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CT INTERNATIONAL ALUMINUM CORP.
TEST REPORT

SCOPE OF WORK
AAMA/WDMA/CSA 101/I.S.2/A440-08 TESTING ON ALUMINUM SIDE HINGED TERRACE DOOR

REPORT NUMBER
I7915.01-525-44-R0

TEST DATE(S)
08/24/18 – 10/25/18

ISSUE DATE
04/01/19

RECORD RETENTION END DATE
10/25/22

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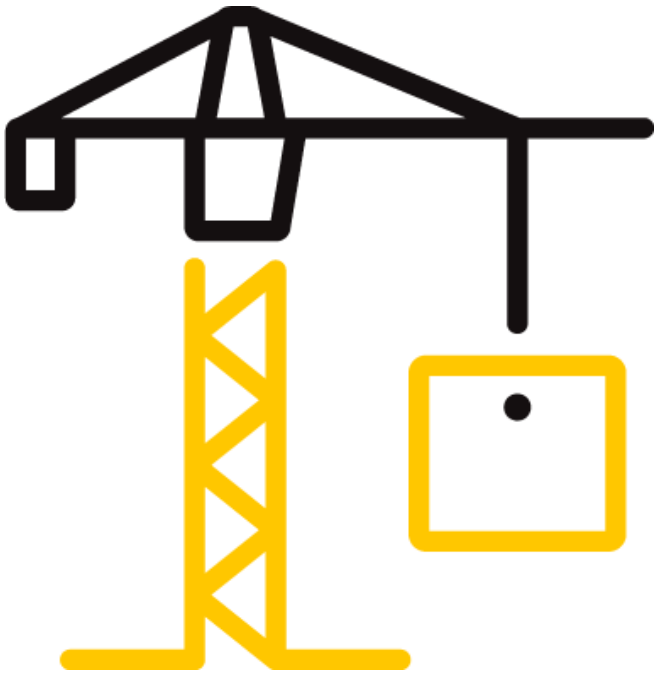

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Report No.: I7915.01-525-44-R0

Date: 04/01/19

REPORT ISSUED TO

CUSTOMER NAME

CT International Aluminum Corp.
5235 74th Street
Elmhurst, NY 11373

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by CT International Corp., Elmhurst, New York, to perform testing in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*, on their Aluminum Terrace Door. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at Intertek ATI test facility in Farmingdale, New York. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2

SUMMARY OF TEST RESULTS

TITLE	RESULTS
AAMA/WDMA/CSA 101/I.S.2/A440-08	Class-AW PG60 1219 x2438 (48 x 96)-ATD
Design Pressure	±2880 Pa (±60.15 psf)
Air Infiltration	0.5 L/s/m^2 (0.10 cfm/ft^2)
Canadian Air Infiltration/Exfiltration Level	A3
Water Penetration Resistance Test Pressure	580 Pa (15.0 psf)

For INTERTEK B&C:

COMPLETED BY:	Craig Ginsberg	**REVIEWED BY:**	Heather Stahl-Figueroa
TITLE:	Mockup Manager	**TITLE:**	Lab Manager
SIGNATURE:	Craig Ginsberg Digitally signed by Craig Ginsberg Date: 2019.04.04 14:12:35 -04'00'	**SIGNATURE:**	Heather Stahl Digitally Signed by: Heather Stahl
DATE:	04/01/19	**DATE:**	04/01/19

cg:cns

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SECTION 3
TEST METHOD(S)

The specimens were evaluated in accordance with the following:

AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

CSA A440S1-09, Canadian Supplement to **AAMA/WDMA/CSA 101/I.S.2/A440**, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

AAMA 920-11, *Specification for Operating Cycle Performance of Side-Hinged Exterior Door Systems*

AAMA 925-13, *Specification for Determining the Vertical Loading Resistance of Side-Hinged Doors*

AAMA 1304-02, *Voluntary Specification for Forced Entry Resistance of Side-Hinged Door Systems*

ASTM E283-04(2012), *Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen*

ASTM E330/E330M-14, *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*

ASTM E331-00(2016), *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*

ASTM E547-00(2016), *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference*

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SECTION 4
MATERIAL SOURCE/INSTALLATION

Test specimen was provided by the client. Representative samples of the test specimen(s) will be retained by Intertek B&C for a minimum of four years from the test completion date.

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/2" shim space. The exterior and interior perimeter of the door was sealed with sealant. This did not permit inspection of the perimeter of the unit hence the frame is excluded from the scope of testing. Installation of the tested product was performed by the client. Seam sealer is applied to fasteners.

LOCATION	ANCHOR DESCRIPTION	ANCHOR LOCATION
Interior jambs and head	Ply wood strip/ blind stop	Entire length of jambs
In-locking jamb	#12 x 3-1/2" countersunk screw	8", 40-3/8" (screw goes thru bottom striker plate), and 91-7/8" from bottom of unit
Hinge Jamb	#14 x 3-3/4" Tapcon	3-1/2", 40", 76", and 93" from bottom of unit

SECTION 5
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Craig Ginsberg	Intertek B&C

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SECTION 6
TEST SPECIMEN DESCRIPTION

Product Type: Side-Hinged Terrace Door (Outswing)
Series/Model: TD4800

Product Size(s):

Test Specimen #1

OVERALL AREA:	**WIDTH**		**HEIGHT**	
4.46 m² (48.0 ft²)	**millimeters**	**inches**	**millimeters**	**inches**
Overall Size	1219	48	2438	96
Panel Size	1137	44-3/4	2356	92-3/4

Frame Construction:

FRAME MEMBER	**MATERIAL**	**DESCRIPTION**
Head, sill, and jambs	Aluminium	Two extruded aluminium profiles bound together with two strut type thermal breaks.
	JOINERY TYPE	**DETAIL**
All Corners	Mitered	Two corner keys per corner, one in each aluminium hollow with four crimps per key per corner. Seam sealer applied.

Leaf Construction:

LEAF MEMBER	**MATERIAL**	**DESCRIPTION**
Rails and stiles	Aluminium	Two extruded aluminium profiles bound together with two strut type thermal breaks.
	JOINERY TYPE	**DETAIL**
All Corners	Mitered	Two corner keys per corner, one in each aluminium hollow, held in place with seam sealer. Larger corner key is crimped with 4 crimps per corner. Seam sealer applied.

Reinforcement: *No reinforcement was utilized.*

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Weatherstripping:

DESCRIPTION	QUANTITY	LOCATION
0.187" Base x 0.290" diameter hollow rubber bulb seal	4 rows	Perimeter of panel
0.187" Base x 0.290" diameter hollow rubber bulb seal with fin	4 rows	Perimeter of frame
27 mm Base x 17 mm high “J” hook compression seal	4 rows	Perimeter of frame

**** Sealant application:*** *Central gasket is adhered to frame profile with seam sealer covering thermal breaks. Seam sealer applied to all miter corners inside and out including the frame and door panel. Seam sealer is applied to exterior glass leg and interior joinery including glass stops. Seam sealer is applied to the perimeter of the interior and exterior handle set. Seam sealer is applied to interior corners of glass pocket.*

Glazing: *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made.*

GLASS TYPE	SPACER TYPE	INTERIOR LITE	EXTERIOR LITE	GLAZING METHOD
1" IG	Metal box channel with butyl backing and desiccant fill supporting a 5/8” air space	3/16” Tempered	3/16” Tempered	Set from the exterior against butyl tape and secured with aluminium snap-in glazing bead and rubber gasket

LOCATION	QUANTITY	DAYLIGHT OPENING		GLASS BITE
		millimeters	inches	
Leaf	1	945 x 2165	37-3/16 x 85-1/4	1/2"

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Drainage:

DRAINAGE METHOD	SIZE	QTY	LOCATION
Weep slot with flaps and seam sealer applied to perimeter	1-5/8" wide by 1/4" high	2	Frame sill centred approximately 7-1/8" from each corner. Backer rod is placed inside the profiles to act as a baffle.
Equalization holes (gap in gasket)	2" long	2	In top rail bulb gasket 3.5" from either side of door panel.
Weep slot	3/8" wide by 1/4" high	2	Top of frame sill inner track measuring approximately 7” from either side of unit. Holes penetrate thru bottom of sill to weep into flashing starter sill.
Weep slot	3/8" wide by 1/4" high	4	Top of frame sill outer track centred at 6-1/2", 16-1/2", 27", and 41" measured from left side of unit (when viewed from interior).
Weep slot	3/8" wide by 1/4" high	2	In bottom of lower rail centred at 6" and 17" away from hinge stile.
Weep hole	1/4" gap in caulk joint	2	Front face of exterior caulk joint allowing flashing starter sill to weep.

Hardware:

DESCRIPTION	QTY	LOCATION
Locking handle set with dead bolt and strike bolt	1	Lock stile midspan centred about 40" from bottom of leaf
Multi point locking system	3	Handle stile, bottom rail, and top rail
Transmission	2	Top and bottom handle stile corners
Aluminium Hinges with cam adjustment	4	Measuring from bottom of unit centered at 6-1/2", 43", 79-1/2", and 90"
Multipoint interlock	6	Locking jamb centered 6-1/2", 31-5/8", 63", and 88-3/4" away from bottom of unit. On head 23-5/8" and on sill 24-3/4" from left side of unit (when viewed form exterior).
Roller block	1	Sill 28-1/2" from left side of unit with corresponding plastic pad on bottom of door panel (when viewed form exterior).

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SECTION 7

TEST RESULTS

The temperature during testing was 21°C (70°F). The results are tabulated as follows:

Test Specimen #1:

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Operating Forces and Force to Latch Side-Hinged Door System, ASTM E2068	Unlock: 107 N (24 lbf) Force to Lock: 98 N (22 lbf) In Motion: <5N (<1 lbf) Close Breakaway: 116 N (26 lbf) Deadbolt: 0.9 Nm (8 in-lbf)	Report only Report only Report only Report only Report only	
Air Leakage, Infiltration per ASTM E283 at 300 Pa (6.27 psf)	0.3 L/s/m^2 (0.06 cfm/ft^2)	0.5 L/s/m^2 (0.10 cfm/ft^2) max.	1
Air Leakage, Infiltration per ASTM E283 at 75 Pa (1.57 psf)	0.5 L/s/m^2 (0.1 cfm/ft^2)	Report Only (Optional)	1
Water Penetration, per ASTM E547 and ASTM E331 at 720 Pa (15 psf)	Pass	No leakage	2
Operation/Cycling Performance, per AAMA 920 25,000 cycles	Pass	Meets as stated	3
Operating Forces and Force to Latch Side-Hinged Door System, ASTM E2068	Unlock: 49 N (11 lbf) Force to Lock: 62 N (14 lbf) In motion: 7 N (1.5 lbf) Open Breakaway: 18 N (4 lbf) Close Breakaway: 9 N (2 lbf) Deadbolt: 0.5 Nm (4 in-lbf)	Report only Report only Report only Report only Report only Report only	
Air Leakage, Infiltration per ASTM E283 at 300 Pa (6.27 psf)	0.45 L/s/m^2 (0.09 cfm/ft^2)	0.5 L/s/m^2 (0.10 cfm/ft^2) max.	1

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TITLE OF TEST	RESULTS	ALLOWED	NOTE
Water Penetration, per ASTM E547 and ASTM E331 at 720 Pa (15.0 psf)	Pass	No leakage	2
Uniform Load Deflection, per ASTM E330 Deflections taken at 36-1/2" span between hinges on hinge stile +2880 Pa (+60.15 psf) -2880Pa (-60.15 psf)	 0.3 mm (0.01") 0.5 mm (0.02")	 5.3 mm (0.21") max. 5.3 mm (0.21") max.	 4, 5, 6
Uniform Load Structural, per ASTM E330 Permanent set taken at 36-1/2" span between hinges on hinge stile +4320 Pa (+90.23 psf) -4320 Pa (-90.23 psf)	 <0.3 mm (<0.01") 0.3 mm (0.01")	 1.8 mm (0.07") max. 1.8 mm (0.07") max.	 4,5, 6
Forced Entry Resistance, per AAMA 1304	Pass	No entry	
Vertical Loading Resistance, per AAMA 925 Test load – 2224 N (500 lbf)	Pass- cam hinges require minor adjustment	No damage	

Note 1: The tested specimen meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440 for air leakage resistance.

Note 2: Leakage was observed from the interior perimeter caulk joint. Because of the caulk joint an assessment regarding the source of the leakage could not be made. See photo 3

Note 3: After 25,000 open close cycles, one keeper had to be replaced along with a hinge adjustment to reseat the door square in its frame. After 18,000 lock/unlock cycles the square handle shaft sheared torsionally. Lock hardware was replaced, hinges and keepers were adjusted and 25,000 lock/unlock cycles repeated.

Note 4: Loads were held for 10 seconds.

Note 5: At the conclusion of the test, there were no signs of damage to the door panel, frame, construction, fasteners, glazing, weatherstripping, or system assembly.

Note 6: Tape and film were used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

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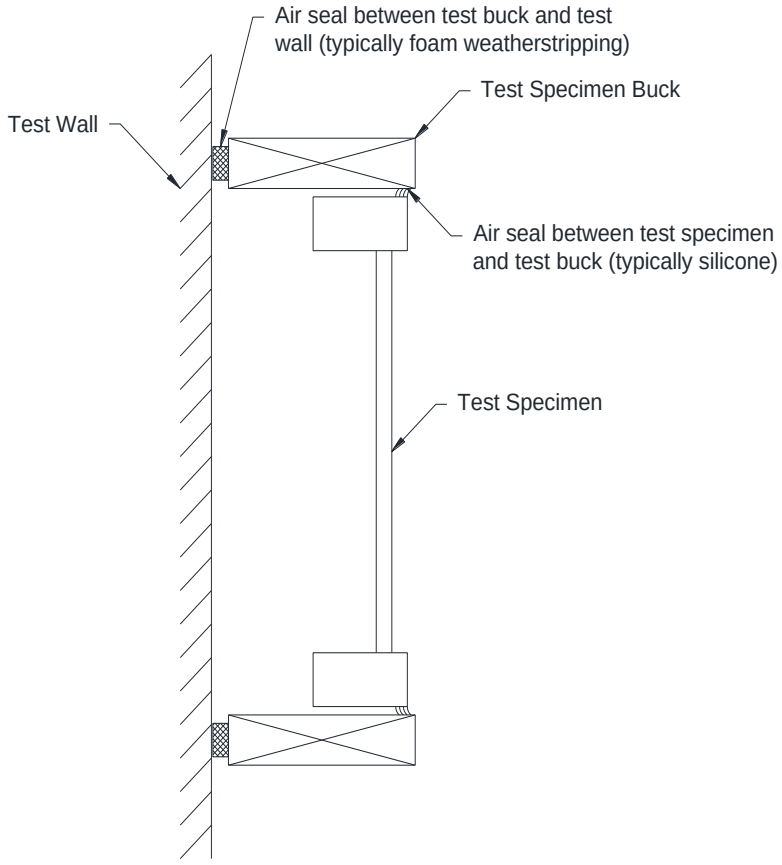
SECTION 8
LOCATION OF AIR SEAL

The air seal between the test specimen and the test wall is detailed below. The seal is made of foam weatherstripping and is attached to the edge of the test specimen buck. The test specimen buck is placed against the test wall and clamped in place, compressing the weatherstripping and creating a seal.



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SECTION 9
CONCLUSION

The specimen tested successfully met the performance requirements for the following rating:

TEST SPECIMEN(S)	TITLE	SUMMARY OF RESULTS
1	101/I.S.2/A440-08	Class-AW PG60 1219 x2438 (48 x 96)-ATD

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SECTION 10
PHOTOGRAPH(S)

Photo No. 1
Exterior View of door

Photo No. 2
Leak observed form interior caulk joint

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Photo No. 3
Various design features and hardware

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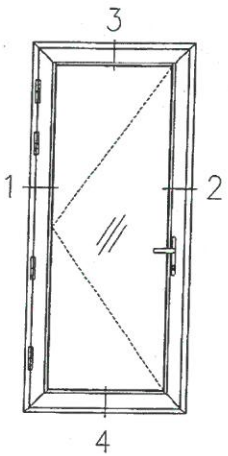
SECTION 11
DRAWING(S)

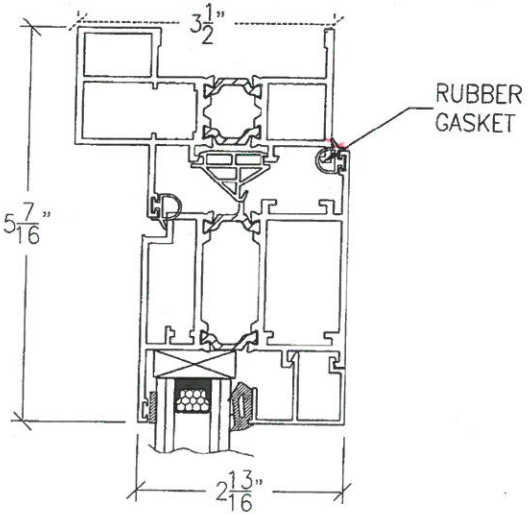
The test specimen drawings have been reviewed by Intertek B&C and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.

TEST SPECIMEN COMPLIES
WITH THESE DETAILS
ANY DEVIATION IS NOTED
REPORT NO. F7915.01
TEST DATE: 10/25/18



EXTERIOR VIEW

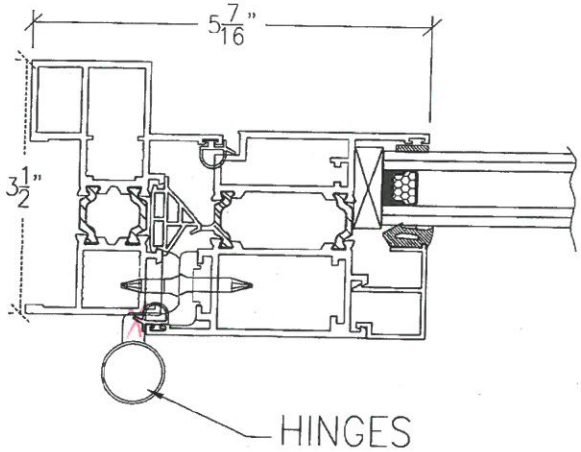
#3 Head



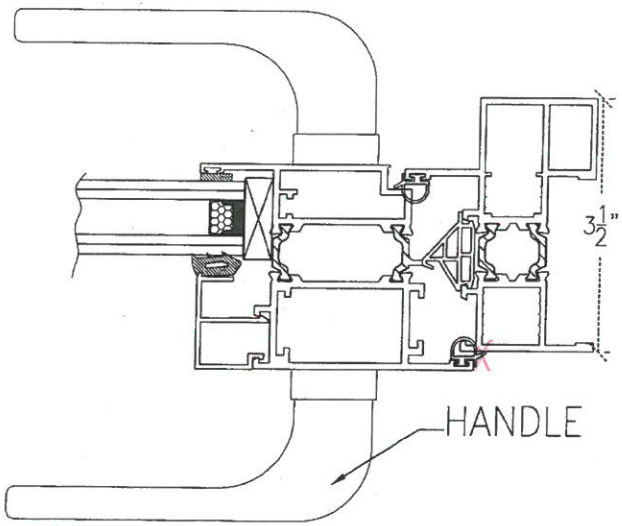
TD4800 TERRACE DOOR BILL OF MATERIALS				
ITEM #	DESCRIPTION	Q'ty	PART #	DWG #
1	DOOR FRAME	4	TT-001AC	1,2,3,&4
2	DOOR SASH	4	TD-101AB	1,2,3,&4
3	MOULDING	4	TT-002MD	1,2,3,&4

INTERIOR

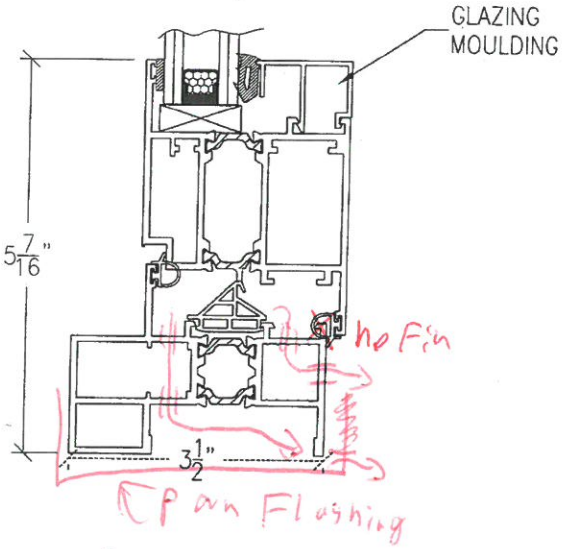
EXTERIOR



#1 Left Jamb



#2 Right Jamb



#4 Sill

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SECTION 12
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	04/01/19	N/A	Original Report Issue