

**AAMA 1801 SOUND TRANSMISSION LOSS
TEST REPORT**

Rendered to:

MI WINDOWS AND DOORS, INC.

SERIES/MODEL: 420/430/440

TYPE: Sliding Glass Door

Summary of Test Results					
ATI Data File No.	Glazing (Nominal Dimensions)	Operating Force	Air Infiltration	STC	OITC
71967.01	5/8" IG (1/8" tempered, 3/8" air space, 1/8" tempered) Glass temperature - 73°F	Pass	Pass	26	23

Reference should be made to ATI Report No. 71967.01-113-11 for complete test specimen description. The complete test results are listed in Appendix B.

ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

MI WINDOWS AND DOORS, INC.
P.O. Box 370
650 West Market Street
Gratz, Pennsylvania 17030-0370

Report No: 71967.01-113-11
Test Date: 11/21/07
Report Date: 01/10/08
Expiration Date: 11/21/11

Test Sample Identification:

Series/Model: 420/430/440

Type: Sliding Glass Door

Performance Class: Residential

Overall Size: 72" by 80"

Glazing (Nominal Dimensions): 5/8" IG (1/8" Tempered, 3/8" Air Space, 1/8" Tempered)

Project Scope: Architectural Testing, Inc. was contracted by MI Windows and Doors, Inc. to conduct operating force, air leakage, and sound transmission loss tests on a Series/Model 420/430/440, sliding glass door. A summary of the results is listed in the Test Results section and the complete test data is included as Appendix B of this report. The sample was provided by the client.

Test Methods: The acoustical test was conducted in accordance with the following:

AAMA 1801-07, Acoustical Rating of Windows, Doors, and Glazed Wall Sections.

ASTM E 1425-91 (Re-approved 1999), Standard Practice for Determining the Acoustical Performance of Exterior Windows and Doors.

ASTM E 90-04, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.

ASTM E 413-04, Classification for Rating Sound Insulation.

ASTM E 1332-90 (Re-approved 2003), Standard Classification for Determination of Outdoor-Indoor Transmission Class.

ASTM E 283-04, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

ASTM E 2235-04, Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods.

ASTM E 2068-00, Standard Test Method for Determination of Operating Force of Sliding Windows and Doors.

Test Equipment: The equipment used to conduct these tests meets the requirements of ASTM E 90. The microphones were calibrated before conducting sound transmission loss tests. The test equipment and test chamber descriptions are listed in Appendix A.

Sample Installation:

Sound transmission loss tests were initially performed on a filler wall that was designed to test 40" by 86" and 80" by 86" test specimens. The filler wall achieved an STC rating of 64.

The 80" by 86" plug was removed from the filler wall assembly. The sliding glass door was installed into a wood buck with screws and caulk by the client. The sliding glass door was placed on a foam isolation pad in the test opening. Duct seal was used to seal the perimeter of the test specimen to the test opening on both sides. The interior side of the sliding glass door frame, when installed, was approximately 1/4" from being flush with the receiving room side of the filler wall. A stethoscope was used to check for any abnormal air leaks around the test specimen prior to testing. The operable panel was opened and closed at least five times prior to testing.

Test Procedure:

Operating Force Test - The Type B method, which utilizes a force gage, was used to determine the breakaway and operating forces required to open and close the panel.

Air Leakage Test - The sliding glass door was closed and locked for this test. A negative pressure of 1.57 psf was applied inside the chamber that was placed around the interior side of the door frame. The total air leakage and extraneous air leakage measurements were used to calculate the specimen air leakage. Barometric pressure corrections were applied to the air leakage calculations.

Sound Transmission Loss Test - The sliding glass door was also closed and locked for this test. One background noise sound pressure level and five sound absorption measurements were conducted at each of the five microphone positions. Two sound pressure level measurements were made simultaneously in both rooms at each of the five microphone positions. The air temperature and relative humidity conditions were monitored and recorded during the background, absorption, source, and receive room measurements.

Sample Descriptions:

Frame Construction:

		Frame
Size		72" by 80"
Thickness		5-9/16"
Corners		Butted
	Fasteners	Screws
	Seal Method	Sealant
Material		Aluminum
	Reinforcement	N/A
	Thermal Break Material	N/A
Daylight Opening Size		N/A

Sample Descriptions: (Continued)

Panel Construction:

	Interior Panel	Exterior Panel
Size	36-1/2" by 79"	36-1/2" by 79"
Thickness	1-3/4"	1-3/4"
Corners	Coped	Coped
Fasteners	Screws	Screws
Seal Method	None	None
Material	Aluminum	Aluminum
Reinforcement	N/A	N/A
Thermal Break Material	N/A	N/A
Daylight Opening Size	32-3/4" by 74-3/4"	32-3/4" by 74-3/4"

Glazing:

Measured Overall Insulation Glass Unit Thickness	0.610"
Spacer Type	Reinforced Butyl

	Exterior Sheet	Gap	Interior Sheet
Measured Thickness	0.121"	0.368"	0.121"
Muntin Pattern	N/A	N/A	N/A
Material	Tempered	Air*	Tempered
Laminate Material	N/A	N/A	N/A

Glazing Method	Channel
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* - Stated per Client/Manufacturer, N/A-Non Applicable

Sample Descriptions: (Continued)

Components:

	TYPE	QUANTITY	LOCATION
Weatherstrip			
	0.187" by 0.270" Poly pile with center fin	2 Rows	Lock jamb stile and fixed jamb stile
	0.187" by 0.270" Poly pile with center fin	1 Row	Both meeting stiles
	0.187" by 0.430" Poly pile with center fin	2 Rows	Top and bottom rails of both panels
	1" by 1" Poly pile pad	2	Sill at both meeting stile corners
	1" by 1/2" Poly pile pad	7	Head corners, meeting stiles corners, and sill corners
Hardware			
	Roller assembly	4	Bottom rails
	Lock assembly	1	Lock stile
	Keeper	1	Lock jamb
	Fixed panel clips	1	Fixed jamb stile
Drainage			
	1/2" Weep notch	6	Sill corners

Comments: The total weight of the sample was 150 lbs. The design drawings (included in Appendix C) supplied by the client, accurately describe the Series/Model 420/430/440, sliding glass door. The dimensions on the drawings that are circled and/or checked were verified against the test specimen. The sliding glass door was disassembled, and the components will be retained by Architectural Testing, Inc. for four years. Photographs of the test specimen are included in Appendix D.

Test Results: The STC (Sound Transmission Class) rating was calculated in accordance with ASTM E 413. The OITC (Outdoor-Indoor Transmission Class) was calculated in accordance with ASTM E 1332. A summary of the operating force, air leakage, and sound transmission loss test results on the Series/Model 420/430/440, sliding glass door is listed below.

ATI Data File No.	Glazing (Nominal Dimensions)	* Operating Force Pass/Fail	** Air Infiltration	STC	OITC
71967.01	5/8" IG (1/8" tempered, 3/8" air space, 1/8" tempered) Glass temperature - 73°F	Pass	Pass	26	23

* *The maximum allowable operating force, according to AAMA/WDMA/CSA 101/I.S.2/A440, is 20 lbs for Residential performance class, sliding glass doors.*

** *The maximum allowable air leakage rate, according to AAMA/WDMA/CSA 101/I.S.2/A440, is 0.3 cfm/ft² when the test pressure is 1.5 psf for performance class, sliding glass doors.*

The complete test results are listed in Appendix B. Flanking limit tests and reference specimen tests are available upon request.

Detailed drawings, data sheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire. Results obtained are tested values and were secured by using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC:

Kurt A. Golden
Senior Technician - Acoustical Testing

Todd D. Kister
Laboratory Supervisor - Acoustical Testing

KAG:crc

Attachments (pages): This report is complete only when all attachments listed are included.

- Appendix-A: Equipment description (1)
- Appendix-B: Complete test results (4)
- Appendix-C: Drawings (16)
- Appendix-D: Photographs (1)

	Architectural Testing, Inc is accredited by the International Accreditation Service, Inc. (IAS) under the specific test methods listed under lab code TL-144, in accordance with the recognized International Standard ISO/IEC 17025:2005. The laboratory's accreditation or test report in no way constitutes or implies product certification, approval, or endorsement by IAS. This test report applies only to the specimen that was tested.
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Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	01/10/08	N/A	Original Report Issue

Appendix A

Instrumentation:

Instrument	Manufacturer	Model	Description	ATI Number
Analyzer	Agilent Technologies	35670A	Dynamic signal analyzer	Y002929
Receive Room Microphone	G.R.A.S.	40AR	1/2", pressure type, condenser microphone	Y003246
Source Room Microphone	G.R.A.S.	40AR	1/2", pressure type, condenser microphone	Y003245
Receive Room Preamp	G.R.A.S.	26AK	1/2" preamplifier	Y003249
Source Room Preamp	G.R.A.S.	26AK	1/2" preamplifier	Y003248
Microphone Calibrator	Bruel & Kjaer	4228	Pistonphone calibrator	Y002816
Noise Source	Delta Electronics	SNG-1	Two, non-coherelated "Pink" noise signals	Y002181
Equalizer	Rane	RPE228	Programmable EQ	Y002180
Power Amplifiers	Renkus-Heinz	P2000	2 - Amplifiers	Y002179 Y001779
Receive Room Loudspeakers	Renkus-Heinz	Trap Jr/9"	2 - Loudspeakers	Y001784 Y001785
Source Room Loudspeakers	Renkus-Heinz	Trap Jr/9"	2 - Loudspeakers	Y002649 Y002650
Lab Pack	ATI	N/A	Air leakage apparatus	Y000370
Force Gage	Chatillon	DPP50	Force gage	Y007402

Test Chamber:

	Volume	Description
Receiving Room	8291.3 ft ³ (234 m ³)	Rotating vane and stationary diffusers. Temperature and humidity controlled. Isolation pads under the floor.
Source Room	7296.3 ft ³ (206.6 m ³)	Stationary diffusers only. Temperature and humidity controlled.

	Maximum Size	Description
TL Test Opening	14 ft wide by 10 ft high	Vibration break between source and receive rooms.

Appendix B
Complete Test Results



SOUND TRANSMISSION LOSS

ASTM E90

Architectural Testing

ATI No.	71967.01	Date	11/21/07
Client	MI Windows and Doors, Inc.		
Specimen	Series/Model 420/430/440, sliding glass door with 5/8" IG (1/8" tempered, 3/8" air space, 1/8" tempered), Glass temperature 73F		
Specimen Area	40.00 Sq Ft		
Filler Area	100.00 Sq Ft		
Operator	Kurt A. Golden		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp F	75.8	74.6	76.3	75.3	73.8	75.5
RH %	46.0	48.2	47.0	46.6	62.0	47.0

Freq (Hz)	Bkgrd SPL (dB)	Absorp (Sabines /Sq Ft)	Source SPL (dB)	Receive SPL (dB)	Filler TL (dB)	Specimen TL (dB)	95% Conf Limit	No. of Deficiencies	Trans Coef Diff
80	44.1	49.9	84.9	64.1	31.9	20	4.00	0	8.1
100	35.6	51.2	88.4	65.0	35.8	23	3.15	0	9.5
125	38.7	51.2	92.7	67.6	43.1	24	2.32	0	15.1
160	37.7	52.1	94.6	71.8	46.3	22	1.29	0	20.6
200	38.3	51.8	99.5	80.2	51.3	18	0.84	0	29.2
250	35.2	57.6	100.9	80.9	51.5	18	1.61	1	29.1
315	33.3	63.7	99.9	80.5	56.6	17	1.10	5	35.1
400	32.6	63.8	99.3	76.5	60.0	21	0.57	4	35.3
500	32.2	64.4	100.3	75.9	59.0	22	0.46	4	32.8
630	27.8	61.5	103.0	76.4	63.1	25	0.57	2	34.4
800	29.1	62.1	102.6	74.4	65.0	26	0.53	2	34.7
1000	27.7	66.1	102.3	73.2	66.7	27	0.84	2	35.8
1250	26.9	68.1	105.4	74.3	73.8	29	0.41	1	41.1
1600	23.0	70.9	111.5	80.3	75.9	29	0.39	1	43.3
2000	15.7	79.1	107.4	75.8	75.7	29	0.52	1	43.1
2500	6.9	88.1	105.8	72.9	75.4	29	0.58	1	42.0
3150	7.4	103.0	107.0	72.8	76.9	30	0.35	0	42.9
4000	6.6	127.9	105.8	73.6	78.6	27	0.36	3	47.5
5000	7.2	161.8	104.4	70.1	80.5	28	0.37	0	48.2

STC Rating = 26 *(Sound Transmission Class)*
Deficiencies = 27 *(Number of deficiencies versus contour curve)*
OITC Rating = 23 *(Outdoor/Indoor Transmission Class)*

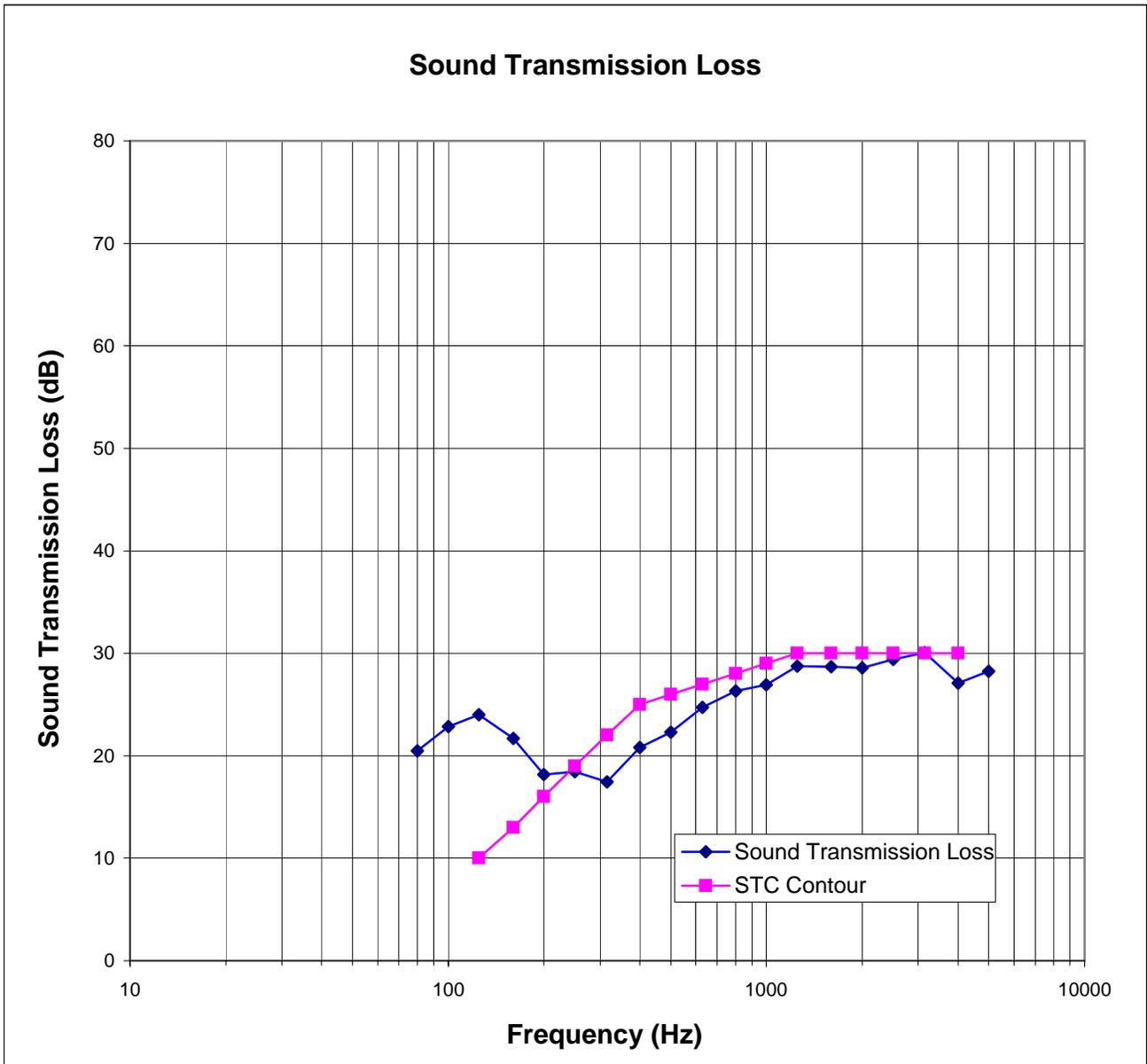
Note: *The acoustical chambers are qualified for measurements down to 80 hertz.
 Data reported below 80 hertz is for reference only.*

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Architectural Testing

ATI No. 71967.01 Date 11/21/07
Client MI Windows and Doors, Inc.
Specimen Series/Model 420/430/440, sliding glass door with 5/8" IG (1/8" tempered, 3/8" air space, 1/8" tempered), Glass temperature 73F
Specimen Area 40.00 Sq Ft
Filler Area 100.00 Sq Ft
Operator Kurt A. Golden



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AAMA 1801 Data Sheets

ATI Job Number :	71967.01-113-11	
Client Name :	MI Windows and Doors, Inc.	
Test Date :	11/21/07	
Tests Performed by:	Kurt Golden	
Specimen Type :	Sliding Glass Door	
Series/Model Number :	420/430/440	
Sample Size :	72" by 80"	
Air Leakage	per ASTM test method ASTM E283	

Total Air flow (ft ³ /min) :	26.0
Extraneous Leakage (ft ³ /min) :	16.75
Temperature (°F) at Specimen:	73
Barometric Pressure at Specimen (in mbar):	1006 (Inches of Hg) : 29.71
Specimen Area in square feet :	40.00
Density of air at reference standard conditions (lb/ft ³)	0.075

Total air flow w/ air density correction (ft ³ /min)	Extraneous leakage with air density correction (ft ³ /min)	Air leakage through the specimen with air density correction (ft ³ /min)	Rate of air leakage per unit area (ft ³ /min)/sq.ft.
25.810	16.627	9.182	0.23

ATI Job Number : 71967.01-113-11
 Client Name : MI Windows and Doors, Inc.
 Test Date : 11/21/07
 Tests Performed by: Kurt Golden
 Specimen Type : Sliding Glass Door
 Series/Model Number : 420/430/440
 Sample Size : 72" by 80"
Operating Force per ASTM test method E2068 Method B - Force Gauge
Top Sash



Trial No.	Opening Breakaway	Opening In-Motion	Closing Breakaway	Closing In-Motion
1	3	3	4	3
2	3	4	3	4
3	3	4	3	3

3 Trial Ave.	3.00	3.67	3.33	3.33
10% of 3 trial avg	0.3	0.4	0.3	0.3
8 Trial Average w/o high & low	3.0	3.7	3.3	3.3

Appendix C
Design Drawings

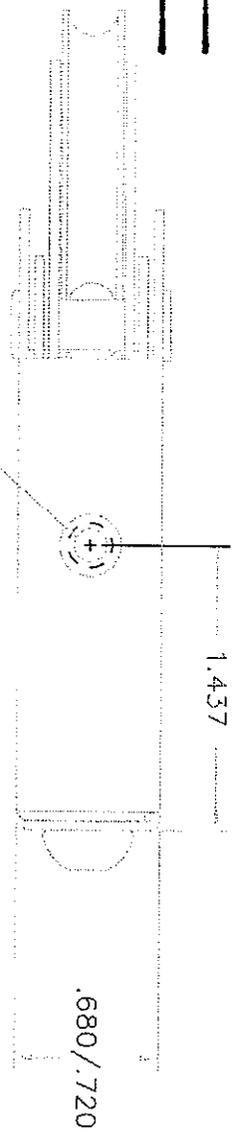


Architectural Testing

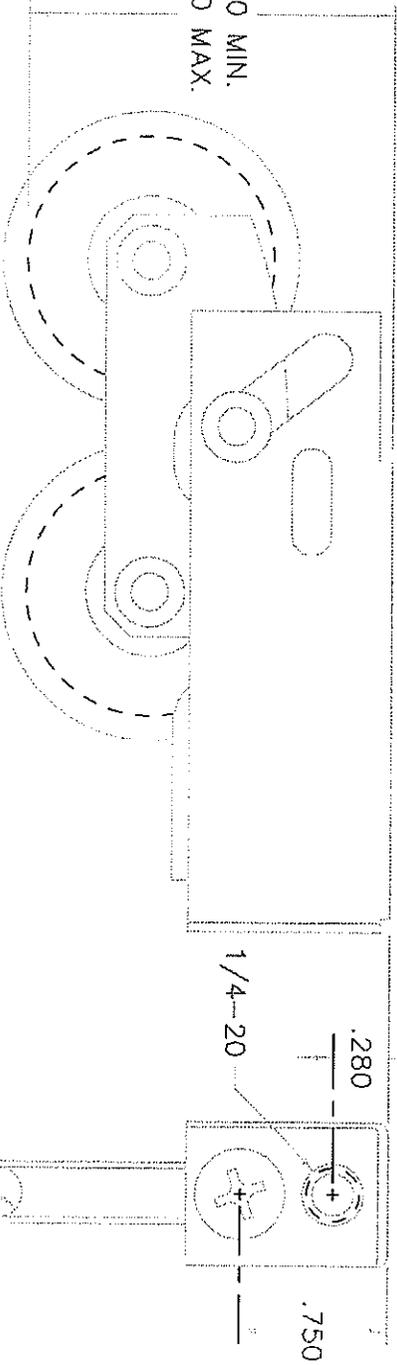
Test sample complies with these details.
Deviations are noted.

Report# 71967.01-113-11

Date 11/21/07 Tech RK.



1.440 MIN.
1.850 MAX.



STANDARD ZINC PLATED REFLECTOLITE PART No. 1951-6000-2A B'BILT PART No. 99-17-195

OPTIONAL STAINLESS STEEL REFLECTOLITE PART No. 1951-9000-2A-SS B'BILT PART No. 99-17-194

BetterBuilt
 Smyrna, TN Prescott Valley, AZ
 (615) 459-4161 (520) 772-7000

DESC. 1 1/2" TANDEM ROLLER ASSEMBLIES
 ZINC PL. STANDARD / SS OPTIONAL
 420/42P/430/43P/440/44P PATIO DOOR PANELS

DATE	BY	REVISION
04/15/98	TC	INITIAL DRAWING RELEASE
3/9/98		ZN PLATE & SS

9917195

Test sample complies with these details. Deviations are noted.

Report# 71967.01-113-11
Date 11/21/07 Tech RB.

REV	DATE	ECN	DESCRIPTION	BY
B	10/06/98	074-98	PANEL LATCH JAMB W/STRIP REVERSED	TC
C	10/14/98	078-98	BUMPERS & W/STRIP PLUGS CHANGED	TC
D	07/23/04	027-01	REMOVED CHILD EGRESS DETERRENT (ITEM 12)	TC
E	07/20/04	101-04	99-10-260 was side fin is now center fin	TC
F	2/23/06	035A-06	Bumper length was 2". part number changed	TC

Dwg. No. BOM0420A BILL OF MATERIAL SERIES 420

ITEM NO.	PART NO.	MATERIAL DESCRIPTION	QUANTITY	MATERIAL
1.	4208	MAIN FRAME HEAD	1	ALUM.
	4231	MAIN FRAME HEAD (Florida Flange Only)	1	ALUM.
2.	4209	MAIN FRAME SILL	1	ALUM.
	4210	MAIN FRAME JAMBS	2	ALUM.
	4232	MAIN FRAME JAMBS (Florida Flange Only)	2	ALUM.
4.	4200	PANEL SILLS (SINGLE GLAZED)	2	ALUM.
	4201	PANEL SILLS (INSULATED)	2	ALUM.
5.	4202	PANEL HEADS (SINGLE GLAZED)	2	ALUM.
	4203	PANEL HEADS (INSULATED)	2	ALUM.
6.	4204	PANEL INTERLOCKS (SINGLE GLAZED)	2	ALUM.
	4205	PANEL INTERLOCKS (INSULATED)	2	ALUM.
7.	4206	PANEL LATCH JAMBS (SINGLE GLAZED)	2	ALUM.
	4207	PANEL LATCH JAMBS (INSULATED)	2	ALUM.
8.	80-02-4201	GLAZING CHANNEL (1/8" SINGLE GLAZED)	FT.	V-FLEX
	80-02-4202	GLAZING CHANNEL (5/32" & 3/16" SINGLE GLAZED)	FT.	V-FLEX
	80-02-4204	GLAZING CHANNEL (5/8" INSULATED GLAZED)	FT.	V-FLEX
9.	-	GLASS AS REQUIRED (SINGLE OR INSULATED)	2	GLASS
10.	99-04-146	STANDARD FLUSH MOUNT HANDLE SET (BLACK)	2	-
	99-04-145	STANDARD FLUSH MOUNT HANDLE SET (WHITE)	2	-
11.	99-04-151	OPTIONAL MORTISE HANDLE SET (BLACK)	2	-
	99-04-150	OPTIONAL MORTISE HANDLE SET (WHITE)	2	-
12.				
13.	99-17-195	TANDEM ROLLERS (STANDARD ON ALL SIZES)	4	-
	99-17-194	OPTIONAL STAINLESS STEEL TANDEM ROLLERS	4	-
14.	99-10-252	.187 X .250 CENTER FIN FOR PANEL HEADS	FT.	SYN. PILE
15.	99-10-260	.187 X .430 CENTER FIN FOR PANEL SILLS	FT.	SYN. PILE
16.	99-10-135	.187 X .200 CENTER FIN ONLY FOR PANEL LATCH JAMBS (USE ON MILL & BZ DOORS)	FT.	SYN. PILE
	99-10-136	.187 X .200 CENTER FIN WHITE FOR PANEL LATCH JAMBS (USE ON WHITE DOORS)	FT.	SYN. PILE
17.	99-10-175	.187 X .180 FOR PANEL INTERLOCKS	FT.	SYN. PILE
A 18.	99-10-425	1,000 X .500 DUST PLUG (1" PCS.) USED UNDER INTERLOCKS	6	SYN. PILE
19.	99-08-240	# 6 X 3/4" SQ. DR. (PANEL HEAD/JAMB JOINERY)	8	ZI PL ST
	99-08-605	OPTIONAL STAINLESS STEEL # 6 X 3/4" SQ. DR. (PANEL HEAD/JAMB JOINERY)	8	ST. STL.
F 20.	99-13-116	WHITE 2 5/8" LONG BUMPERS (FOR WHITE DOORS)	2	RUBBER
	99-13-117	BLACK 2 5/8" LONG BUMPERS (FOR MILL & BRONZE DOORS)	2	RUBBER

2 PANEL XX

SERIES 420

REV	DATE	ECN	DESCRIPTION	BY
-	XX/XX/XX	XXX-XX	INITIAL RELEASE	TC
A	08/17/98	061-98	ITEMS 34, 36 & 37 REVERSED	TC

Dwg. No. BOM0420A BILL OF MATERIAL SERIES 420

ITEM NO.	PART NO.	MATERIAL DESCRIPTION	QUANTITY	MATERIAL
21.	99-08-229	1/4-20 X 3/4" SQ. DR. FOR PANEL ASSEMBLY	4	ZI PL ST
	99-08-695	OPTIONAL STAINLESS STEEL 1/4-20 X 3/4" SQ. DR. FOR PANEL ASSEMBLY	4	ST. STL.
22.	99-16-035	INST. SHEET, INCLUDED IN 99-04-145 & 146 HANDLE SETS	2	-
23.	99-08-193	# 10-32 X 1/2" PHAMS (ATTACH ROLLER TO PANEL SILL)	4	ZI PL ST
	99-08-685	OPTIONAL STAINLESS STEEL # 10-32 X 1/2" PHAMS (ATTACH ROLLER TO PANEL SILL)	4	ZI PL ST
24.	99-08-939	INSTALLATION SCREW PACKAGE	1	ZI PL ST
	99-08-938	OPTIONAL STAINLESS STEEL INSTALLATION SCREW PACKAGE	1	ST. STL.
25.	99-08-120	# 8 X 1/2" PHAMS ATTACH OPTIONAL MORTISE LOCK TO PANEL	4	ZI PL ST
	99-08-620	OPTIONAL ST. STL. # 8 X 1/2" PHAMS ATTACH OPTIONAL MORTISE LOCK TO PANEL	4	ST STL
26.	99-15-060	PANEL GUIDE FOR INTERLOCK (WHITE)	2	NYLON
	99-15-070	PANEL GUIDE FOR INTERLOCK (BLACK)	2	NYLON
27.	99-15-065	PANEL GUIDE FOR LOCK JAMB (WHITE)	2	NYLON
	99-15-075	PANEL GUIDE FOR LOCK JAMB (BLACK)	2	NYLON
28.	4222	PANEL SILL RETAINERS	2	ALUM.
29.	99-17-525	INTERLOCK REINFORCEMENTS (8" TALL DOORS ONLY)	2	STEEL
30.	99-16-070	INTERLOCK REINFORCEMENTS (6-8" TALL DOORS)	2	STEEL
31.	4224	PANEL IDENTIFICATION LABEL	2	-
	4224	OPTIONAL SILL RISER (SERIES 4SR)	1	ALUM.
32.	521	OPTIONAL NAIL FIN (SERIES 423)	3	ALUM.
33.	99-13-033	FRAME KIT CARTON (6"-8")	AS REQ'D.	C'BOARD
	99-13-034	FRAME KIT CARTON (8"-0")	AS REQ'D.	C'BOARD
A 34.	99-13-087	PANEL SLEEVES (FOR 6"-8" PANEL HTS.)	4	C'BOARD
	99-13-087	PANEL SLEEVES (FOR 8"-0" PANEL HTS.)	8	C'BOARD
35.	99-13-305	STRAPPING FOR PANEL SLEEVES	FT.	-
A 36.	99-16-440E	AAMA CERTIFICATION LABEL (C35)	2	-
37.	SECT4237	Optional re-bar (8" tall only)	1	ALUM

2 PANEL XX

SERIES 420

ITEMS BELOW MAY BE ORDERED BY BETTERBILT PART NUMBER ONLY

100.	99-04-112	OPTIONAL WOOD PULL FOR STANDARD HANDLE SET (BLACK)	AS REQ'D.	-
	99-04-116	OPTIONAL WOOD PULL FOR STANDARD HANDLE SET (WHITE)	AS REQ'D.	-
101.	99-04-111	OPTIONAL KEY LOOK FOR STANDARD HANDLE SET	AS REQ'D.	-
	99-17-302	OPTIONAL STAINLESS STEEL TRACK COVER (58" LENGTH)	AS REQ'D.	ST. STL.
102.	99-17-300	OPTIONAL STAINLESS STEEL TRACK COVER (70" LENGTH)	AS REQ'D.	ST. STL.
	99-17-301	OPTIONAL STAINLESS STEEL TRACK COVER (94" LENGTH)	AS REQ'D.	ST. STL.
	99-17-303	OPTIONAL STAINLESS STEEL TRACK COVER (118" LENGTH)	AS REQ'D.	ST. STL.



Test sample complies with these details.
Deviations are noted.

Report# 71967.01-113-11
Date 11/21/07 Tech KL6

REV	DATE	ECN	DESCRIPTION	BY
1	09/10/08	008-38	RELEASE FOR PRODUCTION	TD
2	07/27/07	008-38	REVISIONS: W/RE PARTS LISTED	TD
3	07/27/07	008-38	REVISIONS: W/RE PARTS LISTED	TD
4	07/27/07	008-38	REVISIONS: W/RE PARTS LISTED	TD
5	07/27/07	008-38	REVISIONS: W/RE PARTS LISTED	TD

ITEM NO.	PART NO.	MATERIAL DESCRIPTION	QUANTITY	MATERIAL
Dwg. No. B040430A BILL OF MATERIAL SERIES 430				
A. 1.	4211	MAIN FRAME HEAD	1	ALUM.
	4233	MAIN FRAME HEAD (Florida Flange Only)	1	ALUM.
2.	4212	MAIN FRAME SILL	1	ALUM.
3.	4213	MAIN FRAME JAMBS	2	ALUM.
	4234	MAIN FRAME JAMBS (Florida Flange Only)	2	ALUM.
4.	4200	"X" PANEL SILLS (SINGLE GLAZED)	2	ALUM.
	4201	"X" PANEL SILLS (INSULATED)	2	ALUM.
5.	4202	"X" PANEL HEADS (SINGLE GLAZED)	2	ALUM.
	4203	"X" PANEL HEADS (INSULATED)	2	ALUM.
6.	4204	"X" PANEL INTERLOCKS (SINGLE GLAZED)	2	ALUM.
	4205	"X" PANEL INTERLOCKS (INSULATED)	2	ALUM.
7.	4206	"X" PANEL LATCH JAMBS (SINGLE GLAZED)	2	ALUM.
	4207	"X" PANEL LATCH JAMBS (INSULATED)	2	ALUM.
8.	4208	"T" PANEL SILL (SINGLE GLAZED)	1	ALUM.
	4209	"T" PANEL SILL (INSULATED)	1	ALUM.
9.	4201	"T" PANEL HEAD (SINGLE GLAZED)	1	ALUM.
	4202	"T" PANEL HEAD (INSULATED)	1	ALUM.
10.	4204	"T" PANEL INTERLOCKS (SINGLE GLAZED)	2	ALUM.
	4205	"T" PANEL INTERLOCKS (INSULATED)	2	ALUM.
11.	80-02-4201	GLAZING CHANNEL (1/8" SINGLE GLAZED)	FT.	V-FLEX
	80-02-4202	GLAZING CHANNEL (5/8" SINGLE GLAZED)	FT.	V-FLEX
	80-02-4204	GLAZING CHANNEL (5/8" INSULATED)	FT.	V-FLEX
12.	-	GLASS AS REQUIRED (SINGLE OR INSULATED)	3	TEMP.
13.	99-04-146	STANDARD RUSH MOUNT HANDLE SET (BLACK)	2	-
	99-04-145	STANDARD RUSH MOUNT HANDLE SET (WHITE)	2	-
14.	99-04-151	OPTIONAL MORTISE HANDLE SET (BLACK)	2	-
	99-04-150	OPTIONAL MORTISE HANDLE SET (WHITE)	2	-
15.	-	-	-	-
16.	99-17-195	STANDARD TANDEM ROLLERS	6	-
	99-17-194	OPTIONAL STAINLESS STEEL TANDEM ROLLERS	6	-
17.	99-10-432	.187 X .250 CENTER FIN FOR PANEL HEADS	FT.	SYN. PILE
18.	99-10-260	.187 X .430 CENTER FIN FOR PANEL SILLS	FT.	SYN. PILE

REV	DATE	ECN	DESCRIPTION	BY
1	09/10/08	008-38	RELEASE FOR PRODUCTION	TD
2	07/27/07	008-38	REVISIONS: W/RE PARTS LISTED	TD
3	07/27/07	008-38	REVISIONS: W/RE PARTS LISTED	TD
4	07/27/07	008-38	REVISIONS: W/RE PARTS LISTED	TD
5	07/27/07	008-38	REVISIONS: W/RE PARTS LISTED	TD

ITEM NO.	PART NO.	MATERIAL DESCRIPTION	QUANTITY	MATERIAL
Dwg. No. B040430A BILL OF MATERIAL SERIES 430				
18.	99-10-135	.187 X .270 CENTER FIN FOR PANEL HEADS	FT.	SYN. PILE
	99-10-136	.187 X .270 CENTER FIN FOR PANEL SILLS	FT.	SYN. PILE
20.	99-10-175	1.87 X 1.80 FOR "X" & "T" PANEL INTERLOCKS	10	SYN. PILE
21.	99-10-425	1.00 X .500 DIST. RIB (1/8") USED UNDER INTERLOCKS	12	SYN. PILE
22.	99-08-605	OPTIONAL STAINLESS STEEL 1/2" X 1/2" FINISH (BLACK/WHITE)	12	ST. STL.
E. 23.	99-13-116	WHITE 2 5/8" LONG BUMPER (FOR WHITE DOORS)	2	RUBBER
	99-13-117	BLACK 2 5/8" LONG BUMPER (FOR BLACK DOORS)	2	RUBBER
24.	99-08-229	1/4"-20 X 3/4" SQ DR (PANEL ASS'Y)	6	ZI PL. ST
25.	99-16-035	NET SHEET INCLUDED IN 99-04-145 & 146 HANDLE SETS	2	-
26.	99-08-685	OPTIONAL STAINLESS STEEL 1/2" X 1/2" FINISH (BLACK/WHITE)	6	ST. STL.
27.	99-08-637	INSTALLATION SCREW PACKAGE	1	ZI PL. ST
28.	99-08-620	OPTIONAL STAINLESS STEEL 1/2" X 1/2" FINISH (BLACK/WHITE)	4	ST. STL.
29.	99-15-060	PANEL GUIDE FOR INTERLOCKS (WHITE)	4	NYLON
	99-15-065	PANEL GUIDE FOR INTERLOCKS (BLACK)	4	NYLON
30.	99-15-075	PANEL SILL RETAINERS	4	ALUM.
31.	4222	PANEL SILL RETAINERS	4	ALUM.
32.	99-17-525	INTERLOCK REPAIRMENTS (7' TALL DOORS ONLY)	1	STEEL
33.	99-16-070	PANEL IDENTIFICATION LABEL	3	-
34.	4424	OPTIONAL SILL RISER (SERIES 430)	1	ALUM.
35.	99-15-033	FRAME KIT CARTON (6-8')	AS REQ'D	CSBOARD
	99-15-034	FRAME KIT CARTON (8-10')	AS REQ'D	CSBOARD
	99-15-087	PANEL SLEEVES (FOR 6"-8" PANEL HTS.)	6	CSBOARD
	99-15-087	PANEL SLEEVES (FOR 8"-10" PANEL HTS.)	12	CSBOARD
37.	99-16-440E	STRAPPING FOR PANEL SLEEVES	2	-
A. 38.	99-16-440E	AAA CERTIFICATION LABEL (CS)	2	-
D. 39.	0002	BUMPER BRACKET	2	ALUM.
D. 40.	99-13-108	BUMPER	2	RUBBER
41.	SEC14237	Optional aluminum 1/2" bar (6' tall only)	2	ALUM.

REV	DATE	ECN	DESCRIPTION	BY
1	09/10/08	008-38	RELEASE FOR PRODUCTION	TD
2	07/27/07	008-38	REVISIONS: W/RE PARTS LISTED	TD
3	07/27/07	008-38	REVISIONS: W/RE PARTS LISTED	TD
4	07/27/07	008-38	REVISIONS: W/RE PARTS LISTED	TD
5	07/27/07	008-38	REVISIONS: W/RE PARTS LISTED	TD

ITEM NO.	PART NO.	MATERIAL DESCRIPTION	QUANTITY	MATERIAL
Dwg. No. B040430A BILL OF MATERIAL SERIES 430				
ITEMS BELOW MAY BE ORDERED BY BETTERBILT PART NUMBER ONLY				
100.	99-04-112	OPTIONAL WOOD RAIL FOR STANDARD HANDLE SET (BLACK)	AS REQ'D.	-
	99-04-118	OPTIONAL WOOD RAIL FOR STANDARD HANDLE SET (WHITE)	AS REQ'D.	-
101.	99-04-111	OPTIONAL KEY LOCK FOR STANDARD HANDLE SET	AS REQ'D.	-
	99-17-302	OPTIONAL STAINLESS STEEL TRACK COVER (6' LENGTH)	AS REQ'D.	ST. STL.
	99-17-300	OPTIONAL STAINLESS STEEL TRACK COVER (6' LENGTH)	AS REQ'D.	ST. STL.
	99-17-301	OPTIONAL STAINLESS STEEL TRACK COVER (6' LENGTH)	AS REQ'D.	ST. STL.
	99-17-303	OPTIONAL STAINLESS STEEL TRACK COVER (10' LENGTH)	AS REQ'D.	ST. STL.



Test sample complies with these details.
Deviations are noted.

Report# 71967.01-113-11
Date 11/1/07 Tech K6.

REV	DATE	ECN	DESCRIPTION	BY
1	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
2	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
3	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
4	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
5	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
6	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
7	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
8	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
9	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
10	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
11	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
12	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
13	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
14	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
15	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
16	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
17	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
18	09/10/09	009-99	RELEASE FOR PRODUCTION	TO

REV	DATE	ECN	DESCRIPTION	BY
1	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
2	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
3	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
4	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
5	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
6	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
7	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
8	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
9	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
10	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
11	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
12	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
13	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
14	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
15	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
16	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
17	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
18	09/10/09	009-99	RELEASE FOR PRODUCTION	TO

REV	DATE	ECN	DESCRIPTION	BY
1	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
2	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
3	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
4	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
5	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
6	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
7	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
8	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
9	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
10	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
11	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
12	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
13	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
14	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
15	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
16	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
17	09/10/09	009-99	RELEASE FOR PRODUCTION	TO
18	09/10/09	009-99	RELEASE FOR PRODUCTION	TO

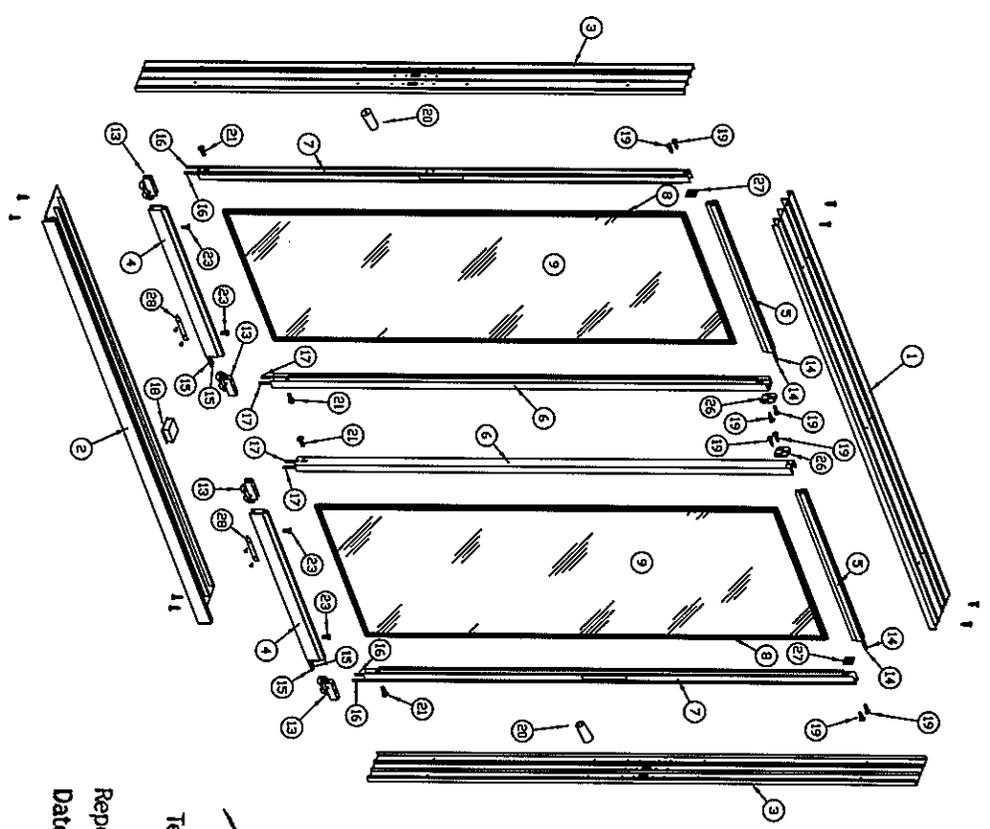
BetterBilt
 BetterBilt
 704 12th. Ave.
 Smyrna, TN 37167
 (615) 459-4161

Performance Specifications

#	DATE	ECN	DESCRIPTION	BY
-	03/27/98	026-98	RELEASE FOR PRODUCTION	TC
A	10/14/98	078-98	BUMPERS CHANGED	TC
B	10/22/98	082-98	RELOCATED #27 PANEL GUIDE	TC

GENERAL DESCRIPTION:	EXPLODED VIEW
TITLE:	"XX" PANEL CONFIGURATION
PRODUCT:	SERIES 420

DRAWN BY:	TC	DATE:	03/27/98
DESIGNED BY:		DATE:	
SCALE:	NONE	SHEET:	1 of 1
FIG. NO.:	EXP0420A	REV.:	B

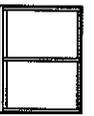


Architectural Testing

Test sample complies with these details.
 Deviations are noted.

Report# 71967.01-113-11
 Date 11/21/07 Tech K6

Series 420

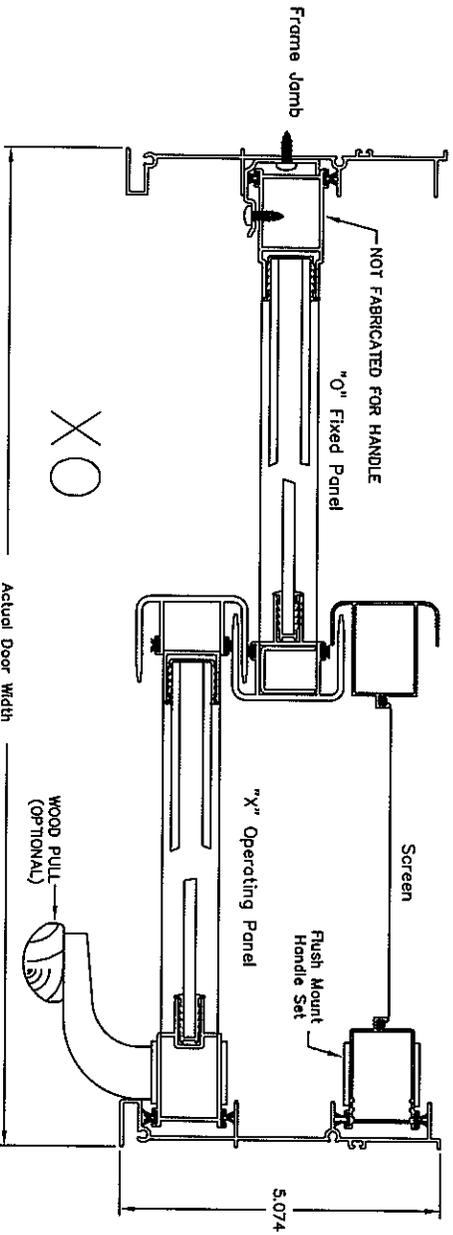
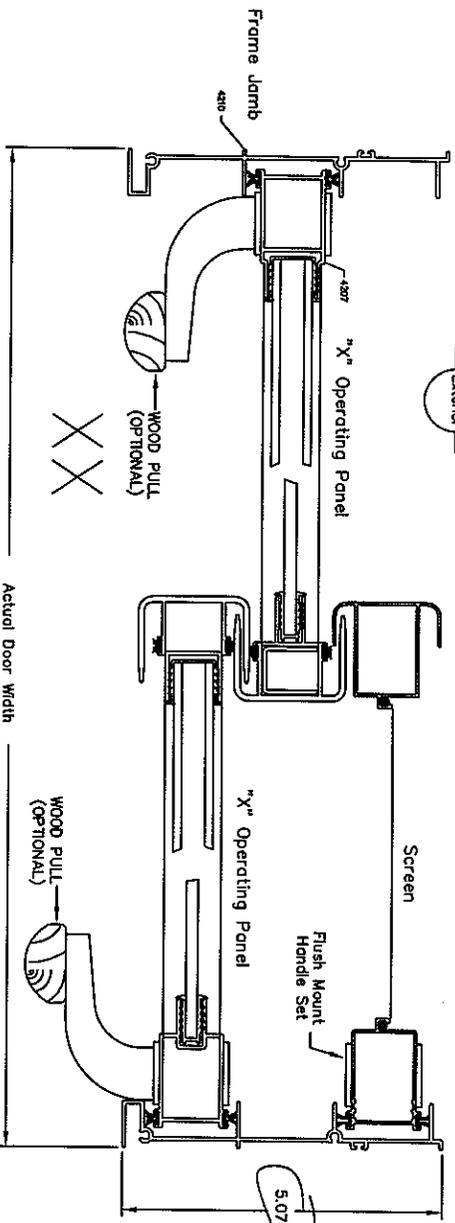


2-Panel Sliding Glass Door "XX" or "XO" *Deviations are noted.*

Architectural Testing

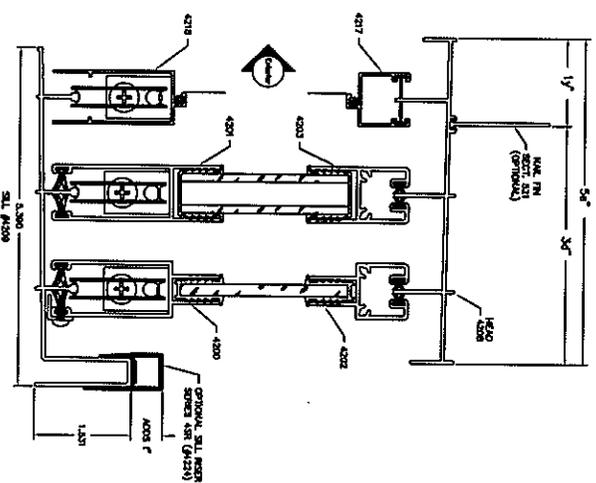
Test sample complies with these details.

Report# 71967.01-113-11
Date 11/2/07 Tech FL



Horizontal Cross Section

Nominal Size	Actual Door Frame Dimension	Suggested Rough Opening
5'0" x 6'8"	60" X 80"	60 1/2" X 80 1/2"
6'0" x 6'8"	72" X 80"	72 1/2" X 80 1/2"
8'0" x 6'8"	96" X 80"	96 1/2" X 80 1/2"
10'0" x 6'8"	120" X 80"	120 1/2" X 80 1/2"
5'0" x 8'0"	60" X 96"	60 1/2" X 96 1/2"
6'0" x 8'0"	72" X 96"	72 1/2" X 96 1/2"
8'0" x 8'0"	96" X 96"	96 1/2" X 96 1/2"
10'0" x 8'0"	120" X 96"	120 1/2" X 96 1/2"



Vertical Cross Section

SERIES 420 2-PANEL OX, XO OR XX

DOOR SIZE	SCREEN SIZE
5'-0" X 6'-8"	30 7/16" X 79"
6'-0" X 6'-8"	36 7/16" X 79"
8'-0" X 6'-8"	48 7/16" X 79"
10'-0" X 6'-8"	60 7/16" X 79"
5'-0" X 8'-0"	30 7/16" X 95"
6'-0" X 8'-0"	36 7/16" X 95"
8'-0" X 8'-0"	48 7/16" X 95"
10'-0" X 8'-0"	60 7/16" X 95"



Architectural Testing

Test sample complies with these details.
Deviations are noted.

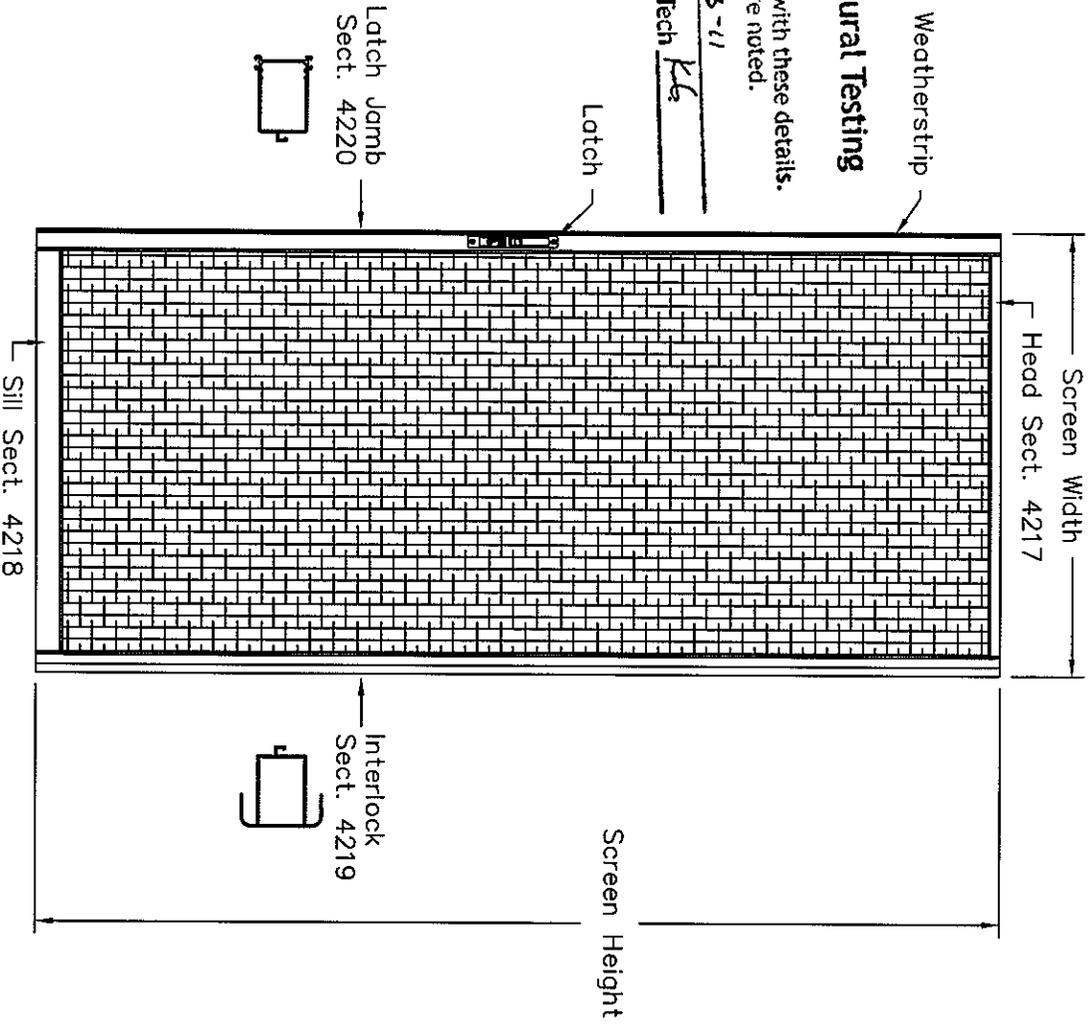
Report# 71967.01.113-11
Date 11/21/07 Tech KG

SERIES 420 3-PANEL OXO

DOOR SIZE	SCREEN SIZE
7'-6" X 6'-8"	30 7/16" X 79"
9'-0" X 6'-8"	36 7/16" X 79"
12'-0" X 6'-8"	48 7/16" X 79"
15'-0" X 6'-8"	60 7/16" X 79"
7'-6" X 8'-0"	30 7/16" X 95"
9'-0" X 8'-0"	36 7/16" X 95"
12'-0" X 8'-0"	48 7/16" X 95"
15'-0" X 8'-0"	60 7/16" X 95"

SERIES 420 4-PANEL OXXX OR XXXX

DOOR SIZE	SCREEN SIZE
10'-0" X 6'-8"	30 7/16" X 79"
12'-0" X 6'-8"	36 7/16" X 79"
16'-0" X 6'-8"	48 7/16" X 79"
10'-0" X 8'-0"	30 7/16" X 95"
12'-0" X 8'-0"	36 7/16" X 95"
16'-0" X 8'-0"	48 7/16" X 95"



BetterBuilt

GENERIC:	PRODUCT INFORMATION
TITLE:	OVERALL SCREEN SIZES SLIDING GLASS DOOR
PRODUCT:	SERIES 420/D185PD/D3185PD

DRAWN BY:	DATE:
Checked:	DATE:
SCALE:	SHEET:
NONE	1 OF 1
DWG. NO. SCR0420A	REV. -

SOLID HOLLOW SEMI HOLLOW SPEC.

ALLOY 6063-T5 DIE # 4201



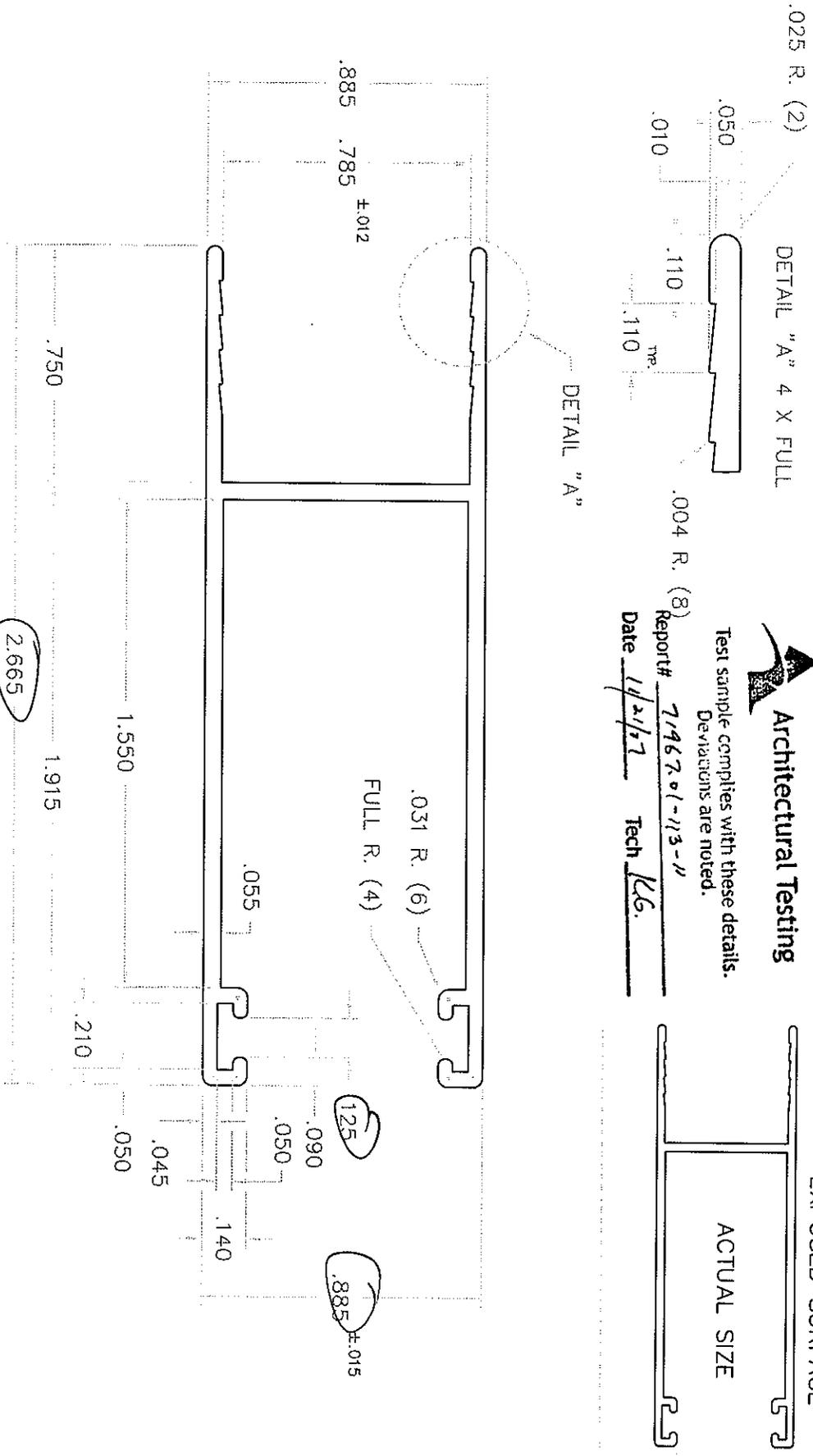
Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# 71467-01-113-11
Date 1/21/97 Tech KG

EXPOSED SURFACE

ACTUAL SIZE



UNSPECIFIED WALL THICKNESS .055 UNSPECIFIED CORNER RADII .010

AREA	.342
PERIMETER	.4104
PERIOD	13.260
PERIOD	3"
PERIOD	5.727

BetterBilt

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ALUMINUM EXTRUSION
CONTACT US TODAY
1-800-888-8888

GENERIC: ALUMINUM EXTRUSION DRAWING

TITLE: PANEL SILL - INSULATED GLAZED

PRODUCT: SERIES 420/42P/430/43P/440/44P

DRAWN BY: TC	DATE: 02/10/98
CHECKED:	DATE:
SCALE: 2 : 1	SHEET: 1 OF 1
DWG. NO. SECT4201	REV. A

#	DATE	BY	DESCRIPTION
A	04/14/98	TC	RELEASE FOR PRODUCTION

SOLID HOLLOW SEMI HOLLOW SPEC.

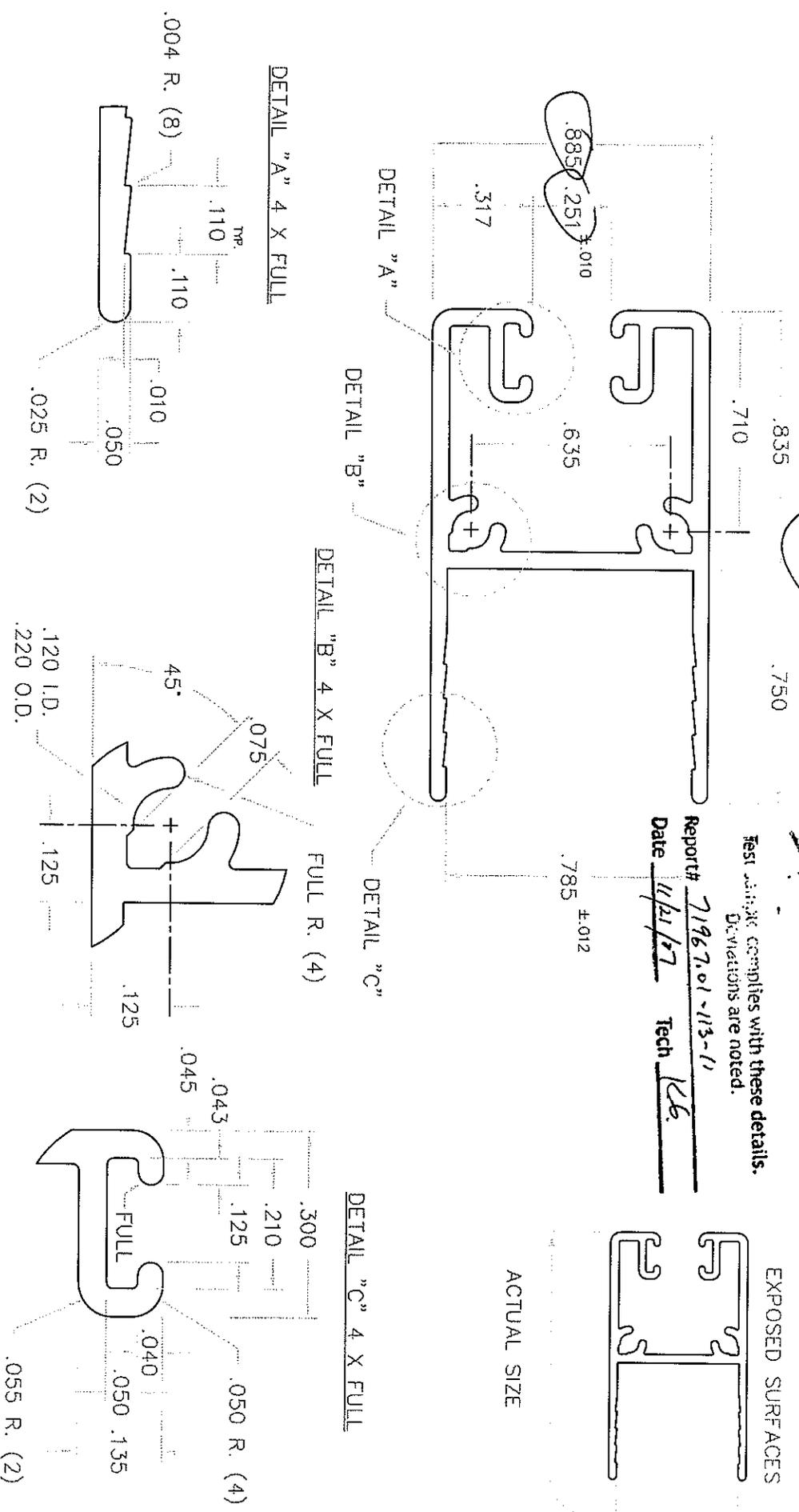
ALLOY 6063-T5 DIE # 4203

Architectural Testing
 Test machine complies with these details.
 Deviations are noted.

Report# 71967.01-113-11
 Date 11/21/97 Tech KE

EXPOSED SURFACES

ACTUAL SIZE



UNSPECIFIED WALL THICKNESS .055 UNSPECIFIED CORNER RADII .010

.284
.341
11.020
2"
3.276

BetterBill
 1004 E. 4th Ave.
 Seattle, WA 98107
 (206) 464-4410

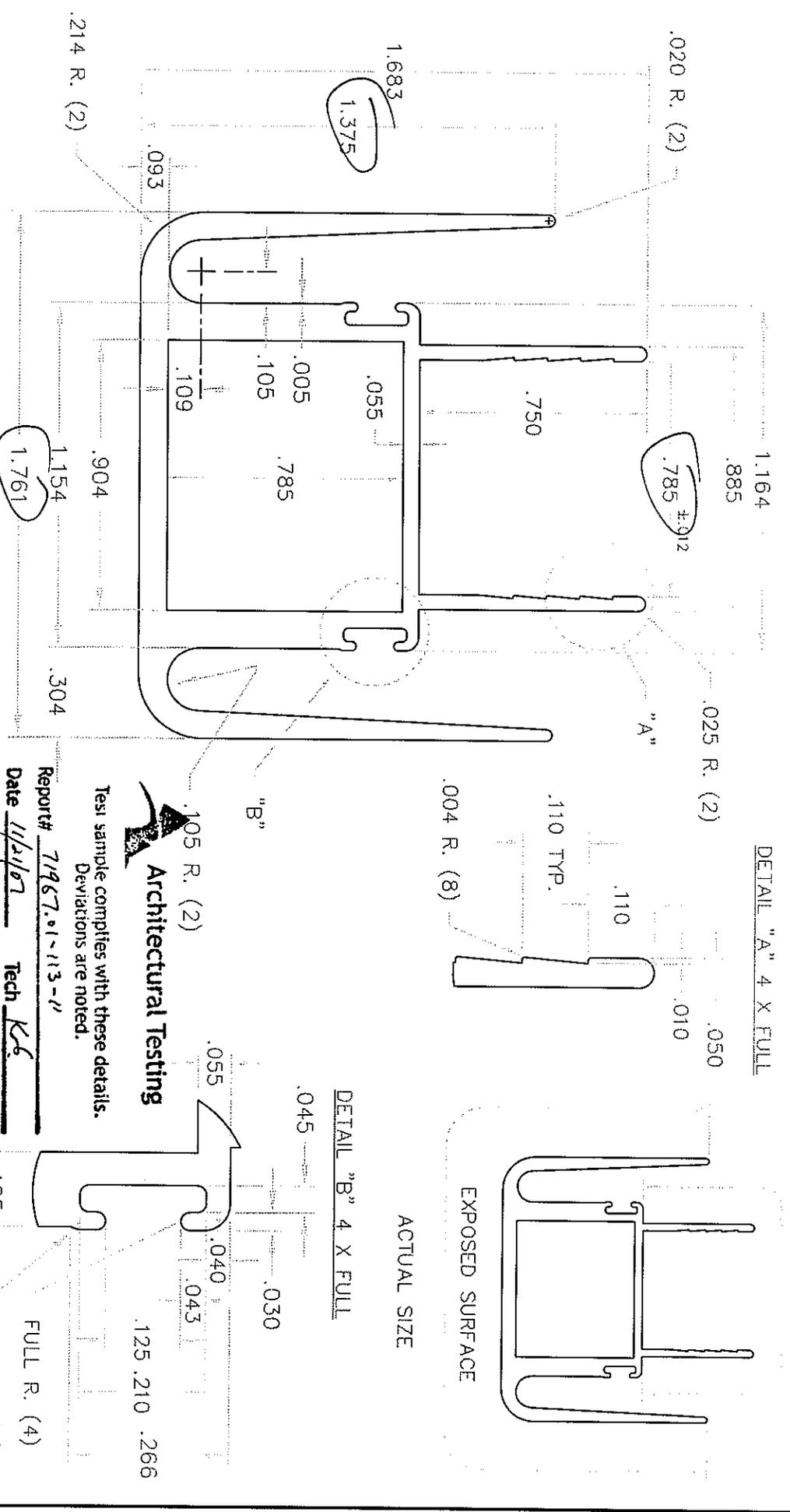
#	DATE	DESCRIPTION	BY
A	04/14/98	026-98 REVISED BOSSES SW	SW

GENERIC: ALUMINUM EXTRUSION DRAWING
 TITLE: PANEL HEAD - INSULATED
 PRODUCT: SERIES 420/42P/430/43P/440/44P

DRAWN BY: TC	DATE: 02/17/98
CHECKED:	DATE:
SCALE: 2 : 1	SHEET: 1 OF 1
DWG. NO. SECT4203	REV. A

SOLID HOLLOW SEMI HOLLOW SPEC.

ALLOY 6063-T5 DIE # 4205



UNSPECIFIED WALL THICKNESS .055

UNSPECIFIED CORNER RADII .010

DRAMA BY:	DATE:
TC	02/17/98
CHECKED:	DATE:
SCALE:	SHEET:
2 : 1	1 OF 1
DWG. NO.	REV.
SECT4205	C

BetterBilt

THE BILT WAY
 SERVICE OF EXCELLENCE
 (800) 445-5800

GENERIC: ALUMINUM EXTRUSION DRAWING

TITLE: PANEL INTERLOCKS - INSULATED GLAZED

PRODUCT: SERIES 420/42P/430/43P/440/44P

DRAMA BY:	DATE:
TC	02/17/98
CHECKED:	DATE:
SCALE:	SHEET:
2 : 1	1 OF 1
DWG. NO.	REV.
SECT4205	C

DATE:	BY:
02/17/98	TC
1.3537	
2 1/4"	
6.283	

SOLID HOLLOW SEMI HOLLOW SPEC.

ALLOY 6063-T5 DIE # 4207



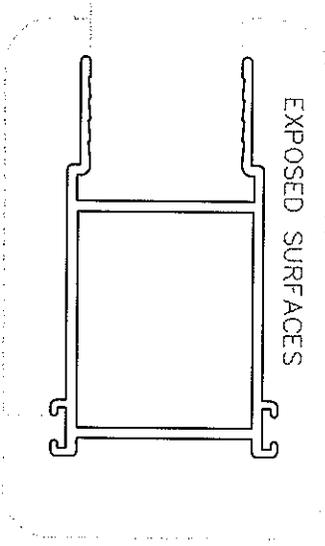
Architectural Testing

Test Sample complies with these details.
Deviations are noted.

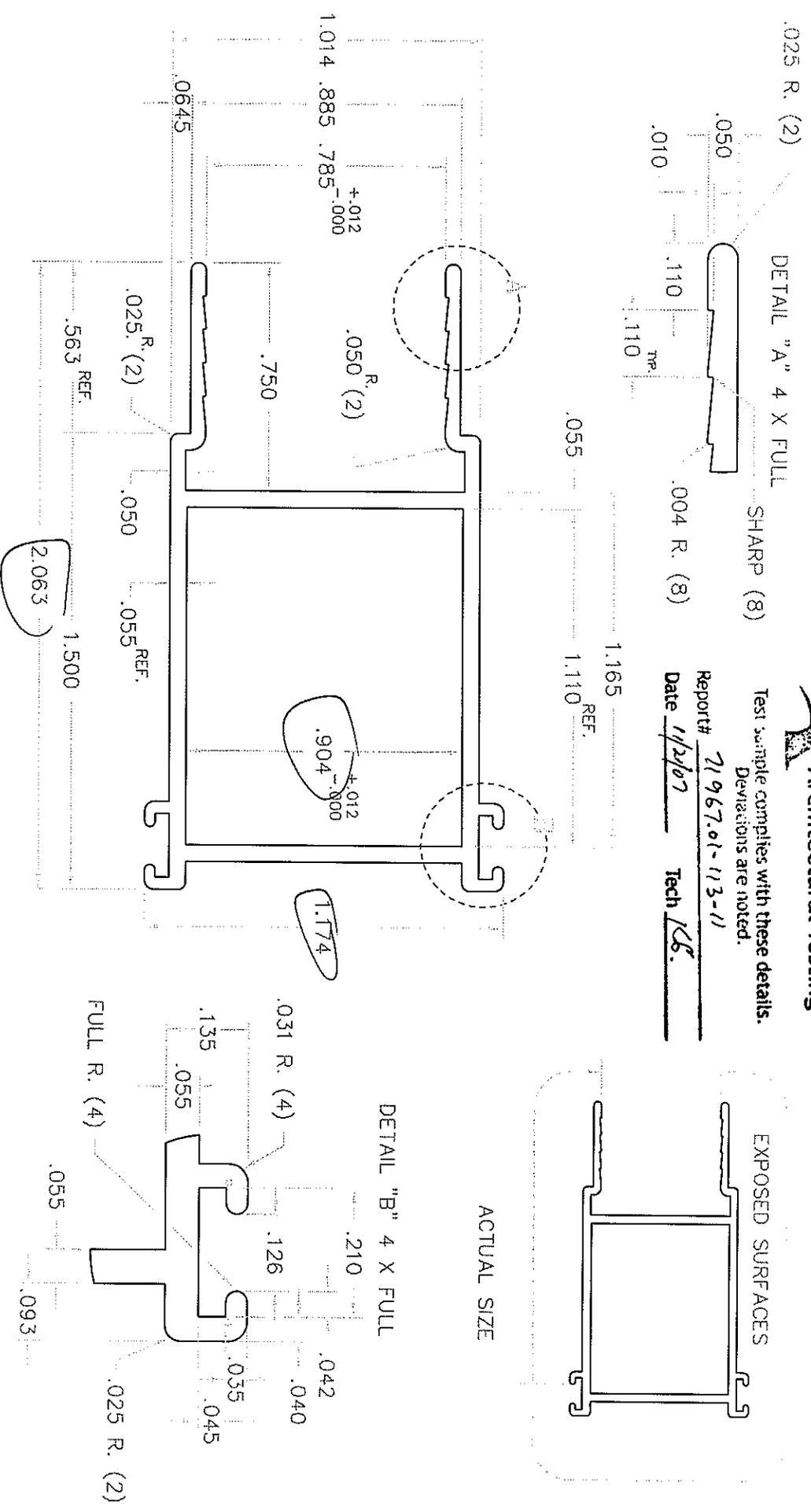
Report# 71967-01-113-11

Date 1/23/07 Tech K.G.

EXPOSED SURFACES



ACTUAL SIZE



UNSPECIFIED WALL THICKNESS .055

UNSPECIFIED CORNER RADI .010

.337
.404
8.906
2 1/2"
5.576

BetterBit

2700 220 AVE.
 GENERAL MFG. CORP.
 6000 600-5410

#	DATE	ECO	DESCRIPTION	BY
A	04/14/98	026-98	RELEASE FOR PRODUCTION	TC

GENERIC: ALUMINUM EXTRUSION DRAWING

TITLE: PANEL LOCK JAMB INSULATED

PRODUCT: SERIES 420/42P/430/43P/440/44P

DRAWN BY: SW DATE: 02/18/98

CHECKED: DATE:

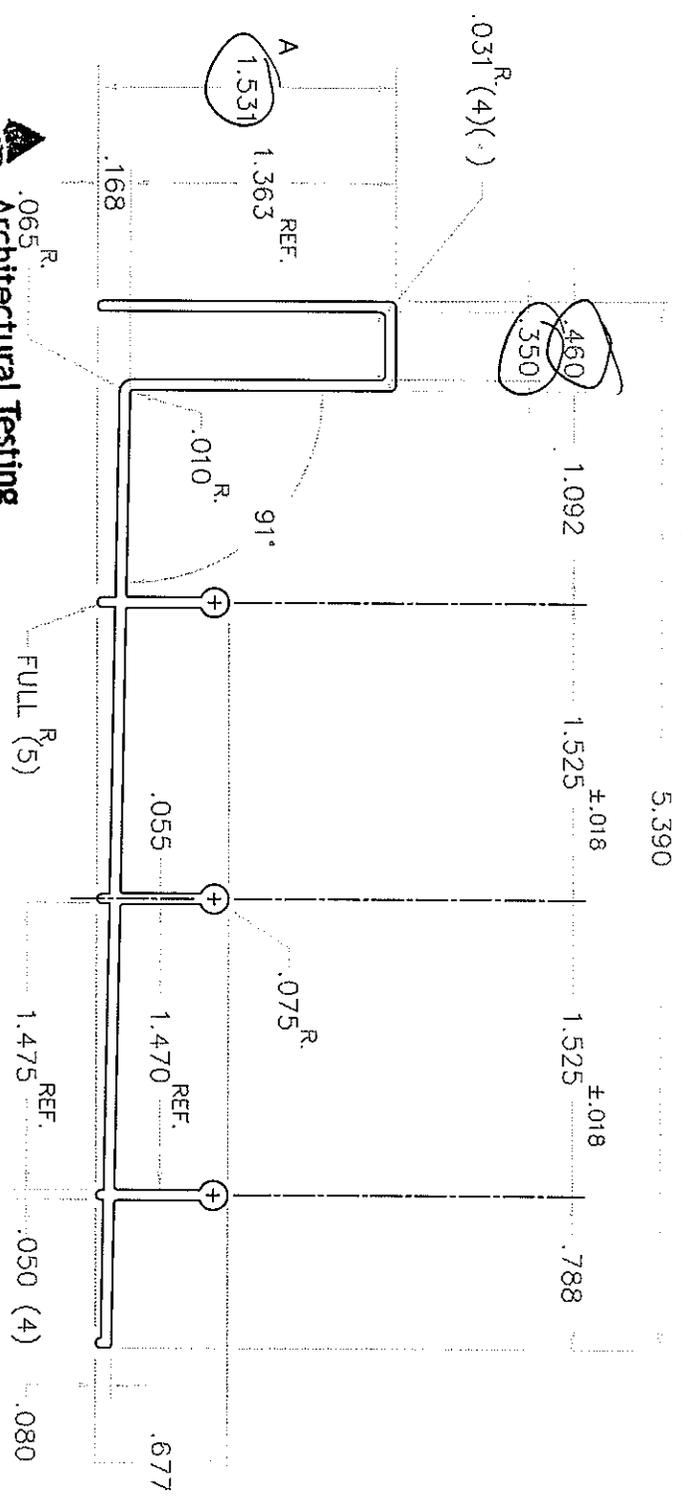
SCALE: 2 : 1 SHEET: 1 OF 1

DWG. NO. SECT4207 REV. A

SOLID HOLLOW SEMI HOLLOW SPEC.

ALLOY 6063-T5 DIE # 4209

MILL FINISH ONLY



Test sample complies with these details.
Deviations are noted.

Report# 71967.01-113-11
Date 1/21/07 Tech KG

UNSPECIFIED WALL THICKNESS .055 UNSPECIFIED CORNER RADII .015

.582
.698
20.322
5 3/4"
NONE

Beta-Bilt			
THE BETA-BILT SYSTEM OF WINDOW AND DOOR SILLING			
#	DATE	REV.	DESCRIPTION
B	10/02/98	074-98	SERIES 43P ADDED
TC			

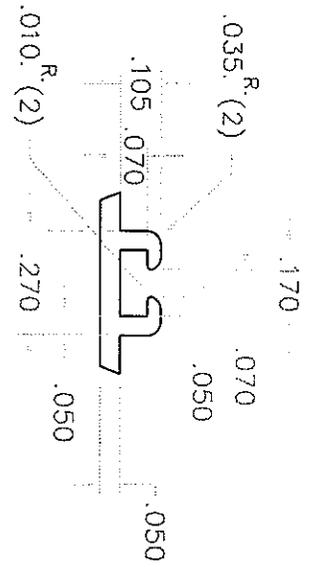
GENERIC:	ALUMINUM EXTRUSION DRAWING
TITLE:	MAIN FRAME SILL
PRODUCT:	SERIES 420/42P/43P

DRAWN BY:	TC	DATE:	02/17/98
CHECKED:		DATE:	
SCALE:	1 : 1	SHEET:	1 OF 1
DWG. NO.:	SECT4209	REV.:	B

SOLID HOLLOW SEMI HOLLOW SPEC.

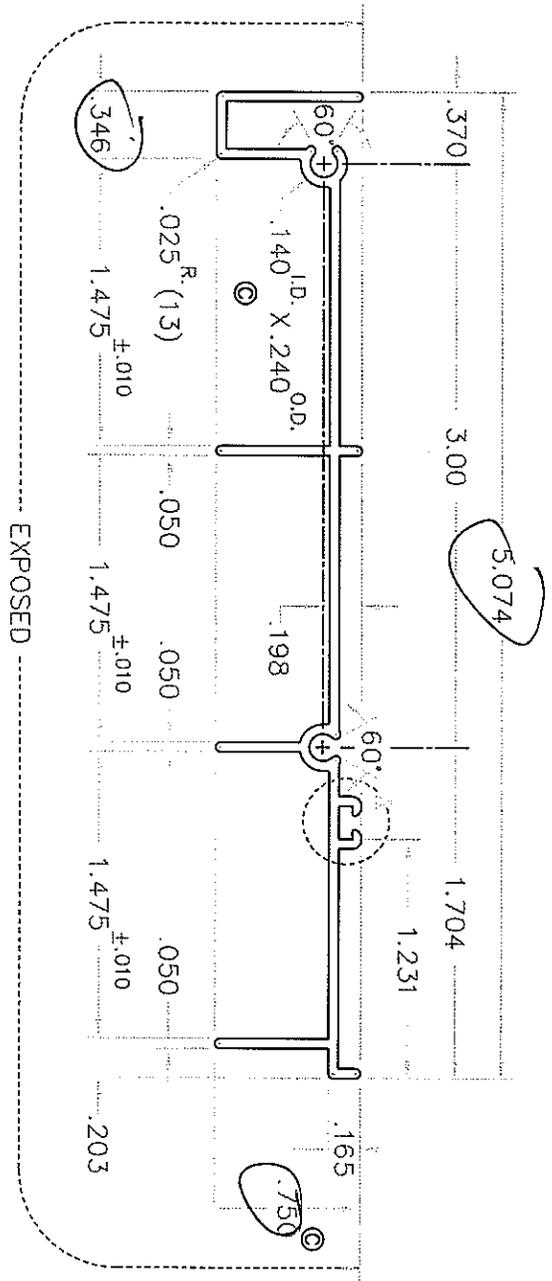
ALLOY 6063-T5 DIE # 4210

DETAIL "A" 2 X FULL



Architectural Testing
 Test sample complies with these details.
 Deviations are noted.

Report# 71967.01-113-11
 Date 11/21/07 Tech *KS*



UNSPECIFIED WALL THICKNESS .050 UNSPECIFIED CORNER RADI .015

THICKNESS	.444
WEIGHT	.533
LENGTH	17.70
SECTION	5 1/8"
TEMPERATURE	9.5

BetterBilt

924 LIND AVE.
 SHERMAN, TX 75087
 (800) 541-5419

#	DATE	REV.	DESCRIPTION	BY
C	5/30/00	021-00	.063 DEEPER + #8 BOSSES SW	SW

GENERIC: ALUMINUM EXTRUSION DRAWING

TITLE: MAIN FRAME JAMB

PRODUCT: SERIES 420/42P/43P

DRAWN BY: SW	DATE: 02/21/98
CHECKED:	DATE:
SCALE: 1 : 1	SHEET: 1 OF 1
DWG. NO. SECT4210	REV. C

Appendix C

Photographs



Receive Room View of Installed Specimen



Source Room View of Installed Specimen