

CERTAINTEED LLC

TEST REPORT

SCOPE OF WORK

UL 1703, SECTION 30, IMPACT RESISTANCE TESTING OF PHOTOVOLTAIC (PV) MODULES
(SOLAR PANELS), ROOFING

REPORT NUMBER

S6997.01-109-44

TEST DATE

06/25/25

ISSUE DATE

08/19/25

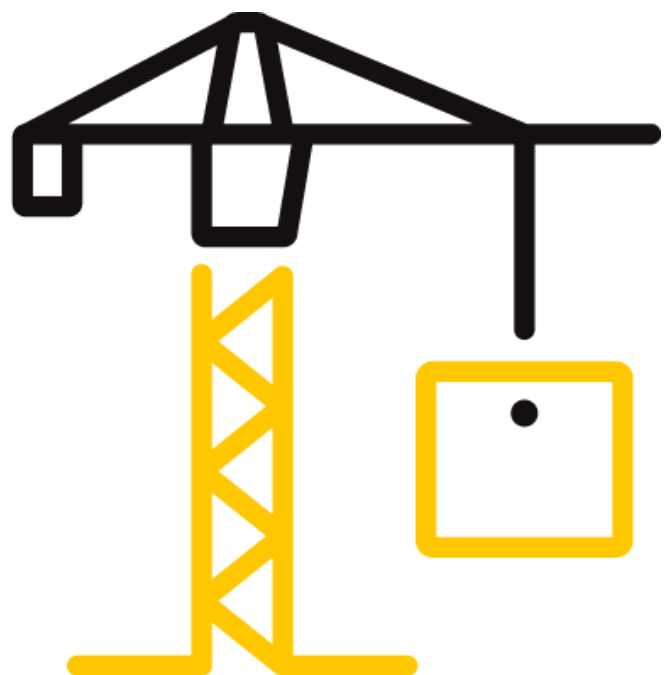
PAGES

35

DOCUMENT CONTROL NUMBER

RT-R-AMER-Test-2957 (11/28/22)

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TEST REPORT FOR CERTAINTEED LLC

Report No.: S6997.01-109-44

Date: 08/19/25

REPORT ISSUED TO

CERTAINTEED LLC

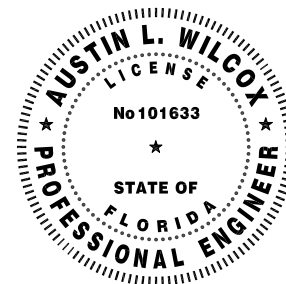
18 Moores Road

Malvern, Pennsylvania 19355

SECTION 1

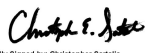
SCOPE

Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by CertainTeed LLC to perform impact resistance testing in accordance with UL 1703, Section 30 on their Photovoltaic (PV) Modules (solar panels), Roofing. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at Intertek B&C test facility in York, Pennsylvania.



2025.08.19 15:37:46 -04'00'

For INTERTEK B&C:

COMPLETED BY:	Christopher E. Sartalis
TITLE:	Technician – Product Testing
SIGNATURE:	 Digitally Signed by: Christopher Sartalis
DATE:	08/19/25

REVIEWED BY:	Austin L. Wilcox, P.E.
TITLE:	Project Engineer – Product Testing
SIGNATURE:	 Digitally Signed by: Austin L. Wilcox
DATE:	08/19/25

CES:mas

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SECTION 2**TEST METHOD**

The specimen was evaluated in accordance with the following:

UL 1703(2015), Section 30, Impact Test, *Flat-Plate Photovoltaic Modules and Panels*

SECTION 3**MATERIAL SOURCE/INSTALLATION**

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

SECTION 4**EQUIPMENT**

Drop Tube: Constructed from PVC piping

Missile: 2.0" (50.8 mm) diameter steel ball, 63655

Weather Station: 63316

Tape Measure Verification: 63788

Digital Scale: 65571

SECTION 5**LIST OF OFFICIAL OBSERVERS**

NAME	COMPANY
Kenneth Keefer	CertainTeed LLC
Larry D. Testerman II	Intertek B&C
Timothy J. McGill	Intertek B&C
Christopher E. Sartalis	Intertek B&C

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SECTION 6

TEST SPECIMEN DESCRIPTION

Product Type: Solar panels, Roofing

Series/Model: Photovoltaic (PV) Modules

Product Sizes:

OVERALL AREA:	WIDTH		HEIGHT	
	millimeters	inches	millimeters	inches
2.3 m ² (25.0 ft ²)				
Overall size	1524	60	1524	60
Module size	870	34-1/4	870	34-1/4

Test Deck Description: The test deck consisted of 1/2" thick plywood sheathing installed over 2x6 perimeter supports and 2x6 intermediate supports spaced 24" on center. Ten 5' 2x4 battens were layered over the sheathing of the test deck. On the bottom layer, three 2x4 battens were spaced 18", 21", and 18". The middle layer consisted of three 2x4 battens, 6" in from the top and bottom of the test deck, spaced 24" on center. The top layer consisted of three 2x4 battens, 2-1/2" in from each side spaced 27-1/2" on center.

Test Specimen Installation: *Refer to Photo #1 in Section 10 to see how the Panels were installed for testing (Client installation)*

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SECTION 7

TEST RESULTS

UL 1703, Section 30, Impact Test

Steel Ball Weight: 1.15 lbs (521.6 g)

Steel Ball Diameter: 2" (50.8 mm)

Steel Ball Drop Height: 4' 3" (1.3 m)

The ambient temperature during testing was 84°F (29°C). The results are tabulated as follows.

IMPACT	IMPACT AREA	OBSERVATIONS	RESULTS
1	Center of PV panel	No visible damage.	Pass
2	Midspan between the right and bottom corners of the PV panel	No visible damage	Pass
3	Midspan between the left and bottom corners of the PV panel	No visible damage	Pass
4	Bottom corner above the fastener	No visible damage.	Pass
5	Top corner below the fastener	No visible damage.	Pass

SECTION 8

CONCLUSION

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. Intertek B&C will service this report for the entire test record retention period. The test record retention period ends ten years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained for the entire test record retention period.

Unless differently required, Intertek reports apply the "Simple Acceptance" rule, also called "Shared Risk Approach," of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.

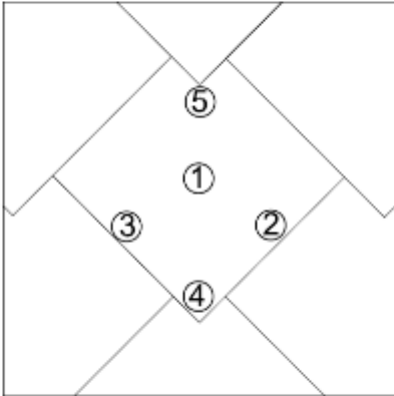
TEST REPORT FOR CERTANTEED LLC

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Date: 08/19/25

SECTION 9

SKETCH

REV	DATE	DESCRIPTION	BY
<u>SPECIMEN #1</u> 			
PROJECT NO: S6997.01 109-44		PROJECT NAME: UL 1703, SECTION 30 CLIENT: CERTANTEED LLC	 IMPACT LOCATIONS
DATE: 8/14/25		TEST NO: 1	TEST BY: 1

Sketch No. 1
Impact Locations

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Date: 08/19/25

SECTION 10

PHOTOGRAPHS

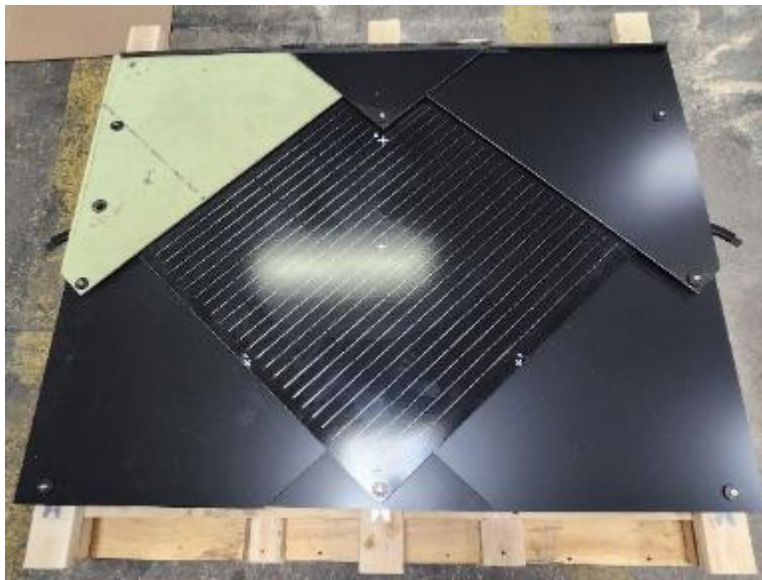


Photo No. 1
Test specimen with Impact Locations

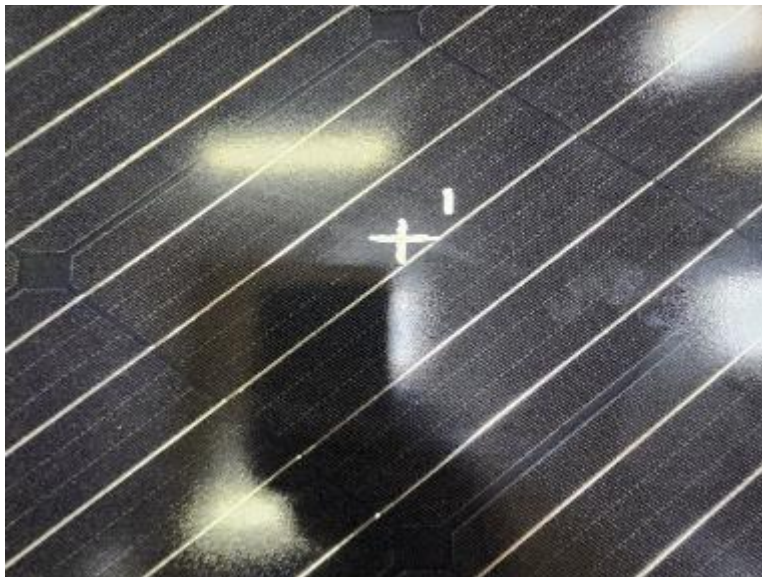


Photo No. 2
Impact Location #1 Before Impact

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Photo No. 3
Impact Location #1 After Impact

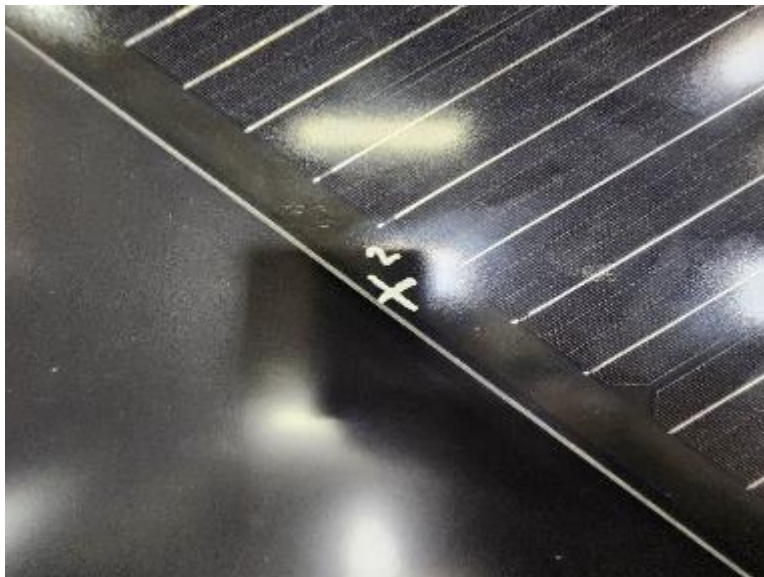


Photo No. 4
Impact Location #2 Before Impact

TEST REPORT FOR CERTAINTED LLC

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Date: 08/19/25

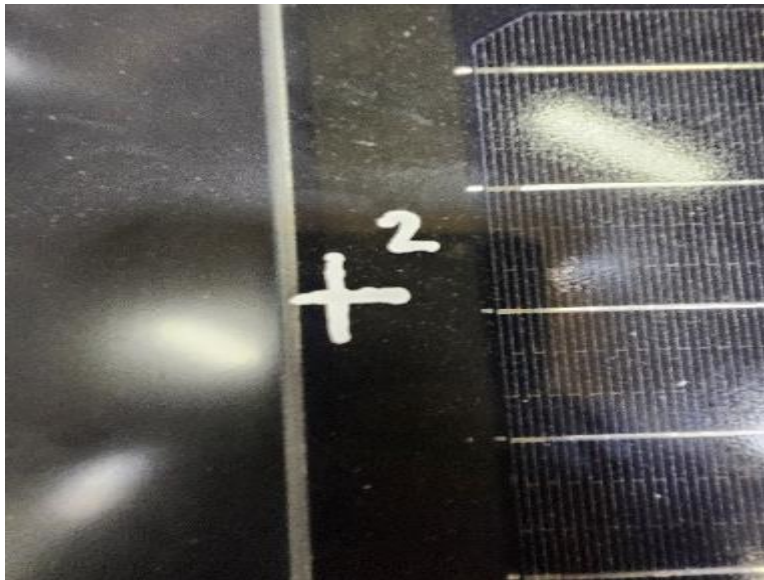


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Impact Location #2 After Impact

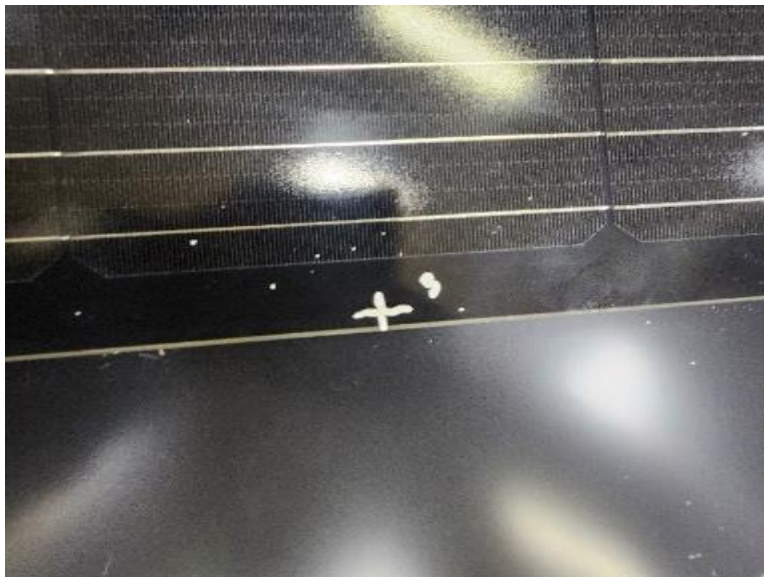


Photo No. 6
Impact Location #3 Before Impact

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Date: 08/19/25

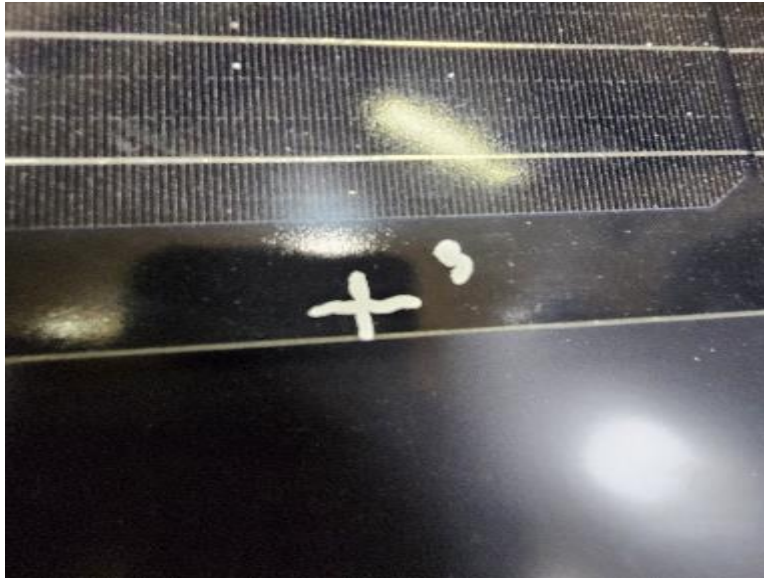


Photo No. 7
Impact Location # 3 After Impact

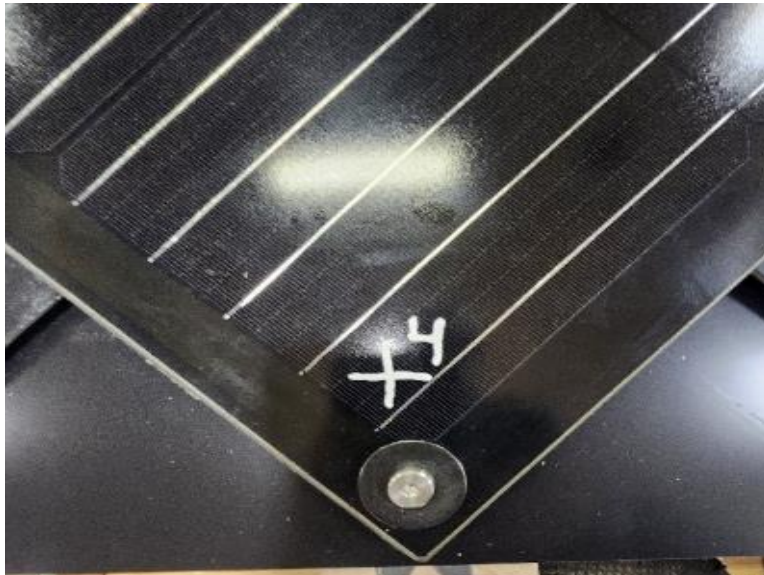


Photo No. 8
Impact Location #4 Before Impact

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Date: 08/19/25



Photo No. 9
Impact Location #4 After Impact

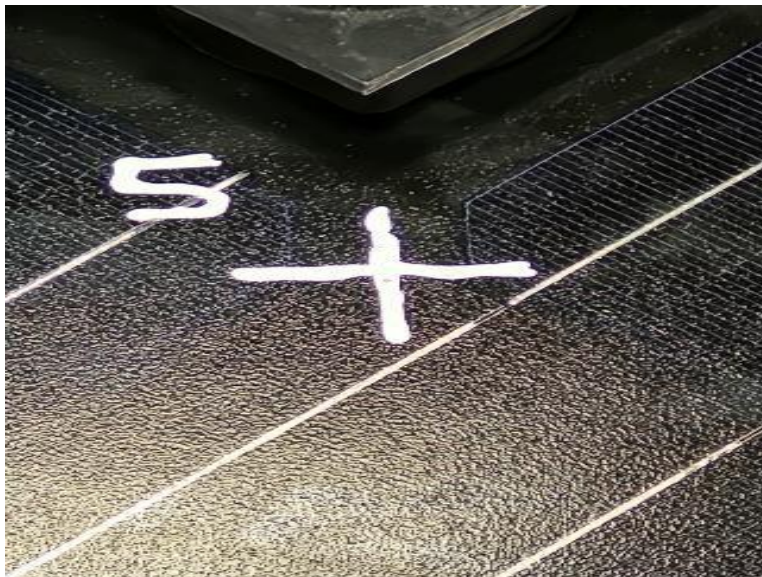


Photo No. 10
Impact Location #5 Before Impact

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Photo No. 11
Impact Location #5 After Impact



Total Quality. Assured.

130 Derry Court
York, Pennsylvania 17406

Telephone: 717-764-7700
Facsimile: 717-764-4129
www.intertek.com/building

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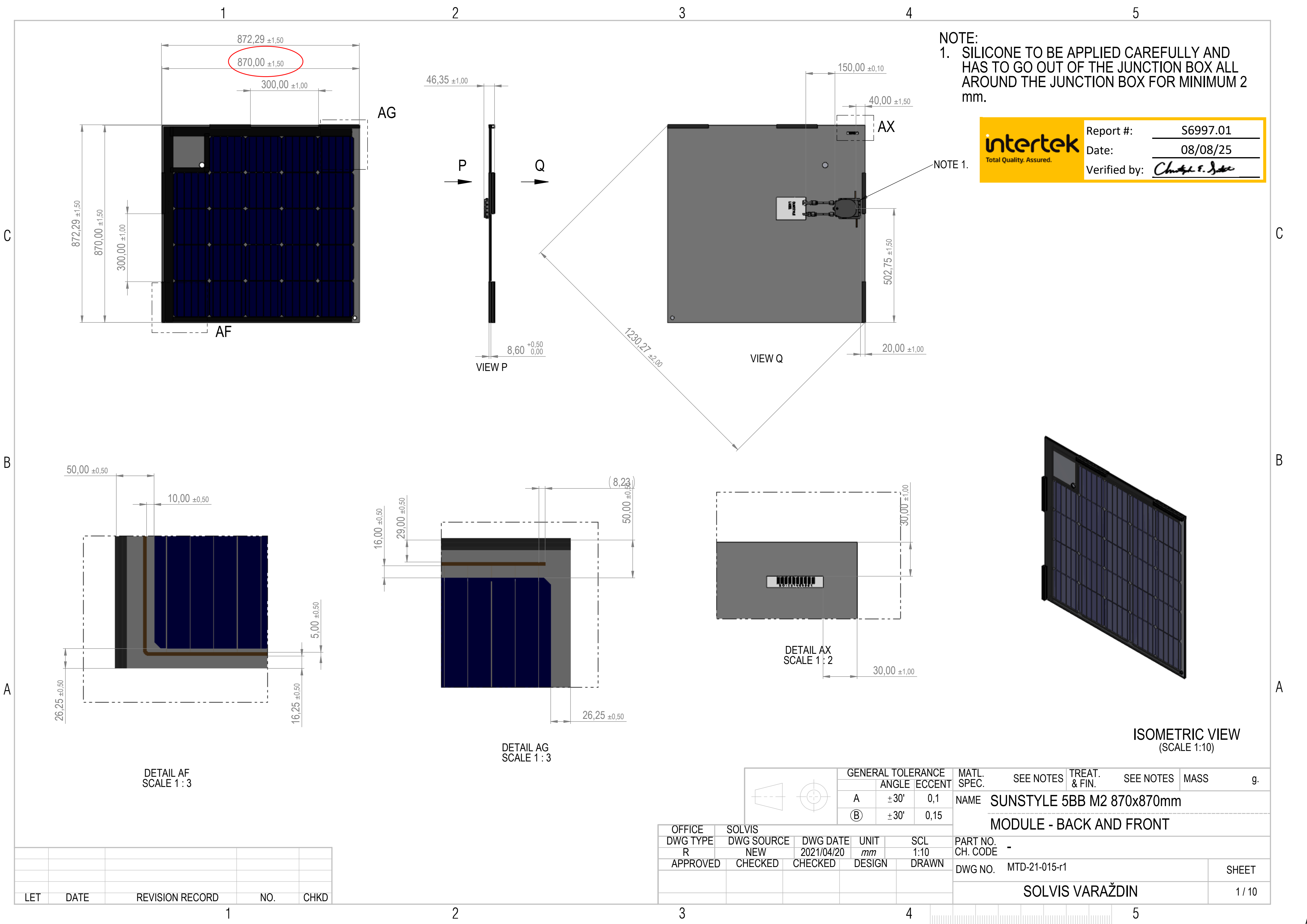
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Date: 08/19/25

SECTION 11

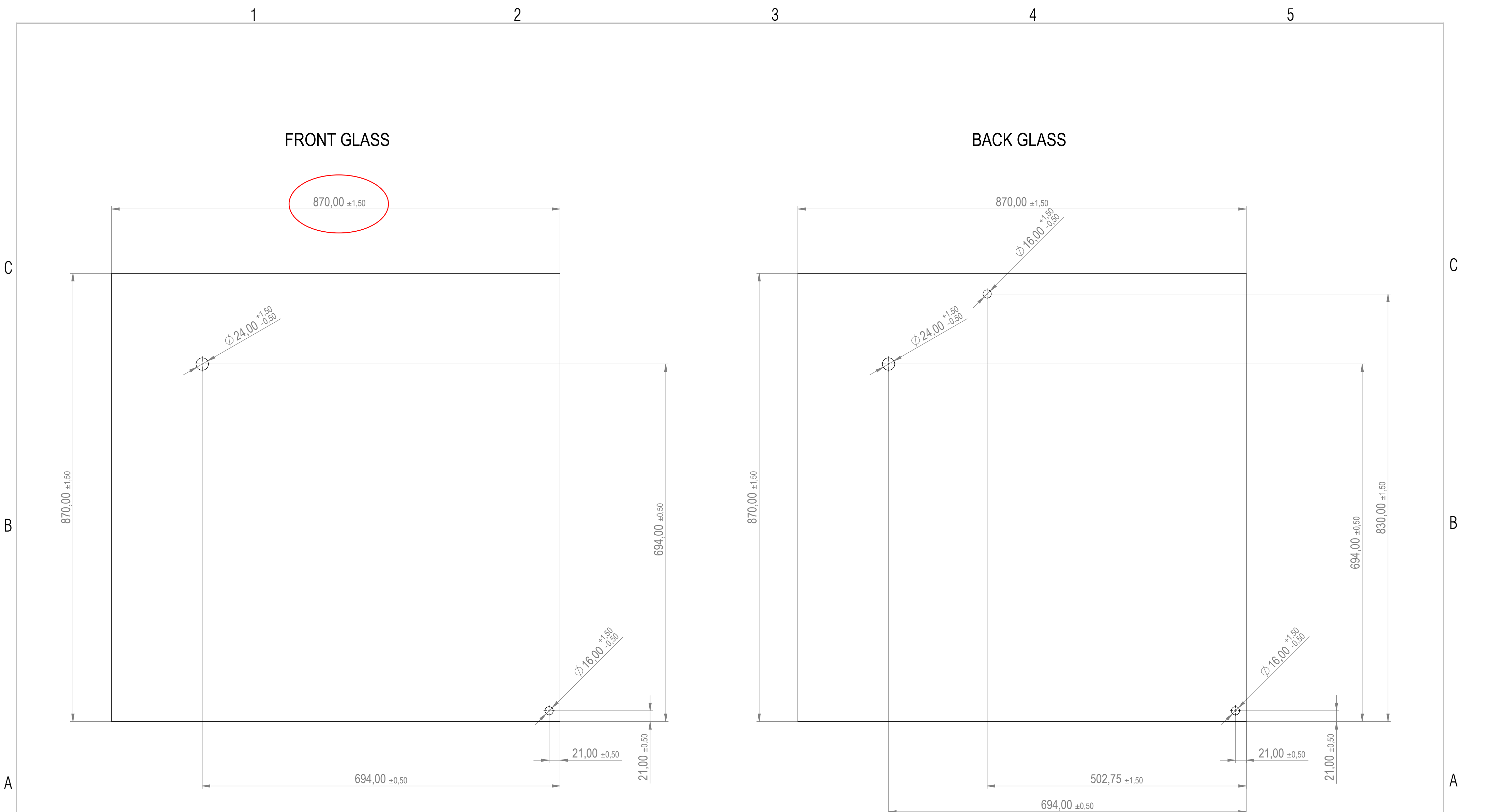
DRAWINGS

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.



LET	DATE	REVISION RECORD	NO.	CHKD

		GENERAL TOLERANCE		MATL. SPEC.	SEE NOTES	TREAT. & FIN.	SEE NOTES	MASS	g.	
			ANGLE	ECCENT						
		A	±30'	0,1	NAME SUNSTYLE 5BB M2 870x870mm MODULE - BACK AND FRONT					
		Ⓑ	±30'	0,15						
OFFICE	SOLVIS				PART NO. CH. CODE -					
DWG TYPE	DWG SOURCE	DWG DATE	UNIT	SCL						
R	NEW	2021/04/20	mm	1:10	DWG NO. MTD-21-015-r1					SHEET
APPROVED	CHECKED	CHECKED	DESIGN	DRAWN						
					SOLVIS VARAŽDIN					1 / 10



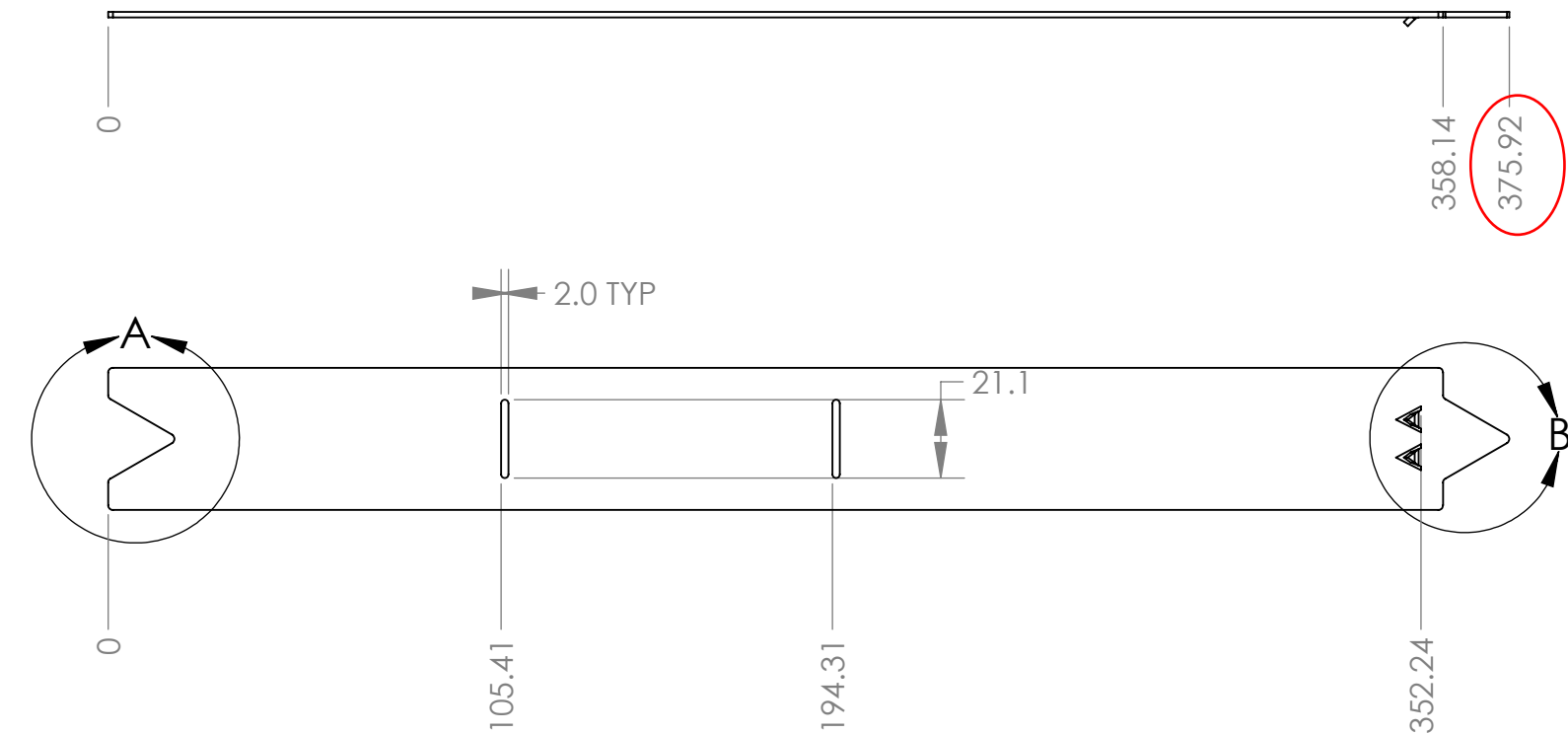
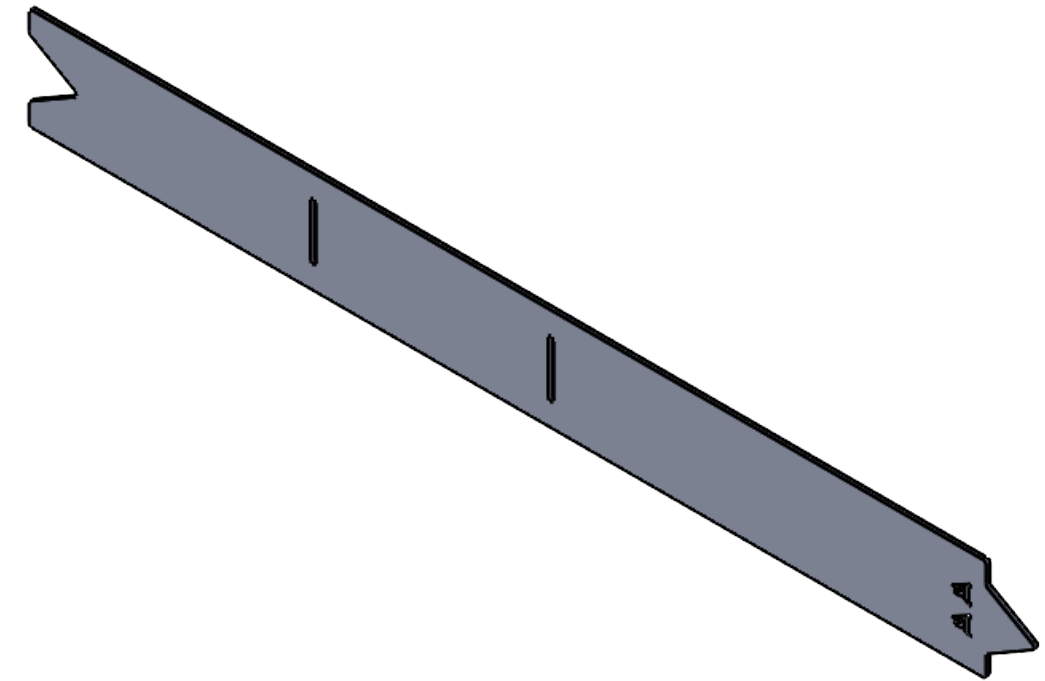
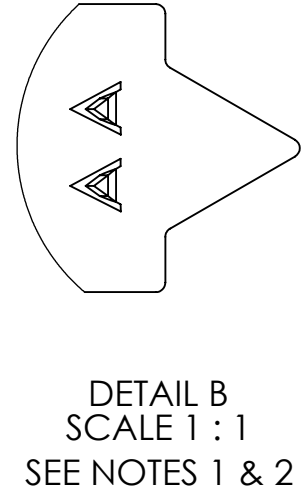
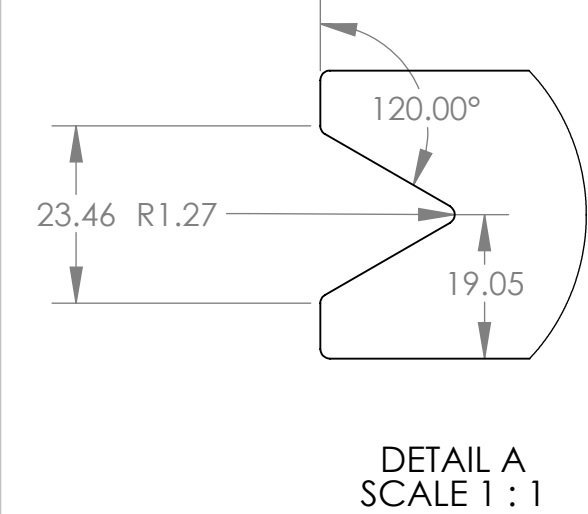
LET	DATE	REVISION RECORD	NO.	CHKD



Report #:	S6997.01
Date:	08/08/25
Verified by:	<i>Cheng E. Jiao</i>

OFFICE	SOLVIS			
DWG TYPE	DWG SOURCE	DWG DATE	UNIT	SCL
R	NEW	2021/04/20	mm	1:10
APPROVED	CHECKED	CHECKED	DESIGN	DRAWN

GENERAL TOLERANCE	MATL. SPEC.	SEE NOTES	TREAT. & FIN.	SEE NOTES	MASS	g.
ANGLE						
ECCENT						
A	±30'	0,1				
(B)	±30'	0,15				
NAME SUNSTYLE 5BB M2 870x870mm						
GLASS DRAWINGS						
PART NO. CH. CODE -						
DWG NO. MTD-21-015-r1					SHEET	
SOLVIS VARAŽDIN					7 / 10	



- NOTES:
1. DETAIL B DIMENSIONS ARE INVERSE OF DETAIL A
2. DETAIL B SHOULD FIT NEATLY INTO DETAIL A



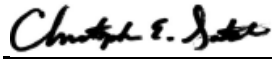
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S6997.01

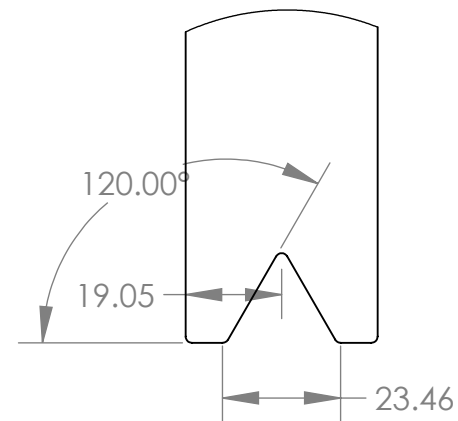
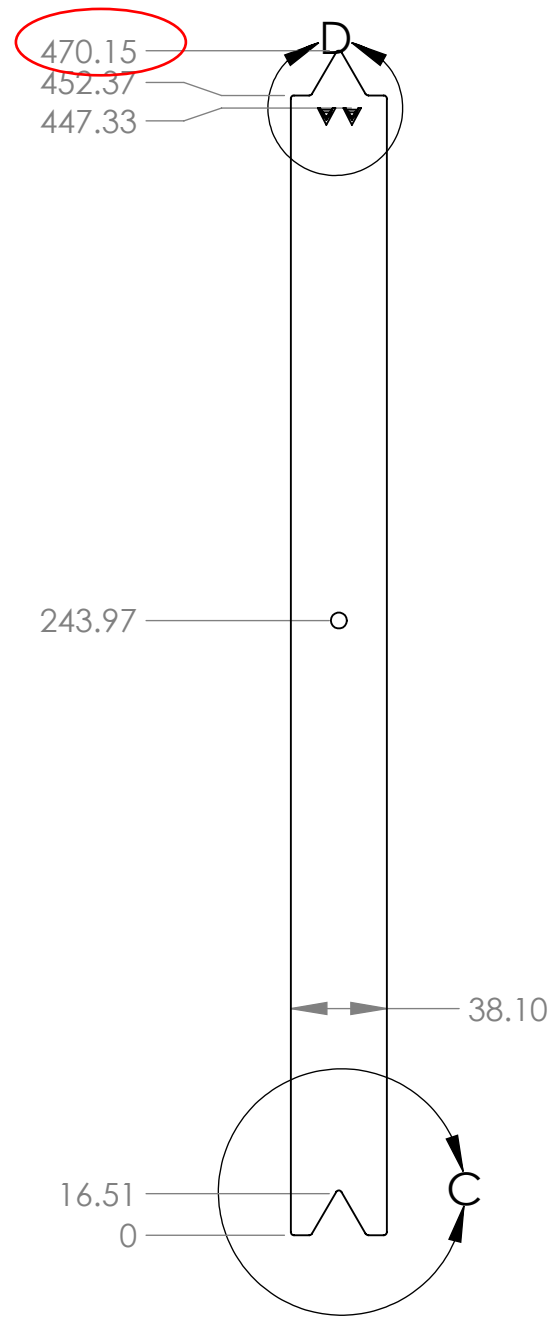
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08/08/25

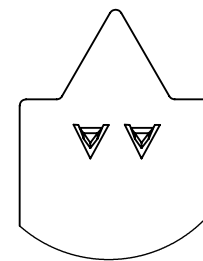
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UNLESS OTHERWISE SPECIFIED DIMENSIONS IN MILLIMETERS TOLERANCES ARE: DECIMALS ANGLES X.X ± .3 X ± 1 X.XX ± .15 X.X ± .5		CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE		 SUNSTYLE USA 250 Alice St Wheeling, IL 60090			
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FINISH Mill	QUAL ENG		---		XX.XX.XX		
	DO NOT SCALE DRAWING						
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DETAIL C
SCALE 2 : 3



DETAIL D
SCALE 2 : 3

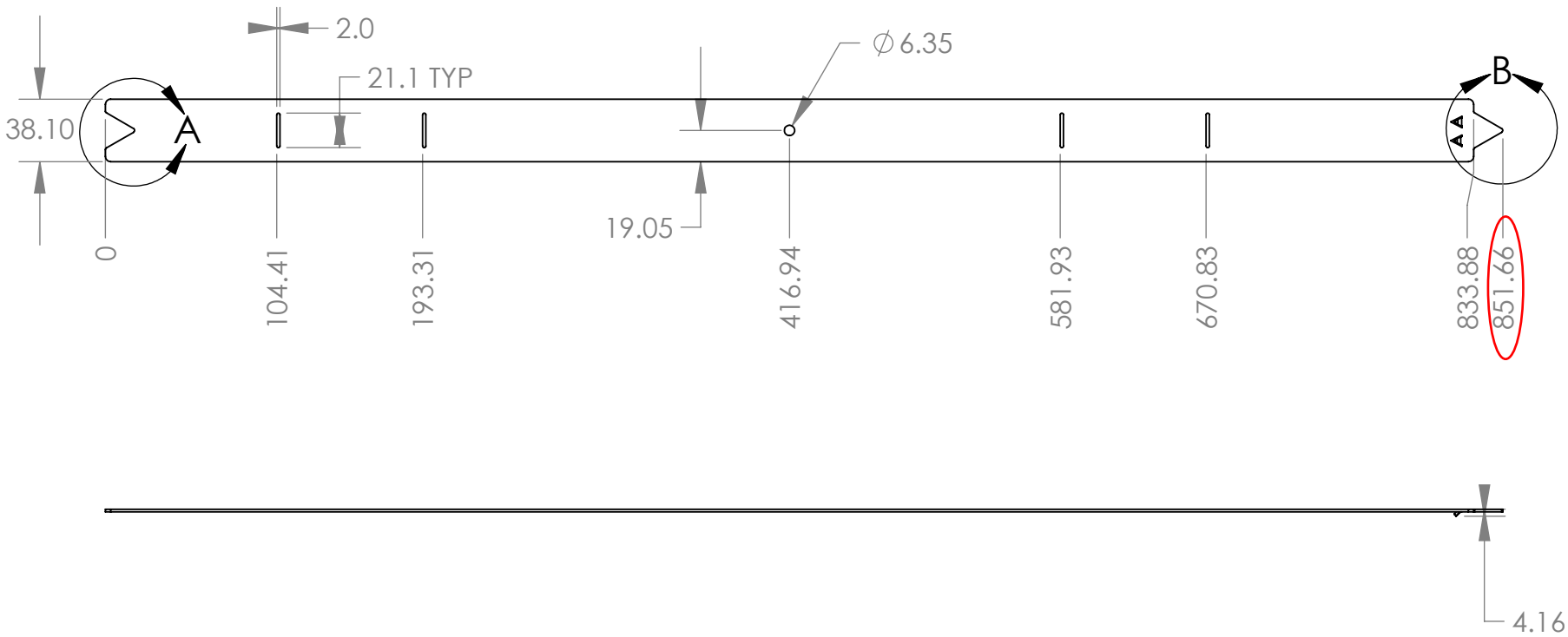
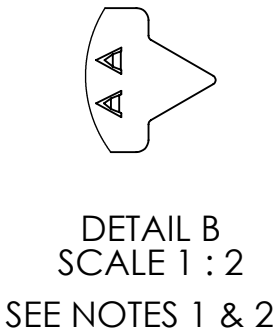
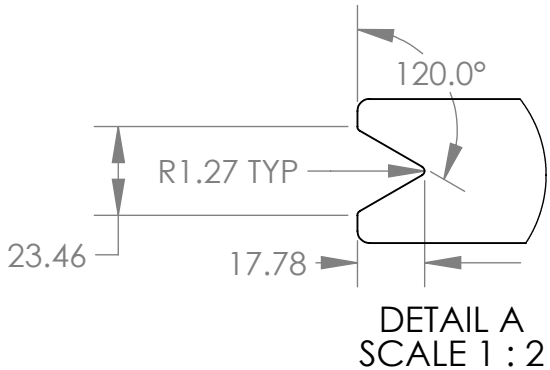
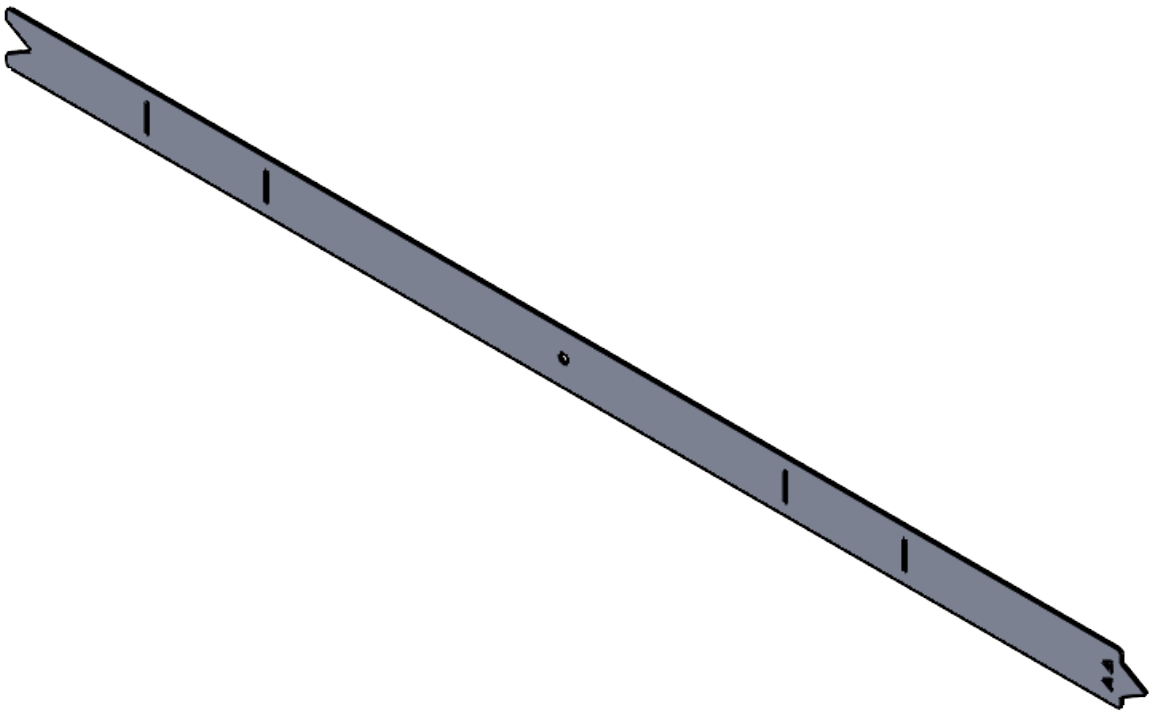


- NOTES:
1. DETAIL D DIMENSIONS ARE INVERSE OF DETAIL C
 2. DETAIL D SHOULD FIT NEATLY INTO DETAIL C



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Date: 08/08/25
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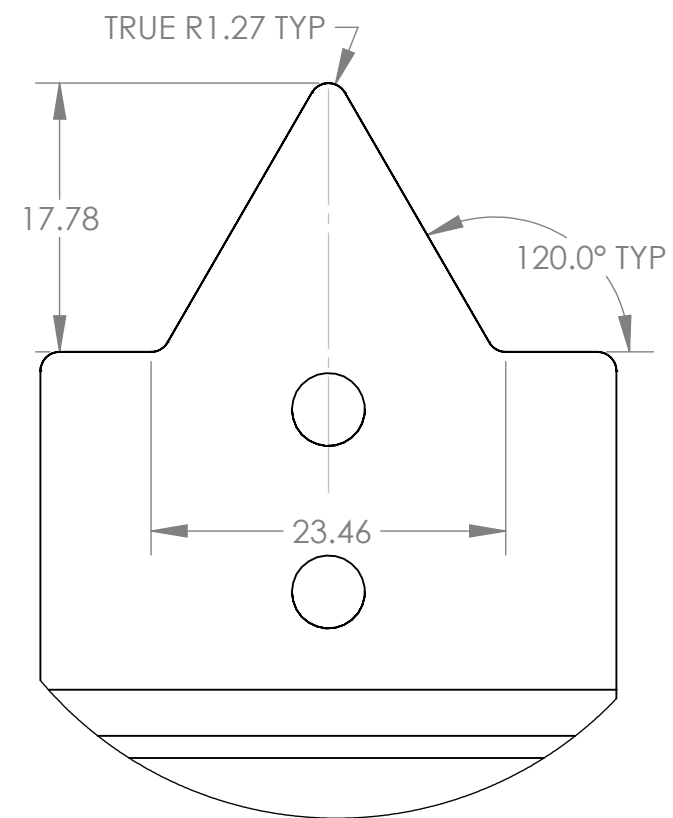
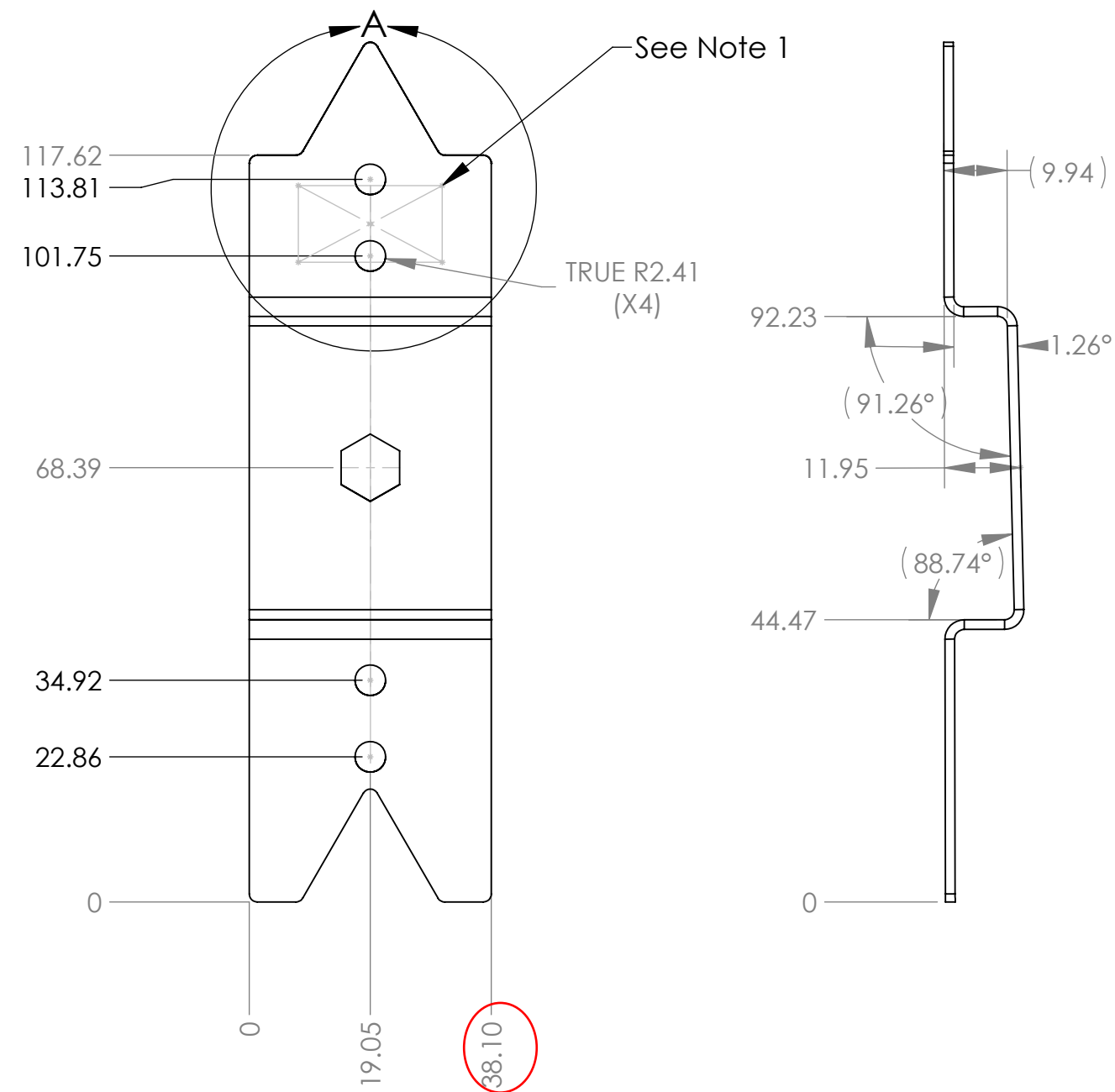


NOTES:
1. DETAIL B DIMENSIONS ARE INVERSE OF DETAIL A
2. DETAIL B SHOULD FIT NEATLY INTO DETAIL A

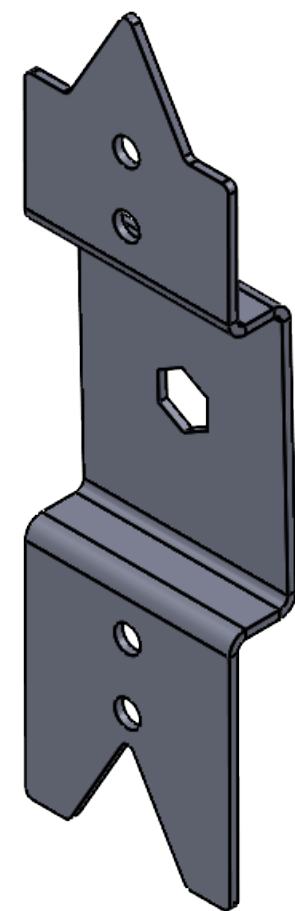


Report #: S6997.01
Date: 08/08/25
Verified by: *Christopher E. Jeter*

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FINISH	Mill	MFG ENG	---	XX.XX.XX	SIZE B
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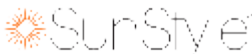
DETAIL A
SCALE 2 : 1



- NOTES:
1. Downward protrusions with length between .025 and .060

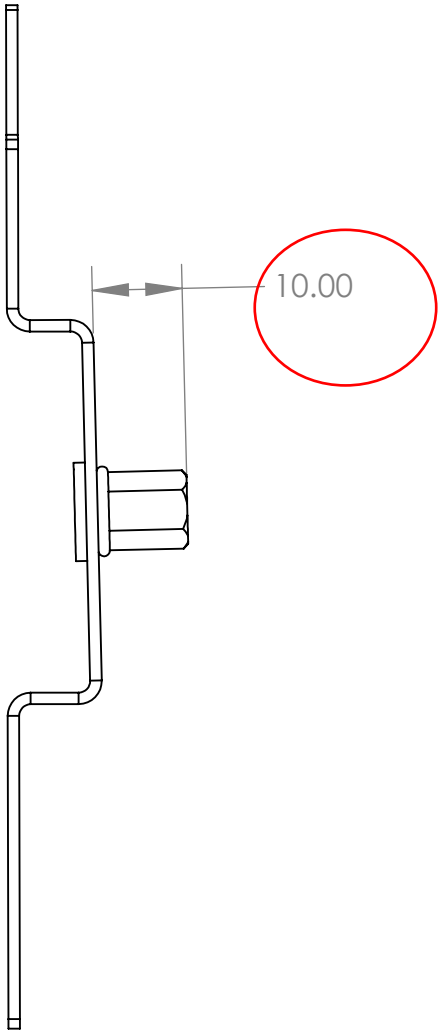
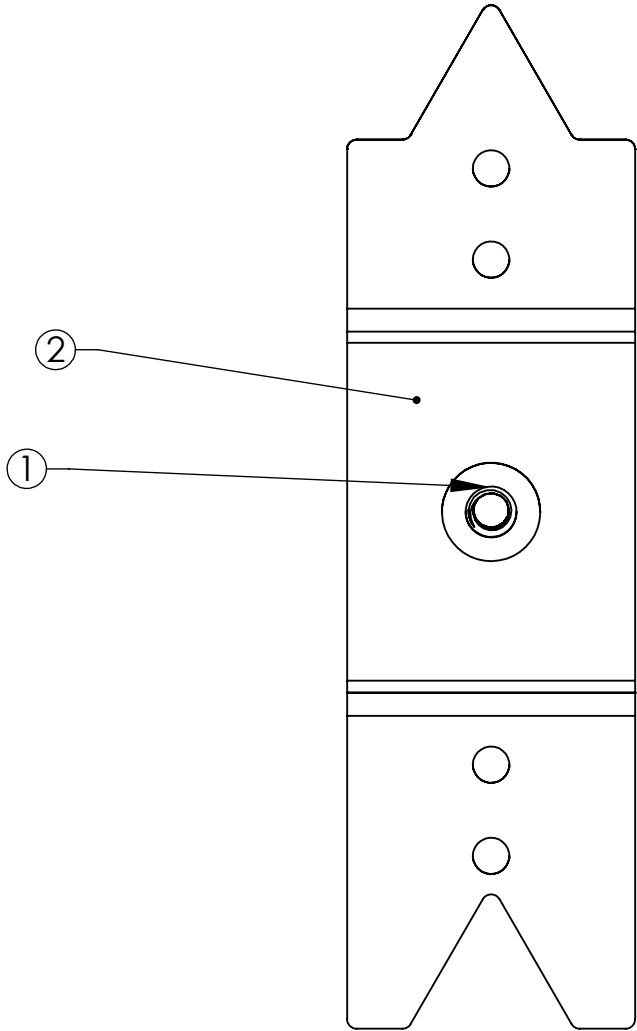


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Date: 08/08/25
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X.X ± .3 X.XX ± .15	X ± 1 X.X ± .5	CHECKED	---	XX.XX.XX		
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FINISH Mill		MFG ENG	---	XX.XX.XX		
DO NOT SCALE DRAWING		QUAL ENG	---	XX.XX.XX	DWG. FILE NAME: 600018	REV. A
		SCALE 1:2		SHEET 1 OF 2		

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	90720A510	18-8 SS HEAVY-DUTY RIVET NUT	1
2	Single Mounting Bracket	Mounting Bracket	1
3	90925A249	Torx Rounded Head Screws for Sheet Metal	2





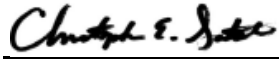
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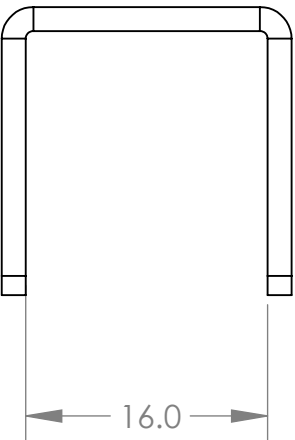
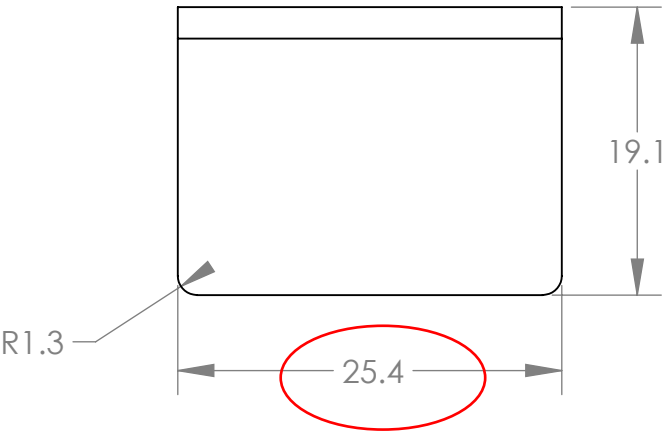
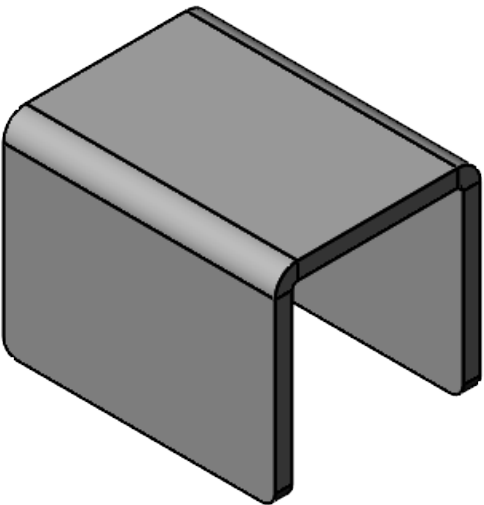
Date:

08/08/25

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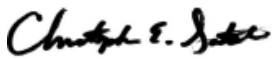
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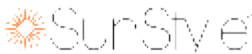
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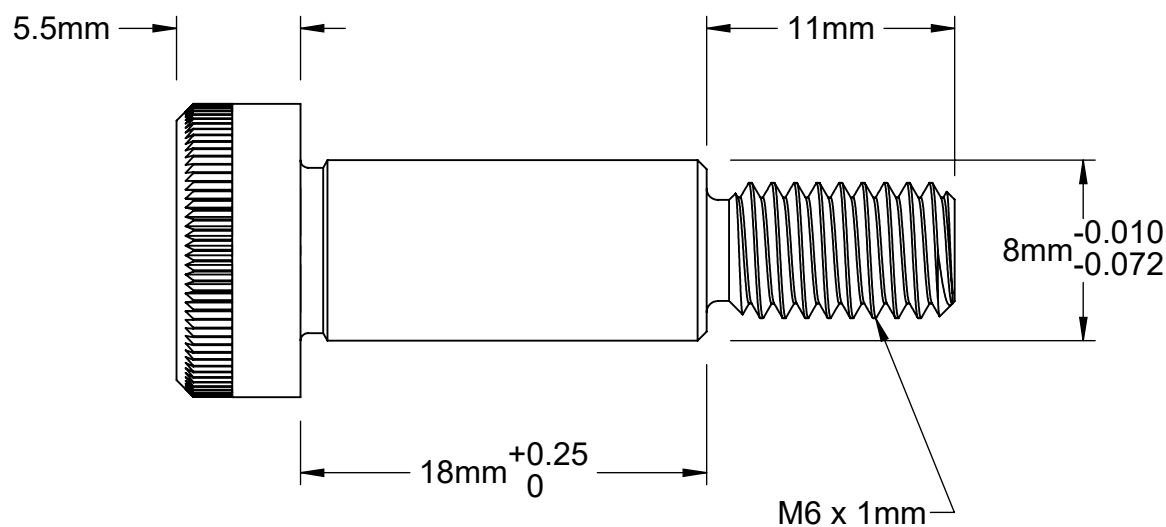
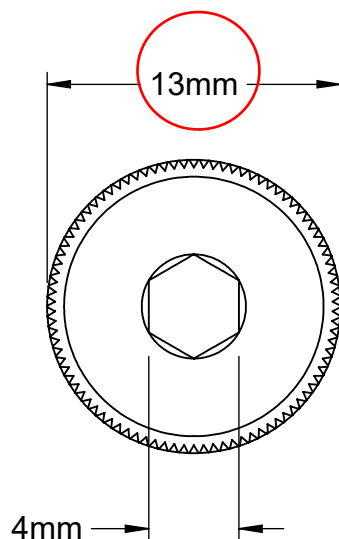
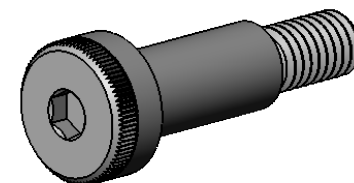
Date:

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		APPROVALS		DATE		3D FILE NAME: Solar Clip					
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MATERIAL 430 SS (16 Gauge)	FINISH Mill	CHECKED		XX.XX.XX		SIZE B			DWG. FILE NAME: 600022		REV. A
		----		XX.XX.XX							
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DO NOT SCALE DRAWING		MFG ENG		XX.XX.XX							
		----		XX.XX.XX							
		QUAL ENG		XX.XX.XX							
		----		XX.XX.XX							



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Report #: S6997.01

Date: 08/08/25

Verified by: *Christopher E. Jeter*

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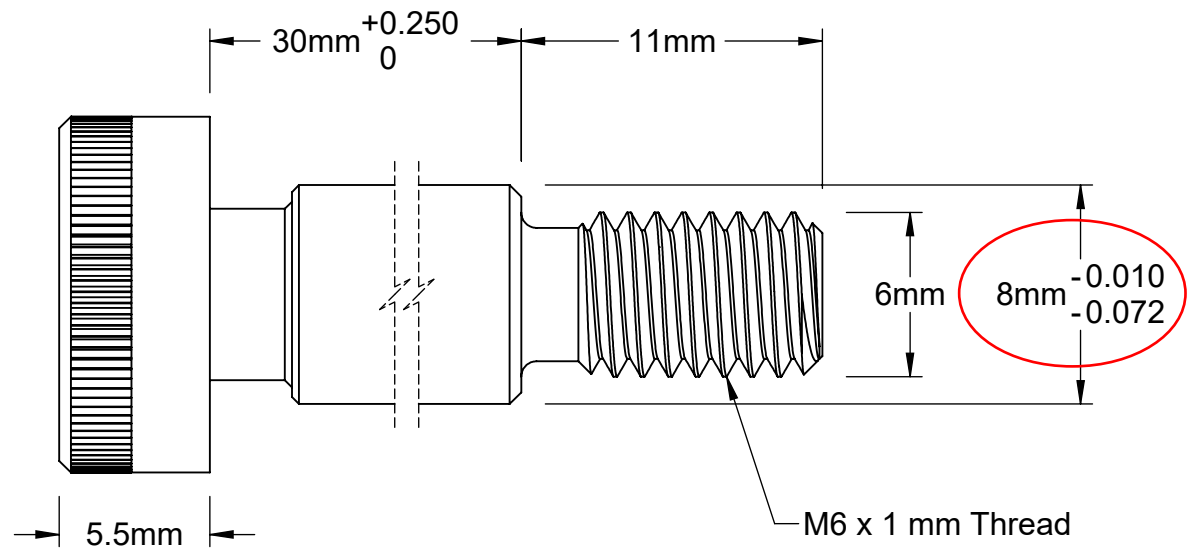
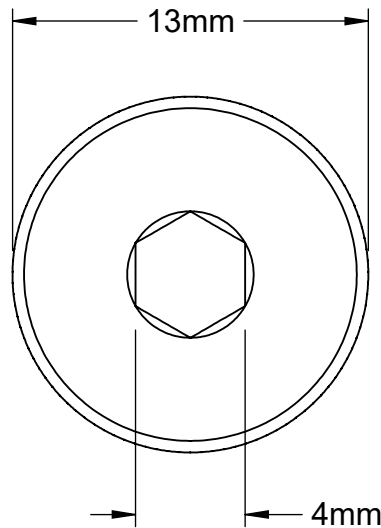
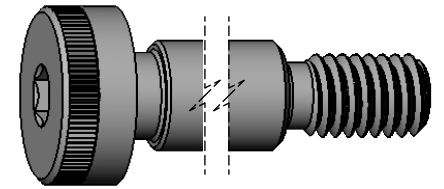
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PART NUMBER **90269A262**

316 Stainless Steel
Shoulder Screw



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Report #: S6997.01

Date: 08/08/25

Verified by: *Charles E. Jeter*

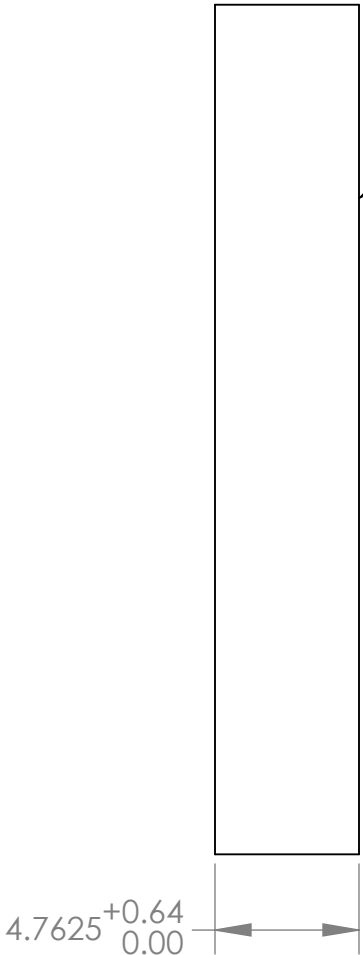
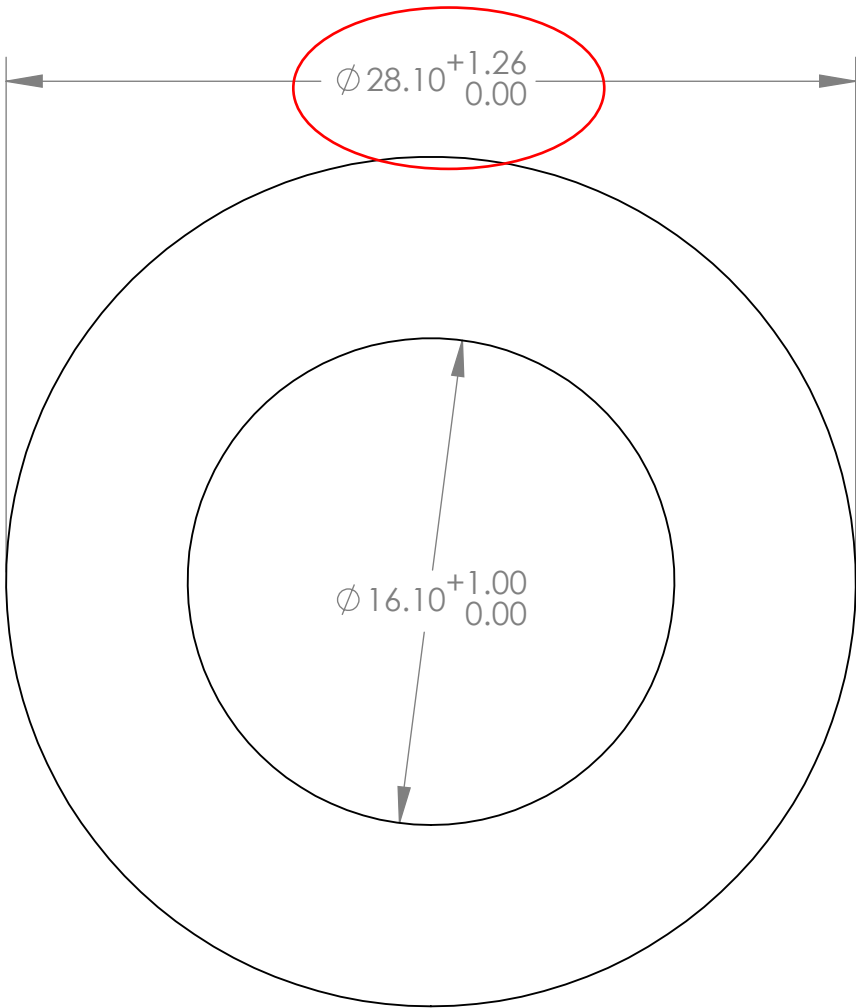
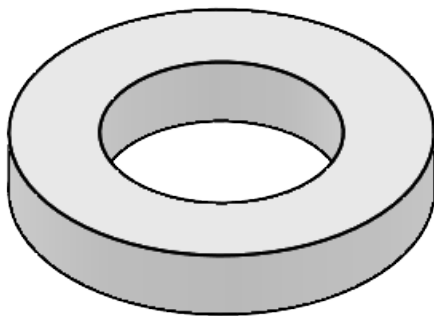
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PART NUMBER **90265A155**

18-8 Stainless Steel
Shoulder Screw



ADHESIVE APPLIED THIS SIDE
SEE NOTES 1-3

NOTES:

- 1. ADHESIVE SHALL BE 3M 5935 TAPE, ACCEPTABLE ALTERNATE IS 3M 5915 TAPE
- 2. ADHESIVE TAPE TOTAL THICKNESS SHALL BE .016"
- 3. REMOVABLE PROTECTIVE BACKING SHALL BE APPLIED OVER ADHESIVE



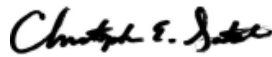
Report #:

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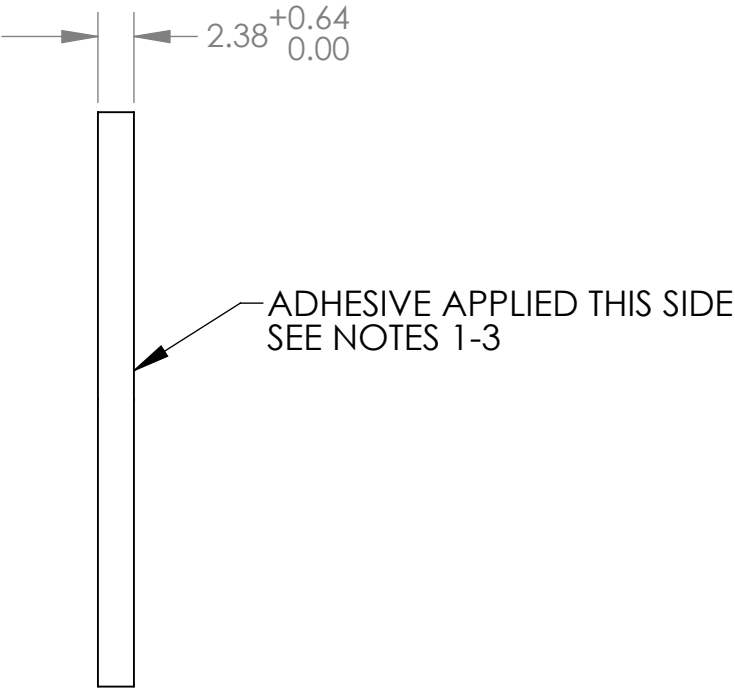
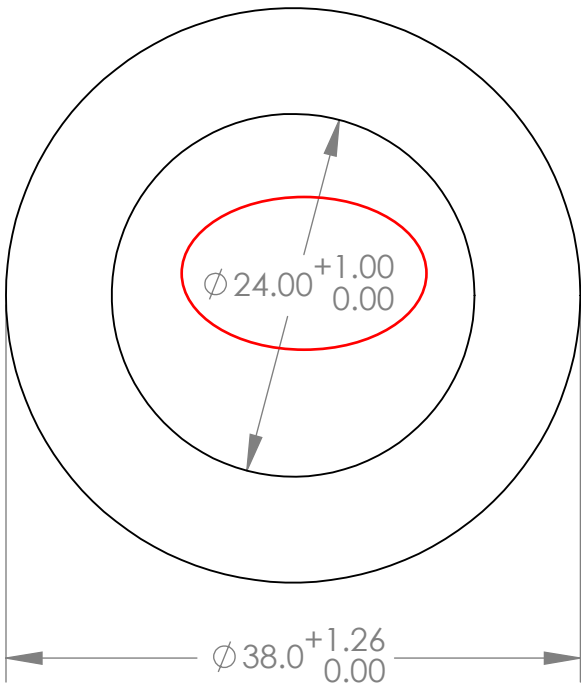
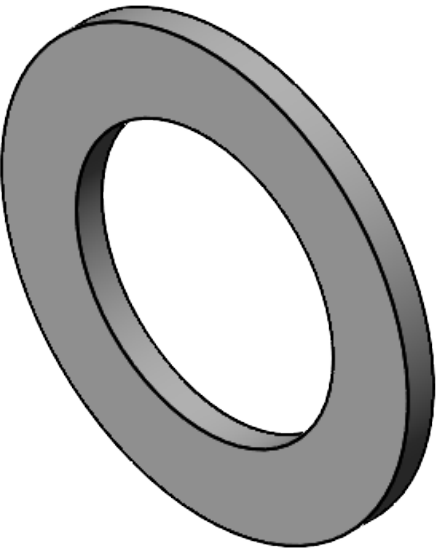
Date:

08/08/25

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		APPROVALS			
		DRAWN	DI	XX.XX.XX	
		CHECKED	---	XX.XX.XX	
MATERIAL	EPDM Shore 60A	RESP ENG	---	XX.XX.XX	3D FILE NAME: 4mm Shingle S1 & S2 Disc
FINISH	Black	MFG ENG	---	XX.XX.XX	SIZE B
DO NOT SCALE DRAWING		QUAL ENG	---	XX.XX.XX	
				SCALE 2:1	SHEET 1 OF 1
					REV. A



NOTES:

- 1. ADHESIVE SHALL BE 3M 5935 TAPE OR 3M 5915 TAPE
- 2. ADHESIVE TAPE TOTAL THICKNESS SHALL BE .016"
- 3. REMOVABLE PROTECTIVE BACKING SHALL BE APPLIED OVER ADHESIVE



Total Quality. Assured.

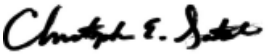
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S6997.01

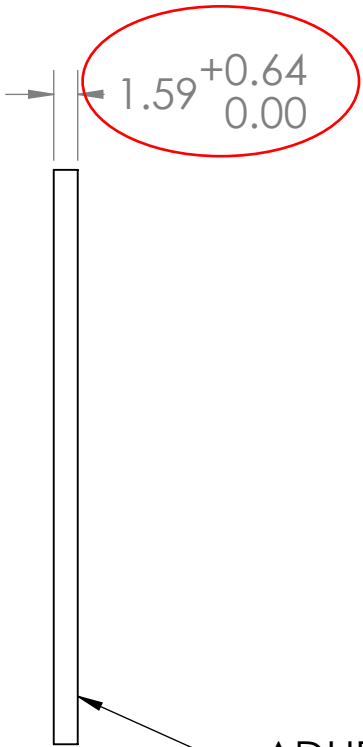
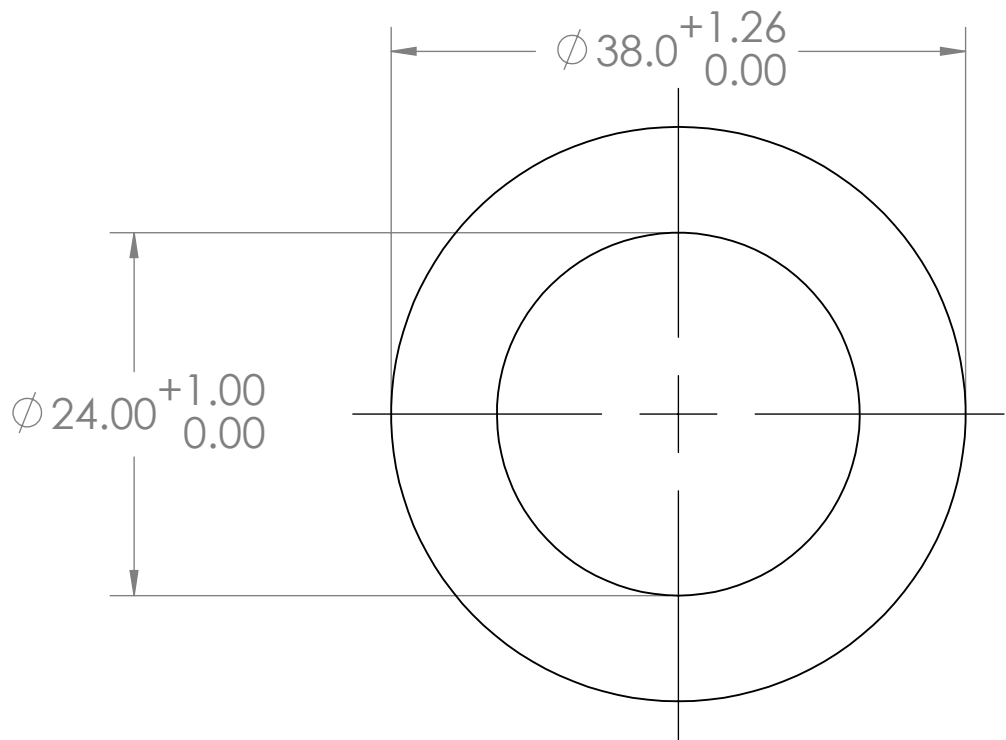
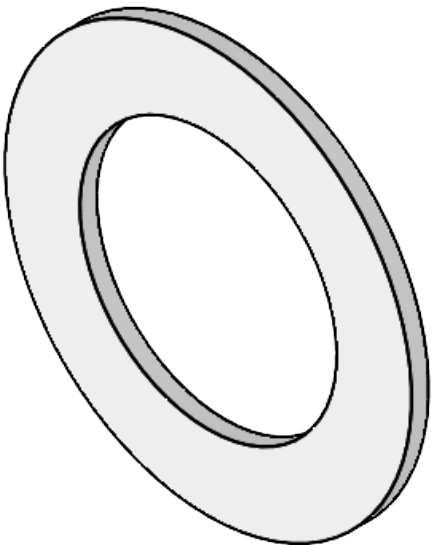
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		APPROVALS			
		DRAWN	DI	XX.XX.XX	
		CHECKED	---	XX.XX.XX	
MATERIAL	EPDM 60A	RESP ENG	---	XX.XX.XX	3D FILE NAME: 4mm Shingle S3 & S4 Disc
FINISH	Black	MFG ENG	---	XX.XX.XX	SIZE B
DO NOT SCALE DRAWING		QUAL ENG	---	XX.XX.XX	DWG. FILE NAME: 600001
				SCALE 2:1	REV. A
					SHEET 1 OF 1



ADHESIVE ON THIS FACE (SEE NOTES 1-3)

NOTES:

- ADHESIVE SHALL BE 3M 5935 TAPE OR 3M 5915 TAPE
- ADHESIVE TAPE TOTAL THICKNESS SHALL BE .016"
- REMOVABLE PROTECTIVE BACKING SHALL BE APPLIED OVER ADHESIVE



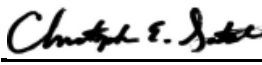
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S6997.01

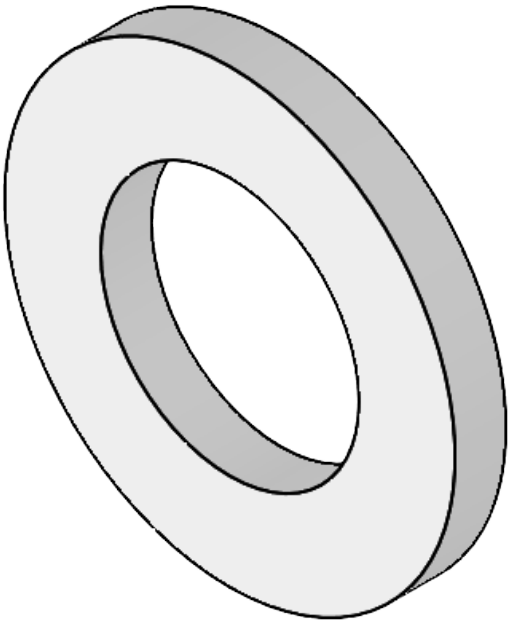
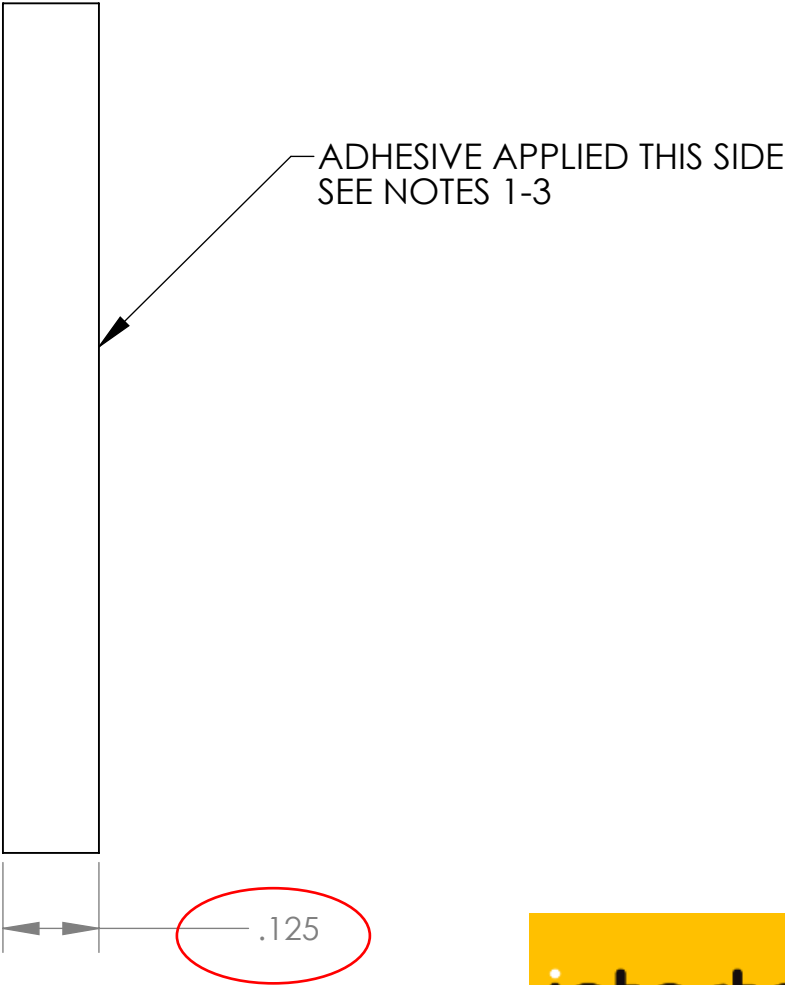
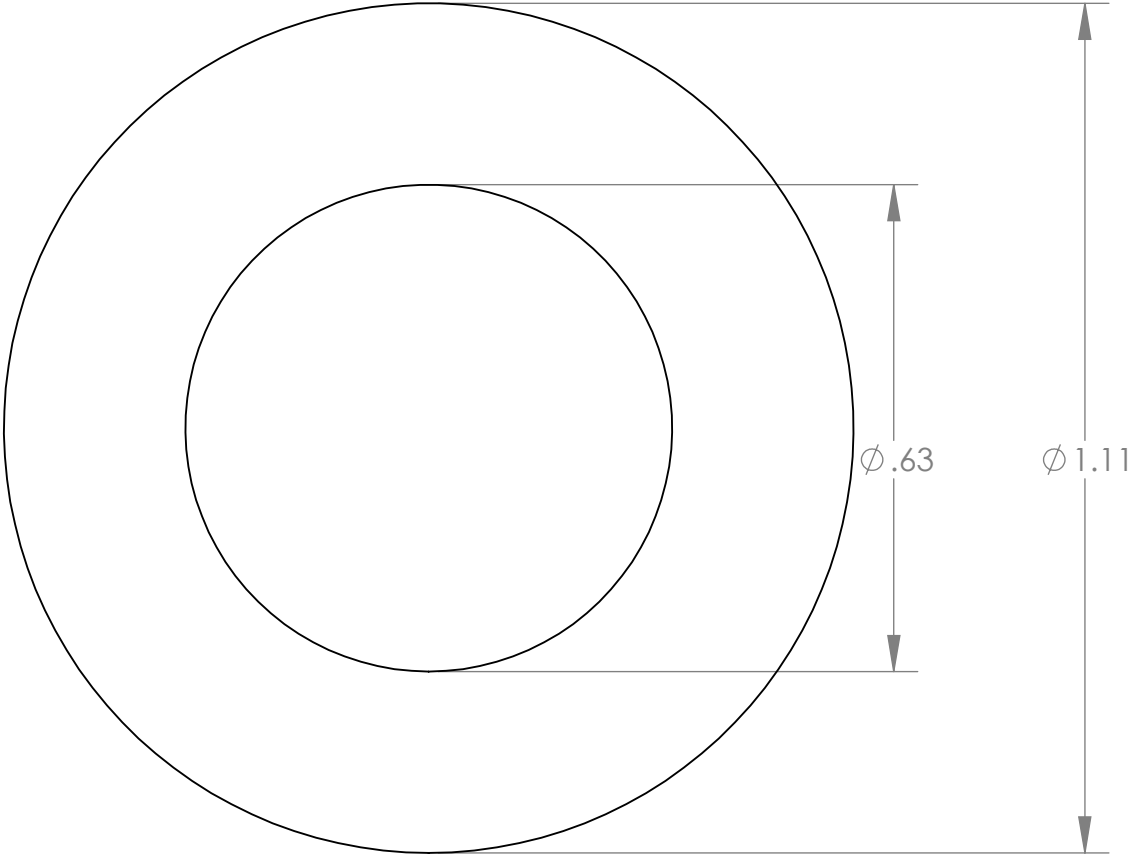
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		APPROVALS				
		DRAWN	DI	XX.XX.XX		
		CHECKED	---	XX.XX.XX		
MATERIAL	EPDM 60A	RESP ENG	---	XX.XX.XX	3D FILE NAME: Shingle S3 Disc	
FINISH	Black	MFG ENG	---	XX.XX.XX	SIZE B	
DO NOT SCALE DRAWING		QUAL ENG	---	XX.XX.XX		
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						SHEET 1 OF 1



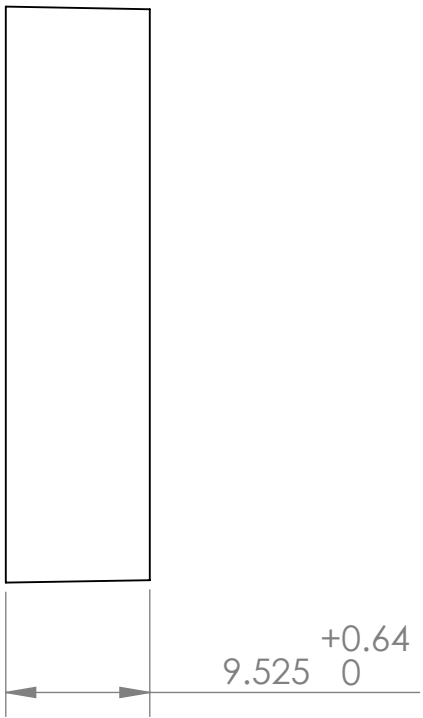
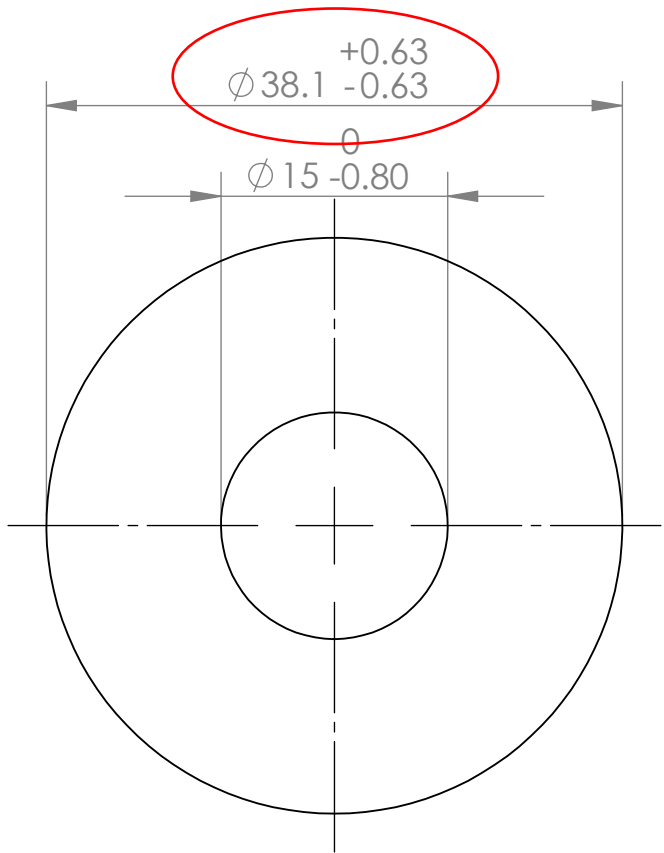
NOTES:

1. ADHESIVE SHALL BE 3M 5935 TAPE
2. ADHESIVE TAPE TOTAL THICKNESS SHALL BE .016"
3. REMOVABLE PROTECTIVE BACKING SHALL BE APPLIED OVER ADHESIVE

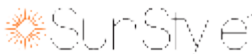


Report #: S6997.01
Date: 08/08/25
Verified by: *Christopher E. Jeter*

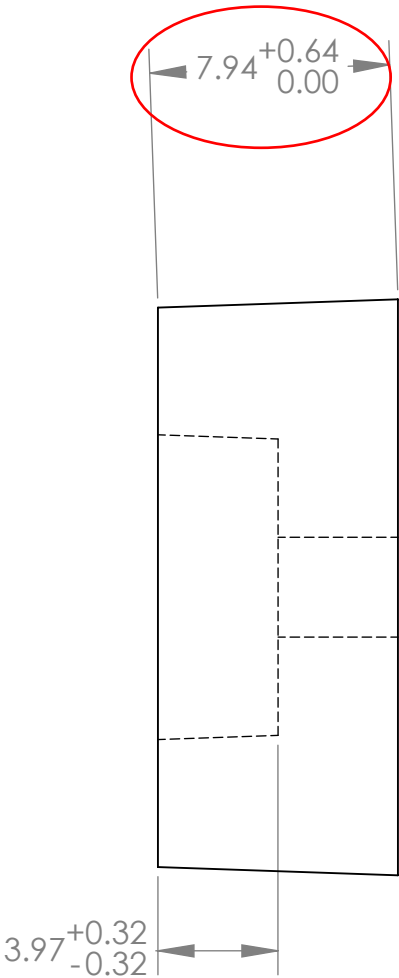
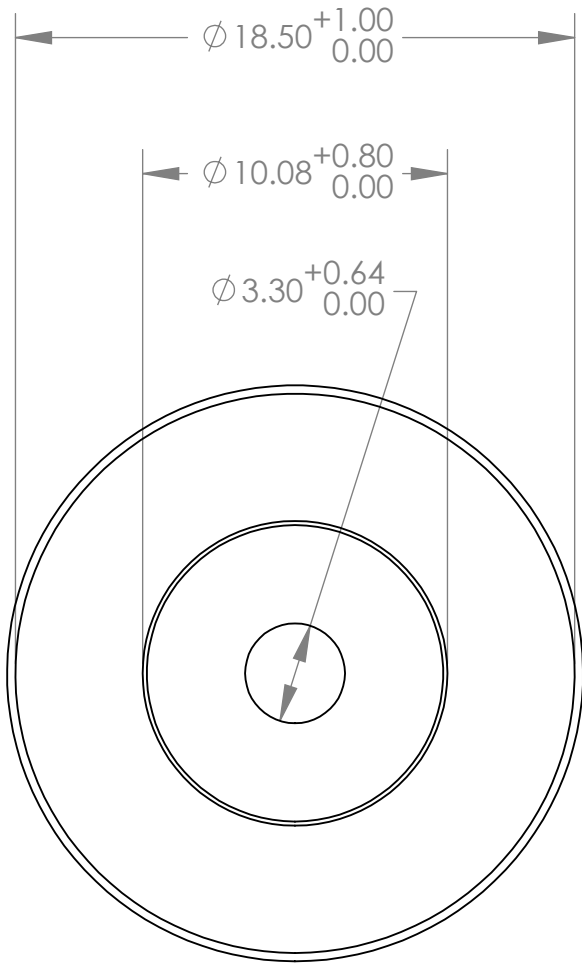
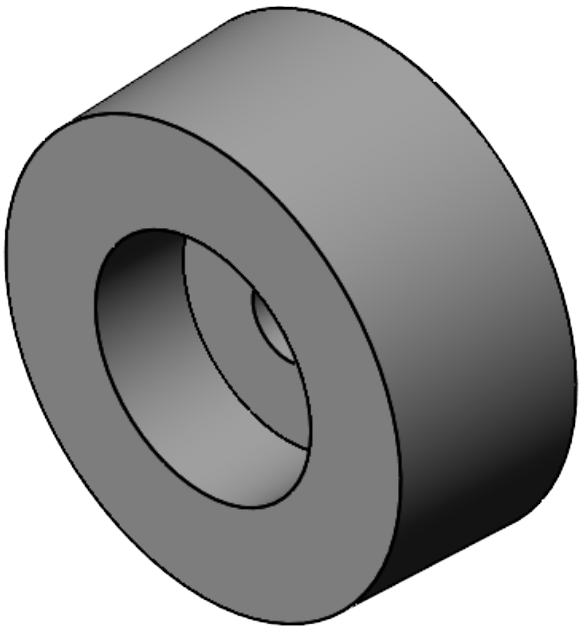
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		APPROVALS	DATE	3D FILE NAME: 6mm Shingle S1 Disc	
		DRAWN	DI		
MATERIAL	EPDM 60A	CHECKED	---	DWG. FILE NAME: 6mm Shingle S1 Disc	
		---	XX.XX.XX		
FINISH	Black	RESP ENG	---	SCALE 2:1	
		---	XX.XX.XX		
DO NOT SCALE DRAWING		MFG ENG	---	SHEET 1 OF 1	
		---	XX.XX.XX		



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Date: 08/08/25
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		APPROVALS		DATE			
		DRAWN	DI	XX.XX.XX			
CHECKED		---		XX.XX.XX			
MATERIAL		RESP ENG		3D FILE NAME:			
EPDM Shore 60A		---		Shingle Mount - Single Shingle			
FINISH		MFG ENG		SIZE			
Black		---		B			
		QUAL ENG		DWG. FILE NAME:			
DO NOT SCALE DRAWING		---		600026			
				SCALE 2:1			
				SHEET 1 OF 1			
				REV. A			

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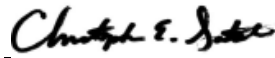
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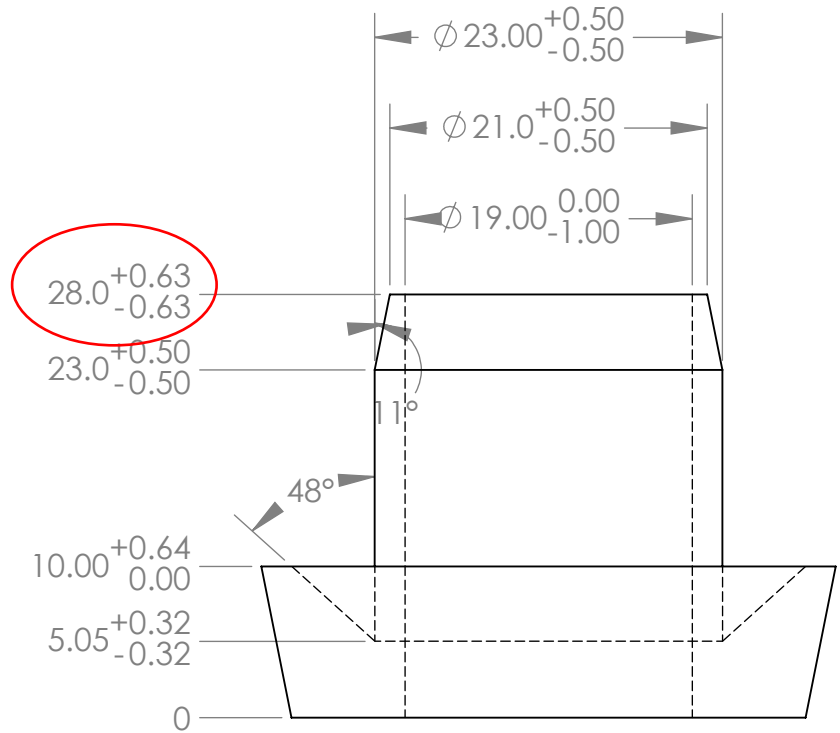
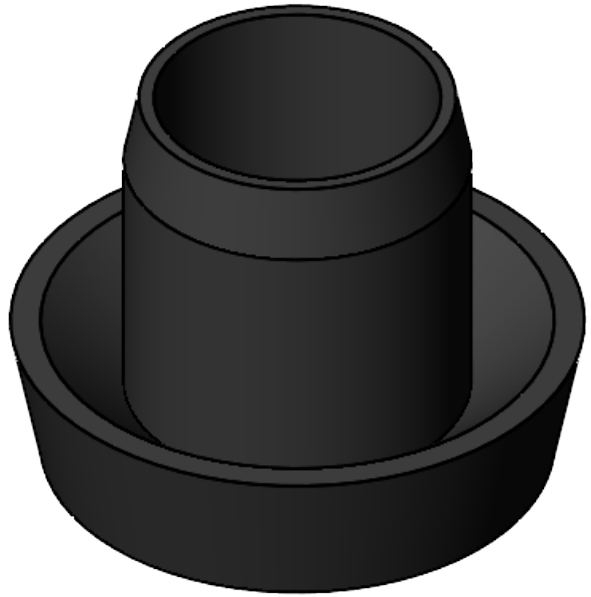
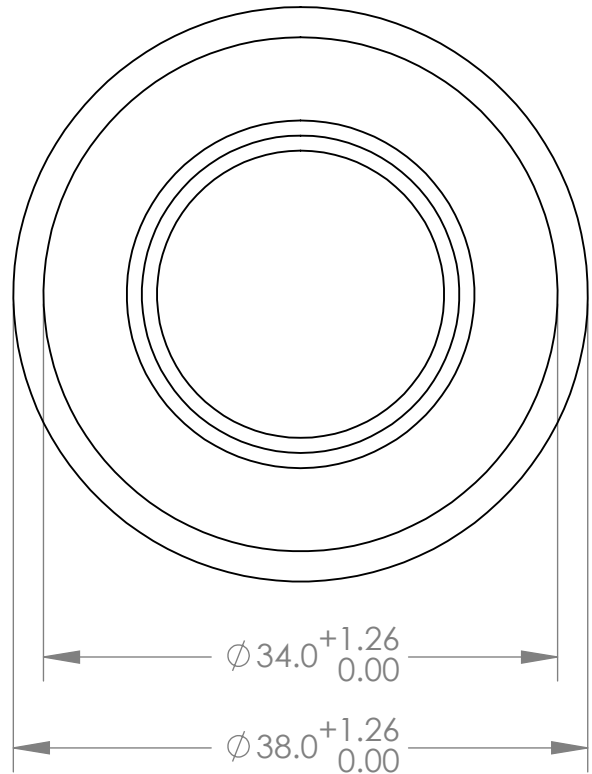
Date:

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		APPROVALS					DATE	
		DRAWN	DI				XX.XX.XX	
		CHECKED						
MATERIAL EPDM Shore 60A		RESP ENG		Support Bumper - Single Shingle				
FINISH Black		MFG ENG						
DO NOT SCALE DRAWING		QUAL ENG						
				SIZE B	DWG. NAME: 600027	REV. A		
				SCALE 4:1		SHEET 1 OF 1		



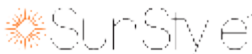


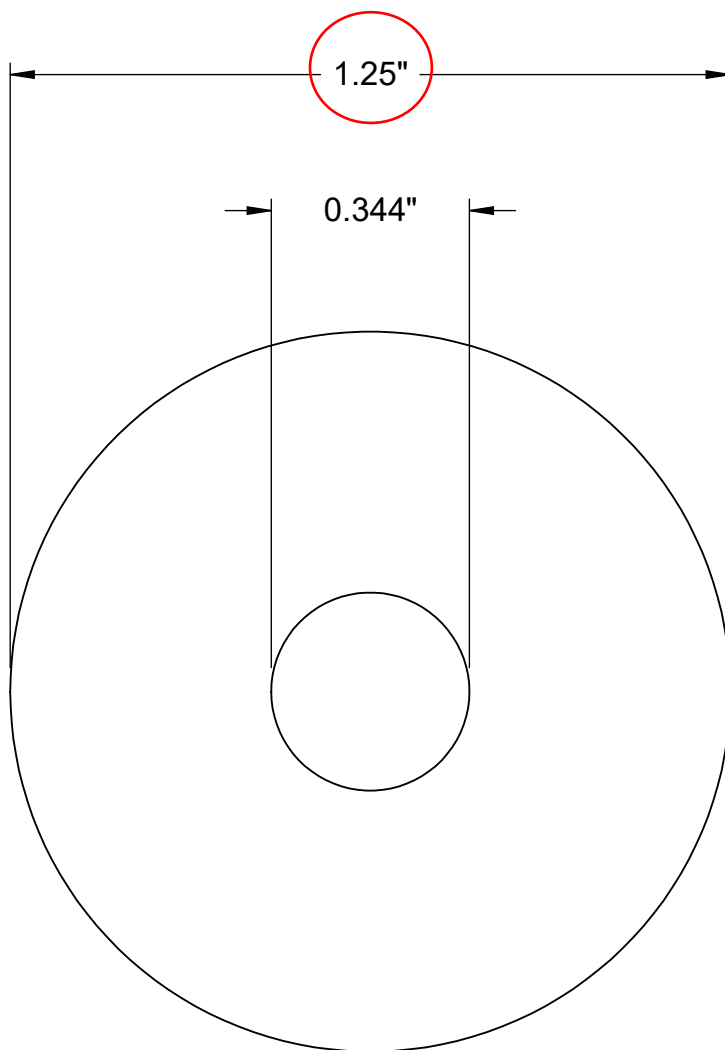
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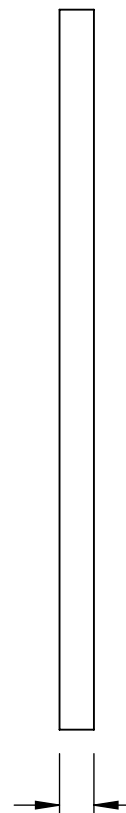
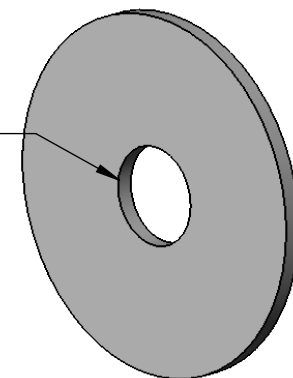
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MATERIAL EPDM Shore 60A	CHECKED	---		XX.XX.XX		
	RESP ENG	---		XX.XX.XX		
	MFG ENG	---		XX.XX.XX		
	QUAL ENG	---		XX.XX.XX		
FINISH Black		3D FILE NAME: Shingle Mount - Two Shingles				
		SIZE B	DWG. FILE NAME: 600024			REV. A
DO NOT SCALE DRAWING		SCALE 2:1		SHEET 1 OF 1		



For 5/16"
Screw Size

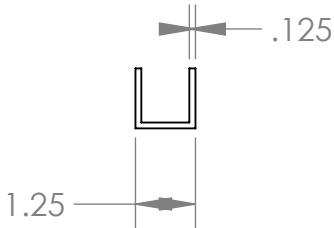
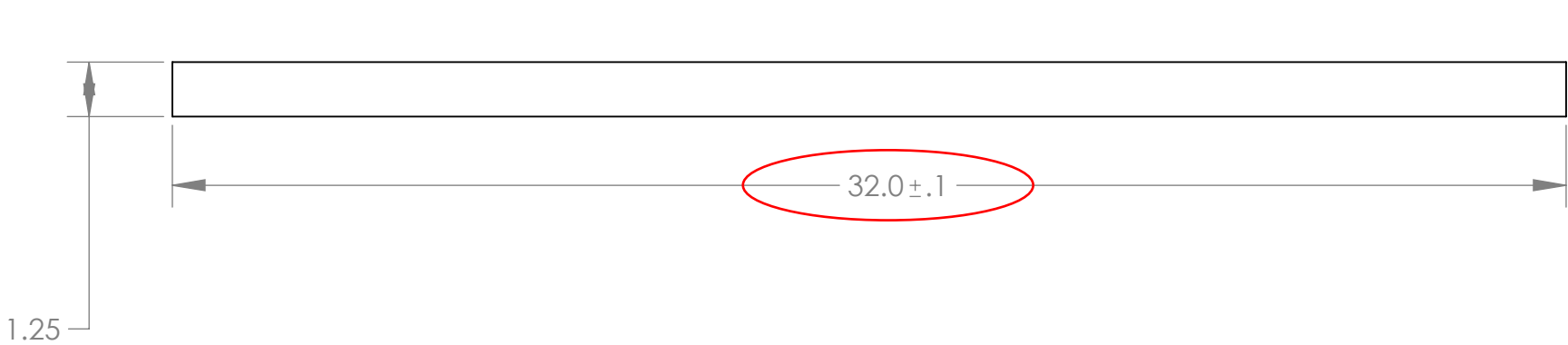
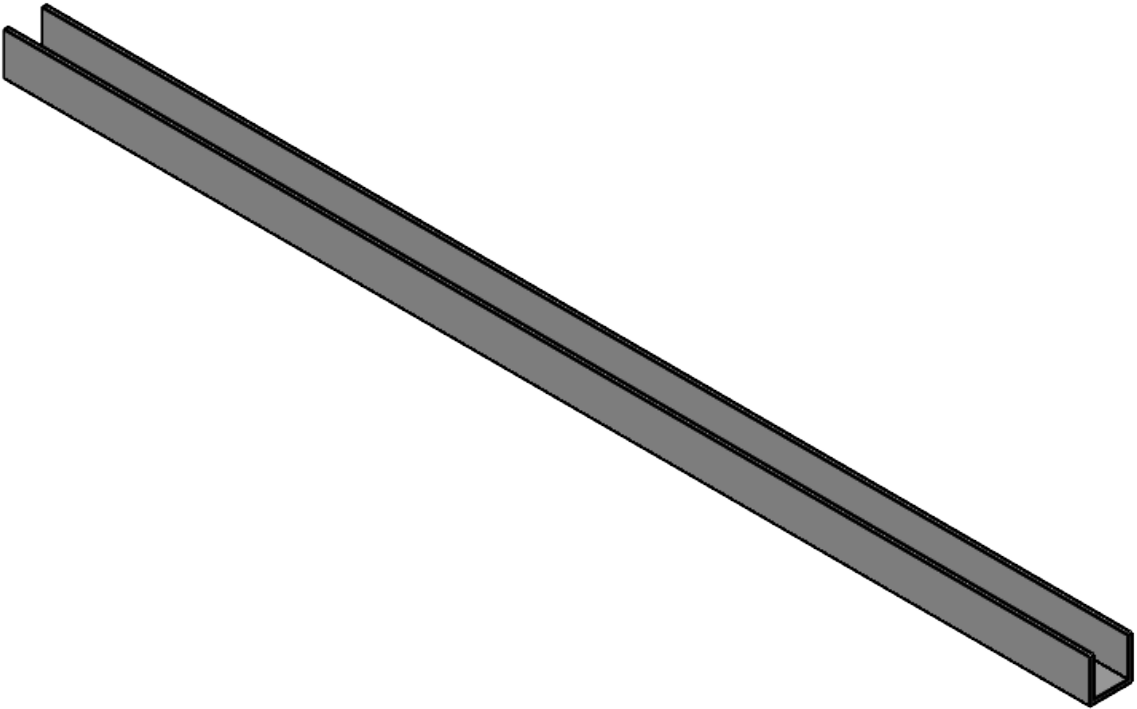


Washer may vary from
0.04" to 0.06" in thickness.

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	Date:	08/08/25
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McMASTER-CARR®  http://www.mcmaster.com © 2021 McMaster-Carr Supply Company Information in this drawing is provided for reference only.	PART NUMBER	90377A164
	Black-Oxide 18-8 Stainless Steel Washer	

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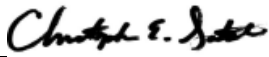
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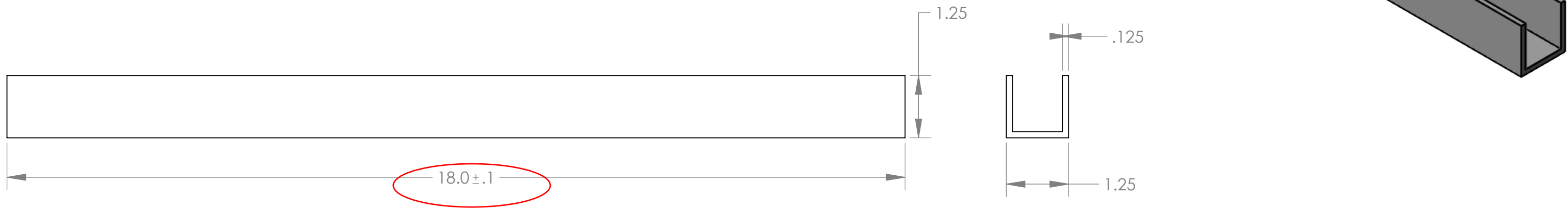
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		APPROVALS	DATE	3D FILE NAME: Shingle Spanner - Long	
		DRAWN DI	XX.XX.XX		
MATERIAL 6063 Aluminum	RESP ENG ---	CHECKED ---	XX.XX.XX	DWG. FILE NAME: Shingle Brace - Long	
FINISH Clear Anodized	MFG ENG ---	---	XX.XX.XX		
DO NOT SCALE DRAWING		QUAL ENG ---	XX.XX.XX	SCALE 1:8	REV. SHEET 1 OF 1

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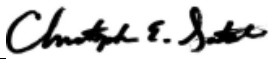
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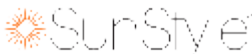
S6997.01

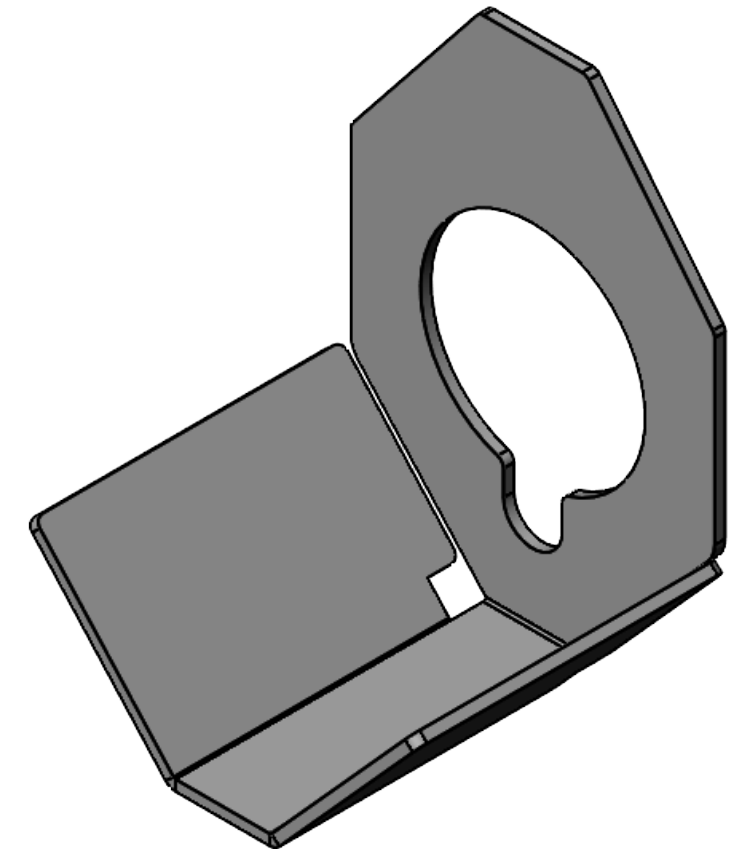
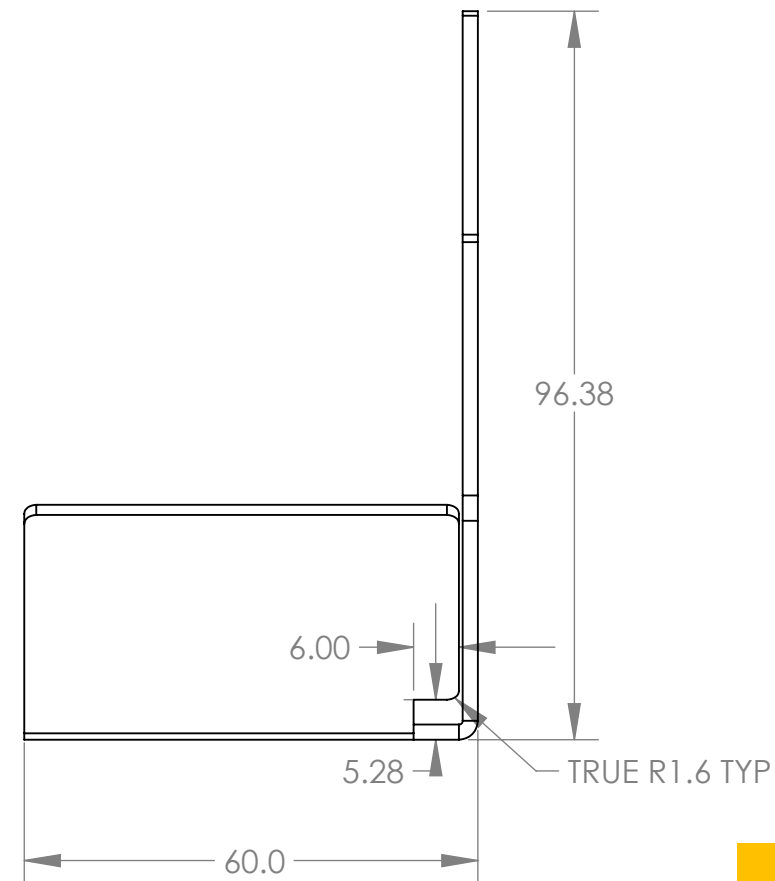
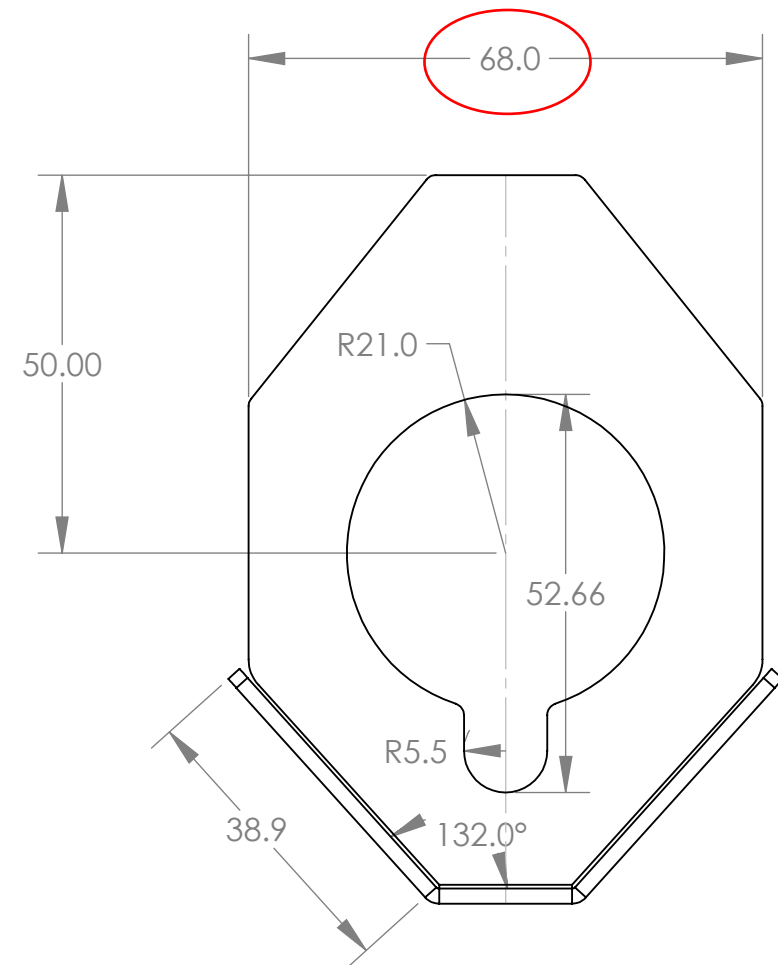
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		APPROVALS				
		DRAWN	DI	XX.XX.XX		
		CHECKED	---	XX.XX.XX		
MATERIAL	6063 Aluminum	RESP ENG	---	3D FILE NAME: Shingle Brace - Short		
		---	XX.XX.XX			
FINISH	Clear Anodized	MFG ENG	---	SIZE B	DWG. FILE NAME: Shingle Brace - Short	REV.
		---	XX.XX.XX			
DO NOT SCALE DRAWING		QUAL ENG	---	SCALE	1:4	SHEET 1 OF 1





Report #: S6997.01
Date: 08/08/25
Verified by: *Christopher E. Jeter*

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		APPROVALS					DATE	
		DRAWN DI					XX.XX.XX	
MATERIAL 430 SS (14 Ga)	FINISH Mill	CHECKED ---		XX.XX.XX				
		RESP ENG ---		XX.XX.XX				
		MFG ENG ---		XX.XX.XX				
		QUAL ENG ---		XX.XX.XX				
DO NOT SCALE DRAWING								



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TEST REPORT FOR CERTAINTEED LLC

Report No.: S6997.01-109-44

Date: 08/19/25

SECTION 12

REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	08/19/25	N/A	Original Report Issue