

IANBENNIE AND ASSOCIATES

TEST REPORT NO. 6044-S2-NZ-2014

**WINSA/EVEREST UPVC AWNING WINDOW
PROTOTYPE TEST to NZS 4211-2008**

for

DECEUNINCK

March 2019



Accreditation No. 2371
Accredited for compliance with ISO/IEC 17025 - Testing



IAN BENNIE & ASSOCIATES PTY. LTD.

Building Performance Testing

ACN : 007 133 253

TEST REPORT NUMBER 6044-S2-NZ-2014

CAVEAT: THIS REPORT IS BASED ON THE PREMISE THAT NO DETAILING OR MATERIAL HAS CHANGED SINCE THE ORIGINAL 2006 TEST - NO LIABILITY FOR ANY SUBSEQUENT CHANGES IS APPLICABLE

Test Client: DECEUNINCK

Sample

Identification: A WINSA/EVEREST UPVC Awning Window, measuring, 1500 mm in height x 900 mm in width. The sample is detailed in the DECEUNINCK drawings given in Appendix B .

Test Method: Tests were conducted and performance was assessed in accordance with the Serviceability Deflection, Air Infiltration, Water Penetration and Ultimate Strength procedures of New Zealand Standard NZS4211:2008, as detailed in Appendix A

Torsional tests and Operating Resistance force tests were not requested by the Client on the basis that the sash had winders installed in lieu of stays

Note: The tests to this New Zealand Standard were conducted in conjunction with tests to Australian Standard AS2047.

Test Location: IBA Test Centre
Dandenong, Melbourne.

Test Date(s): 6-7 June 2006.

Pre-loading: The sample was operated five (5) times prior to the commencement of testing.

TEST RESULTS

Serviceability Deflection Test

Deflections recorded:

	Requirement span/200	
Pressure (Pa)	+3030	-2200
SASH STILE		
Deflection	Span/624	Span/212

All test readings and calculated deflections are given in Table 1 and measurement locations are indicated on Figure 1.

Air Infiltration Test

Air Leakage Recorded (L / s.m ²)	Pressure Applied (Pa)	
	+150	-150
Condition		
Chamber & Sample (A):	0.40	-0.41
Chamber (sample taped) (B):	NR	NR
Sample (A-B):	0.40	-0.41

Sash joint length: 4.56 m

Air Leakage Recorded (L / s.m of joint)	0.09	-0.09

NR: measurement not required

Water Leakage Test 1000 Pa

No water was observed during the test.

Water Leakage Test 1200 Pa

Water was observed in two (2) locations during the test.

- 1/ Water leaked between the glazing bead and frame at the bottom left corner of the sash. This water constitutes a failure.
- 2/ Water leaked from the glazing bead mitre joint at the bottom right corner of the sash. This water constitutes a failure.

Overall Strength Test: +3030 Pa & -2300 Pa

No sign of collapse was observed at either test pressure. When the negative load was increased to -2.45 kPa, however, the top right stay released, which constitutes failure

CONCLUSION

The WINSA/EVEREST UPVC Awning Window sample achieved the following ratings per NZS4211:2008 Amd 1 for Serviceability Deflection, Air Infiltration, Water Penetration and Ultimate Strength.*.

For buildings not requiring specific design

Window Rating (SLS)EXTRA HIGH Wind Zone
Window Rating (ULS) ...EXTRA HIGH Wind Zone
Air LeakageAir conditioned

For buildings requiring specific design

Window rating for SLS+3000[‡] and -2200 Pa
Window rating for ULS+3030 and -2300 Pa
Air LeakageAir conditioned

[‡] limited by water leakage test result

* Torsional tests were not requested by the Client.

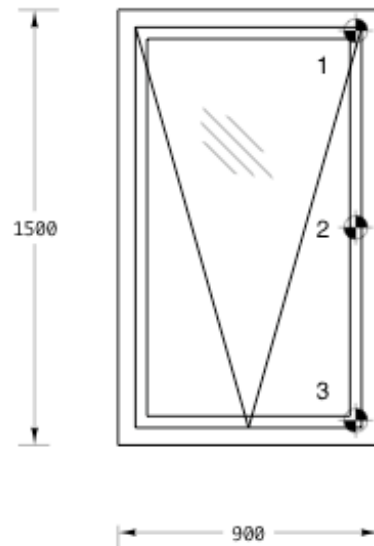


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Ian Bennie 19 March 2019
Authorised Signatory



INDOOR VIEW

◆ Displacement measurement locations:

1. Sash Stile - top
2. Sash Stile- centre
3. Sash Stile - bottom

Figure 1. Indoor view of the test sample showing the displacement measurement locations.

Table 1

STRUCTURAL PERFORMANCE

DATAFILE 536		TEST NUMBER 1			DATE : 07/06/2006		
MEMBER	PRESSURE (kPa)	DISPLACEMENTS (rounded to 0.1 mm)			BENDING DEFLECTION (rounded to 0.01 mm) DC - $\frac{D1+D2}{2}$ DEF (mm)	SPAN L (mm)	SDR L/DEF
		LEFT OR TOP D1 (mm)	CENTRE DC (mm)	RIGHT OR BOTTOM D2 (mm)			
1,2,3	SASH STILE						
	-0.71	-1.0	-2.8	-1.5	-1.53	1304	-852
	-0.85	-1.5	-3.8	-2.3	-1.97		-662
	-1.00	-2.1	-5.2	-3.4	-2.39		-545
	-1.20	-3.1	-7.1	-4.9	-3.08		-423
	-1.50	-4.8	-9.9	-7.1	-3.91		-333
	-1.55	-5.1	-10.5	-7.7	-4.10		-318
	-1.89	-7.0	-14.3	-11.2	-5.21		-250
	-2.20	-9.2	-17.9	-14.3	-6.14		-212
	0.76	0.5	1.0	0.5	0.54		2420
	1.49	0.9	2.2	1.1	1.18		1105
	2.16	1.3	3.5	2.4	1.68		778
	3.03	2.0	5.0	3.8	2.09		624

APPENDIX A - Test Procedures for NZS 4211:2008 - Amd 1

1Preparation for Tests - AS4420.1-1996

Test Description

Prior to commencement of the main tests listed below, any operable windows or doors are to be opened and close five (5) times. The sample is to be subject to positive or negative wind pressures being 50% of the nominated deflection test pressures. This is a pre-requirement for each of the main tests. However, when more than one of the tests is to be conducted the preparations need only be conducted once.

2Serviceability Deflection Test - AS4420.2-1996

Test Description

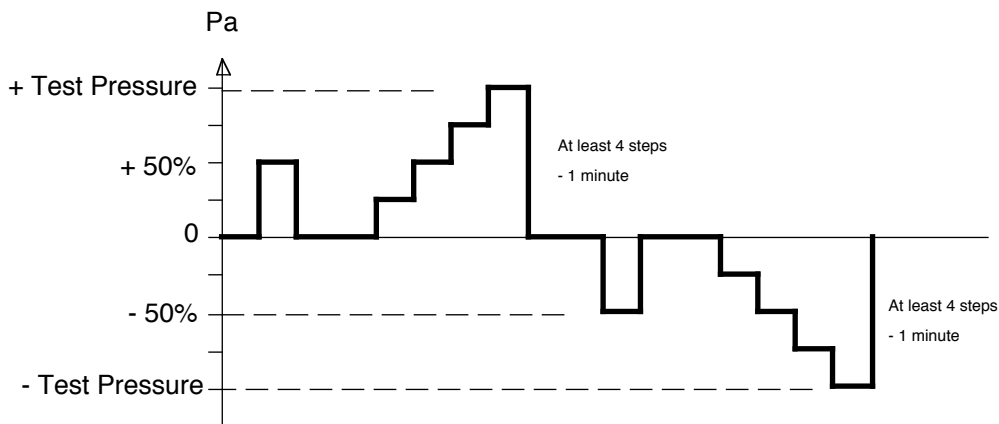
Measurements of movement of critical structural members are taken at a range of test pressures in order to determine if the bending of the members exceed the nominated requirements.

NZ Test Parameters

Test Pressure: is dependent on the Window Rating –

Window Rating	Test Pressure (Pa)
Low	±510
Medium	±680
High	±970
Very High	±1250
Extra High	±1515

Test pressure steps: as given below



Pass / Fail criteria:

Maximum deflection for structural members: 1/200 of span.

3Operating Force Test : AS4420.3-1996

Test Description

The forces required to operate sliding doors and windows are measured to test compliance with the requirements.

NZ Test Parameters

Test measurements: The forces required to initiate and sustain movement of the door/sash in both directions of movement are recorded.

Pass / Fail criteria : Forces shall not exceed the following

Force (Newtons)	Projecting sashes	Sliding window type		Sliding doors
		Horizontal	Vertical	
To initiate movement	90	110	200	180
To sustain movement	90	90	160	110

4 Operation Resistance Test - per Section 7.1 and 7.2 of NZS 4211

Test Description

Small forces are applied to operable sashes to determine if they move too freely.

Test Parameters

Test loads: Vertical Sliding Sashes: 10 N upward and downward.
Projecting Sashes: Force = (35 x Area of Sash in m²) N, inward and outward at all angles of opening.

Pass / Fail criteria : The position of the sash shall not change when subjected to the force.

5 Air Infiltration Test - AS4420.4-1996

Test Description

Air leakage through the entire test sample is measured at the nominated pressures in order to determine if it exceeds the allowable rate.

NZ Test Parameters

Pass / Fail criteria : Maximum air infiltration shall not exceed the following:
Fixed Windows: Value shown on the table for “Per m² of Sample”.
Windows Containing Sashes: Value is the geometric mean of the respective calculated infiltration rates for both the “Per m² of Sample” and “Per m of opening joint length” in the table.

Rate of air infiltration	Litres per second (L/s)	
	Air conditioned	Non air conditioned
Per m ² of Sample	1.6	8.0
Per m of opening joint length	0.6	2.0

6 Water Penetration Resistance Test - AS4420.5-1996

Test Description

Water is sprayed onto the outdoor face of the test sample with air pressure simultaneously being applied across it to determine if unacceptable water leakage occurs.

NZ Test Parameters

Test pressure : The test pressure is dependent on the rating:

Window Rating	Test Pressure (Pa)
Low	153
Medium	204
High	291
Very High	375
Extra High	455
Specific Design	30% of SLS

Test duration: The test pressure shall be maintained for 15 minutes.

Water application rate : 0.05 litre per second per square metre of sample area.

Pass / Fail criteria :

The window shall be designed to permit no uncontrolled water penetration through the window at a static positive air pressure.

Uncontrolled water penetration is defined as-

- (a) water that is not contained in a purpose-built drainage area;
- (b) water that may wet window fixtures and finishes, reveal linings or window furnishings beyond the window frame; or
- (c) water that flows in a constant stream on the inside, or dripping.

Acceptable water penetration is defined as-

- (a) minor splashing which occurs due to air infiltration, within 1 mm after change of pressure;
- (b) minor, intermittent leakage on the indoor side of operable sashes, which is contained on gaskets, sill tracks and thresholds.

A purpose built collection or drainage area is defined as a system that allows water to collect or be drained to the outside (at the cessation of testing) from sills, other framing members or cavities.

7Ultimate Strength Test - AS4420.6-1996

Test Description

Air pressure greater than the design pressure is applied across the test sample in order to demonstrate that it has a suitable structural safety margin.

NZ Test Parameters

Test Pressure: is dependent on the Window Rating -

Window Rating	Test Pressure (Pa)
Low	±720
Medium	±960
High	±1360
Very High	±1760
Extra High	±2130
Extreme	±2500

Pass / Fail criteria:

Windows shall not collapse when subjected to the test pressures for a period of ten (10) seconds. Collapse is defined as any one, or any combination, of the following:

- (a) Dislodgement or breaking of any glazing.
- (b) Dislodgment of a frame or any part of a frame.
- (c) Dislodgement of a sash from its frame.
- (d) Loss of support of a frame, such as when it is unstable in its opening in the building structure.
- (e) Failure of any sash, locking device, fastener or supporting stay allowing an opening light to open.

8Torsional Strength of Sashes - per Appendix A of NZS 4211

Test Description

Projecting sashes are tested with a torsional load to provide an indication of the likely smoothness of operation.

Test Parameters

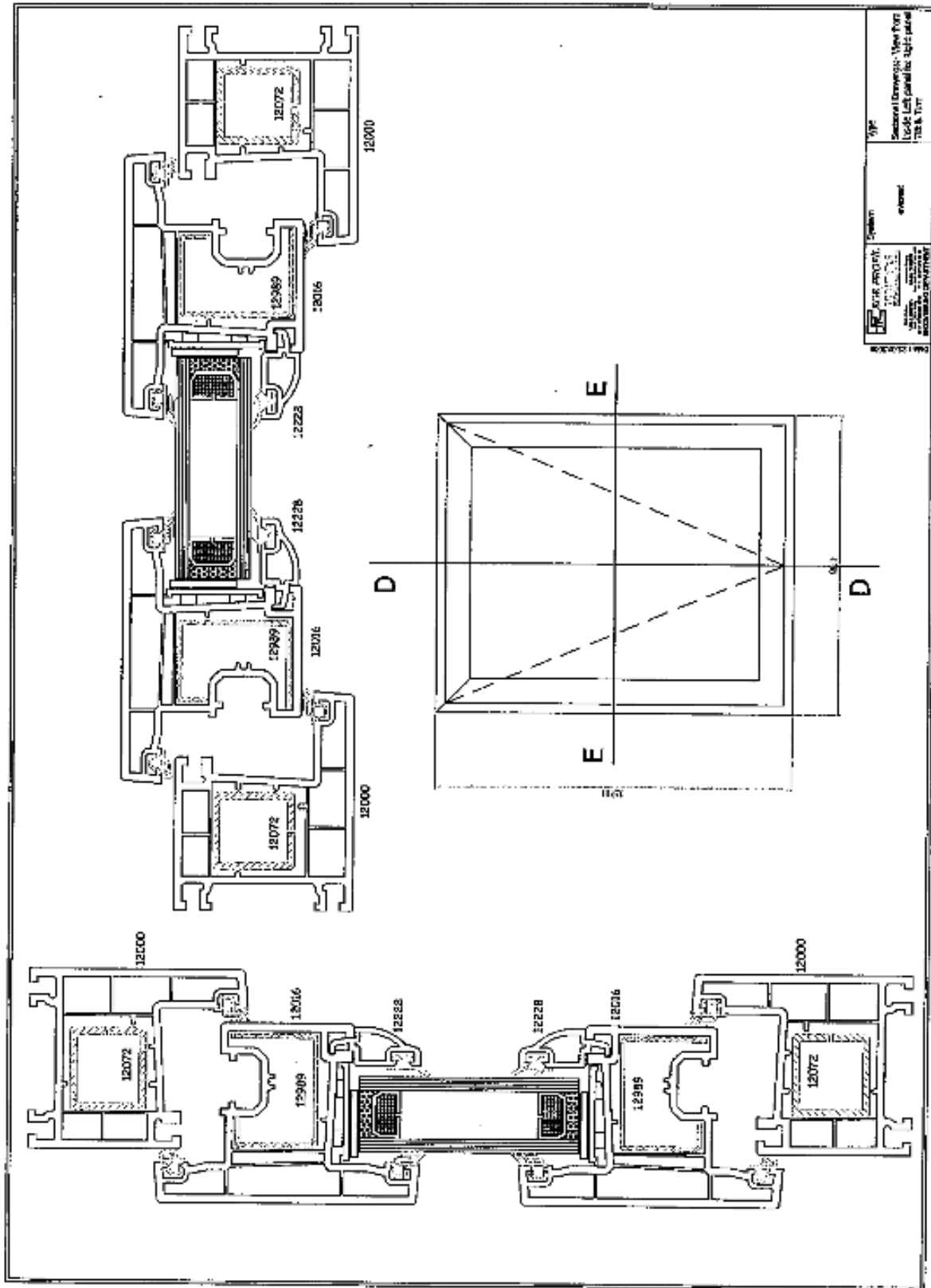
Test Load: a load of 45 N is applied at one corner of the sash in both directions, perpendicular to the plane of the sash, while the other three corners of the sash are held in plane.

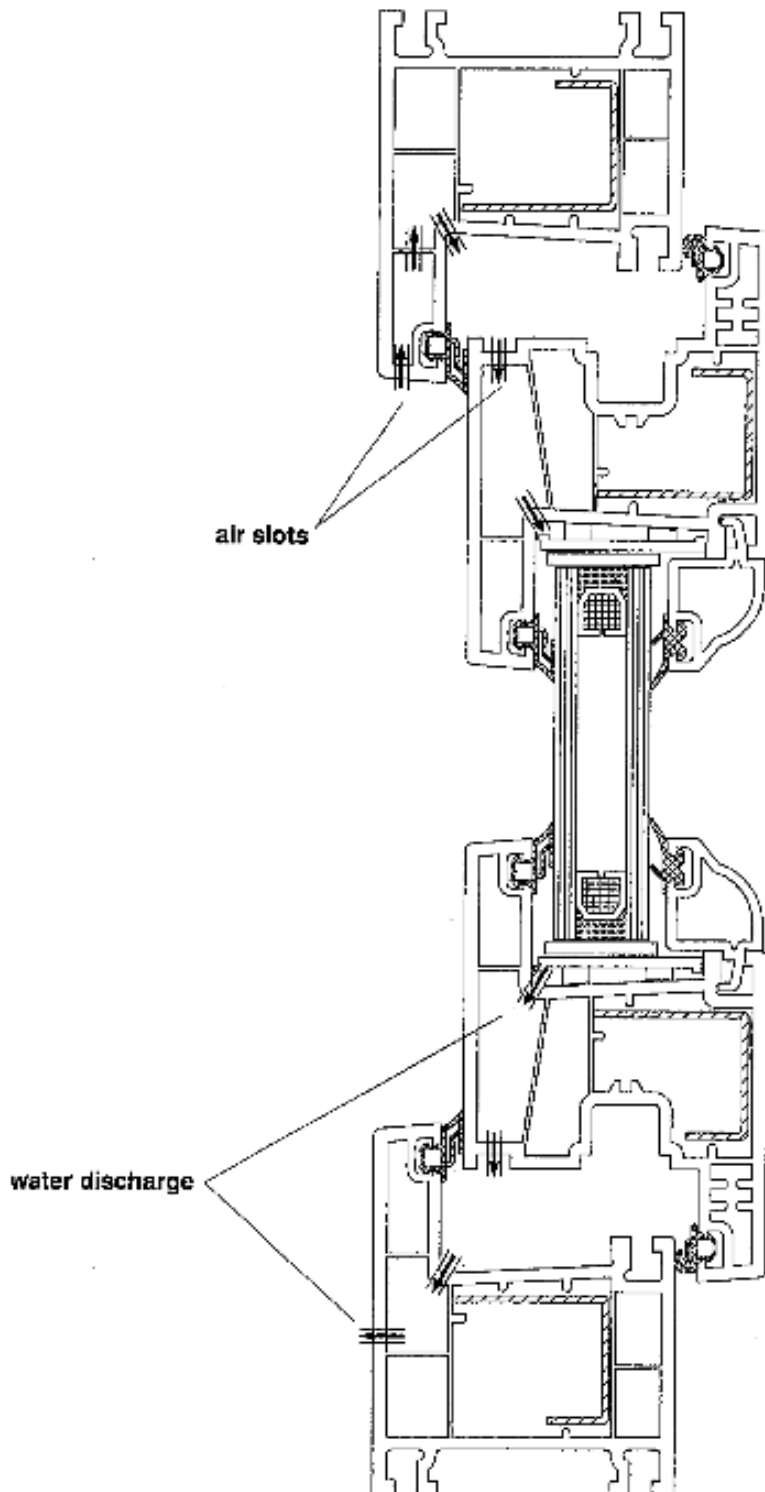
Pass / Fail criteria:

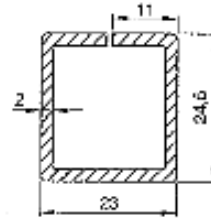
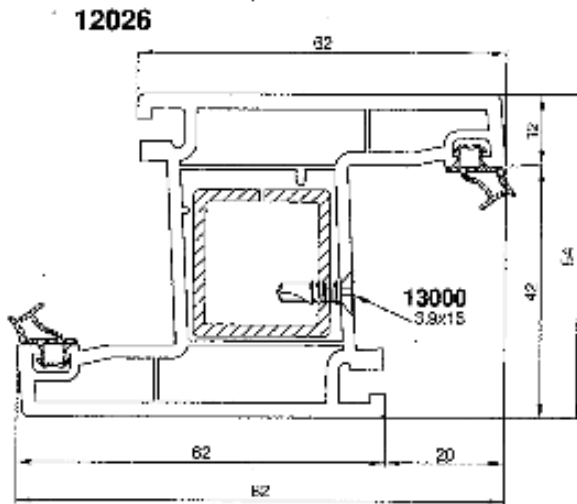
The deflection at the corner of the sash shall not exceed 0.04 times the length of the shortest of the two members joined at the point of the load, or 50 mm whichever is the lesser.

Appendix B – Client drawings

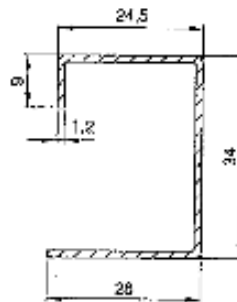
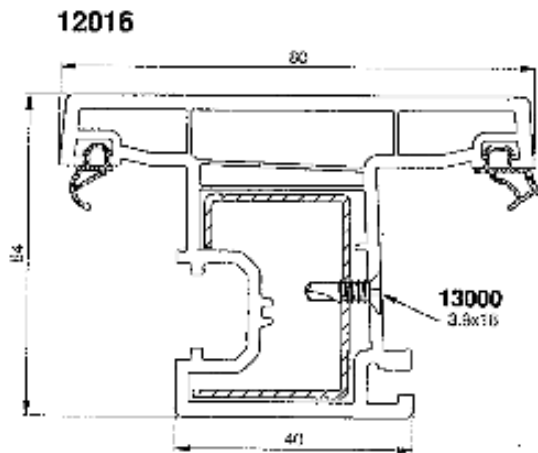
Sample elevation
Drainage details
Hardware accessory drawing
Main profiles (3 pages)
Glazing beads





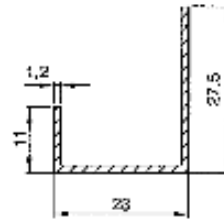
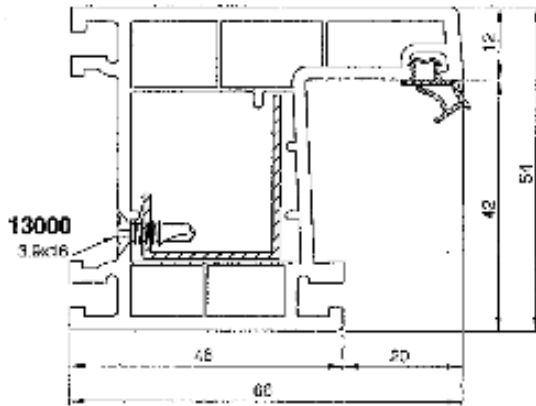


12072
 $i_x: 1.4187 \text{ cm}^4$
 $i_y: 1.3239 \text{ cm}^4$

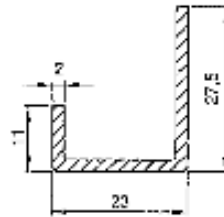


12989
 $i_x: 2.0719 \text{ cm}^4$
 $i_y: 0.6873 \text{ cm}^4$

12000

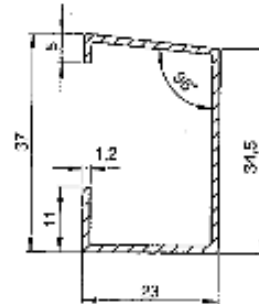
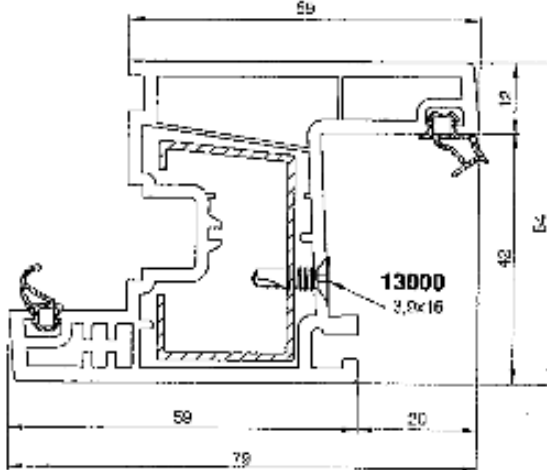


Y
12070
Ix : 0.4782 cm⁴
Iy : 0.15709 cm⁴
X

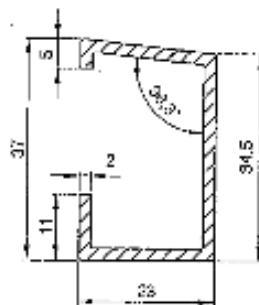


Y
12071
Ix : 0.7498 cm⁴
Iy : 0.8565 cm⁴
X

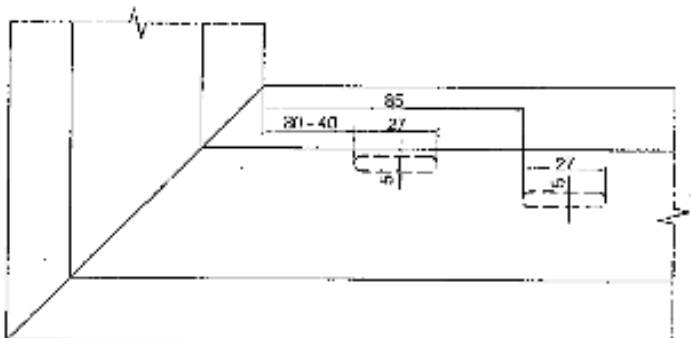
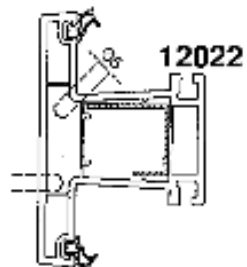
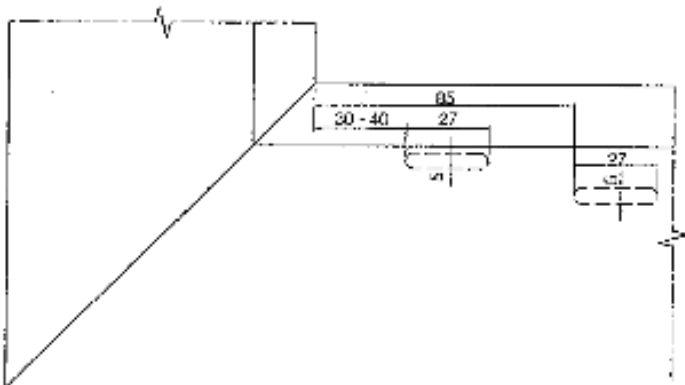
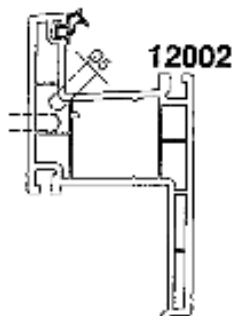
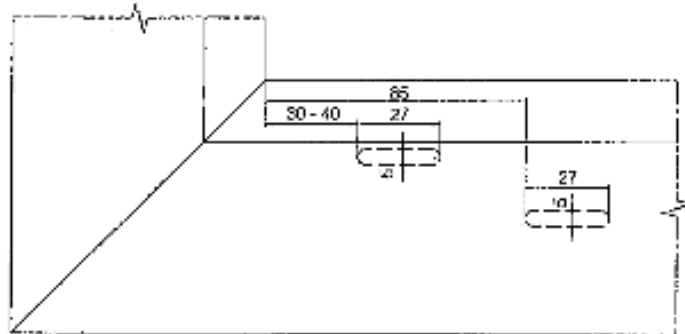
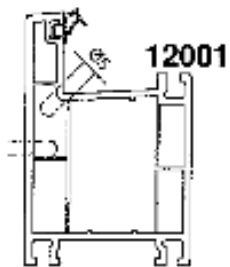
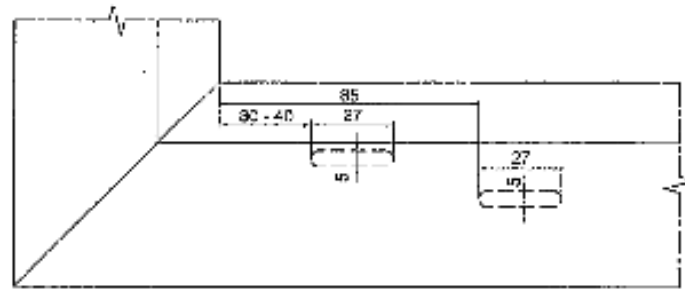
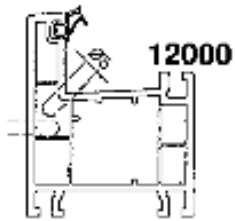
12014

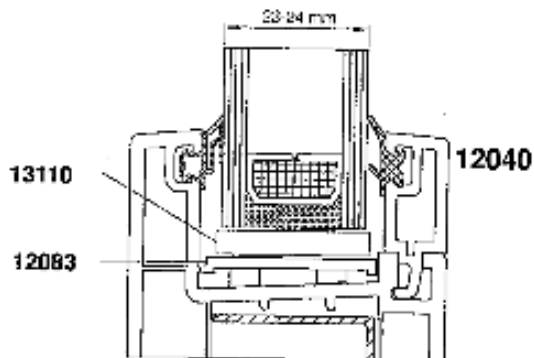
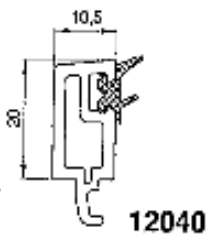
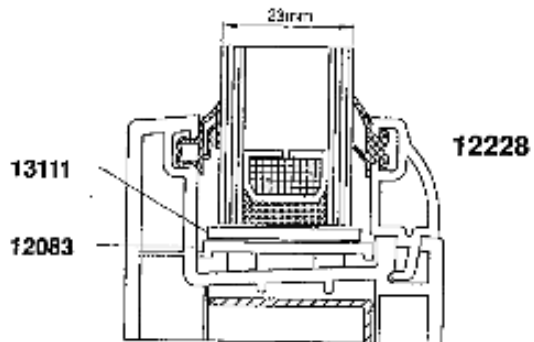
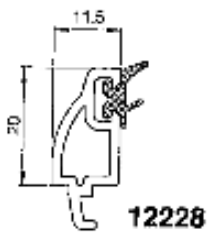
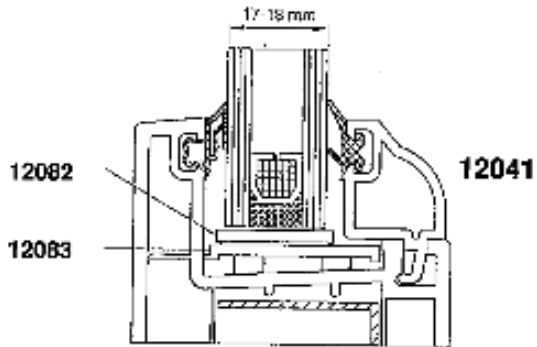
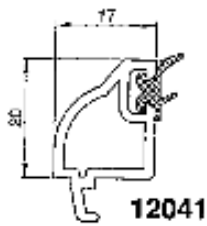
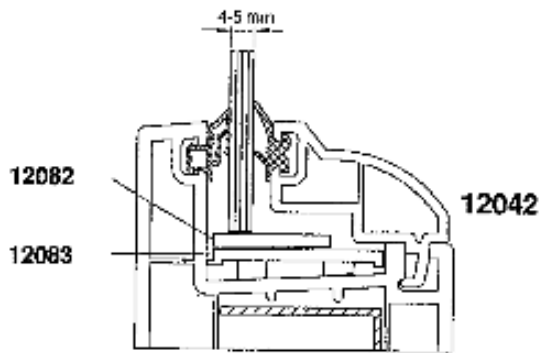
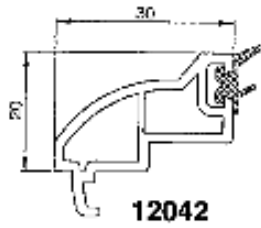


Y
12982
Ix : 2.2725 cm⁴
Iy : 0.8447 cm⁴
X



Y
12069
Ix : 3.4810 cm⁴
Iy : 1.2583 cm⁴
X



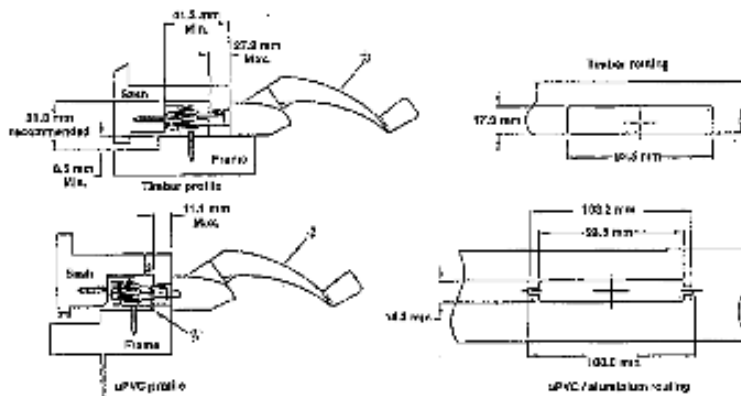
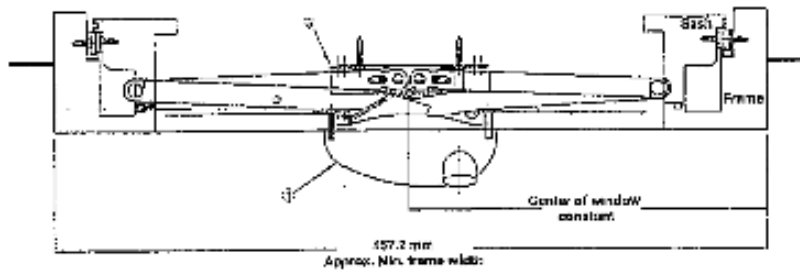


HÄFELE

Awning Window Winder



Notes:
 Handle and esch mount bracket shown must be ordered separately. See page 161



Window Hardware

Window Winders
 Awning Window Winder

Note:
 Other finishes available. Please enquire as minimum order quantities apply.

No.	Awning winder assembly
1	Awning operable
2	Esch mount bracket, face-mounted
3	Crank handle or folding crank handle
4	3.2 mm bottom spacer. Optional for uPVC / aluminium

Packing: 1 piece

White 670.23.007	Amend 670.23.004	Blue-white 670.23.008	Earth-brown 670.23.002	Dark-brown 670.23.001	Bronze 670.23.003

160 670.23.00

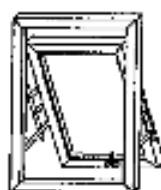
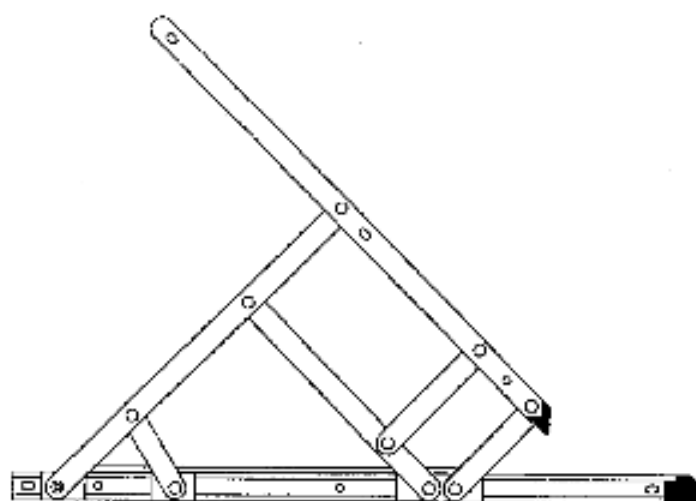
www.hafele.com.au

International product names are shown in the main title and in the title block.

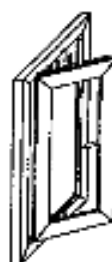
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hardware
outward opening hardware

zendow



TOP HUNG / AWNING



SIDE HUNG / CASEMENT

Code	Product name	Window dim.	Max. weight	angel
13521	FRICTION STAY TH 8" 203 mm TOP HUNG	350 * 1200	12 kg	80°
13522	FRICTION STAY TH 10" 254 mm TOP HUNG	400 * 1200	14 kg	85°
13523	FRICTION STAY TH 12" 305 mm TOP HUNG	550 * 1200	16 kg	85°
13524	FRICTION STAY TH 16" 407 mm TOP HUNG	800 * 1200	20 kg	60°
13525	FRICTION STAY TH 20" 508 mm TOP HUNG	900 * 1200	24 kg	45°
13527	FRICTION STAY ESH 12" 305 mm SIDE HUNG	1200 * 600	24 kg	90°
13528	FRICTION STAY FSH 16" 406 mm SIDE HUNG	1200 * 600	24 kg	80°
13529	STAY ARM 14" 355 mm			90°

Gaskets : TPE (Thermo Plastic Elastomer)

Drain Holes – Frame : two on each panel
Sash : two on each sash

Air slots – 5 mm diameter: two each pair of frame and sash

Glazing : 4 mm Clear Float; 4-12-4 double glazing units used