Ian Bennie & Associates

Test Report No. 2022-009-S1

Finesse Passive 92mm Fix Slide Series Sliding Door

Specimen tests by the methods of AS:4420.1-2016

To the requirements of AS:2047-2014

For

Finesse Window systems Australia Pty Ltd

April 2022

NATA

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

IAN BENNIE & ASSOCIATES PTY. LTD.
Building performance Testing
ACN: 007 133 253

Accredited
Laboratory
No.2371

TEST REPORT NUMBER 2022-009-S1

Test Client: **Finesse Window systems Australia Pty Ltd**
17-23 Bancell St, Campbellfield, VIC, 3061

Specimen identification:

A Finesse Passive 92mm Fix Slide Series Sliding Door sample measuring 2400 mm in height x 2400 mm in width was provided by the client for testing. The sample tested is detailed in the drawings given in Appendix B.
Drawings received Date; 30th March 2022

Test Method:

Structural Deflection, Air Infiltration, Operating Force, Water Penetration Resistance and Ultimate Strength test performance requirements to Section 2 of Australian Standard AS2047-2014, and test procedures to Australian Standard AS4420.1-2016 as detailed in Appendix A.

Test Location: Ian Bennie & Associates, Dandenong South, Victoria

Test Date: 27th January, & 11th February 2022 **Sample received:** 27th January 2022

Test Results

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

Deflection Test: 11th February 2022

All test readings and calculated deflections are given in Table 1 and measurement locations are indicated on Figure 1. The measured deflection ratios were as follows:

Interlock @+450 Pa = Span / 250

@- 490 Pa = Span / 253

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Operating Force Test 11th February 2022

Sample type: Horizontal sliding door

Force (Newton)	Requirement	Force measured
To initiate movement	180 maximum	Opening sash: 69 Closing sash: 31
To maintain movement	110 maximum	Opening sash: 32 Closing sash: 27

Air Infiltration Test: 11th February 2022

RATING: Low

Air Leakage Recorded (L/s.m2)	Pressure Applied (Pa)			
Condition	+50	-50	+75	-75
Chamber & Sample (A):	+0.7	-0.7	+1.0	-0.9
Chamber (sample taped) (B):	NR	NR	NR	NR
Sample (A-B):	+0.7	-0.7	+1.0	-0.9

NR: measurement not required

Water Penetration Test Results

Water penetration Test 1 - 27th January 2022

Pressure: 200 Pa PASS

Water was observed at 2 location(s) on the indoor face of the sample during the test.

1/ water in the sill track. This leak does not constitute a failure

Pressure: 250 Pa PASS

Water was observed at 1 location(s) on the indoor face of the sample during the test.

1/ water in the sill track. This leak does not constitute a failure

Pressure: 300 Pa

Water was observed at 2 location(s) on the indoor face of the sample during the test.

1/ water in the sill track. This leak does not constitute a failure

2/ water overflowed the sill track. This leak constitutes a failure.

Ultimate Strength Test: 11th February 2022
Test Pressures: ±900 Pa PASS
No sign of collapse was observed at either test pressure.

Conclusion:

The Finesse Passive 92mm Fix Slide Series Sliding Door sample complied with the following ratings per Australian Standard AS2047-2014 when tested for Structural Deflection, Air Infiltration, Operating Force, Water Penetration Resistance and Ultimate Strength.

Housing Ratings:

Position on House	Exposure Condition	
	Non-exposed	Exposed
General	N2	N2
Corner	-	-

Residential and Commercial Building Ratings:

Serviceability Limit State Pressure Rating:	+450 Pa	and	-490 Pa
Ultimate Limit State Pressure Rating:	+900 Pa	and	-900 Pa

Air Infiltration Level: Low

Water Penetration Resistance Pressure: 250 Pa

Disclaimer:

Sample information including material properties and detailing was supplied by the client and no verification of actual construction details or sampling of production stock could be performed. The test results contained herein apply to the sample as tested. Ian Bennie & Associates accept no liability for claims of losses, expenses, damages and costs arising as a result of the use of product(s) referred to in this report.

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Report distribution:

Ian Bennie & Associates	PDF	Ian Bennie 06th April 2022
Finesse Window Systems Australia Pty Ltd	PDF	Authorised Signatory

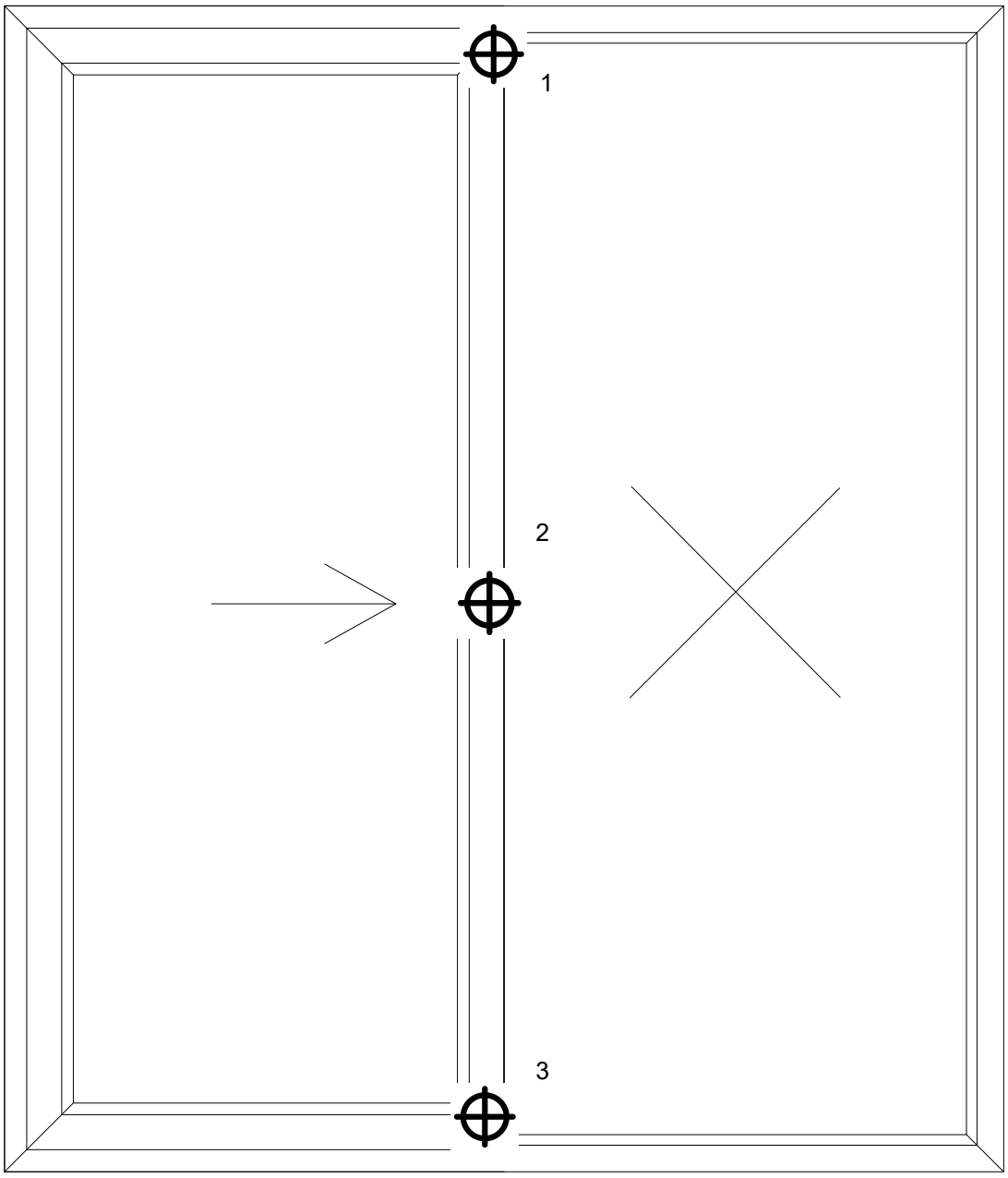


Figure 1; indoor view of the test sample showing the displacement measurement locations

Displacement transducer locations;

1. Top of Interlock
2. Mid span of Interlock
3. Bottom of Interlock

Table 1

Structural Performance

DATAFILE:2021-009-S1			Test Number: ST1		Date: 11/02/2022		
Member	Pressure	Displacements (rounded to 0.1 mm)			Bending Deflection (Rounded to 0.01 mm)	Span	SDR
		Left or Top	Centre	Right or bottom	$DC - \frac{(D1 + D2)}{2}$		
	(kPa)	D1 (mm)	DC (mm)	D2 (mm)	DEF (mm)	L (mm)	L/DEF
1,2,3	Interlock						
	0.14	1.1	2.9	0.4	2.1	1955	918
	0.30	2.0	6.3	1.0	4.8		410
	0.41	2.4	9.0	1.6	6.9		283
	0.45	2.6	10.0	1.9	7.8		250
	0.00	0.2	0.2	0.1	0.1		23625
	-0.14	-1.8	-3.3	-0.5	-2.2		-907
	-0.30	-3.7	-7.0	-1.1	-4.6		-428
	-0.40	-4.4	-10.1	-2.9	-6.4		-304
	-0.49	-5.0	-12.5	-4.6	-7.7		-253
	0.01	-0.3	-2.0	-3.1	-0.2		-7929

Appendix A – Test Parameters and Procedures

1 Details

This appendix summarises details of the following Australian Standards:

• AS2047-2014 Windows and externally glazed doors in buildings, Section 2 Performance (inc. Amendments 1 & 2)

• AS4420.1-2016 Windows, external glazed, timber and composite doors-Methods of test

2 Preparation for Tests: AS4420.1-2016, Clause 2

Test description

Prior to commencement of the main tests listed below, any operable windows or doors are to be opened and closed five (5) times. If the test sequence does not commence with the deflection test the sample is to be subject to positive or negative wind pressures being 50% of the nominated SLS test pressures.

3 Deflection Test: AS4420.1-2016, Clause 3

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 exceeds the nominated requirements.

Test Parameters

Test Pressure: is dependent on the type of building nominated by the client-

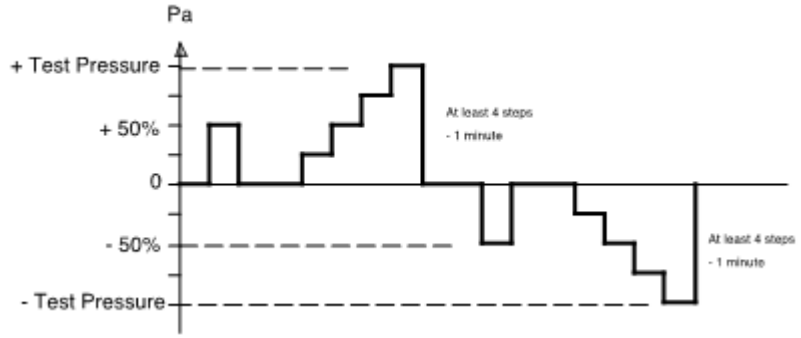
Housing: Based on Window Rating nominated by client as given in the following table:

Window Rating	Test Pressure (Pa)	
	General	Corner Window
N1	400	600
N2	400	600
N3	600	800
N4	800	1200
N5	1200	1800
N6	1600	2500
C1	600	800
C2	800	1200
C3	1200	1800
C4	1600	2500

Residential or commercial buildings

The test pressures shall be the positive and negative Serviceability Limit State Pressures.

Test Pressure Steps: as given below



Pass / Fail criteria:

Maximum deflection for structural members -
Windows and Sliding Doors: Span/250
Doors other than sliding: Span/100

4 Operating Force Test: AS4420.1-2016, Clause 4

Test Description

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

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

Product type	Force (N)	
	Initiate	Maintain
Horizontal Sliding WIndow	110	90
Vertical Sliding window	200	160
Horizontal sliding door	180	110
Swinging Door	60	20
Projecting sash(no operator)	160	80

5 Air Infiltration Test: AS4420.1-2016, Clause 5

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.

Test Parameters

Pass / Fail criteria : Maximum air infiltration shall not exceed the following

Air infiltration level	Pressure Direction	Maximum Air infiltration, L/s.m2
		Test Pressure 75 Pa
Low	Positive & Negative	1.0
High	Positive	5.0

6 Water Penetration Resistance Test: AS4420.1-2016, Clause 6

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.

Test Parameters

Test pressure: The test pressure is dependent on the type of building-
Housing: Based on Window Rating nominated by client as given in the following table-

Window Ratings	Water Penetration resistance test Pressure (Pa)	
	Non-exposed	Exposed
N1, N2	150	200
N3, C1	150	300
N4, C2	200	300
N5, C3	300	450
N6, C4	450	600

Residential or Commercial Buildings:
The test pressure shall be 30% of positive Serviceability Limit State Pressure but not less than 150 Pa.

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 :

"Windows for Class 1 buildings shall be subjected to the water penetration resistance test in accordance with
AS 4420.5, under the test pressures specified in Table 2.4. During and at the completion of the test there shall have been no penetration of uncontrolled water. Uncontrolled water is defined as-

(a) water that is not contained in a purpose-built drainage area;

6 Water Penetration Resistance Test(continued)

(b) water that wets or is likely to wet insulation, fixtures and finishes, reveal linings or window furnishings beyond the window frame; or

(c) water that lies on transoms, rails, sills, etc., that has no designed means of escape to the outside of the product via the drainage system.

Acceptable water penetration is not deemed a failure if-

(i) minor splashing occurs due to air infiltration, within 1 min after change of pressure;

(ii) minor, intermittent leakage on the indoor side of openable sashes, which is contained on sash gaskets, sill tracks and thresholds that are part of a drainage system that allows water to flow to the outside of the product at cessation of the test (constant streams and regular dripping would be regarded as failure); or

(iii) water running down the indoor face of louvers, which is completely contained within a purpose-built drainage area.

7 Ultimate Strength Test: AS4420.1-2016, Clause 7

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.

Test Parameters

Test Pressure: is dependent on the type of building nominated by the client-
Housing: Based on Window Rating nominated by client as given in the following table-

Window Rating	Test Pressure (Pa)	
	General	Corner Window
N1	600	900
N2	900	1300
N3	1400	2000
N4	2000	3000
N5	3000	4500
N6	4000	6000
C1	1800	2700
C2	2700	4000
C3	4000	5900
C4	5300	8000

Residential or Commercial Buildings: the test pressure shall be the Ultimate Limit State Pressure.

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) Failure or dislodgement of any glazing.
(b) Dislodgment of a frame or any part of a frame.
(c) Removal of a light, either with or without its framing sash, from a 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.

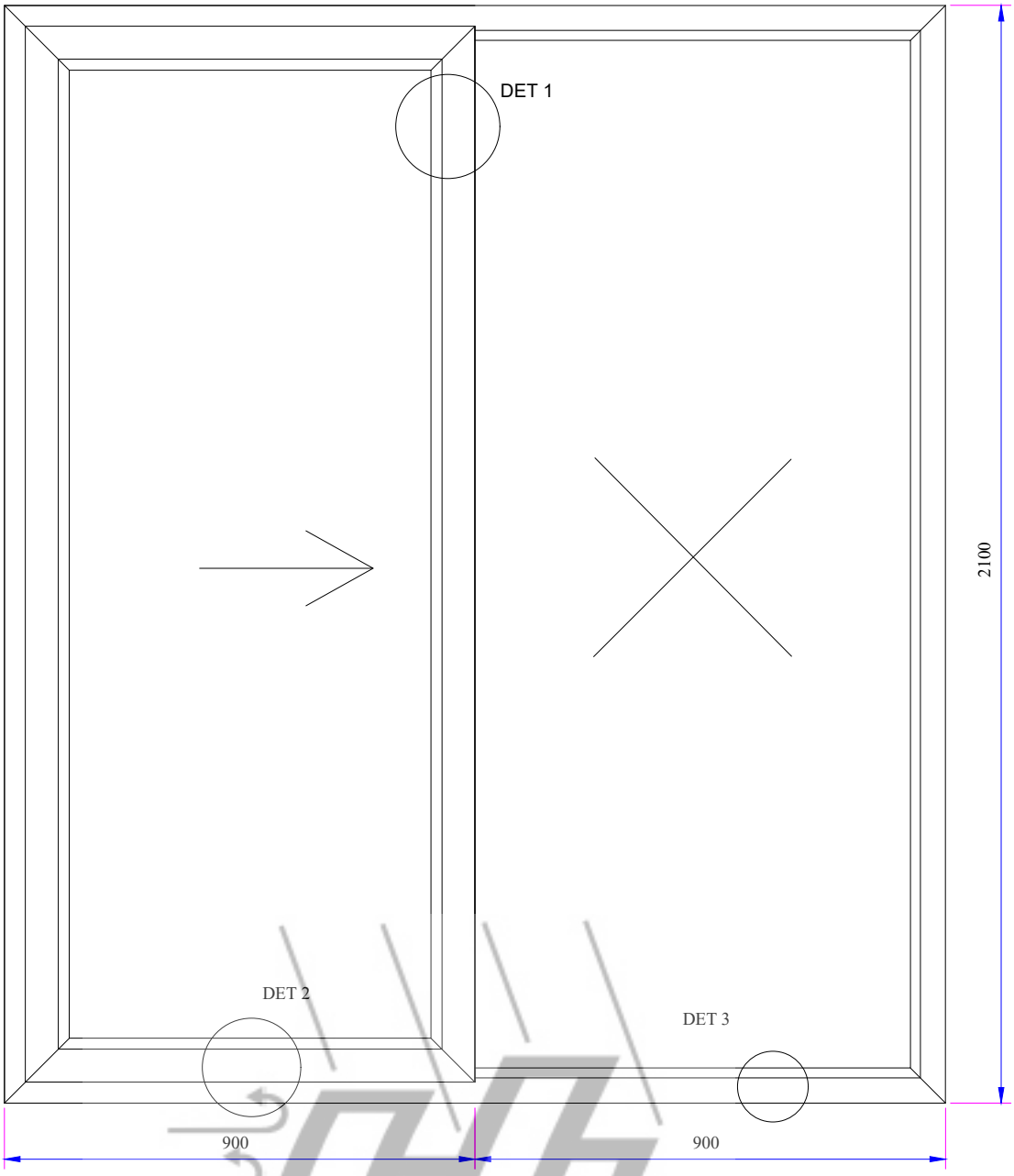
8 Retesting (If Required)

Clause 2.4 of AS4420.1 states:
"*If the test specimen requires modification to gaskets, seals or drainage details, then the operating force, air infiltration and water penetration tests shall be repeated in full.*

Before retesting, all accessible areas of the test specimen shall be dry and the specimen checked for being operable. The test specimen shall first be preloaded to 50% of either the positive or negative SLS test pressure for one minute. The test specimen shall then be inspected after positive preload to ensure there is no residual water visible in the system. If residual water is evident, the test specimen shall be left, or the positive air pressure pre- loading extended, until such time as the system is dry.

Any modification to the test specimen shall be noted on the respective drawing and the amendment coded thereon.

Appendix B – Details of the test sample



Finesse Passive 92mm Fix Slide Series – Drawing attached - Sliding Door gear,

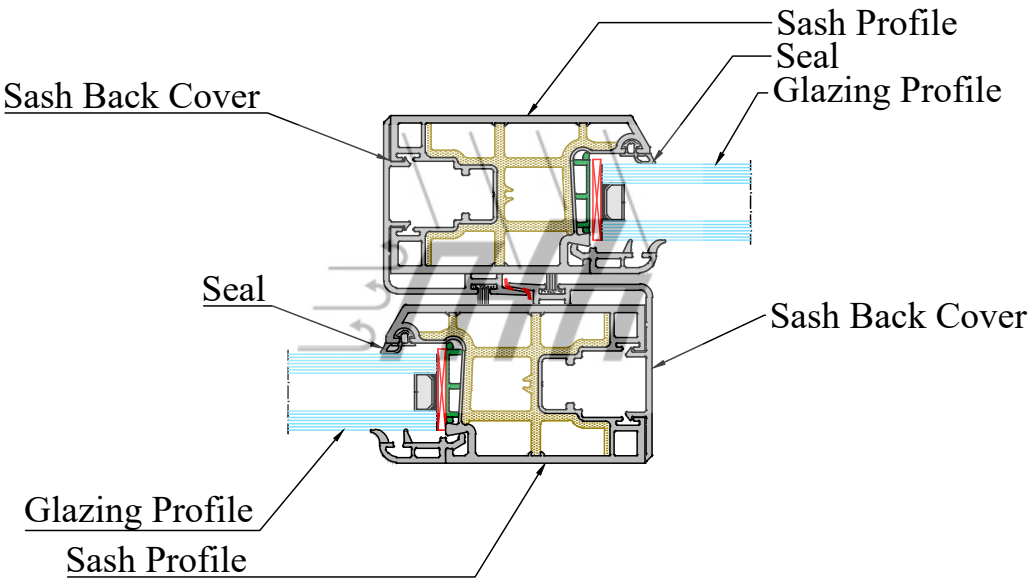
Gear CC PZ Product code – 702802

Stricker plate – 702987

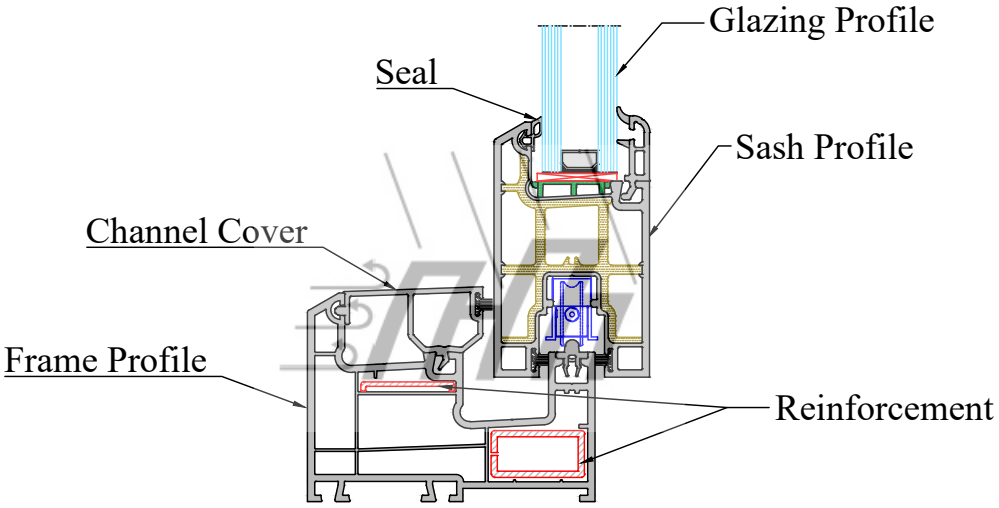
EPDM Seals on frame

6mm Brush Gasgets/Seal on sash

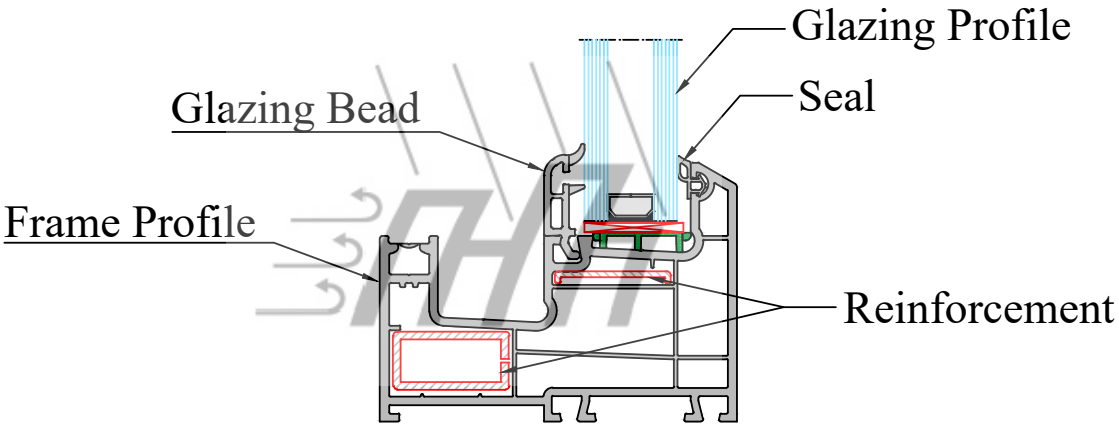
DET 1



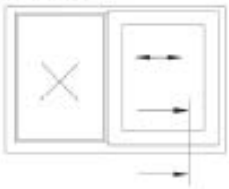
DET 2

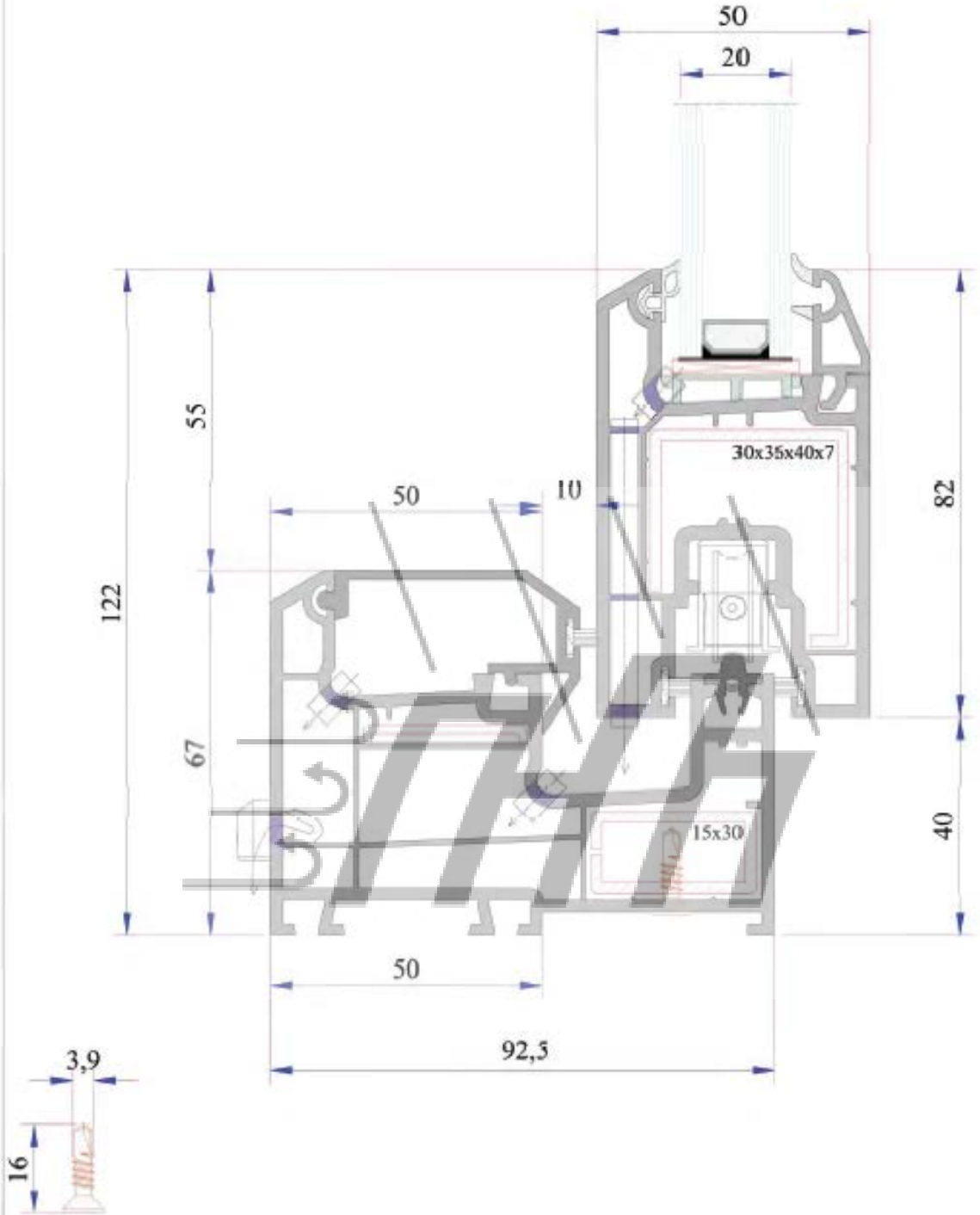


DET 3

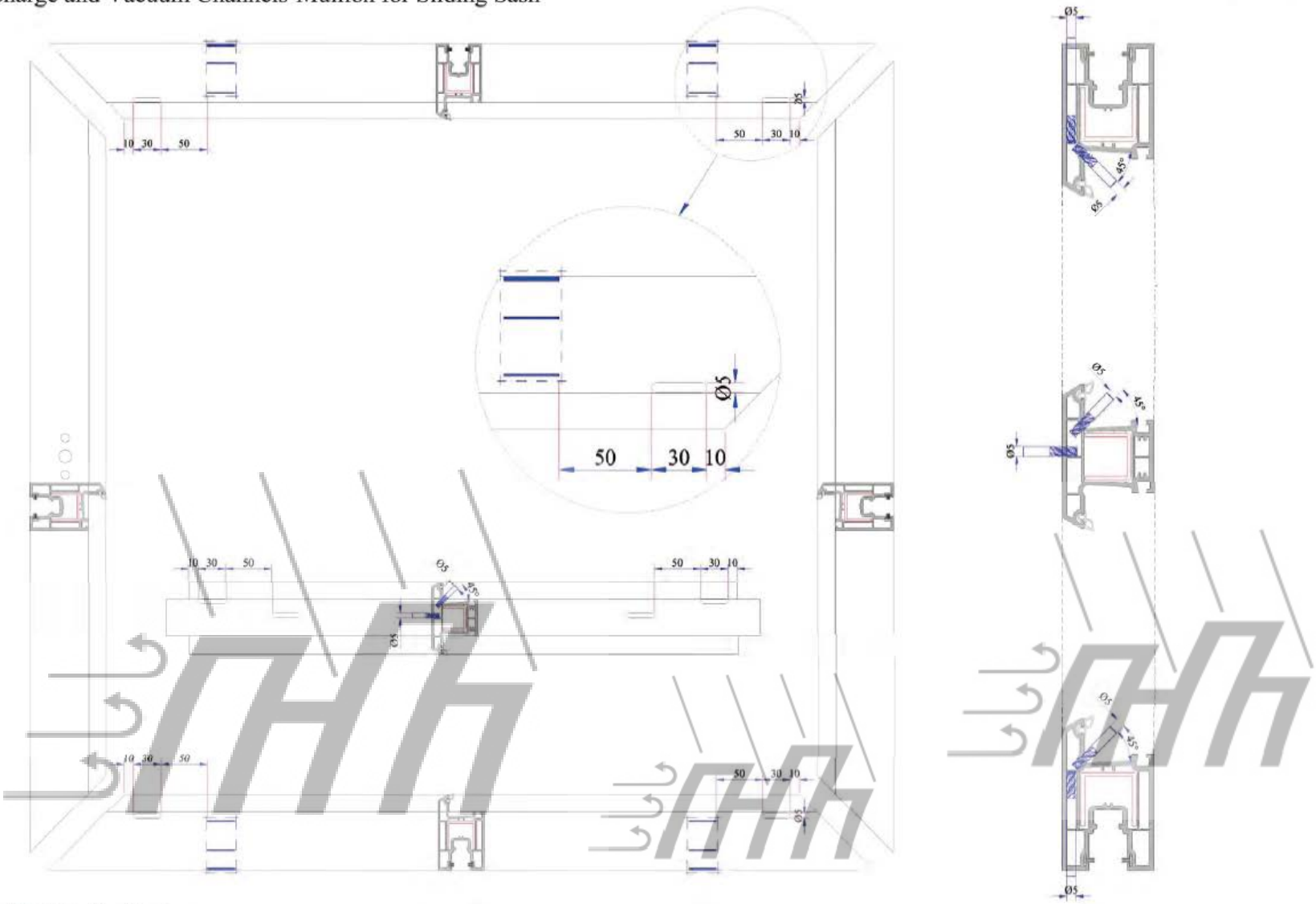


Frame Profile (Single Rail) - Sliding System Static Sash Profile Installation

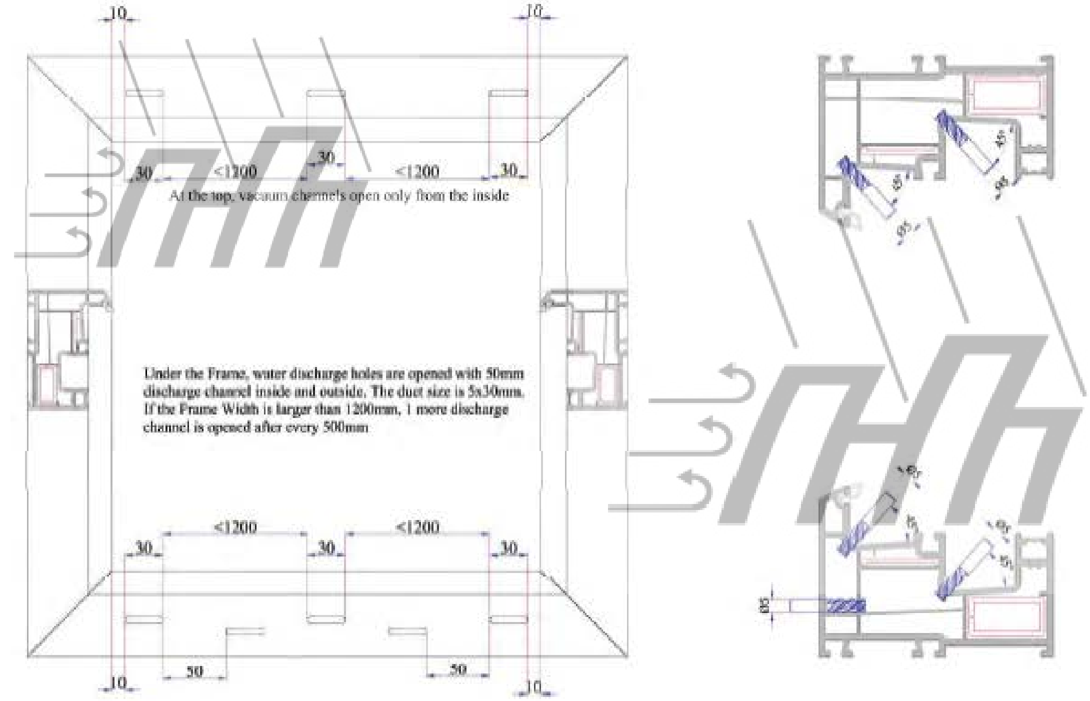




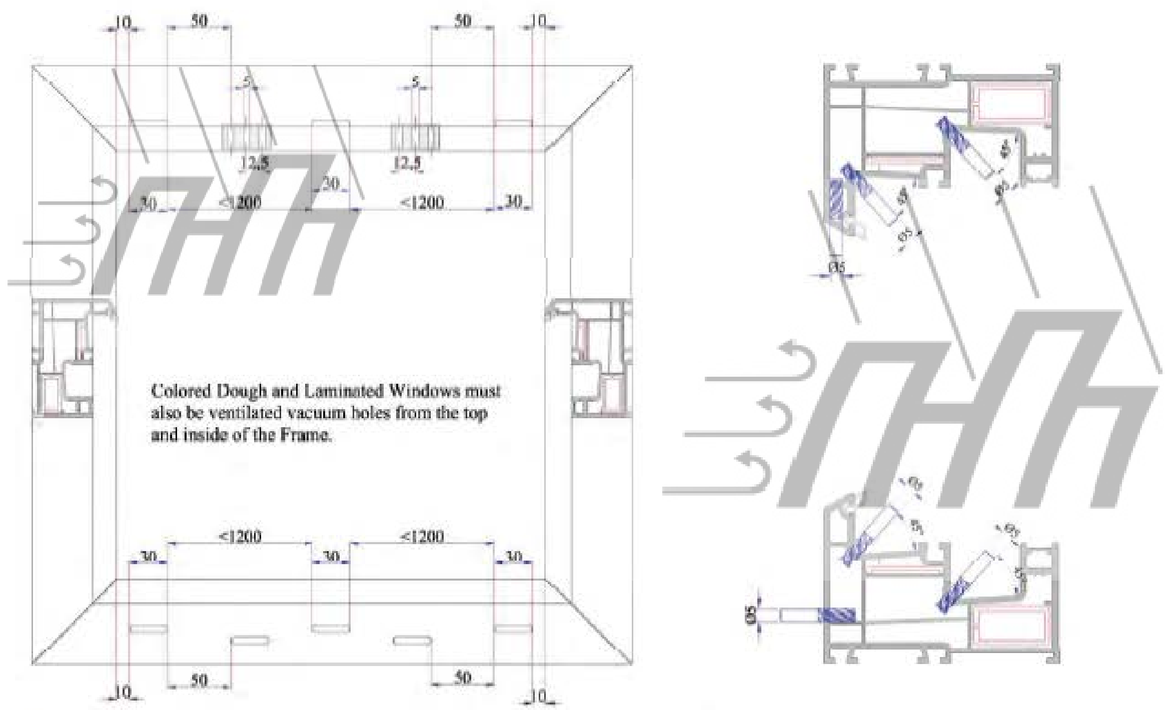
Water Discharge and Vacuum Channels-Mullion for Sliding Sash



Single Rail Frame Water Discharge and Vacuum Channels



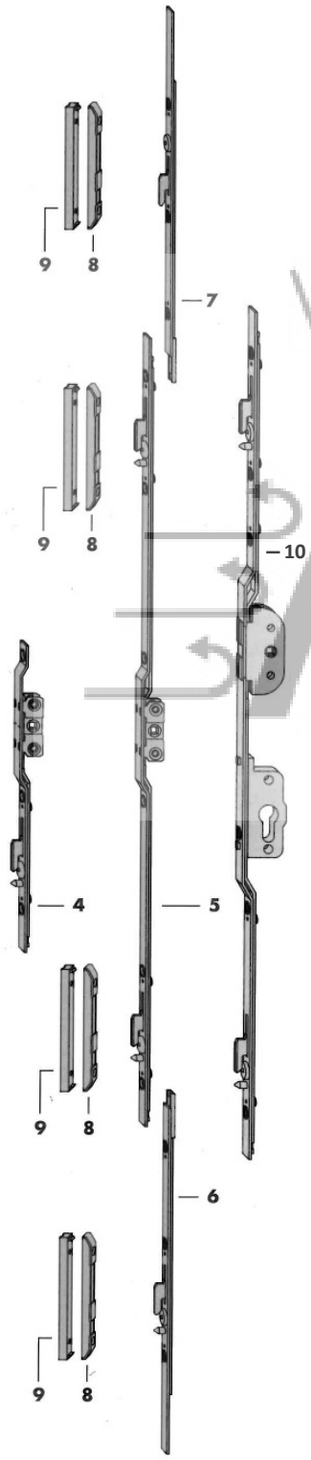
Laminated and Colored Dough Water Discharge and Vacuum Channels



Important Note:In order to increase the resistance of the materials in the laminated and tinted crust products, the use of minimum 1,5mm reinforcement on the windows up to 1,5m and 2 mm reinforcement at the dimensions exceeding 1,5m is recommended. The box reinforcement should be used in the mullion at the dimensions exceeding 2m.

Siegenia CS Sliding System

Product information
Sliding gears, extensions and strikers.



Product code	Descrip! on	Image No	Profile	Packaging unit
702611	Short gear CS	4	-	10
702628	Gear CS 100	5	-	10
702802	Gear CS PZ	10	-	10
718797	Top locking bolt	7	-	10
PGZD0050-100020	Bo om locking bolt	6	-	50
702987	Striker plate	8	Koemerling/Rehau/ Deceuninck	100
702994	Striker plate	8	Aluplast	100
703007	Striker plate	8	Veka	100
703328	Distance piece	9	Rehau	100
703335	Distance piece	9	Koemerling	100
PRUD0050-100010	Distance piece	9	Deceuninck	100