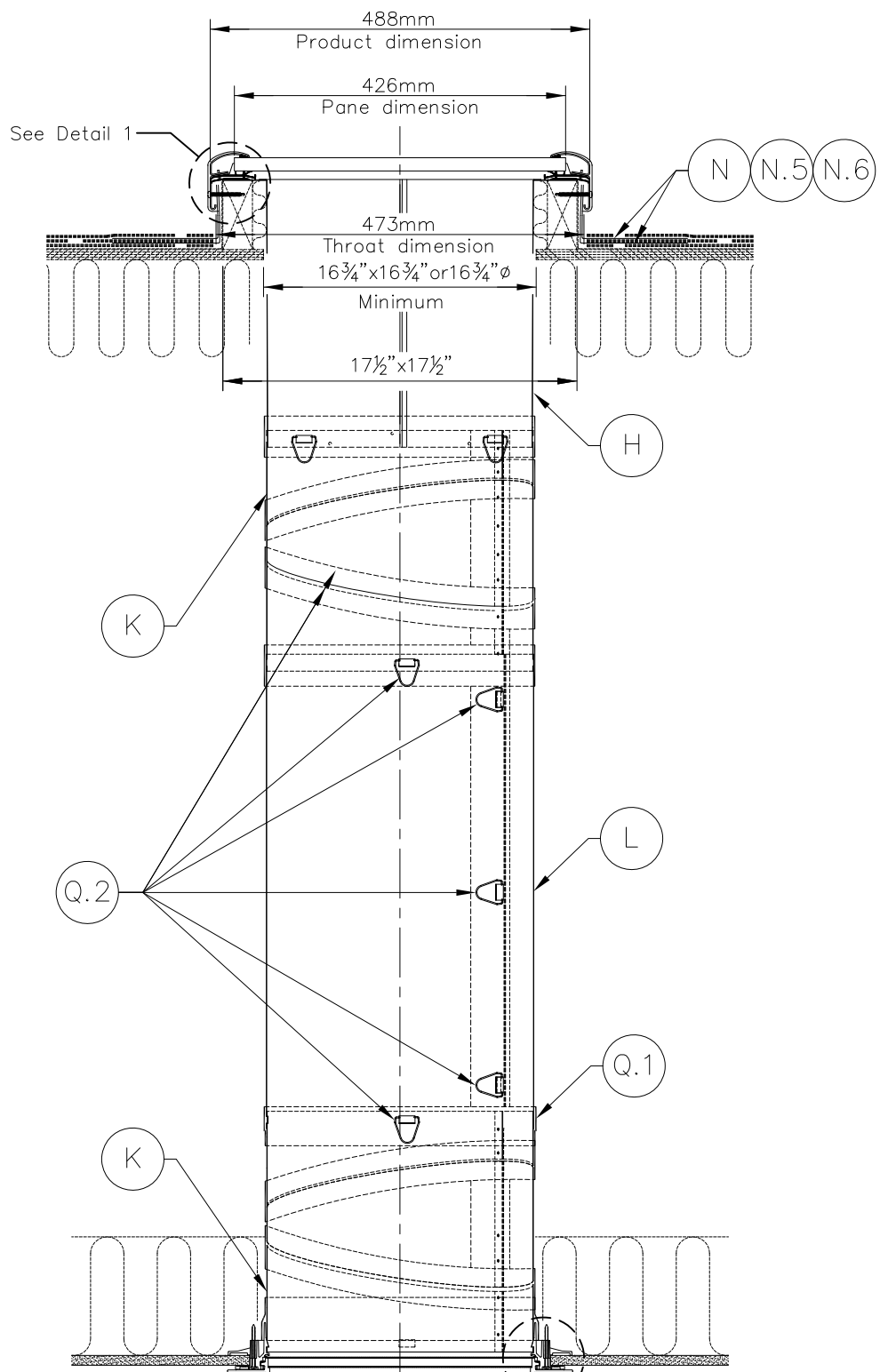
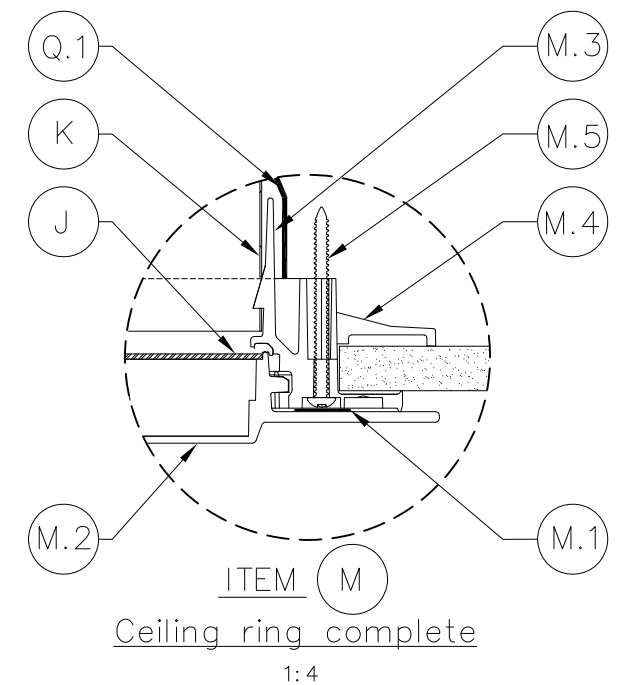
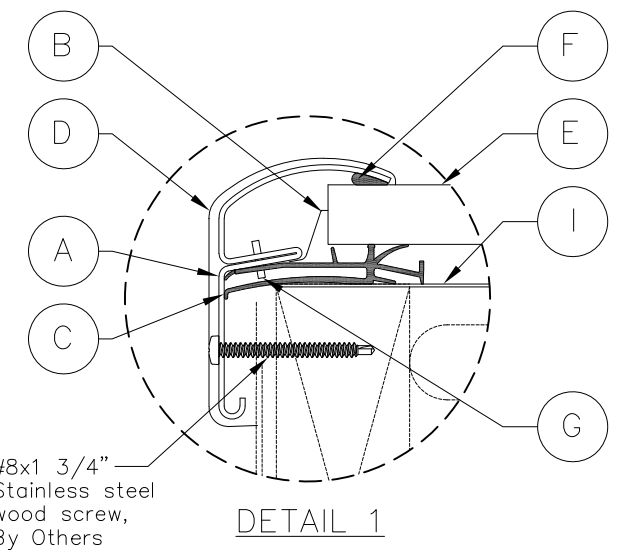


TZR
Curb Mount Plain (Tile)



TZRL
Curb Mount Shingle



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DIMENSIONS ARE IN MM GENERAL TOLERANCES: ANGULAR: ±1 ONE PLACE DECIMAL: ±0.5	NOTE:	VELUX SKY-GPM 1418 Evans Pond Road PO Box 5001 Greenwood, South Carolina 29648-5001
REVISIONS		Residential Sun Tunnel TZR and TZRL Product Certification Basic Arrangement
NO.	DESCRIPTION	
SIZE	COMMODITY NO.	REV. SCALE: OKD/DRAWN/DATE BB/JH 04/14/20
D	21.320109.000.52	01 1:1 SHEET 1 OF 2

PART/COMPONENT SCHEDULE									
ITEM	QTY	PART/COMPONENT	COMPONENT NO.	DESCRIPTION	DRAWING NO.			COMMENTS	
					Category	Commodity No.	Rev.		
TZR-014 2A00 Lens P/N 320075 (Typical for TZR, TZRL & TZRQ)									
A	4	Outer Frame	30219222	Roll formed Aluminum - Cool Grey	21302192	000001	4	Profile drawing	
					21302192	0A0311	3	Punching drawing	
					21302192	0A0361	1	Cutting drawing	
					21302192	0A0431	3	Placement of sealant	
					21302192	0A0510	9	Danger label, Placement drawing	
					21302192	0A0541	3	Placement of laser etching type sign	
B	4	Pane Spacer	303392	Acetal Color: white (Not visible, this view)	21303392	000000	5	Commodity drawing	
					21303392	0A0510	6	Placement drawing	
C	1	Inner frame gasket	30380008	TPE Durometer as noted Color: Black	21303800	000000	4	Commodity drawing	
					21303372	0A0421	4	Welding drawing	
					21303372	0A0511	1	Placement drawing	
					21303372	0A0520	5	Routing and punching drawing	
D	4	Corner Key	303380	ASA-Luran S 778 T or equivalent Color: NCS S-7500-N (grey)	21303380	000001	4	Commodity drawing	
					21303380	0A0510	7	Placement of staples, Assembly drawing	
					21303380	0A0520	7	Sealant placement drawing (Black Butyl-102011.64)	
E	1	Pane	7893271414	IFB 1414 27 (For Item E, see below)					
F	1	Sealant	303127	Hot melt butyl (Hi-Fix)	21267002		6	4	Material specification

Item M - ST13-G Ceiling Ring Diffuser Assembly P/N 30483614 (Typical for TZR, TZRL & TZRQ)									
M	1	Ceiling Ring Diffuser Assembly	30483614	Ceiling Diffuser Complete	21304836	000051	02		Part assembly drawing
M.1	1	Screw cover ring	30088014	.0005"(.13mm) thick White Polyester	21300880	000000	01		Commodity drawing
M.2	1	Screw-in diffuser	303814	Acrylic	21303814	014000	02		Commodity drawing
M.3	1	Ceiling ring	303816	White ABS	21303816	014000	01		Commodity drawing
M.4	4	Swingout	306107	White nylon, 10% glass	21306107	000000	03		Commodity drawing
M.5	4	Srew	306238	#8 Phillips, 2 1/4" PH - clear zinc					

Item N - TZRL Flashing & Underlayment P/N 320077									
* N.1	1	Gutter Middle Piece	30223814	Gutter Middle Piece, 14, Curb Flashing	21302238	00A350	05		Bending & shearing drawing
* N.2	2	Gutter Side Piece	302239	Gutter Side Piece, Curb Flashing	21302239	00A350	03		Commodity drawing
* N.3	1	ECL Middle Piece	30224014	ECL Front Edge Middle Piece, 14	21302240	00A350	03		Commodity drawing
* N.4	2	ECL Side Piece	302241	ECL Front Edge Side Piece	21302241	000350	04		Commodity drawing
N.5	8	Step flashing	320084	Step flashing, Curb flashing					
N.6	1	Roofing underlayment	30560921	Roofing underlayment, HT, 9"x21'					

Item E - IFB 1414 27 P/N 7893271414 (Typical for TZR, TZRL & TZRQ)									
* E.1	1	Glazing	6593271414S	7DW IFB 426 x 426 mm					
* E.2	1	Glazing	6590491414	IFB CLRTMP 3H 426 x 426 mm					
* E.3	1	Spacer	260749	7.5 FB spacer 1611					
* E.4	1	Connector key	266144	7.5 FB connector key					
* E.5	N/A	Oasis plug	268330	Oasis plug					
* E.6	N/A	Tape	105030	Aluminum laminated PIB tape					
* E.7	N/A	TECHNOMELT	268110	TECHNOMELT AS 3004					
* E.8	N/A	PIB	267003	PIB 8HS					
* E.9	N/A	Silicone	267002	Silicone DC 3-0117					
* E.10	N/A	Desiccant	268200	Desiccant 0.7					
* E.11	N/A	Gas fill	268001	Argon					

Item O - TZR Beipack P/N 320076 (Typical for TZR & TZRL)									
O.1	1	AL tape	30487836	36' Section-2.5" AL Tape w/ backing					
NV O.2	24	Flexi loc clip	302329	302 spring tempered stainless steel (Ø1.4mm)	21302239	000000	08		Pull clip
* NV O.3	7	Screws (for Tubes/ZTB)	306050	#6x3/8" Phillips, PH, Self Drill					
* NV O.4	5	Screws (for STuNG)	306118	#6x3/8" Phillips, PH, Sheet Metal					

PARTS/COMPONENTS (Typical for TZR, TZRL & TZRQ)									
H	1	Top Collar	30467014	Aluminum, 16"x0.02" High Reflective	21304647	000000	01		Profile
					21304647	000520	03	Punching	
					21304647	022520	02	Finished drawing	
I	1	TZR FCM adapter	320079	53.5x96x.118 Black polycarb sheet					
J	1	Upper diffuser	30381814	50.75x119.75x.080 2mm Frosted sheet	21303815	000000			
K	2	Elbow	30464914	Aluminum, 12.19"x0.02" High Reflective	21304649	014000	03		14" Elbow
					21304649	014520	02	Punching	
L	1	Tunnel	3046461402	Aluminum, 24" x 0.016" High Reflective	21304646	000520	04		Tube Punching

V = Visible
NV = Non-Visible

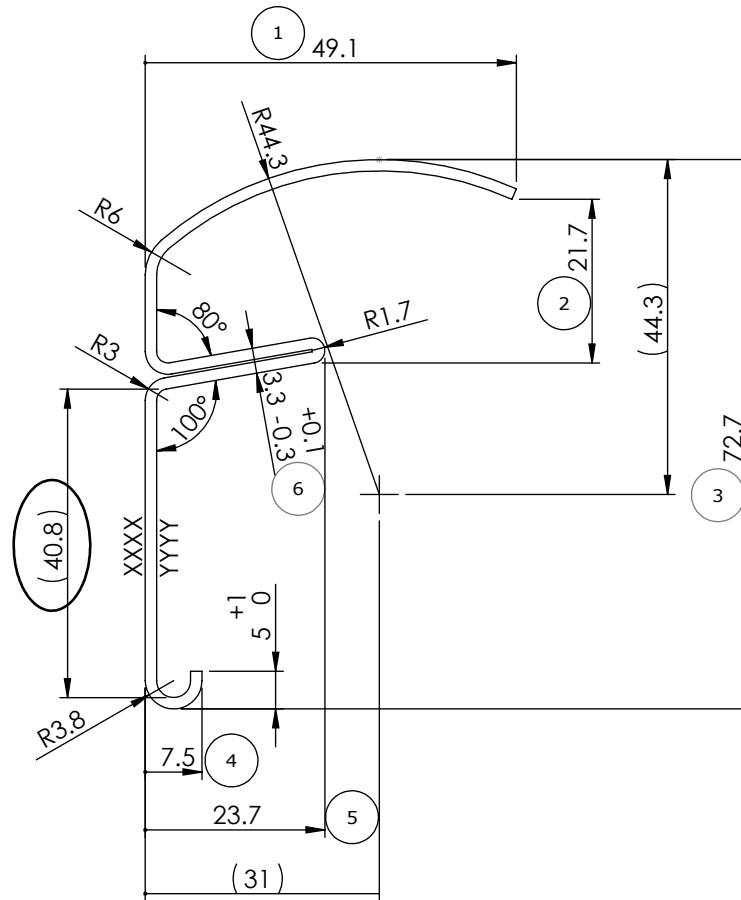
GENERAL NOTES:

- * Designates a PART/COMPONENT not shown on the Basic Arrangement cross-sections.
- Reference Drawings include :
21.TZR.OA0.63.01 for "TZR 014, List of parts" (PROPRIETARY, VG Development Drawing)
21.TZRL.OA0.63.01 for "TZRL 014, List of parts" (PROPRIETARY, VG Development Drawing)
- A copy of these drawings plus any other supplemental documentation regarding these skylight models will be maintained at the Skylight Technical Database in the following category location - Technical Data/Submittal Data/
- The TZR 014 and TZRL 014 is furnished with 1-Tube, however a final assembly can use additional tube lengths.
- Item (Q.2) has a maximum of (24) Flexi loc clips in the cross section configuration shown - longer tube installations will require more clips and tape (Item (Q.1))



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DIMENSIONS ARE IN MM GENERAL TOLERANCES: ANGULAR: ±1 ONE PLACE DECIMAL: ±0.5				NOTE:				SKY-GPM Road PO Box 5001 Greenwood, South Carolina 29648-5001	
MATERIAL				SPECIFICATION				Residential Sun Tunnel	
FINISH				SPECIFICATION				TZR 014 and TZRL 014	
STANDARDS				SCALE: 1:1				Product Certification	
SIZE				REV.				Product List of Parts	
D 21.320110.OA0.61				01				JAD/JDH 04/14/2020	
				SHEET 1 OF 1					

Edition	drawn by/checked by/date	Description of change
12	8/8/17	Changed tol. on J-hook
13	CBB/MM/9/26/18	Added cert to approvals
14	MM/BBN/MM/10/5/19	Added reference dimension

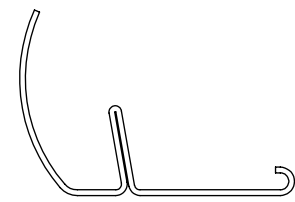
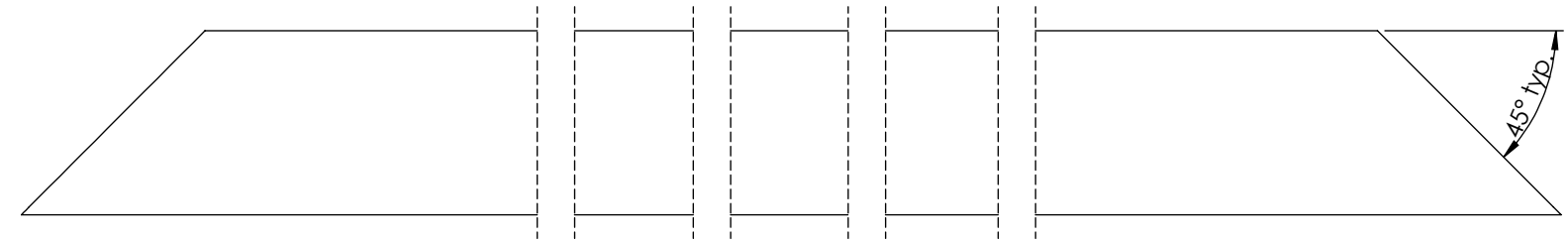


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XXXX= Finish outside
YYYY= Finish inside

Material				Specifications - generally			
3105-H22; NCS S-7500 N (Cool grey) aluminum 157x1.5mm				Lacquered aluminum for FCM outer frame 308521.64			
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648				Aluminum/Flashing standard VG5606.68			
Approvals				Standards - generally			
TMA-A/Cert				Symbol explanations 880006.68			
Checked by/drawn by/date /REC/09.08.2017				FCM/VCM-E - S/QPF ISD/FGT			
Scale 1:1				Outer frame			
Unspec. meas. mm				Profile drawing			
General tolerance ±0.5				Product instructions no.			
Size A				Category		Operation	Edition
				21	302192	000	00 14

Edition	drawn by/checked by/date	Description of change
11	CBB/MM/9/26/18	Added cert to approvals
12	CBB/MM/11/6/18	Added VCS to title block & removed note
13	MM/CBB/6/21/19	Updated tolerance on section A-A



VCM/S/E top punching

Size	A	B
22xx	343	--
30xx	445	--
34xx	496	--
46xx	473	824

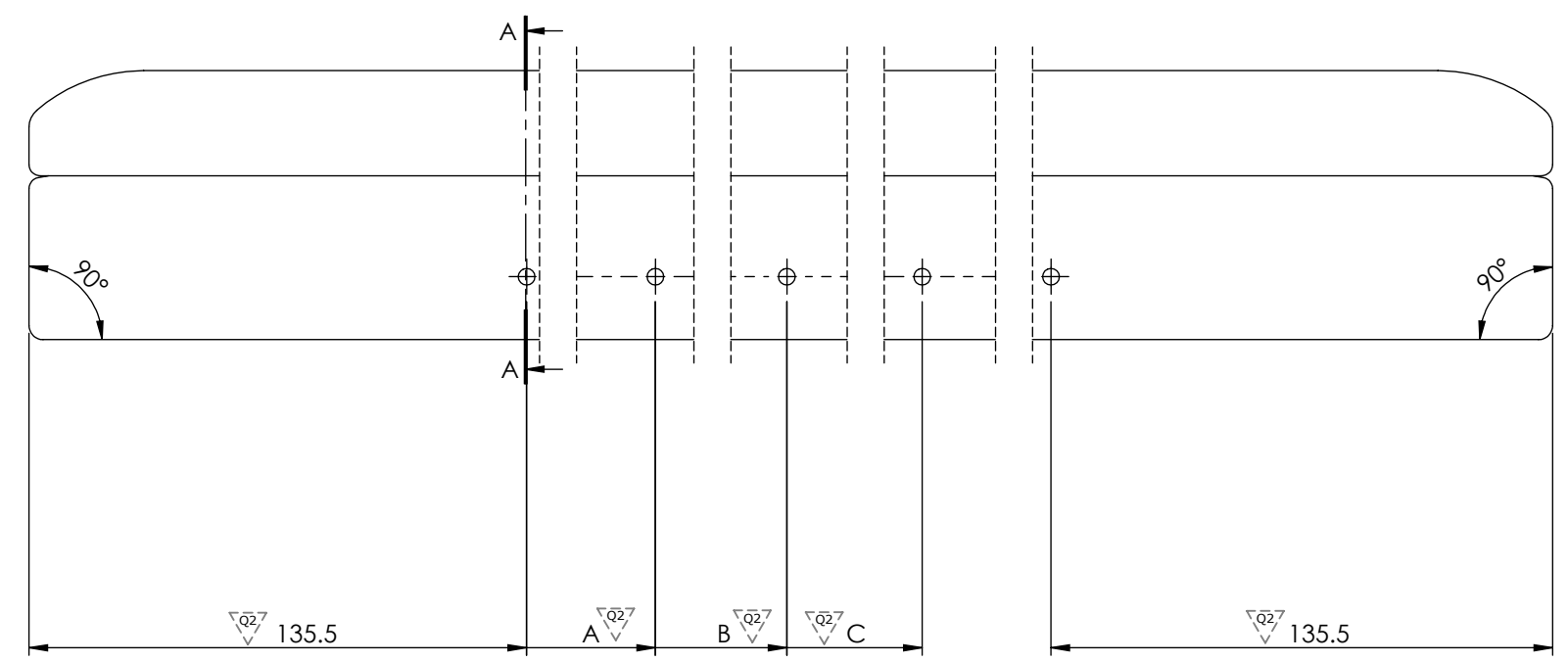
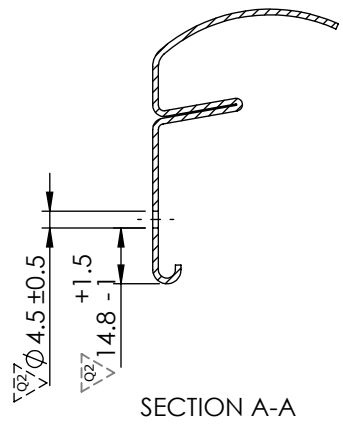
Note: No holes in bottom and sides

QPF chart

Size	A
Q22	--
Q30	407
Q46	610

FCM chart

SIZE	A	B	C
14	--	--	--
20	--	--	--
22	--	--	--
30	445	--	--
34	496	--	--
44	623.5	--	--
46	648	--	--
55	762.5	--	--
70	544	953	1361
72	557	978.5	1400



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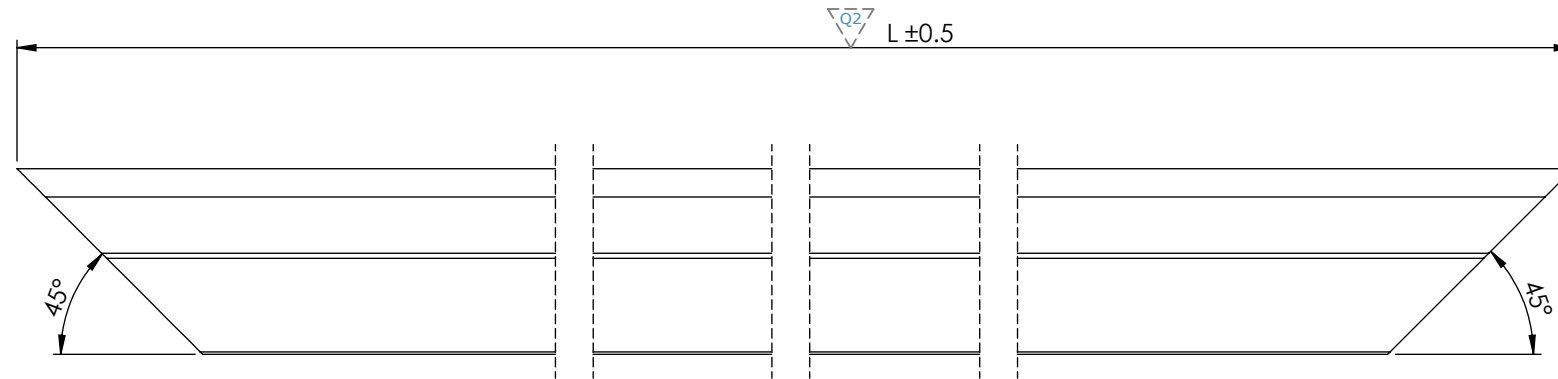
VELUX SKY-PRS
450 Old Brickyard Rd., Greenwood, South Carolina 29648

Approvals
Cert
Checked by/drawn by/date
/REC/17.05.2016

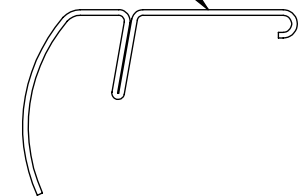
Scale	Unspec. meas.	General tolerance	Size
1:2	mm	±1	B

Standards - generally				
Symbol explanations	880006.68			
FCM/QPF/VCM/VCE/VCS				
Outer frame				
Punching drawing				
Product instructions no.				
Category	21	302192	0A0	31
Operation				13
Edition				

Edition	drawn by/checked by/date	Description of change
09	1/12/15	Added VCS to title
10	5/17/16	Added sizes 55 and 72
11	CBB/MM/11/6/18	Added cert to approvals



Measuring point for miter dimension



QPF

Size	L
Q22	610.5
Q30	813.5
Q46	1219.5

FCM/VCM/VCE/VCS

Size	L
14xx	483
20xx	635
22xx	686
30xx	889
34xx	991
44xx	1247
46xx	1296
55xx	1525
70xx	1905
72xx	1957

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450 Old Brickyard Rd., Greenwood, South Carolina 29648

Approvals
Cert

Checked by/drawn by/date
/REC/17.05.2016

Scale	Unspec. meas.	General tolerance	Size
1:1	mm	±0.5	B

Standards - generally

Symbol explanations 880006.68

FCM/VCM/VCE/VCS/QPF

Outer frame

Cutting drawing

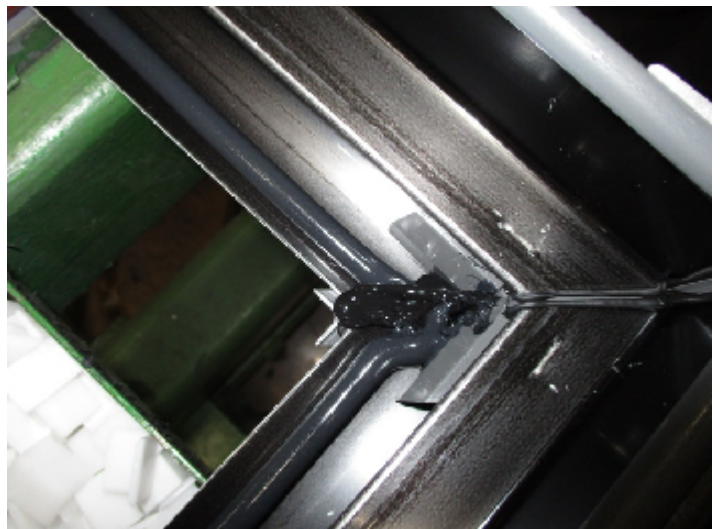
Product instructions no.

Category	Product instructions no.	Operation	Edition
21	302192	0A0	36
			11

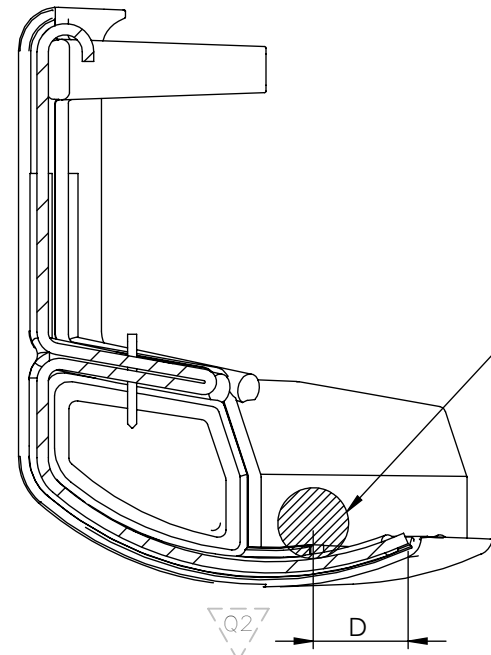
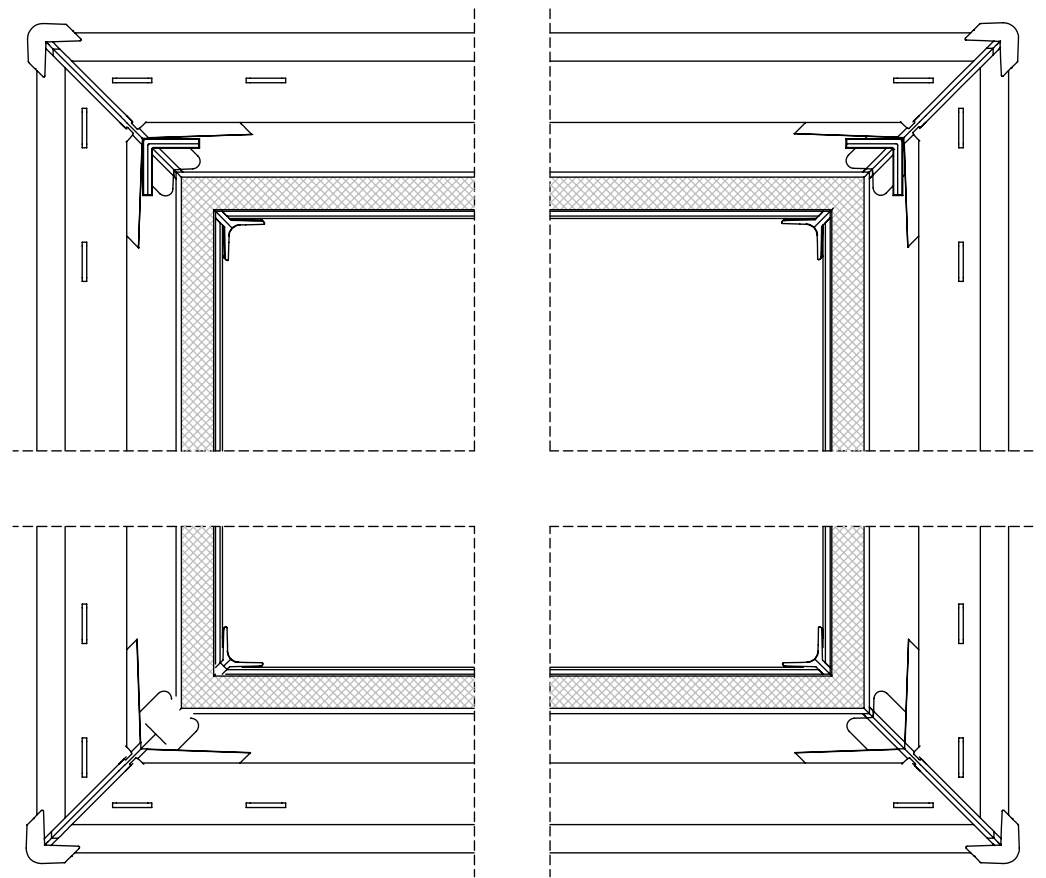
Edition	drawn by/checked by/date	Description of change
11	MM/CBB/6/19/19	Added Chart and D dimension for sealant
12	MM/CBB/12/5/19	Added ISD/FGT to title
13	REC/MM/1/15/20	Added bead of silicone under cornerkey



Max. 5mm squeeze out allowed



Note: Japan units only place a bead of silicone in each corner between the corner key and the glass as shown. Silicone should not be visible from top side of window.



SECTION A-A
SCALE 1:1

Sealant
(Min. $\phi 7$ (38.5mm²) bead per measuring method)
Distance to sealant max. 15mm at corners and max. 12mm along side at final inspection (inspecting with feeler gage.)

	D
4646 & under	11mm
Over 4646	12mm

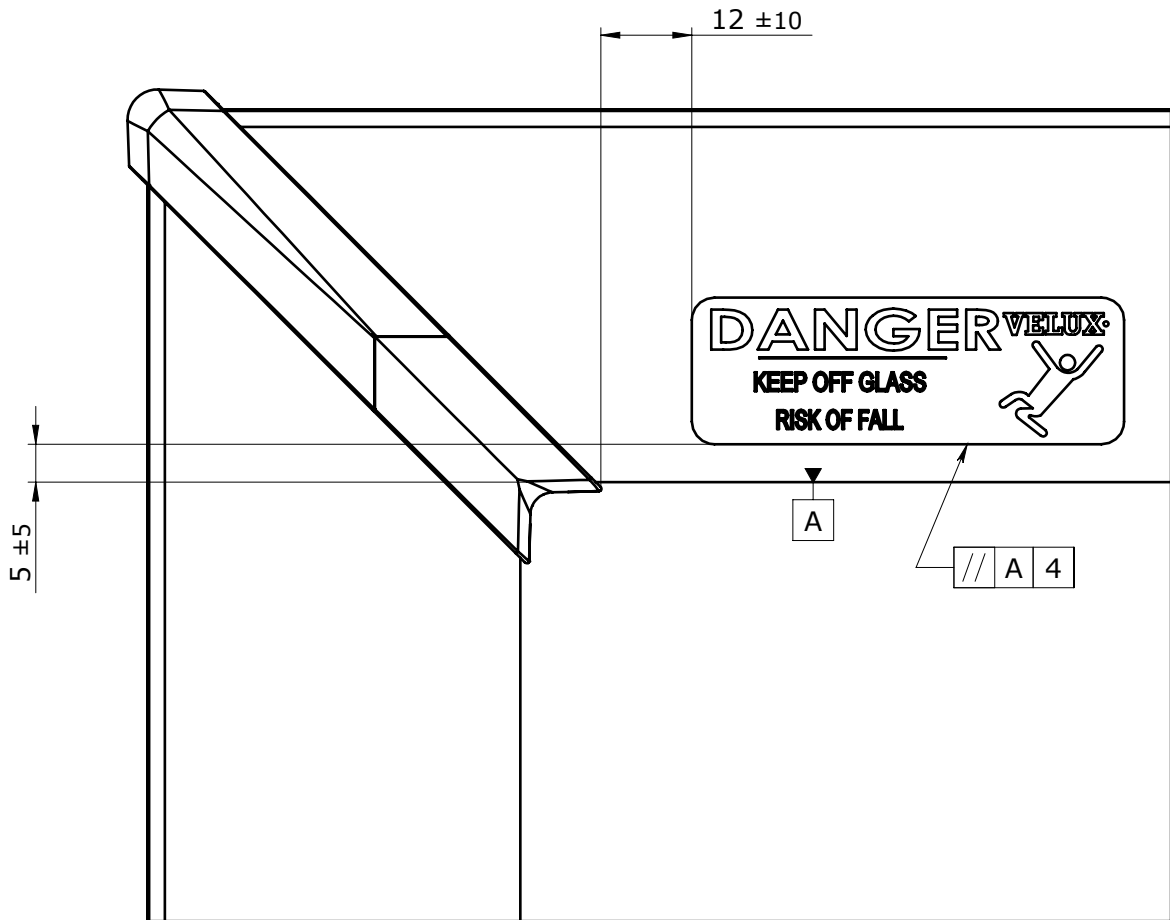
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VELUX SKY-PRS
450 Old Brickyard Rd., Greenwood, South Carolina 29648

Approvals Cert			
Checked by/drawn by/date /REC/15.01.2020			
Scale 1:2	Unspec. meas. mm	General tolerance ±1	Size B

Specifications - generally			
Glazing sealant (FCM)	309001.64		
Standards - generally			
Symbol explanations	880006.68		
FCM/VCM/QPF/VCE/VCS/ISD/FGT			
Outer frame			
Placement of sealant			
Product instructions no.			
Category 21	302192	0A0	Operation Edition 43 13

Edition	drawn by/checked by/date	Description of change
07	CBB/MM/11/6/18	Added cert to approvals
08	MM/CBB/8/8/19	Updated note
09	MM/CBB/12/8/19	Added FGT ISD to title

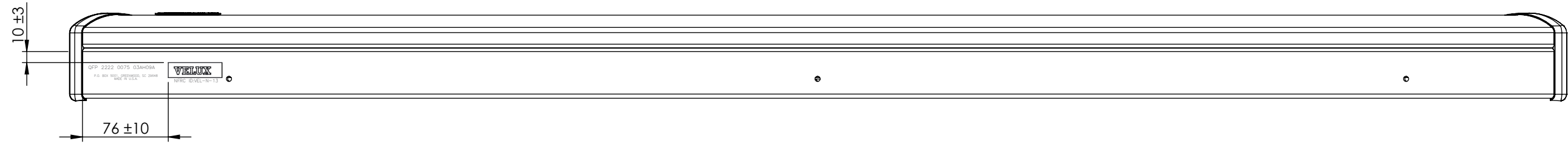


Note: place on top frame, left side viewed from outside.

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VELUX				SKY-PRS				FCM,QPF,VCM/E/S,ISD,FGT							
450 Old Brickyard Rd., Greenwood, South Carolina 29648								Danger label							
Approvals								Placement drawing							
Cert								Product instructions no.							
Checked by/drawn by/date								Category							
/REC/24.08.2017								21							
Scale		Unspec. meas.		General tolerance		Size		302192		0A0		Operation		Edition	
1:1		mm		±0.5		A				51		09			

Edition	drawn by/checked by/date	Description of change
11	CBB/MM/11/26/18	Added VCM/E/S/QPF/ISD/FGT to title
12	MM/CBB/8/8/19	Updated note 2&3.
12	MM/CBB/10/4/19	Updated note and placement.



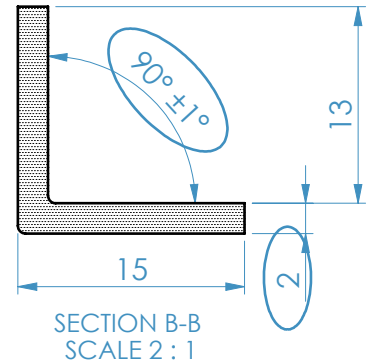
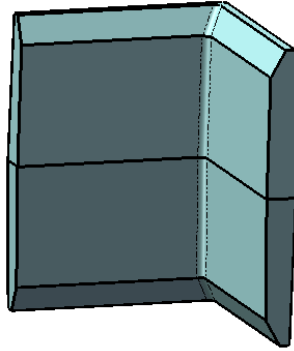
Notes:

1. Regardless of dimension, label should not cover holes.
2. Placement for all sizes except 1430, 1446 bottom left side frame viewed from outside.
3. Placement for sizes 1430 and 1446 top frame left side viewed from outside.

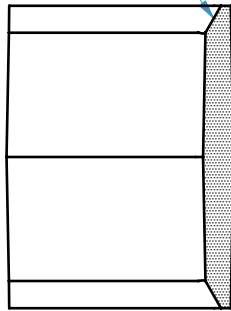
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VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648				FCM/VCM/E/S/QPF/ISD/FGT			
Approvals				Outer frame			
Checked by/drawn by/date /REC/13.06.2018				Placement of laser etching type sign			
				Product instructions no.			
Scale 1:3	Unspec. meas. mm	General tolerance ±0.5	Size B	Category 21	302192	0A0	54 13

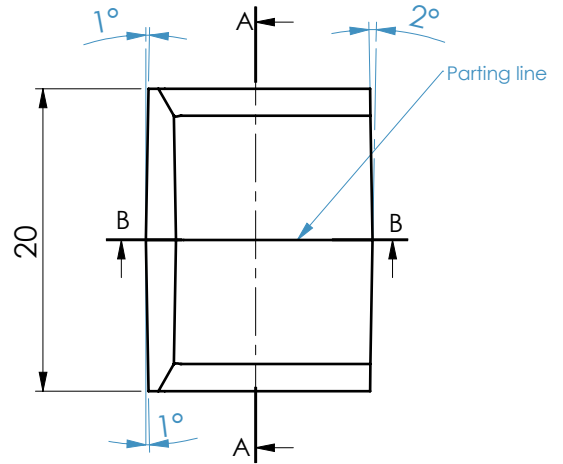
Edition	drawn by/checked by/date	Description of change
03	CBB/MM/11/6/18	Added VCM/E/S/QPF to title and cert approval
04	CBB/MM/9/19/19	Corrected color of material
05	REC/MM/2/5/20	Added angle dim & changed thk. to 2mm



1mm x 60° chamfer typ.



SECTION A-A
SCALE 2 : 1

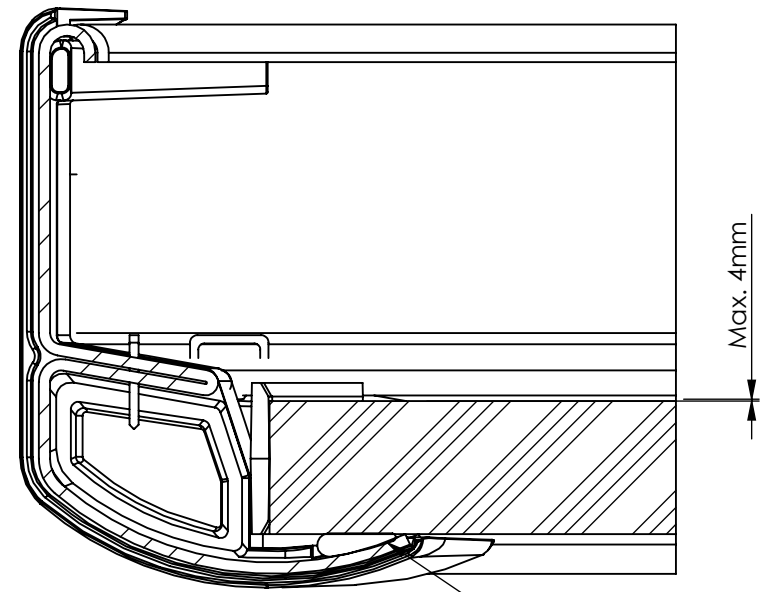
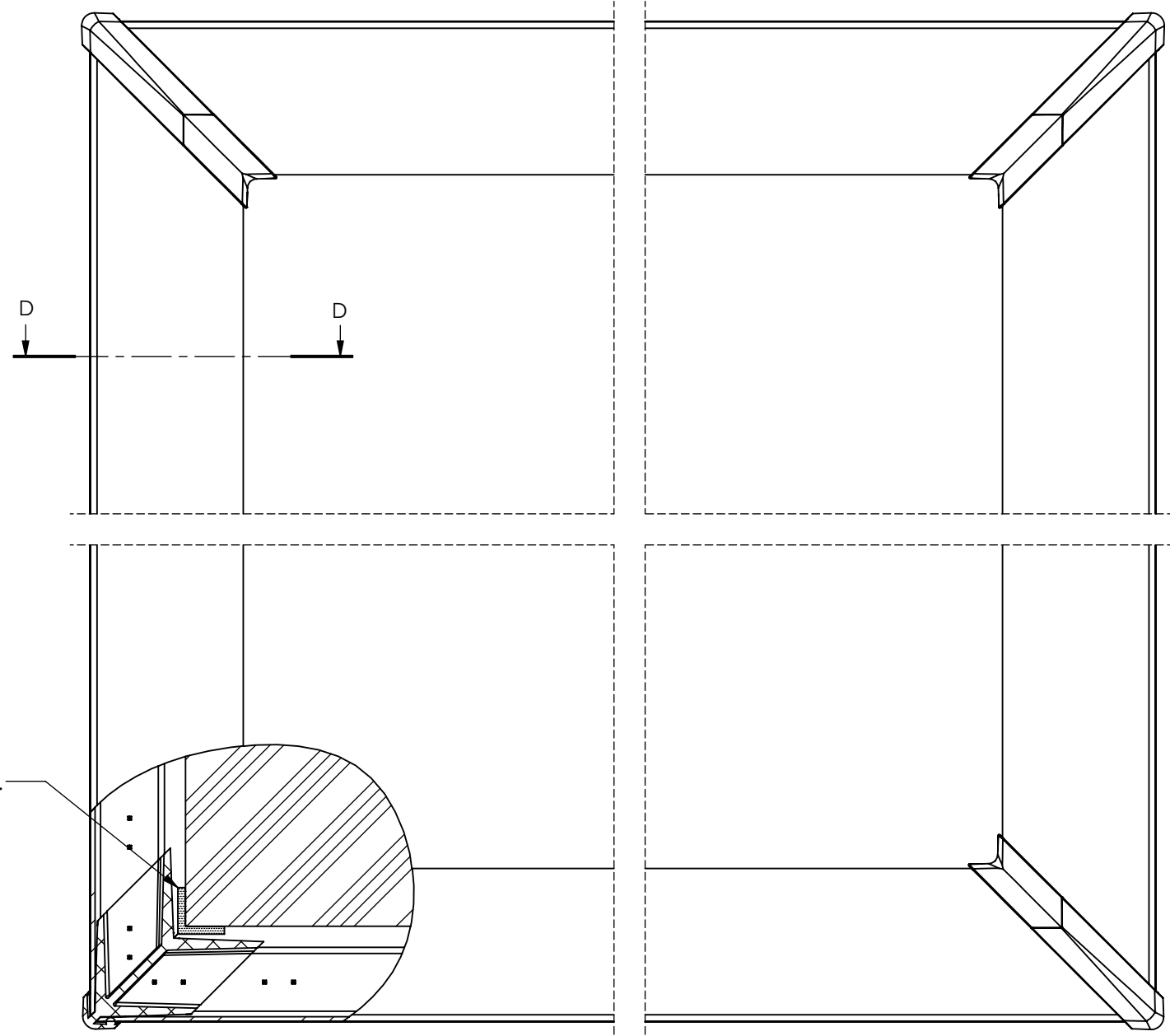


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Part Volume = 1225.18 cubic millimeters

Material				Specifications - generally						
Color:Natural opaque				Acetal	309055.64					
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648				<u>FCM/VCM/E/S/QPF</u>						
Approvals Cert				Pane spacer Commodity drawing						
Checked by/drawn by/date /RC/05.02.2020				Product instructions no.						
Scale 2:1	Unspec. meas. mm	General tolerance ±0.5	Size A	Category 21	303392	000	00	05	Operation	Edition

Edition	drawn by/checked by/date	Description of change
04	3/19/15	Revised note to say top of window
05	7/26/17	Changed the max squeeze out from 3 to 5mm
06	CBB/MM/11/7/18	Added cert, VCM/E/S,QPF to title & adjusted note



Pane spacer seats in gap between glass and corner key.

- Notes:
1. Place two pane spacers in the top of the unit.
 2. Additional spacers can be used in other corners, if needed.
 3. ONLY if prevented by tolerance stack up can spacers be omitted.

SECTION D-D
SCALE 1 : 1

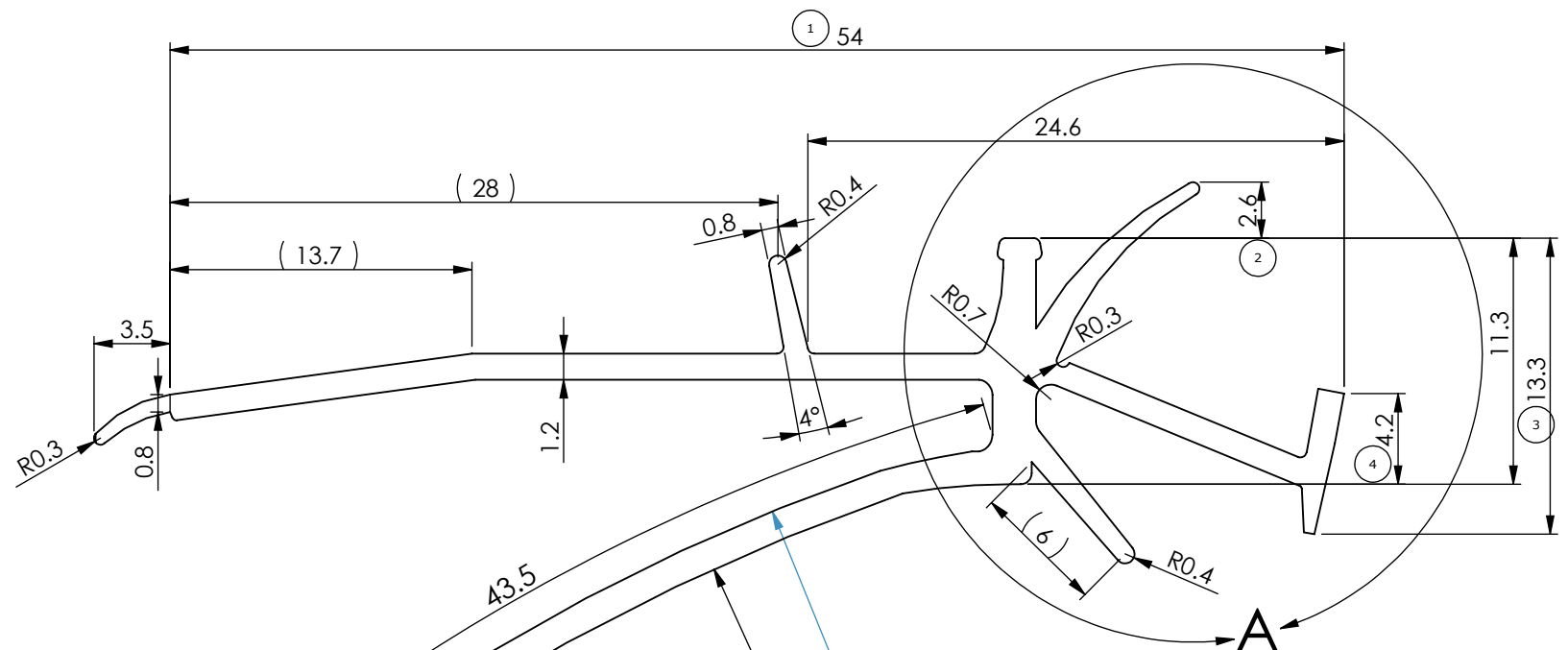
Max squeezeout of silicone after pane is placed is 5mm.

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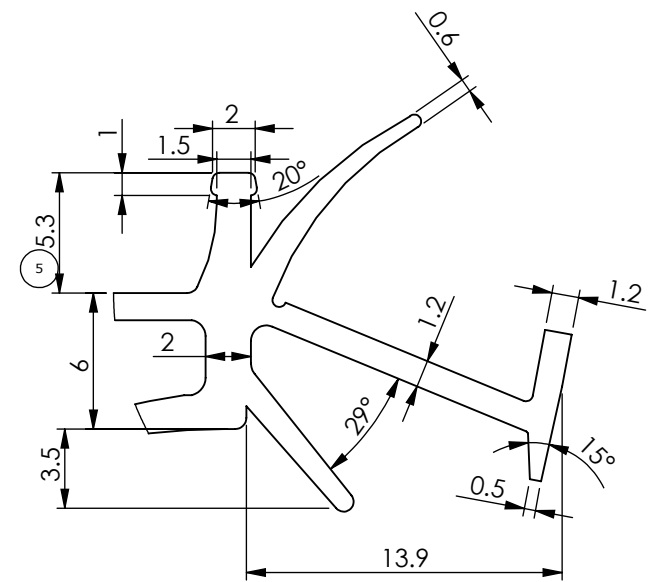
VELUX SKY-PRS			
450 Old Brickyard Rd., Greenwood, South Carolina 29648			
Approvals Cert			
Checked by/drawn by/date /REC/31.07.2017			
Scale 2:1	Unspec. meas. mm	General tolerance ±1	Size B

FCM(VCM/E/S,QPF)				
Pane spacer				
Placement drawing				
Product instructions no.				
Category 21	303392	0A0	51	06

Edition	drawn by/checked by/date	Description of change
02	4/18/17	Added additional sizes
03	4/25/18	Added 1414 size
04	MM/CBB/10/4/19	Updated sizes 3055,3072, & 4672



Measure	Tol.
< 2.5	0.35
2.5-4	0.4
4-6.3	0.5
6.3-10	0.7
10-16	0.8
16-54	1



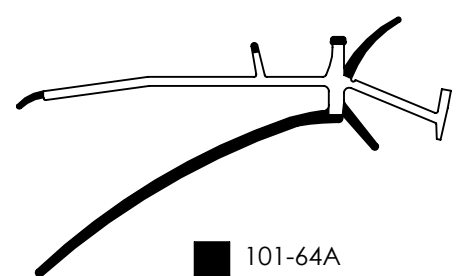
DETAIL A
SCALE 3 : 1

FCM (purchased lengths)

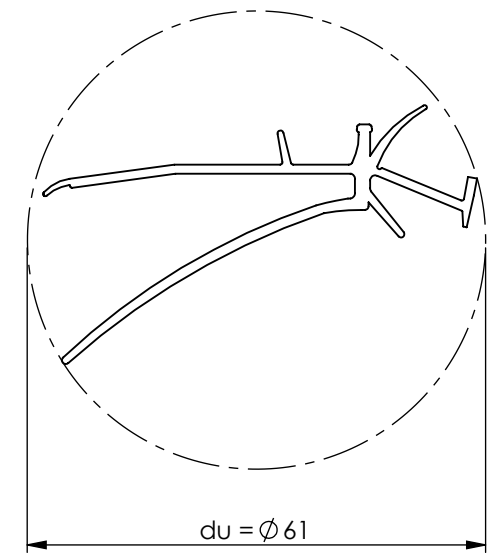
LENS	TOTAL LENGTH (mm) +50/-0	PART NUMBER
1414	2667	30380008
1430	2895	30380009
1446	3784	30380012
2020	2895	30380009
2222	2895	30380009
2230	3784	30380012
2234	3784	30380012
2044	4115	30380013
2246	4115	30380013
2270	2667 (x2)	3038008 (x2)
3030	3784	30380012
3046	4572	30380015
3055	3784(x2)	30380012(x2)
3072	4115(2)	30380013(x2)
3434	4115	30380013
3446	2667(x2)	30380008(x2)
4646	2667(x2)	30380008(x2)
4672	3784(x2)	30380012(x2)

QPF (purchased lengths)

LENS	TOTAL LENGTH (mm) +50/-0	PART NUMBER
2222	2667	30380008
2230	3784	30380012
2246	4115	30380013
3030	3784	30380012
3046	4572	30380015
4646	2667(x2)	30380008(x2)



101-64A
 103-50D
 Scale 1:1

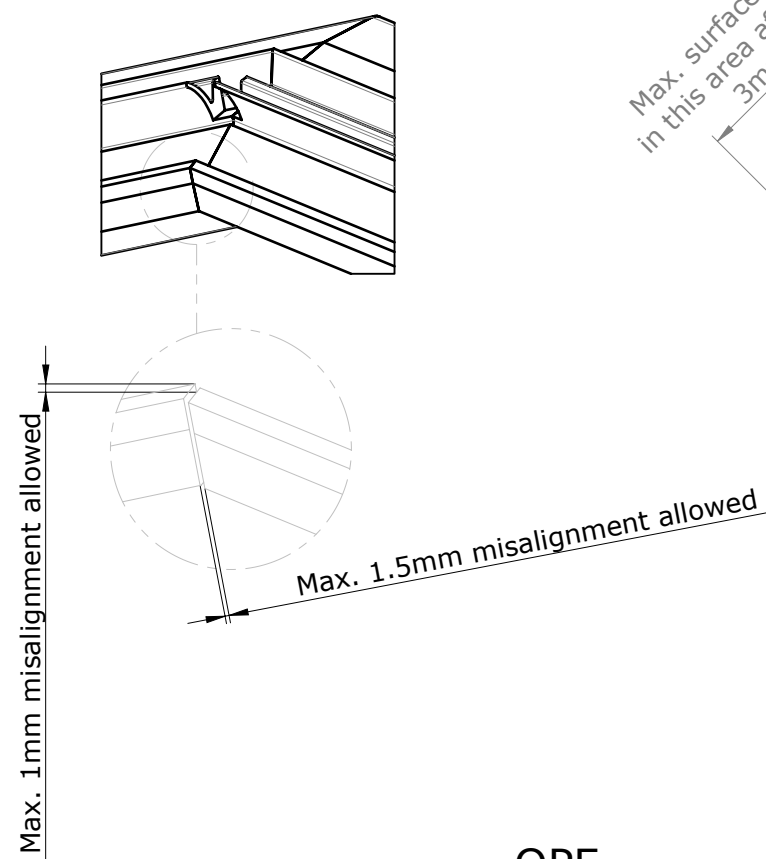
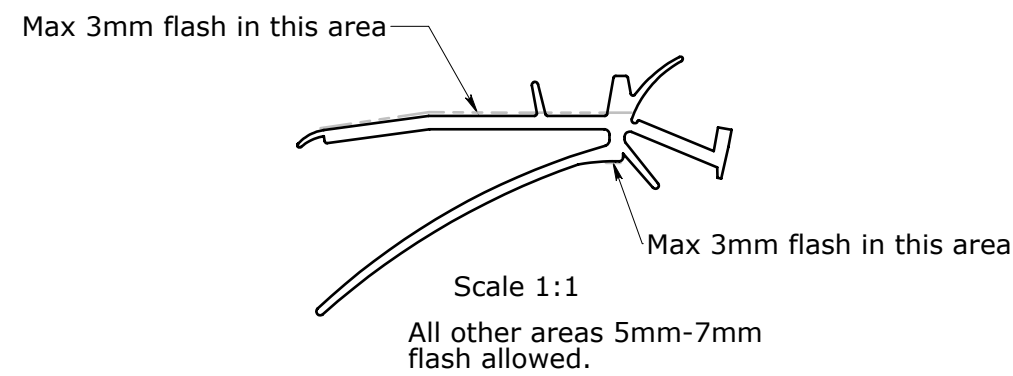
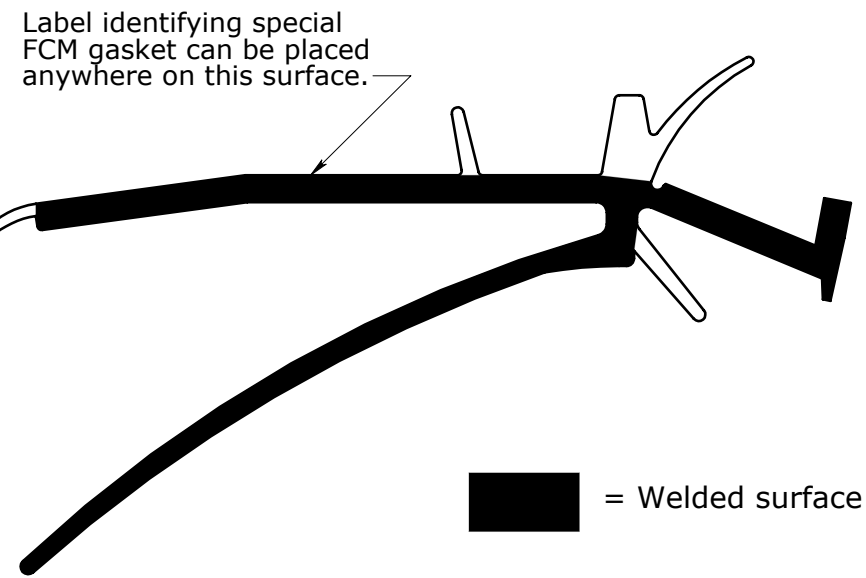


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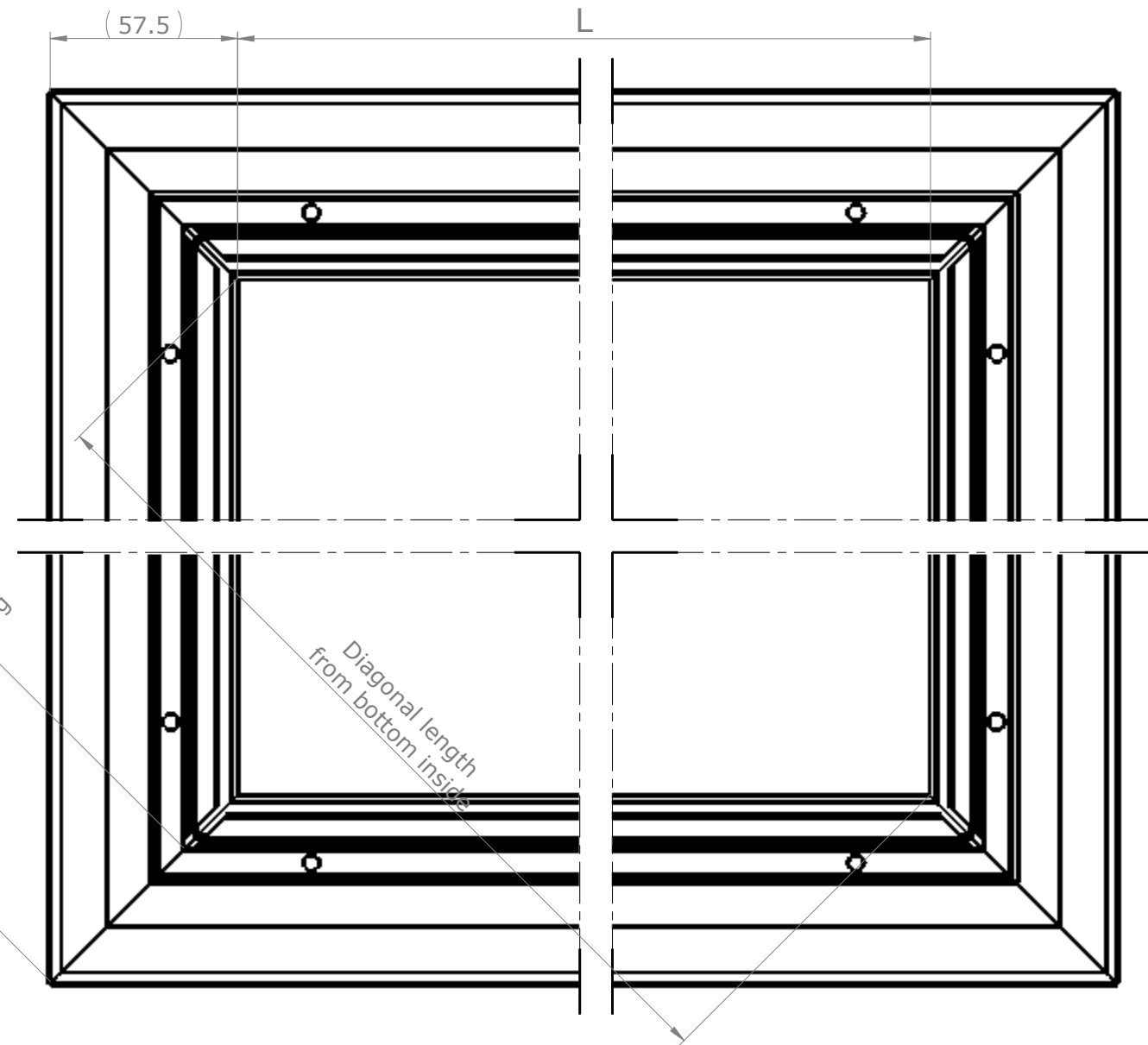
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648			
Approvals TMA-A/Cert			
Checked by/drawn by/date /CBB/25.04.2018			
Scale 1:1	Unspec. meas. mm	General tolerance See Chart	Size B

FCM				
Inner frame gasket Commodity drawing				
Product instructions no.				
Category 21	303800	000	00	04

Edition	Description of change	Date
12	Changed max split from 2mm to 3mm	2/16/17
13	Changed tolerance sizes	7/26/17
14	Added 1414 size	4/25/18



Max. surface deviation in this area after welding 3mm typ.



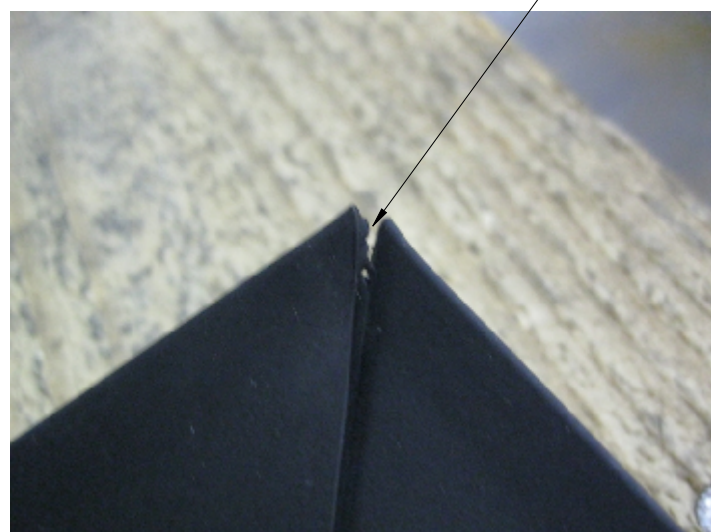
FCM

Size	L ±2	LENS	DIAGONAL LENGTH ±5
14--	372.5	1414	527
20--	524.5	1430	863.5
22--	575.5	1446	1242
30--	779	2020	742
34--	880.5	2222	814
44--	1134	2230	968.5
46--	1185	2234	1052
55--	1414	2044	1144
70--	1795	2246	1317.5
72--	1846	2270	1885
		3030	1101.5
		3046	1418
		3055	1614
		3072	2004
		3434	1245
		4646	1676
		4672	2194

QPF

Size	L ±2	LENS	DIAGONAL LENGTH ±5
19--(22)	499.5	2222	706.5
27--(30)	702.5	2230	862
43--(46)	1109	2246	1216.5
		3030	993.5
		3046	1313
		4646	1568

Max. 3mm split allowed from end in this area

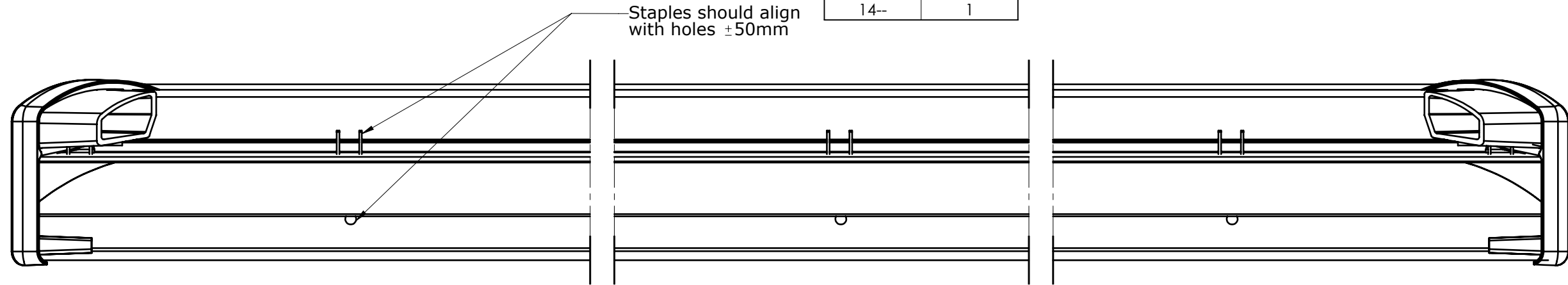


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VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648		FCM/QPF	
Approvals		Inner frame gasket Welding drawing	
Checked by/drawn by/date /CBB/25.04.2018		Product instructions no.	
Scale 1:2	Unspec. meas. mm	General tolerance ±.5	Size B
Category 21	303372	0A0	42 14

Edition	drawn by/checked by/date	Description of change
09	7/26/17	Added descriptions to staples and gaskets
10	MM/BBN/ 3/14/19	Removed picture, added to corner key staple dwg
11	MM/CBB/ 10/9/19	Added note for size 14--

Size	Min. # of staples
72--	5
70--	5
55--	3
46--	3
44--	3
34--	3
30--	3
20--	2
22--	2
14--	1



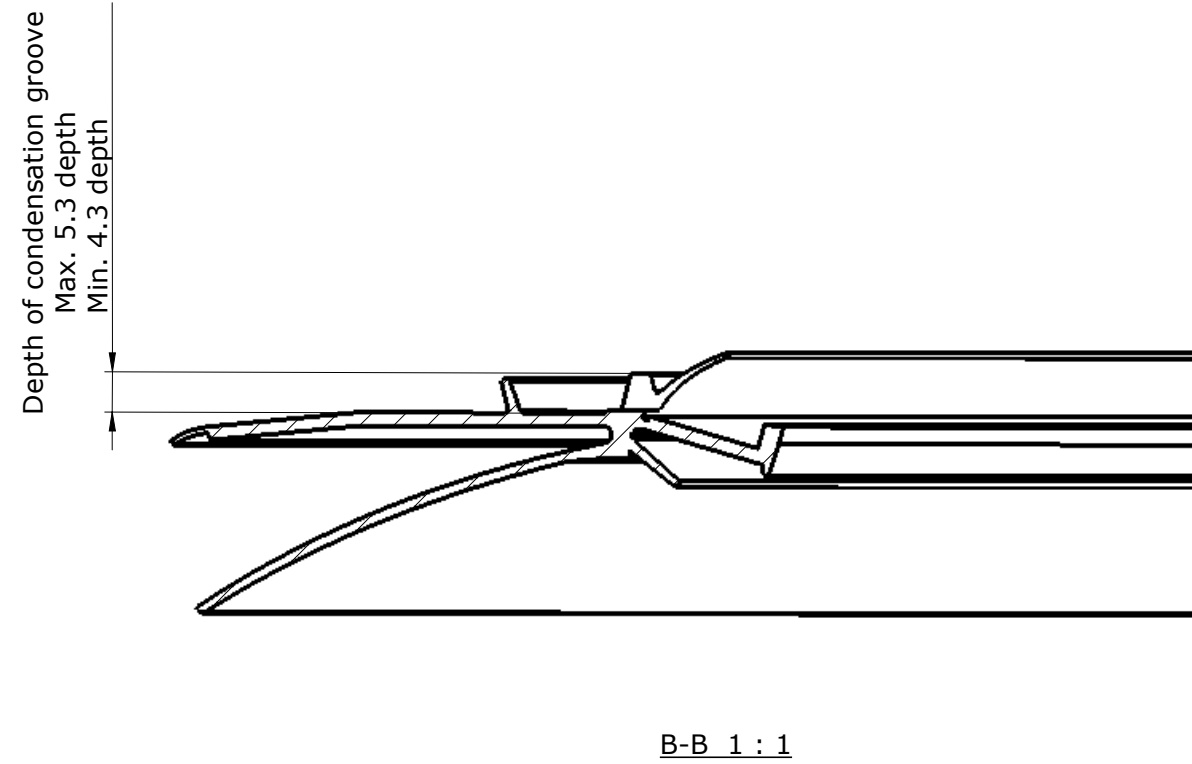
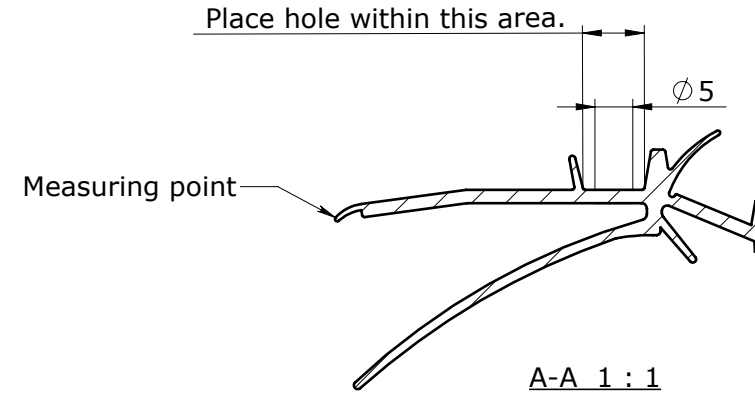
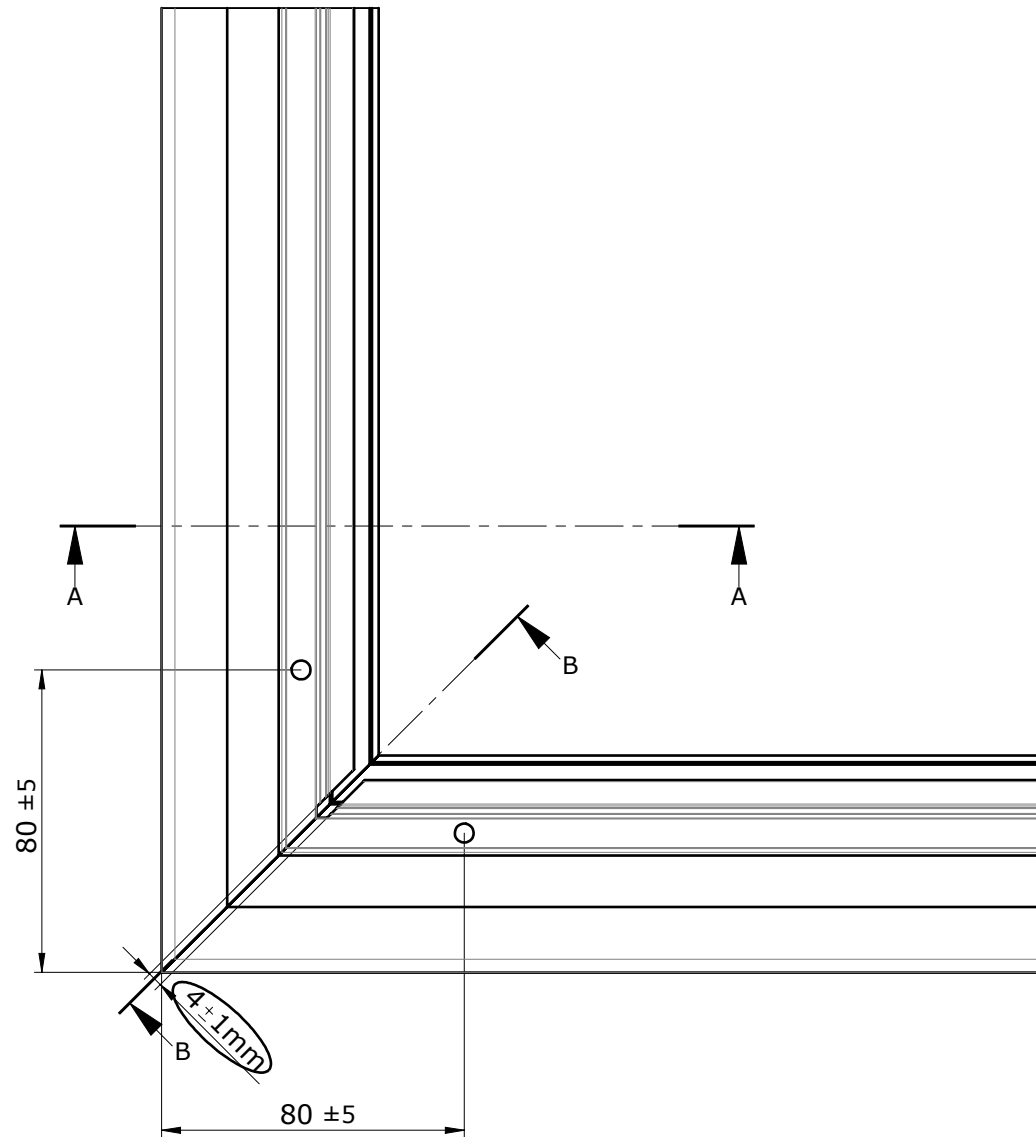
Staples must be placed above crease in gasket as shown.

- NOTES:
1. Staple head a max of 3mm above gasket
 2. Max of 2 staples cut through gasket
 3. On size 14-- staples should be placed in center of part.

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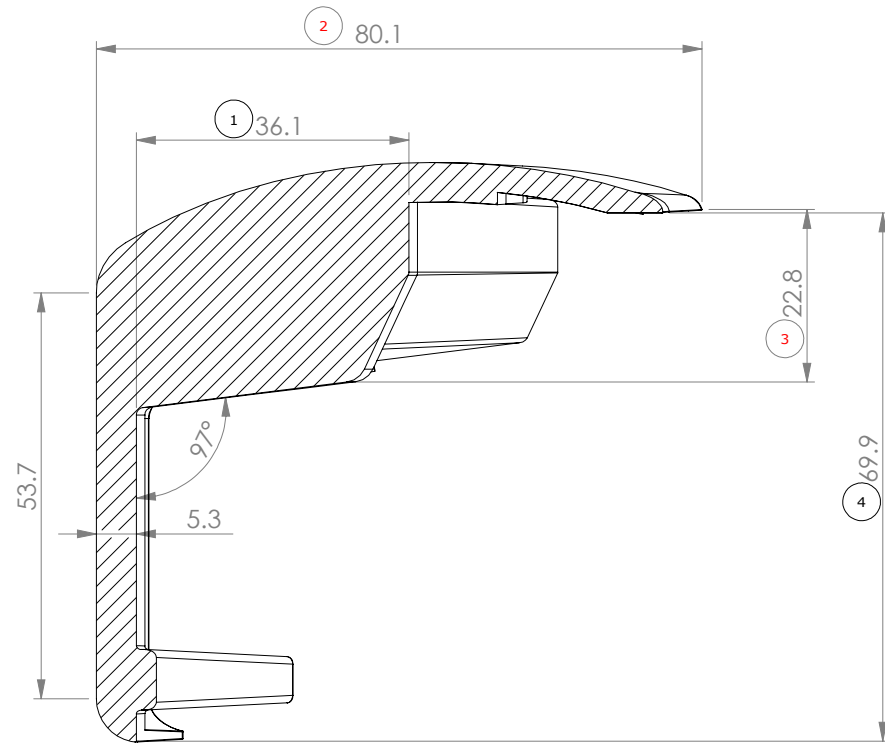
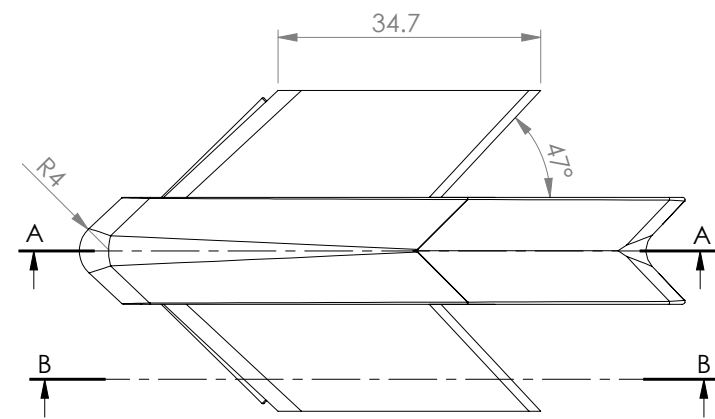
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648				FCM			
Approvals				Inner frame gasket & staple Placement drawing			
Checked by/drawn by/date /CB/31.07.2017				Product instructions no.			
Scale 1:2	Unspec. meas. mm	General tolerance $\pm .5$	Size B	Category 21	303372	0A0	51 11

Edition	Description of change	Date
05	Updated tolerance on dimension	7/31/17

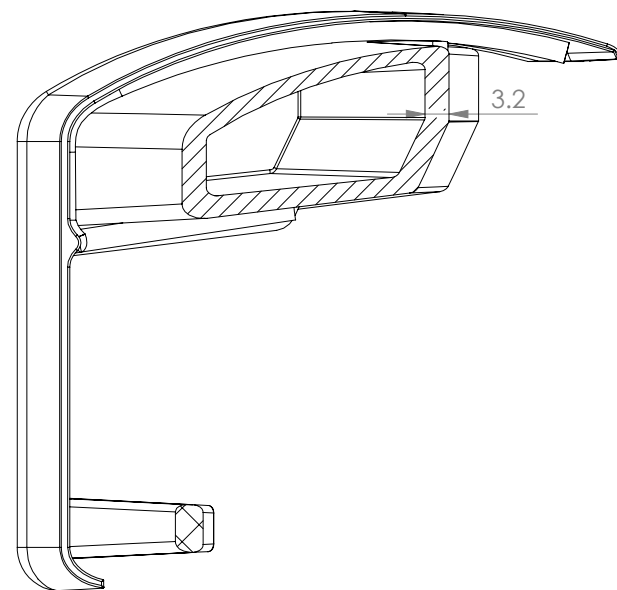


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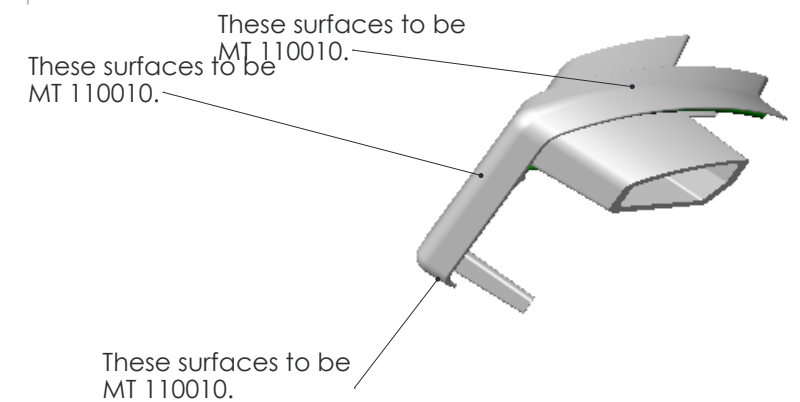
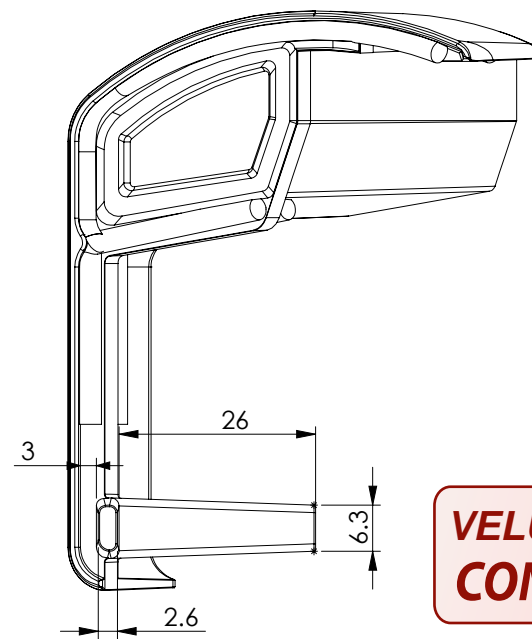
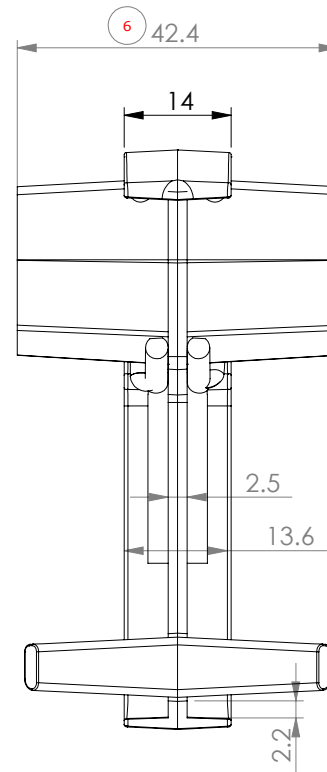
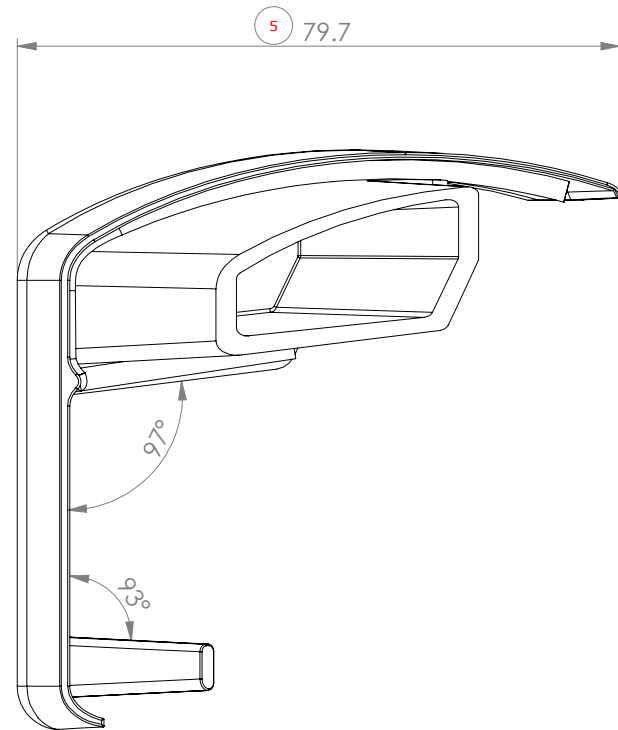
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648				FCM			
Approvals				Inner frame gasket Routing and punching drawing			
Checked by/drawn by/date /CB/31.07.2017				Product instructions no.			
Scale 1:2	Unspec. meas. mm	General tolerance $\pm .5$	Size B	Category 21	303372	0A0	52
				Edition 05			



SECTION A-A



SECTION B-B



Measure	Tol.
21 - 85	.2
.5 - 20	.1

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NOTE:
1. Unless otherwise noted surface finish to be SPI B2 or better.
2. Equilvant color reference: RAL 7043.
3. Part volume= 18815.75 cubic millimeters

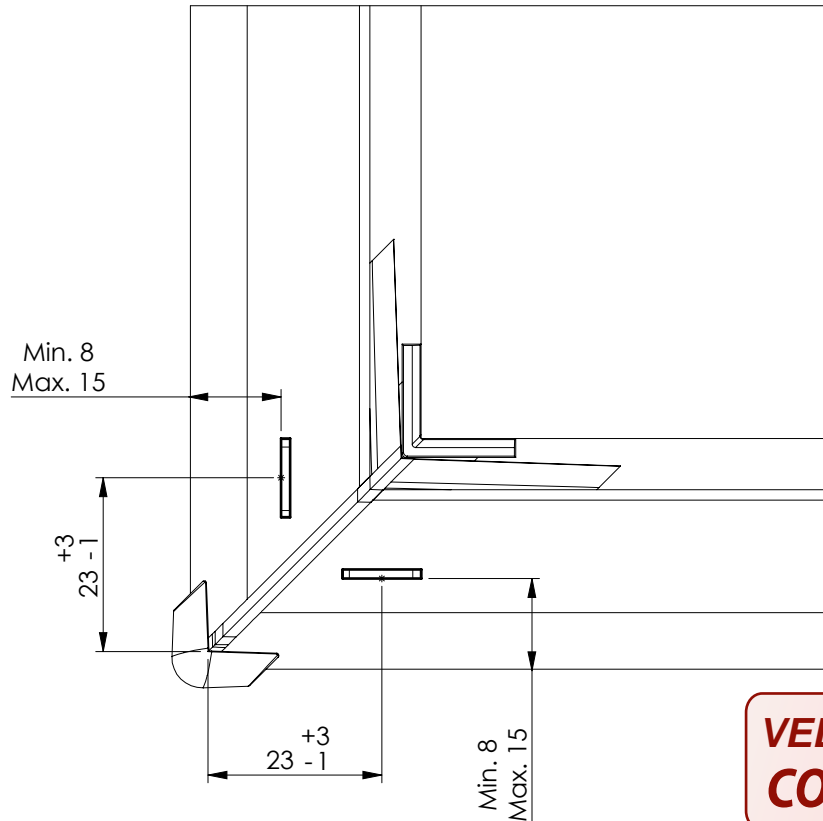
Edition	drawn by/checked by/date	Description of change
12	CBB/MM/11/8/18	Added VCM/E/S,QPF to title
13	MM/CBB/9/25/19	Updated material spec
14	MM/CBB/12/5/19	Added ISD/FGT to title

Material				Specifications - generally			
PC/ASA		Color:NCS S-7500-N(grey)		Plastic material for FCM corner key		309239.64	
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648				FCM/VCM/E/S/QPK/ISD/FGT			
Approvals TMA-A/CERT				Corner key			
Checked by/drawn by/date /RC/13.09.2017				Commodity drawing			
Scale 1:1				Product instructions no.			
Unspec. meas. mm		General tolerance See Chart		Size B		Category 21	
				303380		000 00	
				14		Edition	

Edition	drawn by/checked by/date	Description of change
05	CBB/MM/11/8/18	Added VCM/E/S/QPF to title & cert to approvals
06	MM/BBN/11/8/18	Changed view and added picture for staple
07	MM/CBB/12/5/19	Added ISD/FGT to title



Place two staples in each corner as shown.

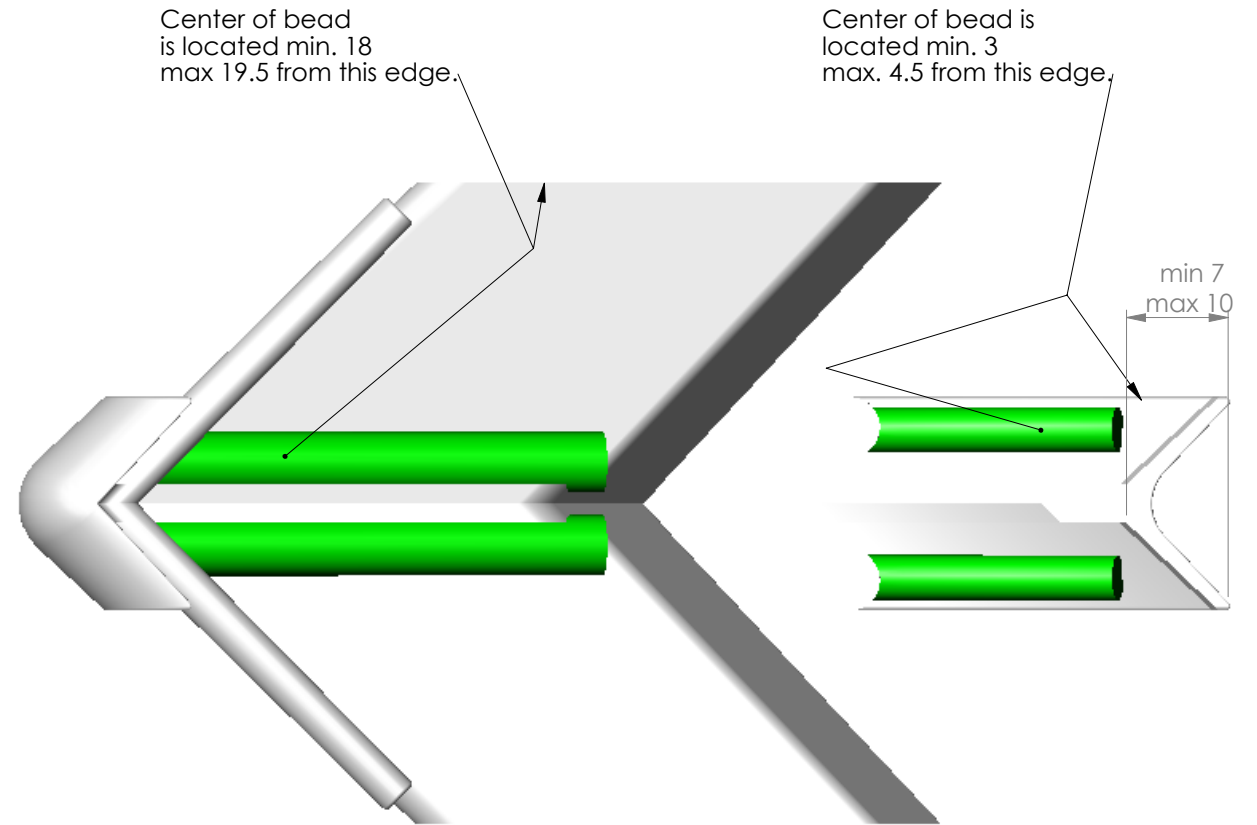
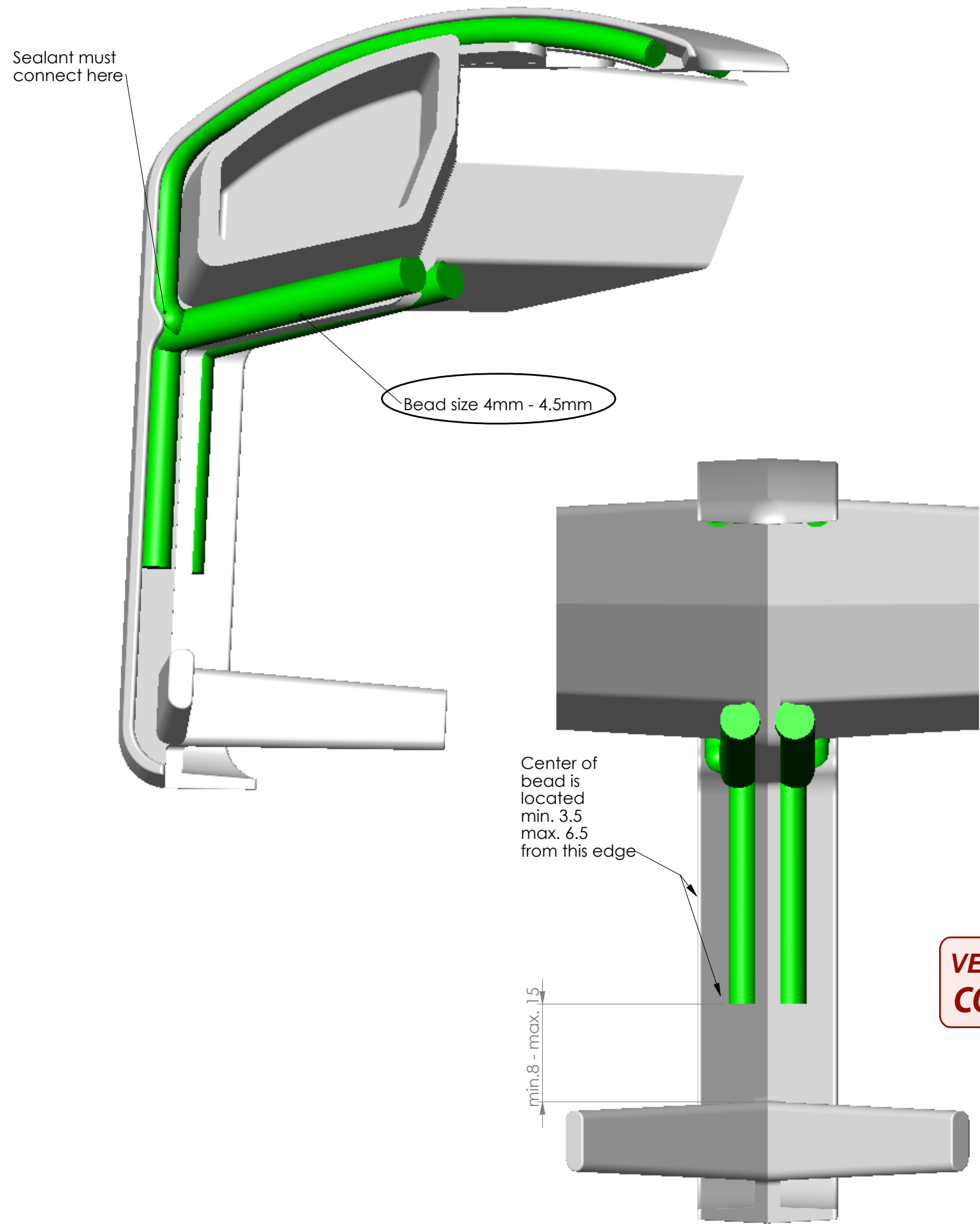


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Note: Placement is the same for all corners

VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648				<u>FCM/VCM/E/S/QPF/ISD/FGT</u>			
Approvals Cert				Corner key Placement of staples Assembly drawing			
Checked by/drawn by/date /REC/27.01.2014				Product instructions no.			
Scale 1:1	Unspec. meas. mm	General tolerance 0.5	Size A	Category 21	303380	0A0	51 07

Edition	drawn by/checked by/date	Description of change
05	CBB/MM/11/8/18	Added VCM/E/S/QPF to title & cert to approvals
06	MM/RC/03/12/19	Added bead both beads of sealant
07	MM/CBB/12/5/19	Added ISD/FGT to title block



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NOTES:
 Bead size is 3.0mm - 4mm, unless noted.
 When outer frame and corner key are assembled, maximum butyl squeeze out onto outer frame is 5mm.
 Maximum putty smear is 25mm sq.
 Only one bead shown. Other side is typical.
 Corner key weight plus butyl: 25.5g + 1.1g -0.5g
 Cornery key weight: 22.4g

VELUX				SKY-PRS			
450 Old Brickyard Rd., Greenwood, South Carolina 29648							
Approvals Cert							
Checked by/drawn by/date /REC/31.07.2017							
Scale	Unspec. meas.	General tolerance	Size				
1:1	mm	±.5	B				

Specifications - generally					
High-Tack structural putty					102011.64
FCM/VCM/E/S/QPF (ISD/FGT)					
Corner key Sealant placement drawing					
Product instructions no.					
Category	303380			Operation	Edition
21	0A0			52	07

VELUX A/S · Panes Øskovvej 2, DK-8740 Brædstrup, Denmark	Drawn up by: KM/LFj	Date: 09.03.2006	Page: 1/3
MATERIAL SPECIFIKATION Silicone as external sealant	Classification: A	PRODUCT INSTRUCTION NO.	
	Part of: WE-Si/Alu-Si	Art 21	Commodity no. 2 6 7 0 0 2
		Opr. 64	Ed. 04

1 General Description

1.1 **VELUX material designation:**

One-component silicone.

1.2 **Application:**

The material is used in connection with the production of Insulating Glass Units forming part of VELUX roof windows.

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2 Properties

2.1 **Specific VELUX-requirements for the properties of the material:**

No.	Properties	Test method	Requirements
1	Shore A hardness	ASTM D 2240	Min. 38 Shore A after 7 days at room conditions.
2	Colour	Visual test, or test by means of RAL colour chart	The colour of the cured product must be grey.
3	Tensile strength at 25% elongation	H- or C- specimen consisting of 2 pcs. of glass with a joint in-between. The supplier states test method and dimensions of the joint. To be tested after 7 days at room conditions.	0.25 – 0.70 MPa (36.26 psi – 101.53 psi)
4	Tensile strength at breakage		Min. 0.80 MPa (116.03 psi)
5	Cohesion failure % of the total surface area		Min. 90%
6	Slump	ASTM D 2202	Max. 2.0 mm (0.079 in.) after 5 min. at room conditions.
7	Tack-free time	ASTM C 679	Max. 90 min.
8	Curing depth after 24 hours	Let cure for 24 hours at room conditions and measure the height of the cured material with a micrometer screw.	0.15 – 0.51 cm (0.059 – 0.201 in.)
9	Specific gravity	The supplier states test method.	1.30 – 1.37
10	Extrusion rate	The supplier states test method.	70 – 150 g/min. (2.47 – 5.29 oz/min.)
11	Storage life	Frost-free storage.	Min. 9 months from date of production of the silicone. Min. 3 months from receipt of the material at the customers.

Room conditions means: 23 ±3°C (73.4±5°F) and 50 ±5% RH.

<p style="text-align: center;">VELUX A/S · Panes Øskovvej 2, DK-8740 Brædstrup, Denmark</p>	<p>Drawn up by: KM/LFj</p>	<p>Date: 09.03.2006</p>	<p>Page: 2/3</p>			
<p><u>MATERIAL SPECIFIKATION</u> Silicone as external sealant</p>	<p>Classification: A</p>	<p style="text-align: center;">PRODUCT INSTRUCTION NO.</p>				
	<p>Part of: WE-Si/Alu-Si</p>	<p>Art 21</p>	<p>Commodity no. 2 6 7 0 0 2</p>	<table border="1"> <tr> <td data-bbox="1385 230 1449 336">Opr. 64</td> <td data-bbox="1449 230 1525 336">Ed. 04</td> </tr> </table>	Opr. 64	Ed. 04
	Opr. 64	Ed. 04				

2.2 General material information:

2.2.1 Climatic influences:

If any information of the resistance to climatic influences is available, these are to be stated including the standards, with which the material complies.

2.2.2 Storage conditions:

The supplier shall state if there are any special demands for storage of the material. If so the material must be stored under these conditions until delivery to the customer.

2.2.3 Further information:

Any special requirements, for example in connection with the application of the silicone to panes with coated or laminated glass, must be stated.

The supplier shall forward a description of the test methods used / mentioned in the certificate.

3 Technical Material Approval at VELUX

3.1 General information:

Along with a sample the supplier shall forward documentation for the properties mentioned in item 2, including the acceptable tolerances.

Supplier shall forward a product data sheet.

The supplier shall forward a safety data sheet if one or more of the components of the material are listed as hazardous acc. to the legislation of the recipient country. The language of the safety data sheet must comply with the legislation of the recipient country within this field, however it must as a minimum be in English.

3.2 Environmental requirements:

The material must meet the labelling requirements in force in the country where it is delivered.

The material must meet the environmental requirements in force at the time in question in the country where it is delivered.

3.3 Further information:

VELUX will internally carry out a Technical Material Approval acc. to document no. 21.267002.94.xx



4 General Requirements

4.1 Accept from the Supplier:

A supplier cannot deliver to the VELUX until all requirements of the Material Specification are certified in writing as accepted.

4.2 Change of the Product:

The supplier informs the customer in writing about any change in the composition of the material, including the effect of such changes.

Submission of information will in no way imply a limitation in the supplier's responsibility for any defect or deficiency of the material.

4.3 Quality system:

The supplier shall have an efficient quality system like f.ex. ISO 9002. The customer reserves the right to conduct audits on the supplier's premises.

VELUX A/S · Panes Øskovvej 2, DK-8740 Brædstrup, Denmark	Drawn up by: KM/LFj	Date: 09.03.2006	Page: 3/3
MATERIAL SPECIFIKATION Silicone as external sealant	Classification: A	PRODUCT INSTRUCTION NO.	
	Part of: WE-Si/Alu-Si	Art 21	Commodity no. 2 6 7 0 0 2
		Opr. 64	Ed. 04

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5 Delivery

5.1 Terms of delivery:

Delivery according to agreement with the customer's purchasing department.

5.2 Certificate:

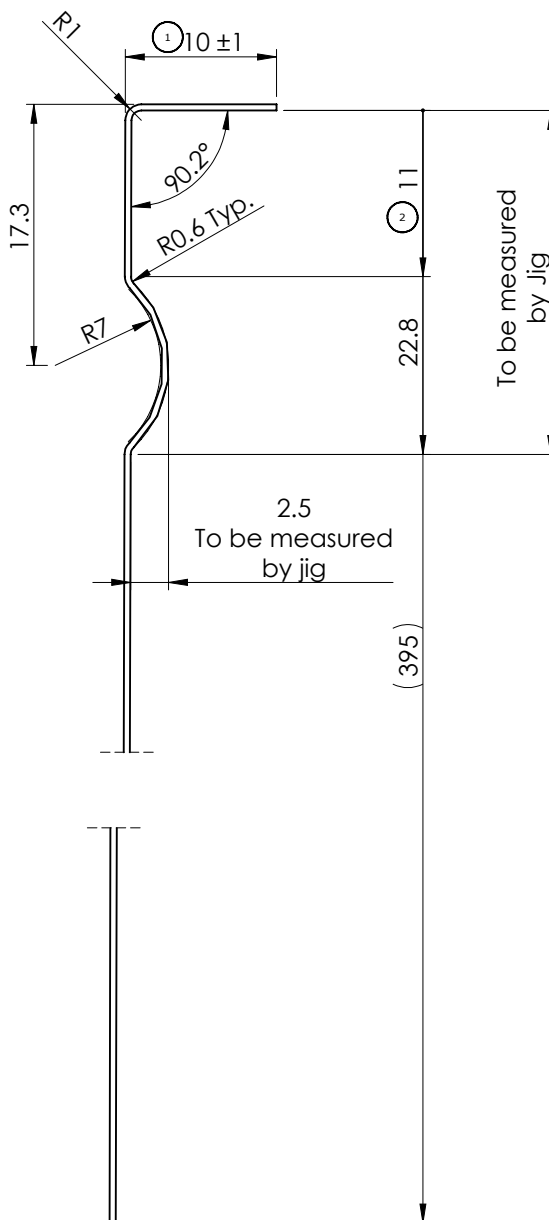
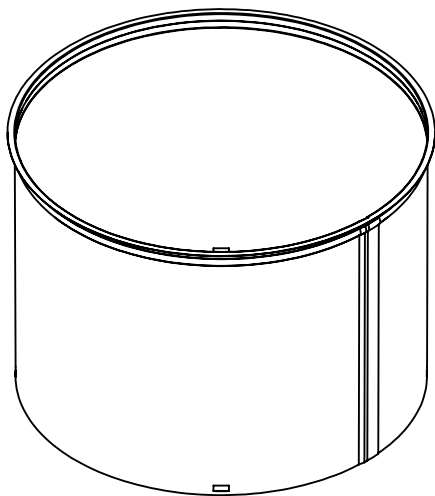
The supplier shall deliver the material with a certificate, in which as a minimum the following values for the batch in question are stated:

Testing:	Limit value:
Specific gravity	1.30 – 1.37
Appearance	Grey, homogenous, viscous mass
Extrusion rate	70 – 150 g/min. (2.47 – 5.29 oz/min)
Tensile stress at 25% elongation	0.25 – 0.70 MPa (36.26 psi – 101.53 psi)
Tensile stress at breakage	Min. 0.80 MPa (116.03 psi)
Cohesion failure	Min. 90%
Cure depth after 24 hours	0.15 – 0.51 cm (0.059 – 0.201 in.)

As to tensile strength at 24% elongation the supplier shall state either the value measured for each batch or guarantee that the material forwarded is within a minimum value. The minimum value stated by the supplier must meet the requirements of item 2.1.6. If the tensile strength at 25% elongation is not tested for each batch the supplier shall make such tests at least once a month.

All measurements must be carried through at 23 ±3°C (73.4±5°F) and 50 ±5% RH.

Besides the batch numbers of the material, number of barrels and supplier's approval signature must appear from the certificate.



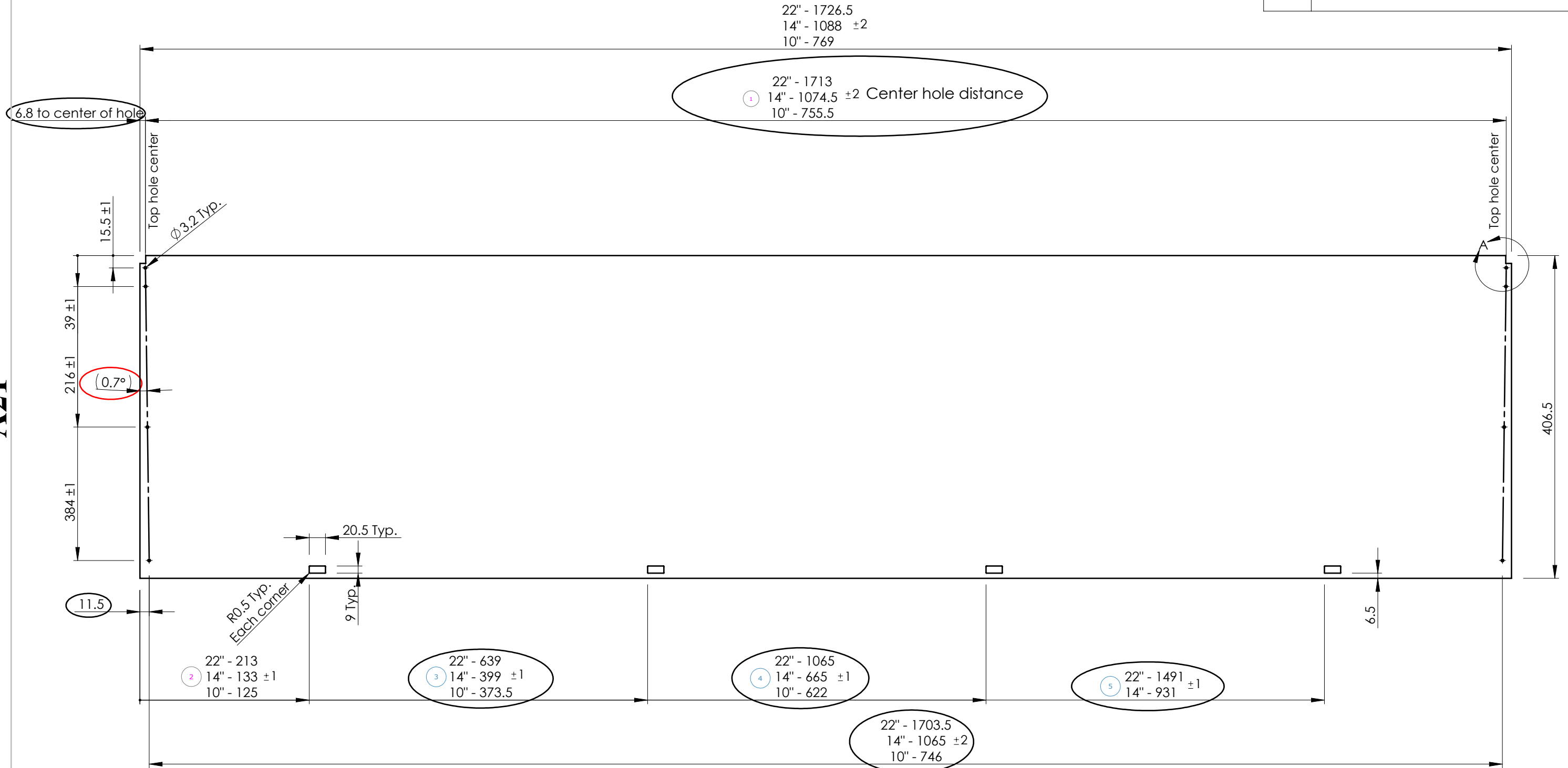
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Edition	Description of change	Date

Material				Specifications - generally			
0.016" (.41mm) 4270 AG mirrored silver				High Reflectance Material for tubular		309048.64	
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648				ST13			
Approvals				16" Collar Profile			
Checked by/drawn by/date /REC/05.11.2012				Product instructions no.			
Scale 1:10	Unspec. meas. mm	General tolerance ±0.5	Size A	Category 21	304647	000	00 01

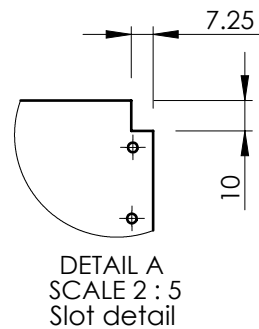
Edition	Description of change	Date
02	Added detail A. Revised 14" slot placement	1/21/13
03	Changed angle dim. on holes from .5° to .7°, changed slot dimensions	2/14/13

A21



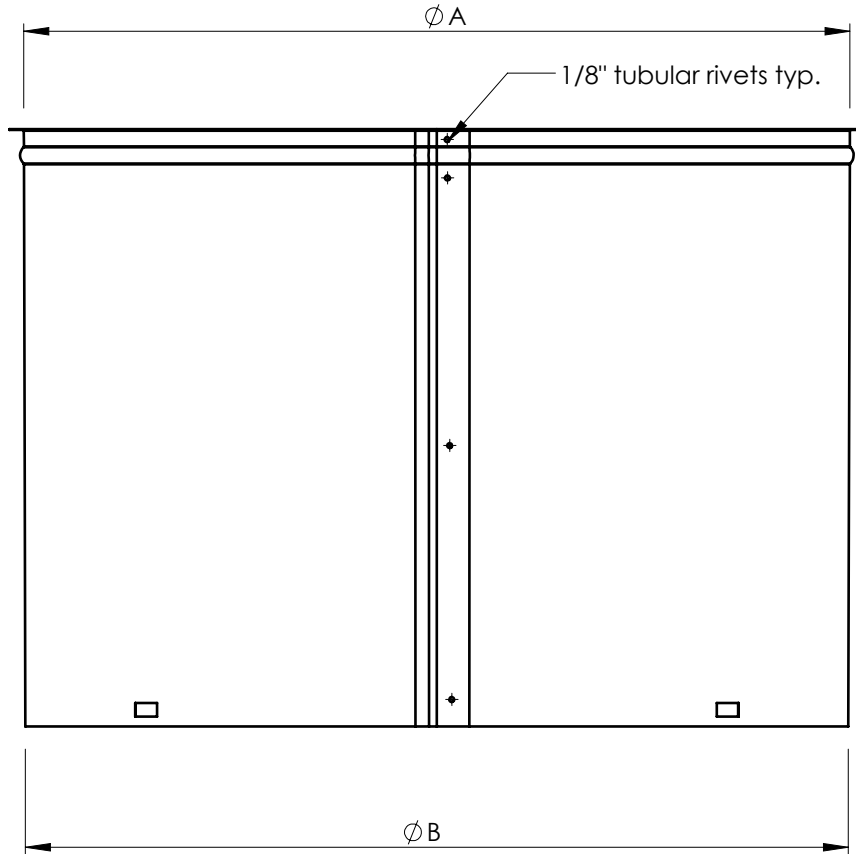
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Strip width = 16"



Material				Specifications - generally			
0.16" (.41mm) Aluminum				High Reflectance Material for tubular		309048.64	
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648				ST13			
Approvals TMA-A				16" Collar Punching			
Checked by/drawn by/date /REC/18.02.2013				Product instructions no.			
Scale 1:5	Unspec. meas. mm	General tolerance ±0.5	Size B	Category 21	304647	000	52 03

Edition	Description of change	Date
02	Added 21" size/added P/N column	1/20/14



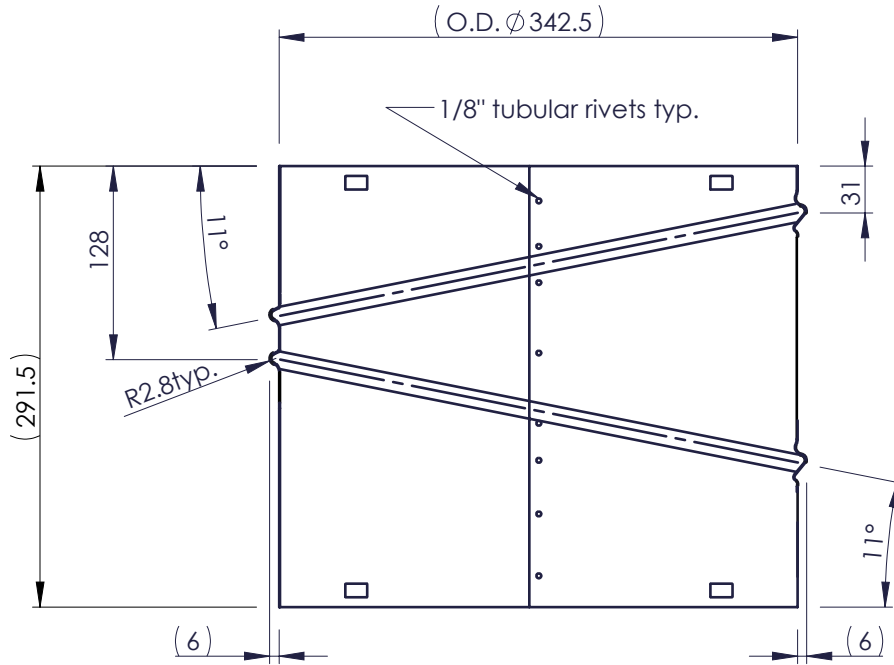
Size	ϕA	ϕB	16" P/N	4" P/N
10"	$\phi 240.5$ max. O.D.	$\phi 238.5$ O.D.	30467010	30465710
14"	$\phi 342.5$ max. O.D.	$\phi 340.5$ O.D.	30467014	30465714
21"	$\phi 515.5$ max. O.D.	$\phi 513.5$ O.D.	N/A	30465721
22"	$\phi 545.5$ max. O.D.	$\phi 543.5$ O.D.	30467022	30465722

Notes:

1. 22" diameter X 16" tall shown
2. 21" does not require notches

VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648				ST13 Collar Finished drawing				VELUX America LLC CONFIDENTIAL			
Approvals				Product instructions no.							
Checked by/drawn by/date /REC/20.01.2014				Category 21				Operation 022		Edition 52 02	
Scale 1:5	Unspec. meas. mm	General tolerance ±1.0	Size A	304647							

Edition	Description of change	Date
02	Made O.D. a reference dimension	4/8/13
03	Added TMA/SI to approvals	8/6/13



Notes:

1. Elbow must be able to rotate and not easily pull apart.
2. Gore detail is determined by tooling provided by supplier.

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VELUX SKY-PRS
450 Old Brickyard Rd., Greenwood, South Carolina 29648

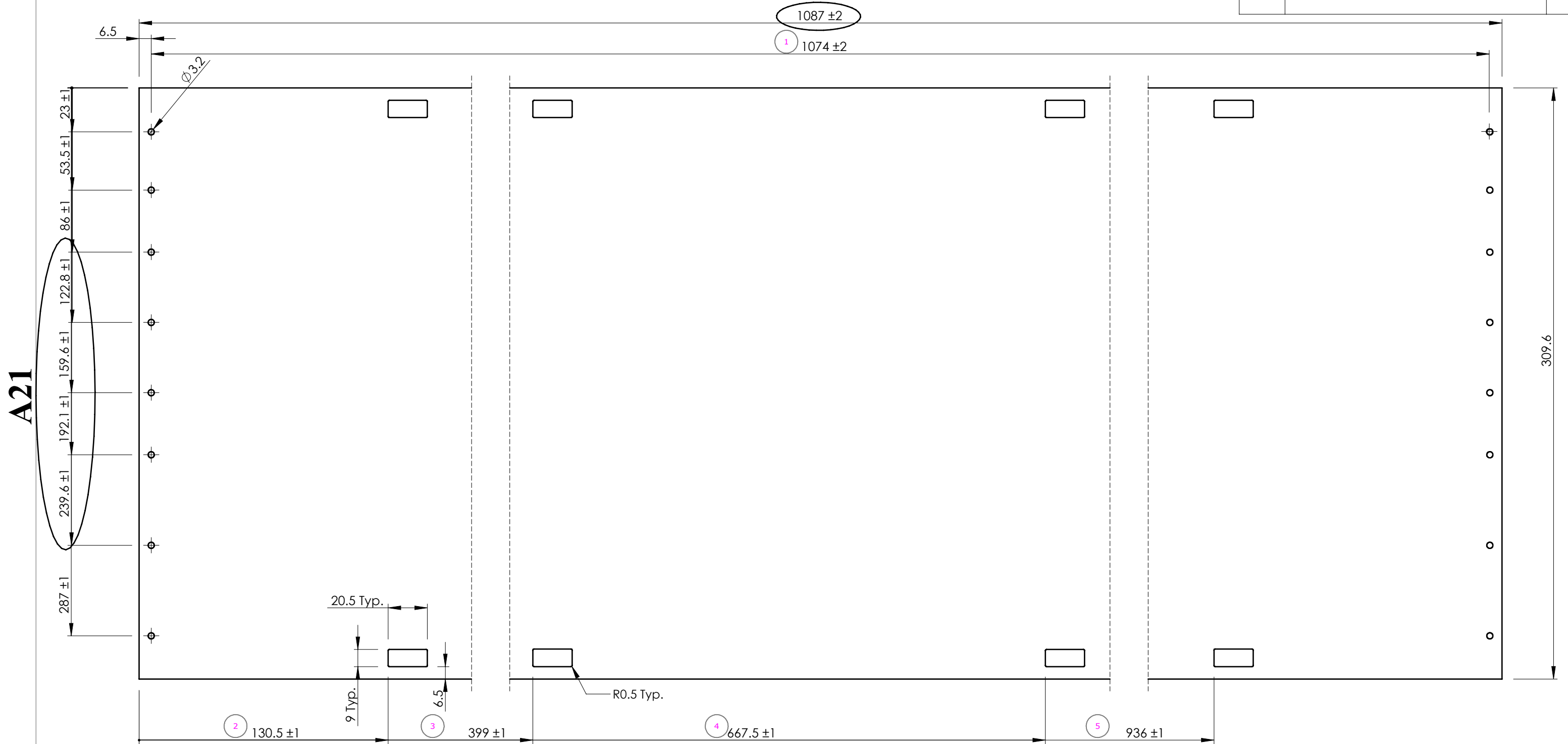
Approvals
TMA/SI

Checked by/drawn by/date
/REC/28.08.2013

Scale 1:5	Unspec. meas. mm	General tolerance ±0.5	Size A
--------------	---------------------	---------------------------	-----------

Specifications - generally			
High Reflectance Material for tubular	309048.64		
<u>TGR, TMR, TSR, TTK</u>			
14" Elbow			
Product instructions no.			
Category		Operation	Edition
21	304649	014 00	03

Edition	Description of change	Date
02	revised dimensions to match vendor supplied part	1/21/13



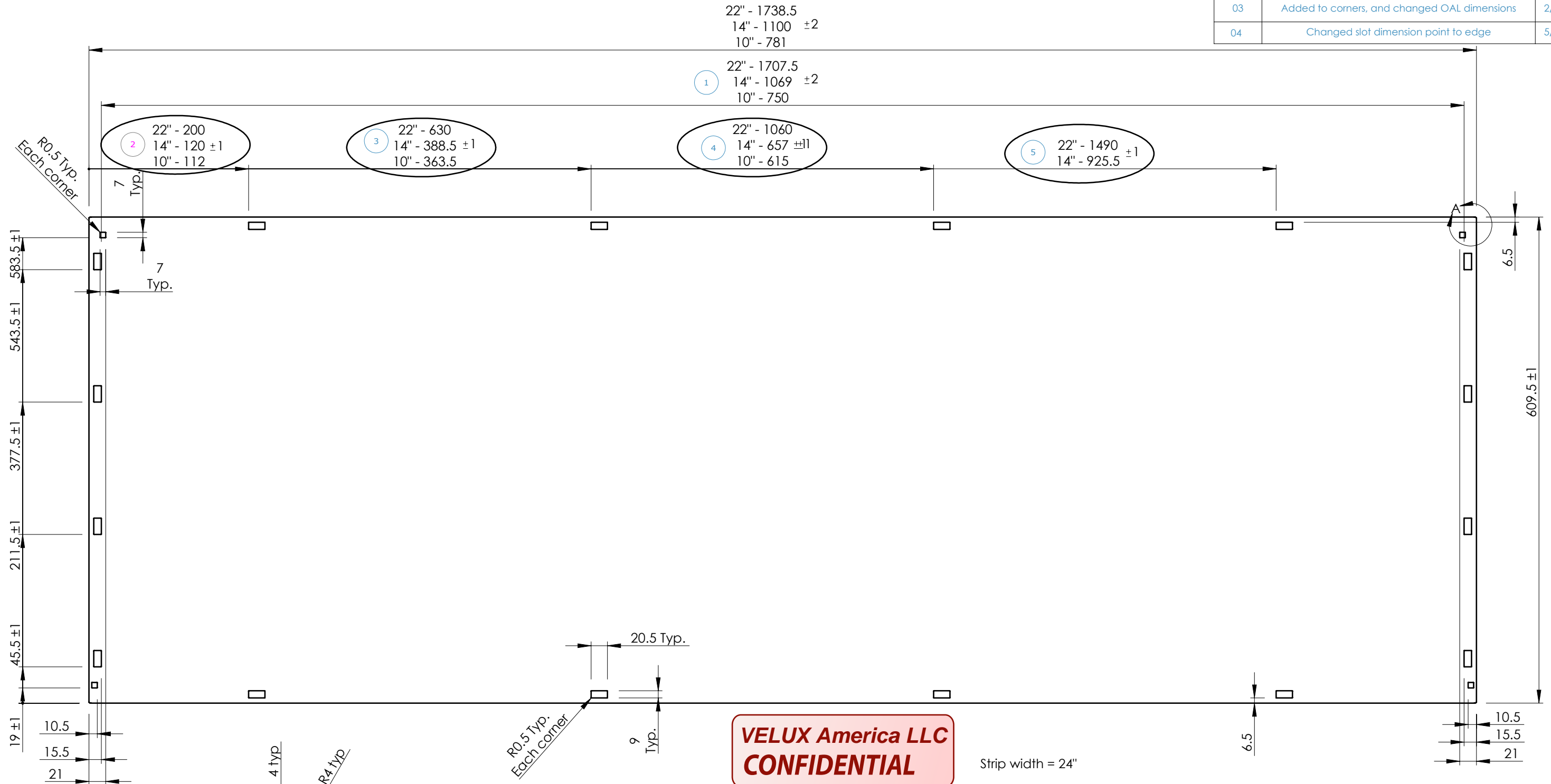
A21

Strip width = 12.19"

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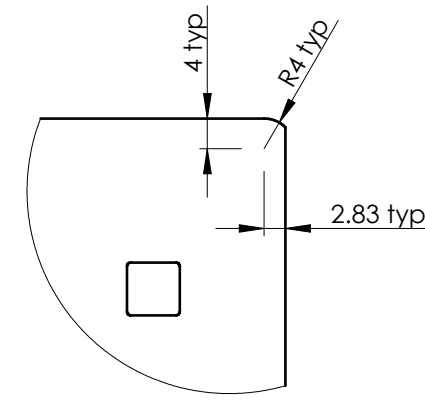
Material				Specifications - generally			
0.020" (.51mm) Aluminum				High Reflectance Material for tubular 309048.64			
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648				TGR, TMR, TSR, TTK			
Approvals TMA-A				14" Elbow Punching			
Checked by/drawn by/date /REC/28.08.2013				Product instructions no.			
Scale 1:5	Unspec. meas. mm	General tolerance ±0.5	Size B	Category 21	304649	014	52
				Operation	52	Edition	02

Edition	Description of change	Date
02	Added rolled radius dimensions	1/16/13
03	Added to corners, and changed OAL dimensions	2/4/13
04	Changed slot dimension point to edge	5/9/18

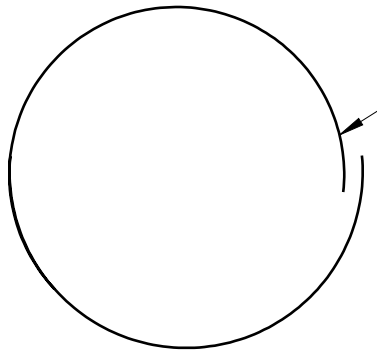


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Strip width = 24"



DETAIL A
SCALE 1:1

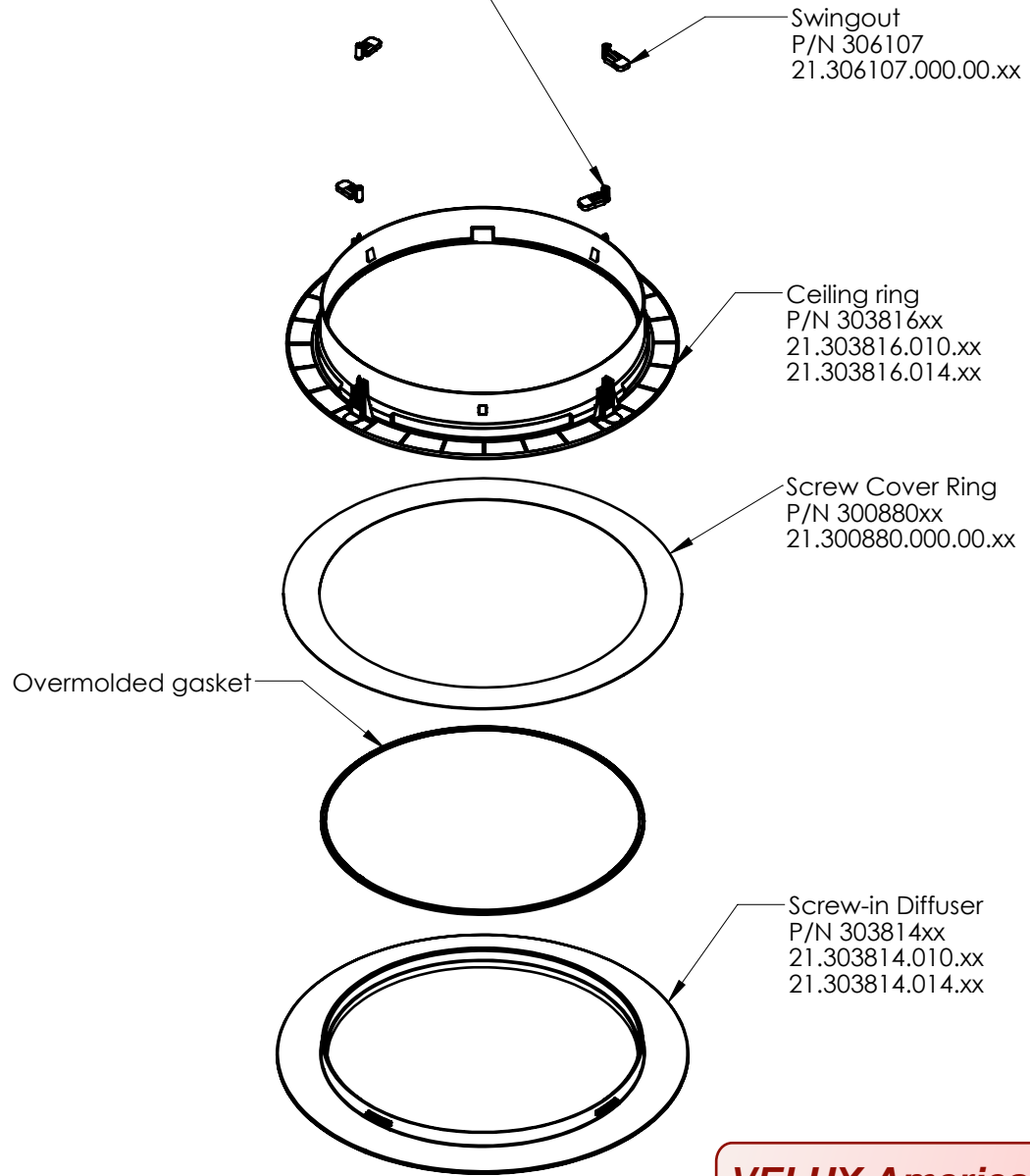


Roll to radius
R122mm 10"
R173mm 14"
R274mm 22"

Material		Specifications - generally			
.016" (.41mm) Aluminum		High Reflectance Material for tubular	309048.64		
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648		TMR, TGR, TLR, TSR			
Approvals TMA-A		Tube Punching			
Checked by/drawn by/date /REC/09.05.2018		Product instructions no.			
Scale 1:5	Unspec. meas. mm	General tolerance ±0.5	Size B	Category 21	304646
		000	52	04	

Edition	drawn by/checked by/date	Description of change
02	MM/CBB/6/24/19	Added screw cover ring

Placement of screw
P/N 306238
#8 Phillips drive screw, 2 1/4" length
pan head, mat'l - clear zinc.
Screw fastens swingout and flipper to ceiling ring

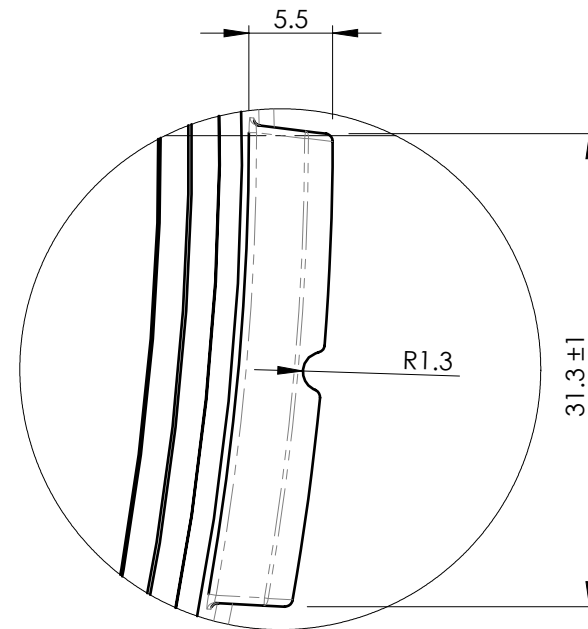
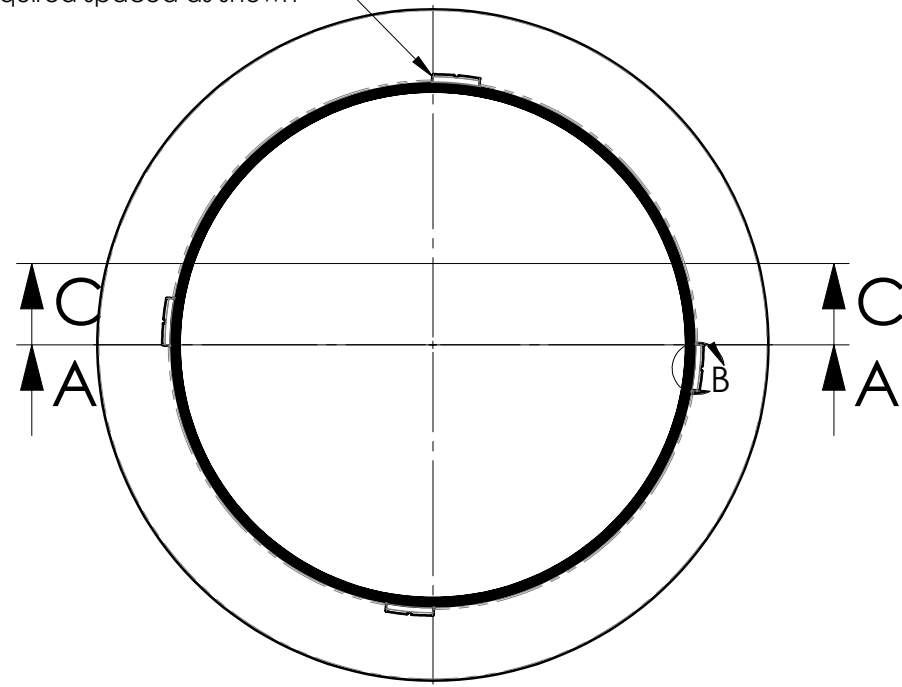


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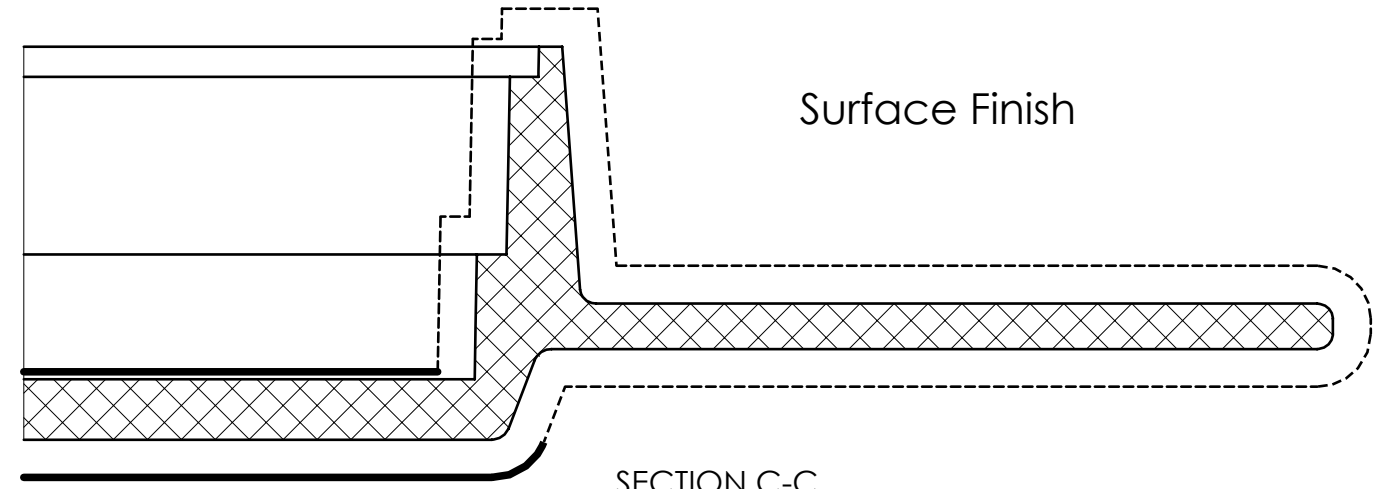
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648				<u>ST13-G</u>				
Approvals				Ceiling diffuser complete Part assembly drawing				
Checked by/drawn by/date BBK/CBB/22.09.2017				Product instructions no.				
Scale 1:8	Unspec. meas. mm	General tolerance ± 0.5	Size A	Category 21	304836	000	51	02

Edition	Description of change	Date
02	Changed height and surface finish	6/19/18

4 required spaced as shown



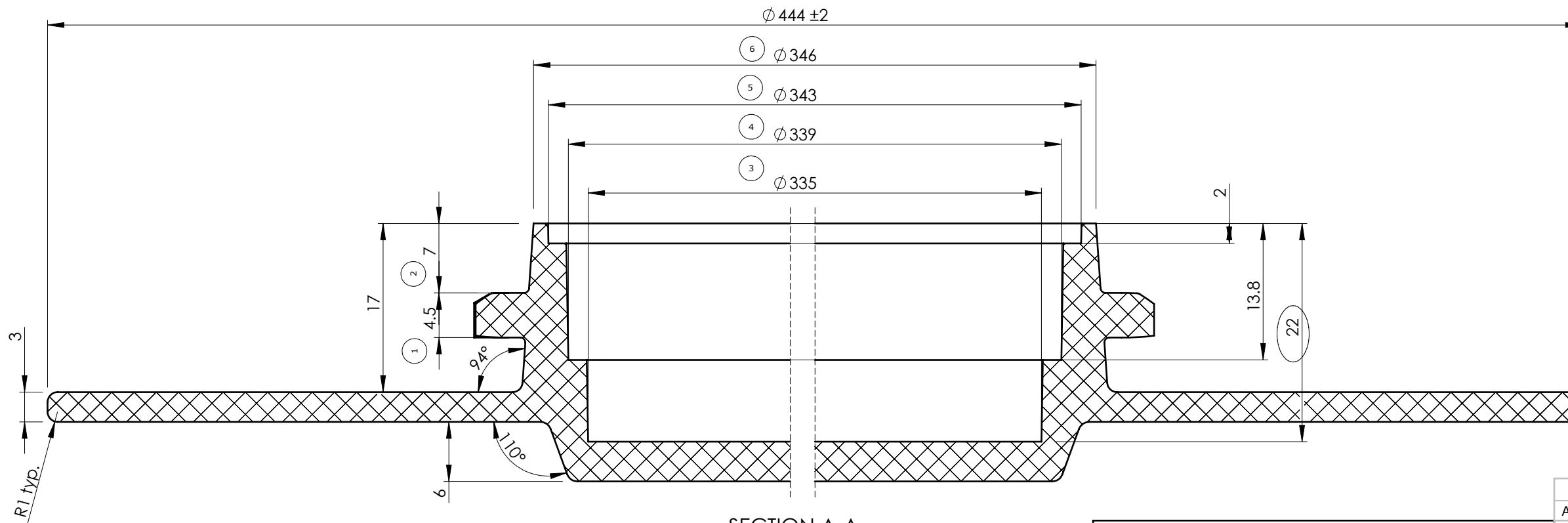
DETAIL B
SCALE 2 : 1



SECTION C-C
SCALE 2 : 1

----- = MT 11006

———— = SFI A-2



SECTION A-A
SCALE 2 : 1

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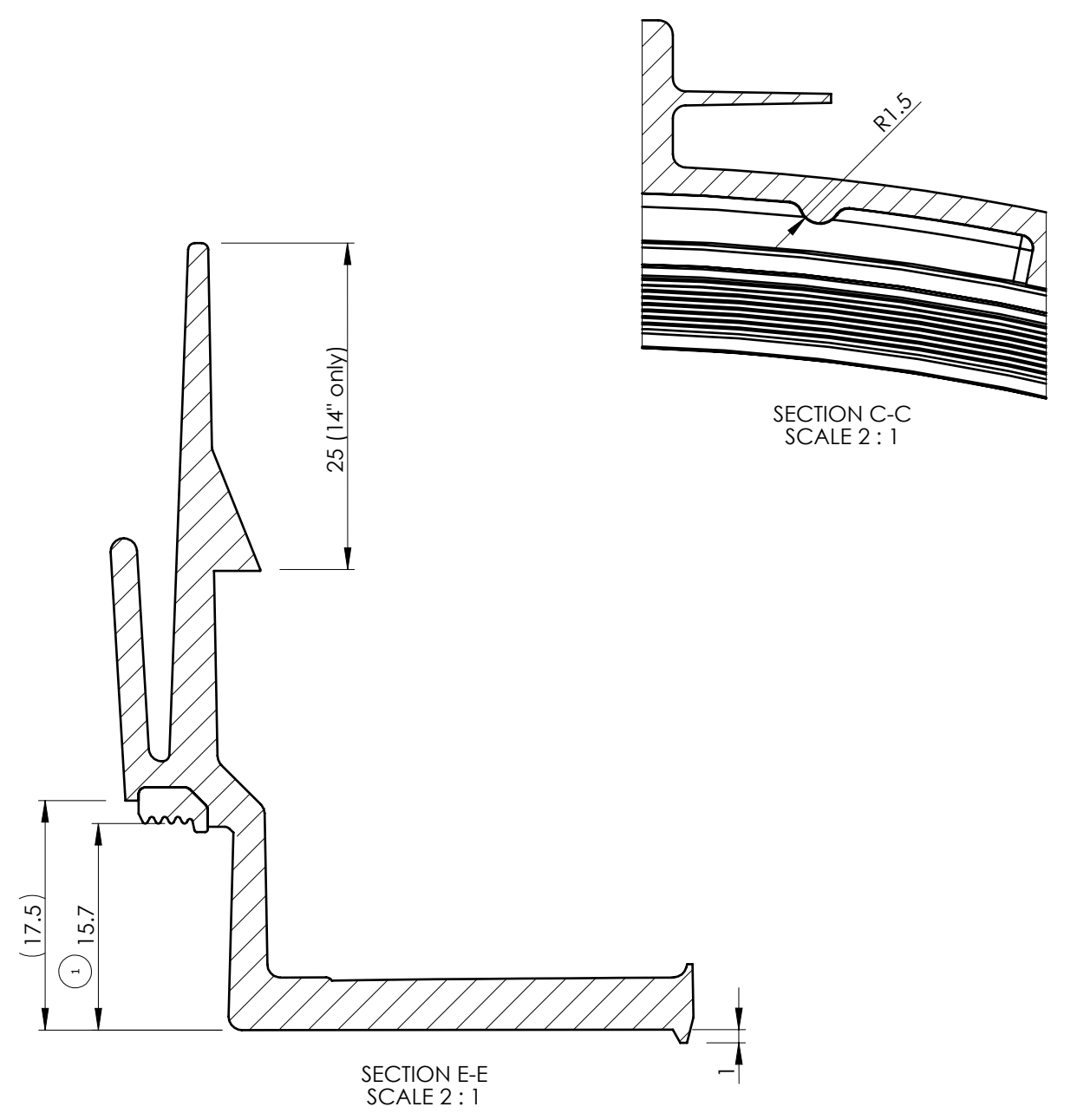
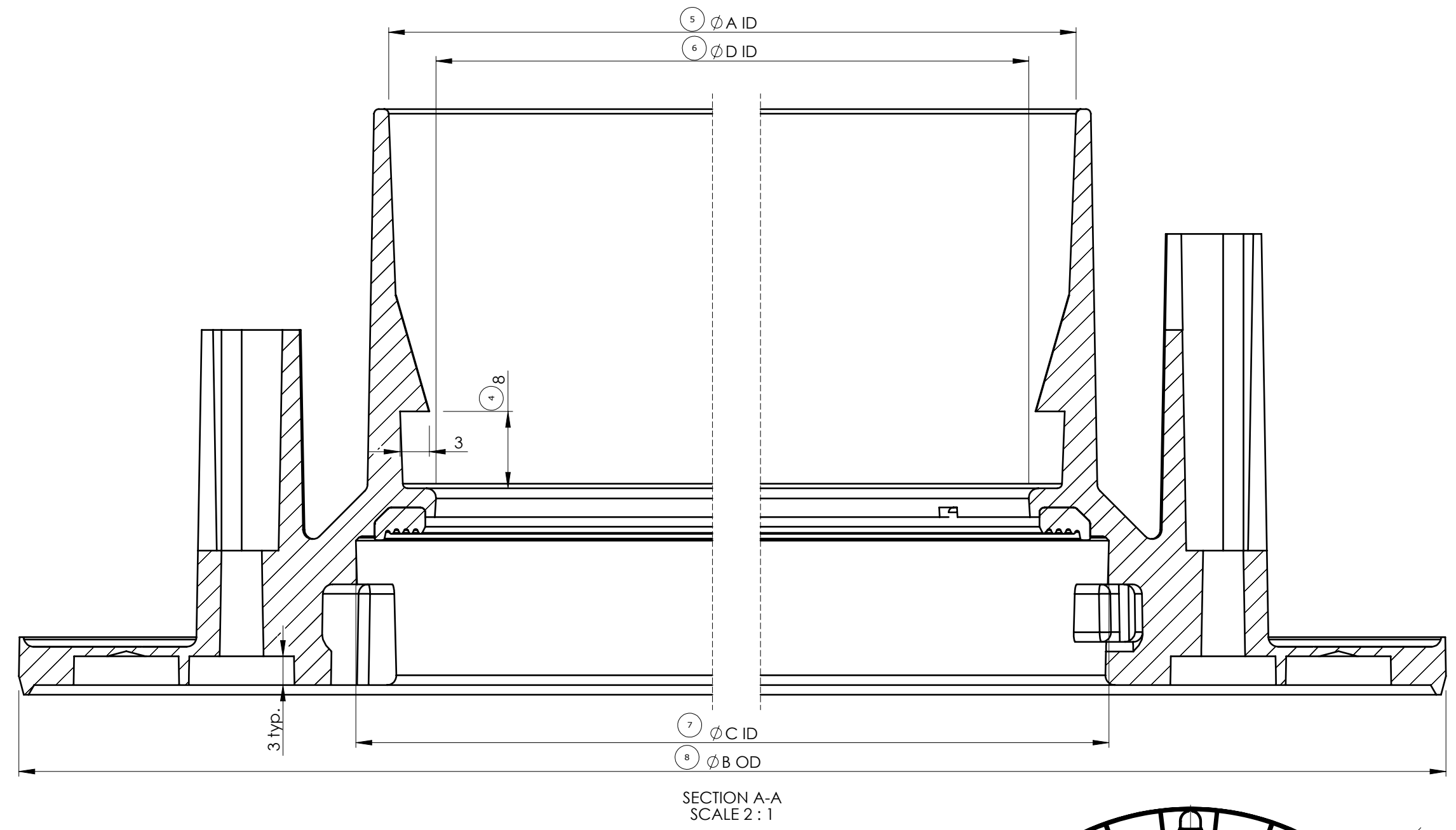
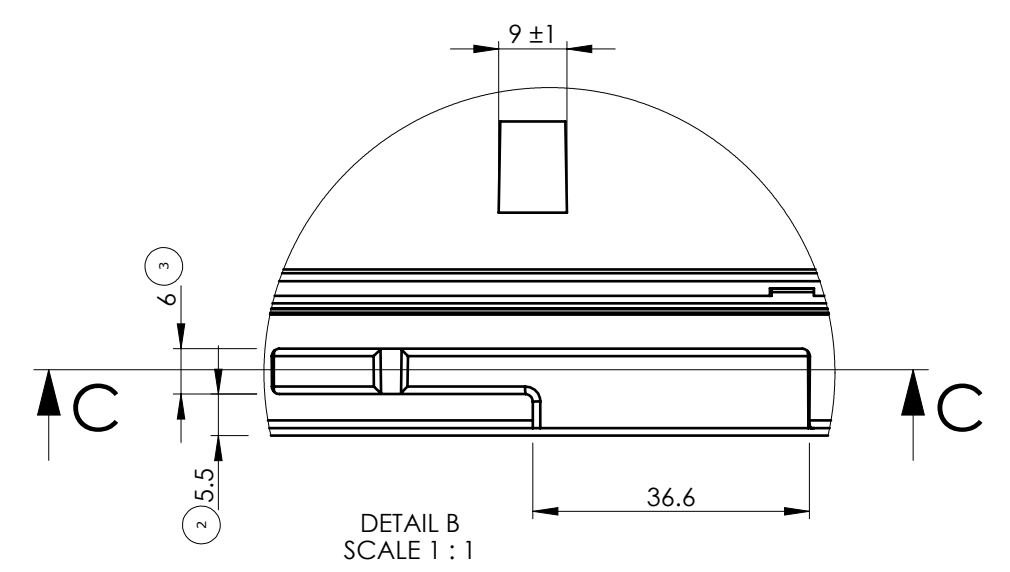
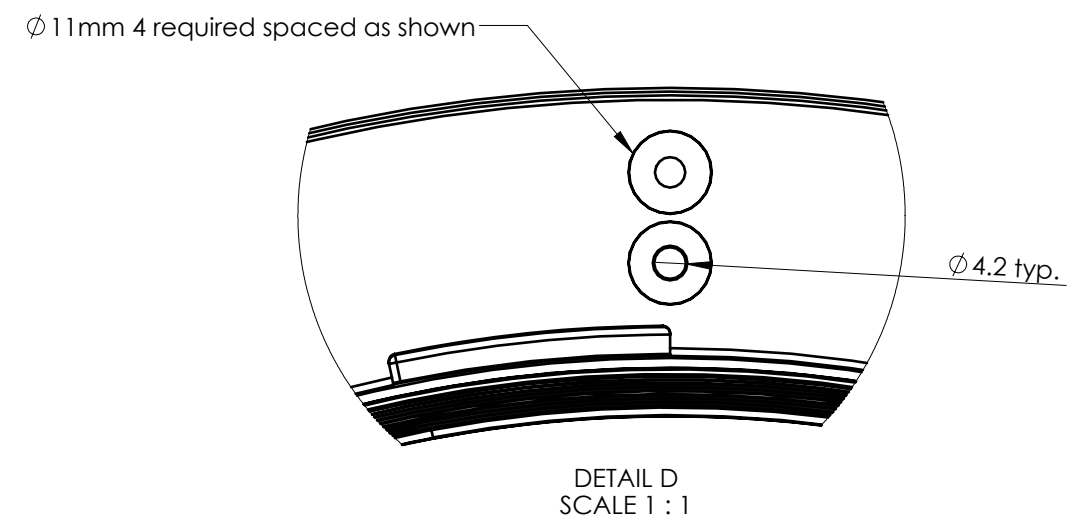
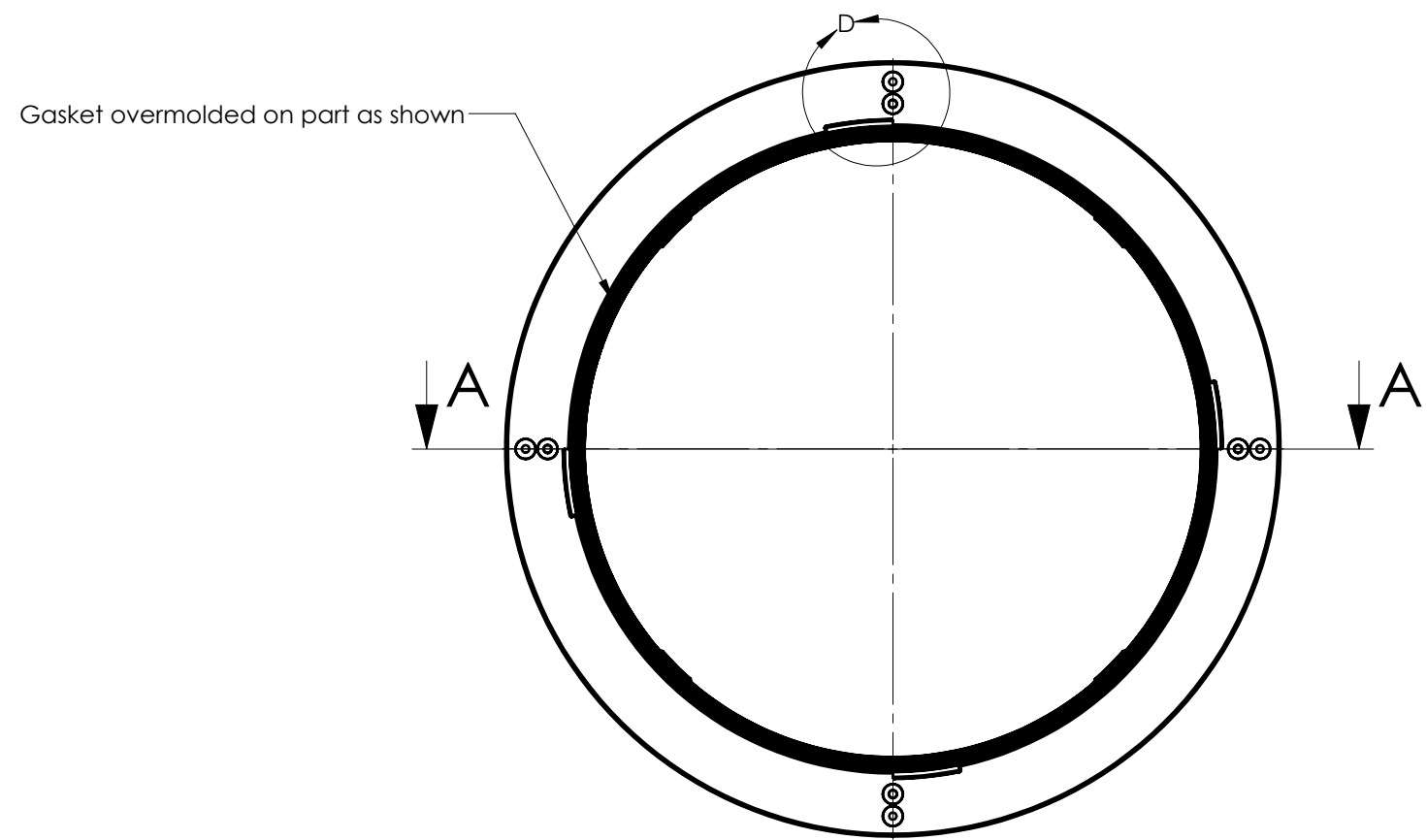
Notes:

1. Manufacture of tooling is by supplied digital file from VELUX greenwood inc. 30381414.01.sldprt
2. Acceptance of part is dependant upon fit and function with ceiling ring.

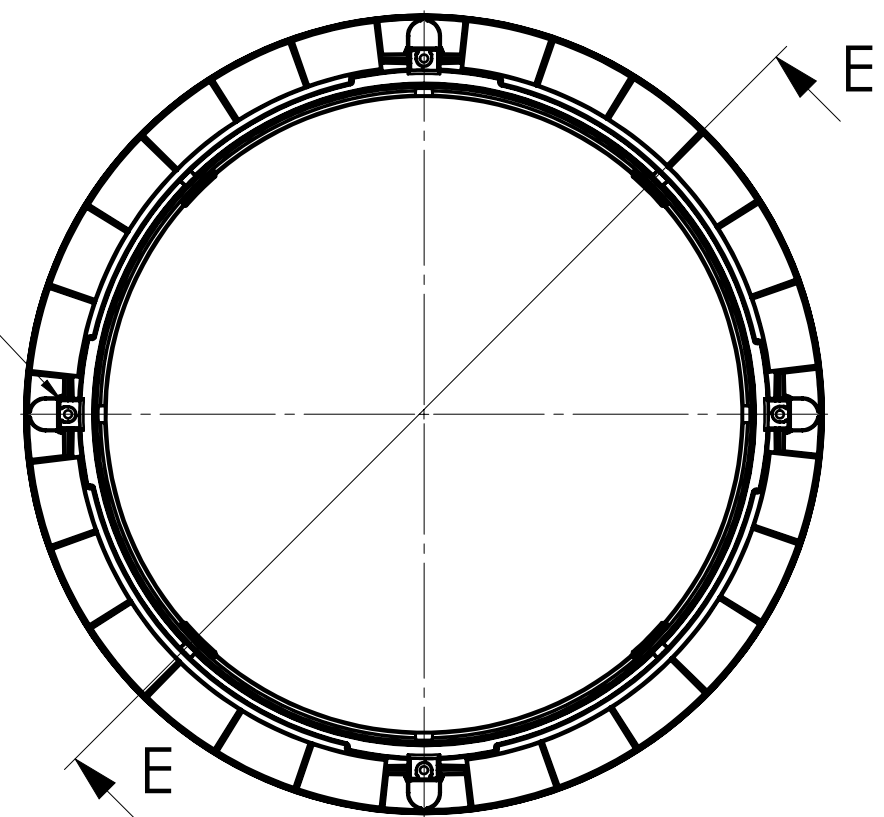
Material			
Acrylic			
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648			
Approvals TMA-A			
Checked by/drawn by/date BBK/CBB/19.06.2018			
Scale 1:5	Unspec. meas. mm	General tolerance ±0.5	Size B

Specifications - generally				
Acrylic	309038.64			
Standards - generally				
Symbol explanations	880006.68			
ST13-G				
14" Screw-in Diffuser Commodity drawing				
Product instructions no.				
Category	21	303814	014	00
Edition	02			

Edition	Description of change	Date



Size	Ø A ±0.5	Ø B ±0.5	Ø C ±0.3	Ø D ±0.5
14"	346	423	352.8	336

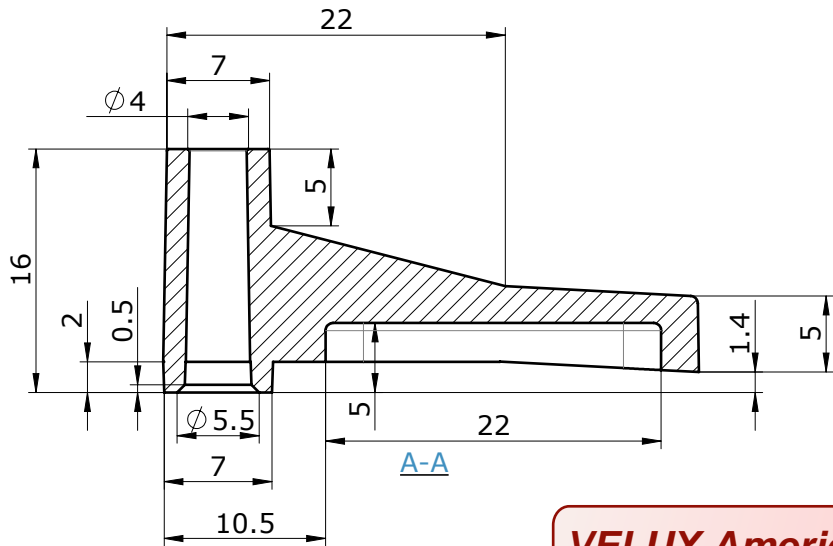
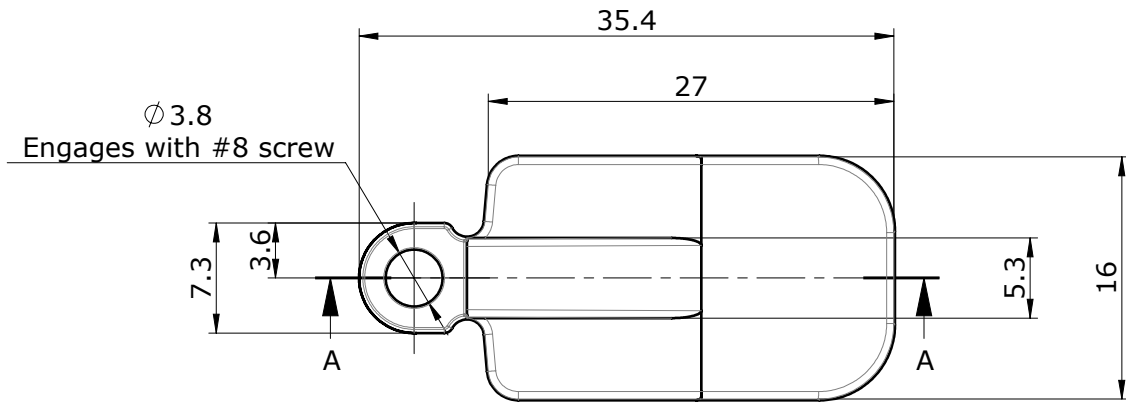


- NOTES:
1. Manufacture of tooling is by supplied digital file from VELUX greenwood inc. 30381614.01.SLDPRT.
 2. Surface finish to be SPI C-3
 3. Acceptance of part is dependent upon fit and function with the screw-in diffuser. (30381414)

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Material			
Ceiling Ring: White ABS			
VELUX		SKY-PRS	
450 Old Brickyard Rd., Greenwood, South Carolina 29648			
Approvals TMA-A			
Checked by/drawn by/date BBK/CBB/29.11.2017			
Scale 1:4	Unspec. meas. mm	General tolerance ±0.5	Size C

Specifications - generally			
Ceiling Ring: White ABS	309043.64		
Standards - generally			
Symbol explanations ST18	880006.68		
14" Ceiling Ring Commodity drawing			
Product instructions no.			
Category 21	303816	014	00 01

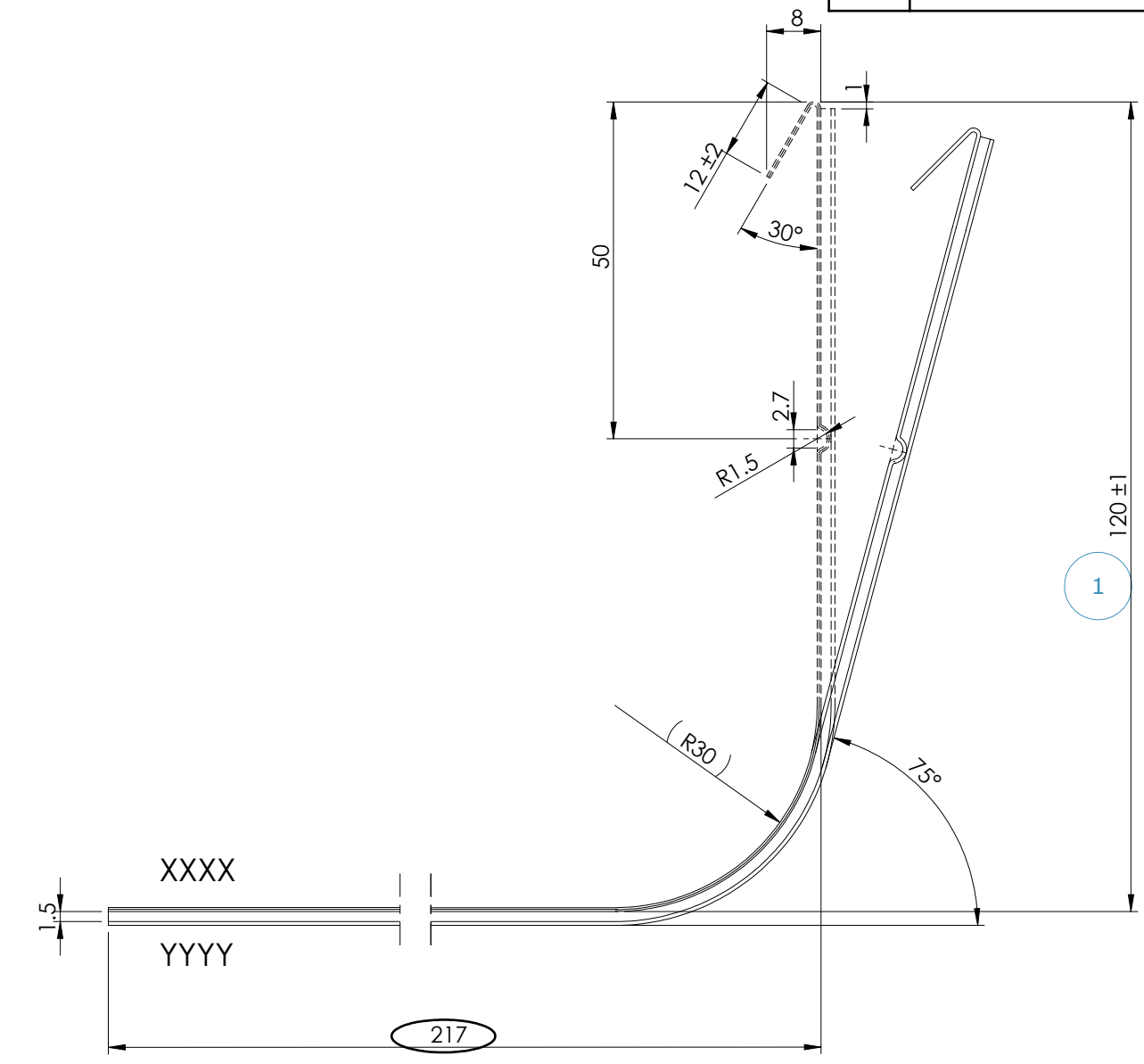
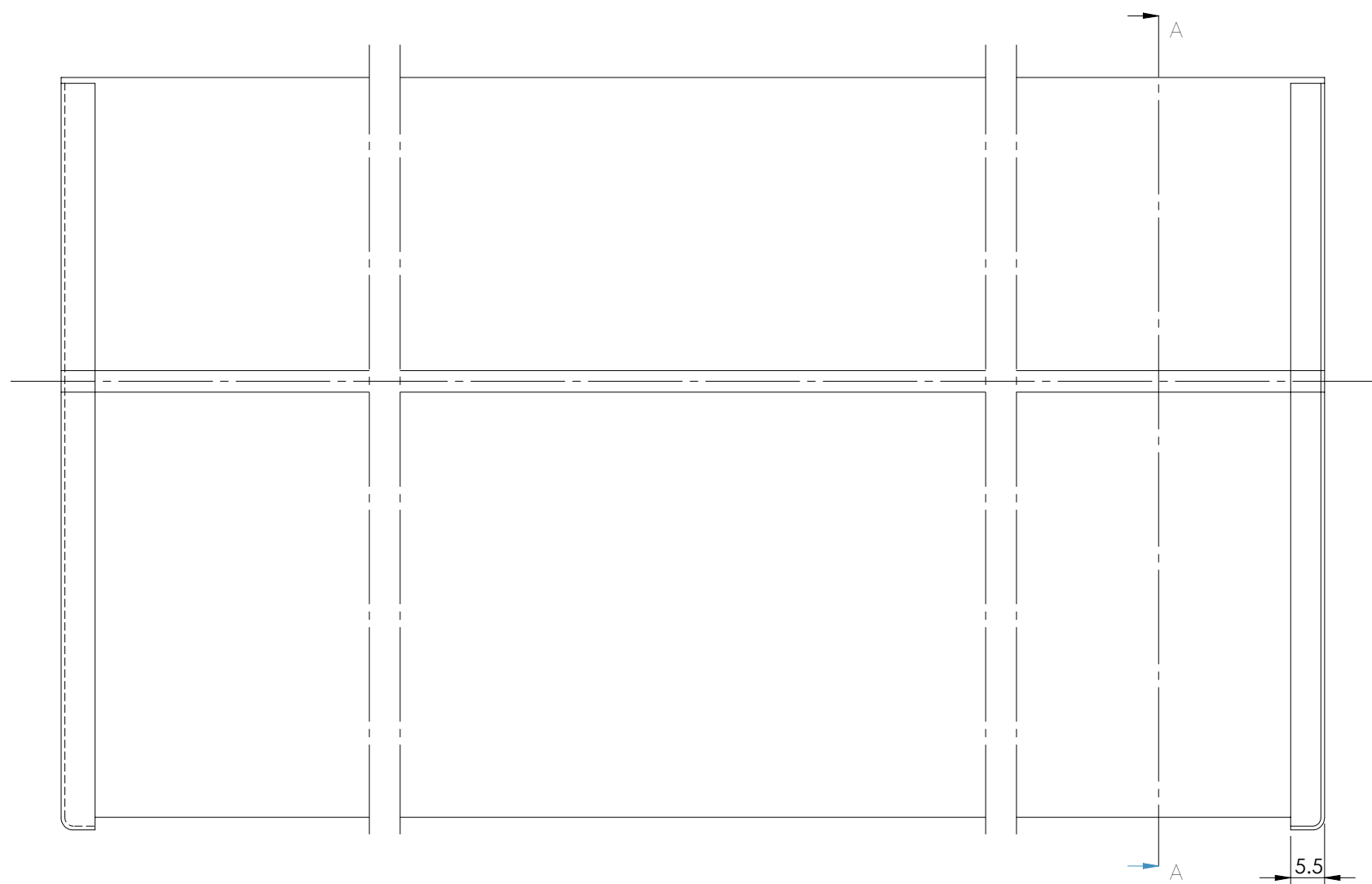


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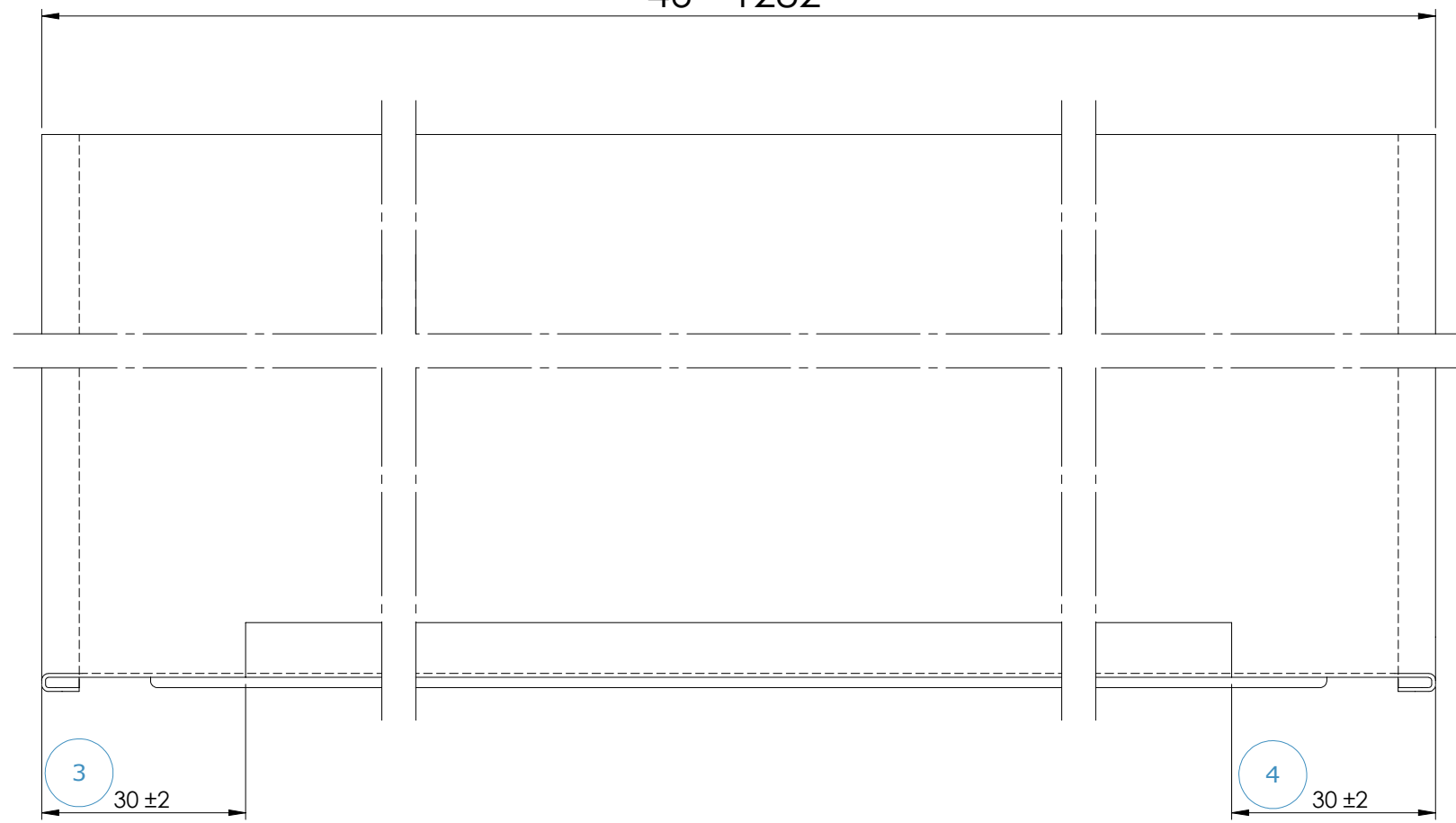
Note:
Swingout must move freely inside ceiling ring

Material				Specifications - generally				
White - nylon 10% glass				Nylon 10% glass fiber		309090.64		
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648				TGR/TGF/TMR/TMF/TLR/TCR/TSR				
Approvals				Swingout Commodity drawing				
Checked by/drawn by/date /REC/30.03.2011				Product instructions no.				
Scale 2:1	Unspec. meas. mm	General tolerance ±.5	Size A	Category 21	306107	000	00	03

Edition	Description of change	Date
03	Removed +/-2 tol. from 50mm dimension	5/22/14
04	Added dimension for fold	6/03/15
05	Changed aluminum to 335 and dimension 232 to 217	8/7/17



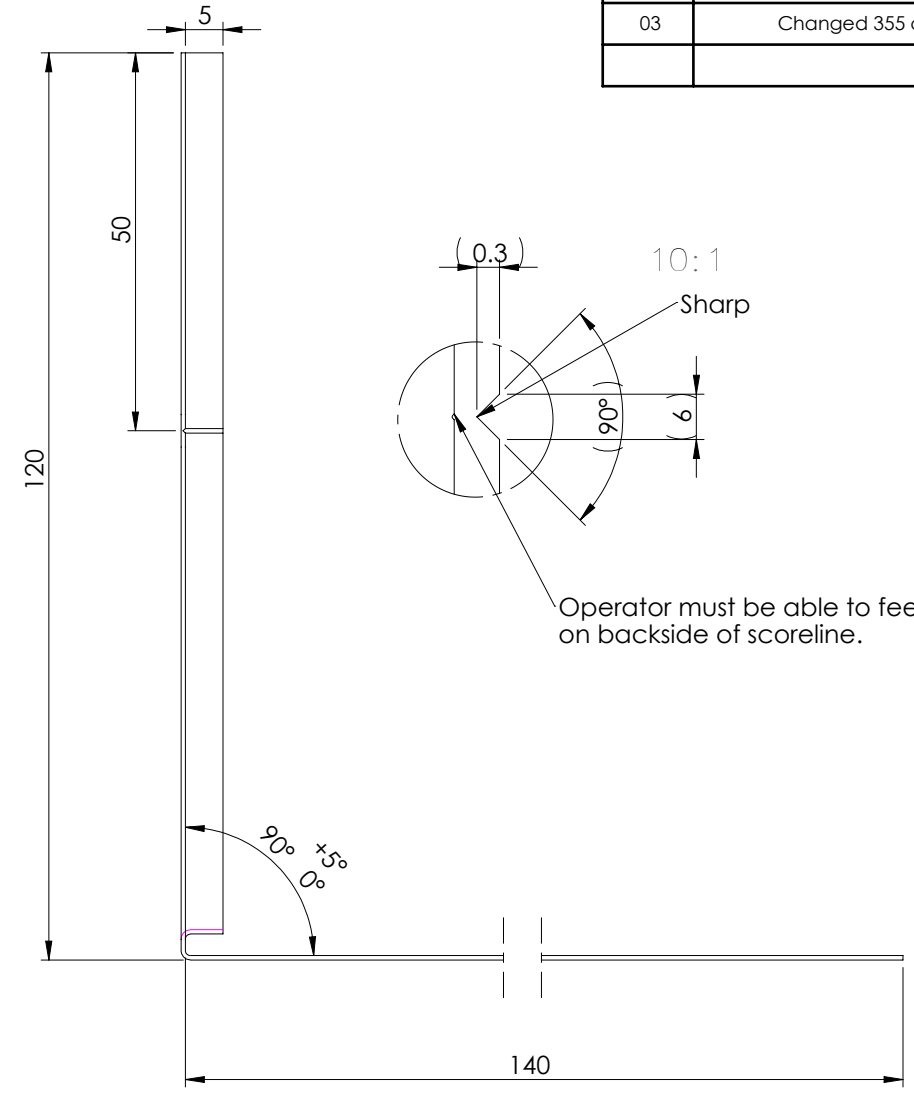
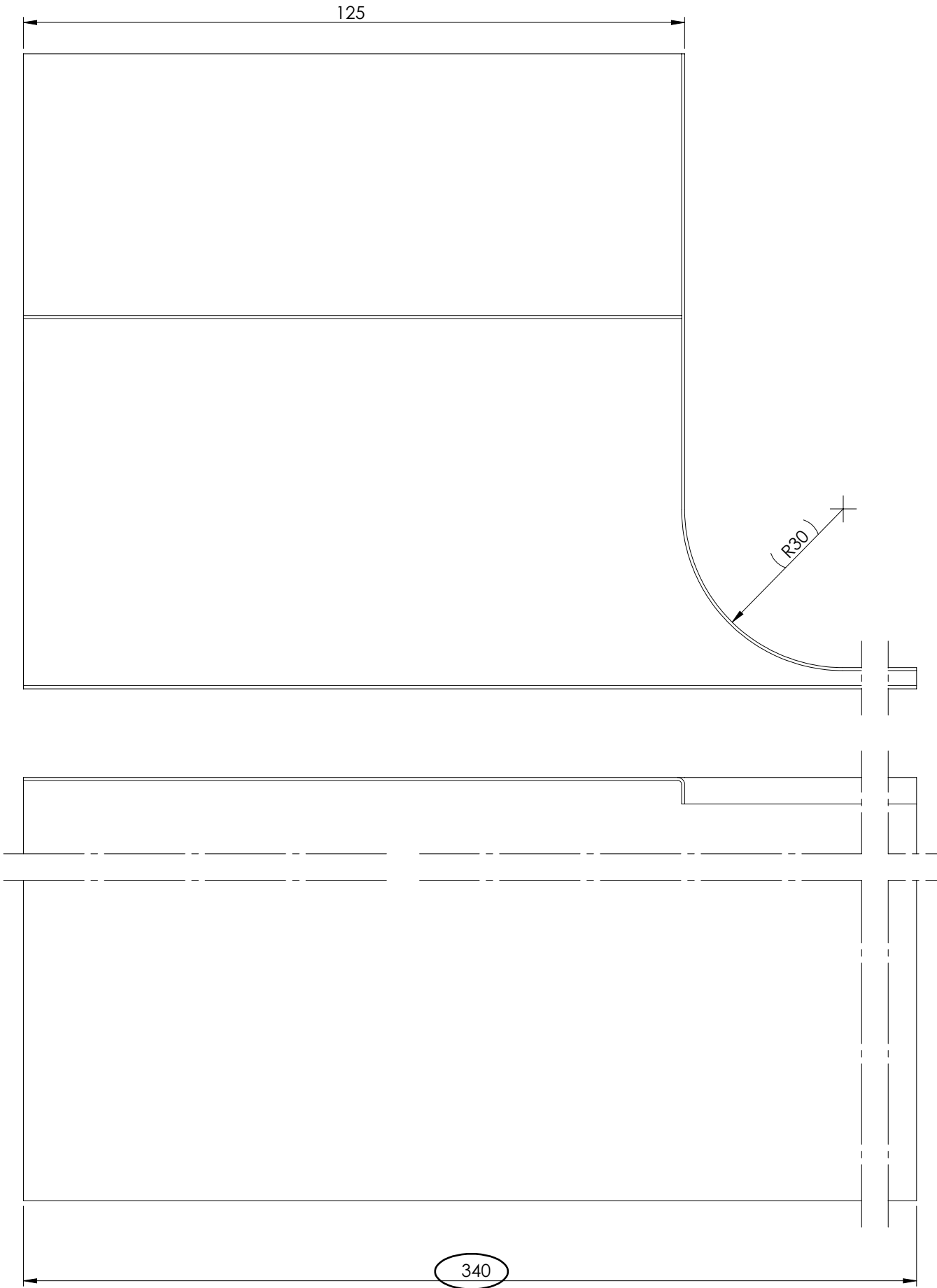
- 14-- 468.5
- 22-- 672
- 30-- 875
- 34-- 973
- 46-- 1282



XXXX= outside
YYYY= inside

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Material		Standards - generally	
0.57 x 335 Aluminum	309204.64	Symbol explanations	880006.68
VELUX SKY-PRS 450 Old Brickyard Rd., Greenwood, South Carolina 29648		ECL	
Approvals		Gutter middle piece	
Checked by/drawn by/date /CBB/21.09.2017		Bending and shearing drawing	
Scale 1:1		Product instructions no.	
Unspec. meas. mm	General tolerance ±1	Size C	Category 21
302238		00A	35 05

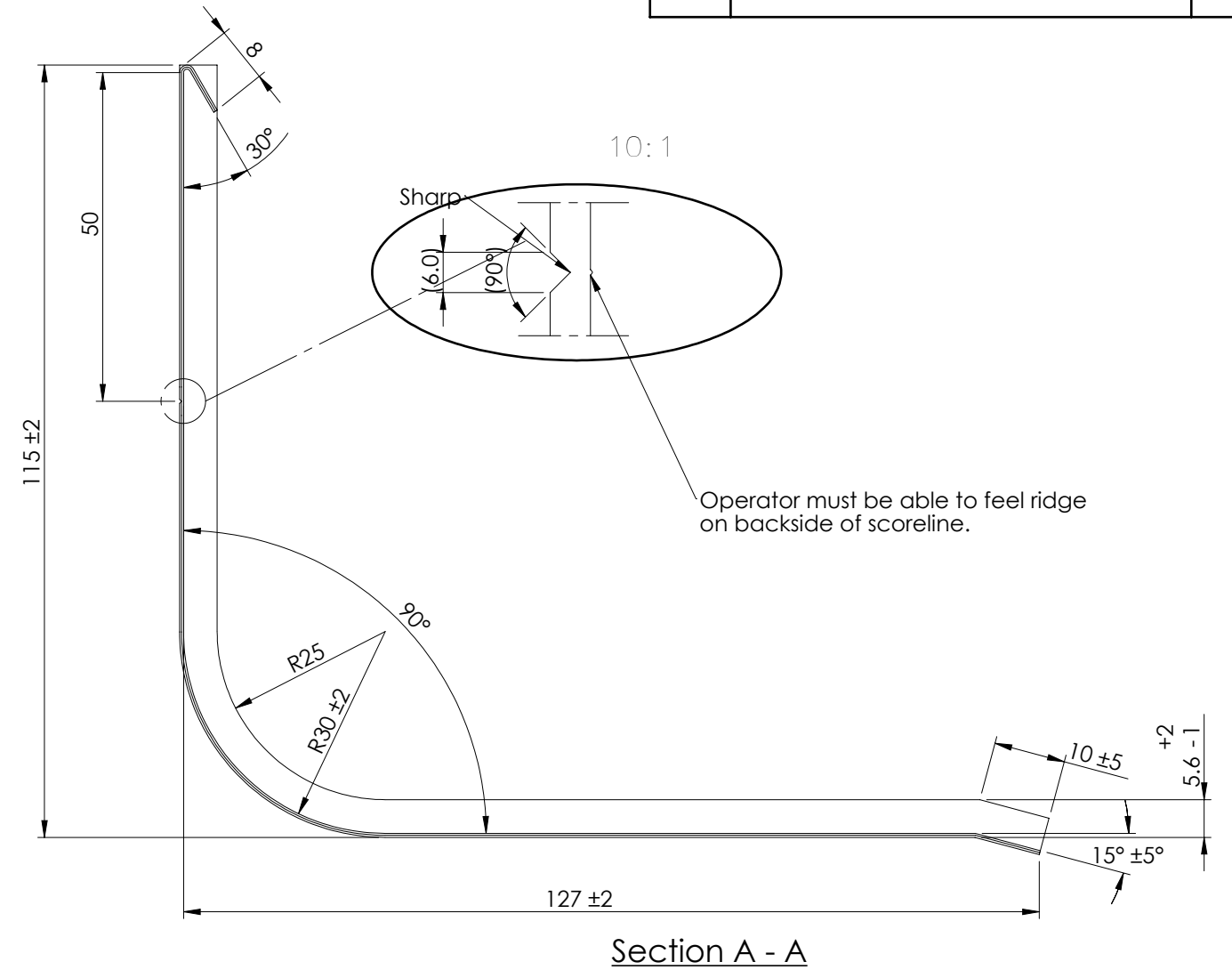
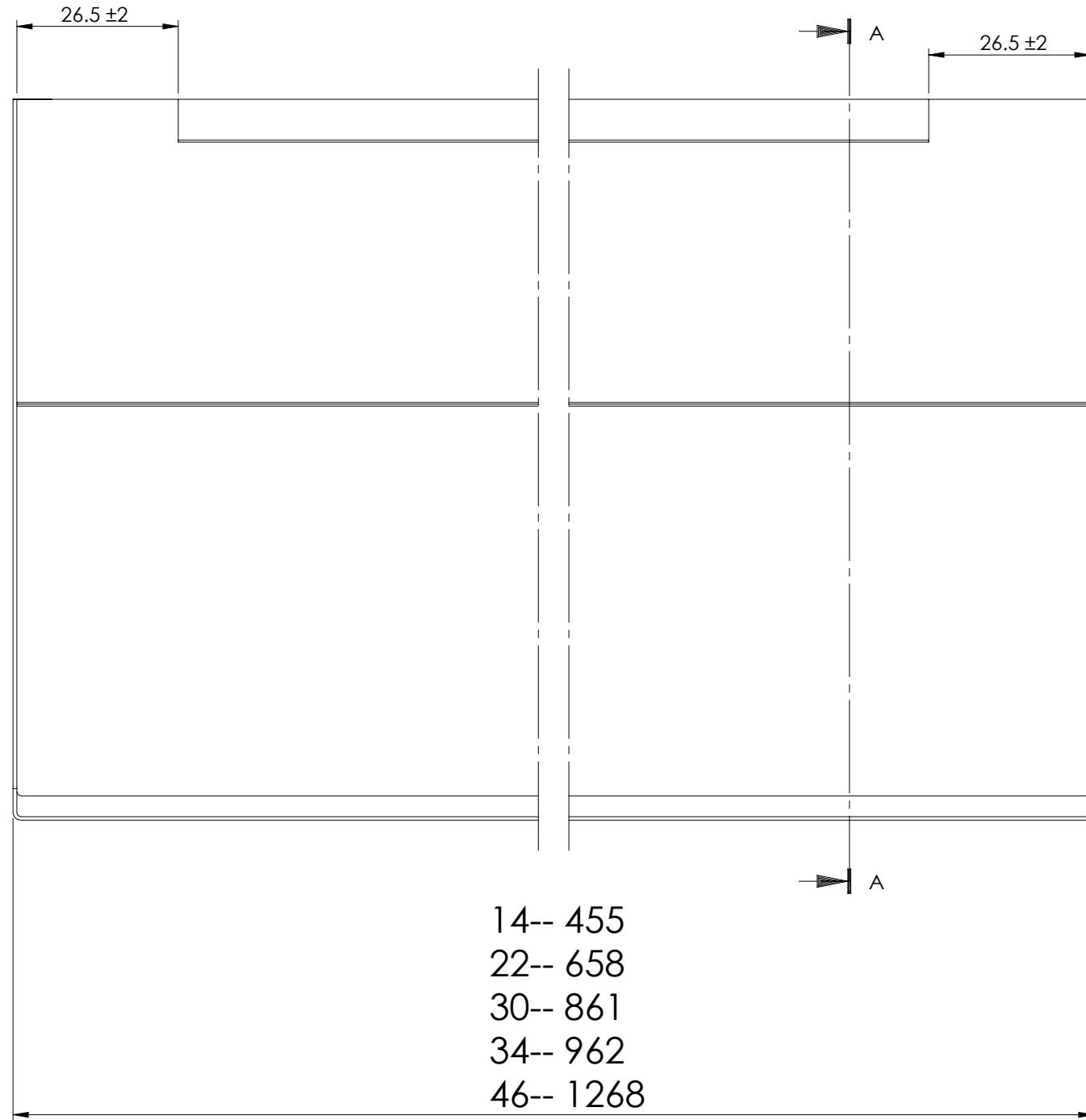


Edition	Description of change	Date
02	Removed +/-2 tol. from 50mm dimension	5/22/14
03	Changed 355 cut dimension to 340	8/7/17

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Material				Standards - generally			
Cool grey lacquered AL .057 x 259 Strip/plate				Damage to lacquered surfaces		885601.68	
VELUX SKY-PRS				Specifications - generally			
450 Old Brickyard Rd., Greenwood, South Carolina 29648				Laquered aluminum		309096.64	
Approvals				ECL			
Checked by/drawn by/date				Gutter side piece			
/CBB/21.09.2017				Commodity drawing			
Scale				Product instructions no.			
1:1	Unspec. meas.	General tolerance	Size	Category	302239	00A	35
	mm	±1	B	21			03

Edition	Description of change	Date
02	Removed +/-2 tol. from 50mm dim.	5/22/14
03	Changed scoreline location	3/11/15

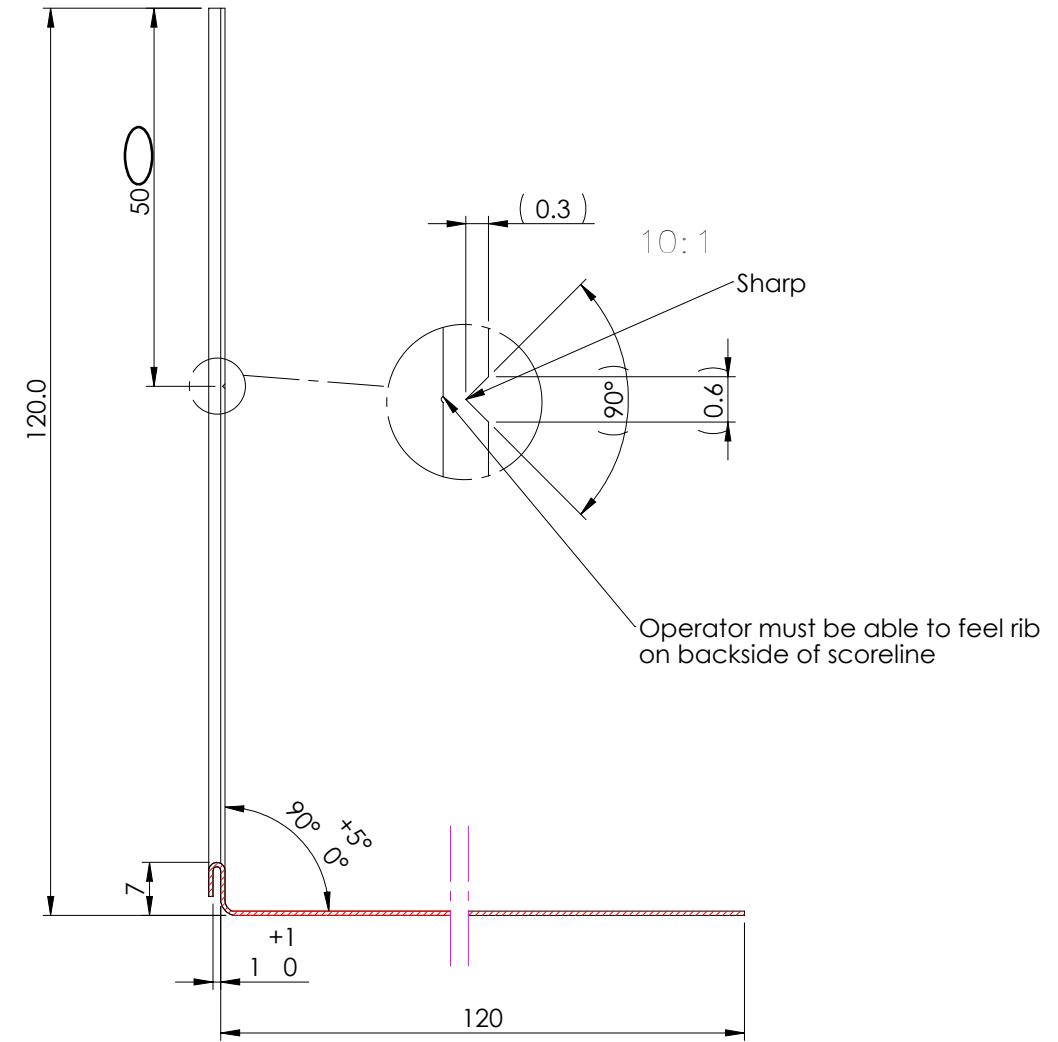
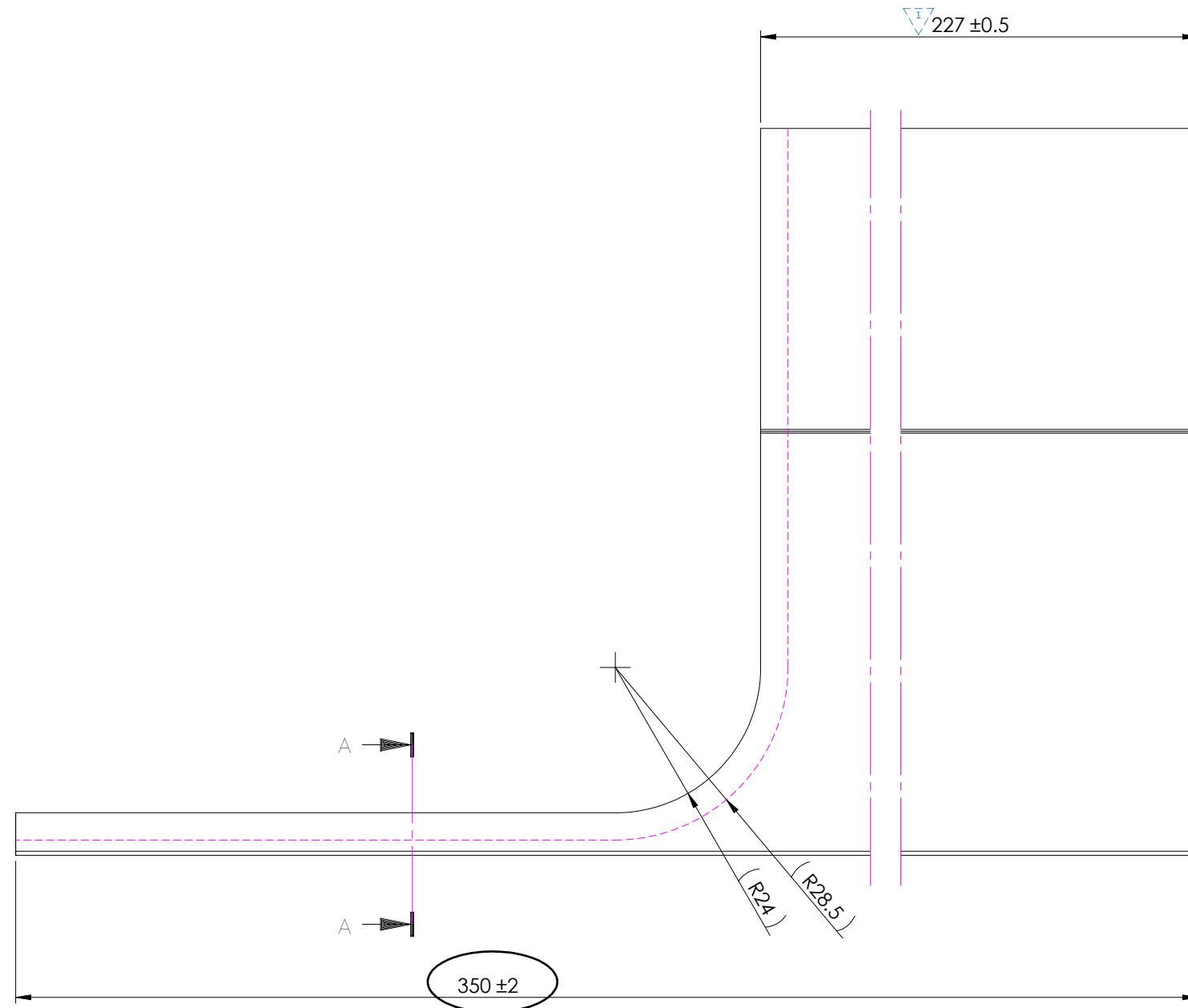


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Material			
Cool grey lacquered Al strip/plate 0.65x244			
VELUX		SKY-PRS	
450 Old Brickyard Rd., Greenwood, South Carolina 29648			
Approvals			
Checked by/drawn by/date			
/MM/11.03.2015			
Scale	Unspec. meas.	General tolerance	Size
1:1	mm	±1	B

Specifications - generally				
Laquered aluminum	309096.64			
Standards - generally				
Damage to lacquered surfaces	885601.68			
<u>ECL</u>				
Front edge middle piece				
Commodity drawing				
Product instructions no.				
Category	302240	00A	Operation	Edition
21			35	03

Edition	Description of change	Date
03	Removed +/-2 tol. from 50mm dim.	5/22/14
04	Updated dimension per quality	8/20/15

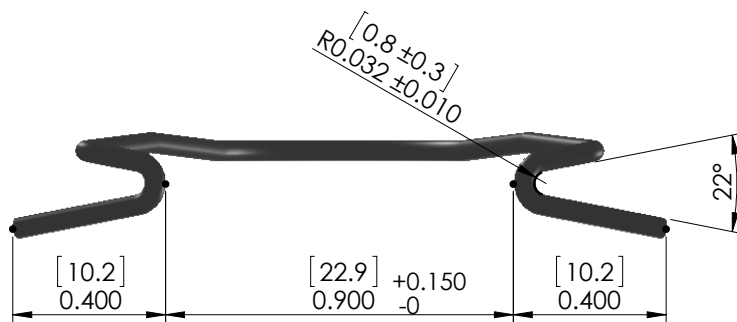
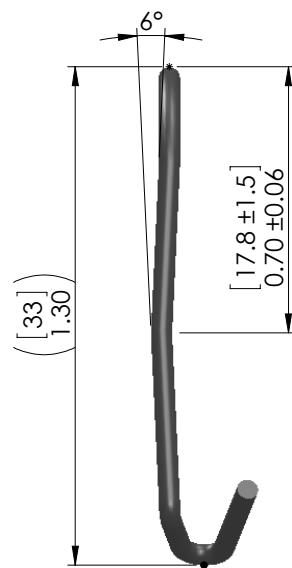
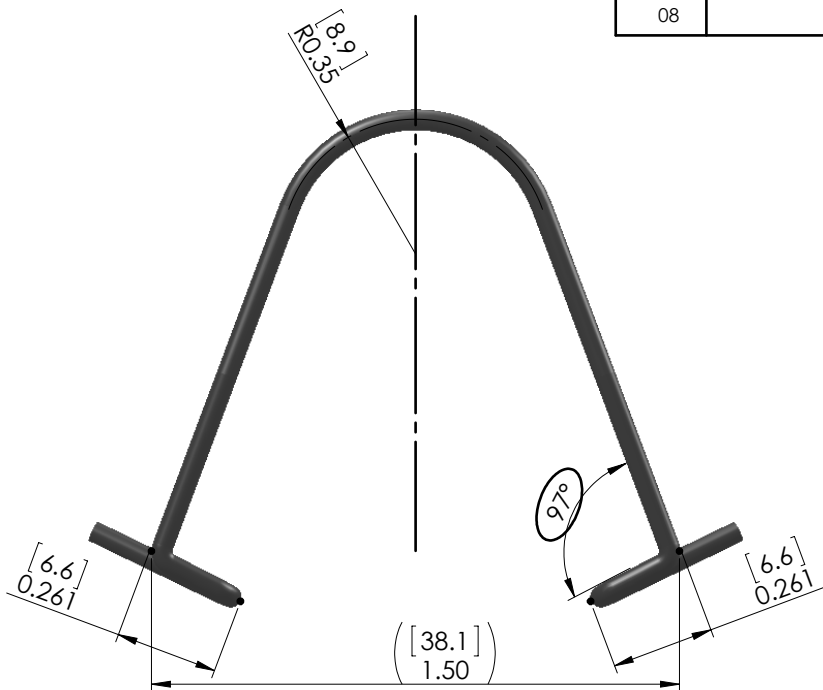


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Material			
Cool grey lacquered Al strip/plate 0.65x239			
VELUX		SKY-PRS	
450 Old Brickyard Rd., Greenwood, South Carolina 29648			
Approvals			
Checked by/drawn by/date			
/MM/20.08.2015			
Scale	Unspec. meas.	General tolerance	Size
1:1	mm	± 1	B

Specifications - generally				
Laquered aluminum	309096.64			
Standards - generally				
Damage to lacquered surfaces	885601.68			
ECL				
Front edge side piece				
Commodity drawing				
Product instructions no.				
Category	302241	000	Operation	Edition
21			35	04

Edition	Description of change	Date
04	Added SI to the approvals	8/6/13
05	Revised tol. for .900 dim. & changed .38 to .400	11/18/13
06	Added material back to drawing	2/27/14
07	Added dual dimensions	5/21/14
08	97° angle was 90°	7/16/14



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General angle tolerance $\pm 3^\circ$



Material			
302 spring tempered stainless steel (\varnothing 1.4mm)			
VELUX		SKY-PRS	
450 Old Brickyard Rd., Greenwood, South Carolina 29648			
Approvals			
TMA-A/SI			
Checked by/drawn by/date			
/REC/16.07.2014			
Scale	Unspec. meas.	General tolerance	Size
2:1	inches	$\pm .025"/.6mm$	A

TMR, TGR, TLR, TTK, ZTE, ZTR			
Pull Clip			
Product instructions no.			
Category		Operation	Edition
21	302329	000 00	08