



CHAPTER VI

HARDWARE AND DOOR CONTROLS

6. HARDWARE & FIXINGS

The selection of the appropriate hardware is of paramount importance to ensure quality architectural aluminium products. The golden rule is to use the hardware recommended by the Architectural Aluminium Systems suppliers at all times. To deviate from this principle is tantamount to providing sub standard end products.

6.1 SASH LIMITATIONS

Distributors of Architectural Aluminium Systems recommend maximum vent (a.k.a. sash) dimensions for the numerous Architectural Systems. It may be required that multiple locking devices (i.e. handles and the like) are installed in sashes having maximum recommended dimensions in both height and width in order to meet certain AAAMSA Performance Test Criteria.

Sash Limitations					
Systems	Top Hung		Side Hung		Top/Side Hung
	Max. vent width in mm	Max. vent height in mm	Max. vent width in mm	Max. vent height in mm	Maximum perimeter in mm
Caselite 28	900	600	600	1200	3600
Caselite 38	1500	1200	700	1500	4400
HSG	1200	600	600	1500	4200
HSG	900	1200	-	-	4200
NuKlip 28	1200	600	600	1200	3600
NuKlip 28	600	1200	-	-	3600
System 30	1000	750	600	1200	3500
Universal 38	1500	1200	700	1800	5000
340 Series	1200	900	700	1500	4400
Coastal 42	1370	1370	1500	900	4800
Thermosash	1370	1370	1500	900	4800

6.2 FRICTION STAY LIMITATIONS

Distributors of Architectural Aluminium Systems have a wide range of stainless steel friction stay models which are used in conjunction with their window systems. Consult the Aluminium System provider for recommendations for the friction stay limitations. The following table reflect the capabilities of the standard range of friction stays:

Top Hung Windows – 4 Bar Stays (Typical Single Glazing)				
Ref #	Max. vent width in mm	Max. vent height in mm	Max. vent weight in kg	Angle of Opening Degrees
203	1100	300	7	70
254	1100	375	8	57
300	1100	450	10	90
406	1100	600	13	90
508	1100	750	16	50
610	1100	900	26	60
570HD	1100	1200	40	90

Top Hung Windows – 4 Bar Stays (Typical Double Glazing)				
Ref #	Max. vent width in mm	Max. vent height in mm	Max. vent weight in kg	Angle of Opening degrees
150	1200	300	10	50
200	1200	350	12	50
250	1200	400	16	80
300	1200	550	20	80
400	1200	750	21	80
500	1200	1000	24	50
500	1200	850	24	50
600	1200	1200	35	34.5

Side Hung Windows – 5 Bar Stays (Typical Single Glazing)				
Ref #	Max. vent width in mm	Max. vent height in mm	Max. vent weight in kg	Angle of Opening degrees
300	600	1200	13.5	60

Side Hung Windows – 5 Bar Stays (Typical Double Glazing)				
Ref #	Max. vent width in mm	Max. vent height in mm	Max. vent weight in kg	Angle of Opening degrees
300	600	1300	22	60
300L	600	1300	22	60
400	700	1300	24	60

6.3 ALUMINIUM FRICTION HINGE LIMITATIONS

Top Hung Windows – Aluminium Friction Hinge			
Ref #	Max. vent height in mm	Max. vent weight in kg	Angle of Opening degrees
200N4B	600	6	49
200N4BV	400	6	30
250N4B	750	6	49
300N4B	1000	7	38
500M4B	1300	12	29
750N4B	1800	13	27

Side Hung Windows – Aluminium Friction Hinge			
Ref #	Max. vent height in mm	Max. vent weight in kg	Angle of Opening degrees
300N4BC	600	20	54
300N4BC	750	16	54

NOTE: This guide is based on standard available shopfront profiles and using standard hardware and fittings. These systems are designed for internal use only and are not designed to be fully weatherproof.

6.4 DOOR CONTROLS

6.4.1 DEFINITIONS

A door control (door closer or floor spring) is used to control the closing movement of a hinged door.

There are three basic types of door control:

- Overhead door closer.
- Floor spring.
- Transom concealed door closer.

6.4.2 WHERE DOOR CONTROLS ARE USED

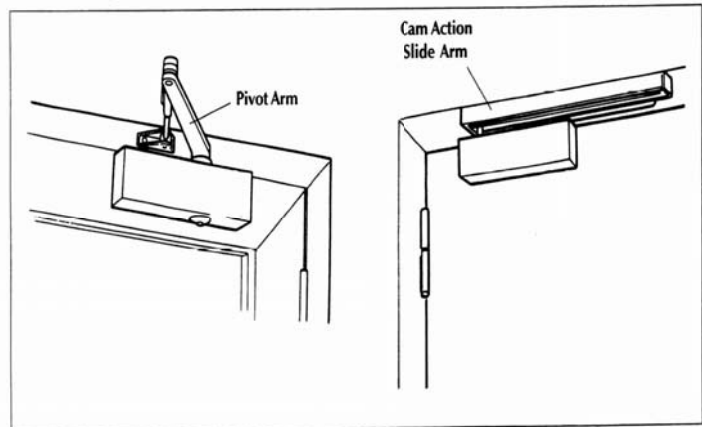
- On any internal door which is required to be kept closed when unattended (e.g. doors in kitchens, toilets, etc.).
- On any main entrance door which needs to be kept closed for reasons of wind and weather.
- On any fire door, internal or external, which must be closed in the event of fire (See later descriptions of electronic hold open and release devices and synchronized closing).

6.4.3 MAIN TYPES OF DOOR CONTROLS

OVERHEAD SURFACE MOUNTED DOOR CLOSERS

An overhead door closer comprises:

- Door closer unit.
- Arm (pivot arm or slide arm).



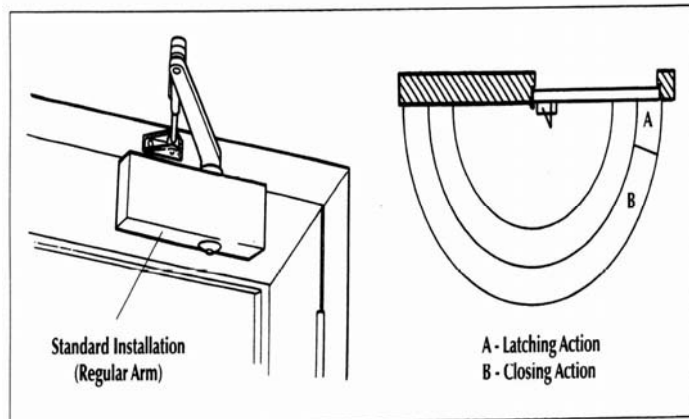
FACTORS TO CONSIDER WHEN SELECTING AN OVERHEAD DOOR CLOSER

DOOR CLOSERS MOUNTED ON THE "PULL-SIDE" OF THE DOOR (REGULAR ARM)

- Most common application for interior doors.
- Closer mounted to the door with the arm fixed to the frame.

Provide: Space behind the door - avoid the closer hitting the adjacent wall.

Specify: Regular arm door closer.



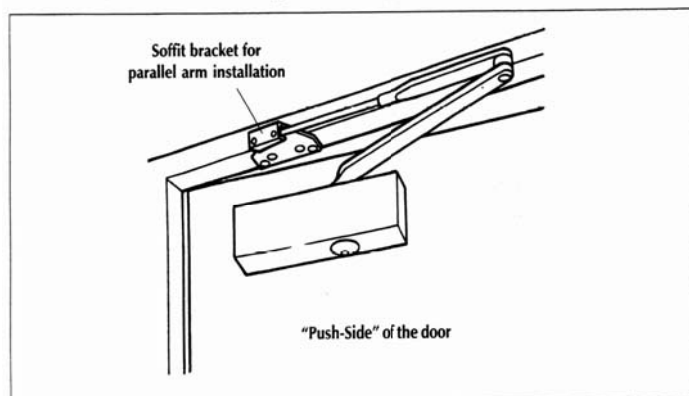
DOOR CLOSER MOUNTED ON THE "PUSH-SIDE" OF THE DOOR

- For doors opening to the exterior.
- There are two methods of fixing.

Parallel arm mounting

- Closer mounted to the door and the arm to the frame via a soffit bracket.

Specify: Parallel arm door closer.

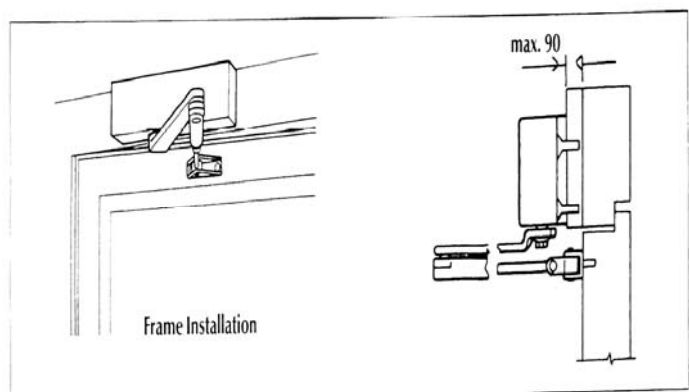


Frame mounted closer (regular arm)

- Closer mounted directly to the frame or on a drop plate, with arm fixed to door

Note: The limit of 0-95mm frame reveals depth, depending on the type of door closer used.

Specify: Regular arm door closer (for frame mounting).



6.4.4 DOOR WIDTH AND MASS

Door Closer Size	Max. recommended Door leaf Width mm	Max. Door Mass kg	Closing Moment		
			Between *		Between
			Nm Min.	Nm Max.	Nm Min.
1	750	20	9	< 13	3
2	850	40	13	< 18	4
3	950	60	18	< 26	6
4	1100	80	26	< 37	9
5	1250	100	37	< 54	12

*Note: That between 0° - 4°, the operating force is at its maximum.

- NOTE: 1) Where the actual size and mass of a door to which the door closer is to be fitted exceeds the maximum width or mass, the next size up should be used.
- 2) The door widths given are for standard installations. In the case of unusually high or heavy doors, windy or draughty conditions, or special applications, a larger power size of closer should be used.

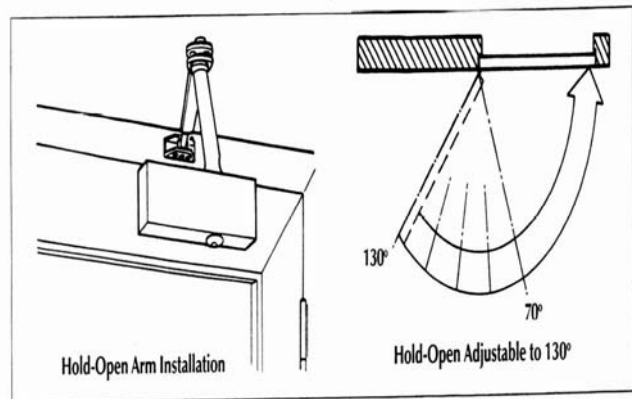
HOLD OPEN REQUIREMENT (MECHANICAL HOLD OPEN ARM)

- For door requiring to be held open, such as for goods loading.
- Hold open arm is adjustable to hold open from 70 to 130°.

Specify: Regular arm or parallel arm closer with "Hold Open"

NOTE: Do not fit a hold open closer to a fire door, as all fire doors must be self-closing.

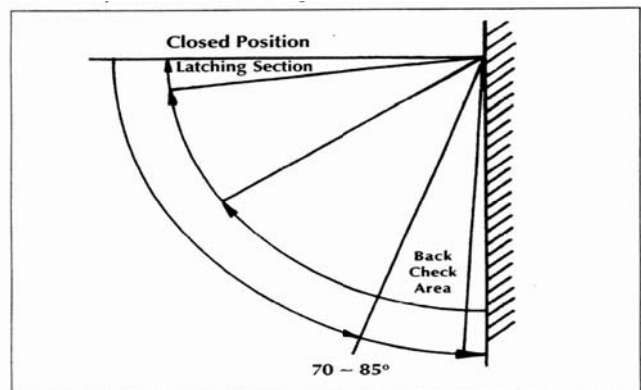
(Government Gazette 3805 Section 4, 1 March 1985)



BACK CHECK REQUIREMENT (CHECK OPENING ACTION)

- To stop the door hitting an adjacent wall or obstruction.
- To control a door opening into a windy environment.
- Backcheck adjustable from 70°.
- (Can be adjustable, but may be pre-set).

Specify: Regular arm or parallel arm closer with "back check".

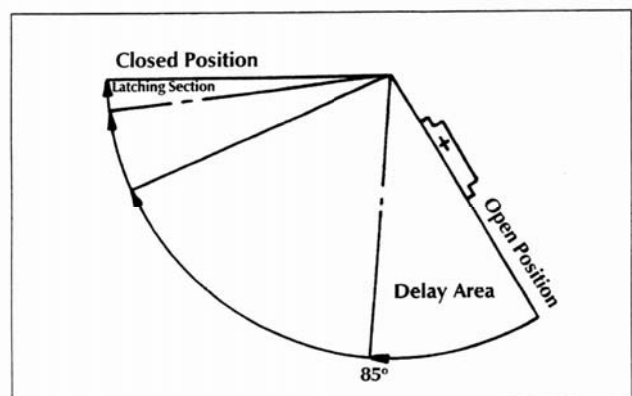


DELAYED CLOSING (AUTOMATIC HOLD OPEN FOR UP TO 2 MINUTES)

- For doors used by handicapped people in wheelchairs.
- For doors in loading areas which must stay open for short periods of time.

Specify: Regular arm or parallel arm closer with delayed opening.

NOTE: To fit an overhead door closer, always use the template provided by the manufacturer.

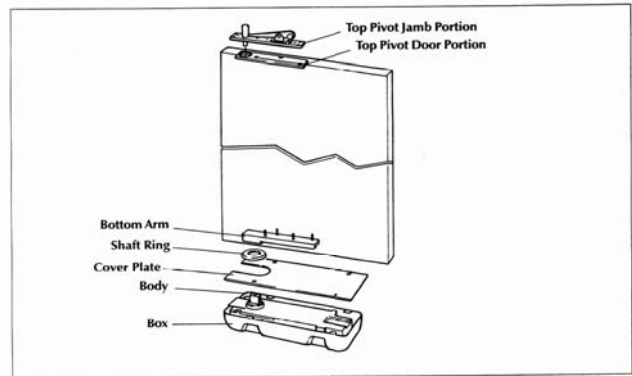


FLOOR SPRINGS

A floor spring comprises:

- Floor spring unit set into the floor.
- Bottom door strap.
- Top door strap.
- Top centre with retractable pin.

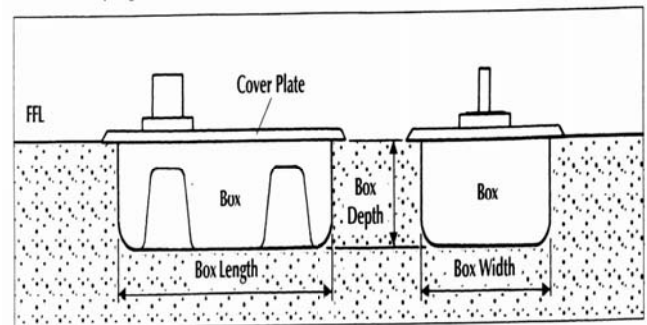
NOTE: A door on a floor spring does not require hinges.



FACTORS TO CONSIDER WHEN SELECTING A FLOOR SPRING

FLOOR DETAIL AND FINISH

- Floor spring box depth up to 75mm must be set into the floor, flush with finished floor level (FFL).
- Weatherstrips, steps or ramps may interfere with floor spring fixing.
- Reinforcing in the floor, electrical conduits or timber floors may not allow floor spring to be fitted.



6.4.5 DOOR WIDTH AND MASS

Door Closer Size	Max. recommended door Leaf Width mm	Max. Door Mass kg	Closing Moment		
			Between * 0° - 4°		Between 88° - 92°
			Nm Min.	Nm Max.	Nm Min.
2	850	40	13	< 18	4
3	950	60	18	< 26	6
4	1100	80	26	< 37	9
5	1250	100	37	< 54	12
6	1400	120	54	< 87	18
7	1600	160	87	< 140	29

**Note that between 0° - 4°, the operating force is at its maximum*

- NOTE:*
- 1) Where the actual size and mass of a door to which the floor spring is to be fitted exceeds the maximum width or mass, the next size up should be used.
 - 2) The door widths given are for standard installations. In the case of unusually high or heavy doors, windy or draughty conditions, or special applications, a larger power size of floor spring should be used.

6.4.6 NARROW DOORS

For doors narrower than those shown in the table, the floor spring may make the door “too heavy” to open. A special light action floor spring may be required.

Specify: Lower strength floor spring for specified door size and weight.

6.4.7 EXPOSED LOCATIONS

For doors exposed to abnormally windy conditions, a stronger floor spring may be required. But consideration of the type of building and the people likely to operate the doors should be given before specifying a stronger floor spring.

6.4.8 BACK CHECK REQUIREMENT (CHECKING ACTION AT 70°)

To stop the door hitting an adjacent wall or obstacle.
To avoid the abuse of the door in high traffic areas.

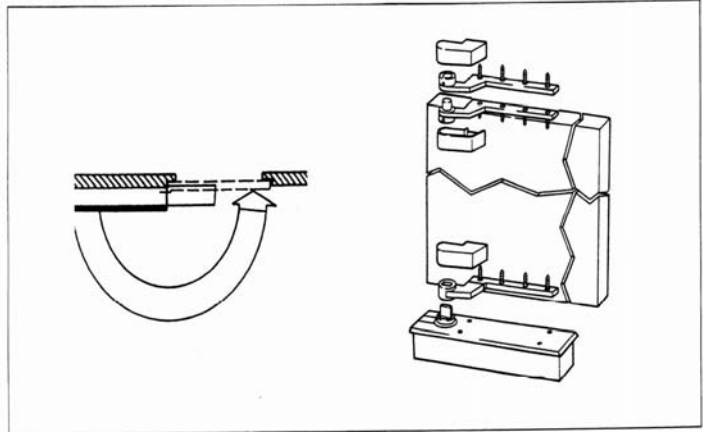
DOOR OPENING ACTION

Single action

- Door opens one way only.
- Door hangs on cranked fittings which close the door into a rebated frame.

Specify: Single action floor spring for specific door weight, size, construction and opening angle (e.g. 90°, 150°, 130°) Specify door stop or backcheck).

NOTE: For fire exit doors, do not specify single action opening inwards.

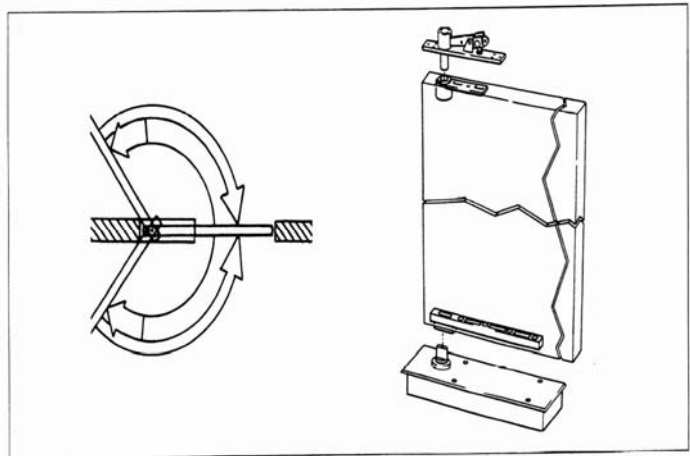


Double action

- Door is centre pivoted.
- Door opens 90° both ways.
- Because door swings both ways, the door should be fully glazed or have a glazed view panel.

Specify: Double action floor spring for specific door weight, size, construction and maximum opening angle.

NOTE: Double action floor spring must not be used for fire control doors, but may be used for smoke check doors under certain circumstances, with the approval of the Fire Prevention Officer. All approved fire doors must have rebates.



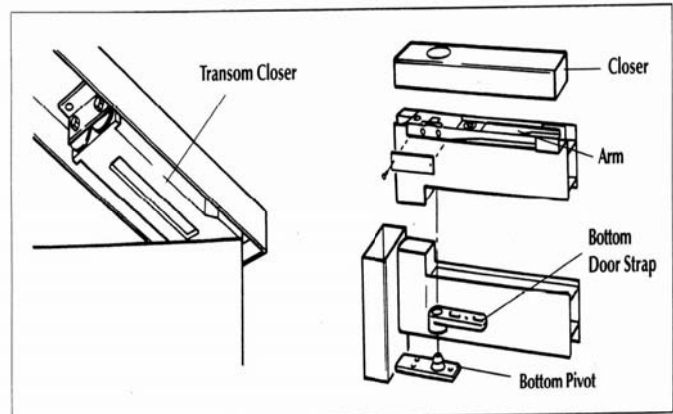
TRANSOM CONCEALED CLOSERS

Used:

- Where threshold details prevent the use of the floor spring. (e.g. modern buildings where floor slabs and screeds may be thin).
- In hygienic environments where the mechanism is best completely concealed.

Closer comprises:

- Transom closer fitted into a standard aluminium transom.
- Top door strap/arm.
- Bottom door strap (for double action).
- Bottom pivot (for double action).



FACTORS TO CONSIDER WHEN SELECTING A TRANSOM CONCEALED DOOR

DOOR WIDTH AND MASS

Door Closer Size	Max. recommended door Leaf Width mm	Max. Door Mass kg	Closing Moment		
			Between * 0° - 4°		Between 88° - 92°
			Nm Min.	Nm Max.	Nm Min.
2	850	40	13	< 18	4
3	950	60	18	< 26	6
4	1100	80	26	< 37	9

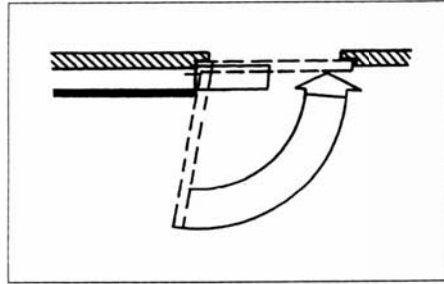
* Note that between 0° - 4°, the operating force is at its maximum

- NOTE:**
- 1) Where the actual size and mass of a door to which the door closer is fitted exceeds the maximum width or mass, the next size up should be used.
 - 2) The door widths given are for standard installations. In the case of unusually high or heavy doors, windy or draughty conditions, or special applications, a larger power size of closer should be used.

DOOR OPENING ACTION

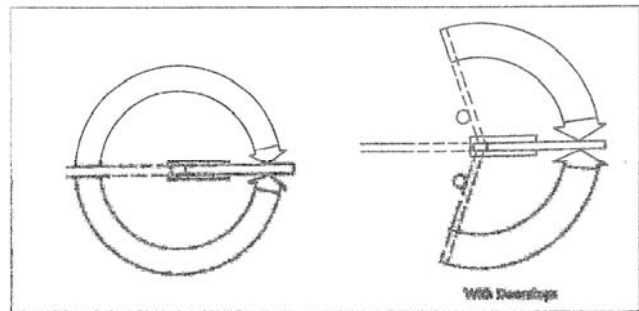
Single action

- Door opens one way only.
- Door closes into rebated frame.
- No hinges are needed with this application.
- Offset arm with slide channel is fitted into the door.



Double action

- Door opens both ways.
- No hinges are needed.



6.4.9 IN-DOOR CONCEALED CLOSER

This type of door closer is concealed inside the top of the door.

- Suitable for interior doors only.
- Single action only.

Closer Comprises:

- Closer body which fits into the top of a door - min 45mm thick.
- Arm linked to a slide channel in the frame.

Performance characteristics correlate to those of overhead surface mounted door closers.

Specify: In-door concealed closer.

6.5 SPECIAL DOORS

6.5.1 OVERSIZE AND HEAVY DOORS

Where doors exceed the sizes and weights shown in the respective closer tables, consult a closer manufacturer before specifying.

6.5.2 FIRE DOORS

Fire doors are covered under the National Building Regulations and all require to be fitted with closers. Regulations also lay down the following criteria for specifying closers for fire doors:

- a) Closers should be firmly fixed and not able to be easily removed.
- b) The closer should not have a mechanical hold-open facility (if the door requires to be held open, it should be fitted with an electromagnetic catch which releases in the event of fire and allows the door to close).
- c) The closer must have a positive latching action to overcome to possible resistance of door latches.
- d) The closer must close the door effectively from any angle.

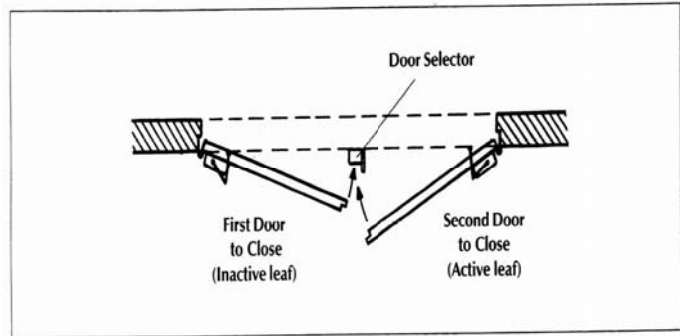
Specify: Overhead door closer with electromagnetic hold-open device of required.

NOTE: The majority of fire doors have overhead door closers.

DOUBLE DOORS WITH DOOR SELECTOR

Double doors normally have rebated meeting stiles or a metal overlapping seal. If they are fitted with door closers, a door selector must be specified to enable the doors to close in the correct sequence.

Specify: Overhead door closers or floor springs with door selector.



Door Control Selector Guide	Overhead Surface Mounted Closers							Floor Springs		Transom Concealed Closer		In-door Concealed Closer	Door Selector	Electro Magnetic Hold Open Device
	Regular arm (Door Mounted)	Regular Arm (Frame Mounted)	Parallel Arm	Hold Open	Back Check	Delayed Action	Slide Channel	Single Action	Double Action	Single Action	Double Action			
Interior Door - Single	•	•	•				•	•	•	•	•	•		
Exterior Door - Inward Opening	•			•			•	•		•				
Exterior Door - Outward Opening		•	•	•				•	•	•				
Interior Door - Limited Space	•	•	•	•	•			•	•	•	•	•		
Interior Fire Door - Single	•		•					•						•
Interior Fire Door - Double	•		•					•					•	•
Exterior Fire Door - Double	•	•						•					•	
Int./Ext. Door - High traffic								•	•	•	•			
Int./Ext. Paraplegic (Light Action)	•	•	•			•		•	•	•	•			
Wide Door (Over 1400mm)								•	•					
Heavy Door (Over 120 kg)								•	•					
Door with Concealed Closer								•	•	•	•	•		
Clean / Hygienic Areas										•	•	•		

6.5.3 SLIDING FOLDING DOORS – BOTTOM ROLLING

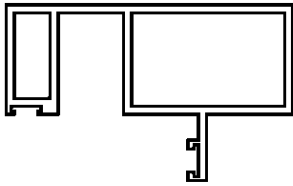
Bottom rolling doors (Foldaside)

- Maximum practical door width: 900mm (up to 2100mm high)
750mm (up to 2700mm high)
- Maximum practical door height: 2700mm
- Maximum practical number of door hinged together and to frame or end pivot: 5
- Maximum mass per door leaf: 70kg

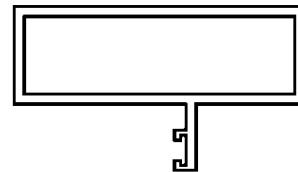
This guide is based on standard available shopfront profiles using available hardware and fittings. These systems are designed for internal and external use. Certain frames may be waterproof.

Recommended aluminium profiles for sliding/folding doors

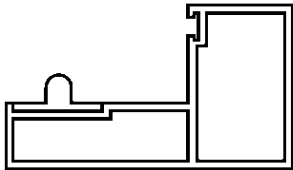
Top guide frame system designed



Side frame - Min 26 series or system designed

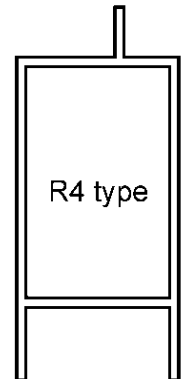
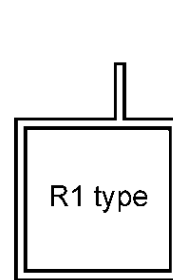
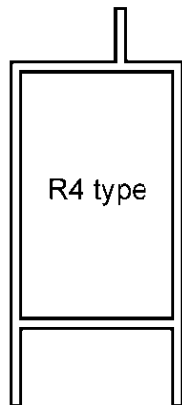
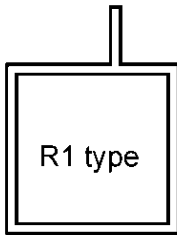


Bottom track frame system designed or track set into floor

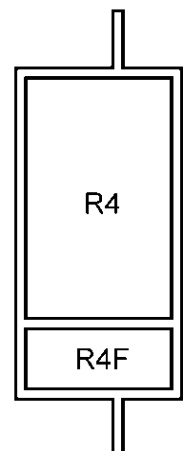
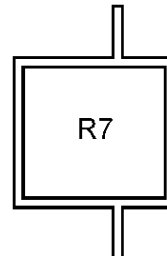
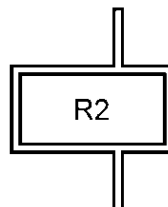


Door Stiles

- Min R1 type up to 2100mm high
- Use R4 type up to 3000mm high



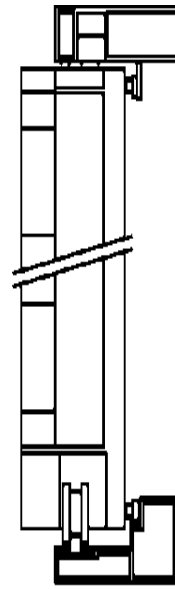
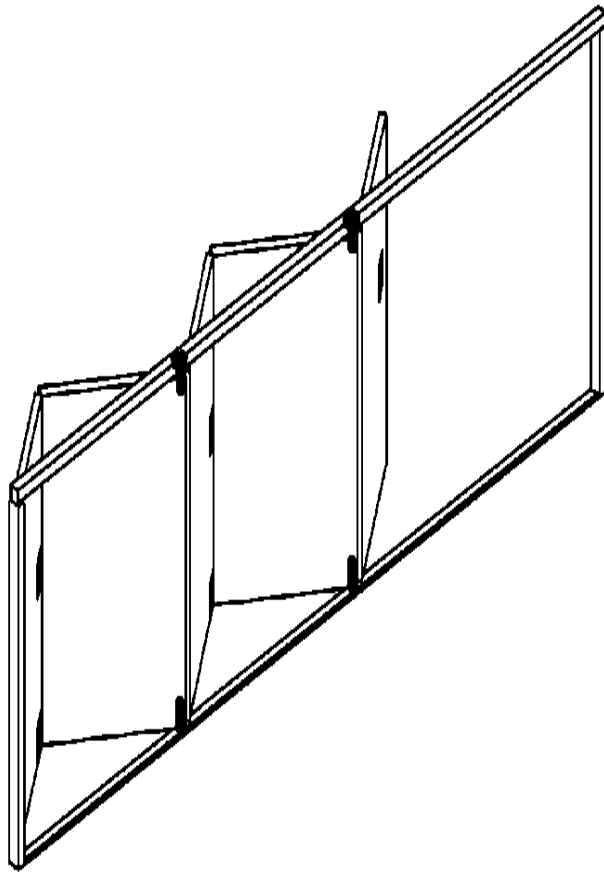
Midrails - Where applicable
R2, R7 or R4 type



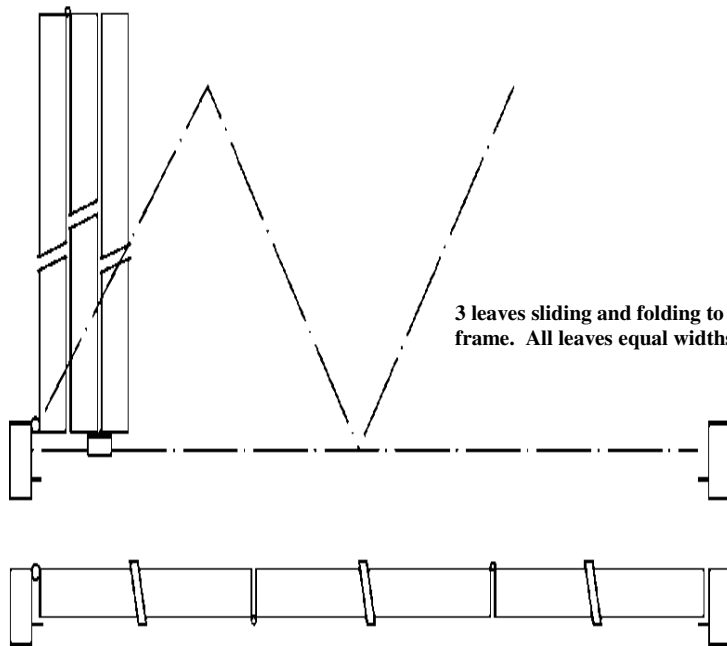
Glazing Beads - Square or bevel to suit



**SLIDING FOLDING DOORS
BOTTOM ROLLING**



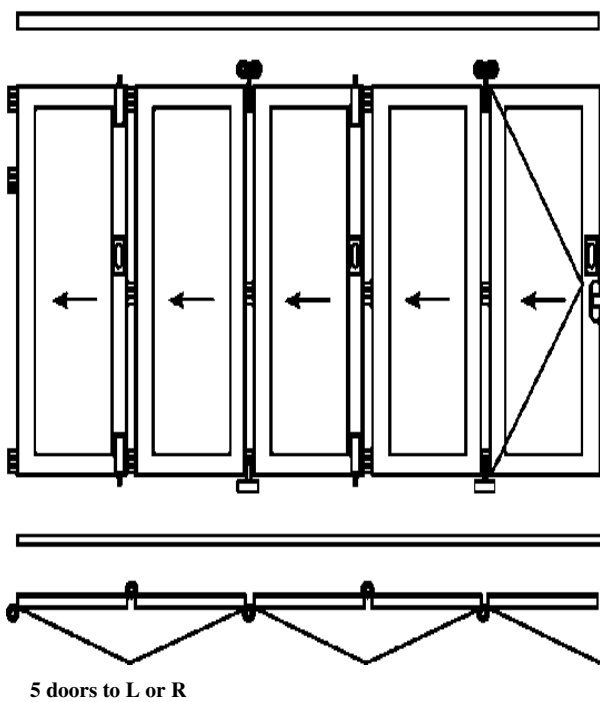
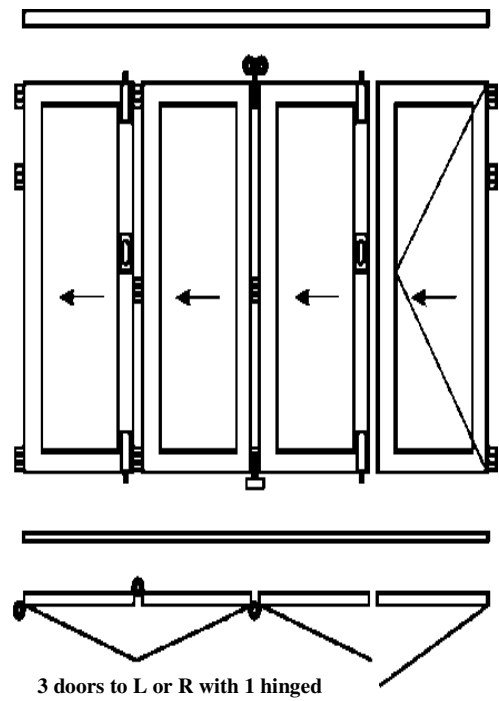
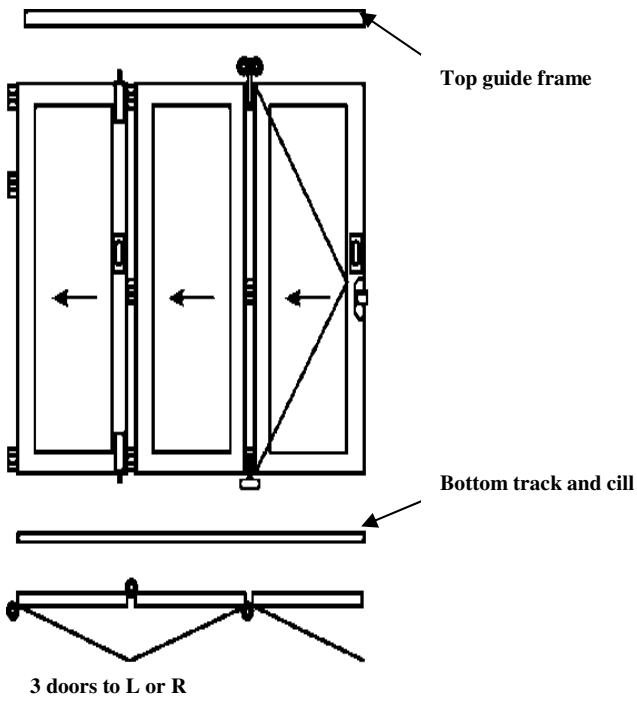
Typical section
throughout frame and
door









3 leaves sliding and folding to one side pivoted at
frame. All leaves equal widths.

Typical plan of 3 leaves folding to one side - Pivot to frame
Door leaves all equal widths

**SLIDING FOLD DOORS – BOTTOM ROLLING
WHERE TO FIT THE HARDWARE**

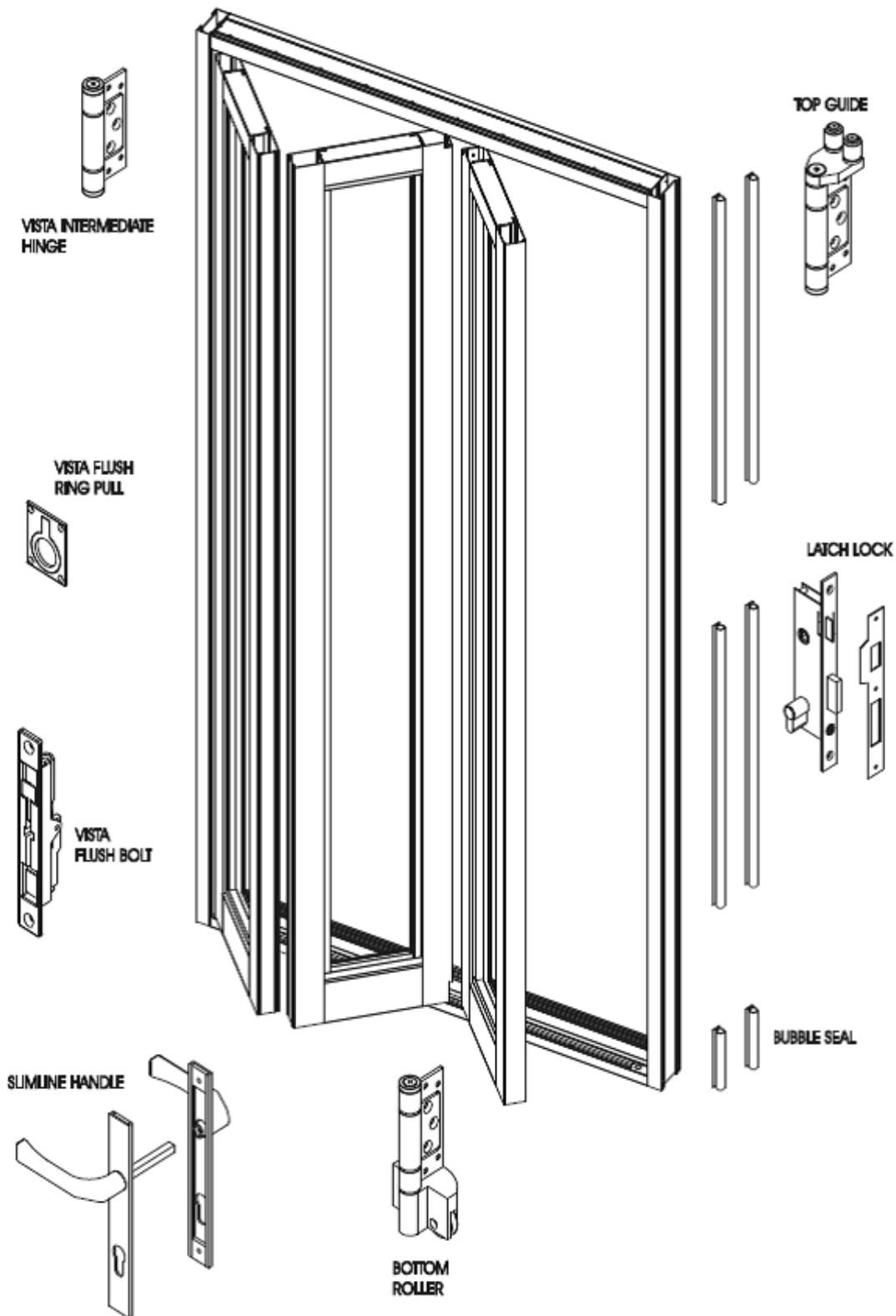


HARDWARE REQUIRED:

-  Bottom Roller
-  Top guide
-  Hinge
-  Flush handle
-  Flush bolt
-  Dead lock

**
+* Use 1 or 2 locks
depending on door
height

Generic Hardware for a Bottom Rolling Sliding Folding Door



6.5.4 SLIDING FOLDING DOORS – TOP HUNG

Top hung doors (Foldaside)

Maximum practical door width: 900mm (up to 2100mm high)
750mm (up to 2700mm high)

Maximum practical door height: 2700mm

Maximum practical number of door hinged together and to frame or end pivot: 5

Maximum mass per door leaf: 50kg

This guide is based on standard available shopfront profiles using available hardware and fittings. These systems are designed for internal and external use.

Recommended aluminium profiles for sliding/folding doors

For top hung doors, top track is fixed to brickwork or to a R26 type transom

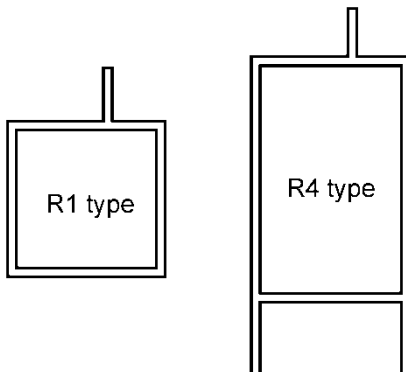


Side Frame - Min 26 Series

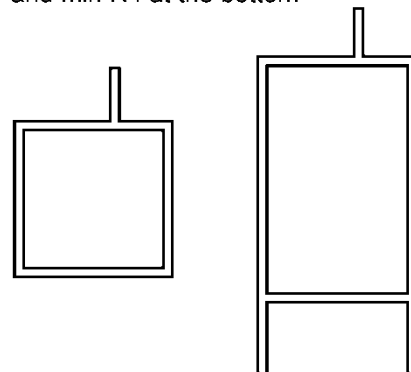


Door Stiles

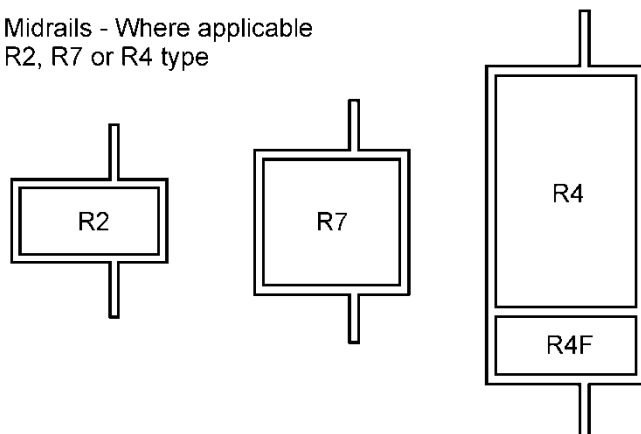
- Min R1 type up to 2100mm high
- Use R4 type up to 3000mm high



Door Rails - Min R1 type at the top and min R4 at the bottom



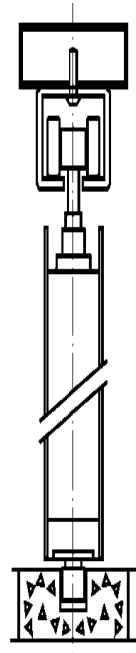
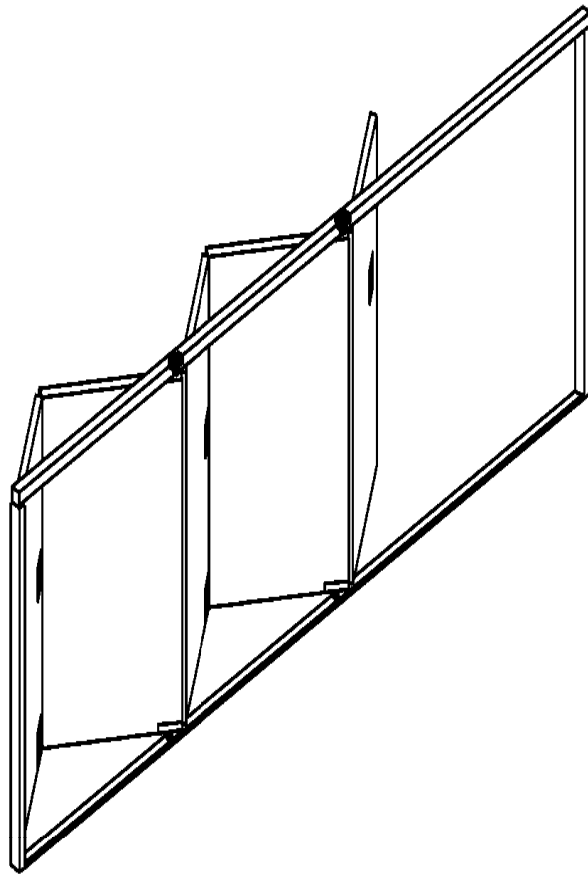
Midrails - Where applicable
R2, R7 or R4 type



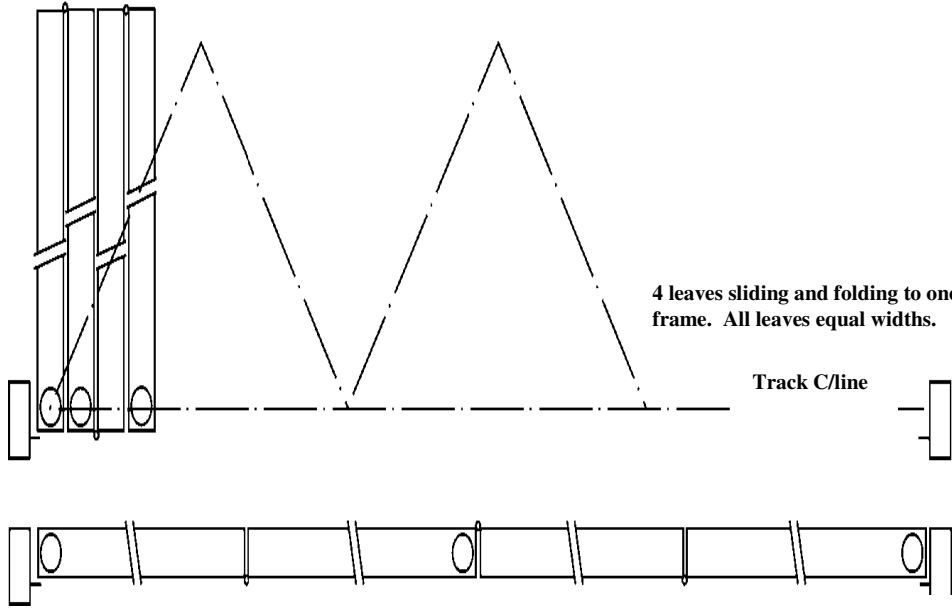
Glazing Beads - Square or bevel to suit



**SLIDING FOLDING DOORS
TOP HUNG**



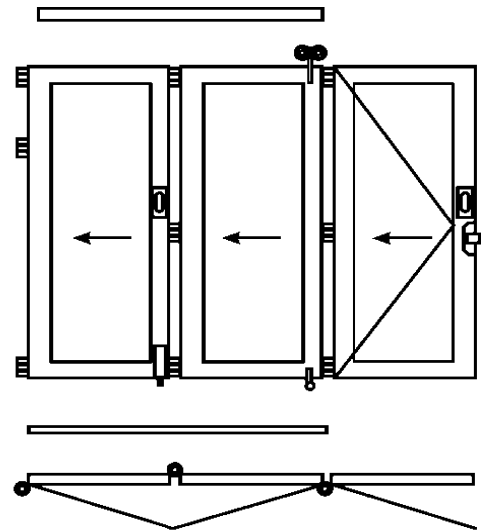
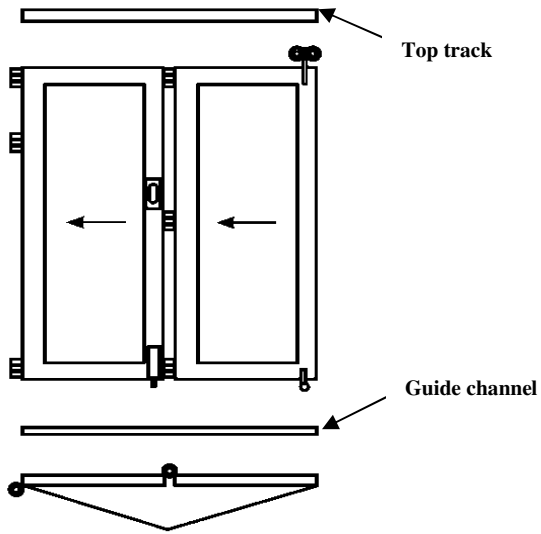
Typical section through top track door and guide channel



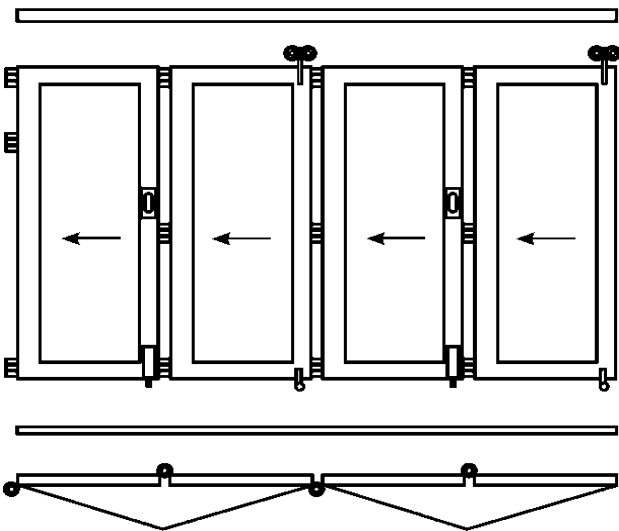
4 leaves sliding and folding to one side pivoted at frame. All leaves equal widths.

Typical plan of 4 leaves folding to one side – pivot to frame. Door leaves all equal widths







**SLIDING FOLDING DOORS – TOP HUNG
WHERE THE HARDWARE FITS**

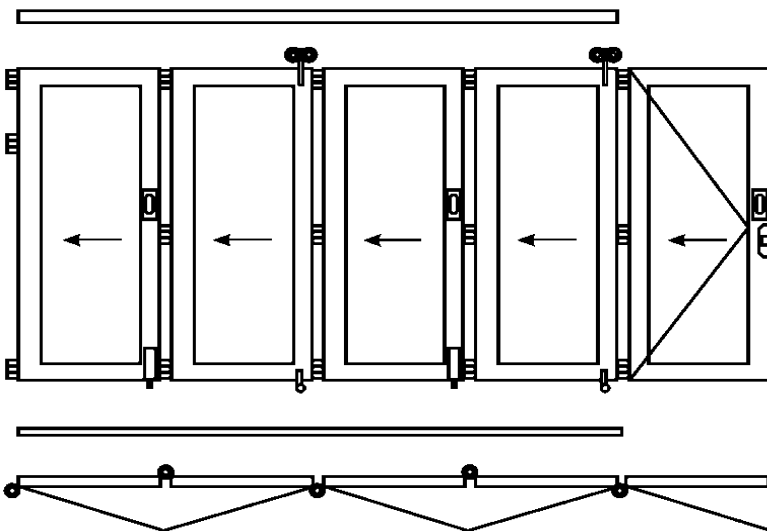


3 doors to L or R



HARDWARE REQUIRED:

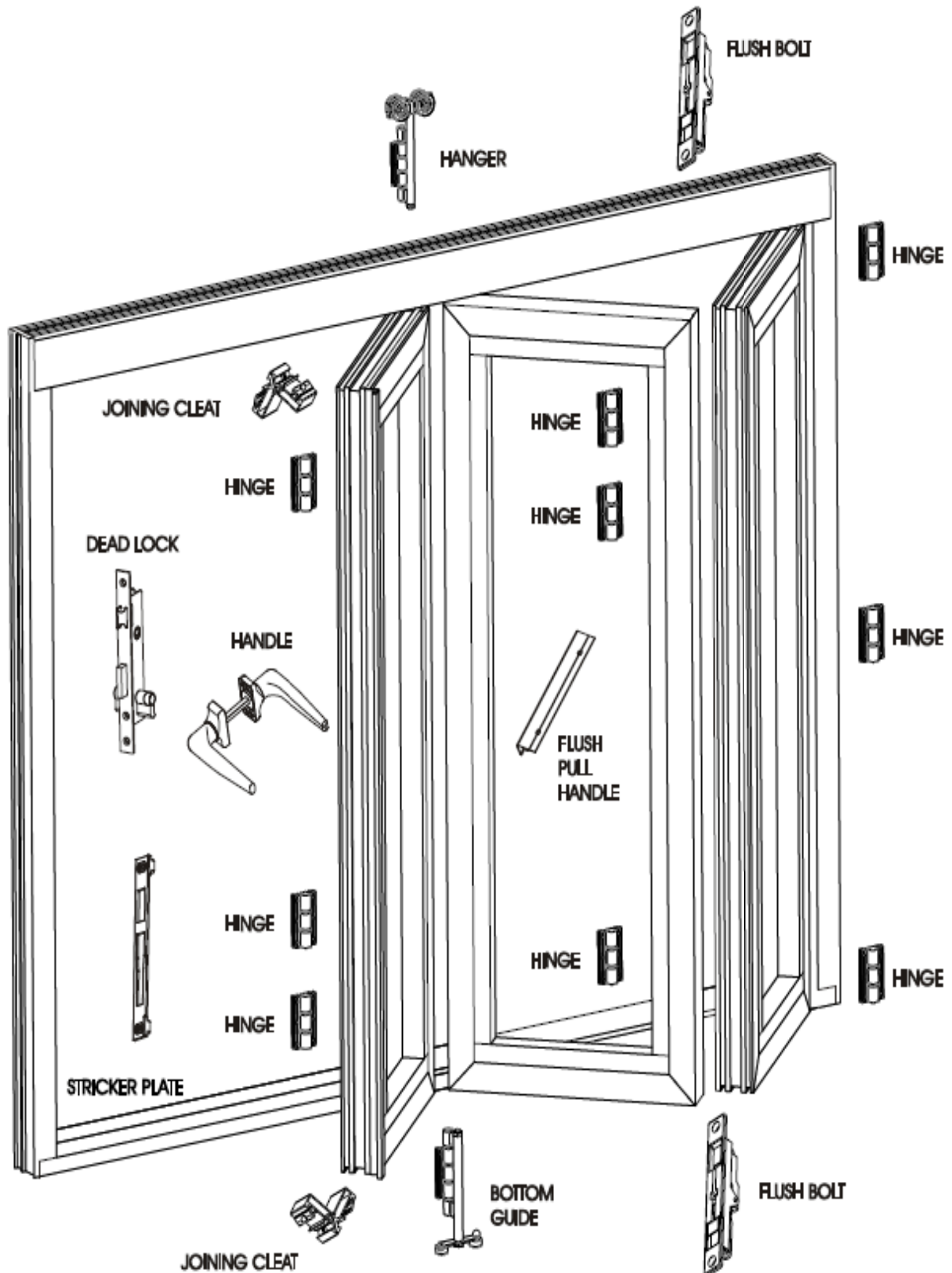
-  Top Hanger
-  Bottom Guide
-  Hinge
-  Flush handle
-  Flush bolt
-  Dead Lock



5 door to L or R

**
** Use 1 or 2 locks
depending on the door
height

Generic Hardware for a Top Hung Sliding Folding Door



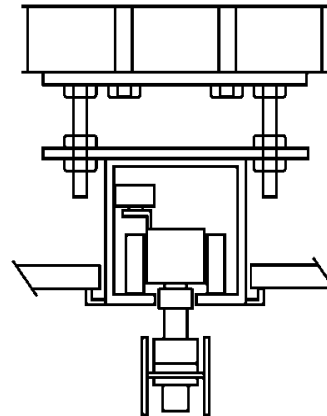
6.5.5 STACKING DOORS

(Stackway) Top Hung doors

- Maximum practical door width: 1200mm
- Maximum practical door height: 3000mm
- Maximum No. of doors in system: UNLIMITED
- Maximum mass per door leaf: 150kg

This guide is based on standard available aluminium shopfront profiles using available hardware and fittings. These systems are designed for internal use only and are not designed to be fully weather-proof.

For top hung doors, top track is fixed to brickwork normally with a suspension bracket fixing

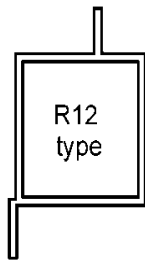


Recommended aluminium profiles for stacking doors
Side Frames - Min 26 Series

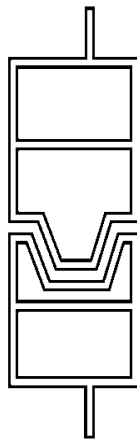


Door Stiles

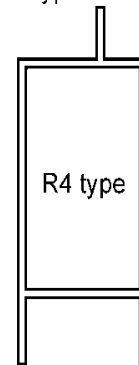
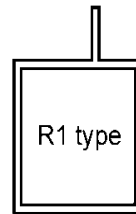
- For bottom rolling doors, R12 type
- For top hung doors, R1 or R7 type with suitable



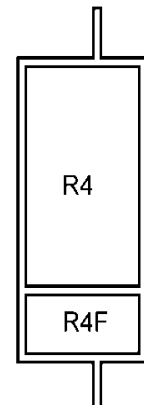
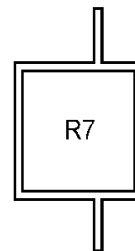
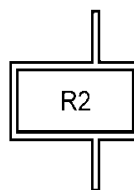
R7 type with male female adaptors



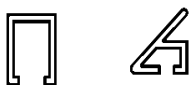
Door Rails - Min R1 type at the top and min R4 type at the bottom



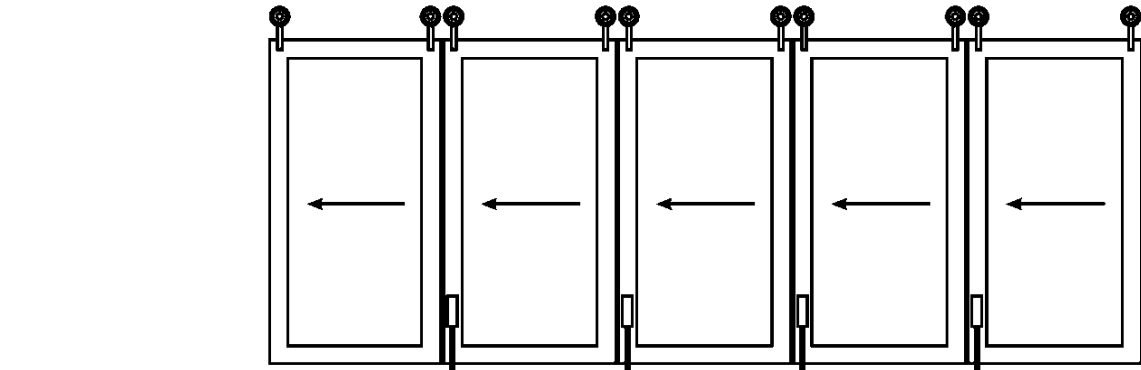
Midrails - Where applicable
R2, R7 or R4 type



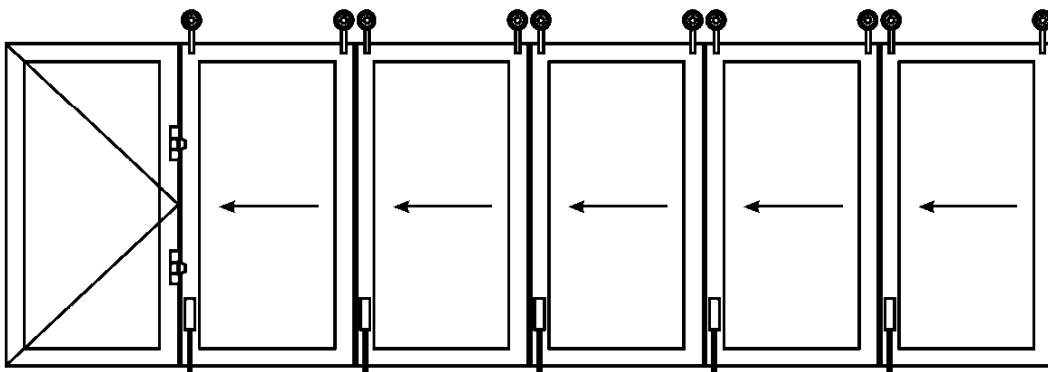
Glazing Beads - Square or bevel to suit






STACKING DOORS - TOP HUNG
Doors stacking behind a fixed panel



Doors stacking against hinged door

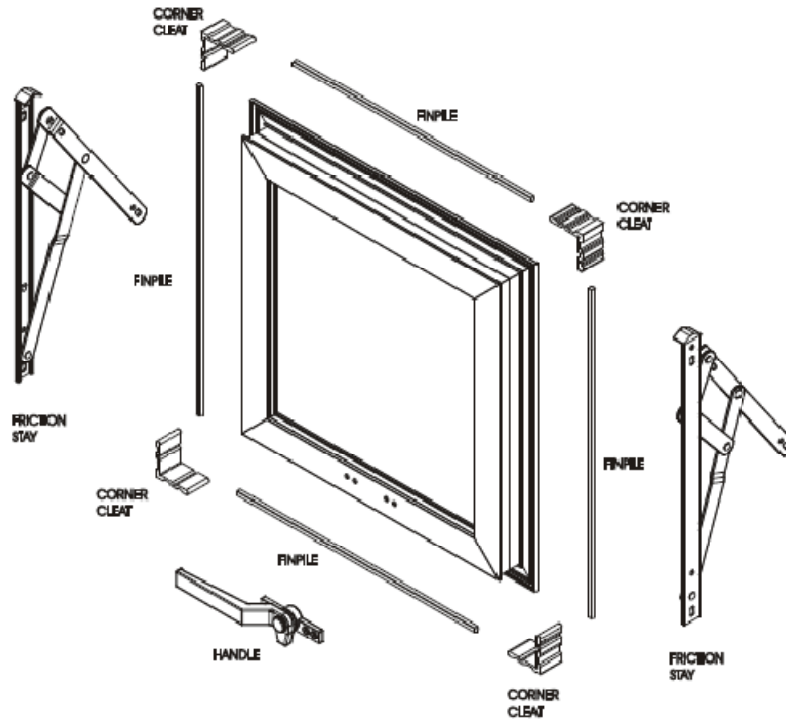


-  Hanger
-  Flush Bolt
-  Dead Lock



6.6 GENERIC FENESTRATION HARDWARE

Generic Hardware for a Top Hung Casement Window



Generic Hardware for a Side Hung Casement Window

