTATION

All machining operations on FX, FXi can be carried out using a set of multi-purpose Perfopack® tools. A series of drill jigs and copy plates are also available for small series.

A technical catalogue and complete set of fabricating drawings are available from your local Technal distributor.





# FX, FXi casement windows and patio-doors

Saphir is Technal's latest robust, easy-to-fabricate, elegant range of casement windows and patio-doors. The 52mm sections used on both the standard (FX) and thermally-improved (FXi) ranges are perfectly compatible with Technal's new Saphir sliders (GX and GXi) enabling them to be installed side by side or in the same structure quite seamlessly.

### Attractive design

- Flush fixed and sash frames.
- Gently curved sash and central rebate sections.
- Drainage system concealed in external groove.
- Aluminium top and bottom rebate plugs to match finish.



FX frame

### Consistent design

- Same 52mm sections for FX and FXi.
- Shared accessories.



FXi frame

### FXi thermal break system

- Flush-mounted strip (9mm air gap).
- Procedure covered by technical appraisal.



### Glazing

- Accommodates up to 35mm-thick glazing.
- EPDM marine-quality, continuous gaskets with low fin.
- Straight or rounded internal glazing beads.

### Hinges

- Adjustable aluminium hinges.
- Polyamide bushings and stainless steel pins.



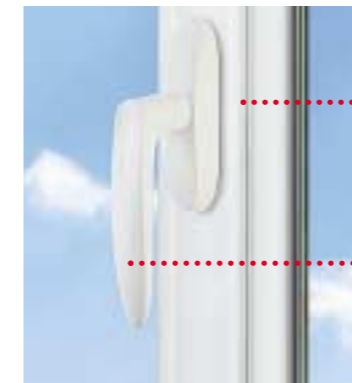
### "Image"

(FXi frames only)

- Gently rounded sash sections for 1- and 2-leaf inward-opening versions.
- Alternative concealed top and bottom pivot system replacing traditional hinges for 1- and 2-leaf inward-opening versions (patented system).

### Locks and handles

- Invisible handle mountings.
- Ergonomic Technal design handle.
- Lever handle with 7mm square and 43mm escutcheon plate.
- Tilt-and-turn version with tilt function first.



### "Eclat"

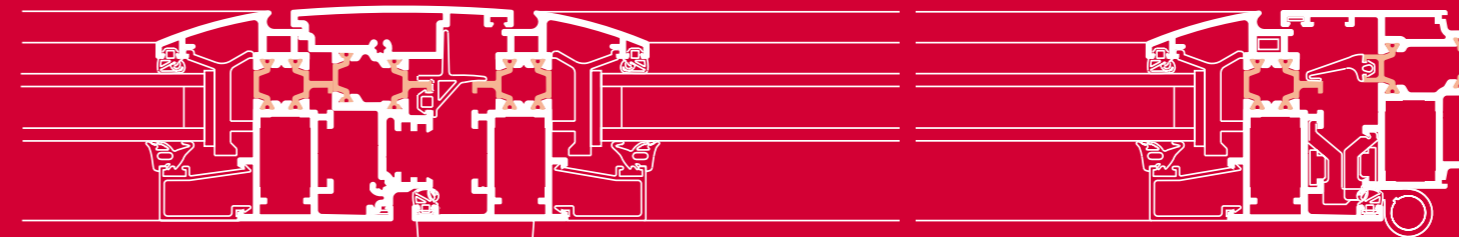
(FXi frames only)

- Rounded central rebate section with 115mm slim sight lines for 2-leaf inward-opening and tilt-and-turn frames.
- Handle centred on rebate.

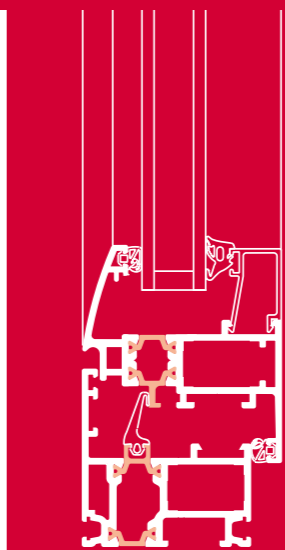
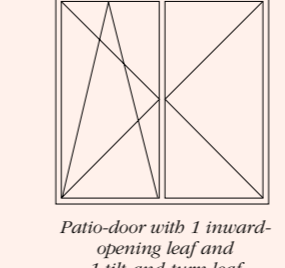
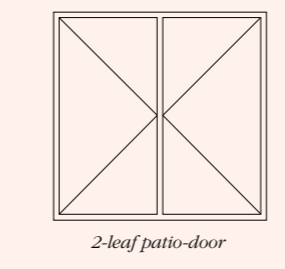
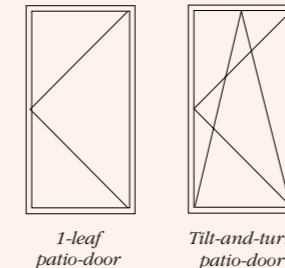
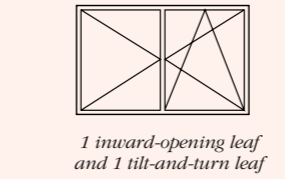
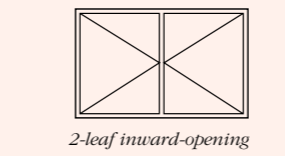
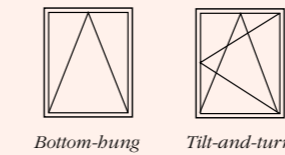
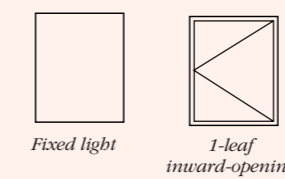
### Tests and performance ratings

FXi 2-leaf frame

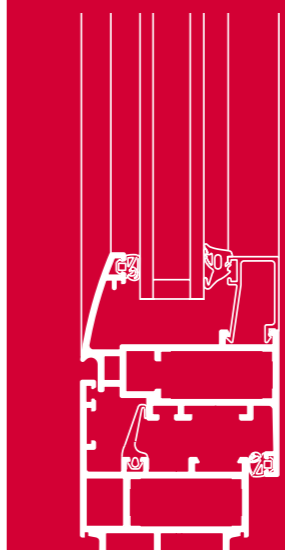
- A3 EE VE rating.
- 34dB(A) attenuation of road noise using 35/20 glazing.
- With low emissivity (0.20) 4/12/4 glass and an average permeability shutter, average day/night U-value (K) is 2.06 W/m<sup>2</sup> °C.
- Maximum leaf weight for tilt-and-turn hardware: 130kgs.



### Applications



Vertical cross-section of FXi



Vertical cross-section of FX

## INNOVATIONS

- Aluminium plug for 2-leaf applications in matching finish
- Top and bottom pivot system on inward-opening versions (patented)
- Concealed drainage system on sash transom (patented) and fixed frame

## composite frames

fixed lights, mullions, transoms, slider composites...

### Connecting sections

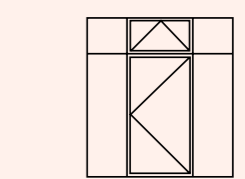


- Structure comprising 52mm fixed frame sections from FX and FXi ranges.
- GX, GXi peripheral sections for integration into FX, FXi structures.
- Mullions for top, bottom and side fixed lights.

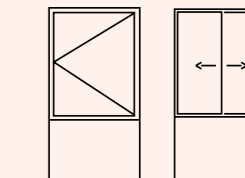
### Consistently designed casements and sliders

- Sliders and casements share the same 52mm module and are designed to be used along side one another in the same building.
- A full set of flashings, trims, sill flashings can be used with all four ranges.

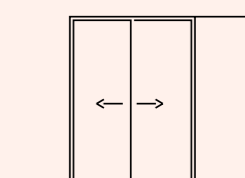
### Applications



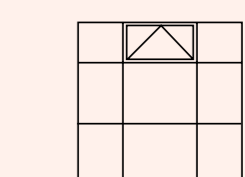
Door with fixed side lights and bottom-bung fanlight



Slider and casement over bottom fixed light



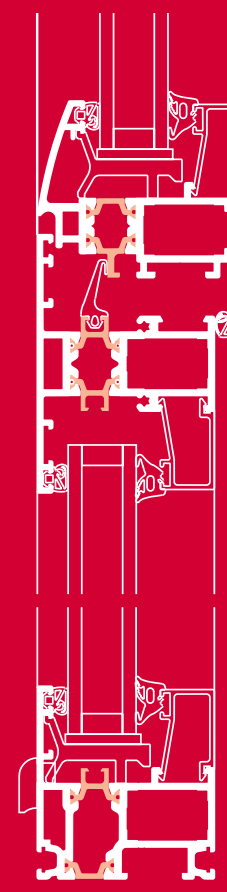
Slider with fixed side light



Fixed lights with bottom-bung fanlight



GXi slider

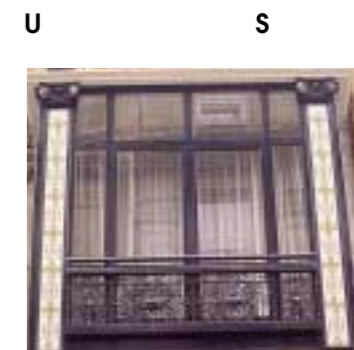


Vertical cross-section of FXi over fixed light



Vertical cross-section of GX frame in FX structure

A P A R T M E N T B L O C K S - O F F I C E S - R E F U R B I S H M E N T - A D M I N I S T R A T I V E B U I L D I N G S



H O U S E S