PERFORMANCE TESTING IN ACCORDANCE WITH
AAMA/WDMA/CSA 101/I.S.2/A440-11 (NAFS 2011), CSA A440S1-09 & CSA A440S1-17
AAMA/WDMA/CSA 101/I.S.2/A440-17 (NAFS 2017) & CSA A440S1:19

Manufactured under licence
Dalmen Windows & Doors 5360, Ste Catherine Street (Box 220) St-Isidore, Ontario K0C 2B0

REPORT AI-04915-G2 (Reissue-02)

TEST REPORT SUMMARY	
Product type	**Awning Window**
Product series/model	**NC65STH HES OUT**
Primary designator	**Class AW – PG70 : Size tested 1500 x 1500 mm (~59 x 59 in) - Type AP**
Optional secondary designator	**Positive Design pressure (DP) = 3360 Pa (~70.18 psf)** **Negative design pressure (DP) = -3360 Pa (~-70.18 psf)** **Water penetration resistance test pressure = 720 Pa (~15.04 psf)** **Canadian air infiltration/ exfiltration level = A3 Level (NAFS-11)/ Passed (NAFS-17)**
Option(s)	**Through frame drainage**

See CLEB laboratory Inc. complete report AI-04915-G2 (Reissue-02) for test specimen description and detailed test results

Test completion date	2019-11-26	**Number of pages**	8 pages & 1 appendix
Report date	2019-11-29	**Revision date**	2020-12-23

Prepared by:

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1.0 INTRODUCTION

CLEB laboratory Inc. was retained by ***"METRA S.p.A"*** to test a fenestration product according to the performance levels in the *AAMA/WDMA/CSA 101/I.S.2/A440-11 (NAFS 2011) Standard and its Canadian supplements CSA A440S1-09 & CSA A440S1-17 and the AAMA/WDMA/CSA 101/I.S. 2/A440-17 (NAFS 2017) Standard and its Canadian supplement CSA A440S1:19*. ***"METRA S.p.A"*** has requested and authorized that this original test report issued under their name, be reissued to **"DALMEN WINDOWS & DOORS"**. The sample components and manufacturing are documented in section 2.0.

Note concerning the use of units of measurement in this report:
According to the AAMA/WDMA/CSA 101/I.S.2/A440 Standard, the use of SI (metric) units is the standard, while IP (Imperial) values given in parentheses are for reference purposes only, and are inexact rounded values. Section 5.0 contains testing results converted to IP units for the sake of convenience only. The only exception to using SI values is in the Performance Grade (PG) portion of the product designation.

Note concerning drawings:
The drawings reviewed for the production of this report are stamped and are on file at CLEB laboratory Inc. The availability of individual drawings will be at the discretion of the client.

2.0 DESCRIPTION OF THE SPECIMEN(S) TESTED

Model
NC65STH HES OUT

Product type
AP – (Awning window)

Operation mode
Outswing

Drawing Package (Appendix)
NC 65 STH HES OUT AWNING WINDOW (elevation and sections A-A & B-B), NC 65 STH HES OUT AWNING WINDOW (installation details and sections A-A & B-B), NC 65 STH HES OUT (SECTIONS), NC 65 STH HES OUT (PROFILES), NC 65 STH HES OUT (ACCESSORIES), NC 65 STH HES OUT (HARDWARE), NC 65 STH HES OUT (GASKETS), NC 65 STH HES OUT (MACHINING FOR HARDWARE), NC 65 STH HES OUT (MACHINING FOR ASSEMBLY), NC 65 STH HES OUT AWNING & CASEMENT WINDOWS - SILL DETAIL SHOWING DRAINAGE PATH, Use and Maintenance guide to METRA windows and doors page 21 (cleaning and maintenance of aluminium windows and doors)

Date(s) of sample reception
2019-11-07

Date(s) of testing
2019-11-11, 2019-11-13, 2019-11-14, 2019-11-19, 2019-11-20, 2019-11-21, 2019-11-22, 2019-11-28

Test specimen installation (test buck)
Material: Laminated wood (~2" x 6"); sill base is doubled up to accommodate through-frame drainage option. See drawing *NC 65 STH HES OUT AWNING & CASEMENT WINDOWS - SILL DETAIL SHOWING DRAINAGE PATH*
R.O. clearances: 6 mm (0.24″)
Fastening: See drawing *NC 65 STH HES OUT AWNING WINDOW*
Sealing detail: Backer rod and sealant between test buck and specimen on exterior perimeter only. Wooden test buck frame wrapped with elastomeric membrane and sealed with compatible sealant. Sealant in the frame installation screw holes.

Frame
Material: Extruded aluminum
Joinery type: Mitre-cut, mechanical assembly with corner keys, pins and epoxy
Reinforcement: No reinforcement
Weatherstripping: See drawing *NC 65 STH HES OUT (GASKETS)*
Sealant: Sealant at the assembly of the frame mitered corners. Sealant over the frame assembly pins. Sealant in the corners of the interior gasket frame groove, before vulcanized corner gasket installation. See drawing *NC 65 STH HES OUT (MACHINING FOR ASSEMBLY) – Gasket fitting on frame MG786D.*
Drainage: See drawing *NC 65 STH HES OUT (MACHINING FOR ASSEMBLY) – Position of the water drainage*
Glazing: None
Overall dimensions: 1500 mm (59.06") W x 1500 mm (59.06") H

Sash
Material: Extruded aluminum
Joinery type: Mitre-cut, mechanical assembly with corner keys, pins and epoxy
Reinforcement: No reinforcement
Weatherstripping: See drawings *NC 65 STH HES OUT (GASKETS)* and *NC 65 STH HES OUT (MACHINING FOR ASSEMBLY) – Gasket fitting on frame MG786D, Gasket fitting on frame MG796D, Gasket fitting on sash MG786D.* Exterior gasket is cut out (notched) for hinge clearance.
Sealant: Sealant at the assembly of the sash mitered corners. Sealant over the sash assembly pins. Sealant in the corners of the exterior gasket frame groove before vulcanized corner gasket installation. Sealant on the corners of the central gasket groove before vulcanized corner gasket installation. Sealant at the corners of the exterior glazing gasket junctions before installing the glass unit. Sealant at the interior and exterior side gasket junctions (on the sash/ glazing stops). See drawings *(MACHINING FOR ASSEMBLY) – Gasket fitting on frame MG796D & Gasket fitting on sash MG786D.*
Drainage: See drawing *NC 65 STH HES OUT (MACHINING FOR ASSEMBLY) – Ventilation Sashes & Pressure compensation position Sashes*
Glazing: Double glazed sealed unit (25.4 mm) / Nominal glass thickness : Exterior : 6 mm/ Interior: 6 mm / Air space gap: 13.4 mm / Type of glass: Exterior: Clear tempered/ Interior: Clear tempered / Type of spacer: Aluminum rectangular/ Type of sealant: Dual-sealed / Type of filling gas: Air / Glass retention: Glazing stops / Glazing seals: glazing gasket on the exterior face (dry glazing) and glazing gasket on the interior face (dry glazing) / Grid description: None / Setting blocks: (4) at the lower rail, (3) per stile and (3) at the upper rail/ Daylight opening: 1282 mm W x 1282 mm H

Overall dimensions: 1465 mm (57.68") W x 1465 mm (57.68") H

Screen

None

Hardware

See hardware descriptions and quantity on drawings *NC 65 STH HES OUT (HARDWARE).* Part number and manufacturer/ supplier information for hardware components provided by the client.
Operating handle with gear-box driven push-out/pull-in mechanisms and multi-point locking with (2) corner transmissions, (3) link bars, (2) fixed locking points, (5) adjustable locking points and (7) fixed keepers. The test sample was also fitted with (3) butt hinges.

3.0 ALTERATION(S)

Alteration(s) performed in the laboratory on tested specimen to meet the reported performances: None.

4.0 TEST BENCH INFORMATION

Test bench identification: TB-AWS-02

The calibration of this test bench was done as per Article 9.0 of *ASTM E283*, *Standard Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors*, and *ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference* and *ASTM E547 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Cycling Static Air Pressure Difference.* The last calibration of this test bench and related equipment was performed in July, 2019.

5.0 RESULTS OF PERFORMANCE TESTS

SPECIFICATIONS	TEST RESULTS
Ease of operation test **NAFS-11 U.S. (only) requirements:** Force to initiate motion: R – LC – CW – AW < 155 N *(~34.85 lbf)* Force to maintain motion: R – LC < 100 N *(~22.48 lbf)* CW – AW: reported only R-LC-CW Force to latch < 100 N *(~22.48 lbf)* **NAFS-11 Canadian (only) requirements & NAFS-17 requirements for U.S. & Canada:** Force to initiate motion: R – LC – CW – AW < 155 N *(~34.85 lbf)* Force to maintain motion: R – LC < 100 N *(~22.48 lbf)* CW – AW< 135 N *(~30.35 lbf)* R-LC-CW Force to latch < 100 N *(~22.48 lbf)* *AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.1.* *A440S1-09 & A440S1-17 Canadian Supplement par. 5.2* *AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.1.* *A440S1-19 Canadian Supplement par. 5.3* *ASTM-E2068-00 (2008)*	**Passed Class AW Classification** Measured to initiate = 18 N *(~4 lbf)* Measured to maintain = 71 N *(~16 lbf)* Measured to latch = Not applicable
U.S. Air Leakage Resistance Test R – LC – CW Classifications: Q_{inf} ≤1.5 l/s-m² @ 75 Pa (~ *≤ 0.3 cfm/ft² @ 1.57 psf)* AW Classification: Q_{inf} ≤0.5 l/s-m² @ 300 Pa (~ *≤ 0.1 cfm/ft² @ 6.27 psf)* **Canadian air infiltration/exfiltration levels** R – LC – CW Classifications: A2: Q ≤ 1.5 l/s-m² @ 75 Pa *(~ ≤ 0.3 cfm/ft² @ 1.57 psf)* A3: Q ≤ 0.5 l/s-m² @ 75 Pa *(~ ≤ 0.1 cfm/ft² @ 1.57 psf)* AW Classification: A2: Q ≤ 0.5 l/s-m² @ 300 Pa *(~ ≤ 0.1 cfm/ft² @ 6.27 psf)* A3: Q ≤ 0.5 l/s-m² @ 300 Pa *(~ ≤ 0.1 cfm/ft² @ 6.27 psf)* *AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.2* *A440S1-09 & A440S1-17 Canadian Supplement par. 5.3* *ASTM-E283-04 (2012)*	**Class AW – U.S. Requirements (NAFS-11)** **A3 Level –Canadian Requirements (NAFS-11)** Surface: 2.25 m² *(~24.22 ft²)* Q_{inf} = 0.47 l/s-m² @ 300 Pa *(~0.09 cfm/ft² @ 6.27 psf)* Q_{exf} = 0.45 l/s-m² @ 300 Pa *(~0.09 cfm/ft² @ 6.27 psf)*
Air Leakage Resistance Test R – LC Classifications: Q_{inf} ≤1.5 l/s-m² @ 75 Pa (~ *≤ 0.3 cfm/ft² @ 1.57 psf)* Canadian air infiltration/exfiltration levels: A2: Q ≤ 1.5 l/s-m² @ 75 Pa *(~ ≤ 0.3 cfm/ft² @ 1.57 psf)* A3: Q ≤ 0.5 l/s-m² @ 75 Pa *(~ ≤ 0.1 cfm/ft² @ 1.57 psf)* CW Classification: Q ≤ 0.5 l/s-m² @ 75 Pa *(~ ≤ 0.1 cfm/ft² @ 1.57 psf)* AW Classification: Q_{inf} ≤ 0.5 l/s-m² @ 300 Pa *(~ ≤ 0.1 cfm/ft² @ 6.27 psf)* Q_{exf} ≤ 0.5 l/s-m² @ 75 Pa *(~ ≤ 0.1 cfm/ft² @ 1.57 psf)* *AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.2* *A440S1-19 Canadian Supplement par. 5.4* *ASTM-E283-04 (2012)*	**Class AW – Passed (NAFS-17)** Surface: 2.25 m² *(~24.22 ft²)* Q_{inf} = 0.47 l/s-m² @ 300 Pa *(~0.09 cfm/ft² @ 6.27 psf)* Q_{exf} = 0.21 l/s-m² @ 75 Pa *(~0.04 cfm/ft² @ 1.57 psf)*

Water Resistance Test No water infiltration under a minimum pressure differential: Class R: 140 Pa *(~2.92 psf)* Class LC: 180 Pa *(~3.76 psf)* Class CW: 220 Pa *(~4.59 psf)* Class AW: 390 Pa *(~8.15 psf)* *AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.3.* *A440S1-09 & A440S1-17 Canadian Supplements par. 5.4* *AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.2* *A440S1-19 Canadian Supplement par. 5.5* *Classes R, LC & CW: ASTM-E547-00 (2009 & 2016)* *Class AW: ASTM-E547-00 (2009 & 2016) & ASTM-E331-00 (2009 & 2016)*	**Class AW – U.S. & Canadian Requirements** No water infiltration under the minimum test pressure for the Class. No water infiltration at an optional test pressure differential of: **580 Pa** *(~12.11 psf)*- U.S. & Canadian Requirements **720 Pa** *(~15.04 psf)* - Canadian requirements only
Life Cycle Testing (AW Classification) The test sequence is the following : Air Infiltration Test *AAMA/WDMA/CSA 101/I.S.2/A440-11&17 par. 7.3.5, ASTM-E283-04 (2012) & AAMA 910-10; 3.1.2* Water Resistance Test *AAMA/WDMA/CSA 101/I.S.2/A440-11&17 par. 7.3.5, ASTM-E547-00 (2009) & ASTM E-331-00 (2009) & AAMA 910-10; 3.1.3* Vent Cycling Test (First Half) 2000 cycles of sash open/close, including the locking hardware. *AAMA 910-10; 3.1.4 & 3.1.5* Misuse Testing *3.6.6.2 Balance Arm Load Test* *3.6.6.3 Vent Lateral Racking Test* *AAMA 910-10; 3.1.7 & 3.6.6* Vent Cycling Test (Second Half) 2000 cycles of sash open/close, including the locking hardware. *AAMA 910-10; 3.1.8 & 3.1.9* Post Vent Cycling Air Infiltration Test *AAMA/WDMA/CSA 101/I.S.2/A440-11&17 par. 7.3.5, ASTM-E283-04 & AAMA 910-10; 3.1.11* Post Vent Cycling Water Resistance Test *AAMA/WDMA/CSA 101/I.S.2/A440-11&17 par. 7.3.5, ASTM-E547-00 (2009) & ASTM E-331-00 (2009) et AAMA 910-10; 3.1.12* Thermal Cycling The test specimen was subjected to 6 thermal cycles per AAMA 501.5-07 (Test Method for Thermal Cycling of Exterior Walls). *AAMA 910-10; 3.1.13*	**Passed Class AW (NAFS-11 & NAFS-17)** Q_{inf} = 0.37 l/s-m² @ 300 Pa *(~0.07 cfm/ft² @ 6.27 psf)* Q_{exf} = 0.32 l/s-m² @ 300 Pa *(~0.06 cfm/ft² @ 6.27 psf)* Q_{exf} = 0.15 l/s-m² @ 75 Pa *(~0.03 cfm/ft² @ 1.57 psf)* No water infiltration at an optional test pressure differential of 720 Pa *(~15.04 psf)* All operating/ locking parts were lubricated with white lithium grease every 500 cycles during the first half of the life cycling test. Hinges were not lubricated, nor was there any other maintenance performed on the specimen. There was no damage to fasteners, hardware parts, support arms, actuating mechanisms or any other damage that would cause the window to be inoperable. All operating/ locking parts were lubricated with white lithium grease every 500 cycles during the second half of the life cycling test. Hinges were not lubricated, nor was there any other maintenance performed on the specimen. Q_{inf} = 0.36 l/s-m² @ 300 Pa *(~0.07 cfm/ft² @ 6.27 psf)* Q_{exf} = 0.31 l/s-m² @ 300 Pa *(~0.06 cfm/ft² @ 6.27 psf)* Q_{exf} = 0.15 l/s-m² @ 75 Pa *(~0.03 cfm/ft² @ 1.57 psf)* No water infiltration at an optional test pressure differential of 720 Pa *(~15.04 psf)* High temperature= 82°C (180°F) Low temperature= -18°C (0°F) No damage observed

Uniform Load Deflection Test (L/175) at DP40 *AAMA/WDMA/CSA 101/I.S.2/A440-11&17 par. 7.3.5, ASTM-E283-04 & AAMA 910-10; 3.1.14 & ASTM-E330-02 (2010)* Post Thermal Cycling Air Infiltration Test *AAMA/WDMA/CSA 101/I.S.2/A440-11&17 par. 7.3.5, ASTM-E283-04 (2012) & AAMA 910-10; 3.1.15* Post Thermal Cycling Water Resistance Test *AAMA/WDMA/CSA 101/I.S.2/A440-11&17 par. 7.3.5, ASTM-E547-00 (2009) & ASTM E-331-00 (2009) & AAMA 910-10; 3.1.16* Uniform Load Structural Test at 1.5x DP40 (STP40) *AAMA/WDMA/CSA 101/I.S.2/A440-11&17 par. 7.3.5, et la spécification AAMA 910-10; 3.1.17, ASTM-E330-02 (2010) & ASTM-E330-14*	Member deflection does not exceed the limit of L/175 at a design pressure (DP) of 1920 Pa (~40.10 psf) Q_{inf} = 0.47 l/s-m² @ 300 Pa *(~0.09 cfm/ft² @ 6.27 psf)* Q_{exf} = 0.45 l/s-m² @ 300 Pa *(~0.09 cfm/ft² @ 6.27 psf)* Q_{exf} = 0.21 l/s-m² @ 75 Pa *(~0.04 cfm/ft² @ 1.57 psf)* No water infiltration at an optional test pressure differential of 720 Pa *(~15.04 psf)* Permanent deformation does not exceed the limit of 0.2% (L) at a structural test pressure (STP) of 2880 Pa *(~60.15 psf)*
Uniform Load Deflection Test Member deflection at a minimum design pressure (DP) and at optional DP: Class R: 720 Pa *(~15.04 psf)* – Reported only Class LC: 1200 Pa *(~25.06 psf)* – Reported only Class CW: Limited to L/175 at 1440 Pa *(~30.08 psf*) Class AW: Limited to L/175 at 1920 Pa *(~40.10 psf*) *AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.4* *AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.4* *ASTM-E330-02 (2010) & ASTM-E330-14*	**DP 70 – Class AW** Net deflection measured on the lower rail: 0.69 mm @ –1920 Pa (*~0.03" @ –40.10 psf)* 0.59 mm @ +1920 Pa *(~0.02" @ +40.10 psf)* 1.04 mm @ –3360 Pa (*~0.04" @ –70.18 psf)* 0.97 mm @ +3360 Pa *(~0.04" @ +70.18 psf)* Allowed ≤ 7.72 mm *(~0.30 ")*
Uniform Load Structural Permanent deformation is limited at a minimum structural test pressure (STP) and at optional STP of: Class R: ≤ 0.4% (L) at 1080 Pa *(~22.56 psf)* Class LC: ≤ 0.4% (L) at 1800 Pa *(~37.59 psf)* Class CW: ≤ 0.3% (L) at 2160 Pa *(~45.11 psf)* Class AW: ≤ 0.2% (L) at 2880 Pa *(~60.15 psf)* *AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.4* *AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.4* *ASTM-E330-02 (2010) & ASTM-E330-14*	**STP 70 – Class AW** Permanent deformation measured on the lower rail: 0.04 mm @ –2880 Pa (*~0.00" @ –60.15 psf)* 0.01 mm @ +2880 Pa *(~0.00" @ +60.15 psf)* 0.02 mm @ –5040 Pa *(~0.00" @ –105.26 psf)* 0.02 mm @ +5040 Pa *(~0.00" @ +105.26 psf)* Allowed ≤ 2.70 mm *(~0.11")*
Forced-Entry Resistance All windows shall be tested according to *ASTM F588-07 & ASTM F588-14* Grade 10. *AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.5* *AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.5*	**Passed Grade 40** T_1=10 min., L_1=1334 N *(~300 lbf)*, L_2=667 N *(~150 lbf) &* L_3=267 N *(~60 lbf)*
Sash/ Leaf Torsion Test Deflection of the unrestrained corner of an unglazed sash < 33.3 x (sash area in m²) under a load of 70 N (~15.74 lbf) *AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 7.3.4.2* *AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 7.3.5.2*	**Passed Class AW** Deflection under a load of 70 N *(~15.74 lbf):* Allowed deflection = 71.5 mm *(2.81")* Measured deflection = 45.0 mm *(1.77")*

Sash/leaf Load Test on Latch Rail Deflection of the center of the span of the latch rail under a concentrated load of 135 N *(~30.35 lbf)* parallel and perpendicular to the plane of the sash (both directions) <1.5 mm *(0.06")* *AAMA/WDMA/CSA 101/I.S.2/A440-11 par. 9.3.6.4.3* *AAMA/WDMA/CSA 101/I.S.2/A440-17 par. 9.3.6.4.3*	**Passed Class AW – unglazed sash** Allowed parallel: 1.5 mm (0.06") Measured parallel: 0.31 mm (0.01") Allowed perpendicular: 1.5 mm (0.06") Measured perpendicular: 0.40 mm (0.02")
Insect Screen Test Canadian (only)requirements: Insect screens shall be tested in accordance with ASTM E1748-95(09) in the outward direction only under a load of 60 N (~13 lbf). *A440S1-09 & A440S1-17 Canadian Supplements par. 5.1* *A440S1-19 Canadian Supplement par. 5.2*	No screen supplied with the product.

6.0 CONCLUSION

Based on the tests results, the fenestration product described in this report meets the requirements of the *AAMA/WDMA/CSA 101/I.S.2/A440-11 (NAFS 2011) Standard and its Canadian supplements CSA A440S1-09 & CSA A440S1-17 and the AAMA/WDMA/CSA 101/I.S. 2/A440-17 (NAFS 2017) Standard and its Canadian supplement CSA A440S1:19*, regarding performance testing.

Detailed assembly drawings showing wall thickness of all members, corner construction and hardware application are on file and have been compared to the sample submitted.

The above results were secured by using the designated test methods and they indicate compliance with the performance requirements of the referenced specification. The test records from this evaluation will be retained for a minimum of four (4) years from the date of report issuance. This report does not constitute certification of this product, which may only be granted by a certification agency.

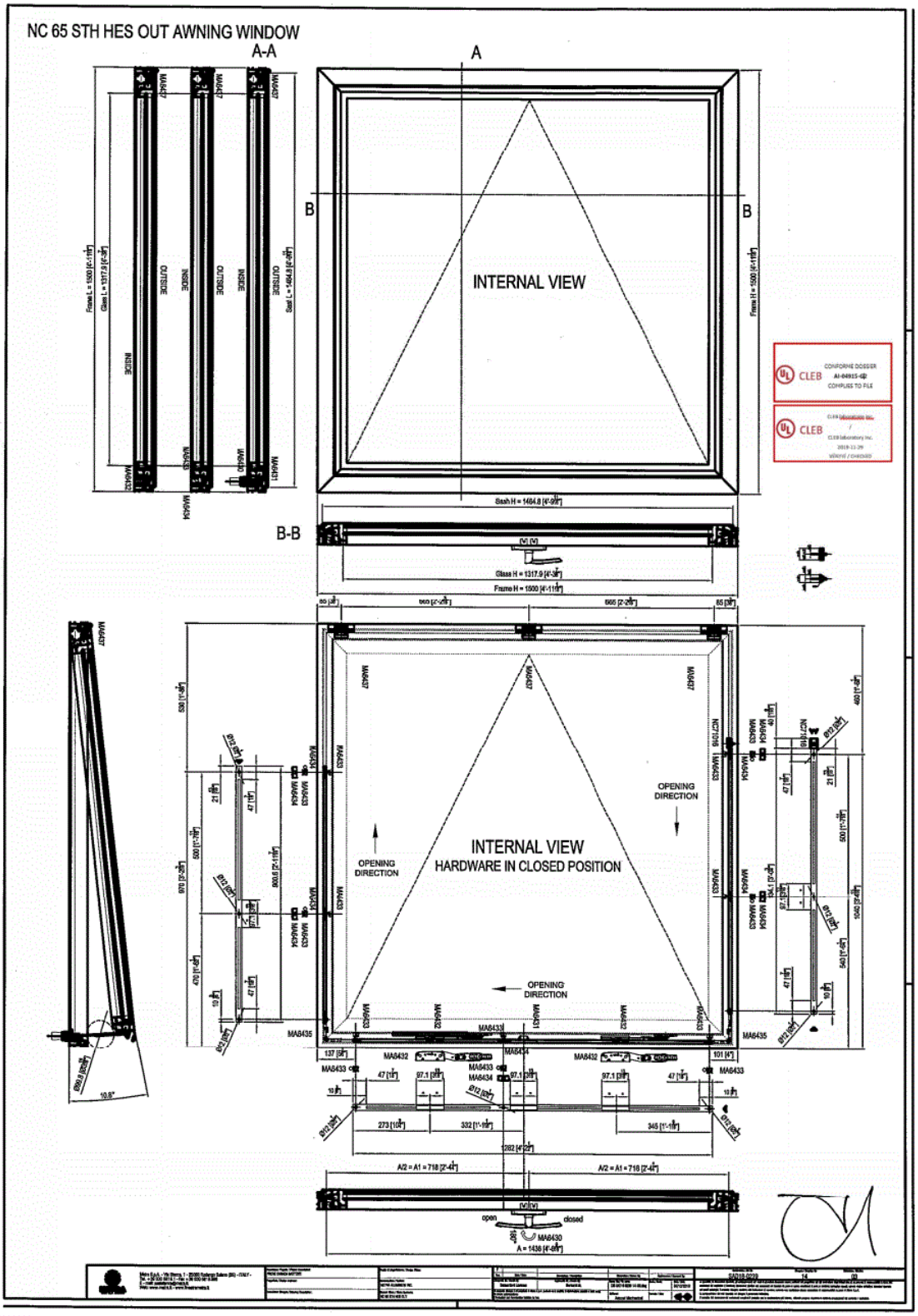
Note on the Limitation of Liability:
Due care was taken in performing the testing sequence and in reporting the results related to the test specimen received for evaluation. Through acceptance of this report, the Client agrees to exempt CLEB laboratory Inc. employees and owners from all liability claims and demands arising from any matter related to or concerning the quality and execution of the performance evaluation contained in this report.

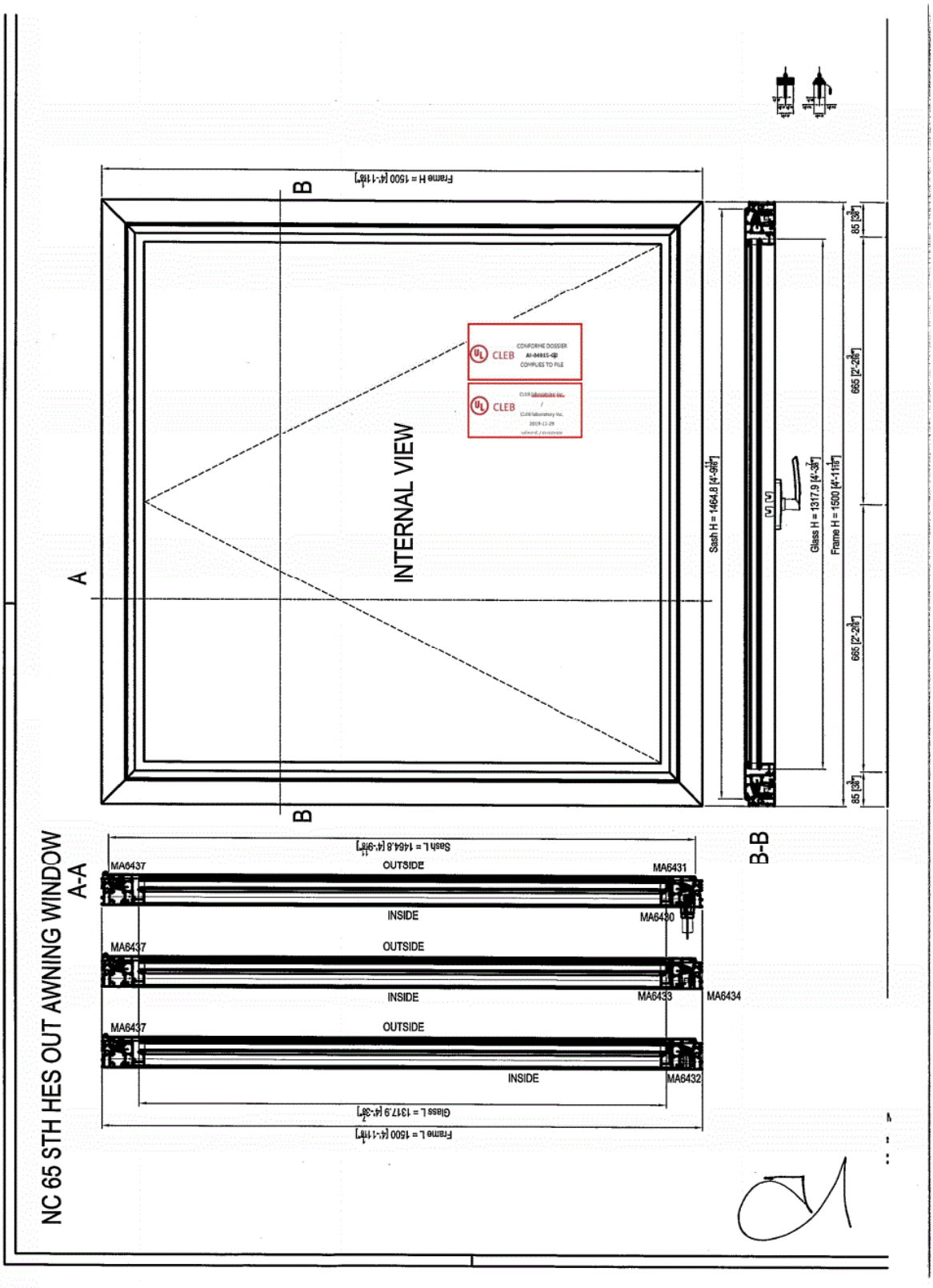
7.0 REVISION LOG

Rev. #	Date	Page(s)	Revision(s)

APPENDIX

DRAWINGS, SEALANT, DRAINAGE DETAILS & BILL OF MATERIALS




NC 65 STH HES OUT AWNING WINDOW
A-A
B-B
INTERNAL VIEW
A
B
B
Frame H = 1500 [4'-11"]
Sash H = 1464.8 [4'-9"]
Glass H = 1317.9 [4'-3"]
Frame H = 1500 [4'-11"]
85 [3"]
665 [2'-2"]
665 [2'-2"]
85 [3"]
Sash L = 1464.8 [4'-9"]
Glass L = 1317.9 [4'-3"]
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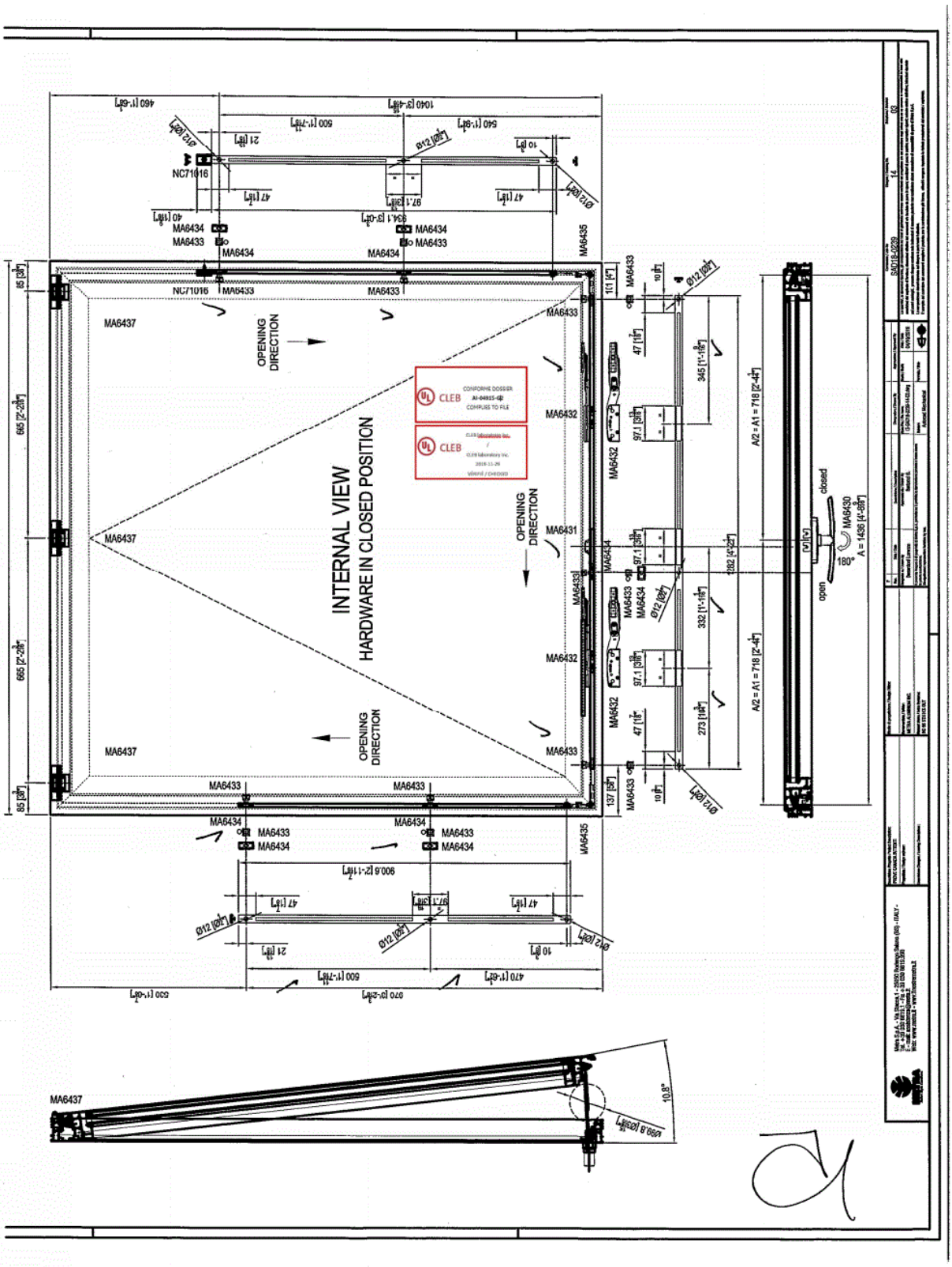
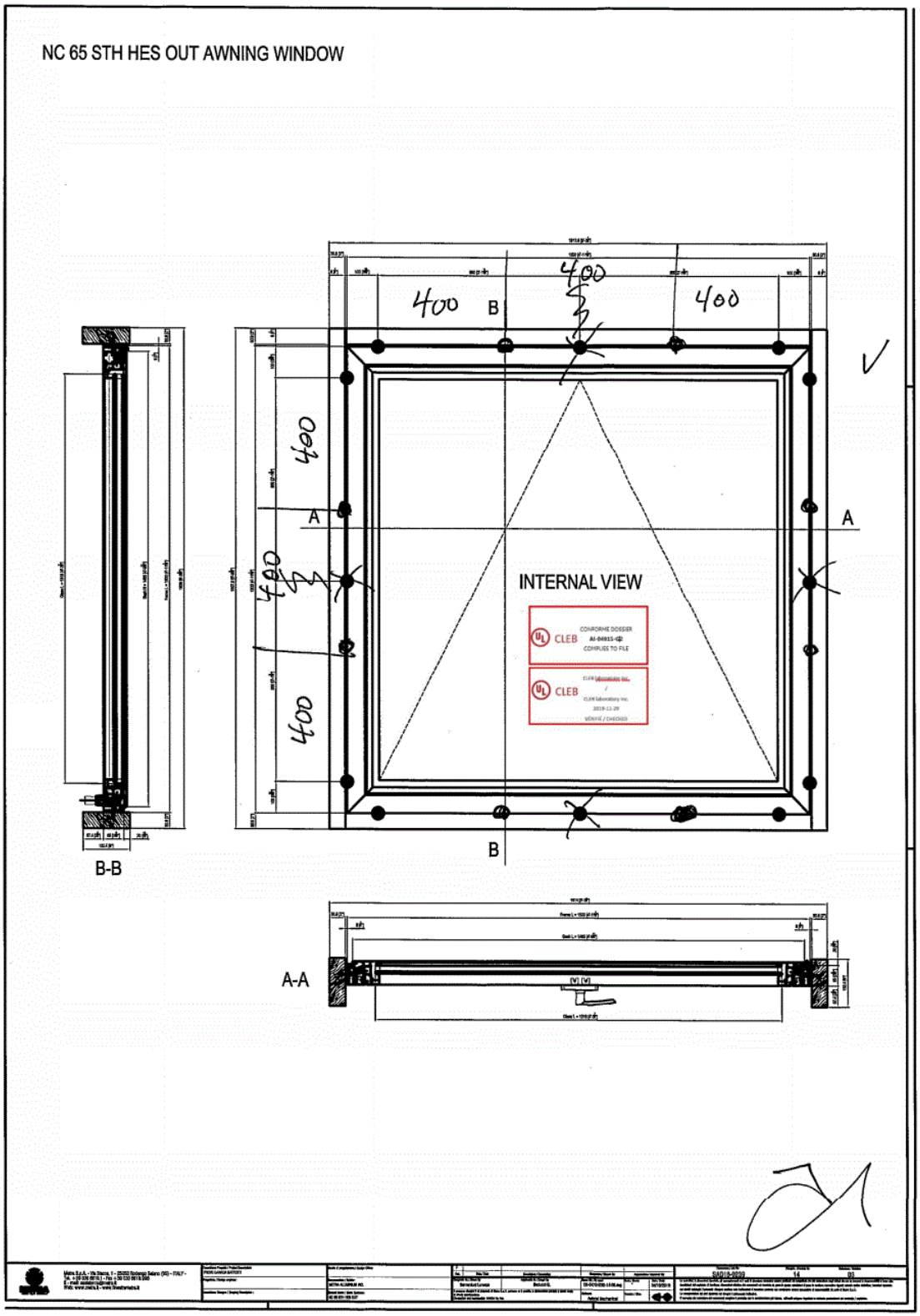
INSIDE
MA6431
MA6430
MA6433
MA6434
MA6432





METRA

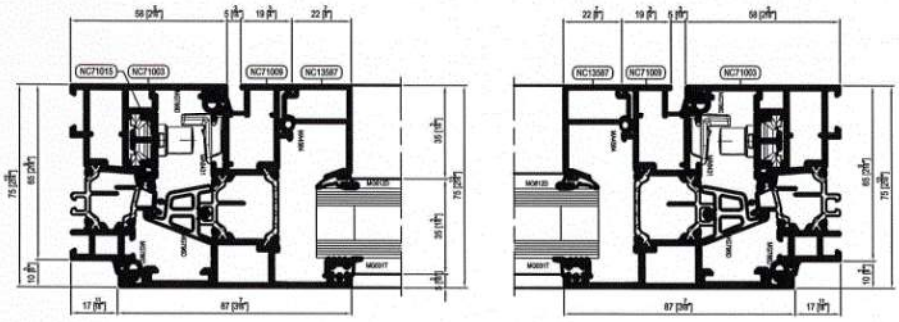
SECTIONS

DS-SAD-0239-13 rev E

CONFORME DOSSIER
AI-04915-G2
COMPLIES TO FILE
CLEB

CLEB laboratory Inc.
2019-11-29
VÉRIFIÉ / CHECKED
CLEB

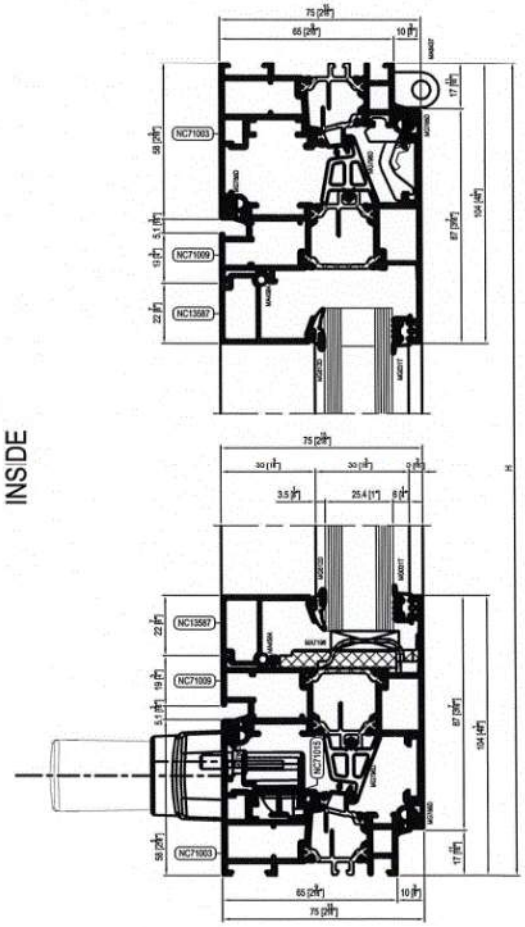
INSIDE



OUTSIDE

DS-SAD-0239-14 rev H

NC 65 STH HES OUT



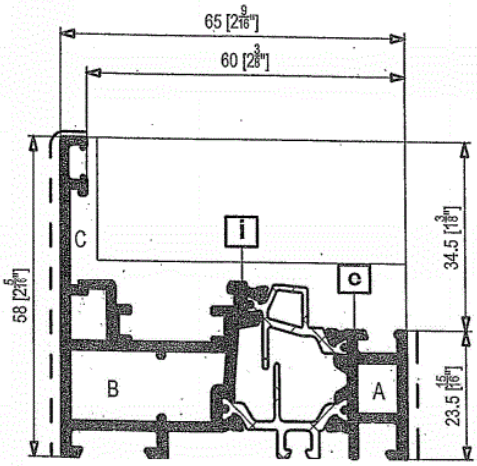
CONFORME DOSSIER
AI-04915-G2
COMPLIES TO FILE
CLEB
CLEB laboratory Inc.
2019-11-29
VERIFIÉ / CHECKED

DS-SAD-0239-14 rev H

METRA

PROFILES

DS-SAD-0239-13 revE

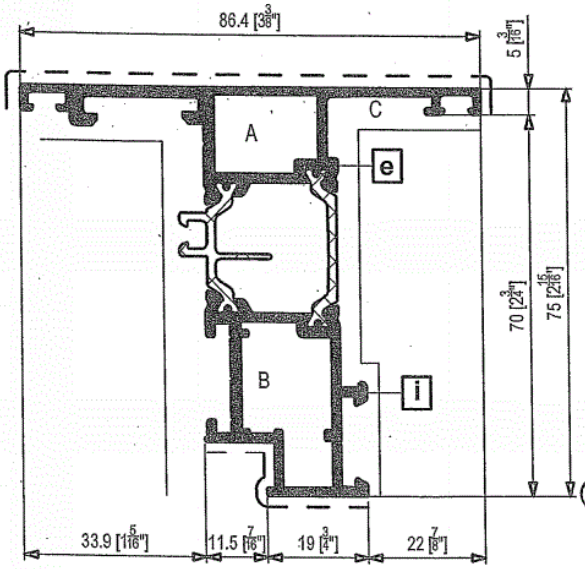


NC71003	I_x cm⁴ / I_y in⁴	S_x cm³ / S_y in³	USE
PERIMETER 350 [13.78] mm / in	8.306 [0.2]	2.147 [0.131]	Frame
VISIBLE SURFACE 81.5 [3.21] mm / in	24.317 [0.584]	6.421 [0.392]	AESTHETIC LINES BL

	A	B	C	D
	MA2806	MA2807 (MA5550)	MA4081	
	MA2806	MA2807	MA4081	
	MA2806 (MA8259)	MA2807 (MA5550)	MA4081	
	MA2840 (MA8864)	MA2841 (MA5550)		

COMPONENTS

SHAPE	CODE	CUT PERIMETER	EXPOSED SURFACE
e	NC71002	124 [4 7/8"]	23.5 [15/16"]
i	NC71001	278 [10 15/16"]	63 [2 1/2"]
	PF0014		
	PF0013		



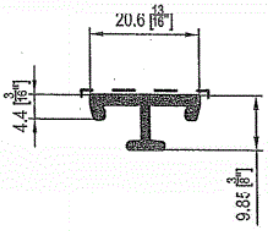
NC71009	I_x cm⁴ / I_y in⁴	S_x cm³ / S_y in³	USE
PERIMETER 427 [16.81] mm / in	38.629 [0.928]	8.186 [0.490]	Sash
VISIBLE SURFACE 127 [5] mm / in	16.267 [0.439]	4.038 [0.240]	AESTHETIC LINES BL

	A	B	C	D
	MA7227	MA7228 (MA5550)	MA2811 MA7187	
	MA7227	MA7228	MA2811 MA7107	
	MA7227 (MA2691)	MA7228 (MA5550)	MA2811 MA7187	

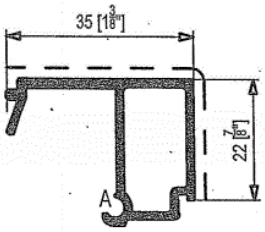
COMPONENTS

SHAPE	CODE	CUT PERIMETER	EXPOSED SURFACE
i	NC71008	189 [7 7/16"]	40 [1 9/16"]
	NC71007	286 [11 1/4"]	92 [3 5/8"]
	PF0011		
	PF0013		

DS-SAD-0239-13 rev E



NC71015			I_X cm⁴ / I_Y (in⁴)	$S_{X_{cm^3}}$ / S_Y (in³)	USE
PERIMETER	80 [3.15]	cm / in	0.064 [0.002]	0.095 [0.006]	Closing rod
VISIBLE SURFACE	20.8 [0.81]	cm / in	0.221 [0.005]	0.214 [0.013]	



NC13587			I_X cm⁴ / I_Y (in⁴)	$S_{X_{cm^3}}$ / S_Y (in³)	USE
PERIMETER	148 [5.83]	cm / in	1.698 [0.041]	0.791 [0.048]	Glass stop
VISIBLE SURFACE	55 [2.17]	cm / in	1.303 [0.031]	0.778 [0.047]	AESTHETIC LINES BL

A	B	C	D
MG1530 MA4664			

DS-SAD-0239-13 revE

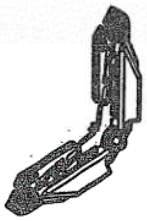
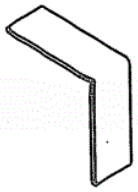
METRA

ACCESSORIES

DS-SAD-0239-13 revE

NC 65 STH HES OUT

ITEM LIST

CODE	DESCRIPTION	MATERIAL	IMAGE
MA2806	CORNER CLEAT	DIE-CAST ALUMINIUM	
MA2807	CORNER CLEAT	DIE-CAST ALUMINIUM	
MA2811	CORNER CLEAT	VARIOUS	
MA4081	ALIGNMENT CORNER CLEAT	ALUMINIUM	
MA5550	ZAMAK WINDOW PIN	ZAMAK	

DS-SAD-0239-13 revE

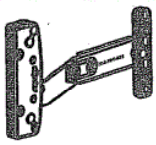
METRA

HARDWARE

DS-SAD-0239-13 revE

NC 65 STH HES OUT

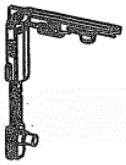
ITEM LIST

CODE	DESCRIPTION	MATERIAL	IMAGE
MA6430	HANDLE FOR OUTWARD OPENING	PLASTIC - STEEL	
MA6431	MOVEMENT DEVICE FOR HANDLE	STEEL	
MA6432	LEVER MECHANISM FOR OTWARD OPENING	STEEL	
MA6433	KEEPER	ZAMAK	
MA6434	ADJUSTABLE LOCKING POINT	STEEL	

DS-SAD-0239-13 revE

NC 65 STH HES OUT

ITEM LIST

CODE	DESCRIPTION	MATERIAL	IMAGE
MA6435	ANGULAR TRANSMISSION	STEEL	
MA6437	HINGE	VARIOUS	

DS-SAD-0239-13 rev E

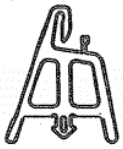
METRA

GASKETS

DS-SAD-0239-13 revE

NC 65 STH HES OUT

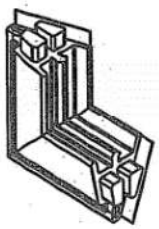
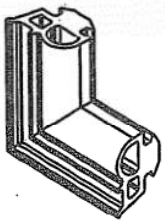
ITEM LIST

CODE	DESCRIPTION	MATERIAL	IMAGE
MG031T	EXTERNAL GLAZING GASKET	EPDM	
~~MG612D~~ MG613D	INTERNAL GLAZING GASKET 3/3.5	EPDM	
MG786D	INTERNAL RABBET GASKET	EPDM	
MG796D	CENTRAL GASKET	EPDM	

DS-SAD-0239-13 revE

NC 65 STH HES OUT

ITEM LIST

CODE	DESCRIPTION	MATERIAL	IMAGE
MA7198	GLASS SHIMMING BASE FOR SASHES	NYLON	
MA9327	VULCANISED CORNER FOR MG796D	EPDM	
MA5407	INTERNAL VULCANISED CORNER FOR MG786D	EPDM	
MA4564	GLASS STOP GASKET IN PCS	EPDM	

DS-SAD-0239-13 revE

METRA

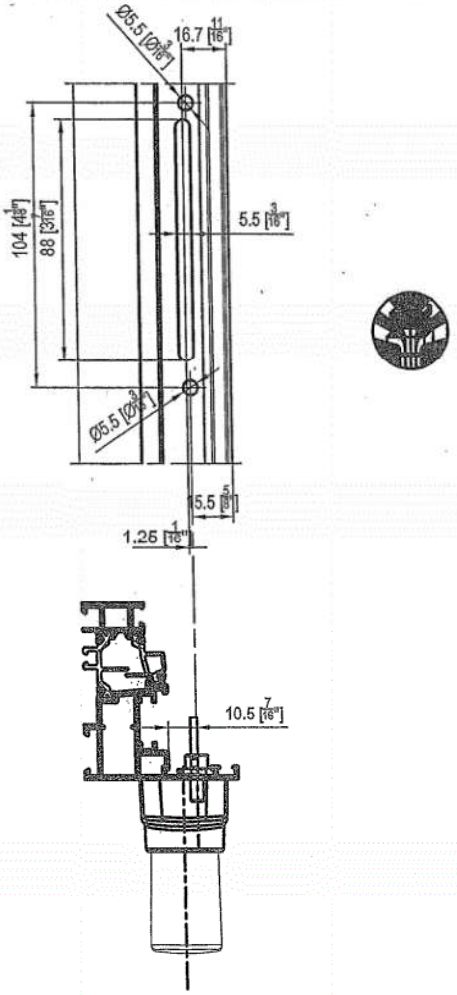
MACHINING FOR HARDWARE

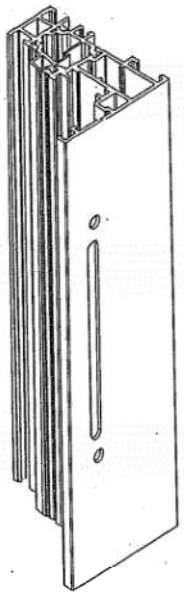
DS-SAD-0239-13 revE

NC 65 STH HES OUT

Machining for handle installation

Handle with 104 mm [4 1/8"] interaxis





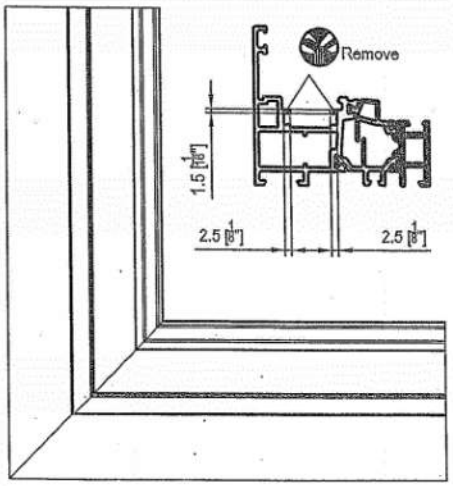
Machinable profiles: NC71003 - NC71006 - NC71012 - NC71014

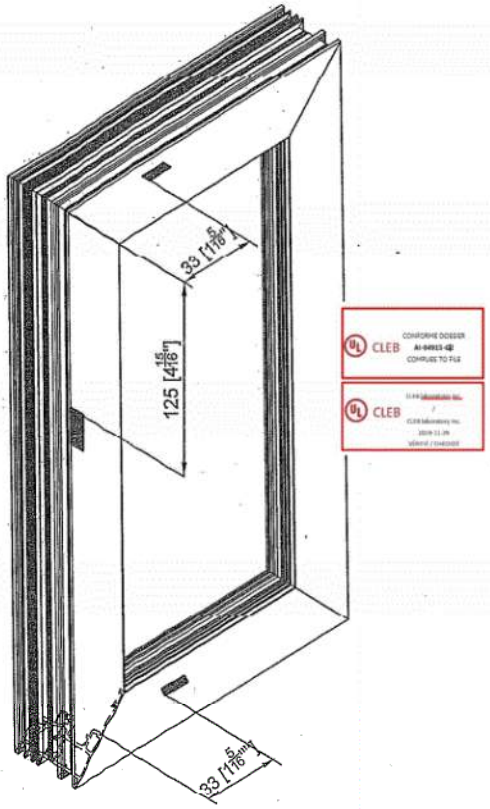
DS-SAD-0239-13 revE

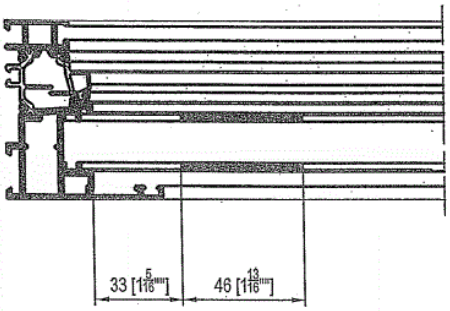
NC 65 STH HES OUT

Machining for hardware housing

Fin removal on frame





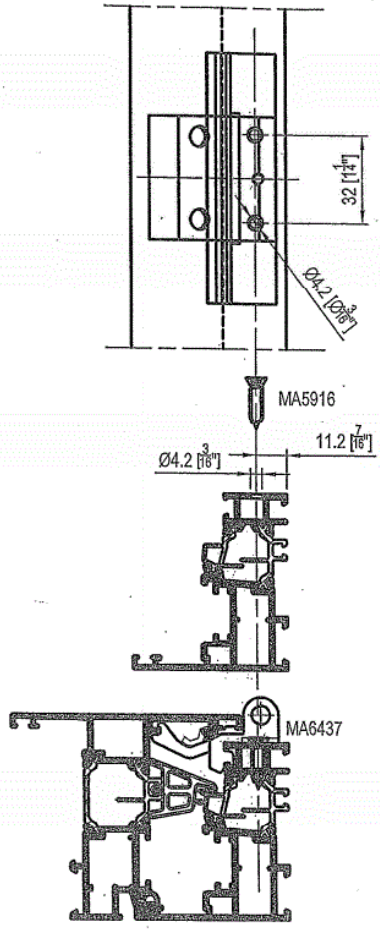


For the choice of the hardware and the handles refer to the specific documentation

Machinable profile: NC71003 - NC71006 - NC71012 - NC71014

DS-SAD-0239-13 rev E

Machining for hinge MA6437 on frame



DS-SAD-0239-13 revE

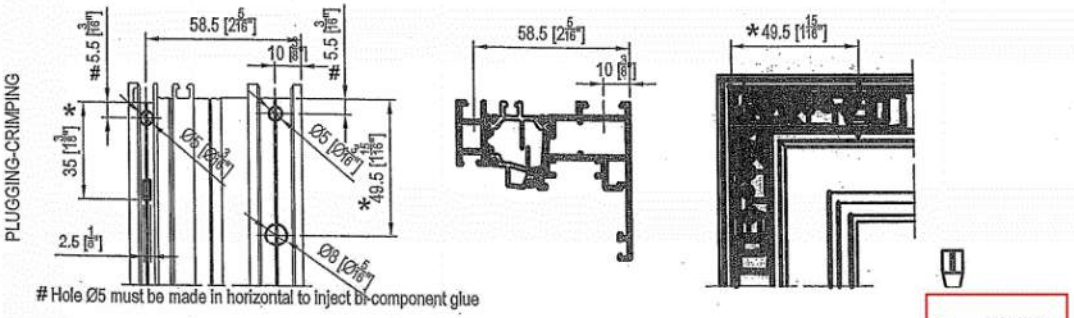
METRA

MACHINING FOR ASSEMBLY

DS-SAD-0239-13 revE

NC 65 STH HES OUT

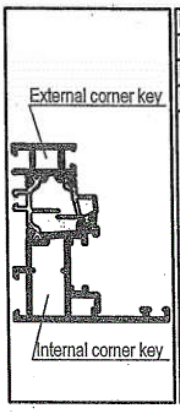
Corner key fixing for corner assembly



Hole Ø5 must be made in horizontal to inject bi-component glue

SMALL FRAME

Internal corner key	MA2807
Internal pin	MA5550
External corner key	MA2806
External pin	MA8250



NC71003

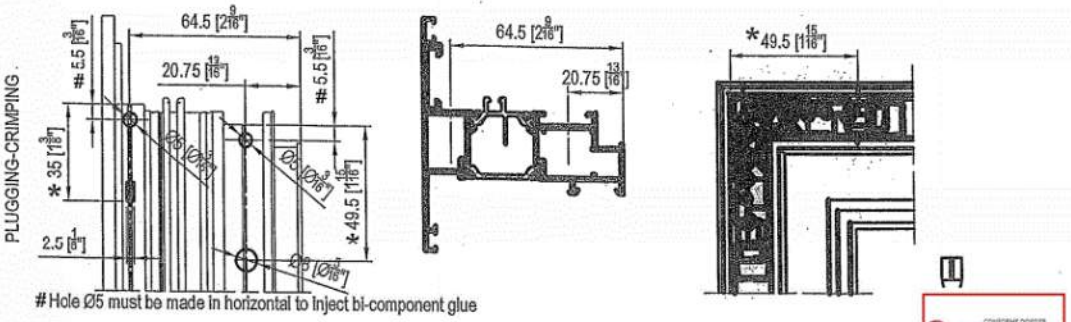
*CHECK THE THEORETICAL DIMENSION DURING THE FABRICATION PHASE

Scale 1:2

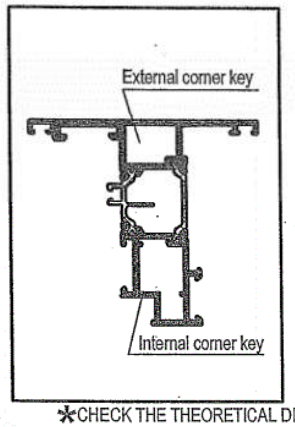
DS-SAD-0239-13 revE

NC 65 STH HES OUT

Corner key fixing for corner assembly



Hole Ø5 must be made in horizontal to inject bi-component glue



SMALL FRAME

Internal corner key	MA7228
Internal pin	MA5550
Ext. corner key	MA7227
External pin	MA2864

NC71009

*CHECK THE THEORETICAL DIMENSION DURING THE FABRICATION PHASE

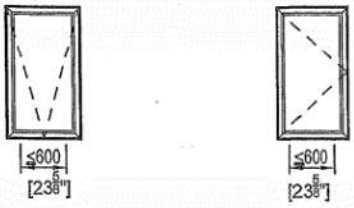
Scale 1:2

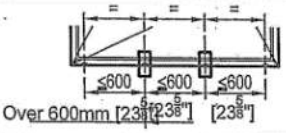
DS-SAD-0239-13 revE

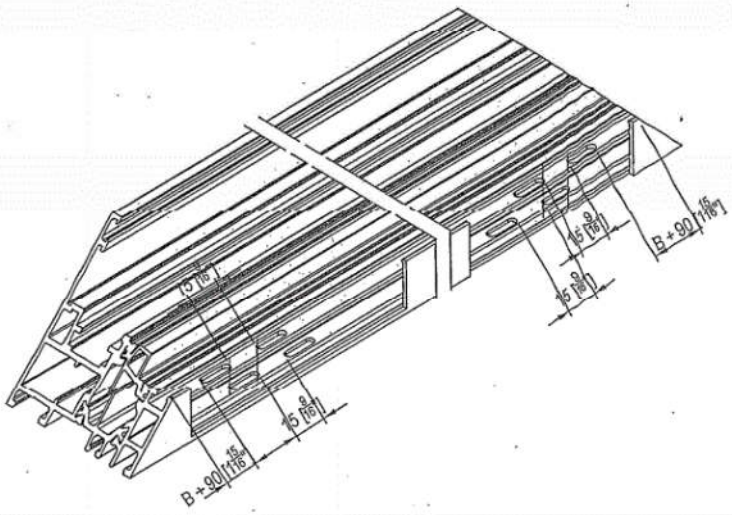
Position of the water drainage

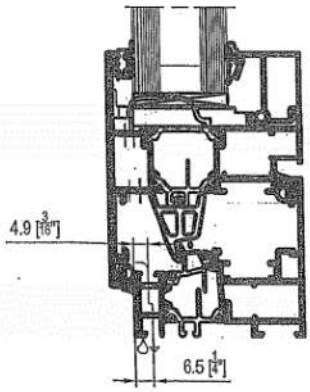
Frames

Solution with awning or casement opening





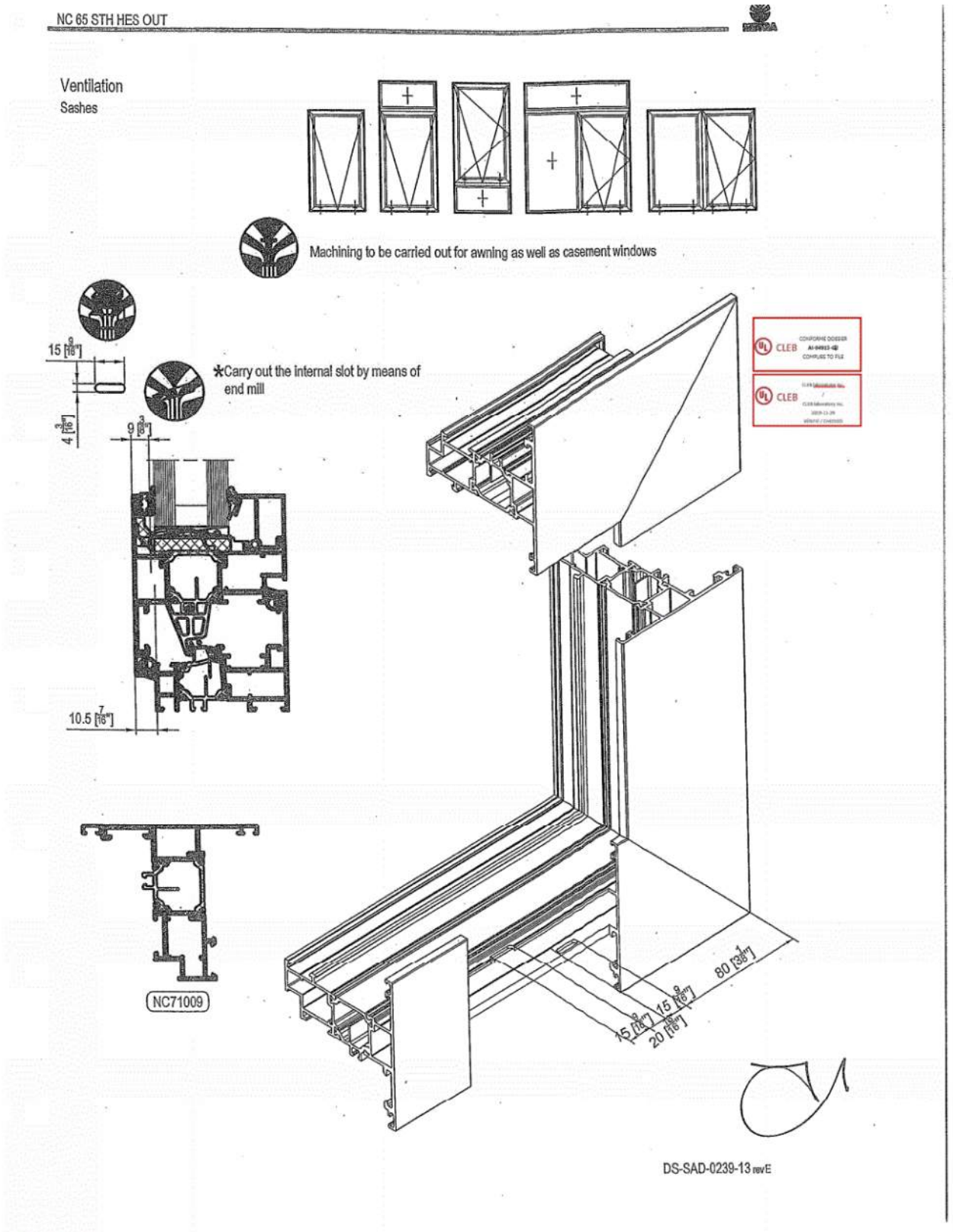


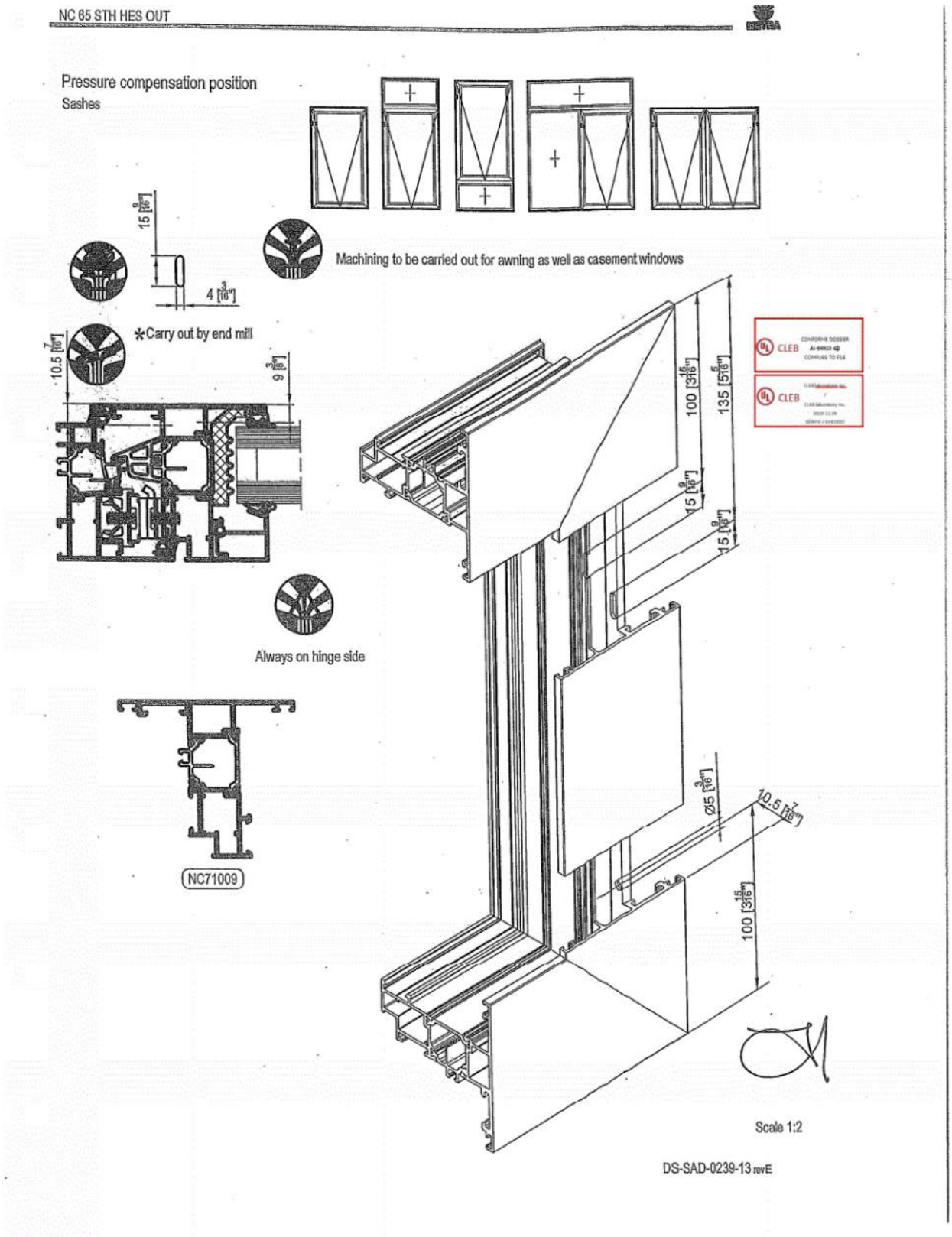


Machining possible for the following frames: NC71003 - NC71012 - NC71014

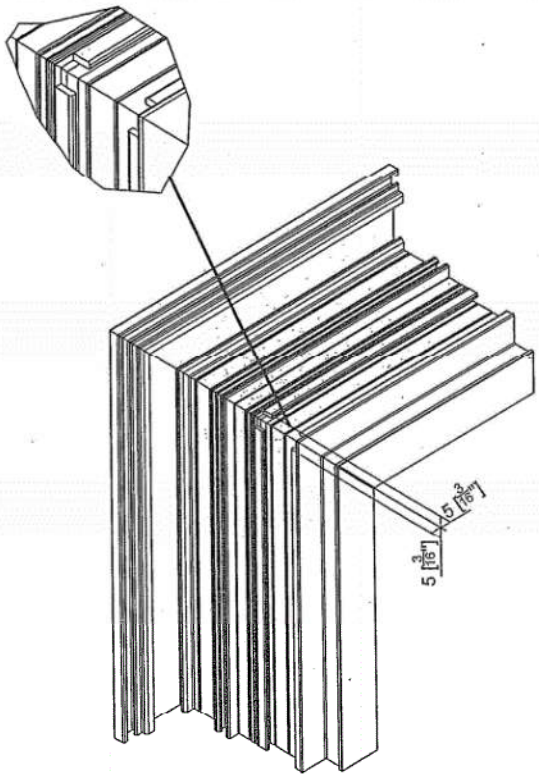
Scale 1:2

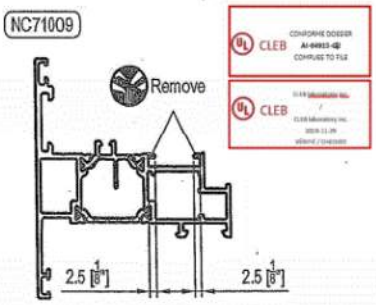
DS-SAD-0239-13 rev E

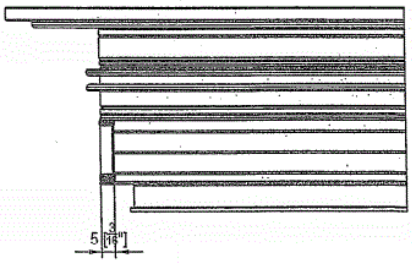



NC 65 STH HES OUT
Pressure compensation position
Sashes
Machining to be carried out for awning as well as casement windows
15 [16"]
4 [3/16"]
*Carry out by end mill
10.5 [7/16"]
9 [3/8"]
Always on hinge side
NC71009
100 [15/16"]
135 [5/16"]
15 [16"]
15 [16"]
Ø5 [3/16"]
10.5 [7/16"]
100 [15/16"]
Scale 1:2
DS-SAD-0239-13 revE

Fin removal for hardware passage
Machining on sash



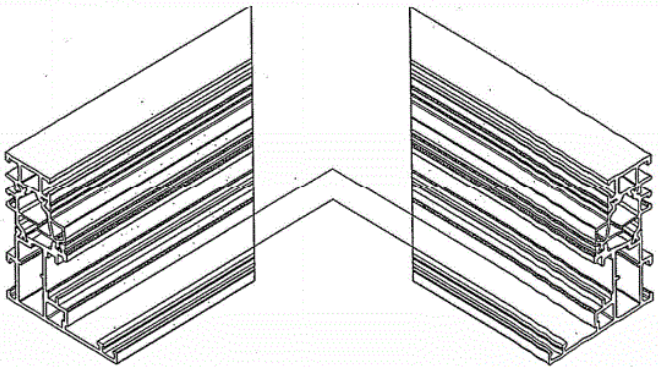




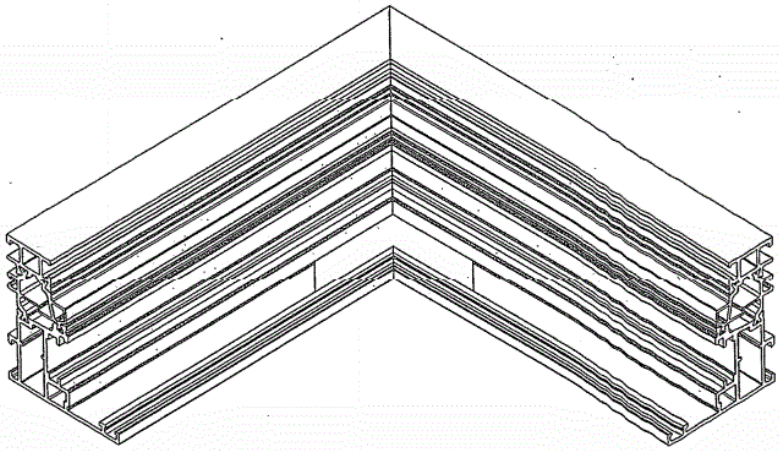
DS-SAD-0239-13 revE

Application of alignment corner key MA4081
Frame/Frame

1 Insert the corner key before the assembling of the corner



2 Assemble the corner

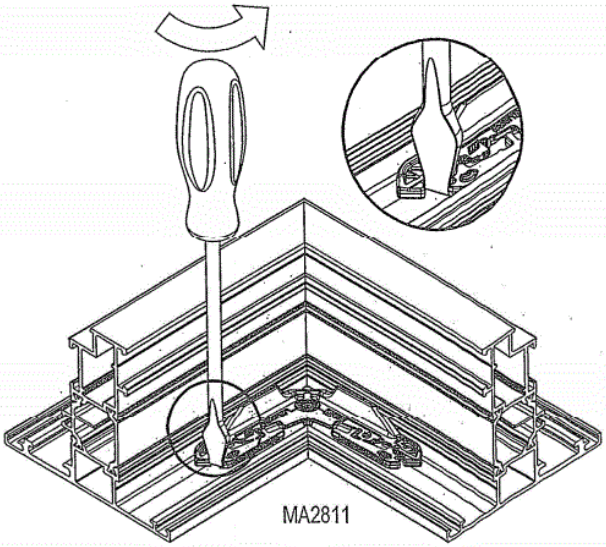


DS-SAD-0239-13 revE

Application of alignment corner key MA2811

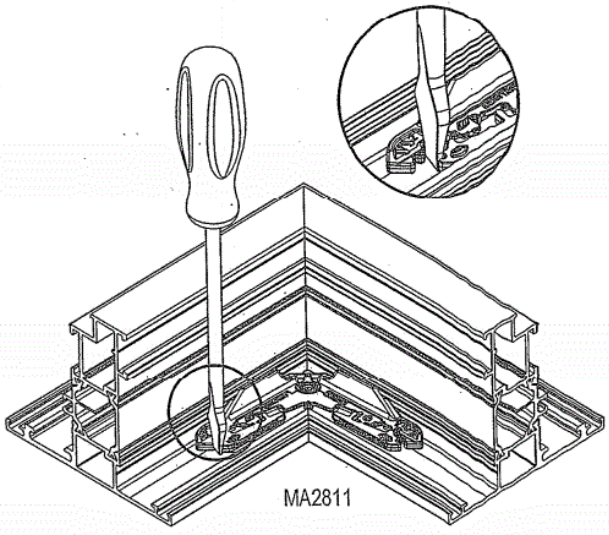
Sash

③



Rotate the screw driver in order to unplug the part from the main body and push it forward. Carry out the same operation on the opposite side to center the corner key in the profile.

④

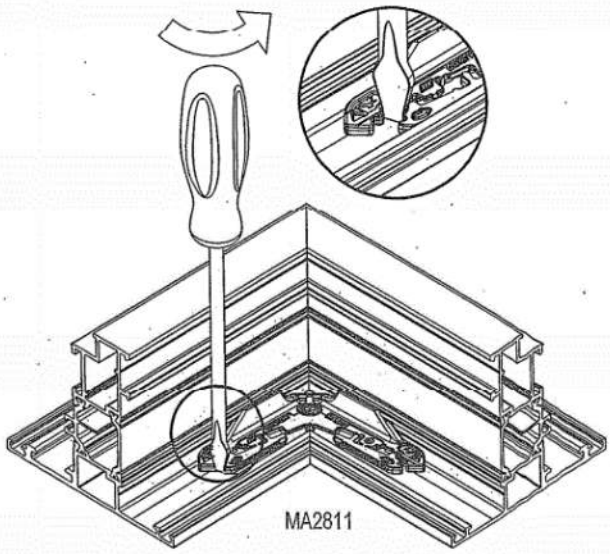


Position a screw driver 1.2x6.5 into the seat indicated by the number 2

DS-SAD-0239-13 revE

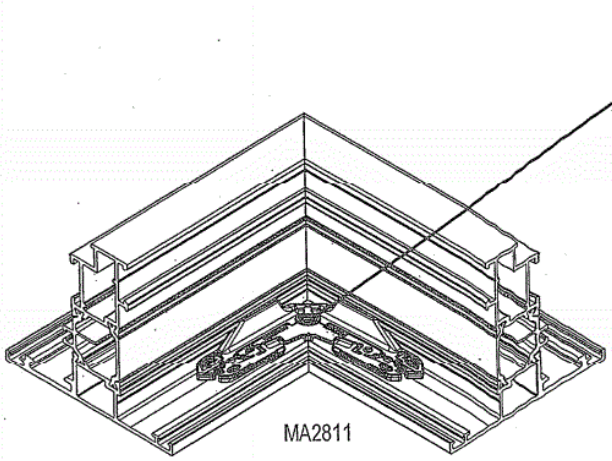
Application of alignment corner key MA2811
Sash

5



Rotate the screw driver and fix the corner key.
Carry out the same operation on the opposite side.

6

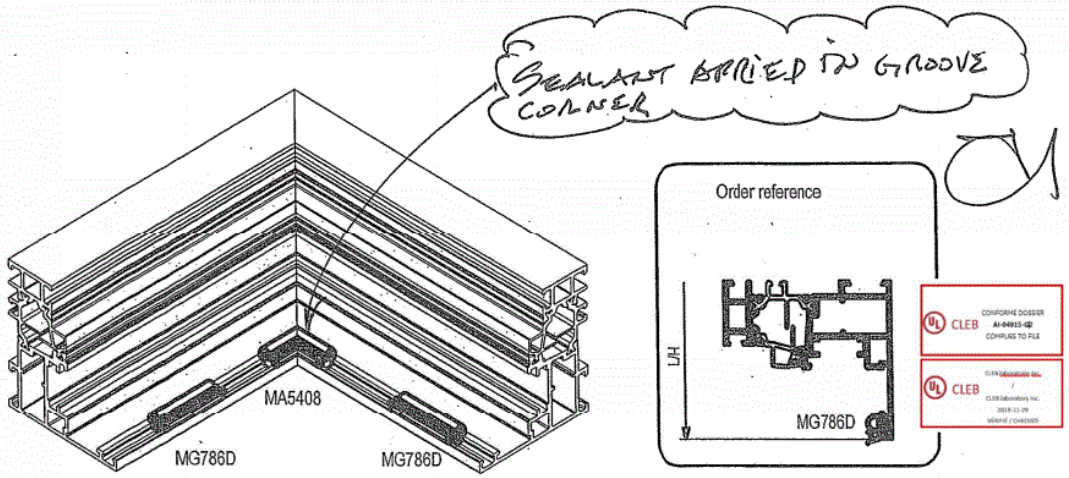


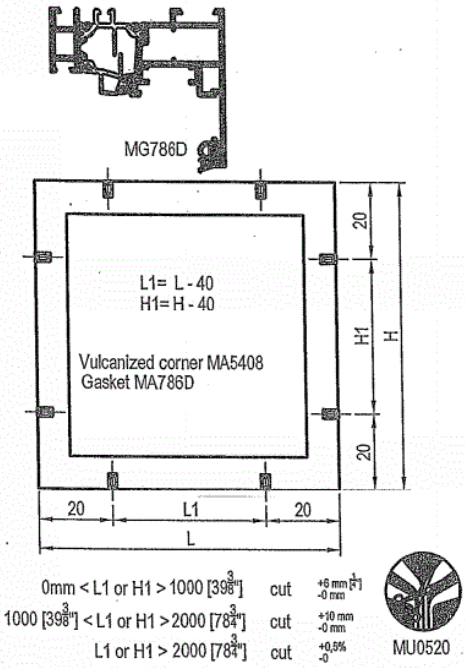
Apply bi-component glue MU0440 being careful not to let it come out of the corner key.

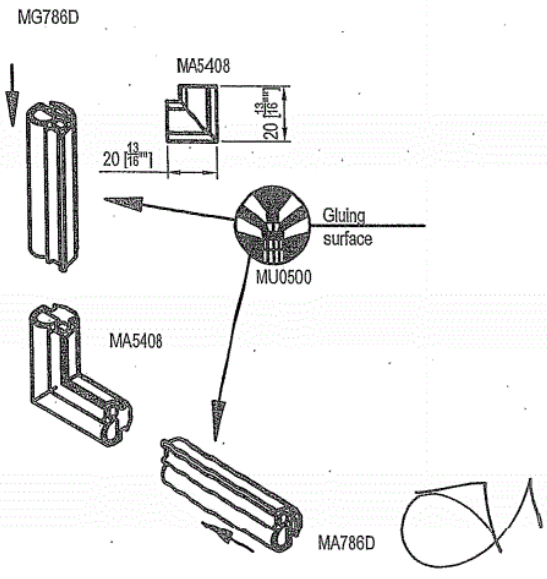
DS-SAD-0239-13 revE

Gasket fitting on frame

MG786D

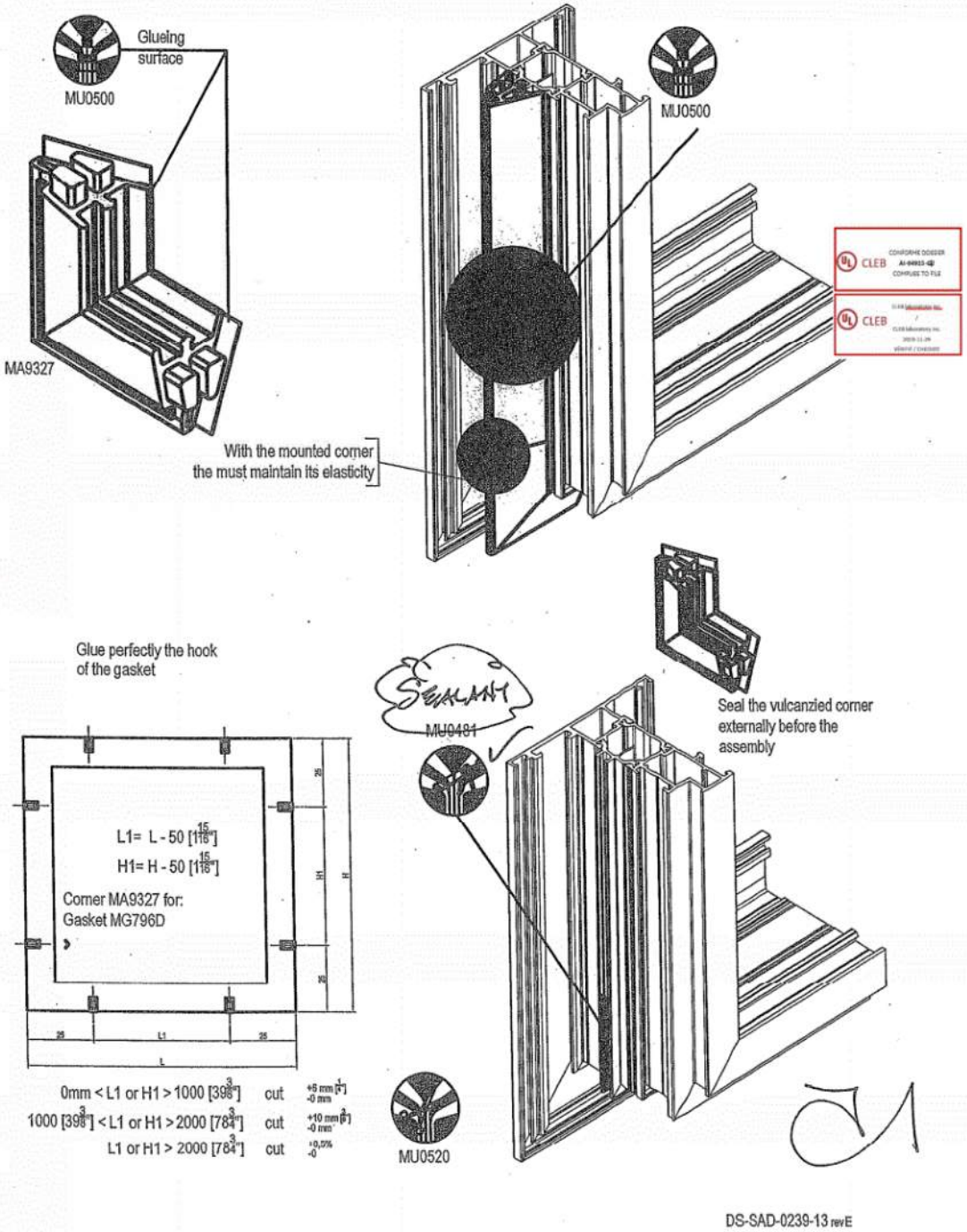






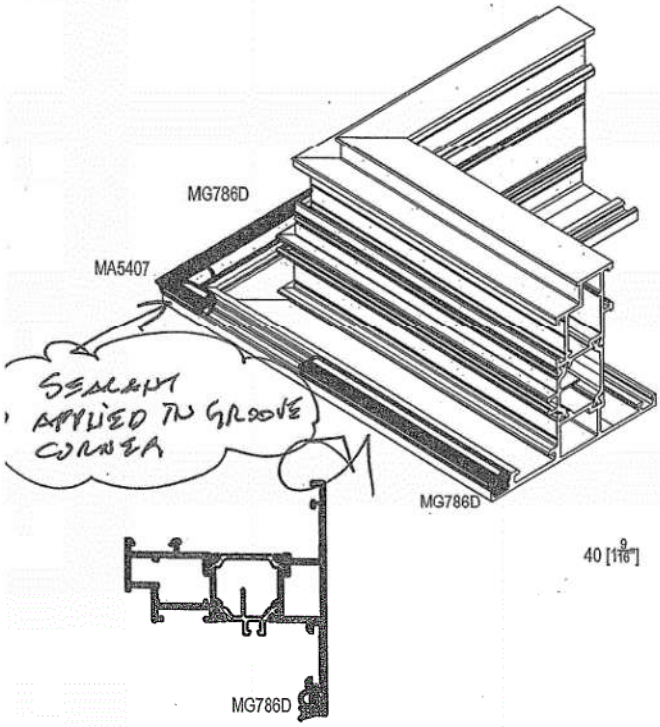
DS-SAD-0239-13 revE

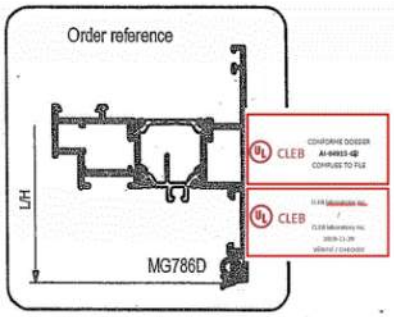
Gasket fitting on frame
MG796D



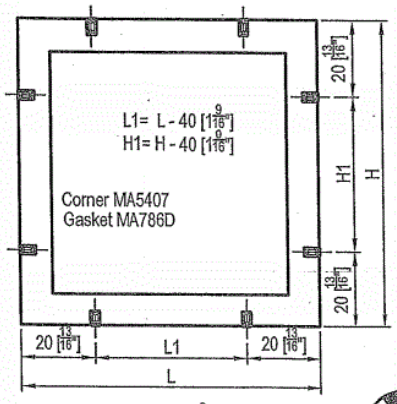
DS-SAD-0239-13 revE

Gasket fitting on sash
MG786D

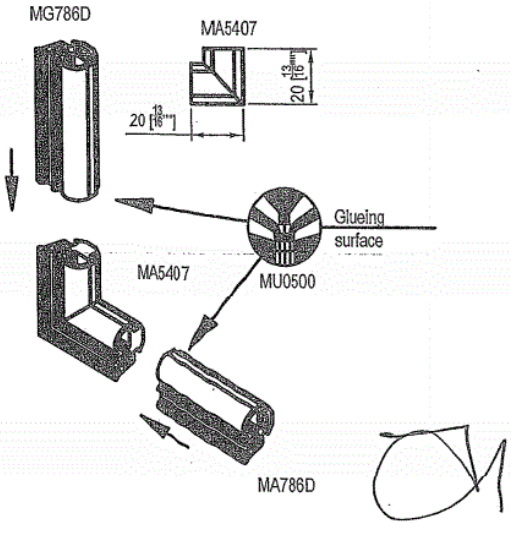




40 [9/16"]



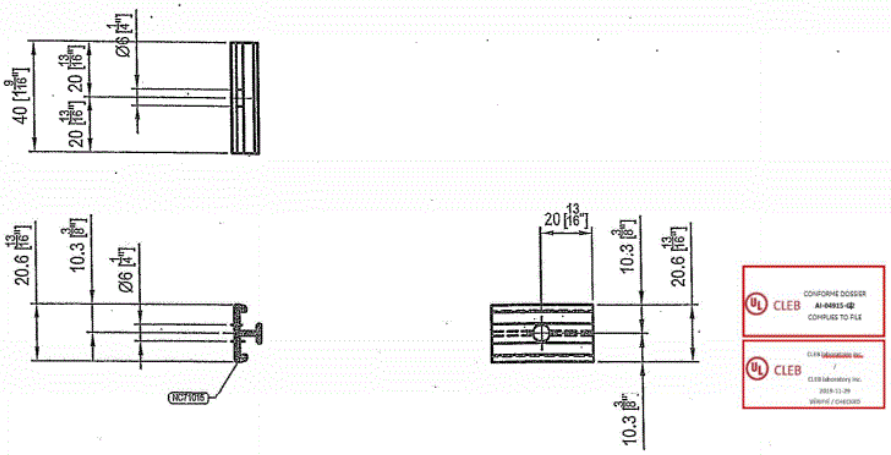
0mm < L1 or H1 > 1000 [39 3/8"] cut +6 mm [1/4"] -0 mm
1000 [39 3/8"] < L1 or H1 > 2000 [78 3/4"] cut +10 mm [3/8"] -0 mm
L1 or H1 > 2000 [78 3/4"] cut +0,5% -0

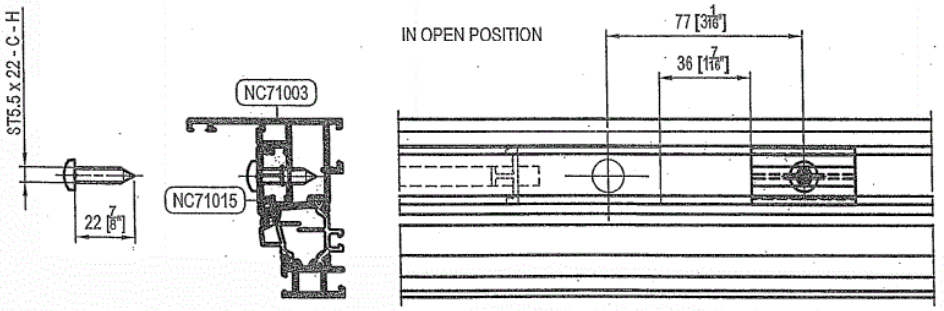


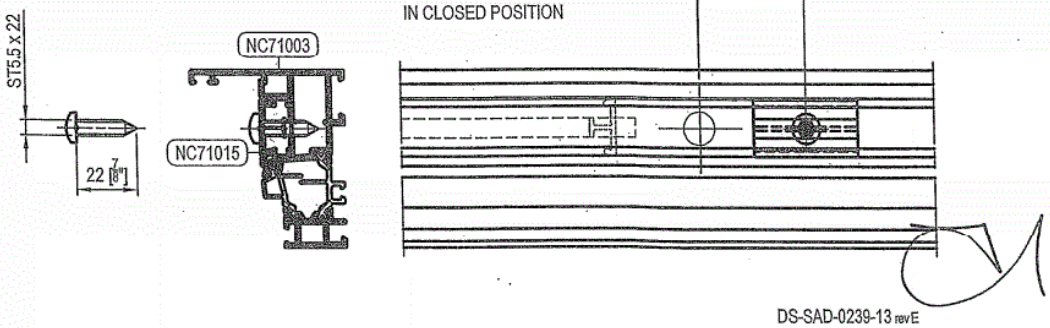
DS-SAD-0239-13 revE

Stroke end profile

NC71015 machining and position detail

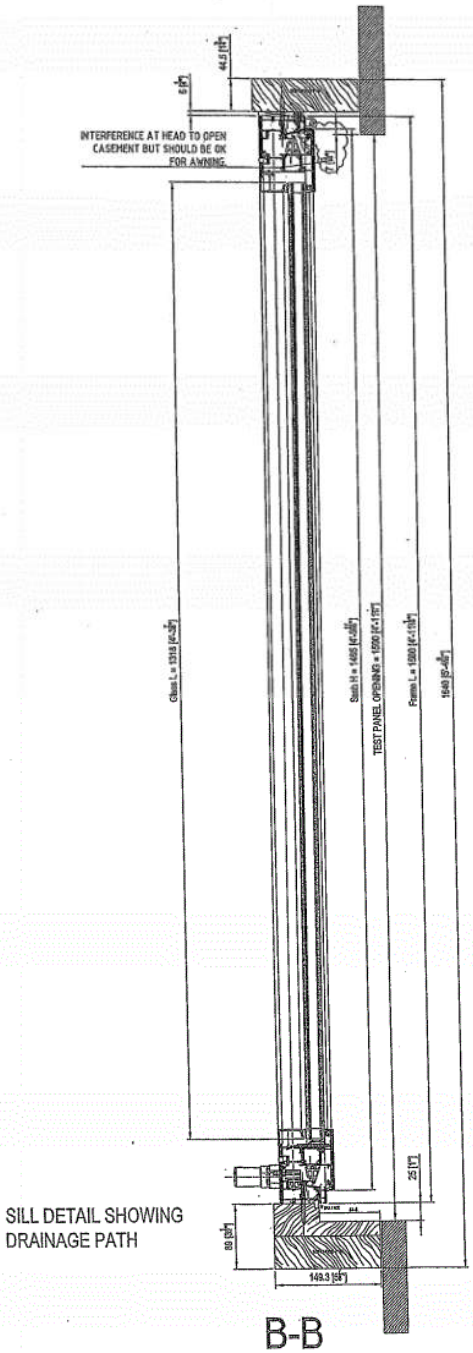


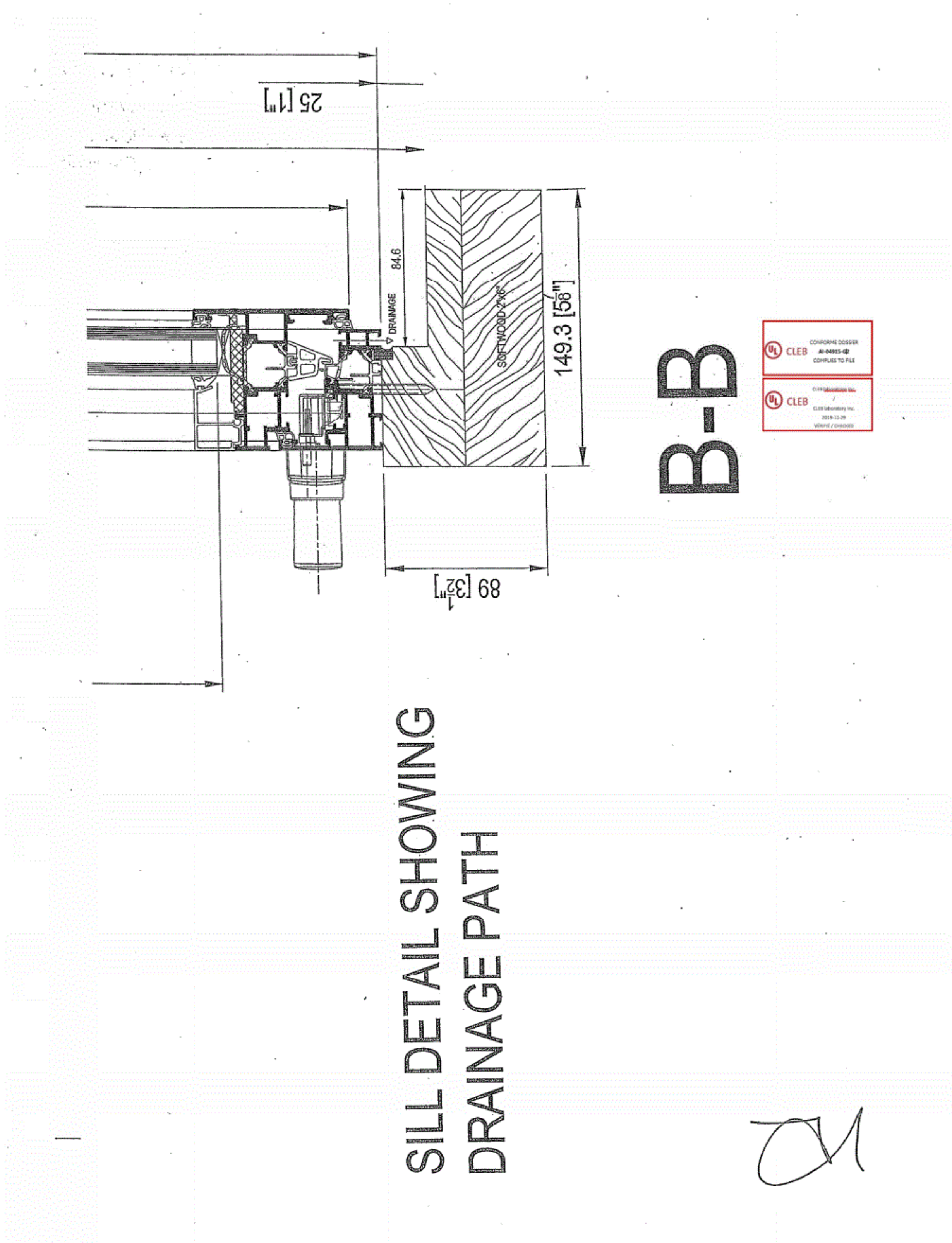




DS-SAD-0239-13 revE

NC 65 STH HES OUT AWNING & CASEMENT WINDOWS
04/11/2019



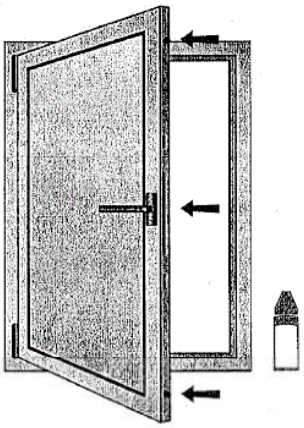


Cleaning and maintenance of aluminium windows and doors

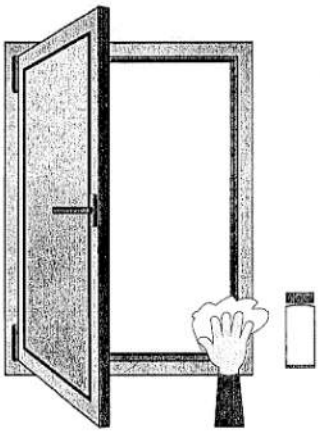
Window/door maintenance

In addition to the cleaning of the profiles, you are also required to periodically perform maintenance on the seals and accessories, as well as check for any signs of wear or damage.

⚠ Note: Any eventual adjustments or replacements of worn or damaged window/door parts must be performed exclusively by competent persons.



1) Lubricating product for equipment
The mobile parts and all of the closing points must be lubricated.
The product leaves a protective film on all the parts that have been treated, thus movement is improved and aggravating squeaks are minimised.



2) Product for the seals
By rubbing down the seal with the designated stick and cloth, the seals maintain the correct level of elasticity.

CONFORME DOSSIER
CLEB AI-04915-G2
COMPLIES TO FILE

CLEB laboratory Inc.
2019-11-29
VÉRIFIÉ / CHECKED