

**NOTES:**  
 - components 1-30 are to be made at GSI  
 - components 31-62 are the HDPE parts to be made externally  
 - some components on this sheet are subassemblies

Pos.	Qua.	Name & dimensions	drawing nr./standard	Material	Mass
71	50	T-nut M8	DIN 1624	8.8	0.01
70	50	Hex screw M8x20	ISO 4762	8.8	0.01
69	2	Washer Ø 8.8x Ø 20x2	ISO 7089	Steel	0.01
68	8	Hex screw M8x25	ISO 4762	8.8	0.01
67	16	Countersunk screw M16x60	DIN 7991	8.8	0.01
66	60	Hex nut M16	ISO 4034	8.8	0.01
65	60	Washer Ø 17x Ø 30x2	ISO 7089	Steel	0.01
64	5	Hex screw M1 6x30	ISO 4762	8.8	0.01
63	25	Hex screw M1 6x55	ISO 4762	8.8	0.01
62	1	Rear insert shield 500x467x50	bottom_part_short	BurnGuard	12
61	2	Rear bottom shield 900x300x50	Bottom_part	BurnGuard	13
60	1	MR-TOF lower shield 739x254x50	Under_pipe_right	BurnGuard	7
59	1	MR-TOF inner shield 1014x513x50	Above_pipe_main	BurnGuard	18
58	1	MR-TOF outer shield 1064x513x50	Above_pipe_main	BurnGuard	19
57	1	Right outer pipe plate 900x218x50	pipe_plate_3	BurnGuard	10
56	1	Right middle pipe plate 900x283x50	pipe_plate_2	BurnGuard	12
55	1	Right inner pipe plate 900x283x85	Right_block_set	BurnGuard	14
54	1	Right block set 152x700x250	Right_bottom-2	BurnGuard	264
53	1	Right block support 152x725x90	Right_bottom-1	BurnGuard	27
52	1	Right side larger pin 149x513x50	Right_bottom-1	BurnGuard	10
51	1	Right side smaller pin 149x5100x50	Right_bottom-1	BurnGuard	8
50	2	Inner shield 765x450x50	inner_shield_borated	BurnGuard	17
49	1	Bookcase assembly 1121x615x200	block_set_left	BurnGuard	125
48	1	Left back block 1172x275x400	Left_bottom-2	BurnGuard	54
47	1	Left support shielding 775x300x89	Left_middle	BurnGuard	17
46	1	Left front block 1610x250x775	Left_bottom-1	BurnGuard	224
45	1	Front right corner block 850x195x170	corner_set_1	BurnGuard	25
44	1	Front left corner block 850x245x170	corner_set_2	BurnGuard	31
43	1	Front bottom plates 1180x362x250	Front_Brown_bar	BurnGuard	60
42	1	Front vertical plates 850x100x150	Front_Top_part	BurnGuard	130
41	1	Left inner plate 246x275x50	Left_side.slot_inner	BurnGuard	31
40	1	Left outer plate 246x275x50	Left_side.slot	BurnGuard	31
39	1	Right outer plate 1995x275x50	Right_side.slot	BurnGuard	28
38	1	Right inner plate 1995x275x50	Right_side.slot_2	BurnGuard	28
37	1	Second bottom cover 850x400x50	OverPlate	BurnGuard	26
36	1	Left Brownbar block 246x140x125	Brownbar_left	BurnGuard	33
35	2	Bottom side plate 48x100x50	Topbar	BurnGuard	2
34	1	Bottom front plate 740x270x50	top_plate	BurnGuard	10
33	1	First bottom cover 900x590x50	Main_top_sheet	BurnGuard	27
32	1	Main bottom plate 246x1180x50	Undermain	BurnGuard	90
31	1	Right Brownbar block 1995x140x125	Brownbar_block	BurnGuard	32
30	1	Left side top holder 367x195x70	holster_top_3	Steel	1.7
29	2	Right side top holder 367x195x70	holster_top_2	Steel	1.7
28	1	Pipe-side top holder 367x195x70	holster_top	Steel	1.5
27	1	Bookcase holder 854x151x40	holster_top_4	Steel	4
26	6	Inner plate holder L-shape 60x15x22	inner_plate_holder_L	Steel	0.01
25	6	Inner plate holder flat 50x15x2	inner_plate_holder	Steel	0.01
24	1	Rear right holder 850x230x70	rear_right_holster	Steel	12
23	1	Rear left holder 672x304x70	rear_left_holster	Steel	12
22	1	Left top bar 1205x100x10	top_connector_2	Steel	9
21	1	Front top bar 1180x100x10	top_connector	Steel	9
20	3	Rod spacer 10x Ø 30	distanznic	Steel	0.04
19	6	Support rod 1120x Ø 30	rod_1	Steel	6
18	1	Rear right bracket 370x275x250	back_bracket_1	Steel	12
17	1	Front right bracket 370x275x250	front_bracket_1	Steel	12
16	1	Front left bracket 370x275x250	front_bracket_2	Steel	12
15	1	Rear left bracket 1152x230x415	back_bracket_2	Steel	31
14	1	Rear plate holder 460x510x12	back_plate_holder_1	Steel	7
13	1	Right rear support 712x400x258	back_support_1	Steel	33
12	1	Left rear support 712x100x20	back_support_2	Steel	25
11	1	Side support plate 311x100x20	side_plate_1	Steel	4
10	1	Supporting front plate 1460x275x25	inbetweenplate_front_holster	Steel	77
9	2	Connecting front plate 436x400x10	middle_connector_bottom	Steel	14
8	1	Red pillar front plate 900x250x25	inBetweenPlate_front	Steel	43
7	2	Brownbar 3 1364x9x090	Brownbar_assembly_3	Steel	252
6	2	Brownbar 4 1364x9x090	Brownbar_assembly_4	Steel	25
5	1	Brownbar 3 1364x9x090	Brownbar_assembly_3	Steel	25
4	3	Brownbar 2 1364x9x090	Brownbar_assembly_2	Steel	25
3	1	Brownbar 1 1364x9x090	Brownbar_assembly_1	Steel	25
2	1	Frame of CSC 2220x1390x1066	Frame_model	Al / Steel	25
1	1	CSC 1925x50x150	Cryogenic_Shielding	Aluminum	670
Pos.	Qua.	Name & dimensions	drawing nr./standard	Material	Mass
			drawing nr./standard	Material	Mass
			Projection: ISO 128	Tolerance principles: ISO 8015	Merito: 1:15
				Datum: 11/02/2024	Ime: Neutron Shielding for CSC
				Design: Bizar G.	2515 x 1712 x 2480
				Confr.: C. std.	file: Full_shielding_assembly.SLDSASM
					Page 1/99 A2

Ver.	Change	Day	Name
			GSI
			Helmholtz-Zentrum für Schwerionenforschung
			CSC_Shielding
			file: Full_shielding_assembly.SLDSASM

4

3

2

1

F

E

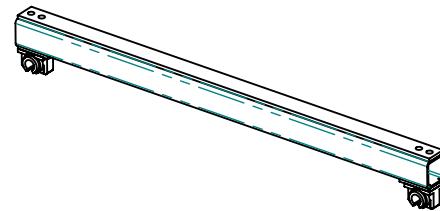
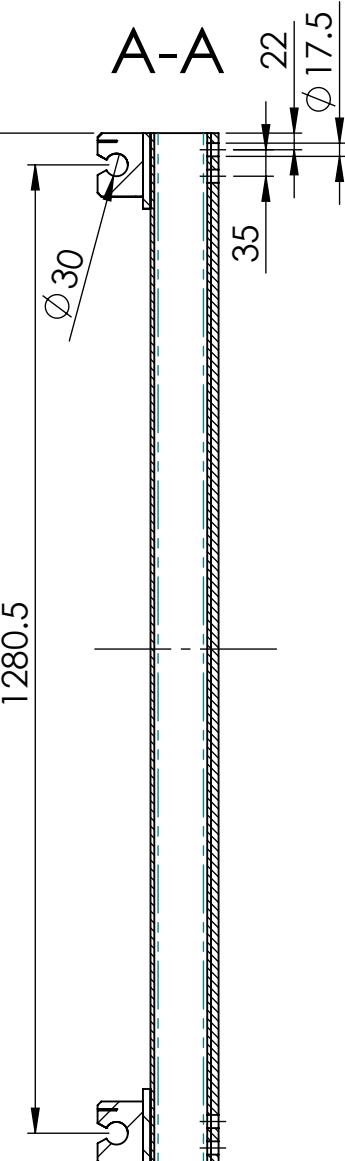
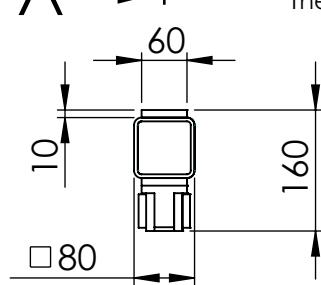
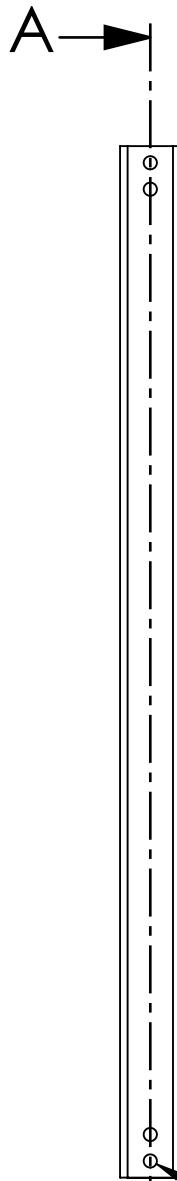
D

C

B

A

Outside radii and chamfers  
 ISO 2768-c-y ±0.4 ±1 ±3° ±2°  
 ISO 2768-f-m ±0.8 ±0.2 ±1.0 ±0.30 ±1.0  
 FREE from 0.5 from 3 from 6 from 10 from 50  
 DIMENSION to 3 to 6 to 30 to 30 to 120 to 400



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Brownbar 1</b>
1	3	Steel / 1		Project: <b>CSC neutron shielding</b>
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:10 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 2 / 99 Mass (kg): 25
				Belongs to: FRS/SFRS
				File name: Brownbar_assembly_1.SLDASM

4

3

2

1

F

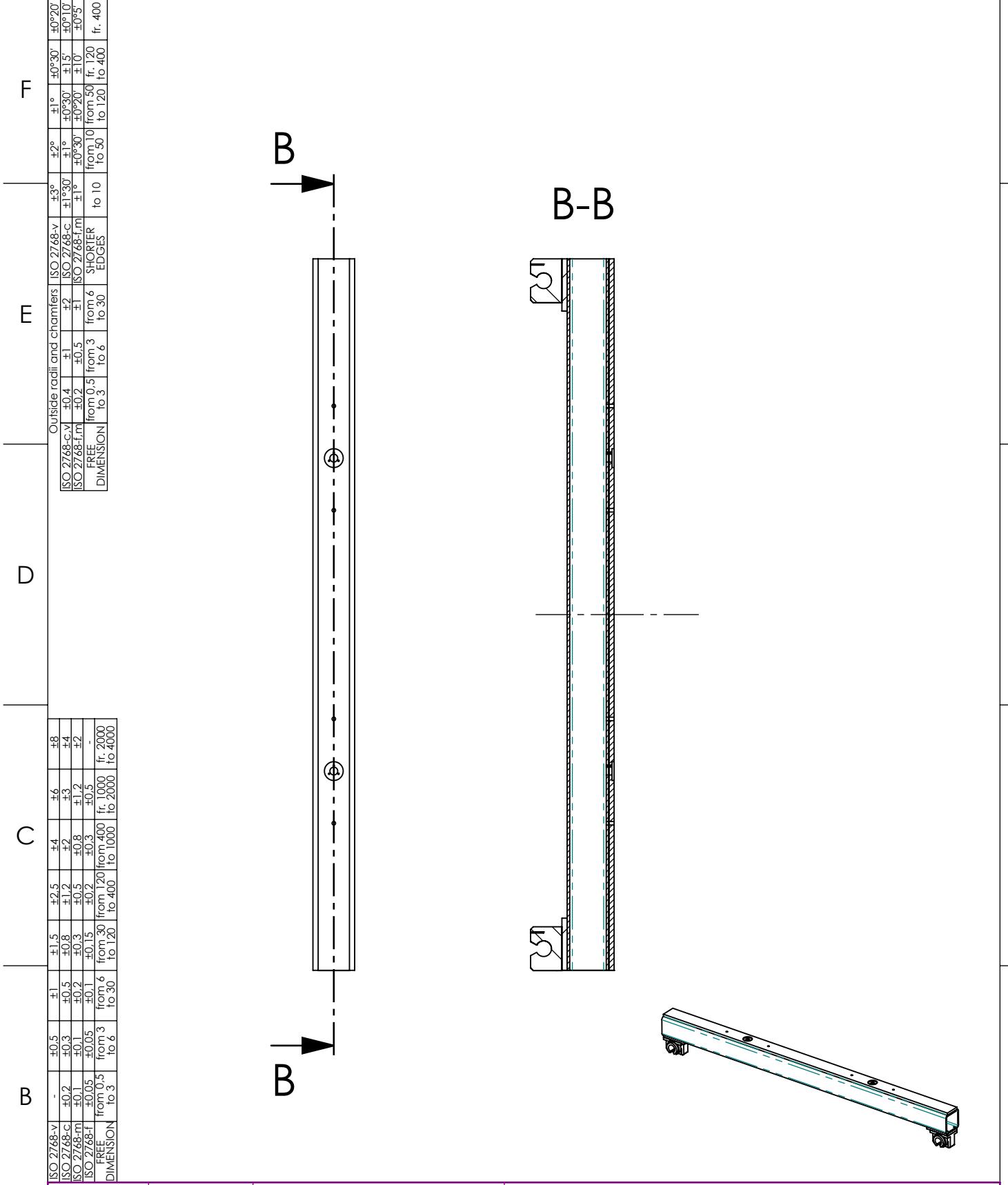
E

D

C

B

A



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Brownbar 2</b>
1	4	Steel / 2		
	Date	Name	Signature	Project: <b>CSC neutron shielding</b>
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:10 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 3 / 99 Mass (kg): 25 Belongs to: FRS/SFRS File name: Brownbar_assembly_2.SLDASM

F

F

E

E

D

D

C

C

B

B

A

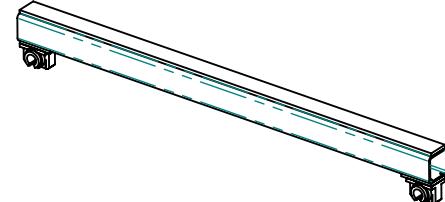
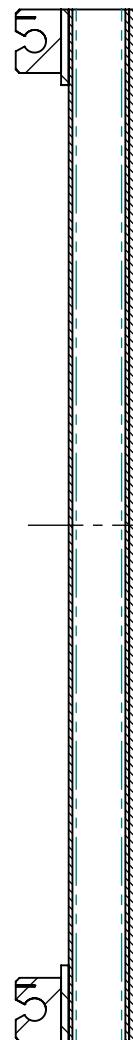
A

ISO 2768-v	-	±0.5	±1	±1.5	±2.5	±4	±6	±8
ISO 2768-c	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3	±4
ISO 2768-m	±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2
ISO 2768-f	±0.05	±0.05	±0.1	±0.15	±0.2	±0.3	±0.5	±0.7
DIMENSION	from 0.5 to 3	from 0.5 to 3	from 3 to 6	from 120 to 400	from 120 to 400	from 200 to 1000	from 1000 to 2000	from 2000 to 4000

ISO 2768-c,v	±0.4	±1	±2	±3	±2°	±1°	±0°30'	±0°20'
ISO 2768-f,m	±0.2	±0.5	±0.2	±0.5	±0.5	±1	±0°30'	±0°10'
FREE	from 0.5	from 0.5	from 0.5	from 3 to 6	from 6	from 6	from 10 to 30	from 20 to 400
DIMENSION	to 3	to 3	to 30	to 120	to 400	to 6	EDGES	fr. 120 to 400



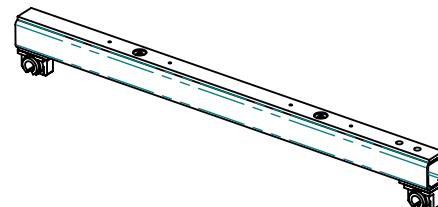
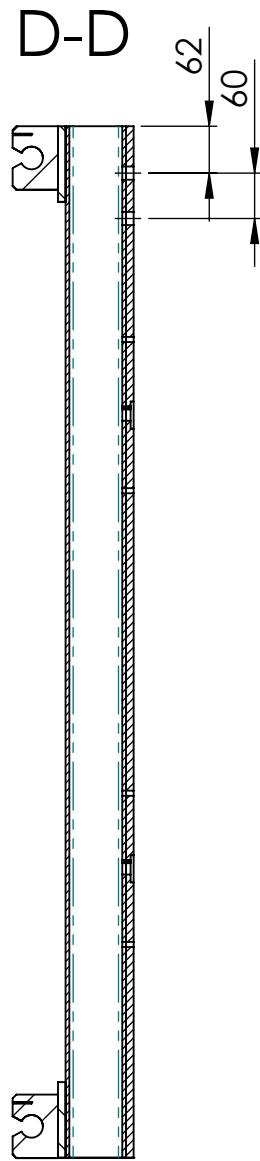
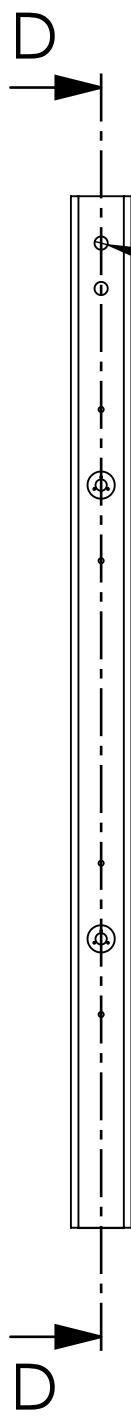
C-C



Ver. no.:	Part. no.	Material / quantity:	Title: <b>Brownbar 3</b>	
1	5	Steel / 2		
	Date	Name	Signature	Project: <b>CSC neutron shielding</b>
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:10 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 4 / 99 Mass (kg): 252
				Belongs to: FRS/SFRS
				File name: Brownbar_assembly_3.SLDASM

ISO 2768-v	-	$\pm 0.5$	$\pm 1$	$\pm 1.5$	$\pm 2.5$	$\pm 4$	$\pm 6$	$\pm 8$
ISO 2768-c	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$	$\pm 3$	$\pm 4$
ISO 2768-m	$\pm 0.1$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$
ISO 2768-f	$\pm 0.05$	$\pm 0.05$	$\pm 0.1$	$\pm 0.15$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.7$
DIMENSION	from 3 to 30	from 3 to 30	from 6 to 30	from 120 to 400	from 200 to 600	from 1000 to 2000	from 5000 to 40000	

Outside radii and chamfers  
ISO 2768-c,v  $\pm 0.4$   $\pm 1$  ISO 2768-v  $\pm 2^{\circ}$   $\pm 3^{\circ}$   
ISO 2768-f,m  $\pm 0.2$   $\pm 0.5$  ISO 2768-c  $\pm 1^{\circ}$  ISO 2768-m  $\pm 1^{\circ}$   
FREE from 0.5 to 3 from 6 to 30  
DIMENSION to 3 to 6 to 30  
to 10 to 50  
from 50 to 120  
to 120 to 400



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Brownbar 4</b>
1	6	Steel / 2		
	Date	Name	Signature	Project: <b>CSC neutron shielding</b>
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:10 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 5 / 99 Mass (kg): 25
				Belongs to: FRS/SFRS
				File name: Brownbar_assembly_4.SLDASM

F

E

D

C

B

A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
DIMENSION

$\pm 0.5$   
 $\pm 0.3$   
 $\pm 0.1$   
 $\pm 0.05$   
from 0.5 to 3

$\pm 0.5$   
 $\pm 0.3$   
 $\pm 0.2$   
 $\pm 0.1$   
from 0.5 to 3

$\pm 1$   
 $\pm 0.5$   
 $\pm 0.2$   
 $\pm 0.1$   
from 0.5 to 3

$\pm 1.5$   
 $\pm 0.8$   
 $\pm 0.3$   
 $\pm 0.1$   
from 0.5 to 3

$\pm 2.5$   
 $\pm 1.2$   
 $\pm 0.5$   
 $\pm 0.15$   
from 0.5 to 3

$\pm 4$   
 $\pm 3$   
 $\pm 2$   
 $\pm 1.2$   
from 0.5 to 3

$\pm 6$   
 $\pm 3$   
 $\pm 2$   
 $\pm 1.2$   
from 0.5 to 3

$\pm 8$   
 $\pm 4$   
 $\pm 2$   
 $\pm 1.2$   
from 0.5 to 3

Outside radii and chamfers  
ISO 2768-c-v  
ISO 2768-f-m  
FREE  
DIMENSION

$\pm 0.4$   
 $\pm 0.2$   
 $\pm 0.5$   
 $\pm 0.3$   
from 0.5 to 3

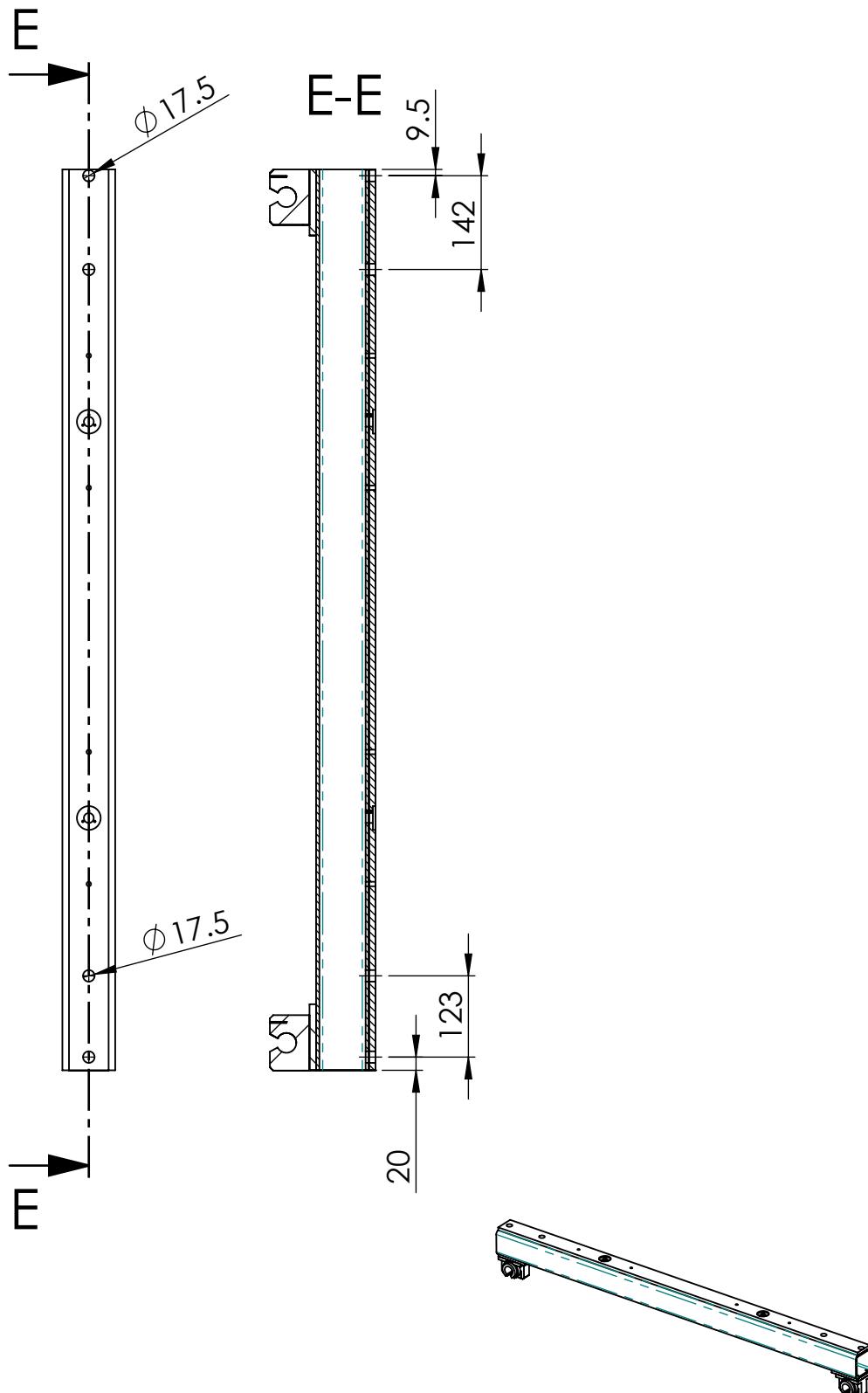
$\pm 1$   
 $\pm 0.2$   
 $\pm 0.5$   
 $\pm 0.3$   
from 0.5 to 3

$\pm 2$   
 $\pm 1$   
 $\pm 1$   
 $\pm 1$   
from 0.5 to 3

$\pm 3^{\circ}$   
 $\pm 1^{\circ}$   
 $\pm 1^{\circ}$   
 $\pm 1^{\circ}$   
from 0.5 to 3

$\pm 2^{\circ}$   
 $\pm 1^{\circ}$   
 $\pm 1^{\circ}$   
 $\pm 1^{\circ}$   
from 0.5 to 3

$\pm 0^{\circ} 20'$   
 $\pm 0^{\circ} 10'$   
 $\pm 0^{\circ} 10'$   
 $\pm 0^{\circ} 5'$   
from 0.5 to 3



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Brownbar 5</b>
1	7	Steel / 2		Project: <b>CSC neutron shielding</b>
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		Scale: 1:10 Format: A4
Checked:				
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 6 / 99 Mass (kg): 25
				Belongs to: FRS/SFRS
				File name: Brownbar_assembly_5.SLDASM

F

E

D

C

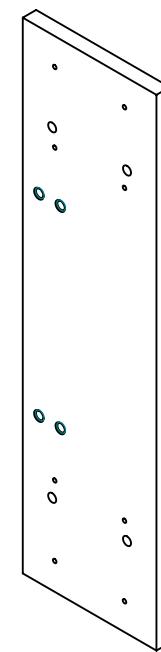
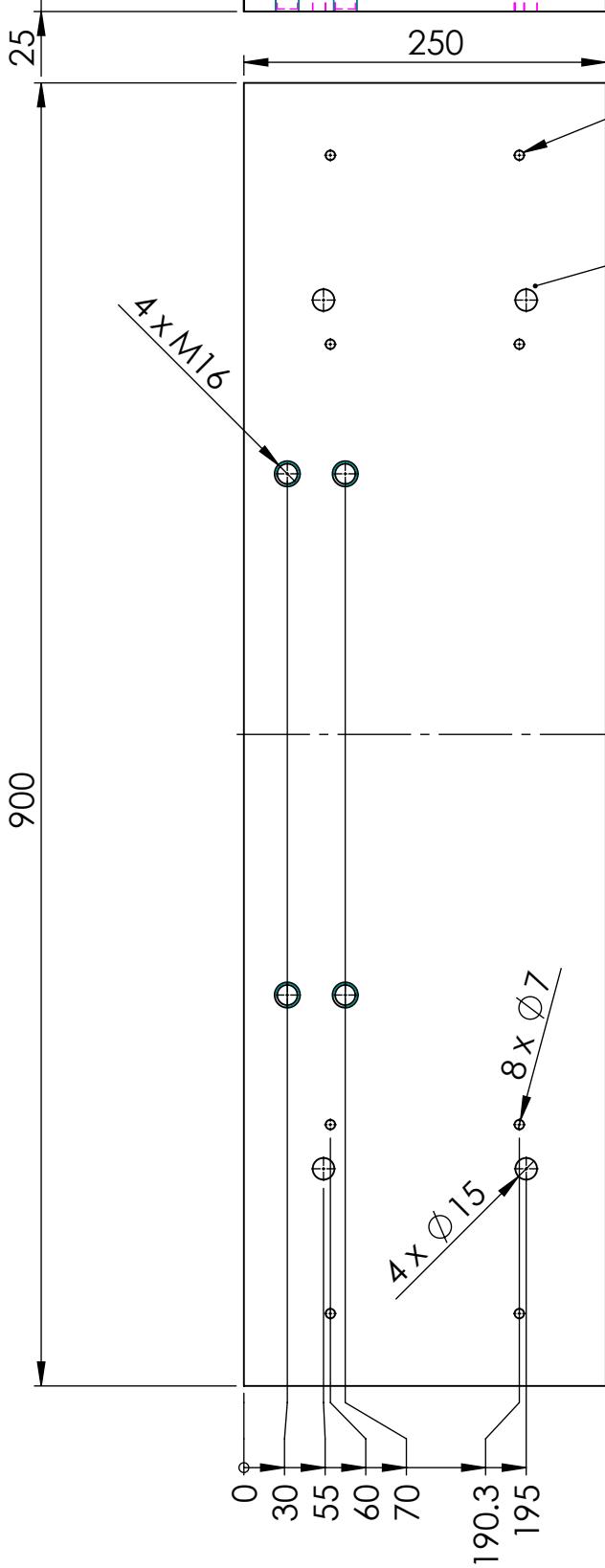
B

A

ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 FREE DIMENSION

ISO 2768-c-V  
 ISO 2768-f-m  
 FREE from 0.5 to 3  
 DIMENSION to 3

ISO 8015



Ver. no.:	Part. no.:	Material / quantity:		Title: Red pillar front plate	
1	8	Steel / 1			
	Date:	Name:	Signature:	Project: CSC neutron shielding	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale: 1:5	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 7 / 99	Mass (kg): 43
				Belongs to: FRS/SFRS	
				File name: InBetweenPlate_front.SLDPR	

4

3

2

1

F

F

E

E

D

D

C

C

B

B

A

A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
DIMENSION

±0.5 ±0.5 ±0.5 ±0.5 ±0.5  
±0.2 ±0.3 ±0.1 ±0.2 ±0.05  
±0.1 ±0.1 ±0.05 ±0.1 ±0.05  
from 0.5 from 0.5 from 0.5 from 0.5 from 0.5  
to 3 to 3 to 3 to 3 to 3

±1 ±1 ±1 ±1 ±1  
±0.2 ±0.3 ±0.1 ±0.2 ±0.05  
±0.1 ±0.2 ±0.05 ±0.1 ±0.05  
from 3 from 3 from 3 from 3 from 3  
to 10 to 10 to 10 to 10 to 10

±1.5 ±1.5 ±1.5 ±1.5 ±1.5  
±0.8 ±0.8 ±0.3 ±0.2 ±0.1  
±0.2 ±0.2 ±0.1 ±0.1 ±0.05  
from 6 from 6 from 6 from 6 from 6  
to 30 to 30 to 30 to 30 to 30

±2.5 ±2.5 ±2.5 ±2.5 ±2.5  
±1.2 ±1.2 ±0.5 ±0.5 ±0.2  
±0.5 ±0.5 ±0.2 ±0.2 ±0.1  
from 20 from 20 from 20 from 20 from 20  
to 400 to 400 to 400 to 400 to 400

±4 ±4 ±4 ±4 ±4  
±2 ±2 ±1 ±1 ±0.5  
±1.2 ±1.2 ±0.8 ±0.8 ±0.5  
from 30 from 30 from 30 from 30 from 30  
to 120 to 120 to 100 to 100 to 100

±6 ±6 ±6 ±6 ±6  
±3 ±3 ±2 ±2 ±1  
±1.2 ±1.2 ±0.8 ±0.8 ±0.5  
from 30 from 30 from 30 from 30 from 30  
to 120 to 120 to 100 to 100 to 100

±8 ±8 ±8 ±8 ±8  
±3 ±3 ±2 ±2 ±1  
±1.2 ±1.2 ±0.8 ±0.8 ±0.5  
from 30 from 30 from 30 from 30 from 30  
to 120 to 120 to 100 to 100 to 100

ISO 2768-c-v  
ISO 2768-f-m  
FREE  
DIMENSION

±0.4 ±0.2 ±0.5  
±1.0 ±0.5 ±1.0  
±1.0 ±1.0 ±1.0  
from 0.5 from 0.5 from 0.5  
to 3 to 3 to 3

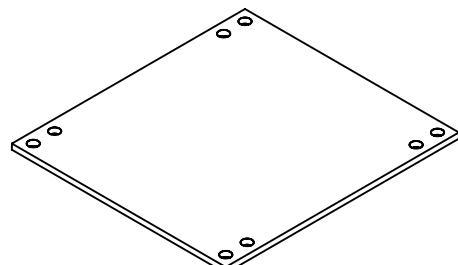
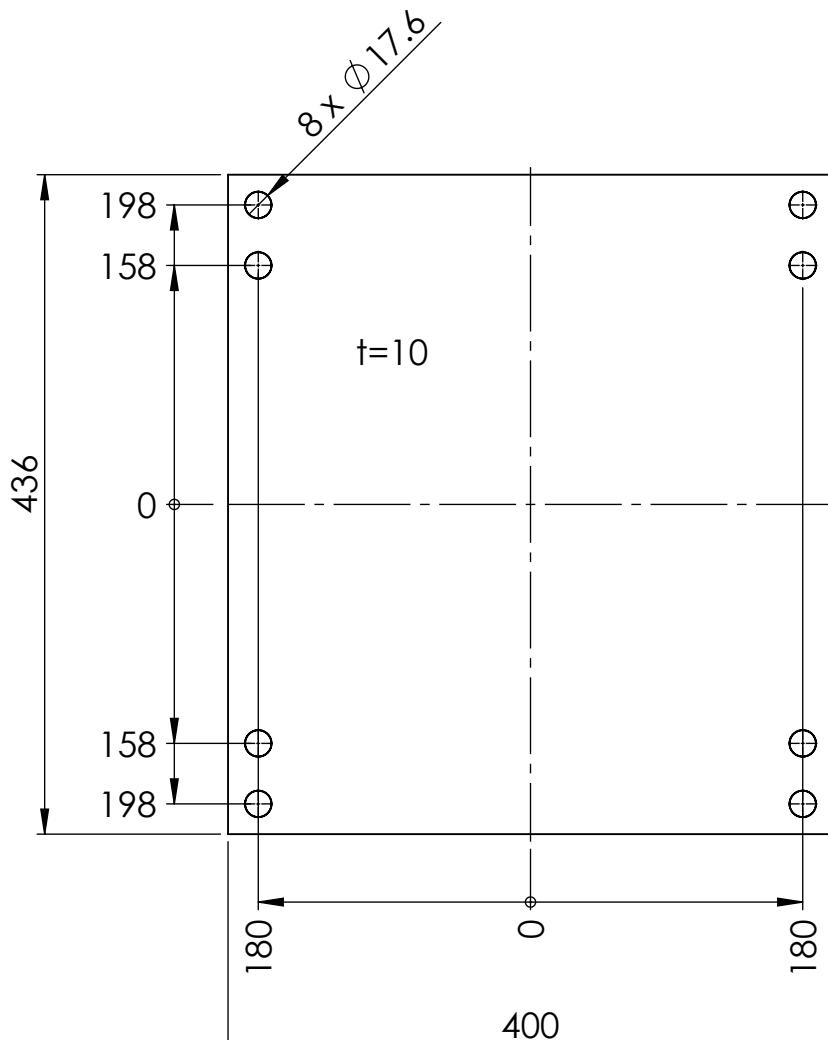
±2 ±2 ±1  
±0.5 ±0.5 ±0.5  
±1.0 ±1.0 ±1.0  
from 6 from 6 from 6  
to 30 to 30 to 30

±3 ±3 ±2  
±1.0 ±1.0 ±1.0  
±1.0 ±1.0 ±1.0  
from 10 from 10 from 10  
to 50 to 50 to 50

±2° ±2° ±1°  
±1° ±1° ±1°  
±1° ±1° ±1°  
from 10 from 10 from 10  
to 50 to 50 to 50

±0°20' ±0°30' ±0°30'  
±0°10' ±0°20' ±0°20'  
±0°5' ±10' ±10'  
from 10 from 10 from 10  
to 50 to 50 to 50

fr. 120 fr. 120 fr. 400



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Connecting front plate</b>	
1	9	Steel / 1			
	Date	Name	Signature	Project: <b>CSC neutron shielding</b>	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale: 1:5	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 8 / 99	Mass (kg): 14
				Belongs to: FRS/SFRS	
				File name: middle_connector_bottom.SLDPRT	

4

3

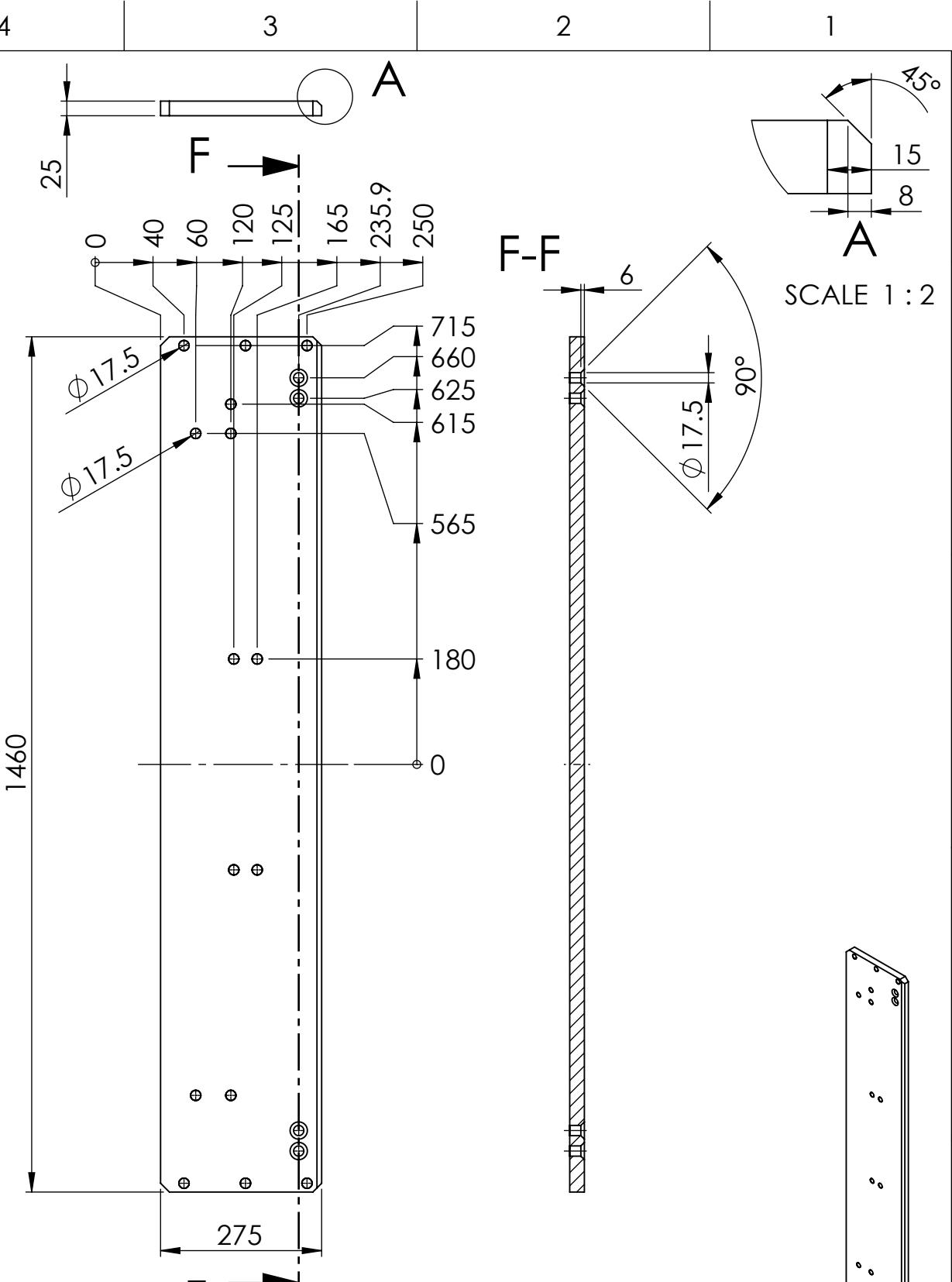
2

1

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
DIMENSION

Outside radii and chamfers  
ISO 2768-c,v  
ISO 2768-f,m  
ISO 2768-t,m  
FREE from 0.5 to 3  
from 0.5 to 6  
from 0.5 to 30  
from 0.5 to 300  
from 0.5 to 3000  
from 0.5 to 30000

fr. 1000 fr. 2000 fr. 10000 fr. 20000 fr. 40000



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Supporting front plate</b>	
1	10	Steel / 1			
	Date	Name	Signature	Project: <b>CSC neutron shielding</b>	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale: 1:10	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 9 / 99	Mass (kg): 77
				Belongs to: FRS/SFRS	
				File name: inbetweenPlate_front_holster.SLDprt	

F

E

D

C

B

A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
DIMENSION

±0.5  
±0.2  
±0.05  
±0.05  
from 0.5 to 3

±1  
±0.1  
±0.05  
±0.05  
from 0.5 to 3

±1.5  
±0.3  
±0.1  
±0.05  
from 0.5 to 3

±2.5  
±1.2  
±0.2  
±0.15  
from 0.5 to 3

±4  
±2  
±0.5  
±0.15  
from 0.5 to 3

±6  
±3  
±0.8  
±0.2  
from 0.5 to 3

±8  
±4  
±1.2  
±0.5  
from 0.5 to 3

Outside radii and chamfers  
ISO 2768-c/v  
ISO 2768-f/m  
FREE  
DIMENSION

±0.4  
±0.2  
from 0.5 to 3

±1  
±0.5  
from 0.5 to 3

±2  
±1  
from 0.5 to 3

±3  
±1  
from 0.5 to 3

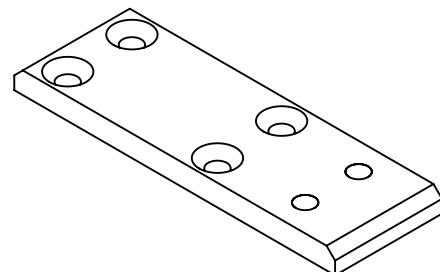
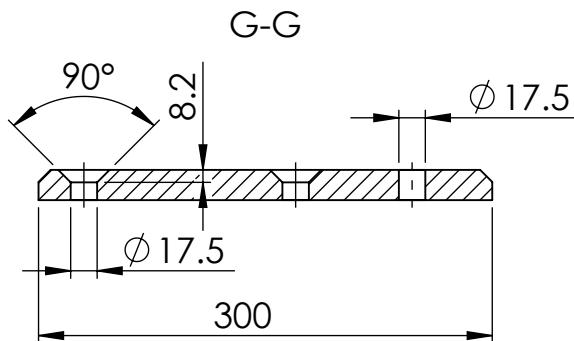
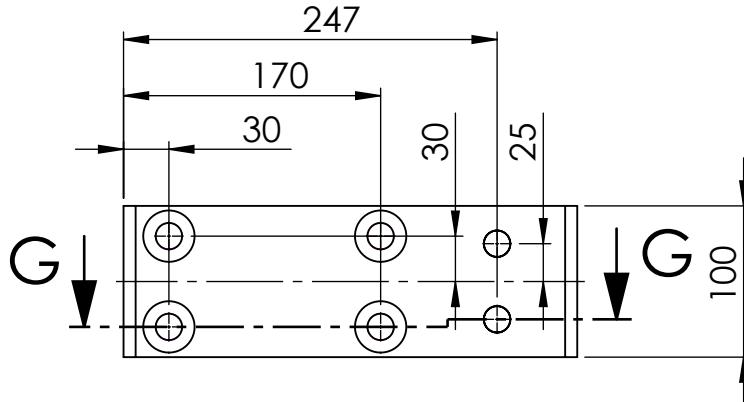
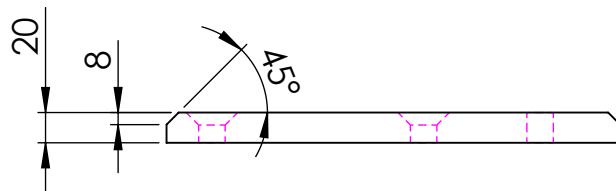
±2°  
±1°  
±1°  
±0.5°  
from 10 to 50

±1°  
±1°  
±1°  
±0.5°  
from 10 to 50

±2°  
±1°  
±1°  
±0.5°  
from 10 to 50

±3°  
±1.5°  
±1.5°  
±0.5°  
from 10 to 50

±20°  
±10°  
±10°  
±5°  
from 10 to 50

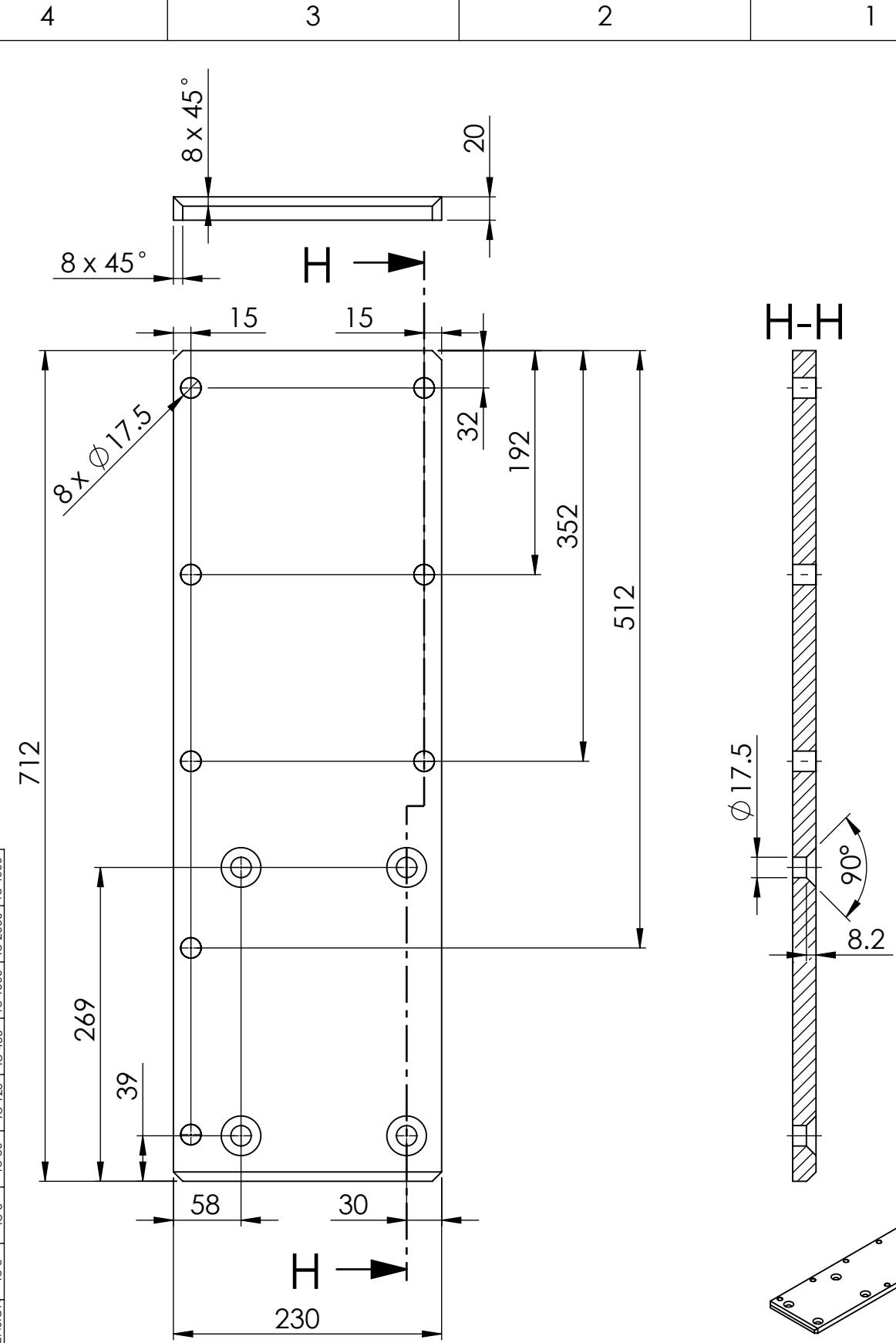


Ver. no.:	Part. no.	Material / quantity:		Title: <b>Side support plate</b>
1	11	Steel / 1		Project: <b>CSC neutron shielding</b>
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:5 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 10 / 99 Mass (kg): 4 Belongs to: FRS/SFRS File name: side_plate_1.SLDPR

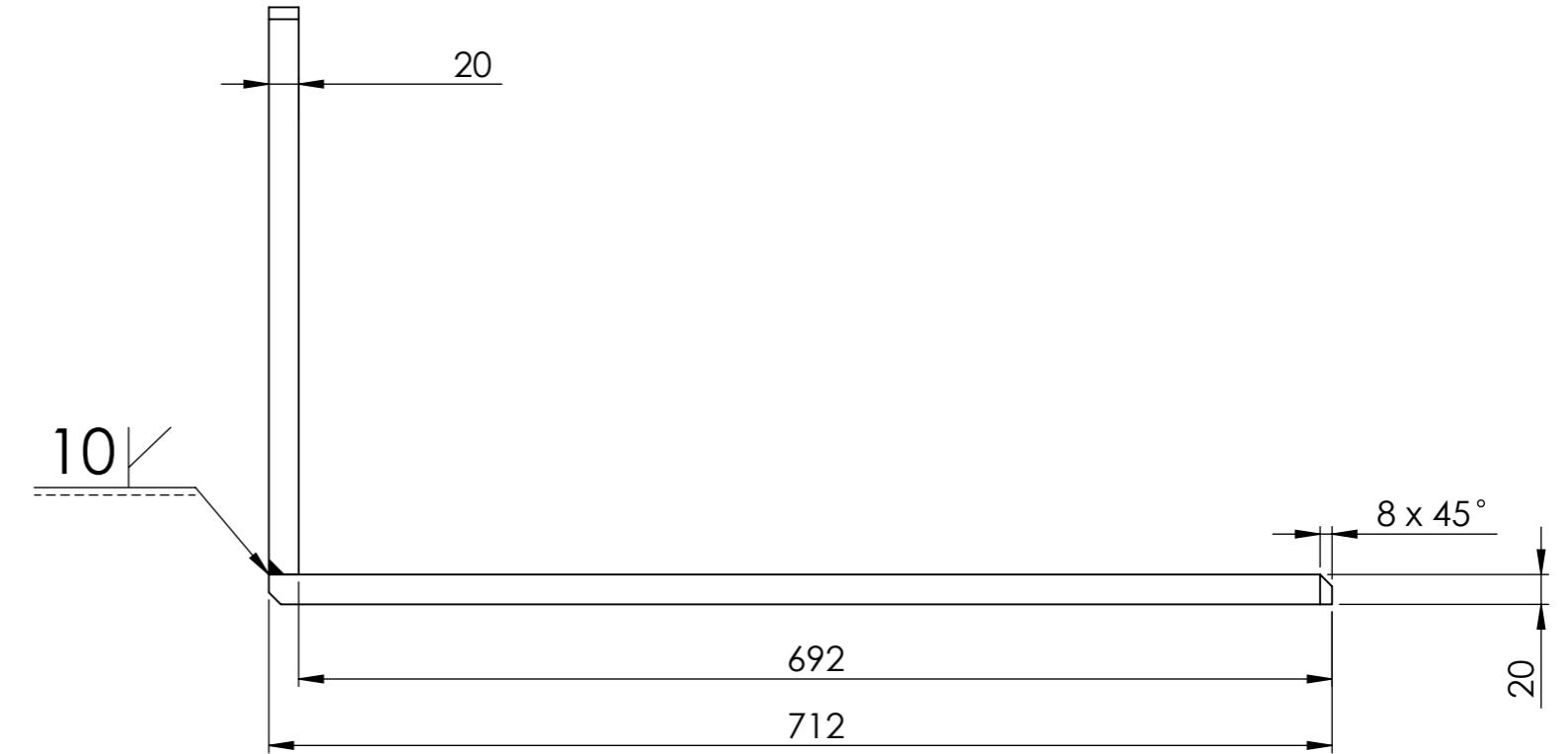
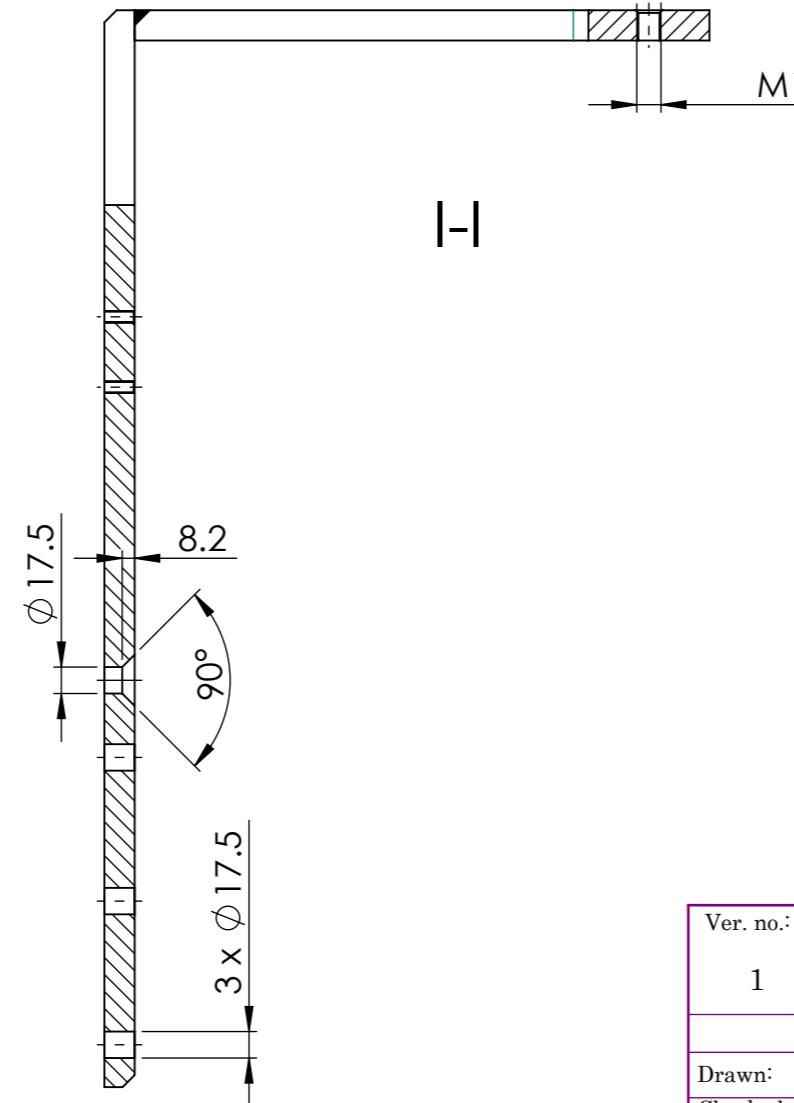
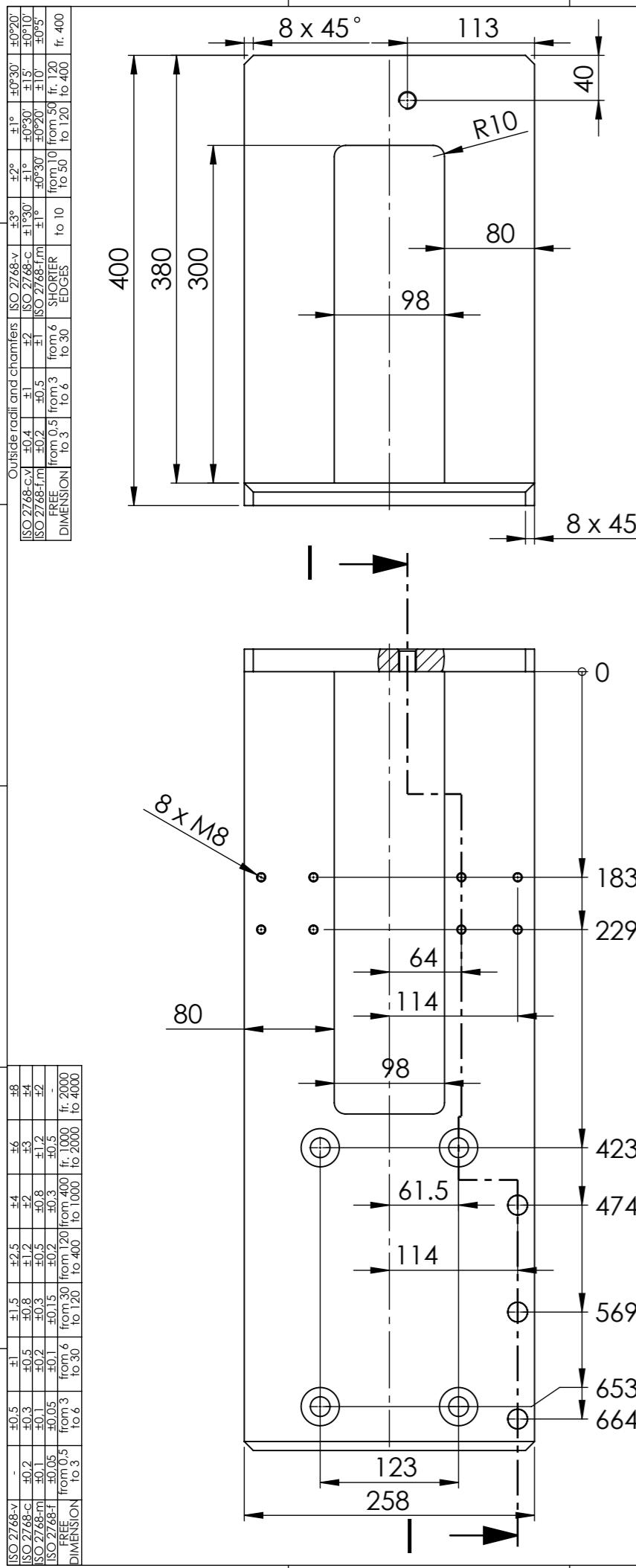
ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 ISO 2768-t  
 FREE DIMENSION

from 3 to 3  
 from 5 to 5  
 from 0.5 to 0.5  
 from 0.5 to 0.5  
 from 0.5 to 0.5  
 from 0.5 to 0.5

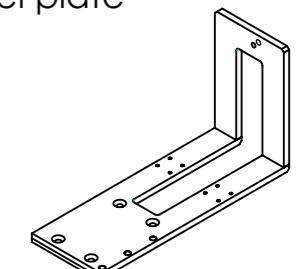
to 3 to 3  
 to 0.5 to 0.5  
 to 0.5 to 0.5  
 to 0.5 to 0.5  
 to 0.5 to 0.5  
 to 0.5 to 0.5



Ver. no.:	Part. no.:	Material / quantity:		Title: Left rear support
1	12	Steel / 1		
	Date:	Name:	Signature:	Project: CSC neutron shielding
Drawn:	11/02/2024	Gasper Bizjan		Scale: 1:5 Format: A4
Checked:				
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 11 / 99 Mass (kg): 25
				Belongs to: FRS/SFRS
				File name: back_support_2.SLDPR

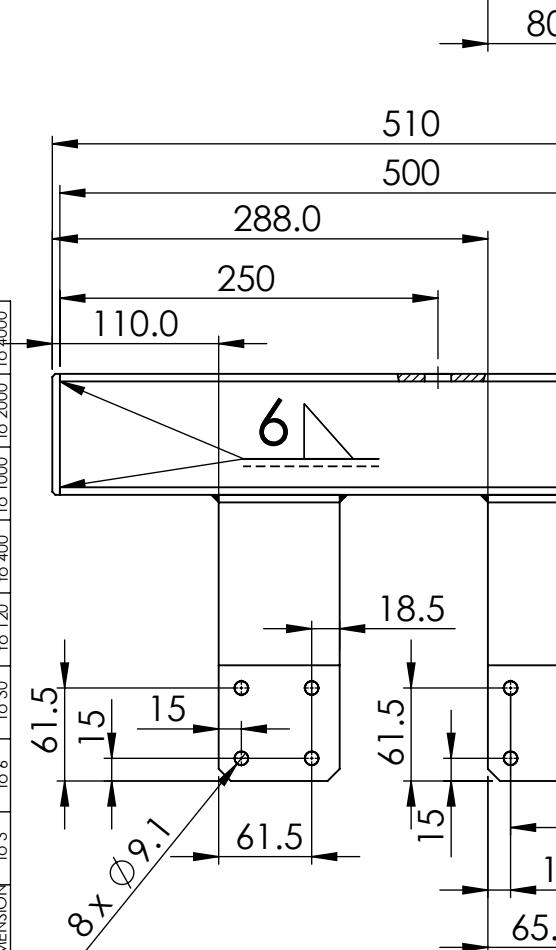


Component made entirely of 10mm steel plate welded together

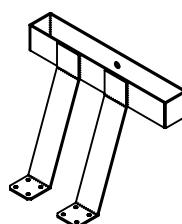


Ver. no.:	Part. no.:	Material / quantity:	Title: Right rear support	
		Steel / 1	Project: CSC neutron shielding	
Drawn:	Date:	Name:	Signature:	Scale: 1:5 Format: A3
		Gasper Bizjan		Dwg. / Dwg. no: 12 / 99 Mass (kg): 33
Checked:				Belongs to: FRS/SFRS
		GSI Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m ISO 128 File name: back_support_1.SLDPRT

ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 FREE DIMENSION  
 to 3 from 6  
 to 30 from 60  
 to 300 from 400  
 to 2000 from 3000



Component made entirely of 10mm steel plate welded together



Ver. no.:  
1

Part. no.:  
14

Material / quantity:  
Steel / 1

Title:  
**Rear plate holder**

Project:  
**CSC neutron shielding**

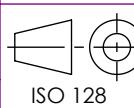
Drawn:  
11/02/2024

Date:

Name:  
Gasper Bizjan

Signature:

Checked:  
A



Tolerance principles  
ISO 8015

Tolerances:  
ISO 2768-m

Dwg. / Dwg. no:  
13 / 99

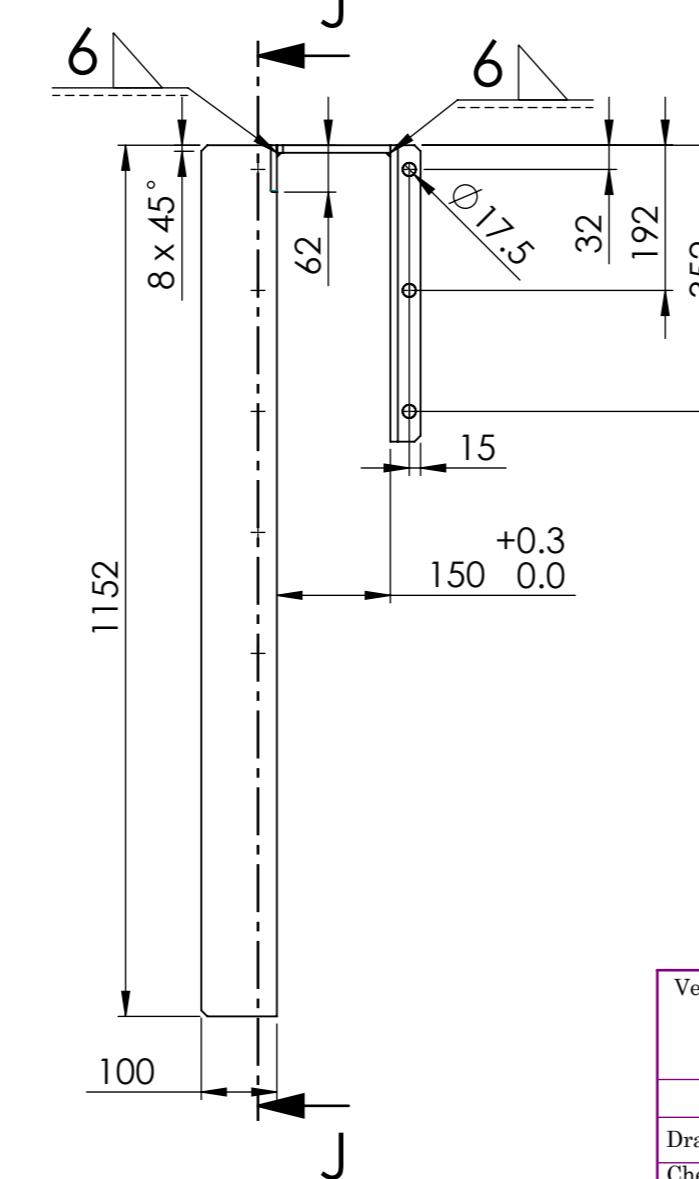
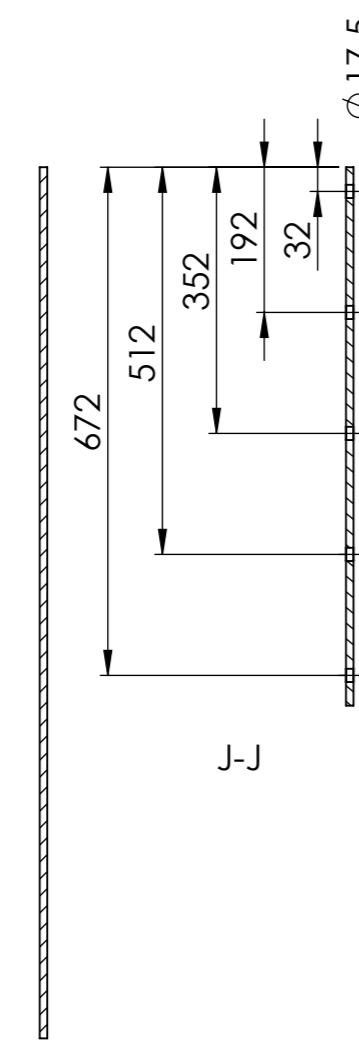
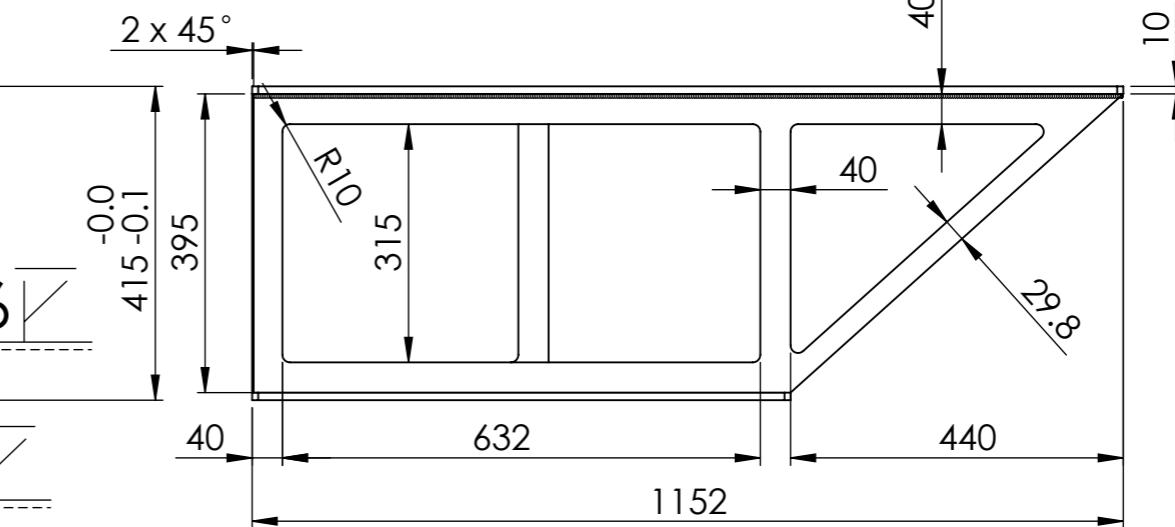
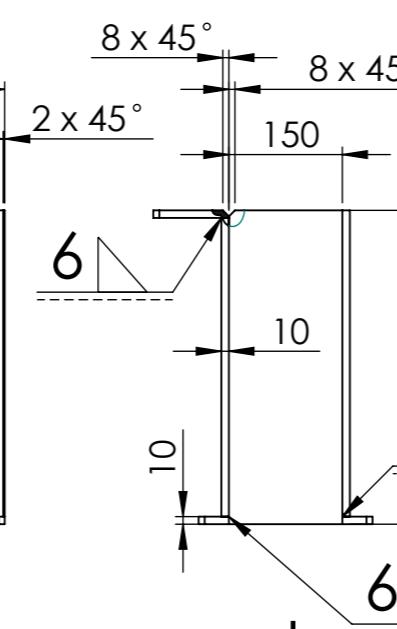
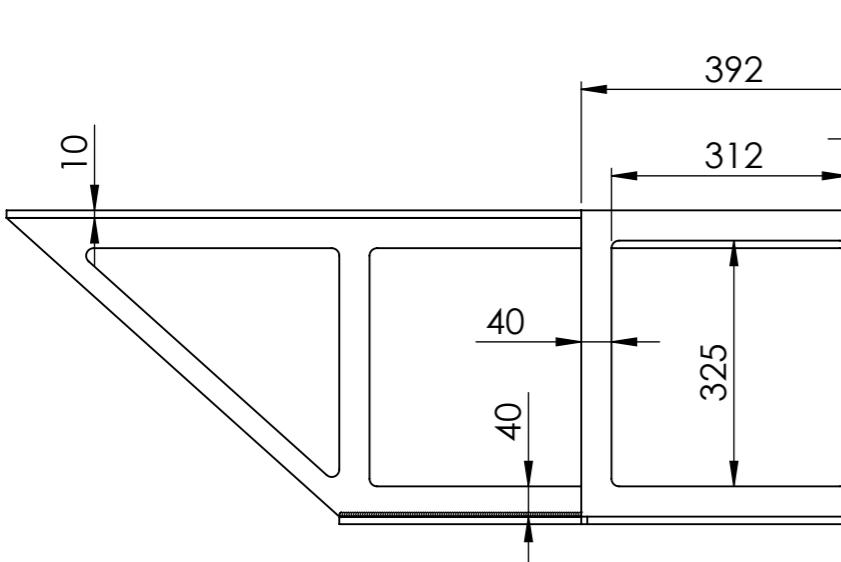
Mass (kg):  
7

Belongs to:  
FRS/SFRS

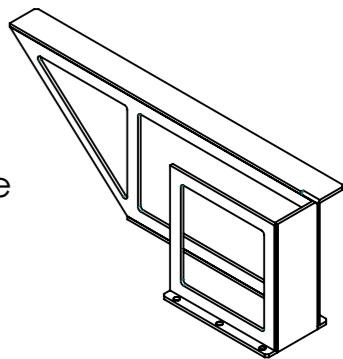
File name:  
back\_plate\_holder\_1.SLDPRT

**GSI**  
Helmholtzzentrum für  
Schwerionenforschung

ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 Dimension  
 from 0.5 to 3  
 from 3 to 6  
 from 6 to 10  
 from 10 to 20  
 from 20 to 40  
 from 40 to 100  
 from 100 to 200  
 from 200 to 400



Component made entirely of 10mm steel plate welded together



Ver. no.:	Part. no.:	Material / quantity:	Title: Rear left bracket	
1	15	Steel / 1		
	Date:	Name:	Signature:	Project: CSC neutron shielding
Drawn:	11/02/2024	Gasper Bizjan		Scale: 1:10 Format: A3
Checked:				Dwg. / Dwg. no: 14 / 99 Mass (kg): 31
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Belongs to: FRS/SFRS File name: back_bracket_2.SLDPRT
				ISO 128

8 7 6 5 4 3 2 1

F F E E D D C C B B A A

4

3

2

1

F

F

E

E

D

D

C

C

B

B

A

A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
FREE  
DIMENSION

Outside radii and chamfers  
ISO 2768-c,v ±0.4  
ISO 2768-f,m ±0.2  
FREE from 0.5 to 3  
from 6 to 30  
from 30 to 300  
from 300 to 4000

±1.0  
±0.5  
±0.1  
±0.05  
from 0.5 to 3  
from 3 to 30  
from 30 to 300  
from 300 to 4000

±1.2  
±0.3  
±0.1  
±0.05  
from 0.5 to 3  
from 3 to 30  
from 30 to 300  
from 300 to 4000

±2.0  
±1.2  
±0.3  
±0.15  
from 0.5 to 3  
from 3 to 30  
from 30 to 300  
from 300 to 4000

±3.0  
±1.8  
±0.6  
±0.2  
from 0.5 to 3  
from 3 to 30  
from 30 to 300  
from 300 to 4000

±4.0  
±2.4  
±0.8  
±0.3  
from 0.5 to 3  
from 3 to 30  
from 30 to 300  
from 300 to 4000

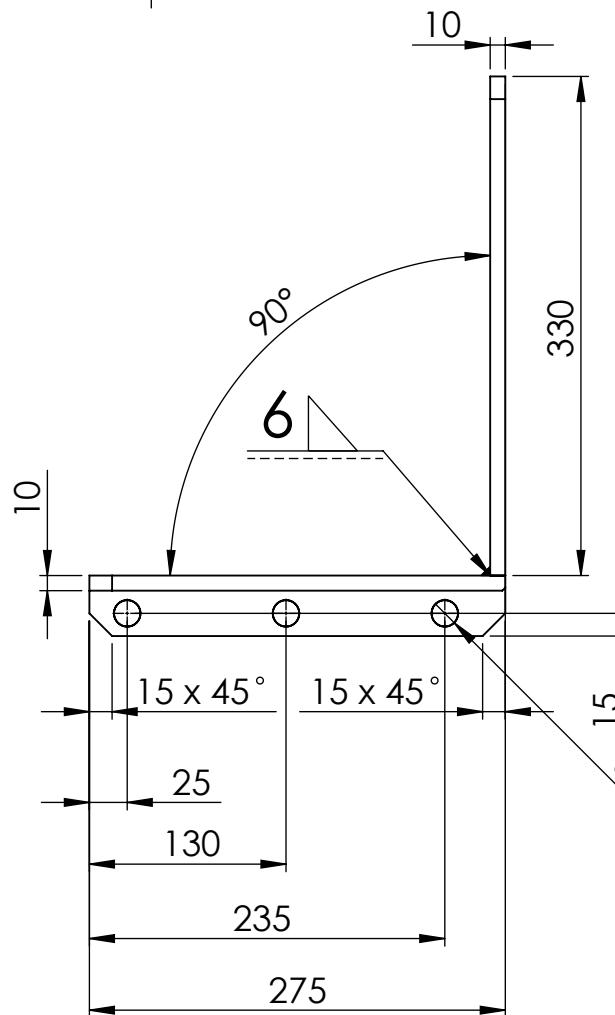
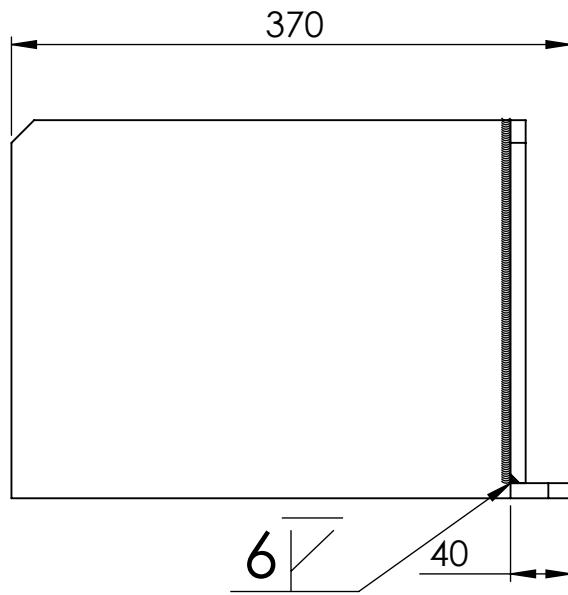
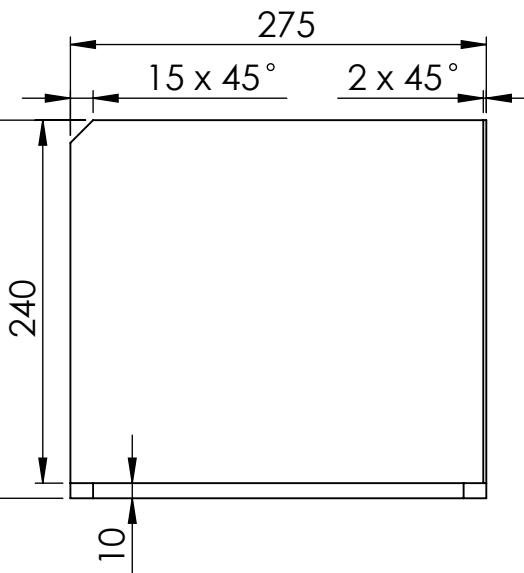
±6.0  
±4.0  
±1.2  
±0.5  
from 0.5 to 3  
from 3 to 30  
from 30 to 300  
from 300 to 4000

±10.0  
±6.0  
±2.0  
±1.0  
from 0.5 to 3  
from 3 to 30  
from 30 to 300  
from 300 to 4000

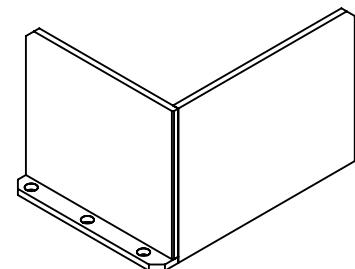
±15.0  
±10.0  
±5.0  
±3.0  
from 0.5 to 3  
from 3 to 30  
from 30 to 300  
from 300 to 4000

±20.0  
±15.0  
±10.0  
±5.0  
from 0.5 to 3  
from 3 to 30  
from 30 to 300  
from 300 to 4000

-0.0  
250 -0.1



Component made entirely of 10mm steel plate welded together



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Front left bracket</b>
1	16	Steel / 1		Project: <b>CSC neutron shielding</b>
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:5 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m	ISO 128	Dwg. / Dwg. no: 15 / 99 Mass (kg): 12
				Belongs to: FRS/SFRS
				File name: front_bracket_2.SLDPR

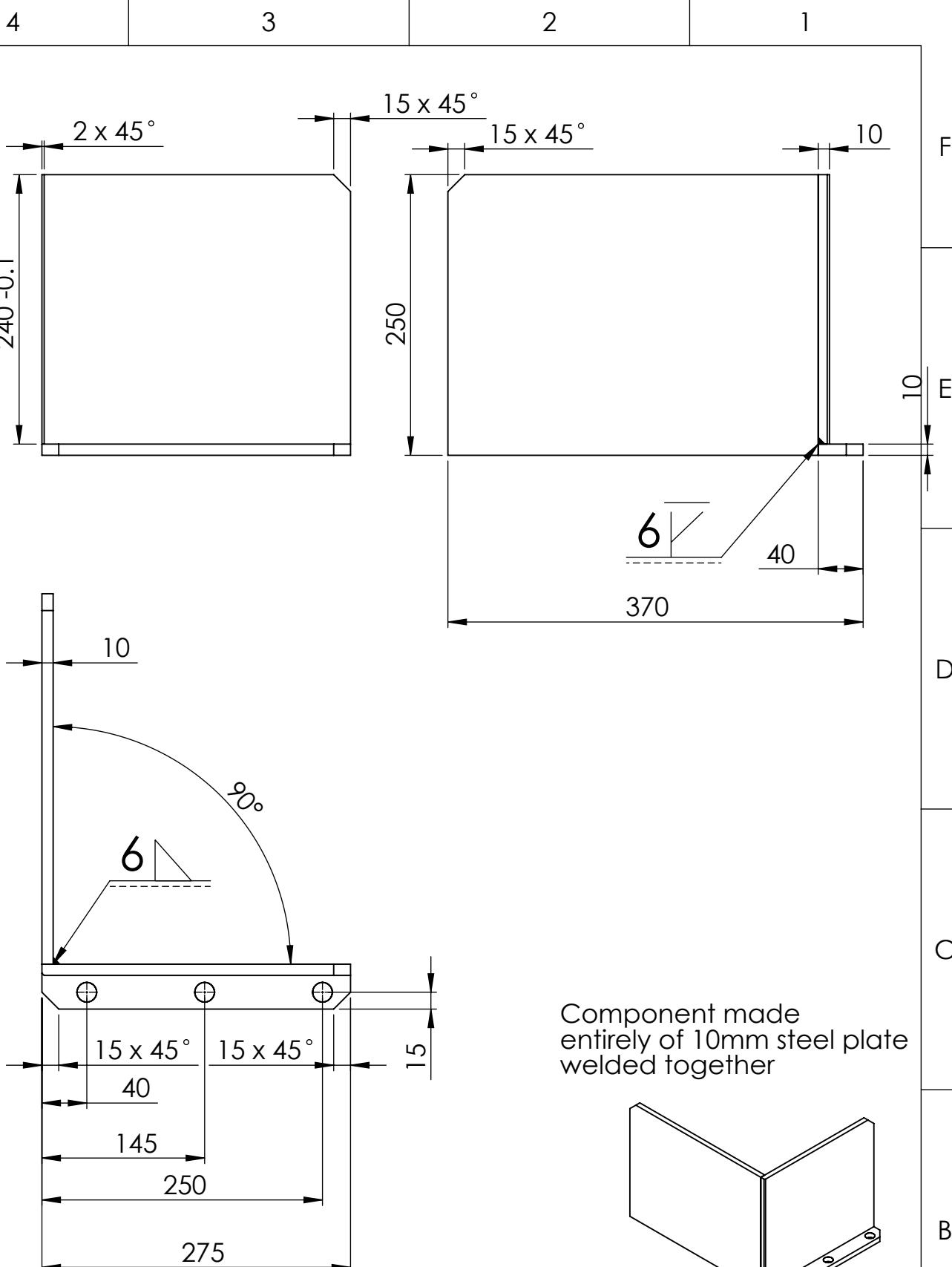
4

3

2

1

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
ISO 2768-p  
ISO 2768-fm  
ISO 2768-tm  
ISO 2768-1  
ISO 2768-2  
ISO 2768-3  
ISO 2768-4  
ISO 2768-5  
ISO 2768-6  
ISO 2768-7  
ISO 2768-8  
ISO 2768-9  
ISO 2768-10  
ISO 2768-11  
ISO 2768-12  
ISO 2768-13  
ISO 2768-14  
ISO 2768-15  
ISO 2768-16  
ISO 2768-17  
ISO 2768-18  
ISO 2768-19  
ISO 2768-20  
ISO 2768-21  
ISO 2768-22  
ISO 2768-23  
ISO 2768-24  
ISO 2768-25  
ISO 2768-26  
ISO 2768-27  
ISO 2768-28  
ISO 2768-29  
ISO 2768-30  
ISO 2768-31  
ISO 2768-32  
ISO 2768-33  
ISO 2768-34  
ISO 2768-35  
ISO 2768-36  
ISO 2768-37  
ISO 2768-38  
ISO 2768-39  
ISO 2768-40  
ISO 2768-41  
ISO 2768-42  
ISO 2768-43  
ISO 2768-44  
ISO 2768-45  
ISO 2768-46  
ISO 2768-47  
ISO 2768-48  
ISO 2768-49  
ISO 2768-50  
ISO 2768-51  
ISO 2768-52  
ISO 2768-53  
ISO 2768-54  
ISO 2768-55  
ISO 2768-56  
ISO 2768-57  
ISO 2768-58  
ISO 2768-59  
ISO 2768-60  
ISO 2768-61  
ISO 2768-62  
ISO 2768-63  
ISO 2768-64  
ISO 2768-65  
ISO 2768-66  
ISO 2768-67  
ISO 2768-68  
ISO 2768-69  
ISO 2768-70  
ISO 2768-71  
ISO 2768-72  
ISO 2768-73  
ISO 2768-74  
ISO 2768-75  
ISO 2768-76  
ISO 2768-77  
ISO 2768-78  
ISO 2768-79  
ISO 2768-80  
ISO 2768-81  
ISO 2768-82  
ISO 2768-83  
ISO 2768-84  
ISO 2768-85  
ISO 2768-86  
ISO 2768-87  
ISO 2768-88  
ISO 2768-89  
ISO 2768-90  
ISO 2768-91  
ISO 2768-92  
ISO 2768-93  
ISO 2768-94  
ISO 2768-95  
ISO 2768-96  
ISO 2768-97  
ISO 2768-98  
ISO 2768-99  
ISO 2768-100  
ISO 2768-101  
ISO 2768-102  
ISO 2768-103  
ISO 2768-104  
ISO 2768-105  
ISO 2768-106  
ISO 2768-107  
ISO 2768-108  
ISO 2768-109  
ISO 2768-110  
ISO 2768-111  
ISO 2768-112  
ISO 2768-113  
ISO 2768-114  
ISO 2768-115  
ISO 2768-116  
ISO 2768-117  
ISO 2768-118  
ISO 2768-119  
ISO 2768-120  
ISO 2768-121  
ISO 2768-122  
ISO 2768-123  
ISO 2768-124  
ISO 2768-125  
ISO 2768-126  
ISO 2768-127  
ISO 2768-128  
ISO 2768-129  
ISO 2768-130  
ISO 2768-131  
ISO 2768-132  
ISO 2768-133  
ISO 2768-134  
ISO 2768-135  
ISO 2768-136  
ISO 2768-137  
ISO 2768-138  
ISO 2768-139  
ISO 2768-140  
ISO 2768-141  
ISO 2768-142  
ISO 2768-143  
ISO 2768-144  
ISO 2768-145  
ISO 2768-146  
ISO 2768-147  
ISO 2768-148  
ISO 2768-149  
ISO 2768-150  
ISO 2768-151  
ISO 2768-152  
ISO 2768-153  
ISO 2768-154  
ISO 2768-155  
ISO 2768-156  
ISO 2768-157  
ISO 2768-158  
ISO 2768-159  
ISO 2768-160  
ISO 2768-161  
ISO 2768-162  
ISO 2768-163  
ISO 2768-164  
ISO 2768-165  
ISO 2768-166  
ISO 2768-167  
ISO 2768-168  
ISO 2768-169  
ISO 2768-170  
ISO 2768-171  
ISO 2768-172  
ISO 2768-173  
ISO 2768-174  
ISO 2768-175  
ISO 2768-176  
ISO 2768-177  
ISO 2768-178  
ISO 2768-179  
ISO 2768-180  
ISO 2768-181  
ISO 2768-182  
ISO 2768-183  
ISO 2768-184  
ISO 2768-185  
ISO 2768-186  
ISO 2768-187  
ISO 2768-188  
ISO 2768-189  
ISO 2768-190  
ISO 2768-191  
ISO 2768-192  
ISO 2768-193  
ISO 2768-194  
ISO 2768-195  
ISO 2768-196  
ISO 2768-197  
ISO 2768-198  
ISO 2768-199  
ISO 2768-200  
ISO 2768-201  
ISO 2768-202  
ISO 2768-203  
ISO 2768-204  
ISO 2768-205  
ISO 2768-206  
ISO 2768-207  
ISO 2768-208  
ISO 2768-209  
ISO 2768-210  
ISO 2768-211  
ISO 2768-212  
ISO 2768-213  
ISO 2768-214  
ISO 2768-215  
ISO 2768-216  
ISO 2768-217  
ISO 2768-218  
ISO 2768-219  
ISO 2768-220  
ISO 2768-221  
ISO 2768-222  
ISO 2768-223  
ISO 2768-224  
ISO 2768-225  
ISO 2768-226  
ISO 2768-227  
ISO 2768-228  
ISO 2768-229  
ISO 2768-230  
ISO 2768-231  
ISO 2768-232  
ISO 2768-233  
ISO 2768-234  
ISO 2768-235  
ISO 2768-236  
ISO 2768-237  
ISO 2768-238  
ISO 2768-239  
ISO 2768-240  
ISO 2768-241  
ISO 2768-242  
ISO 2768-243  
ISO 2768-244  
ISO 2768-245  
ISO 2768-246  
ISO 2768-247  
ISO 2768-248  
ISO 2768-249  
ISO 2768-250  
ISO 2768-251  
ISO 2768-252  
ISO 2768-253  
ISO 2768-254  
ISO 2768-255  
ISO 2768-256  
ISO 2768-257  
ISO 2768-258  
ISO 2768-259  
ISO 2768-260  
ISO 2768-261  
ISO 2768-262  
ISO 2768-263  
ISO 2768-264  
ISO 2768-265  
ISO 2768-266  
ISO 2768-267  
ISO 2768-268  
ISO 2768-269  
ISO 2768-270  
ISO 2768-271  
ISO 2768-272  
ISO 2768-273  
ISO 2768-274  
ISO 2768-275  
ISO 2768-276  
ISO 2768-277  
ISO 2768-278  
ISO 2768-279  
ISO 2768-280  
ISO 2768-281  
ISO 2768-282  
ISO 2768-283  
ISO 2768-284  
ISO 2768-285  
ISO 2768-286  
ISO 2768-287  
ISO 2768-288  
ISO 2768-289  
ISO 2768-290  
ISO 2768-291  
ISO 2768-292  
ISO 2768-293  
ISO 2768-294  
ISO 2768-295  
ISO 2768-296  
ISO 2768-297  
ISO 2768-298  
ISO 2768-299  
ISO 2768-300  
ISO 2768-301  
ISO 2768-302  
ISO 2768-303  
ISO 2768-304  
ISO 2768-305  
ISO 2768-306  
ISO 2768-307  
ISO 2768-308  
ISO 2768-309  
ISO 2768-310  
ISO 2768-311  
ISO 2768-312  
ISO 2768-313  
ISO 2768-314  
ISO 2768-315  
ISO 2768-316  
ISO 2768-317  
ISO 2768-318  
ISO 2768-319  
ISO 2768-320  
ISO 2768-321  
ISO 2768-322  
ISO 2768-323  
ISO 2768-324  
ISO 2768-325  
ISO 2768-326  
ISO 2768-327  
ISO 2768-328  
ISO 2768-329  
ISO 2768-330  
ISO 2768-331  
ISO 2768-332  
ISO 2768-333  
ISO 2768-334  
ISO 2768-335  
ISO 2768-336  
ISO 2768-337  
ISO 2768-338  
ISO 2768-339  
ISO 2768-340  
ISO 2768-341  
ISO 2768-342  
ISO 2768-343  
ISO 2768-344  
ISO 2768-345  
ISO 2768-346  
ISO 2768-347  
ISO 2768-348  
ISO 2768-349  
ISO 2768-350  
ISO 2768-351  
ISO 2768-352  
ISO 2768-353  
ISO 2768-354  
ISO 2768-355  
ISO 2768-356  
ISO 2768-357  
ISO 2768-358  
ISO 2768-359  
ISO 2768-360  
ISO 2768-361  
ISO 2768-362  
ISO 2768-363  
ISO 2768-364  
ISO 2768-365  
ISO 2768-366  
ISO 2768-367  
ISO 2768-368  
ISO 2768-369  
ISO 2768-370  
ISO 2768-371  
ISO 2768-372  
ISO 2768-373  
ISO 2768-374  
ISO 2768-375  
ISO 2768-376  
ISO 2768-377  
ISO 2768-378  
ISO 2768-379  
ISO 2768-380  
ISO 2768-381  
ISO 2768-382  
ISO 2768-383  
ISO 2768-384  
ISO 2768-385  
ISO 2768-386  
ISO 2768-387  
ISO 2768-388  
ISO 2768-389  
ISO 2768-390  
ISO 2768-391  
ISO 2768-392  
ISO 2768-393  
ISO 2768-394  
ISO 2768-395  
ISO 2768-396  
ISO 2768-397  
ISO 2768-398  
ISO 2768-399  
ISO 2768-400



Ver. no.:	Part. no.	Material / quantity:	Title: <b>Front right bracket</b>
1	17	Steel / 1	Project: <b>CSC neutron shielding</b>
	Date	Name	Signature
Drawn:	11/02/2024	Gasper Bizjan	
Checked:			
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Scale: 1:5 Format: A4
			Dwg. / Dwg. no: 16 / 99 Mass (kg): 12
			Belongs to: FRS/SFRS
			File name: front_bracket_1.SLDPR

4

3

2

1

F

F

E

E

D

D

C

C

B

B

A

A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
FREE DIMENSION

Outside radii and chamfers  
ISO 2768-c,v ±0.4  
ISO 2768-f,m ±0.5  
from 0.5 to 3 from 3 to 6  
from 3 to 6 from 6 to 30

±1  
±2  
±0.5  
±1.2  
±0.5  
±0.5  
±0.3  
±0.2  
±0.1  
±0.05  
from 0.5 to 3 from 3 to 6 from 6 to 30

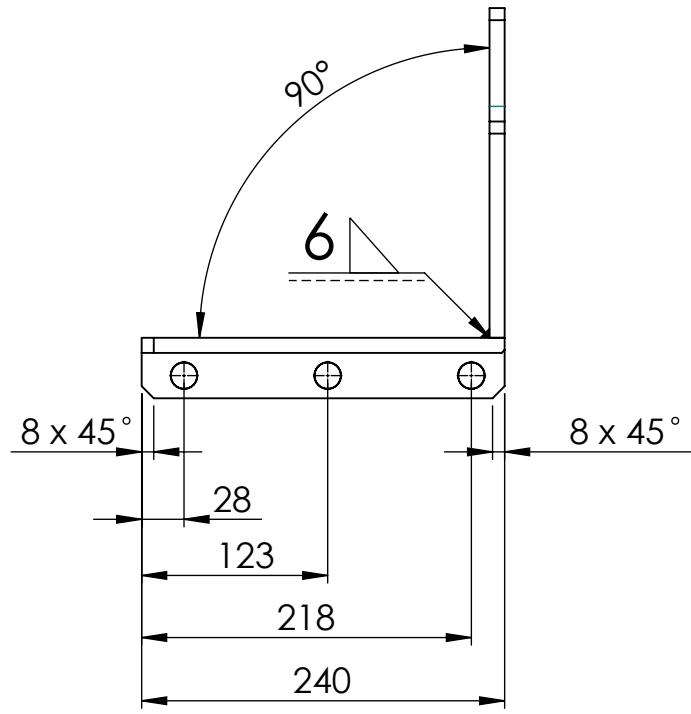
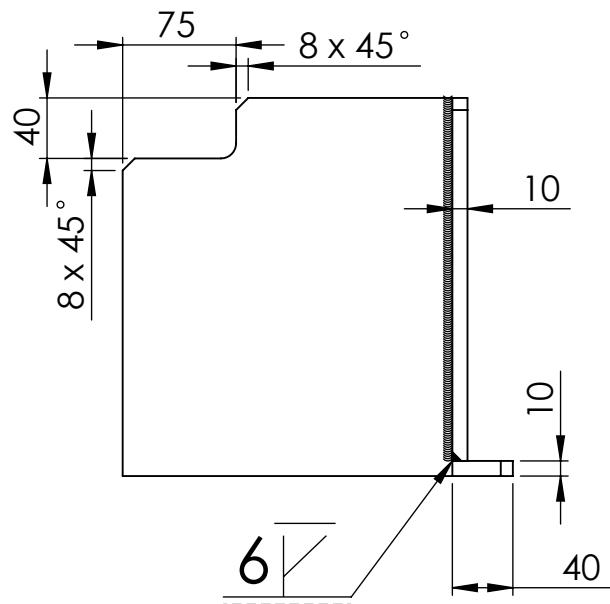
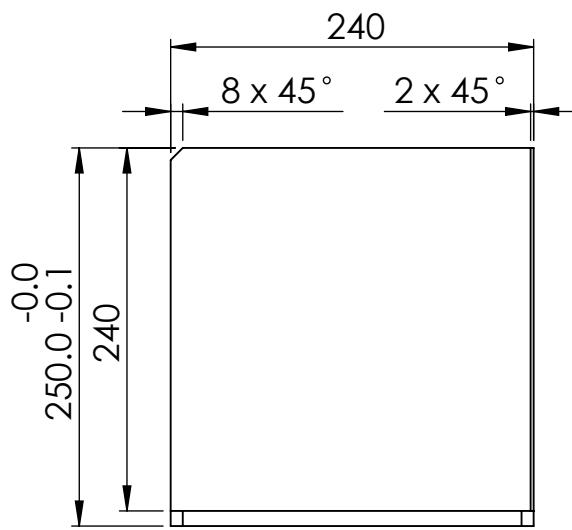
±4  
±3  
±2  
±1.2  
±2  
±0.8  
±0.5  
±0.3  
±0.2  
±0.1  
±0.05  
from 0.5 to 3 from 3 to 6 from 6 to 30

±6  
±5  
±4  
±3  
±2  
±1.2  
±0.8  
±0.5  
±0.3  
±0.2  
±0.1  
±0.05  
from 0.5 to 3 from 3 to 6 from 6 to 30

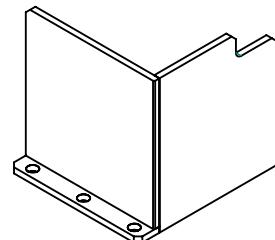
±13°  
±1°  
±30°  
±1°  
±10°  
from 0.5 to 3 from 3 to 6 from 6 to 30

±2°  
±1°  
±30°  
±1°  
±10°  
from 0.5 to 3 from 3 to 6 from 6 to 30

±0°20'  
±0°15'  
±0°20'  
±1°  
±0°5'  
from 0.5 to 3 from 3 to 6 from 6 to 30



Component made entirely of 10mm steel plate welded together



Ver. no.:	Part. no.:	Material / quantity:		Title: <b>Rear right bracket</b>
1	18	Steel / 1		
	Date:	Name:	Signature:	Project: <b>CSC neutron shielding</b>
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:5 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no.: 17 / 99 Mass (kg): 12
				Belongs to: FRS/SFRS
				File name: back_bracket_1.SLDPR
		ISO 128		

4

3

2

1

F

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
FREE DIMENSION

Outside radii and chamfers  
ISO 2768-c-v  
ISO 2768-f-m  
ISO 2768-t-m  
from 0.5 to 3  
from 0.5 to 6  
from 6 to 30

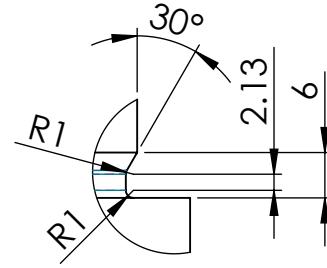
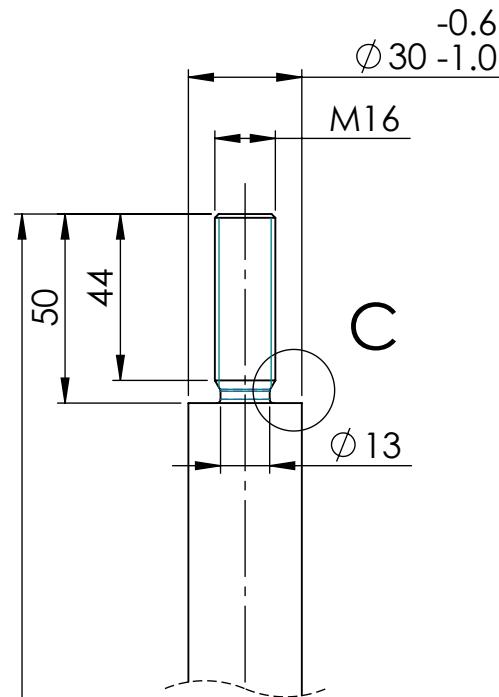
<sup>+0.4</sup>  
<sup>+0.2</sup>  
<sup>+0.5</sup>  
<sup>+0.2</sup>  
<sup>+0.1</sup>  
<sup>+0.05</sup>

<sub>-0.4</sub>  
<sub>-0.2</sub>  
<sub>-0.3</sub>  
<sub>-0.2</sub>  
<sub>-0.1</sub>  
<sub>-0.05</sub>

<sup>+1.0</sup>  
<sup>+2.0</sup>  
<sup>+1.2</sup>  
<sup>+0.8</sup>  
<sup>+0.1</sup>  
<sup>0.05</sup>

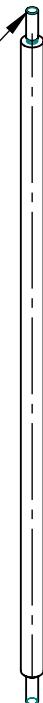
<sup>+4</sup>  
<sup>+6</sup>  
<sup>+3</sup>  
<sup>+0.8</sup>  
<sup>+0.15</sup>  
<sup>0.05</sup>

<sup>+8</sup>  
<sup>+12</sup>  
<sup>+4</sup>  
<sup>+1.2</sup>  
<sup>+0.3</sup>  
<sup>0.15</sup>



C 1 : 1

1120

Same M16 thread  
on both sides of the rod

C

B

A

Ver. no.:

Part. no.

Material / quantity:

1

19

Steel / 6

Title:  
Support rod

Drawn:

Date

Name

Signature

Project:

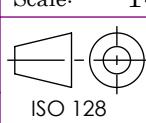
CSC neutron shielding

Checked:

**GSI**Helmholtzzentrum für  
Schwerionenforschung

Scale: 1:2

Format: A4

Tolerance principles  
ISO 8015Tolerances:  
ISO 2768-m

Dwg. / Dwg. no: 18 / 99

Mass (kg): 6

Belongs to: FRS/SFRS

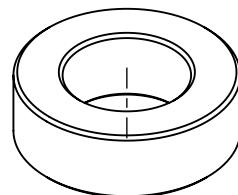
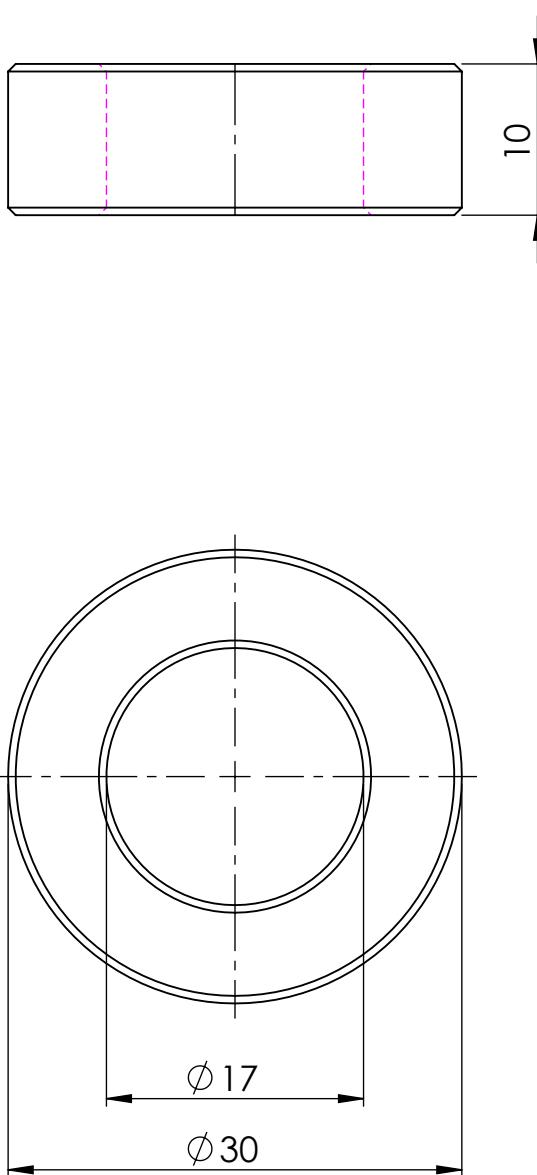
File name: rod\_1.SLDPR

F

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
FREE  
DIMENSION

- ±0.5 ±0.5 ±0.5 ±0.5 ±0.5  
±0.2 ±0.3 ±0.1 ±0.2 ±0.05  
±0.05 ±0.05 ±0.05 ±0.1 ±0.05  
from 0.5 from 0.5 from 0.5 from 0.6 from 0.6  
to 3 to 3 to 3 to 3 to 3  
to 1.2 to 0.8 to 0.3 to 0.2 to 0.1  
to 0.1 to 0.1 to 0.1 to 0.1 to 0.05  
to 0.6 to 0.6 to 0.6 to 0.6 to 0.6  
to 2000 to 2000 to 2000 to 2000 to 2000  
fr. 1000 fr. 1000 fr. 1000 fr. 1000 fr. 1000  
fr. 4000 fr. 4000 fr. 4000 fr. 4000 fr. 4000

Outside radii and chamfers  
ISO 2768-c-v ISO 2768-f-m ISO 2768-m  
±0.4 ±0.2 ±0.5  
±1 ±0.2 ±0.5  
±2 ±1 ±1  
ISO 2768-c-m ISO 2768-f-m ISO 2768-m  
±1.0 ±1.0 ±1.0  
±15° ±10° ±10°  
±0.30 ±0.20 ±0.20  
±1.0 ±1.0 ±1.0  
±10' ±10' ±10'  
from 10 from 10 from 10  
to 30 to 30 to 30  
to 50 to 50 to 50  
fr. 120 fr. 120 fr. 120  
fr. 400 fr. 400 fr. 400



B

C

D

E

F

F

E

D

C

B

A

Ver. no.:	Part. no.	Material / quantity:		Title: <b>Rod spacer</b>
1	20	Steel / 3		Project: <b>CSC neutron shielding</b>
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		Scale: 2:1 Format: A4
Checked:				Dwg. / Dwg. no: 19 / 99 Mass (kg): 0.04
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Belongs to: FRS/SFRS
				File name: distancknik.SLDPRT

F

F

E

E

D

D

C

C

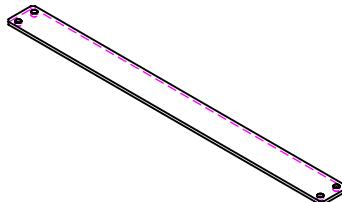
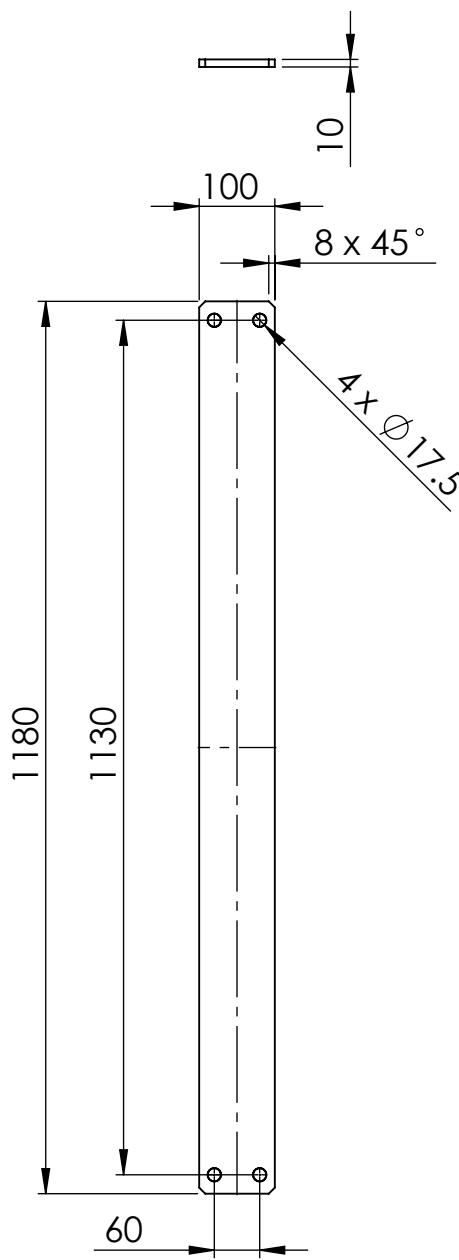
B

B

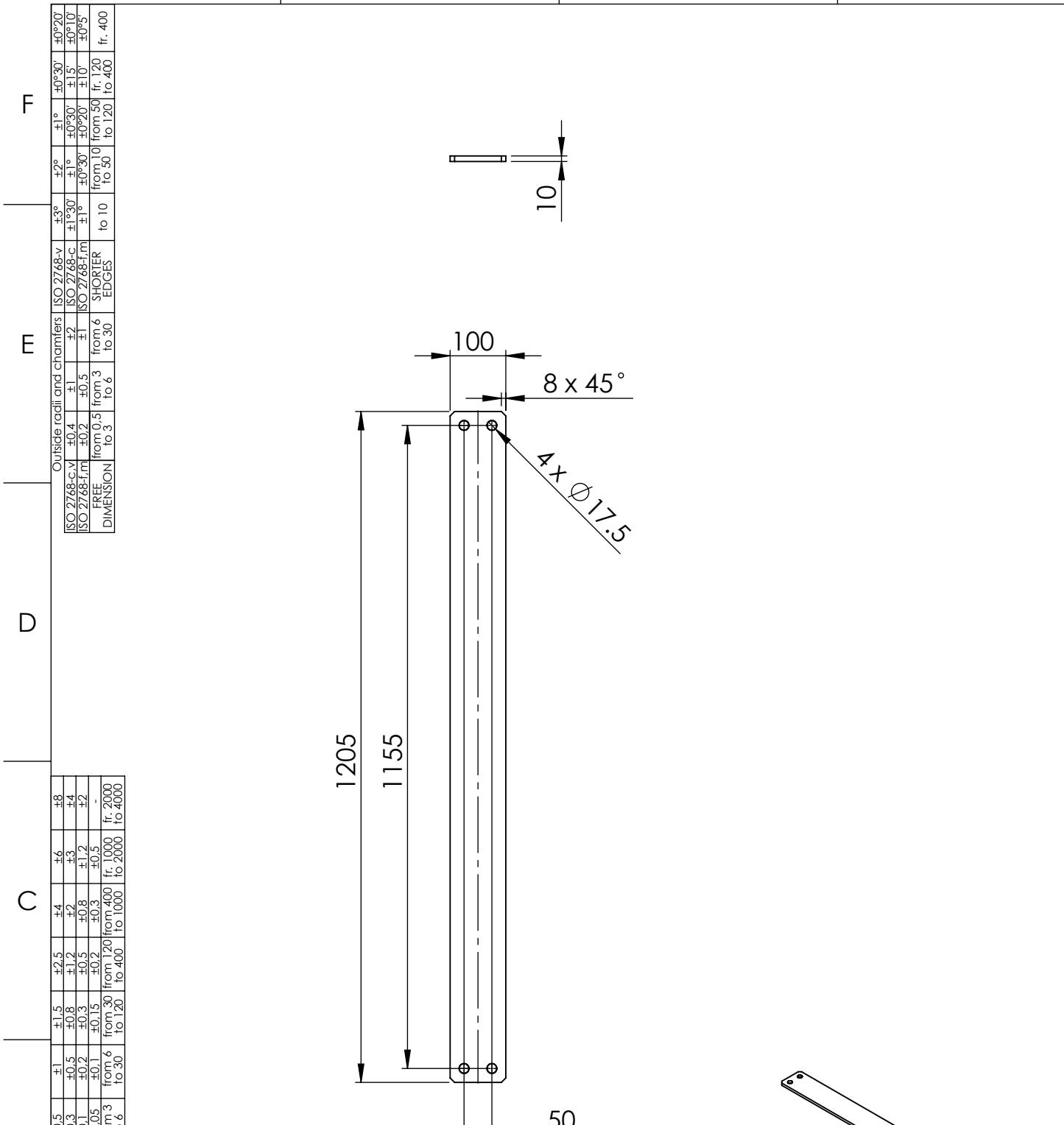
A

A

ISO 2768-v	-	$\pm 0.5$	$\pm 1$	$\pm 1.5$	$\pm 2.5$	$\pm 4$	$\pm 6$	$\pm 8$
ISO 2768-c	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$	$\pm 3$	$\pm 4$
ISO 2768-m	$\pm 0.1$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$
ISO 2768-f	$\pm 0.05$	$\pm 0.05$	$\pm 0.1$	$\pm 0.15$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 7$
DIMENSION	from 3 to 3	from 3 to 6	from 30 to 30	from 120 to 120	from 400 to 400	from 1000 to 1000	from 2000 to 2000	from 4000 to 4000

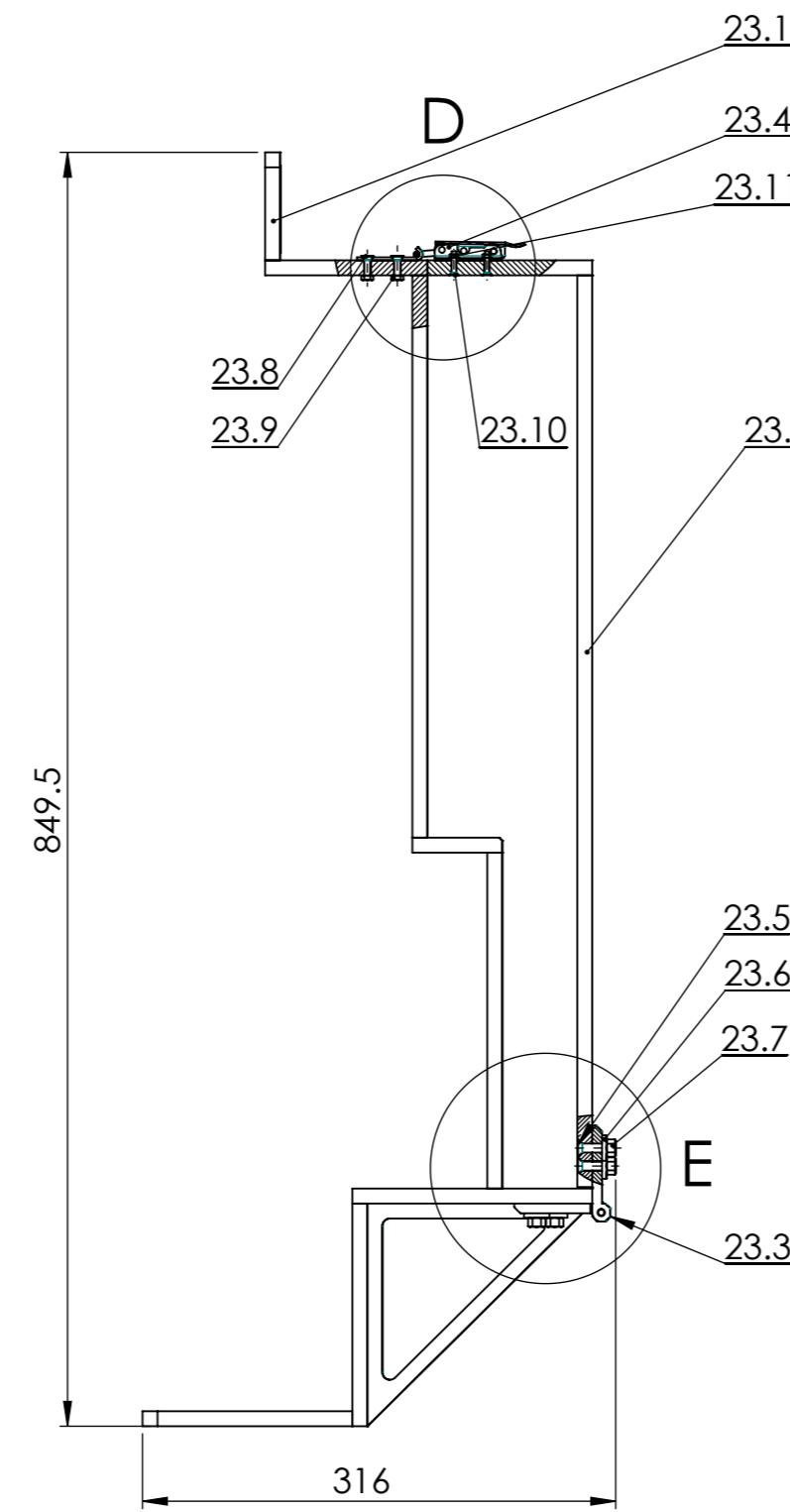
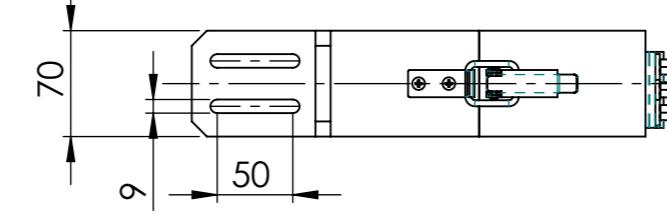
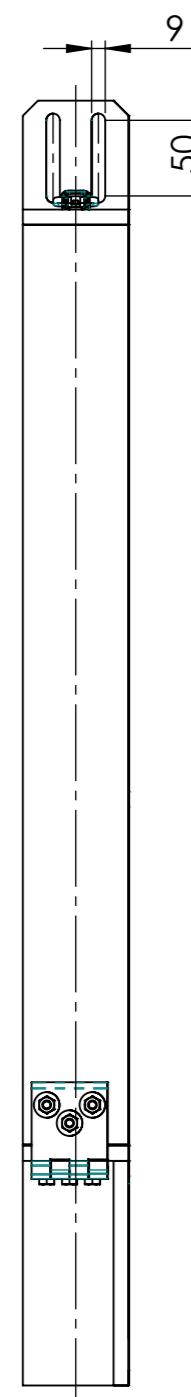


Ver. no.:	Part. no.:	Material / quantity:		Title: Front top bar
1	21	Steel / 1		
	Date:	Name:	Signature:	Project: CSC neutron shielding
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:10 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 20 / 99 Mass (kg): 9 Belongs to: FRS/SFRS File name: top_connector.SLDPR
		ISO 128		

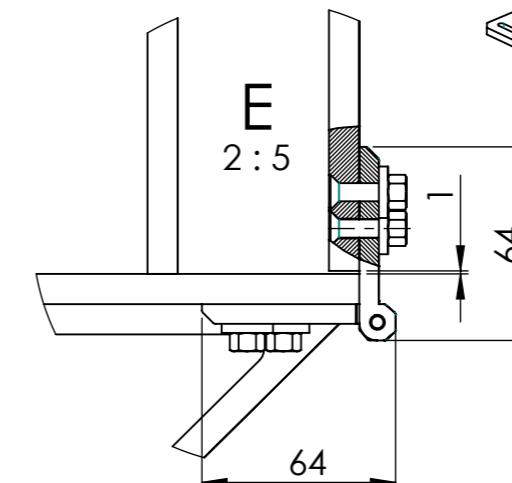
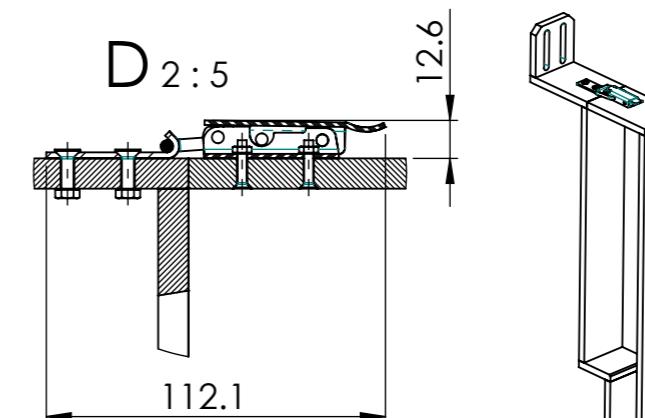


Ver. no.:	Part. no.:	Material / quantity:		Title: <b>Left top bar</b>
1	22	Steel / 1		
	Date:	Name:	Signature:	Project: <b>CSC neutron shielding</b>
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:10 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 21 / 99 Mass (kg): 9
				Belongs to: FRS/SFRS
				File name: top_connector_2.SLDPR

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
DIMENSION from 3 to 30 to 60 to 120 to 200 to 400



In order to be able to insert the top rear shielding (the one at the MR\_TOF) a system that allows opening and closing should be implemented



Pos.	Qua.	Name and dimensions	drawing nr./standard	Material	Mass
23.11	2	Hex nut M3	ISO 4034	8.8	0.01
23.10	2	Countersunk flat head screw M3x16	ISO 7046	8.8	0.01
23.9	2	Hex nut M4	ISO 4034	8.8	0.01
23.8	2	Countersunk flat head screw M4x16	ISO 7046	8.8	0.01
23.7	6	Hex nut M6	ISO 4034	8.8	0.01
23.6	6	Washer Ø 6.4xØ 17x3	ISO 7089	Steel	0.01
23.5	6	Countersunk hex screw M6x25	DIN 7991	8.8	0.01
23.4	1	Latch	Latch	Steel	0.05
23.3	1	Bottom Hinge 50mm	50mm Mentese	Steel	0.05
23.2	1	Rear left holster 2 620x110x70	rear_left_holder_2	Steel	4
23.1	1	Rear left holster 1 850x310x70	rear_left_holder	Steel	7.2

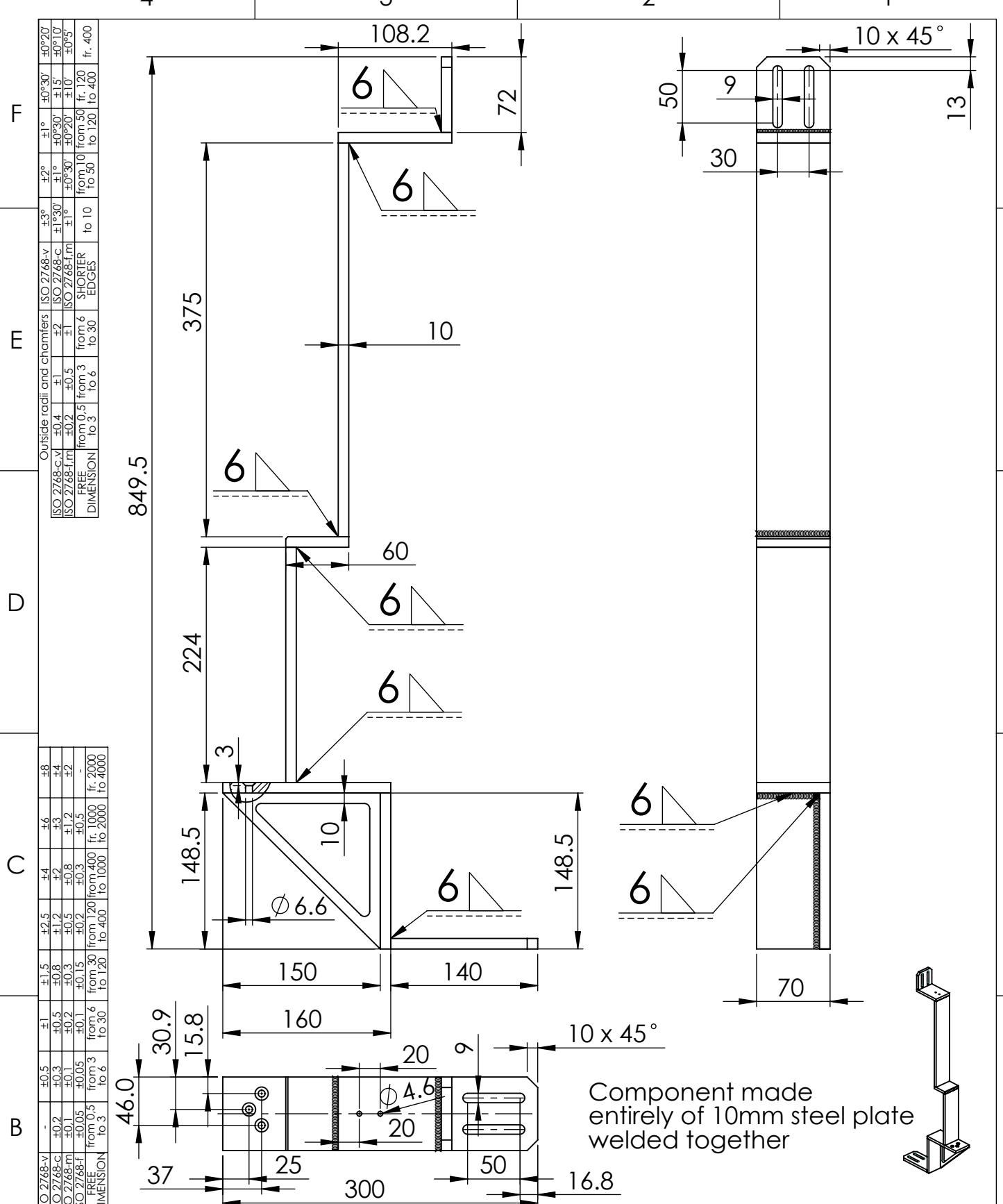
Ver. no.:	Part. no.:	Quantity:	Title: Rear left holster	
1	23	1		
	Date:	Name:	Project: CSC neutron shielding	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:			Scale: 1:5	
GSI Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Format: A3
				Dwg. / Dwg. no: 22 / 99 Mass (kg): 12
				Belongs to: FRS/SFRS
				File name: Rear left holster.SLDASM

ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 FREE DIMENSION  
 to 3 from 6

Outside radii and chamfers  
 ISO 2768-c-v  
 ISO 2768-f-m  
 FREE from 0.5 to 3

ISO 2768-c  
 ISO 2768-f  
 FREE from 0.5 to 3

ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 FREE DIMENSION  
 to 3 from 6



Ver. no.:	Part. no.:	Material / quantity:		Title: Rear left holster 1
1	23.1	Steel / 1		Project: CSC neutron shielding
	Date:	Name:	Signature:	Scale: 1:5 Format: A4
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 23 / 99 Mass (kg): 7.2 Belongs to: FRS/SFRS File name: rear_left_holder.SLDPR

4

3

2

1

F

E

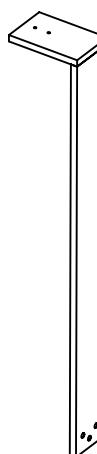
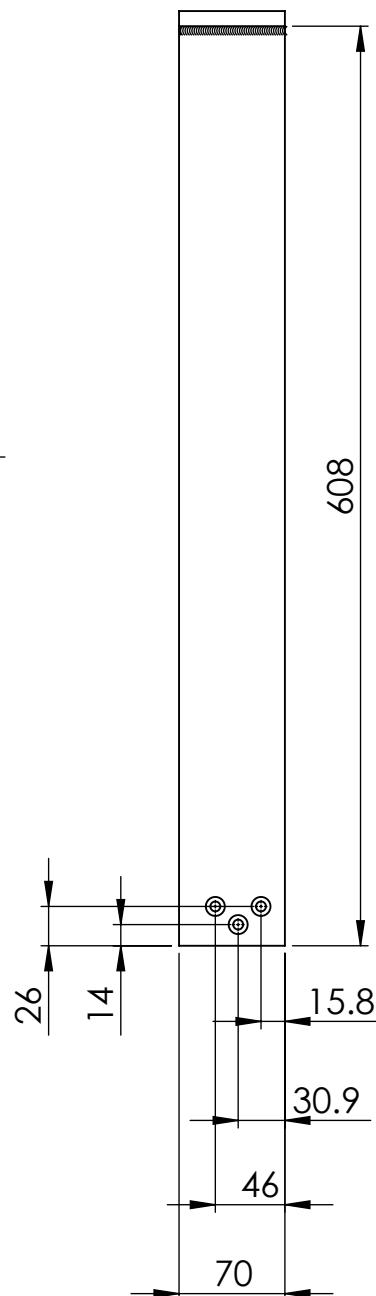
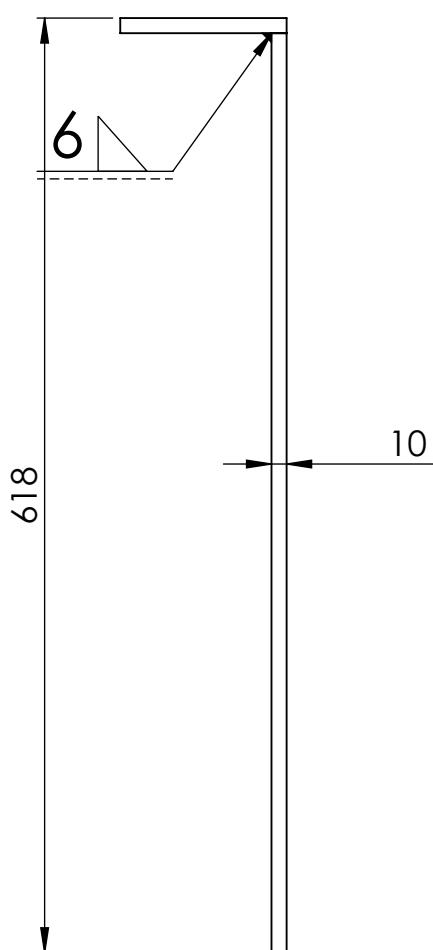
D

C

B

Component made  
entirely of 10mm steel plate  
welded together

ISO 2768-v	-	±0.5	±1.5	±2.5	±4	±6	±8
ISO 2768-c	±0.2	±0.3	±0.5	±1.2	±2	±3	±4
ISO 2768-m	±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2
ISO 2768-f	±0.05	±0.05	±0.1	±0.15	±0.2	±0.3	±0.5
FREE DIMENSION	from 0.5	from 0.5	from 1.20	from 2.00	from 3.0	from 4.00	from 6.00
to 3	to 3	to 3.0	to 4.00	to 5.00	to 6.00	to 8.00	to 10.00



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Rear left holster 2</b>
1	23.2	Steel / 1		
	Date	Name	Signature	Project: <b>CSC neutron shielding</b>
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:5 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 24 / 99 Mass (kg): 4
				Belongs to: FRS/SFRS
				File name: rear_left_holder.SLDPR

4

3

2

1

F

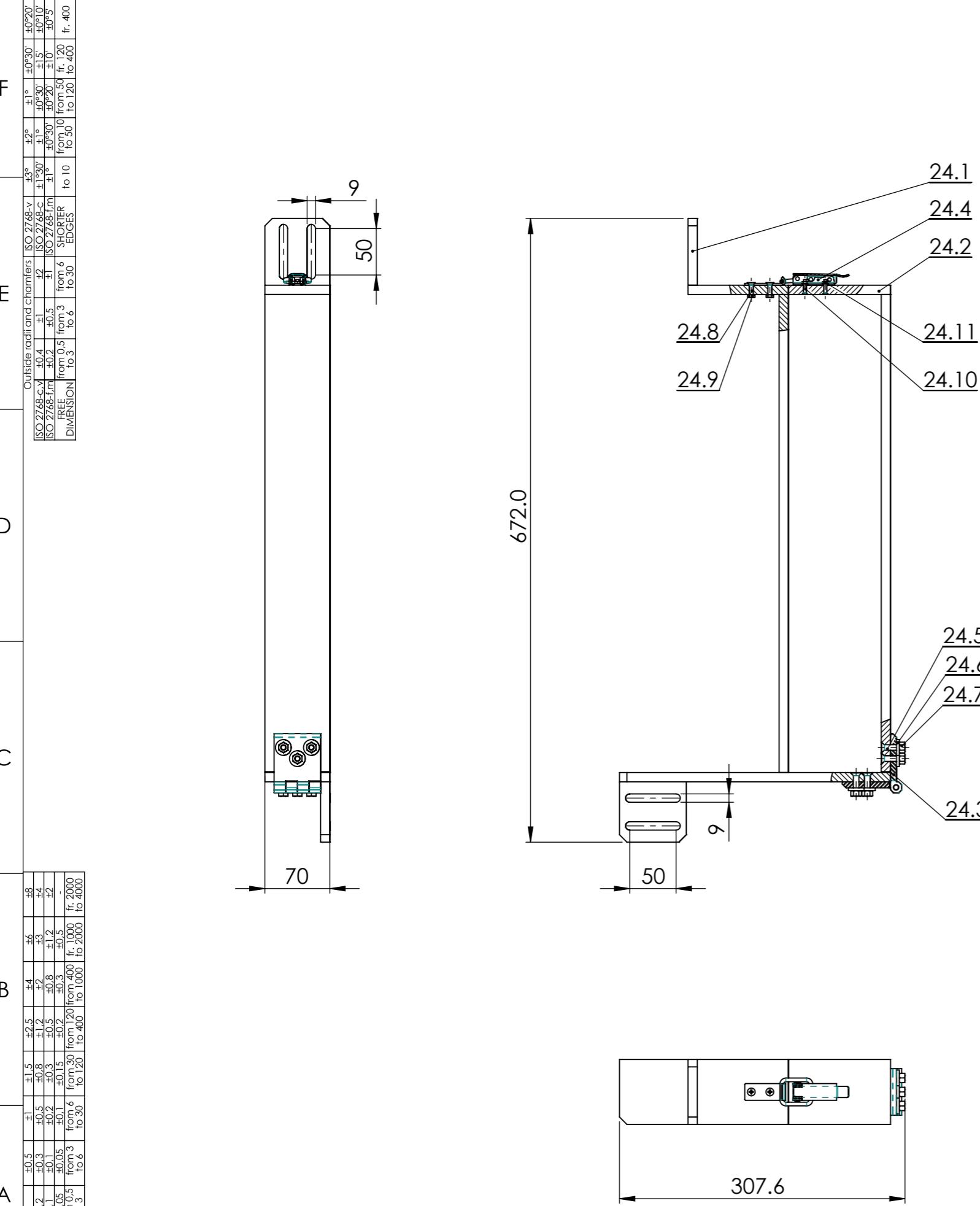
E

D

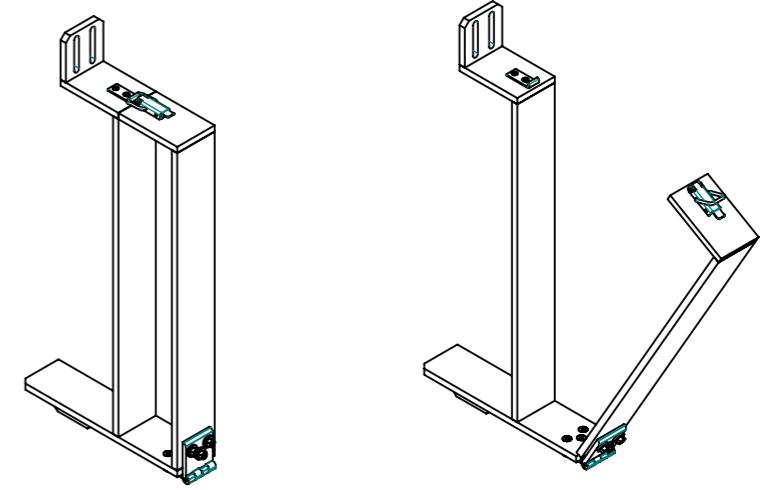
C

B

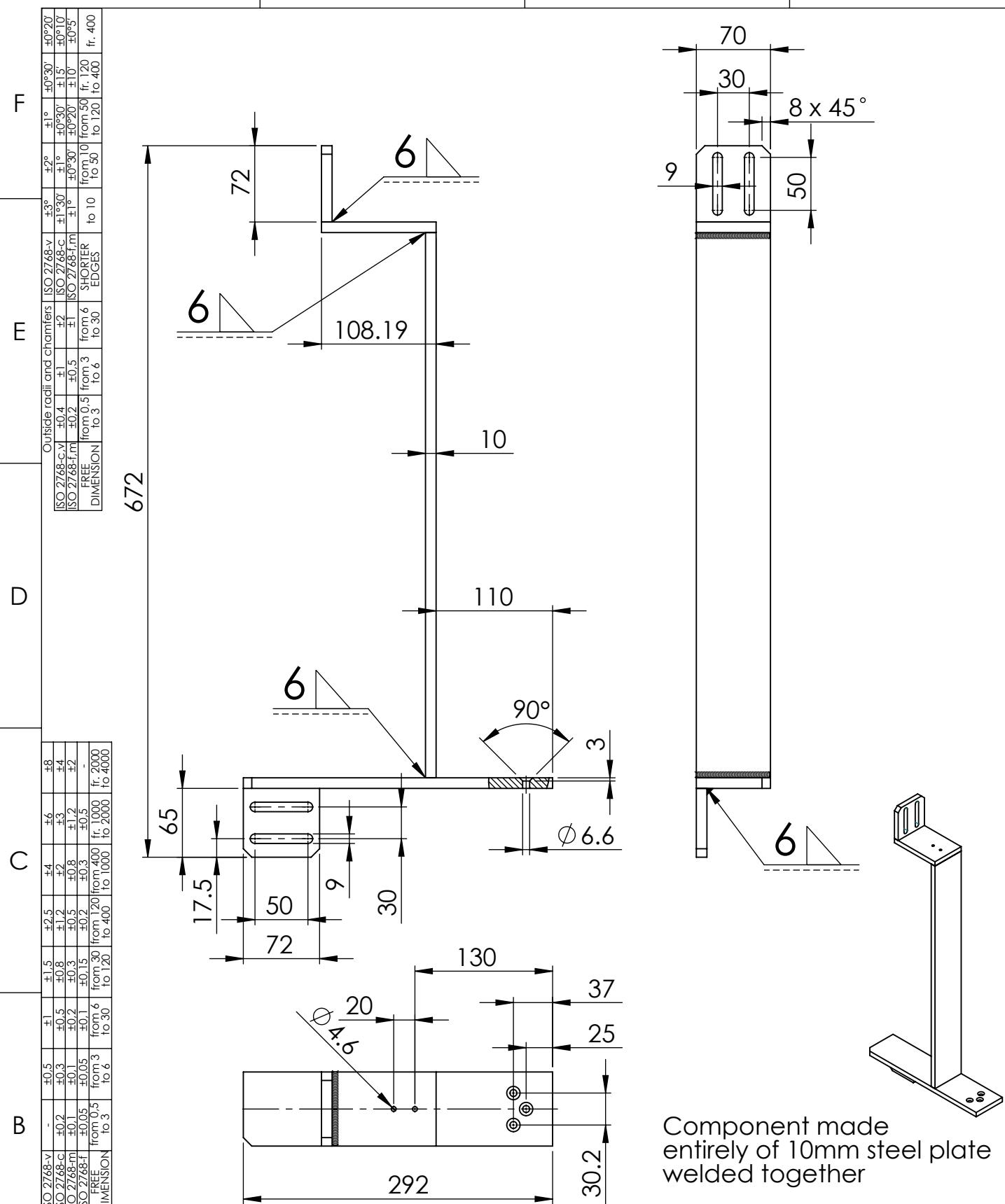
A



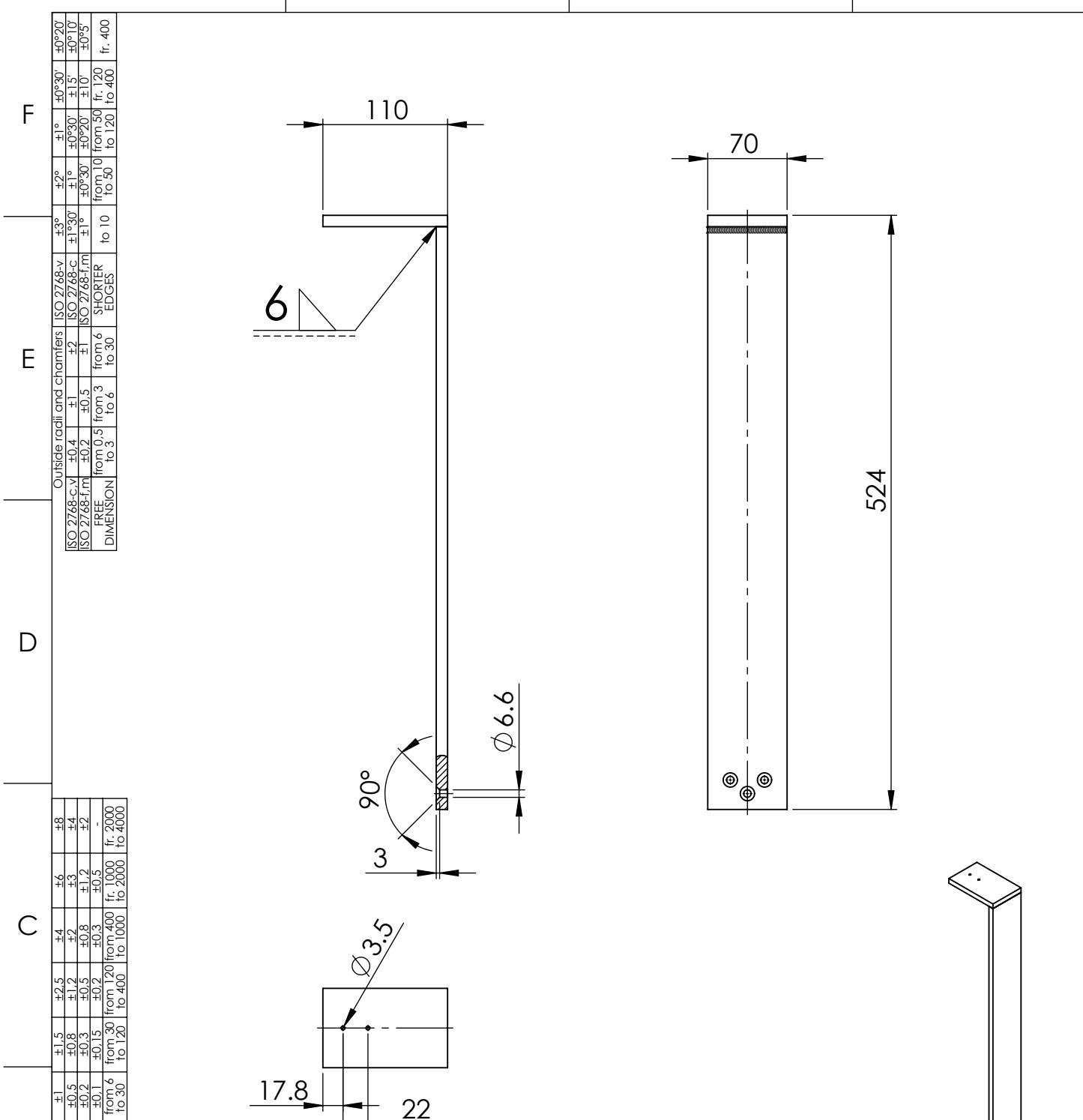
In order to be able to insert the top rear shielding (the one at the MR\_TOF) a system that allows opening and closing should be implemented



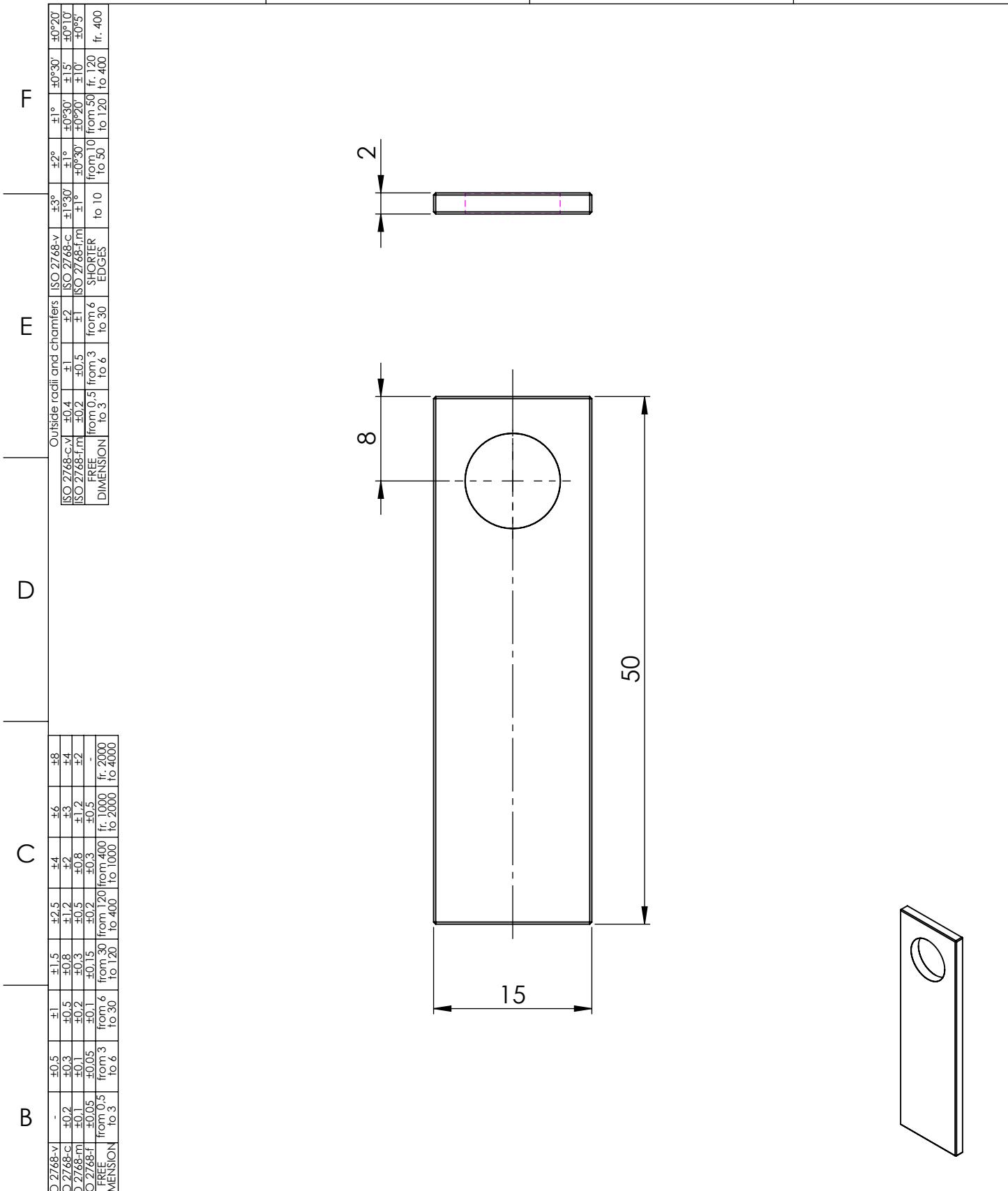
Pos.	Qua.	Name and dimensions	drawing nr./standard	Material	Mass
24.11	2	Hex nut M3	ISO 4034	Steel	0.01
24.10	2	Countersunk flat head screw M3x16	ISO 7046	Steel	0.01
24.9	2	Hex nut M4	ISO 4034	Steel	0.01
24.8	2	Countersunk flat head screw M4x16	ISO 7046	Steel	0.01
24.7	6	Hex nut M6	ISO 4034	Steel	0.01
24.6	6	Washer Ø 6.4xØ 17x3	ISO 7089	Steel	0.01
24.5	6	Countersunk hex screw M6x25	DIN 7991	Steel	0.01
24.4	1	Latch	Latch	Steel	0.05
24.3	1	Bottom Hinge 50mm	50mm Mentese	Steel	0.05
24.2	1	Rear right holster 2 524x110x70	rear_right_holder_2	Steel	4
24.1	1	Rear right holster 1 672x308x70	rear_right_holder	Steel	7.2
Pos.	Qua.	Name and dimensions	drawing nr./standard	Material	Mass
Ver. no.:		Part. no.:	Quantity:	Title:	
1	24	1		Rear right holster	
		Date:	Name:	Project:	
		11/02/2024	Gasper Bizjan	CSC neutron shielding	
Drawn:				Signature:	
Checked:					
			Scale:	1:10	Format: A3
			Dwg. / Dwg. no:	25 / 99	Mass (kg): 12
			Belongs to:	FRS/SFRS	
			ISO 128	File name: rear_left_holster.SLDASM	



Ver. no.:	Part. no.:	Material / quantity:		Title:
1	24.1	Steel / 1		Rear right holster 1
	Date:	Name:	Signature:	Project:
Drawn:	11/02/2024	Gasper Bizjan		CSC neutron shielding
Checked:				Scale: 1:5 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles: ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 26 / 99 Mass (kg): 5.6
				Belongs to: FRS/SFRS
				File name: rear_right_holder.SLDPRT



Ver. no.:	Part. no.:	Material / quantity:		Title: <b>Rear right holster 2</b>
1	24.2	Steel / 1		Project: <b>CSC neutron shielding</b>
	Date:	Name:	Signature:	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:5 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 27 / 99 Mass (kg): 3.4
				Belongs to: FRS/SFRS
				File name: rear_right_holder.SLDPRT



Ver. no.:	Part. no.	Material / quantity:		Title: Inner plate holder flat
1	25	Steel / 6		
	Date	Name	Signature	Project: CSC neutron shielding
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 2:1 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 28 / 99 Mass (kg): 0.01
				Belongs to: FRS/SFRS
				File name: inner_plate_holder.SLDPRT

4

3

2

1

F

E

D

C

B

Ver. no.:  
1

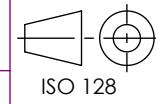
Part. no.  
26

Material / quantity:  
Steel / 6

Title:  
**Inner plate holder L-shape**

Project:  
**CSC neutron shielding**

Scale: 2:1 Format: A4



Dwg. / Dwg. no: 29 / 99 Mass (kg): 0.01

Belongs to: FRS/SFRS

File name: inner\_plate\_holder.SLDPRT

4

3

2

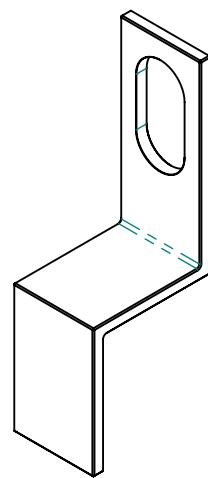
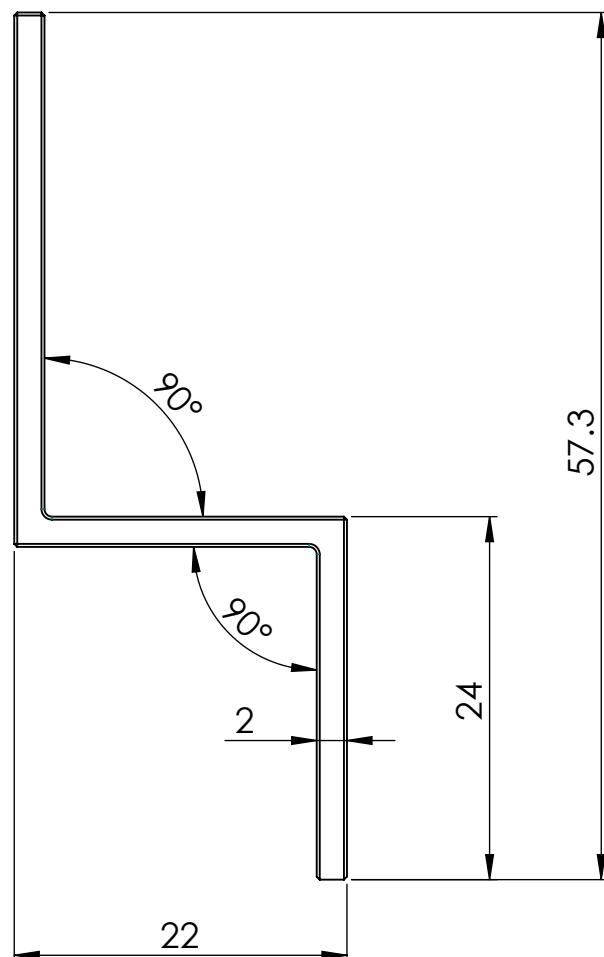
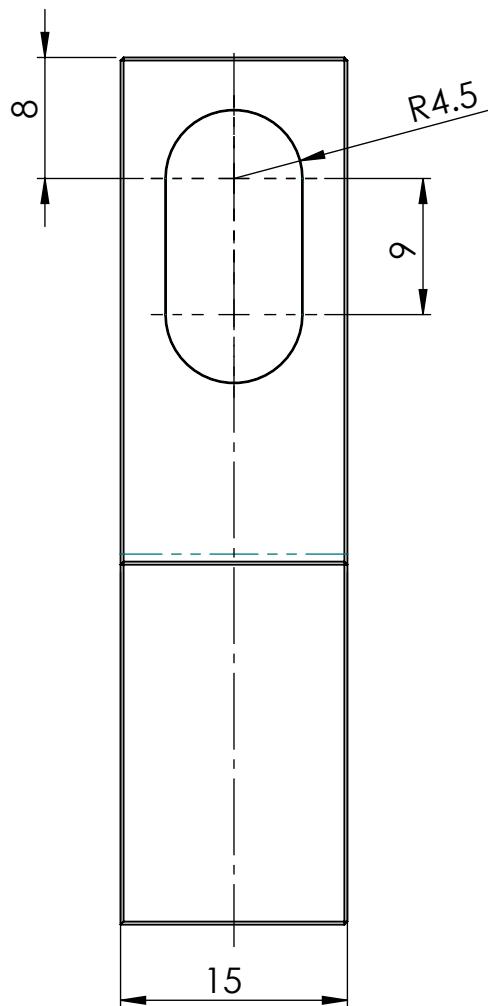
1

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
DIMENSION

±0.5 ±1 ±1.5 ±2.5 ±4 ±6  
±0.3 ±0.1 ±0.8 ±1.2 ±2 ±3  
±0.5 ±0.2 ±0.3 ±0.5 ±0.8 ±1.2  
±0.1 ±0.05 ±0.05 ±0.1 ±0.2 ±0.3  
from 0.5 from 3 from 6 from 120 from 200  
to 3 to 3 to 30 to 120 to 2000

fr. 1000 fr. 2000 fr. 10000 fr. 20000

to 40000



**GSI**  
Helmholtzzentrum für  
Schwerionenforschung

Tolerance principles  
ISO 8015

Tolerances:  
ISO 2768-m

ISO 128

4

3

2

1

F

E

D

C

B

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
FREE  
DIMENSION

Outside radii and chamfers  
ISO 2768-c,v  
ISO 2768-f,m  
from 0.5 to 3  
from 0.5 to 6  
to 30

$\pm 0.4$   
 $\pm 0.5$   
 $\pm 0.2$   
 $\pm 0.1$   
 $\pm 0.05$

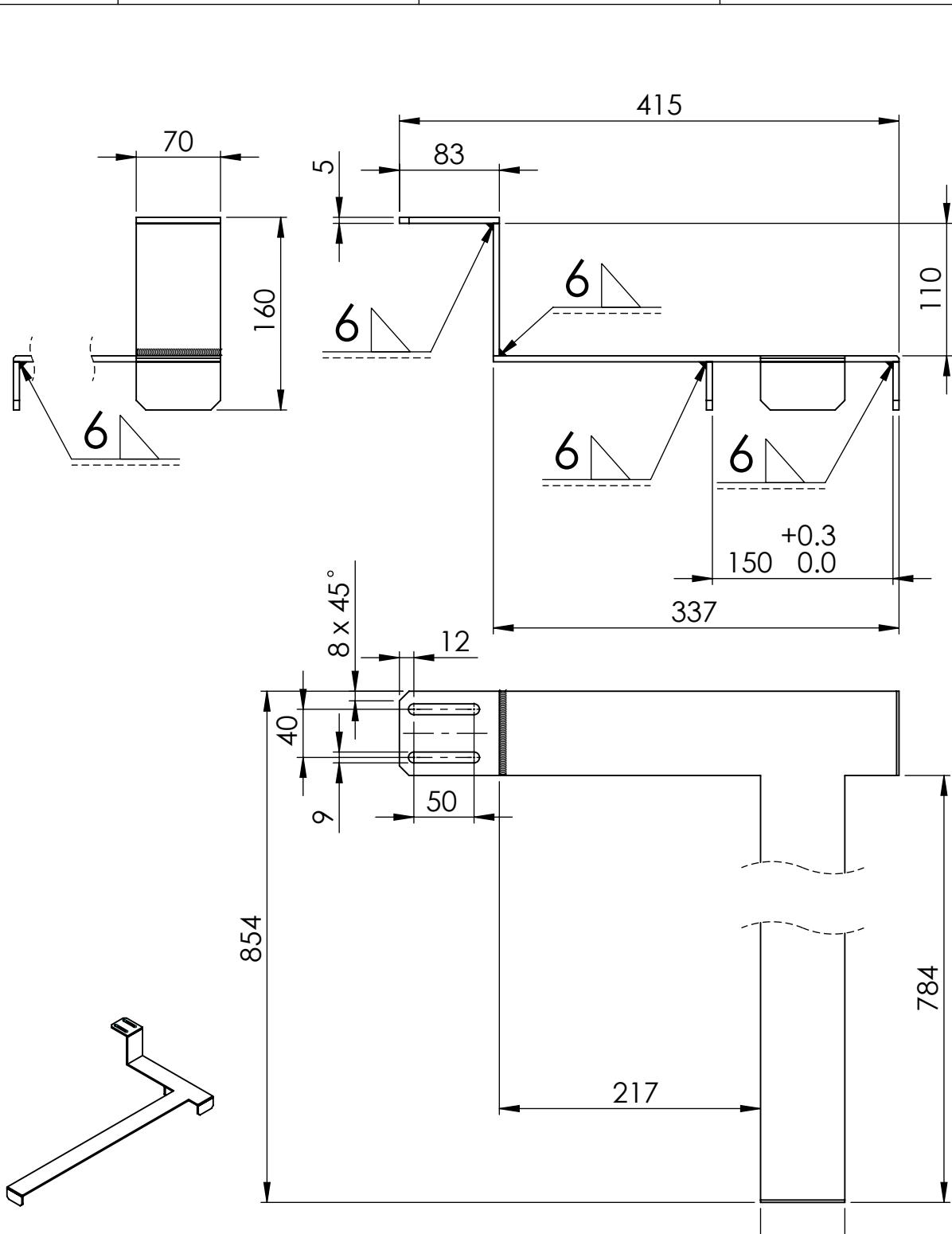
$\pm 1$   
 $\pm 0.5$   
 $\pm 0.2$   
 $\pm 0.1$   
 $\pm 0.05$

$\pm 2$   
 $\pm 1.2$   
 $\pm 0.8$   
 $\pm 0.5$   
 $\pm 0.3$

$\pm 3$   
 $\pm 1.2$   
 $\pm 0.8$   
 $\pm 0.5$   
 $\pm 0.3$

$\pm 4$   
 $\pm 2$   
 $\pm 1.2$   
 $\pm 0.8$   
 $\pm 0.5$

$\pm 8$   
 $\pm 4$   
 $\pm 2$   
 $\pm 1$   
 $\pm 0.5$



Component made  
entirely of 5 mm steel plate  
welded together

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
FREE  
DIMENSION

1

27

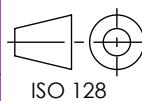
Material / quantity:

Steel / 1

Title:  
Bookcase holster

Project:  
CSC neutron shielding

Scale: 1:5 Format: A4

**GSI**Helmholtzzentrum für  
SchwerionenforschungTolerance principles  
ISO 8015Tolerances:  
ISO 2768-m

Dwg. / Dwg. no: 30 / 99 Mass (kg): 4

Belongs to: FRS/SFRS

File name: holster\_top\_4.SLDPRT

4

3

2

1

A

F

E

D

C

B

A

4

3

2

1

F

E

D

C

B

Ver. no.:

Part. no.

Material / quantity:

1

28

Steel / 1

Component made  
entirely of 5 mm steel plate  
welded together

**GSI**  
Helmholtzzentrum für  
Schwerionenforschung

Title:

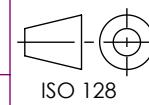
Pipe-side top holster

Project:

CSC neutron shielding

Scale: 1:5

Format: A4



Dwg. / Dwg. no: 31 / 99 Mass (kg): 1.5

Belongs to: FRS/SFRS

File name: holster\_top.SLDPRT

ISO 2768-v  
-  
ISO 2768-c  
±0.2  
±0.3  
±0.5  
±0.7  
±1  
±1.5  
±2.5  
±4  
±6  
±8

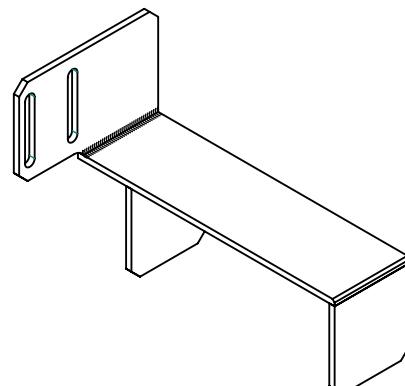
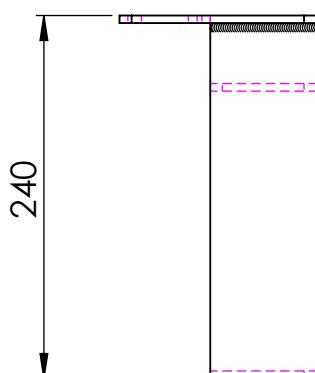
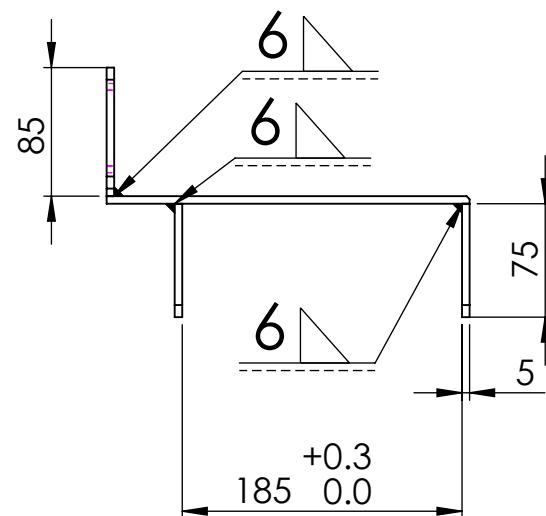
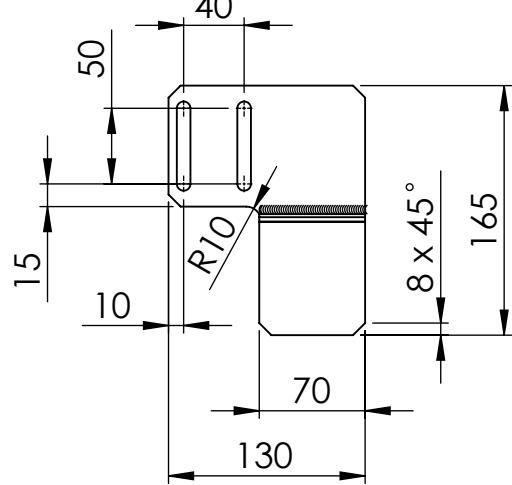
ISO 2768-c,v  
±0.4  
±0.5  
±0.7  
±1  
±1.5  
±2  
±3  
±4  
±6  
±8

ISO 2768-f,m  
±0.2  
±0.3  
±0.5  
±0.7  
±1.2  
±2  
±3  
±4  
±6  
±8

ISO 2768-f  
±0.5  
±0.7  
±1.2  
±2  
±3  
±4  
±6  
±8

FREE  
from 0.5  
from 3  
from 6  
from 120  
from 200  
from 300  
from 400  
from 600  
from 1000  
from 1200  
from 2000  
from 3000  
from 4000  
from 6000  
from 10000  
from 12000  
from 20000  
from 30000  
from 40000

DIMENSION  
to 3  
to 6  
to 120  
to 200  
to 300  
to 400  
to 600  
to 1000  
to 1200  
to 2000  
to 3000  
to 4000  
to 6000  
to 10000  
to 12000  
to 20000  
to 30000  
to 40000



A

4

3

2

1

F

E

D

C

B

A

4

3

2

1

F

E

D

C

B

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
DIMENSION

-  
±0.2  
±0.1  
±0.05  
from 0.5

±0.5  
±0.3  
±0.1  
±0.05  
from 0.5

±1  
±0.5  
±0.2  
±0.1  
from 0.5

±1.5  
±0.8  
±0.3  
±0.2  
from 0.5

±2.5  
±1.2  
±0.5  
±0.2  
from 0.5

±4  
±2  
±1.2  
±0.5  
from 0.5

±6  
±3  
±1.2  
±0.8  
from 0.5

±8  
±4  
±3  
±2  
from 0.5

±1.5  
±1.2  
±0.5  
±0.2  
from 0.5

±2.5  
±1.2  
±0.5  
±0.2  
from 0.5

±4  
±2  
±1.2  
±0.8  
from 0.5

±6  
±3  
±1.2  
±0.8  
from 0.5

±1.5  
±1.2  
±0.5  
±0.2  
from 0.5

±2.5  
±1.2  
±0.5  
±0.2  
from 0.5

±4  
±2  
±1.2  
±0.8  
from 0.5

±6  
±3  
±1.2  
±0.8  
from 0.5

±1.5  
±1.2  
±0.5  
±0.2  
from 0.5

±2.5  
±1.2  
±0.5  
±0.2  
from 0.5

±4  
±2  
±1.2  
±0.8  
from 0.5

±6  
±3  
±1.2  
±0.8  
from 0.5

±1.5  
±1.2  
±0.5  
±0.2  
from 0.5

±2.5  
±1.2  
±0.5  
±0.2  
from 0.5

±4  
±2  
±1.2  
±0.8  
from 0.5

±6  
±3  
±1.2  
±0.8  
from 0.5

±1.5  
±1.2  
±0.5  
±0.2  
from 0.5

±2.5  
±1.2  
±0.5  
±0.2  
from 0.5

±4  
±2  
±1.2  
±0.8  
from 0.5

±6  
±3  
±1.2  
±0.8  
from 0.5

±1.5  
±1.2  
±0.5  
±0.2  
from 0.5

±2.5  
±1.2  
±0.5  
±0.2  
from 0.5

±4  
±2  
±1.2  
±0.8  
from 0.5

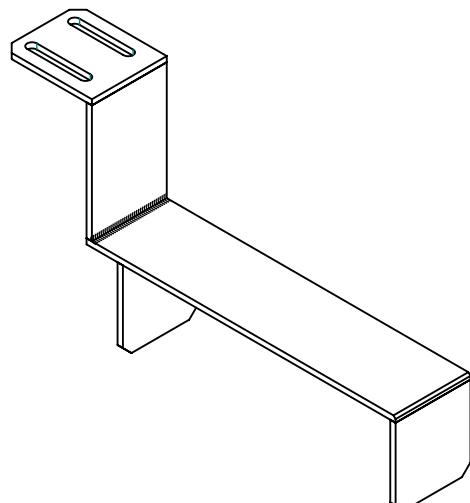
±6  
±3  
±1.2  
±0.8  
from 0.5

±1.5  
±1.2  
±0.5  
±0.2  
from 0.5

±2.5  
±1.2  
±0.5  
±0.2  
from 0.5

±4  
±2  
±1.2  
±0.8  
from 0.5

Component made  
entirely of 5 mm steel plate  
welded together



Ver. no.:	Part. no.	Material / quantity:	Title: <b>Right side top holster</b>
1	29	Steel / 2	Project: <b>CSC neutron shielding</b>
	Date	Name	Signature
Drawn:	11/02/2024	Gasper Bizjan	
Checked:			
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Scale: 1:5 Format: A4
			Dwg. / Dwg. no: 32 / 99 Mass (kg): 1.7
			Belongs to: FRS/SFRS
			File name: holster_top_2.SLDPRT

4

3

2

1

A

B

C

E

F

4

3

2

1

F

E

D

C

B

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
FREE  
DIMENSION

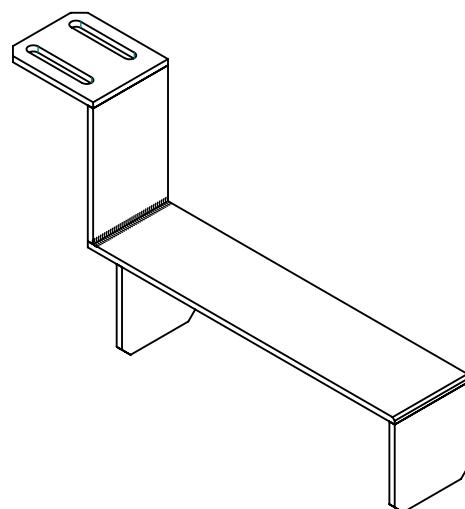
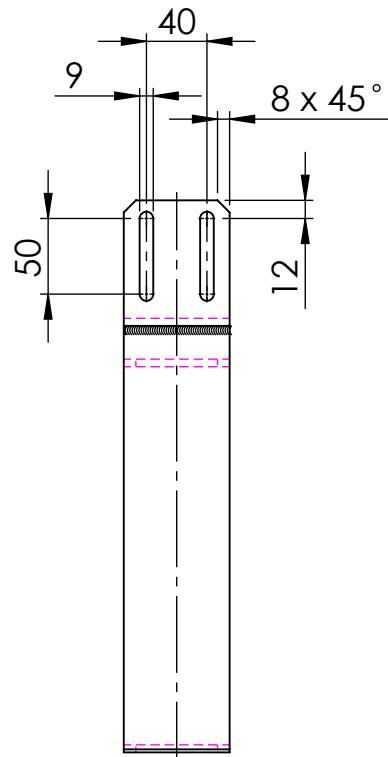
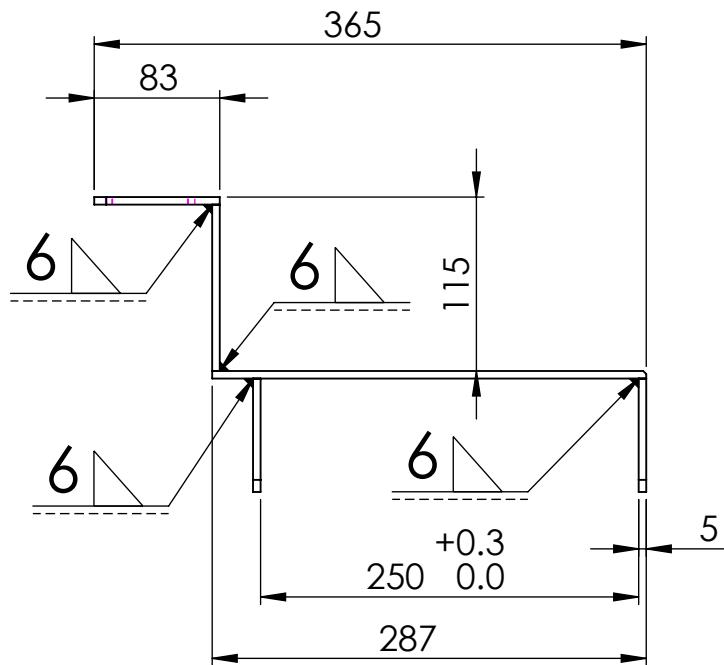
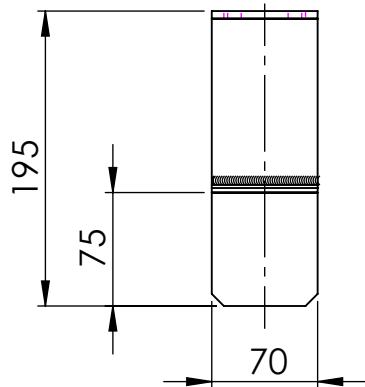
- ±0.5 ±1 ±0.5 ±1.5 ±2.5 ±4 ±6  
±0.2 ±0.3 ±0.5 ±0.8 ±1.2 ±2 ±3  
±0.1 ±0.1 ±0.2 ±0.3 ±0.5 ±1.2 ±2  
±0.05 ±0.05 ±0.05 ±0.1 ±0.15 ±0.3 ±2  
from 0.5  
to 0.6  
fr. 1000 fr. 2000 fr. 1000 fr. 2000 fr. 1000 fr. 2000 fr. 1000

fr. 4000

fr. 4000

fr. 4000

fr. 4000



Component made  
entirely of 5 mm steel plate  
welded together

A

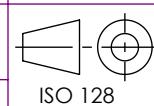
**GSI**  
Helmholtzzentrum für  
Schwerionenforschung

Ver. no.:	Part. no.	Material / quantity:	
1	30	Steel	/ 1

Title:  
**Left side top holster**

Project:  
**CSC neutron shielding**

Scale: 1:5 Format: A4



Dwg. / Dwg. no: 33 / 99 Mass (kg): 1.7

Belongs to: FRS/SFRS

File name: holster\_top\_3.SLDPRT

4

3

2

1

A

F

E

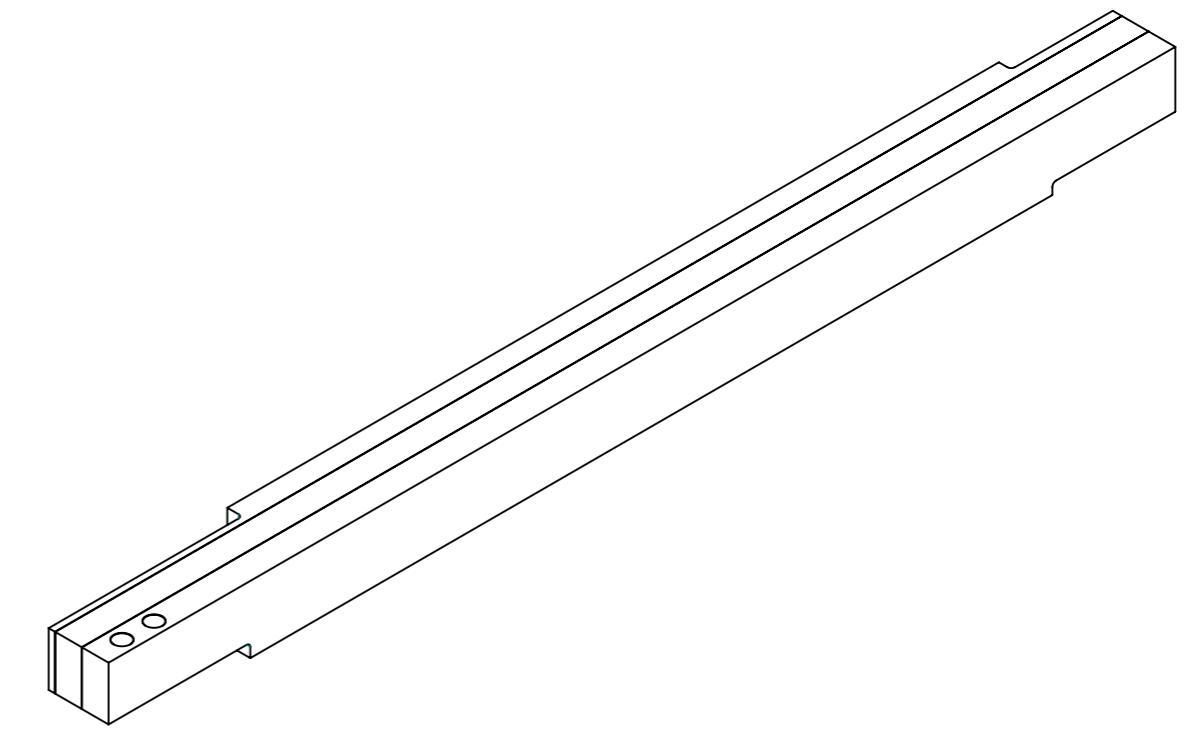
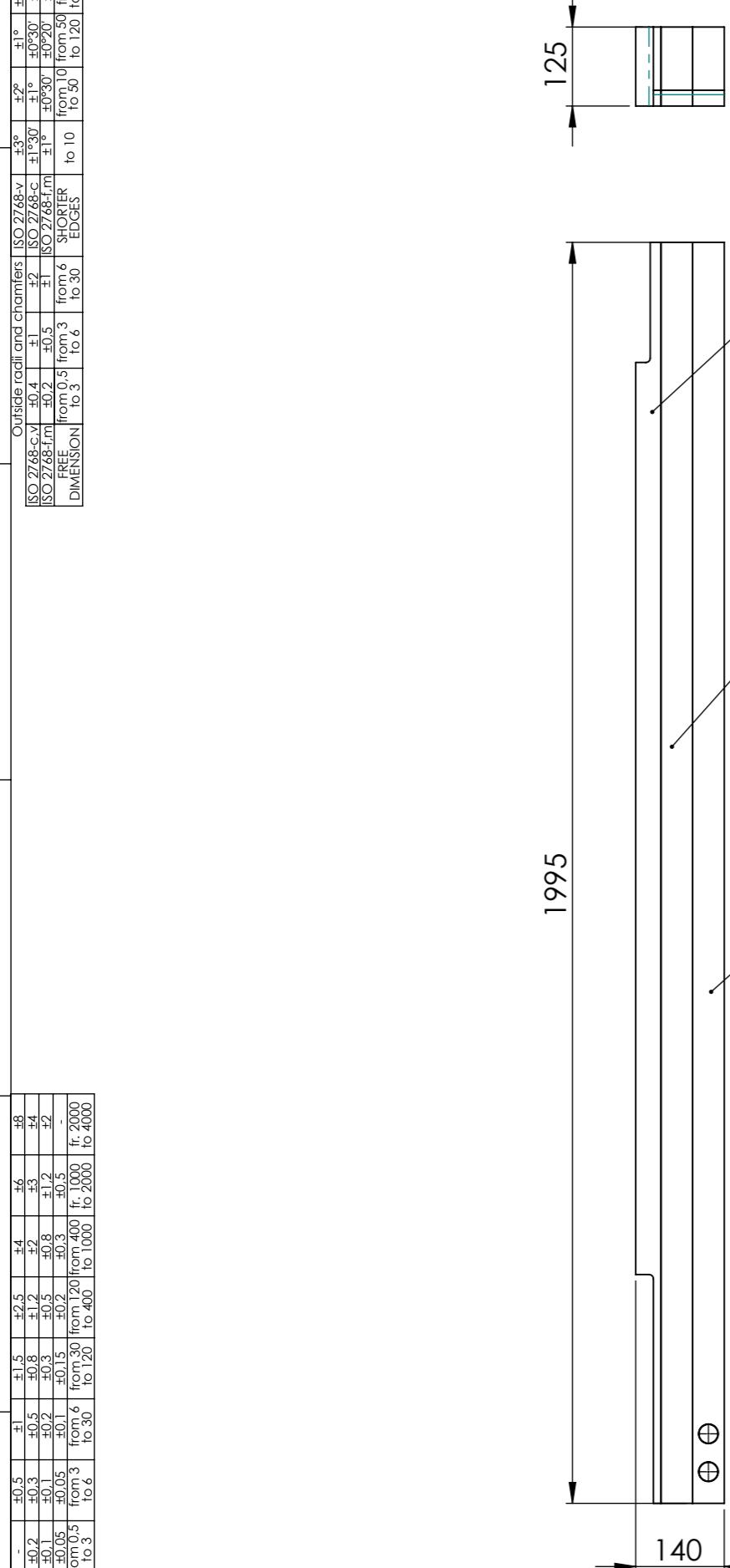
D

C

B

A

ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 ISO 2768-t  
 Dimension  
 FREE  
 DIMENSION



Pos.	Qua.	Name and dimensions	drawing nr./standard	Material	Mass
31.3	1	Right brownbar 3 1995x125x50	Brownbar_block	BurnGuard	12
31.2	1	Right brownbar 2 1995x125x50	Brownbar_block	BurnGuard	12
31.1	1	Right brownbar 1 1995x125x40	Brownbar_block	BurnGuard	8
Title: Right Brownbar block					
Project: CSC neutron shielding					
Scale: 1:10 Format: A3					
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 34 / 99 Mass (kg): 32	Belongs to: FRS/SFRS
					File name: Brownbar_block.SLDASM

4

3

2

1

F

E

D

C

B

Ver. no.:  
1

Part. no.:  
31.1

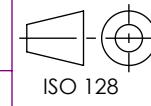
Material / quantity:  
BurnGuard / 1

Title:  
**Right Brownbar 1**

Project:  
**CSC neutron shielding**

Scale: 1:10

Format: A4



Dwg. / Dwg. no: 35 / 99 Mass (kg): 8

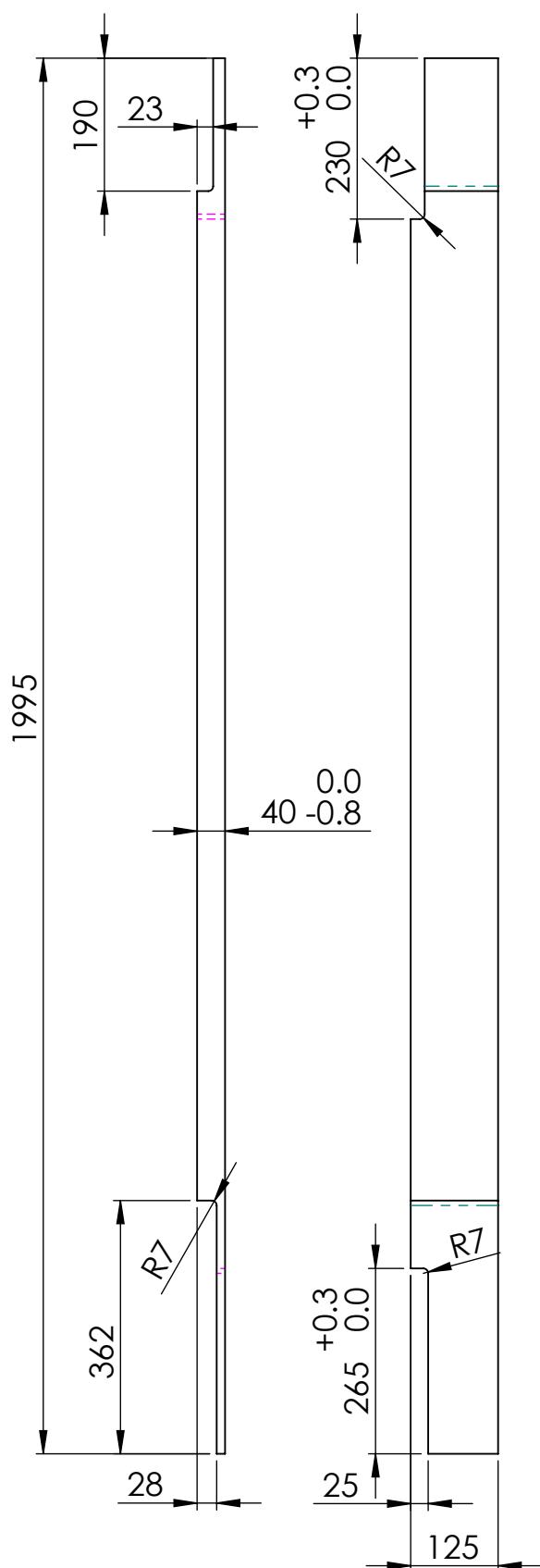
Belongs to: FRS/SFRS

File name: Brownbar\_block.SLDPR

**GSI**  
Helmholtzzentrum für  
Schwerionenforschung

Tolerance principles  
ISO 8015

Tolerances:  
ISO 2768-m



2

1

4

3

A

B

C

D

F

4

3

2

1

F

E

D

C

B

A

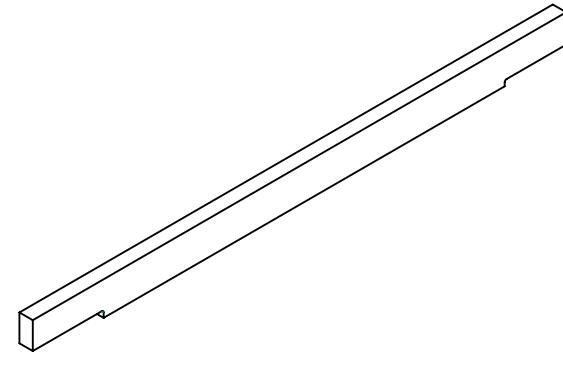
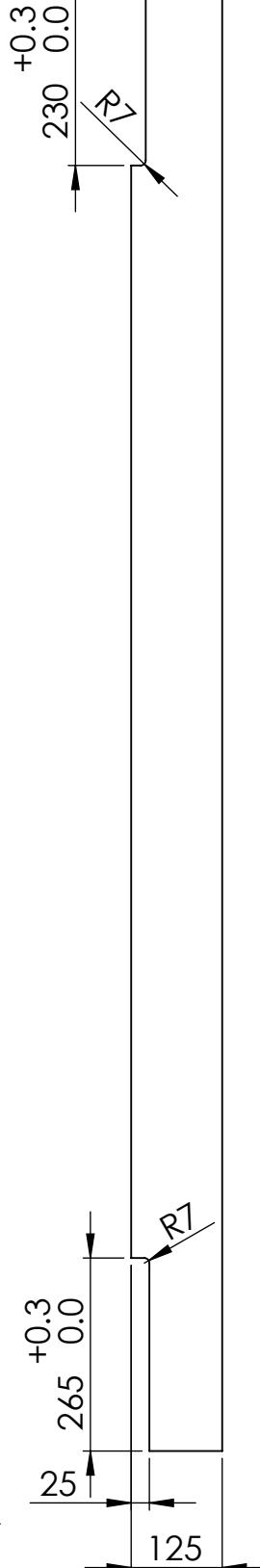
ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
FREE DIMENSION

Outside radii and chamfers  
ISO 2768-c,v  
ISO 2768-f,m  
ISO 2768-t,m  
from 0.5 to 3  
from 3 to 6  
from 6 to 10  
from 10 to 15  
from 15 to 20  
from 20 to 30  
from 30 to 40  
from 40 to 50  
from 50 to 60  
from 60 to 70  
from 70 to 80  
from 80 to 90  
from 90 to 100  
from 100 to 110  
from 110 to 120  
from 120 to 130  
from 130 to 140  
from 140 to 150  
from 150 to 160  
from 160 to 170  
from 170 to 180  
from 180 to 190  
from 190 to 200  
from 200 to 210  
from 210 to 220  
from 220 to 230  
from 230 to 240  
from 240 to 250  
from 250 to 260  
from 260 to 270  
from 270 to 280  
from 280 to 290  
from 290 to 300  
from 300 to 310  
from 310 to 320  
from 320 to 330  
from 330 to 340  
from 340 to 350  
from 350 to 360  
from 360 to 370  
from 370 to 380  
from 380 to 390  
from 390 to 400

1995

50 -0.8

0.0



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Right Brownbar 2</b>
1	31.2	BurnGuard / 1		Project: <b>CSC neutron shielding</b>
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:10 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 36 / 99 Mass (kg): 12
				Belongs to: FRS/SFRS
				File name: Brownbar_block.SLDPR

4

3

2

1

F

E

D

C

B

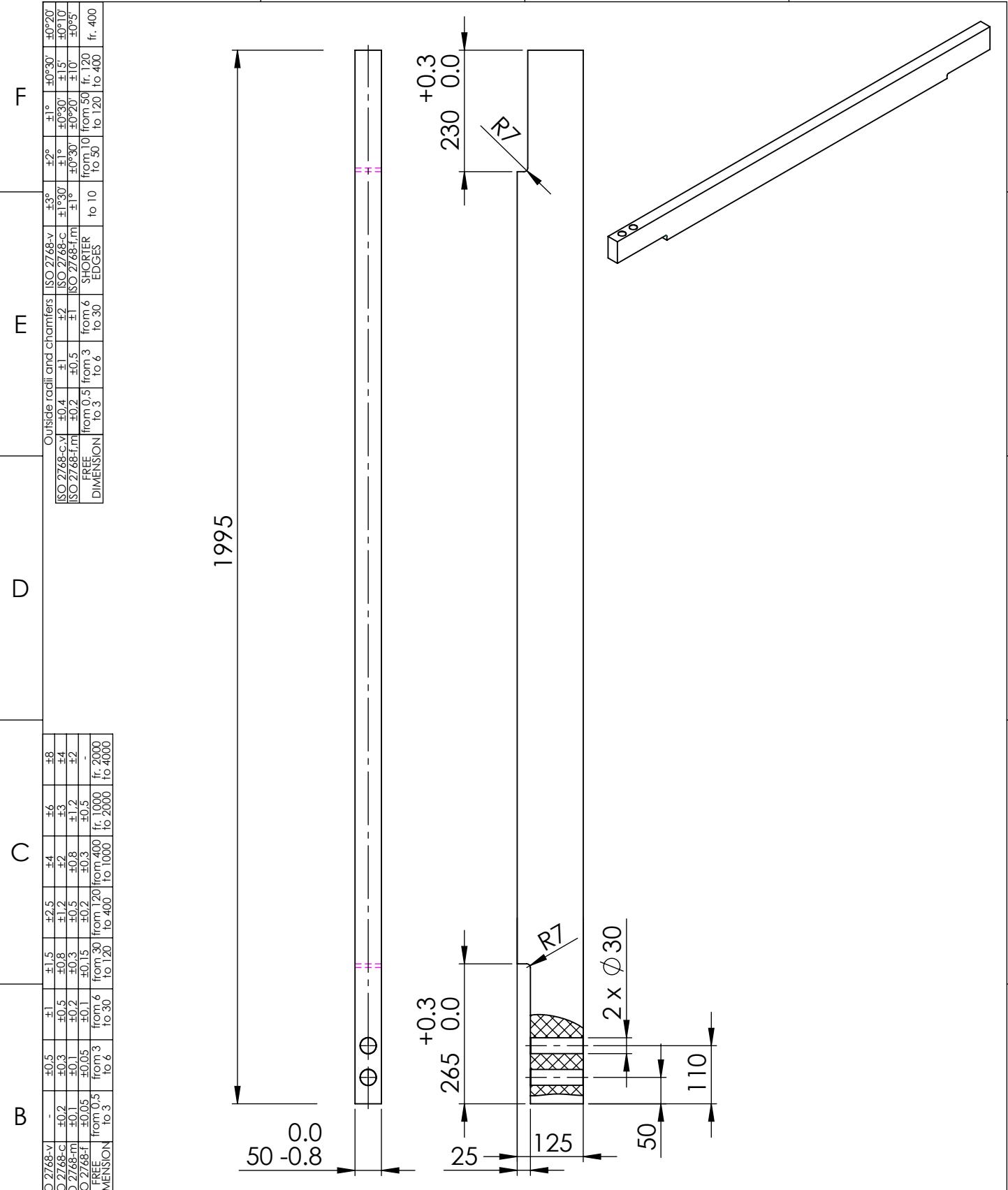
A

4

3

2

1



A

Ver. no.:	Part. no.	Material / quantity:		Title: <b>Right Brownbar 3</b>
1	31.3	BurnGuard / 1		Project: <b>CSC neutron shielding</b>
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:10 Format: A4
GSI Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 37 / 99 Mass (kg): 12 Belongs to: FRS/SFRS File name: Brownbar_block.SLDPR

4

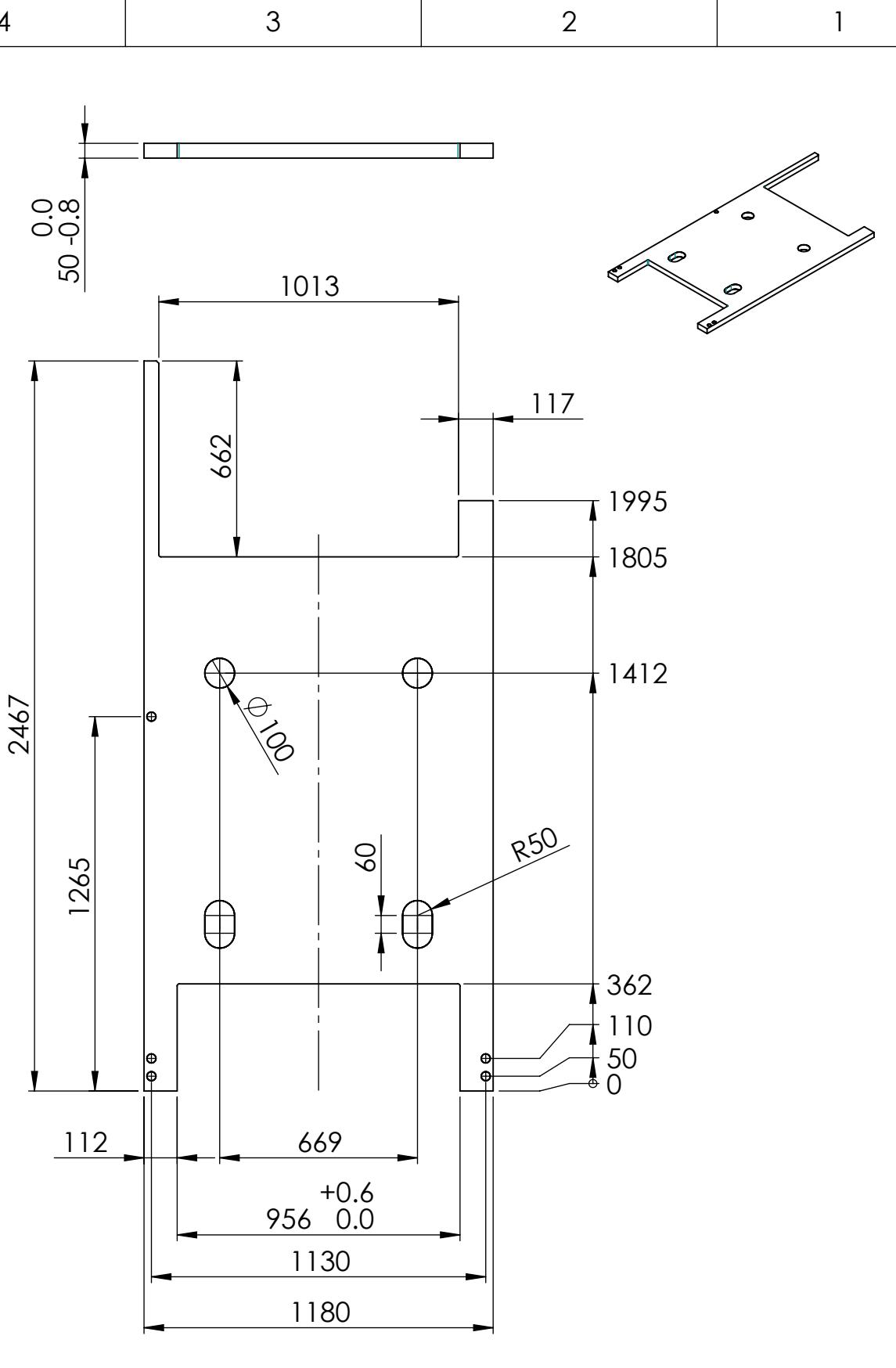
3

2

1

A

ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 ISO 2768-t  
 FREE DIMENSION to 3 from 0.5 to 30  
 Outside radii and chamfers ISO 2768-v, ISO 2768-c, ISO 2768-m, ISO 2768-t  
 to 10 from 0.5 to 6  
 to 30 from 3 to 30  
 to 100 from 10 to 100  
 to 200 from 20 to 200  
 to 400 from 40 to 400



Ver. no.:	Part. no.	Material / quantity:		Title: Main bottom plate
1	32	BurnGuard / 1		Project: CSC neutron shielding
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:20 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 38 / 99 Mass (kg): 90 Belongs to: FRS/SFRS File name: Undermain.SLDPRT

F

F

E

E

D

D

C

C

B

B

A

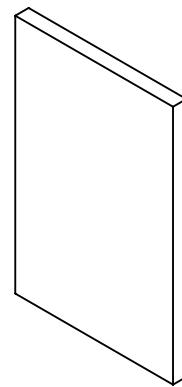
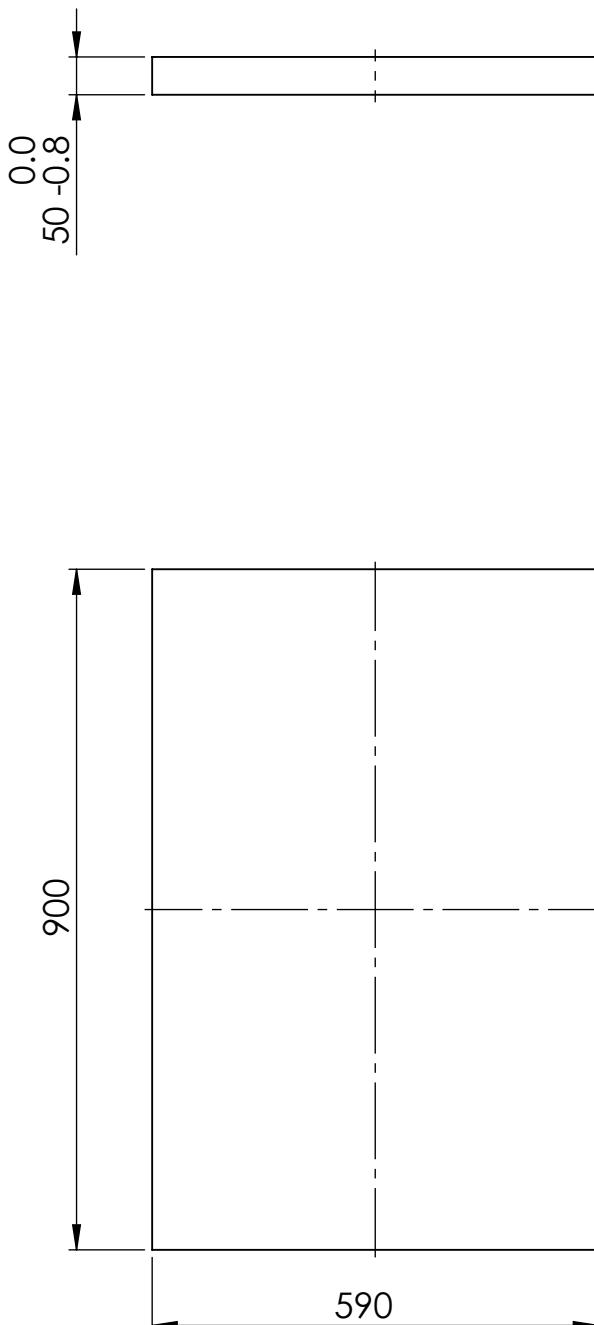
A

ISO 2768-v	-	$\pm 0.5$	$\pm 1$	$\pm 1.5$	$\pm 2.5$	$\pm 4$	$\pm 6$	$\pm 8$
ISO 2768-c	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$	$\pm 3$	$\pm 4$
ISO 2768-m	$\pm 0.1$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$
ISO 2768-f	$\pm 0.05$	$\pm 0.05$	$\pm 0.1$	$\pm 0.15$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$
DIMENSION	FREE	from 0.5	from 3	from 6	from 120	from 200	from 1000	fr. 2000 to 4000

50 -0.8

900

590



ISO 2768-c,v	$\pm 0.4$	$\pm 1$	$\pm 2$	$\pm 3$	$\pm 2^{\circ}$	$\pm 1^{\circ}$	$\pm 0^{\circ}20'$
ISO 2768-f,m	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.5$	$\pm 1$	$\pm 0^{\circ}10'$
ISO 2768-f	$\pm 0.05$	$\pm 0.05$	$\pm 0.1$	$\pm 0.15$	$\pm 0.2$	$\pm 0.5$	$\pm 10'$
DIMENSION	FREE	from 0.5	from 3	from 6	from 10	from 30	fr. 120 to 400

Ver. no.:	Part. no.:	Material / quantity:	Title: <b>First bottom cover</b>
1	33	BurnGuard / 1	Project: <b>CSC neutron shielding</b>
	Date:	Name:	Signature:
Drawn:	11/02/2024	Gasper Bizjan	
Checked:			
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Scale: 1:10 Format: A4
			Dwg. / Dwg. no: 39 / 99 Mass (kg): 27
			Belongs to: FRS/SFRS
			File name: Main top sheet.SLDPRT

4

3

2

1

F

F

E

E

D

D

C

C

B

B

A

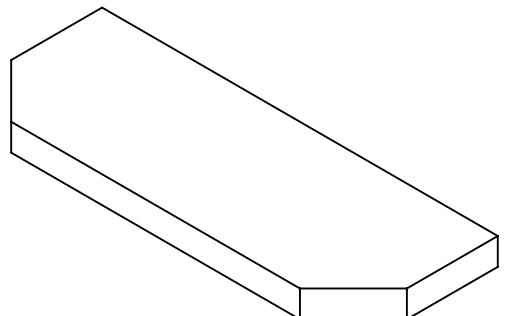
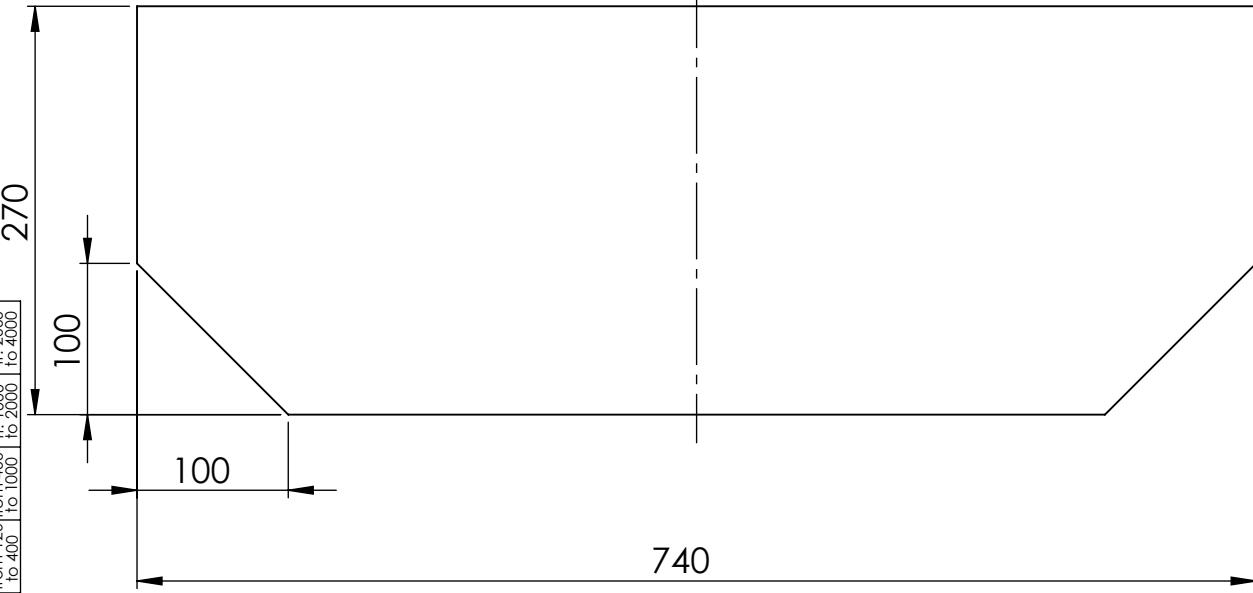
A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
FREE  
DIMENSION

Outside radii and chamfers  
ISO 2768-c,v  
ISO 2768-f,m  
FREE from 0.5 to 3  
DIMENSION to 3

$\pm 0.5$     $\pm 1$     $\pm 1.5$     $\pm 2.5$     $\pm 4$     $\pm 6$   
 $\pm 0.3$     $\pm 0.5$     $\pm 0.8$     $\pm 1.2$     $\pm 2$     $\pm 3$   
 $\pm 0.1$     $\pm 0.2$     $\pm 0.3$     $\pm 0.5$     $\pm 0.8$     $\pm 1.2$   
 $\pm 0.05$     $\pm 0.05$     $\pm 0.1$     $\pm 0.15$     $\pm 0.2$     $\pm 0.3$   
from 0.5 to 3 from 3 to 6 from 6 to 30 from 30 to 120 from 120 to 400 from 400 to 1000 from 1000 to 2000 from 2000 to 4000

0.0  
50 -0.8



Ver. no.:	Part. no.:	Material / quantity:		Title: <b>Bottom front plate</b>
1	34	BurnGuard / 1		Project: <b>CSC neutron shielding</b>
	Date:	Name:	Signature:	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:5 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m	 ISO 128	Dwg. / Dwg. no: 40 / 99 Mass (kg): 10 Belongs to: FRS/SFRS File name: top plate.SLDPR

4

3

2

1

F

F

E

E

D

D

C

C

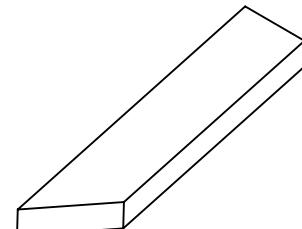
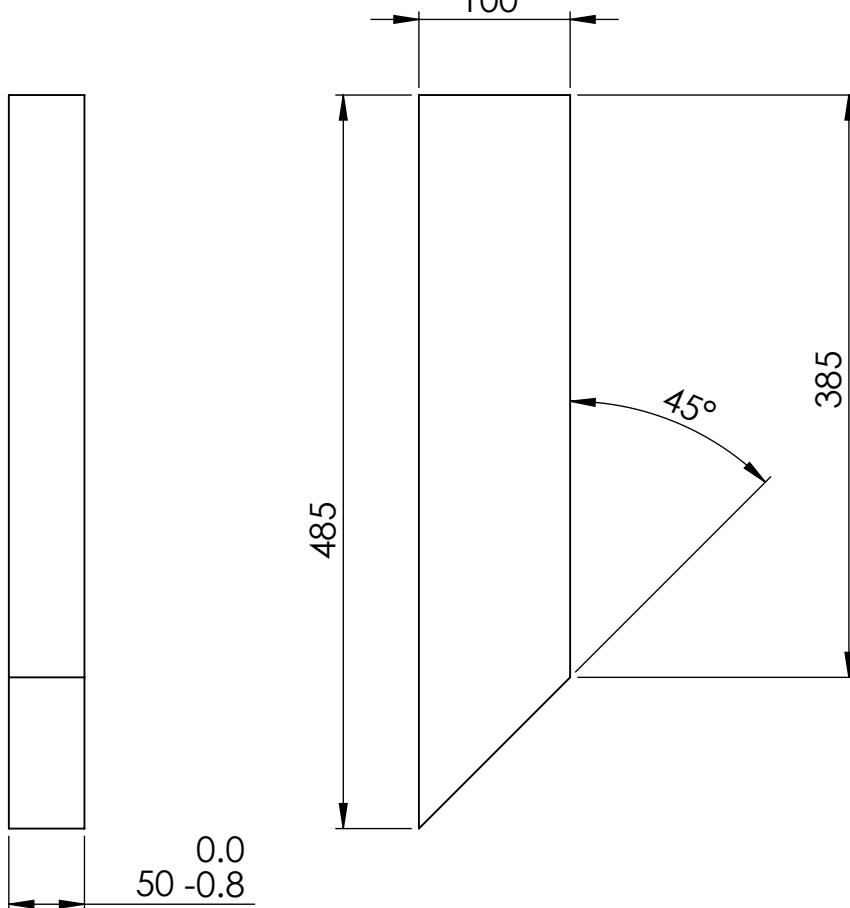
B

B

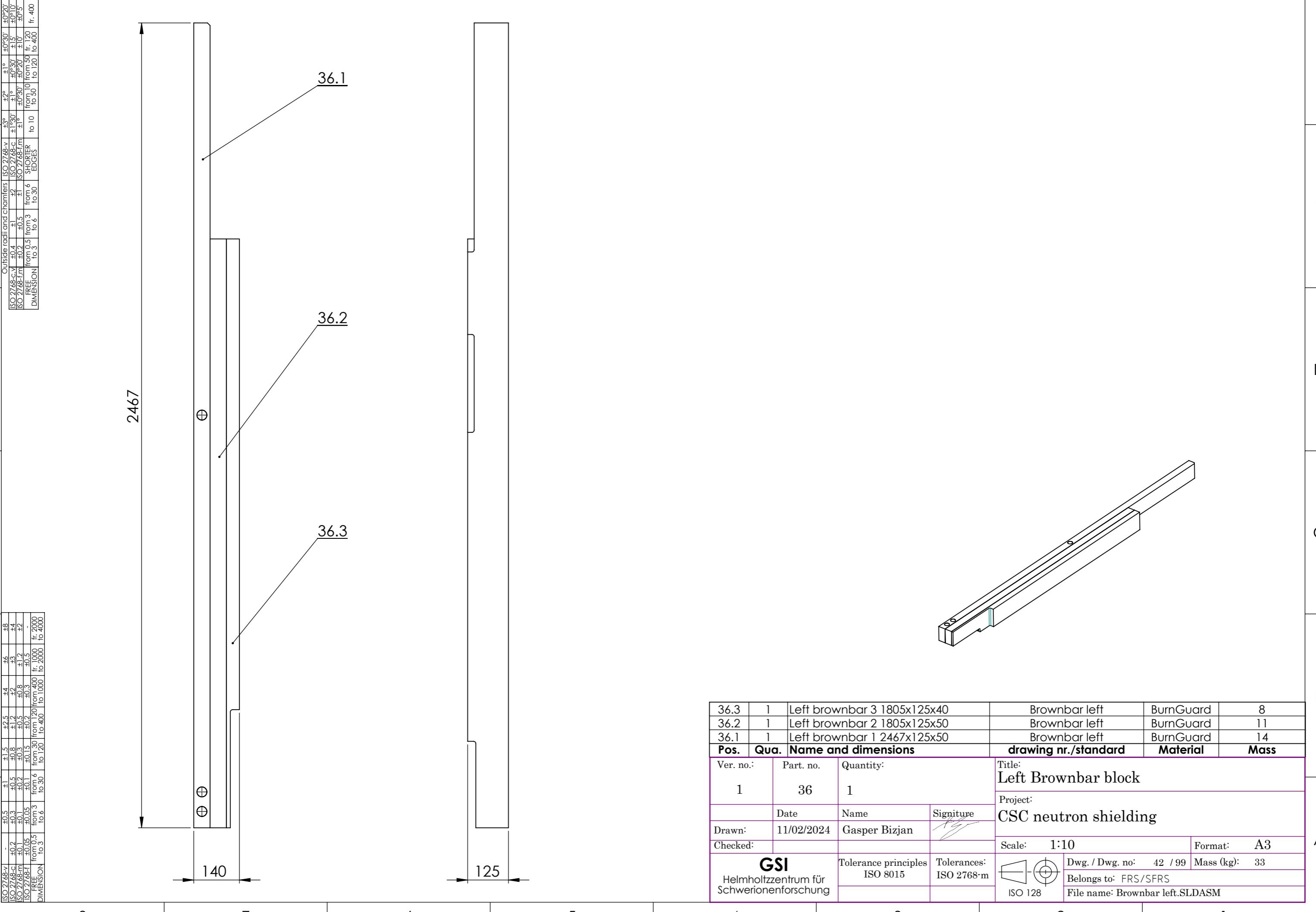
A

A

ISO 2768-v	-	$\pm 0.5$	$\pm 1$	$\pm 1.5$	$\pm 2.5$	$\pm 4$	$\pm 6$	$\pm 8$
ISO 2768-c	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$	$\pm 3$	$\pm 4$
ISO 2768-m	$\pm 0.1$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$
ISO 2768-f	$\pm 0.05$	$\pm 0.05$	$\pm 0.1$	$\pm 0.15$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	-
DIMENSION	from 3 to 3	from 3 to 6	from 6 to 30	from 30 to 120	from 120 to 400	from 400 to 1000	from 1000 to 2000	from 2000 to 4000



Ver. no.:	Part. no.:	Material / quantity:	Title: Bottom side plate		
1	35	BurnGuard / 2			
	Date:	Name:	Signature:	Project: CSC neutron shielding	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale:	1:5
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no:	41 / 99
				Mass (kg):	2
				Belongs to:	FRS/SFRS
				File name:	Topbar.SLDPR



F

E

D

C

B

A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
FREE DIMENSION

Outside radii and chamfers  
ISO 2768-c,v  
ISO 2768-f,m  
ISO 2768-t,m  
from 0.5 to 3  
from 3 to 6  
from 6 to 10  
from 10 to 15  
from 15 to 20  
from 20 to 30  
from 30 to 40  
from 40 to 50  
from 50 to 60  
from 60 to 70  
from 70 to 80  
from 80 to 90  
from 90 to 100  
from 100 to 110  
from 110 to 120  
from 120 to 130  
from 130 to 140  
from 140 to 150  
from 150 to 160  
from 160 to 170  
from 170 to 180  
from 180 to 190  
from 190 to 200  
from 200 to 210  
from 210 to 220  
from 220 to 230  
from 230 to 240  
from 240 to 250  
from 250 to 260  
from 260 to 270  
from 270 to 280  
from 280 to 290  
from 290 to 300  
from 300 to 310  
from 310 to 320  
from 320 to 330  
from 330 to 340  
from 340 to 350  
from 350 to 360  
from 360 to 370  
from 370 to 380  
from 380 to 390  
from 390 to 400

2467



1265

50 -0.8

110  
50  
0

2467

1765  
1512  
1212  
0

702 +0.5 0.0

265 +0.3 0.0

100  
125105  
105105  
105

F 1 : 10

All radii are R7

F

F

E

D

C

B

A

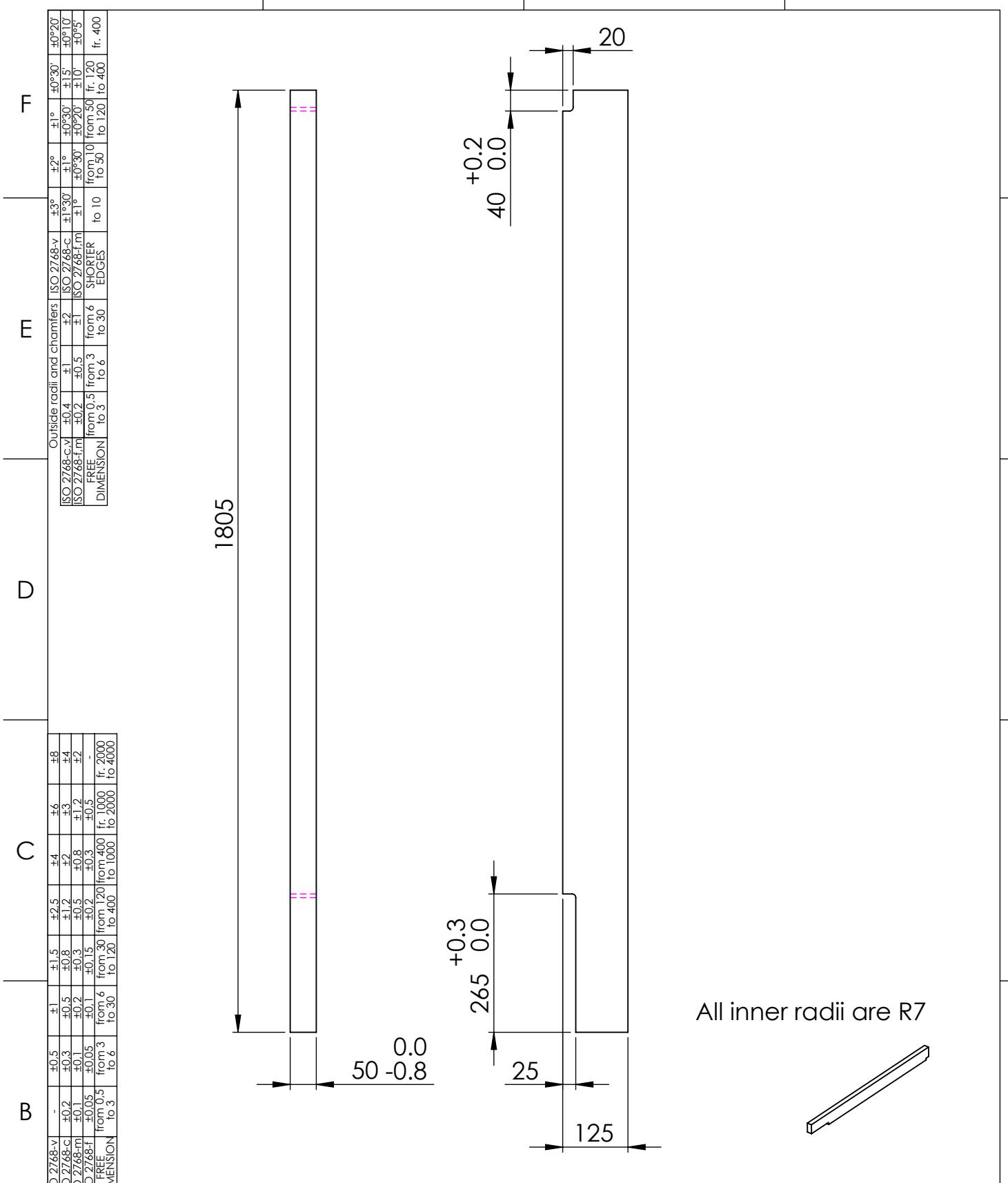
Ver. no.:	Part. no.	Material / quantity:		Title: <b>Left Brownbar 1</b>
1	36.1	BurnGuard / 1		Project: <b>CSC neutron shielding</b>
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:20 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 43 / 99 Mass (kg): 14
				Belongs to: FRS/SFRS
				File name: Brownbar left.SLDPR

4

3

2

1



Ver. no.:	Part. no.:	Material / quantity:		Title: Left Brownbar 2
1	36.2	BurnGuard / 1		Project: CSC neutron shielding
	Date:	Name:	Signature:	Scale: 1:10 Format: A4
Drawn:	11/02/2024	Gasper Bizjan		Dwg. / Dwg. no: 44 / 99 Mass (kg): 11
Checked:				Belongs to: FRS/SFRS
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	File name: Brownbar left.SLDPRT
		ISO 128		

4

3

2

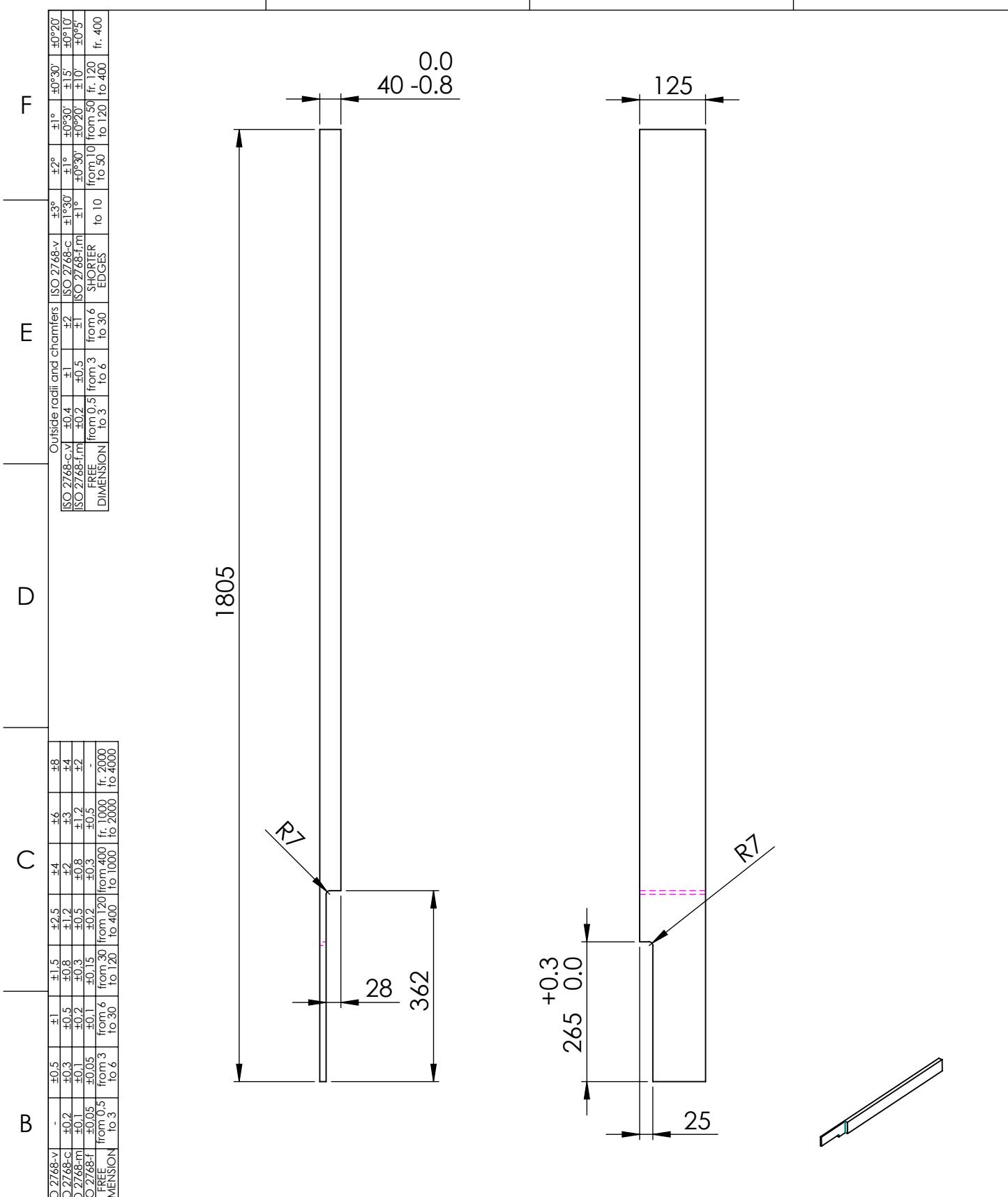
1

4

3

2

1



Ver. no.:	Part. no.	Material / quantity:		Title: Left Brownbar 3	
1	36.3	BurnGuard / 1			
	Date	Name	Signature		
Drawn:	11/02/2024	Gasper Bizjan			
Checked:					
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 45 / 99	Mass (kg): 8
				Belongs to: FRS/SFRS	
				File name:	Brownbar left.SLDPR

4

3

2

1

A

B

C

D

E

F

F

E

E

D

D

C

C

B

B

A

A

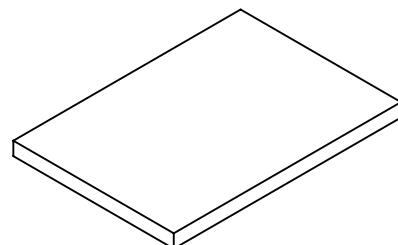
ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
FREE  
DIMENSION

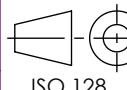
- ±0.5 ±0.5 ±1.5 ±2.5 ±4 ±6  
±0.2 ±0.3 ±0.5 ±1.2 ±2 ±3  
±0.1 ±0.1 ±0.2 ±0.3 ±0.8 ±1.2  
±0.05 ±0.05 ±0.05 ±0.1 ±0.15 ±0.2  
from 0.5 from 0.5 from 3 from 6 from 120 from 400  
to 3 to 3 to 3 to 30 to 30 to 300  
to 1.20 to 1.20 to 1.20 to 400 to 400 to 4000

0.0  
50 -0.8

850

600



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Second bottom cover</b>
1	37	BurnGuard / 1		Project: <b>CSC neutron shielding</b>
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:10 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m	 ISO 128	Dwg. / Dwg. no: 46 / 99 Mass (kg): 26
				Belongs to: FRS/SFRS
				File name: OverPlate.SLDPR

4

3

2

1

F

E

D

C

B

F

E

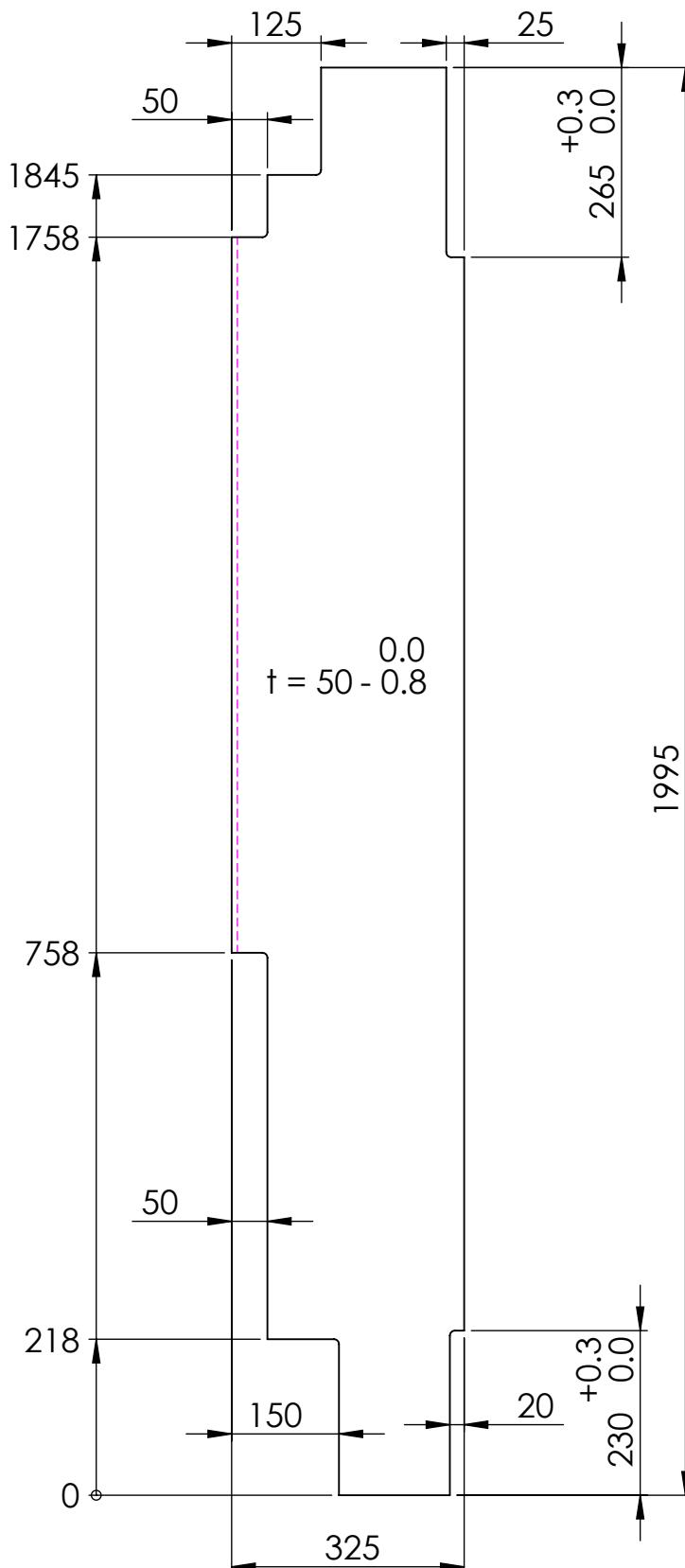
D

C

B

A

ISO 2768-v	-	$\pm 0.5$	$\pm 1$	$\pm 1.5$	$\pm 2.5$	$\pm 4$	$\pm 6$	$\pm 8$
ISO 2768-c	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$	$\pm 3$	$\pm 4$
ISO 2768-m	$\pm 0.1$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$
ISO 2768-f	$\pm 0.05$	$\pm 0.05$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$
DIMENSION	to 3	from 3	to 6	from 6	to 10	from 10	to 20	from 20



Ver. no.:	Part. no.:	Material / quantity:		Title: Right inner plate	
1	38	BurnGuard / 1			
	Date:	Name:	Signature:	Project: CSC neutron shielding	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale:	1:10
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no:	47 / 99
				Mass (kg):	28
				Belongs to:	FRS/SFRS
				File name:	Right side slot_2.SLDPRPT

4

3

2

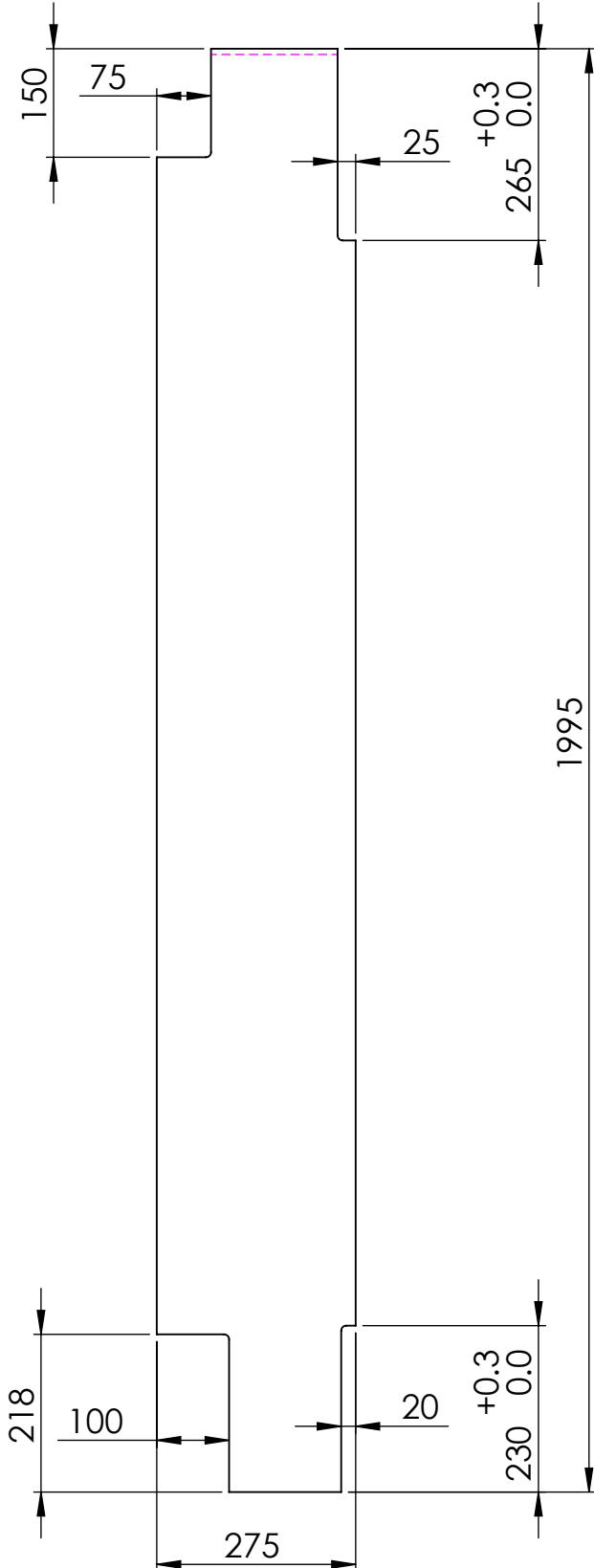
1

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
DIMENSION

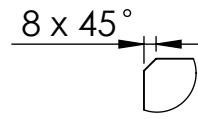
Outside radii and chamfers  
ISO 2768-c,v  
ISO 2768-f,m  
FREE  
from 0.5 to 3  
from 0.5 to 30  
from 0.5 to 300  
from 0.5 to 3000

from 1.2 to 10  
from 0.3 to 100  
from 0.1 to 1000  
from 0.05 to 10000  
from 0.01 to 100000

$\pm 0.5$     $\pm 0.5$     $\pm 1.5$     $\pm 2.5$     $\pm 4$     $\pm 6$   
 $\pm 0.3$     $\pm 0.3$     $\pm 0.8$     $\pm 1.2$     $\pm 3$     $\pm 8$   
 $\pm 0.1$     $\pm 0.1$     $\pm 0.3$     $\pm 0.5$     $\pm 1.2$     $\pm 4$   
 $\pm 0.05$     $\pm 0.05$     $\pm 0.1$     $\pm 0.2$     $\pm 0.5$     $\pm 2$   
 $\pm 0.01$     $\pm 0.01$     $\pm 0.05$     $\pm 0.15$     $\pm 0.5$     $\pm 1.2$



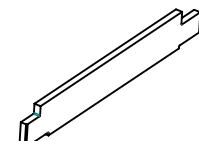
G



G  
1 : 5

0.0  
50 -0.8

All inner radii are R7



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Right outer plate</b>
1	39	BurnGuard / 1		Project: <b>CSC neutron shielding</b>
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		Scale: 1:10 Format: A4
Checked:				
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 48 / 99 Mass (kg): 28
				Belongs to: FRS/SFRS
				File name: Right side slot.SLDPRT

F

E

D

C

B

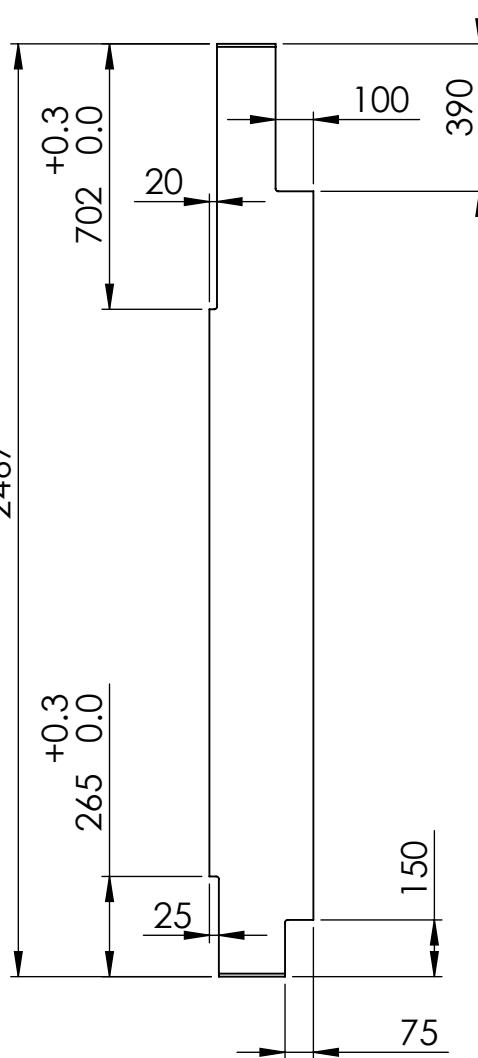
A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
FREE  
DIMENSION

$\pm 0.5$     $\pm 0.5$     $\pm 1.5$     $\pm 2.5$     $\pm 4$     $\pm 6$   
 $\pm 0.3$     $\pm 0.3$     $\pm 0.8$     $\pm 1.2$     $\pm 2$     $\pm 3$   
 $\pm 0.1$     $\pm 0.1$     $\pm 0.3$     $\pm 0.5$     $\pm 0.8$     $\pm 1.2$   
 $\pm 0.05$     $\pm 0.05$     $\pm 0.1$     $\pm 0.2$     $\pm 0.5$     $\pm 2$   
 $\text{from } 0.5 \text{ to } 3$     $\text{from } 0.5 \text{ to } 3$     $\text{from } 0.2 \text{ to } 0.5$     $\text{from } 0.2 \text{ to } 0.5$     $\text{from } 0.3 \text{ to } 0.6$     $\text{from } 0.6 \text{ to } 1.0$   
 $\text{to } 3$     $\text{to } 3$     $\text{to } 0.3$     $\text{to } 0.3$     $\text{to } 0.3$     $\text{to } 0.6$

Outside radii and chamfers  
 ISO 2768-c-v   ISO 2768-c   ISO 2768-c-m   ISO 2768-c-f  
 ISO 2768-f-m   ISO 2768-f   ISO 2768-f-m   ISO 2768-f  
 FREE from 0.5 to 3   FREE from 0.5 to 3   FREE from 0.5 to 3   FREE from 0.5 to 3  
 DIMENSION to 3 to 3 to 3 to 3 to 3 to 3

2467

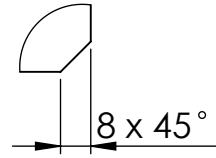


HA

HA 1 : 2

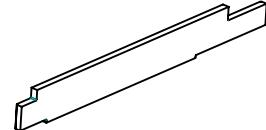
0.0  
50 -0.8

HB 1 : 2



HB

All inner radii are R7



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Left outer plate</b>
1	40	BurnGuard / 1		Project: <b>CSC neutron shielding</b>
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:20 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 49 / 99 Mass (kg): 31
				Belongs to: FRS/SFRS
				File name: Left side slot.SLDprt

4

3

2

1

F

F

E

E

D

D

C

C

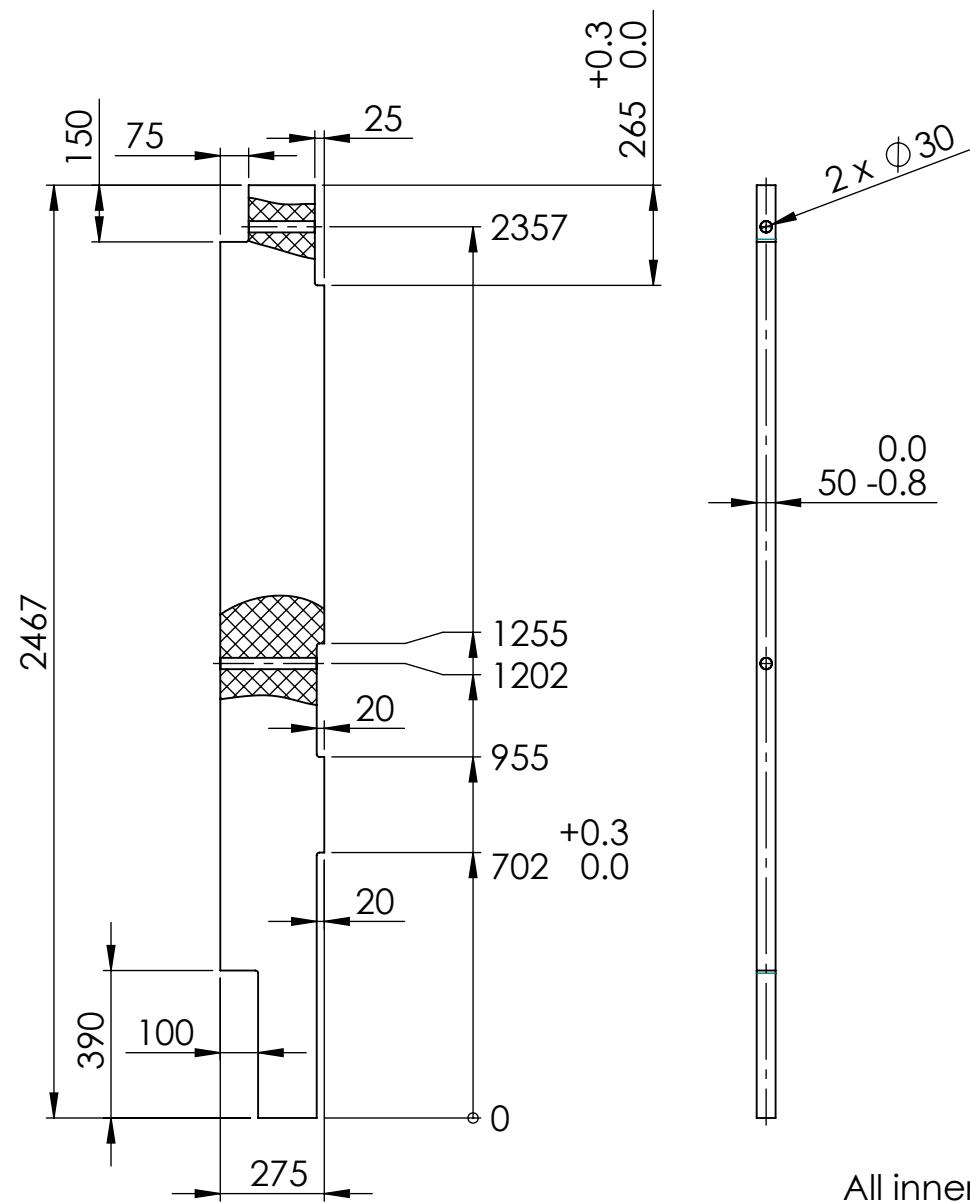
B

B

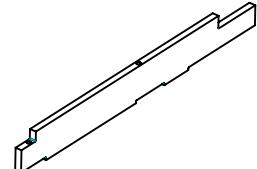
A

A

ISO 2768-v	-	±0.5	±1.5	±2.5	±4	±6	±8
ISO 2768-c	±0.2	±0.3	±0.5	±1.2	±2	±3	±4
ISO 2768-m	±0.1	±0.1	±0.2	±0.3	±0.8	±1.2	±2
ISO 2768-f	±0.05	±0.05	±0.1	±0.15	±0.2	±0.3	±0.5
DIMENSION	from 3 to 3	from 3 to 3	from 6 to 30	from 120 to 400	from 200 to 1000	from 1000 to 2000	from 2000 to 4000



All inner radii are R7



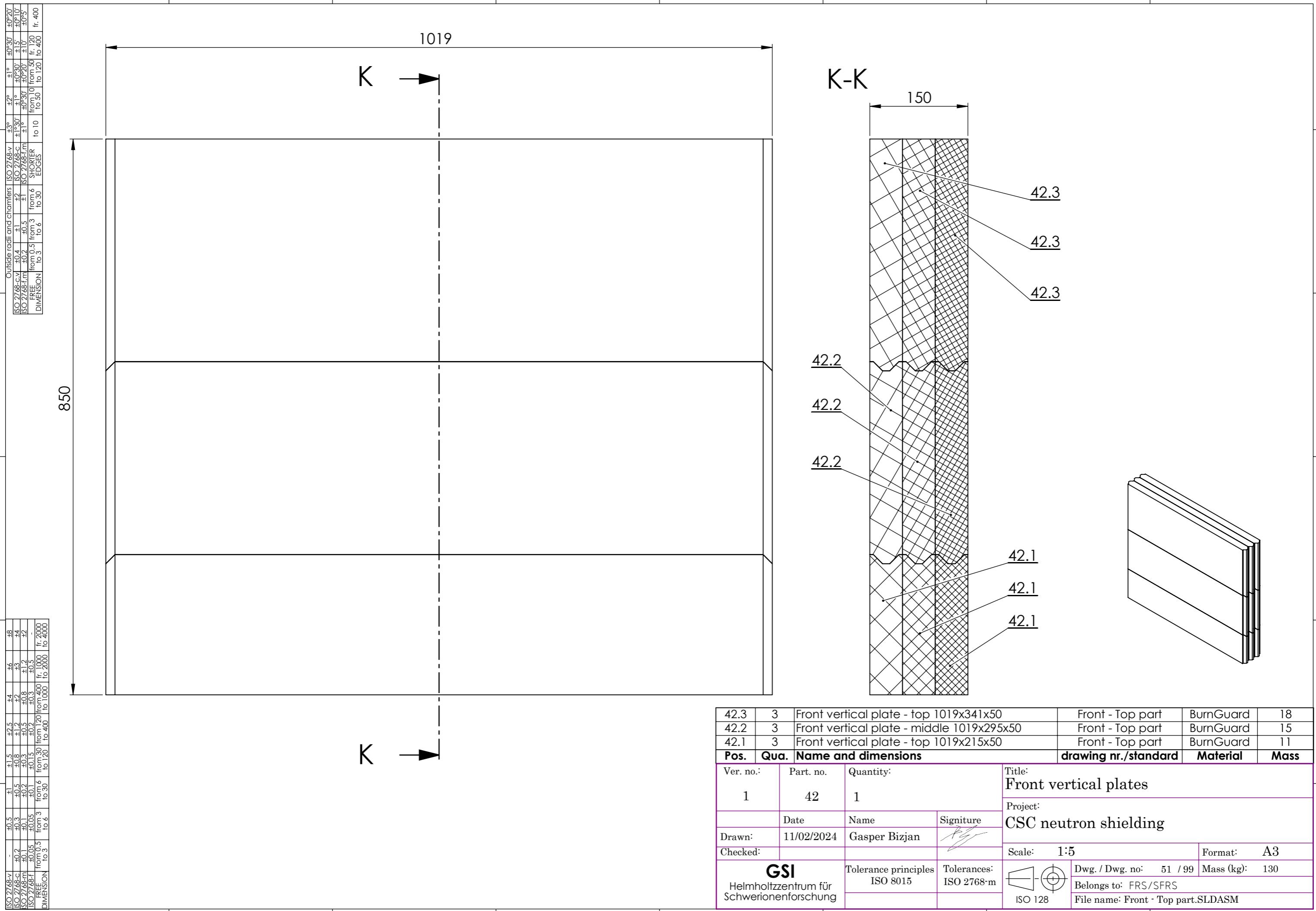
Ver. no.:	Part. no.	Material / quantity:	Title: Left inner plate		
1	41	BurnGuard / 1			
	Date	Name	Signature	Project: CSC neutron shielding	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale: 1:20	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 50 / 99 Belongs to: FRS/SFRS File name: Left side slot_inner.SLDPR	Mass (kg): 31

4

3

2

1



ISO 2768-v  
ISO 2768-c  
ISO 2768-f  
ISO 2768-f  
FREE  
DIMENSION

ISO 2768-c/v  
ISO 2768-f/m  
FREE  
from 0.5 to 3

ISO 2768-c  
ISO 2768-f/m  
FREE  
from 0.5 to 3

ISO 2768-v  
ISO 2768-c  
ISO 2768-f  
ISO 2768-f  
FREE  
DIMENSION

+0.25°  
90° 0.00°

0.0  
50 -0.8

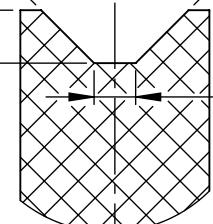
-0.01  
14 -0.05

-0.01  
11 -0.03

-0.01  
14 -0.05

0.00°  
90° -0.25°

+0.03  
14 0.00



+0.03  
11 0.00

IB 1 : 2

IA 1 : 2

D

C

B

A

F

F

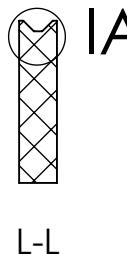
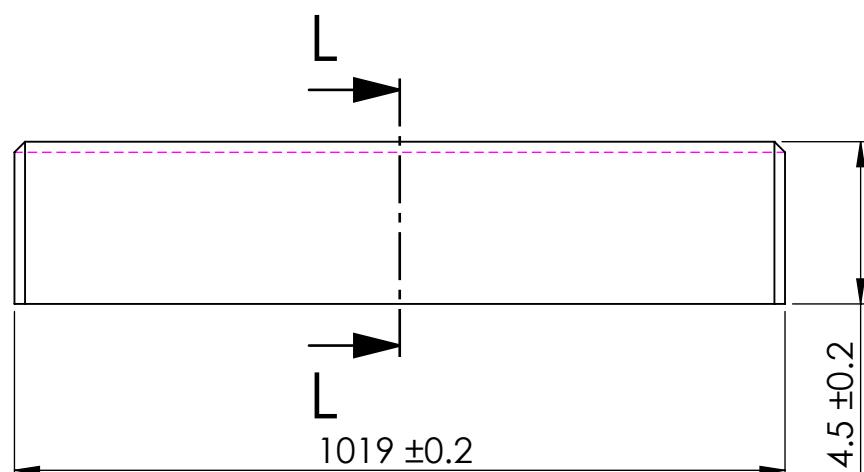
E

D

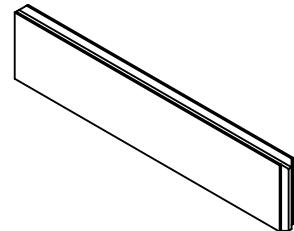
C

B

A



IB



Ver. no.: 1 Part. no. 42.1 Material / quantity: BurnGuard / 3

Title:  
Front verticle plate - bottom

Date Drawn: 11/02/2024 Name Gasper Bizjan Signature

Project:  
CSC neutron shielding

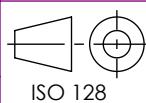
Checked:

Scale: 1:10 Format: A4

**GSI**  
Helmholtzzentrum für  
Schwerionenforschung

Tolerance principles  
ISO 8015

Tolerances:  
ISO 2768-m



Dwg. / Dwg. no: 52 / 99 Mass (kg): 11

Belongs to: FRS/SFRS

File name: Front vertical plates.SLDPRT

4

3

2

1

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
FREE  
DIMENSION

Outside radii and chamfers  
ISO 2768-c,v  
ISO 2768-f,m  
ISO 2768-t,m  
FREE from 0.5 to 3  
from 6 to 30  
from 3 to 6  
from 10 to 30  
from 120 to 400

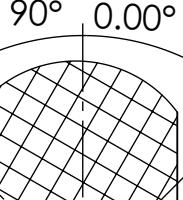
+0.25°  
90° 0.00°

0.0  
50 -0.8

-0.01  
14 -0.05  
11 -0.03  
14 -0.01  
11 -0.03

JA 1 : 2

+0.25°  
90° 0.00°



JC 1 : 2

+0.03  
14 0.00

90° 0.00°  
-0.25°

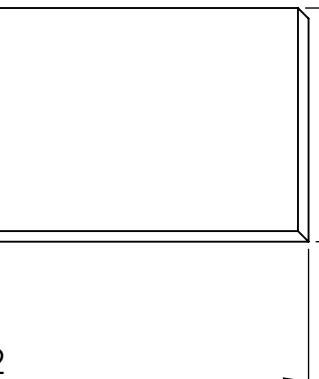
-0.01  
14 -0.05

+0.03  
11 0.00

JB 1 : 2

M-M  
JB

309 ±0.2



JA

1019 ±0.2



**GSI**  
Helmholtzzentrum für  
Schwerionenforschung

Tolerance principles  
ISO 8015

Title:

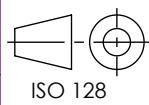
Front verticle plate - middle

Project:

CSC neutron shielding

Scale: 1:10

Format: A4



Dwg. / Dwg. no: 53 / 99

Mass (kg): 15

Belongs to: FRS/SFRS

File name: Front vertical plates.SLDPRT

4

3

2

1

F

E

D

C

B

A

F

E

D

C

B

A

4

3

2

1

4

3

2

1

F

E

D

C

B

A

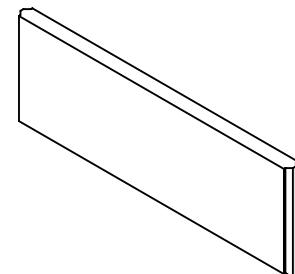
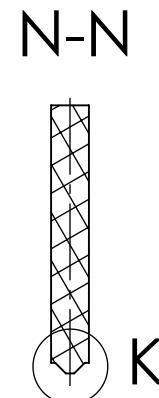
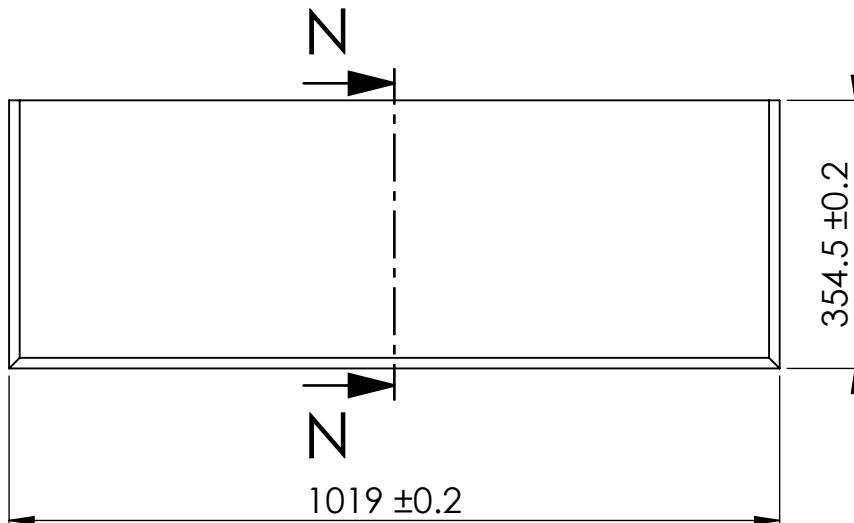
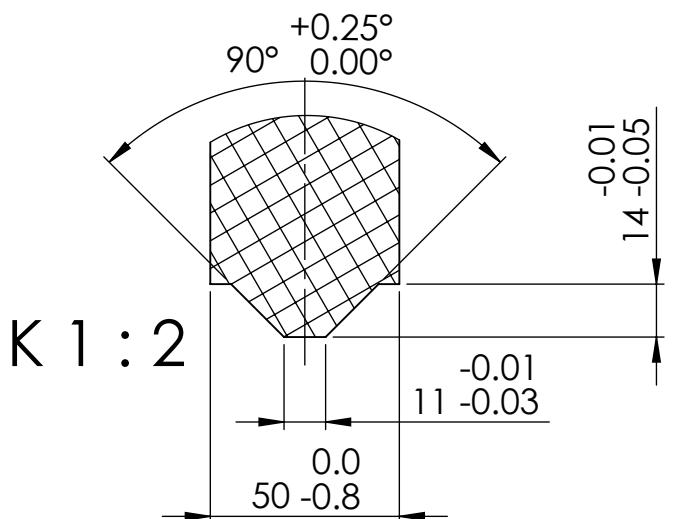
ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
DIMENSION

-0.20  
±0.4  
±0.2  
±0.5  
from 50 to 400

+0.20  
±0.4  
±0.2  
±0.5  
from 50 to 400

Outside radii and chamfers  
ISO 2768-c-v  
ISO 2768-f-m  
FREE  
DIMENSION

from 10 to 50  
from 10 to 50  
from 10 to 50  
from 10 to 50  
from 10 to 50



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Front verticle plate - top</b>	
1	42.3	<b>BurnGuard / 3</b>			
	Date	Name	Signature	Project: <b>CSC neutron shielding</b>	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale: 1:10	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m	 ISO 128	Dwg. / Dwg. no: 54 / 99 Belongs to: FRS/SFRS File name: Front vertical plates.SLDPRT	Mass (kg): 18

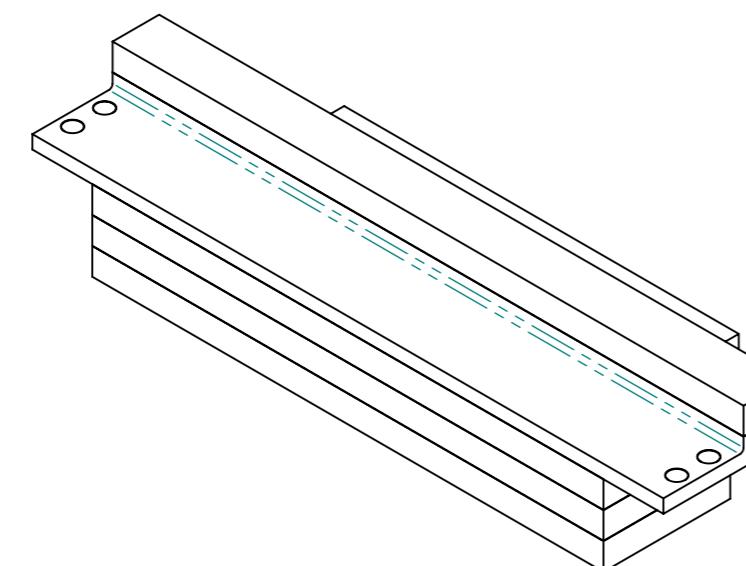
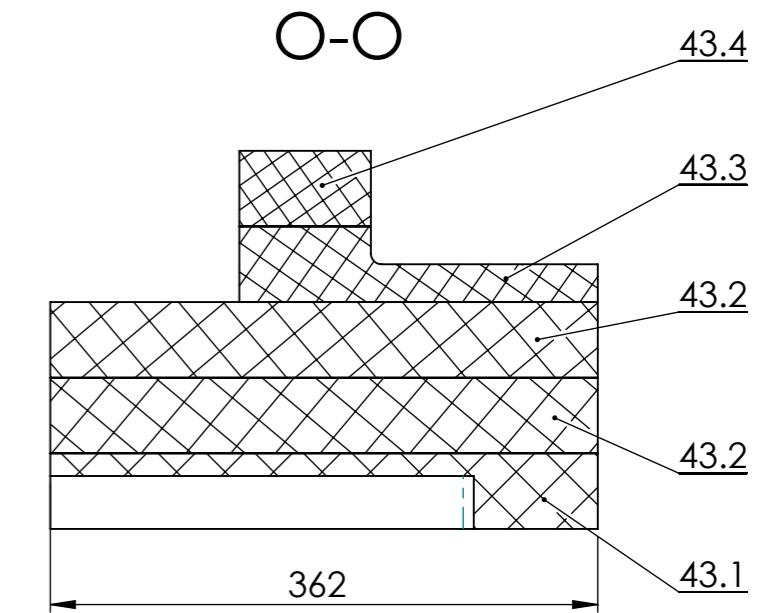
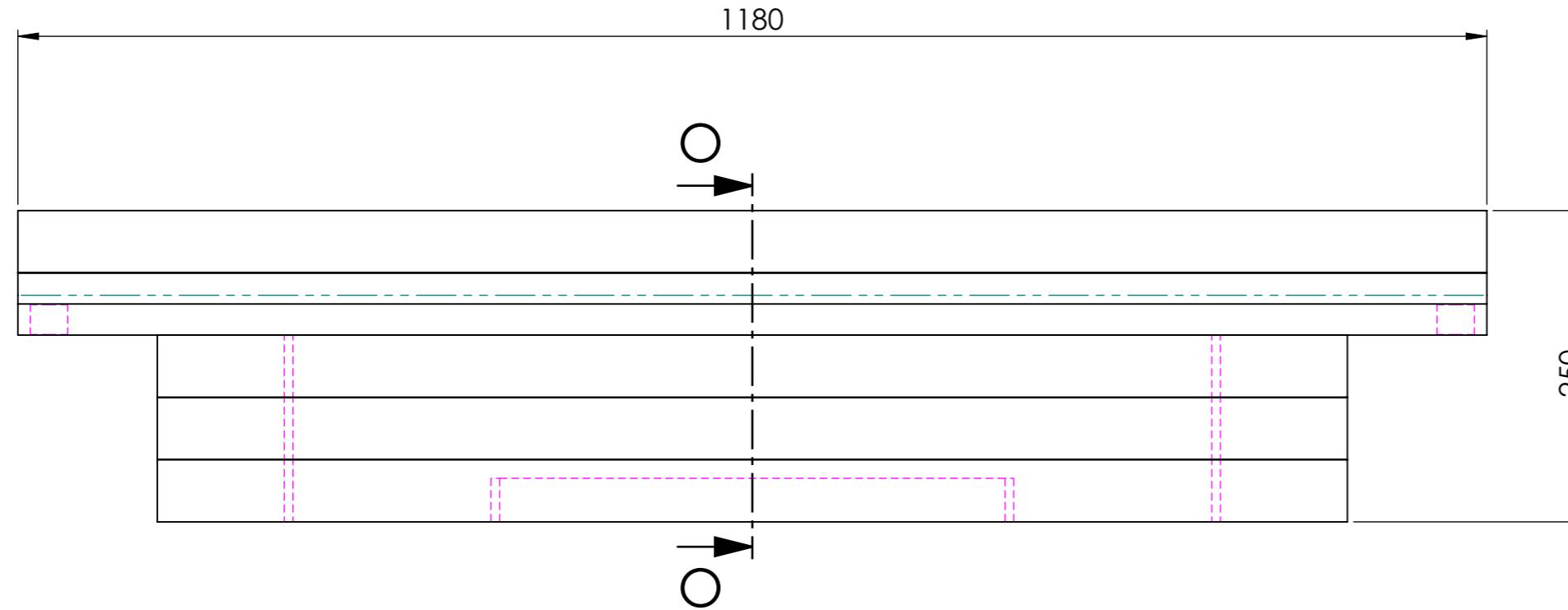
4

3

2

1

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
ISO 2768-DIMENSION



Pos.	Qua.	Name and dimensions	drawing nr./standard	Material	Mass
43.4	1	Front bottom plate 4 1180x87x50	Front - Brown bar	BurnGuard	5
43.3	1	Front bottom plate 3 1180x237x50	Front - Brown bar	BurnGuard	10
43.2	2	Front bottom plate 2 956x362x50	Front - Brown bar	BurnGuard	16
43.1	1	Front bottom plate 1 1956x362x50	Front - Brown bar	BurnGuard	12
Pos. Qua. Name and dimensions			drawing nr./standard	Material	Mass
Ver. no.:	Part. no.	Quantity:	Title:		
1	43	1	Front bottom plates		
	Date	Name	Project:		
Drawn:	11/02/2024	Gasper Bizjan	CSC neutron shielding		
Checked:			Scale:	1:5	Format: A3
GSI		Tolerance principles ISO 8015	Tolerances:	Dwg. / Dwg. no: 55 / 99 Mass (kg): 60	
Helmholtzzentrum für Schwerionenforschung		ISO 2768-m	Belongs to:	FRS/SFRS	
		ISO 128	File name:	Front - Brown bar.SLDASM	

F

F

L 1 : 2



P

P

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
DIMENSION

Outside radii and chamfers  
ISO 2768-c,v  
ISO 2768-f,m  
FREE from 0.5 to 3  
from 6 to 30

$\pm 0.4$   $\pm 0.2$   $\pm 0.5$   $\pm 0.2$   $\pm 0.5$

$\pm 1$   $\pm 1$   $\pm 0.5$   $\pm 0.5$   $\pm 1$

$\pm 3$   $\pm 2$   $\pm 0.8$   $\pm 0.8$   $\pm 2$

$\pm 6$   $\pm 4$   $\pm 1.2$   $\pm 1.2$   $\pm 4$

420

738 -0.0  
-0.1

R

280

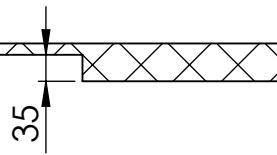
362

D

D

C

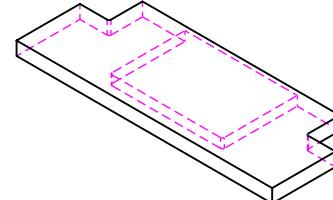
C

0.0  
50 -0.8

P-P

B

B



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Front bottom plate 1</b>	
1	43.1	BurnGuard / 1			
	Date	Name	Signature	Project: <b>CSC neutron shielding</b>	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale: 1:10	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 56 / 99 Belongs to: FRS/SFRS File name: Front - Brown bar.SLDPR	Mass (kg): 12
				ISO 128	

F

F

E

E

D

D

C

C

B

B

A

A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
DIMENSION

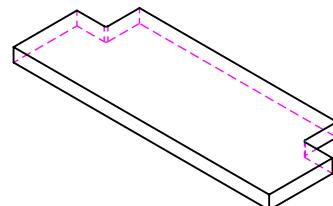
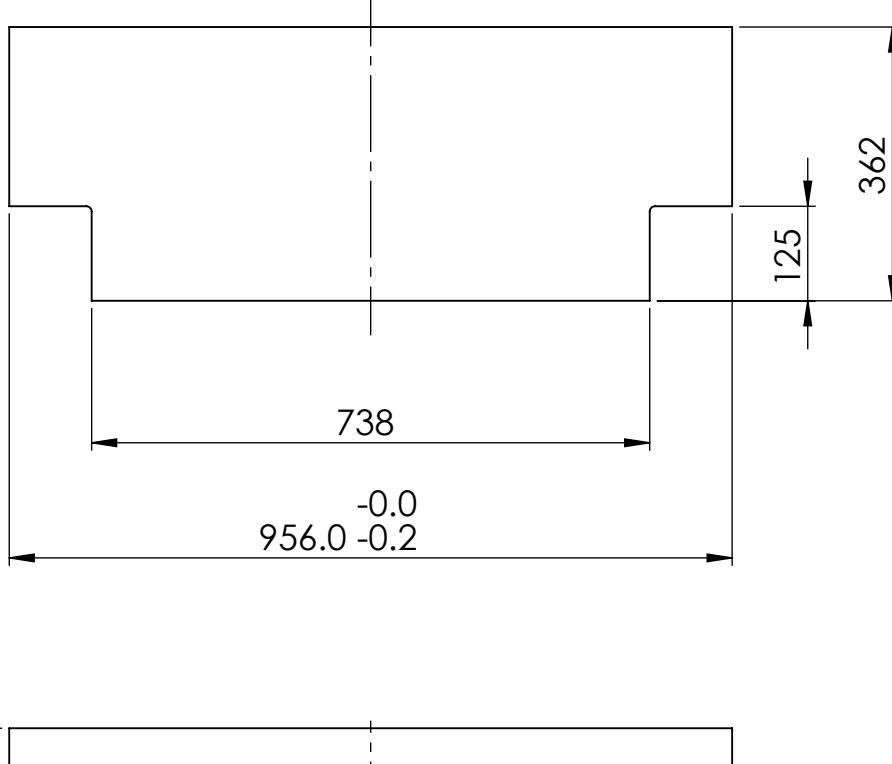
±0.5 ±1.0 ±1.5 ±2.5 ±4 ±6  
±0.3 ±0.5 ±0.8 ±1.2 ±2 ±3  
±0.1 ±0.2 ±0.3 ±0.5 ±0.8 ±1.2  
±0.05 ±0.05 ±0.1 ±0.15 ±0.2 ±0.3  
from 0.5 from 3 from 6 from 120 from 400 from 1000  
to 3 to 30 to 30 to 120 to 400 to 2000  
fr. 4000 fr. 2000 fr. 1000 fr. 2000 fr. 4000

Outside radii and chamfers  
ISO 2768-c-v  
ISO 2768-f-m  
FREE  
DIMENSION

±0.4 ±1 ±2  
±0.2 ±0.5 ±1  
from 0.5 from 3 from 6  
to 3 to 30 to 30  
fr. 100  
fr. 120  
fr. 400

±3° ±2° ±1° ±0.30° ±0.10°  
±1° ±0.30° ±1° ±0.10°  
±1° ±0.30° ±1° ±0.10°  
±1° ±0.30° ±1° ±0.10°  
from 10 to 50 from 10 to 50 from 10 to 50

0.0  
50 -0.8



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Front bottom plate 2</b>	
1	43.2	BurnGuard / 2			
	Date	Name	Signature	Project: <b>CSC neutron shielding</b>	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale: 1:10	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 57 / 99 Belongs to: FRS/SFRS File name: Front - Brown bar.SLDPR	Mass (kg): 16

4

3

2

1

F

F

E

E

D

D

C

C

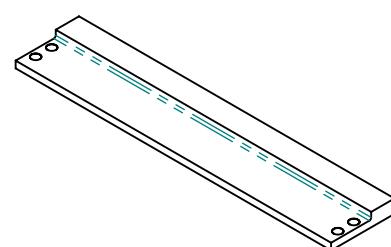
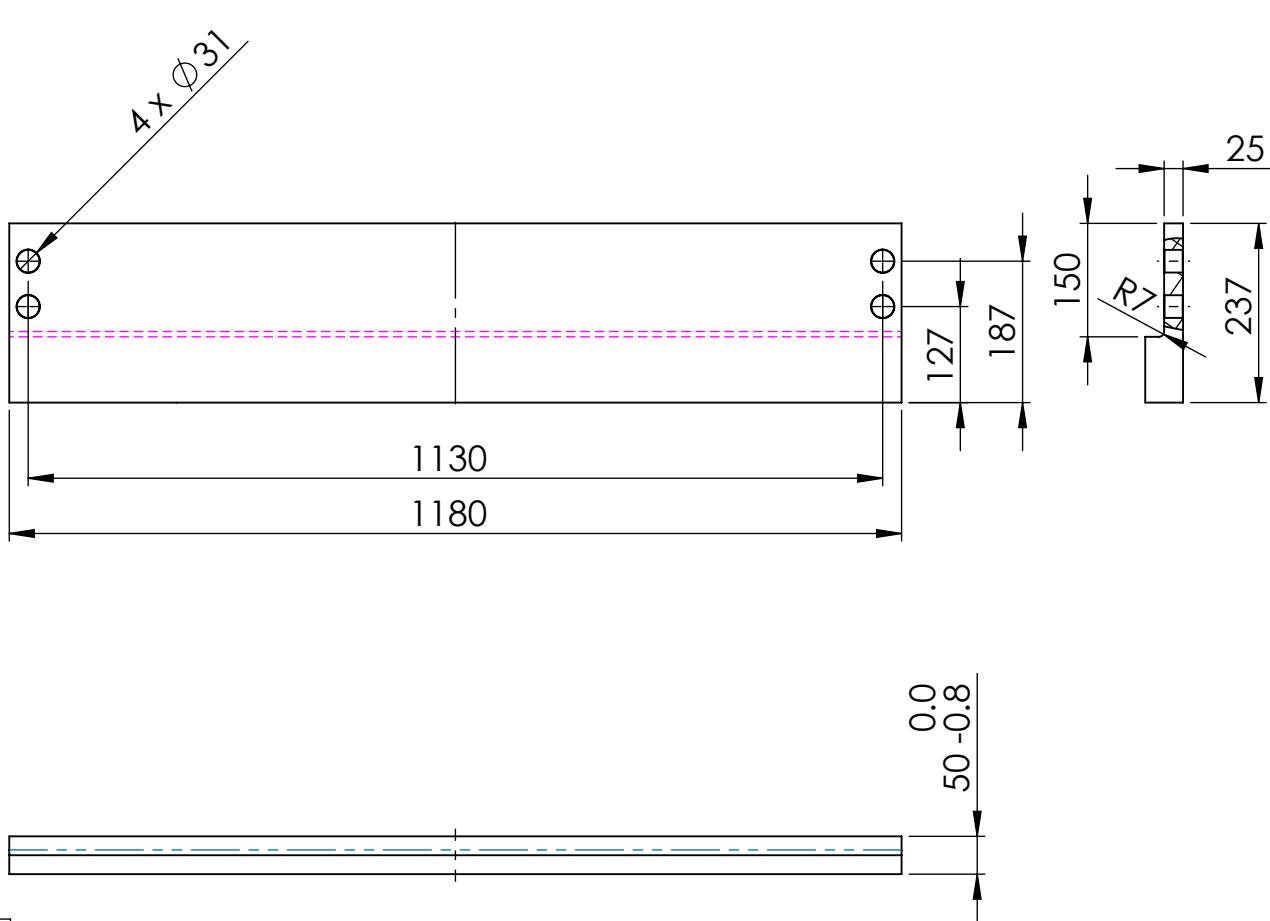
B

B

A

A

ISO 2768-v	-	$\pm 0.5$	$\pm 1$	$\pm 1.5$	$\pm 2.5$	$\pm 4$	$\pm 6$	$\pm 8$	Outside radii and chamfers	ISO 2768-v	$\pm 2^\circ$	$\pm 3^\circ$	$\pm 2^\circ$	$\pm 1^\circ$	$\pm 0^\circ 30'$	$\pm 0^\circ 20'$
ISO 2768-c	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$	$\pm 3$	$\pm 4$	ISO 2768-c	$\pm 0.4$	$\pm 1$	$\pm 30'$	$\pm 1^\circ$	$\pm 0^\circ 30'$	$\pm 15'$	
ISO 2768-m	$\pm 0.1$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$	ISO 2768-m	$\pm 0.2$	$\pm 0.5$	$\pm 1^\circ$	$\pm 0^\circ 30'$	$\pm 10'$	$\pm 0^\circ 55'$	
ISO 2768-f	$\pm 0.05$	$\pm 0.05$	$\pm 0.05$	$\pm 0.1$	$\pm 0.15$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	ISO 2768-f	$\pm 0.5$	$\pm 1$	$\pm 30'$	$\pm 1^\circ$	$\pm 0^\circ 20'$	$\pm 10'$	
DIMENSION	to 3	from 3	from 6	from 120	from 200	from 300	from 30	from 6	from 120	from 200	from 300	from 6	from 120	from 200	fr. 1000 fr. 2000 fr. 4000	



Ver. no.:	Part. no.:	Material / quantity:	Title: <b>Front bottom plate 3</b>		
1	43.3	BurnGuard / 1	Project: <b>CSC neutron shielding</b>		
	Date:	Name:	Signature:		
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale: 1:10	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no.: 58 / 99	Mass (kg): 10
				Belongs to: FRS/SFRS	
				File name: Front - Brown bar.SLDPR	

4

3

2

1

F

F

E

E

D

D

C

C

B

B

A

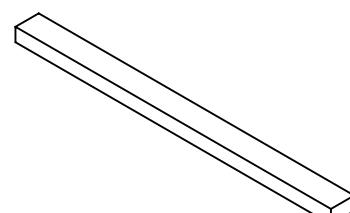
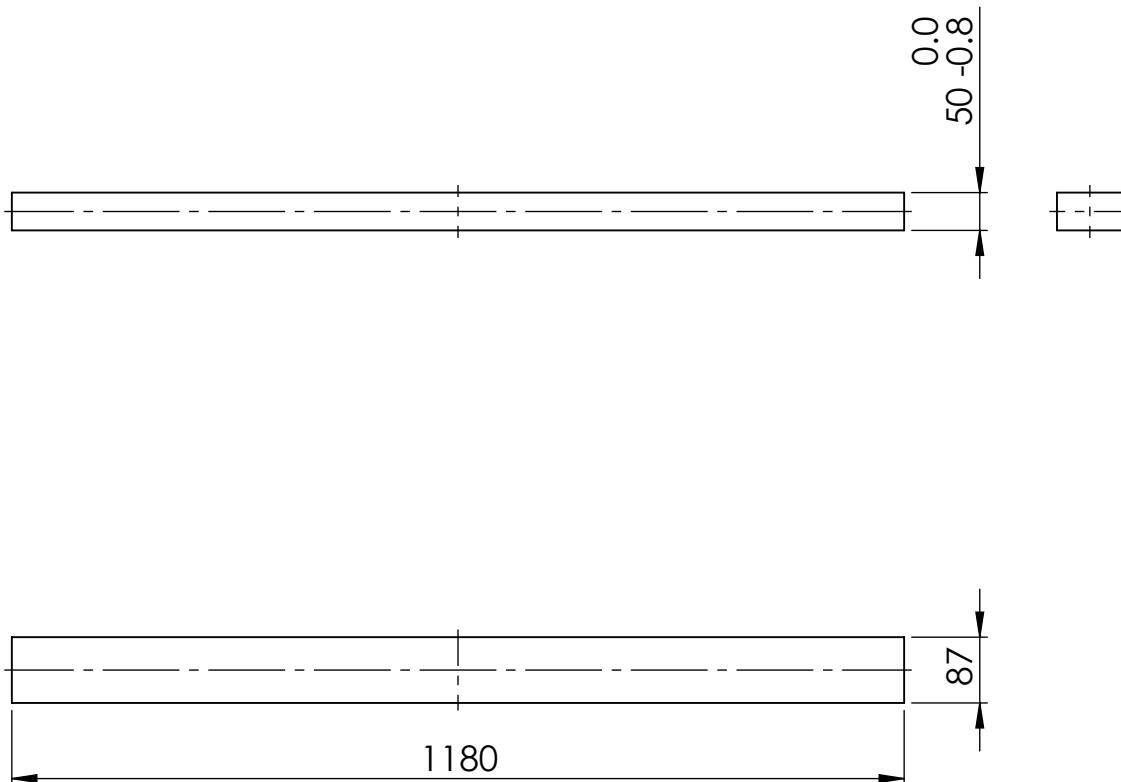
A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
FREE  
DIMENSION

- ±0.5 ±1 ±1.5 ±2.5 ±4 ±6  
±0.2 ±0.3 ±0.5 ±1.2 ±2 ±3  
±0.1 ±0.2 ±0.3 ±0.5 ±0.8 ±1.2  
±0.05 ±0.05 ±0.05 ±0.1 ±0.2 ±0.3  
from 0.5 from 3 from 6 from 120 from 400 from 1000  
to 3 to 3 to 6 to 30 to 120 to 400 to 1000 to 2000 to 4000

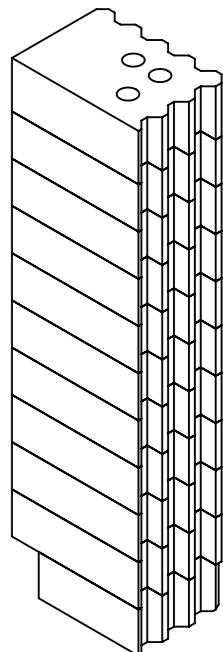
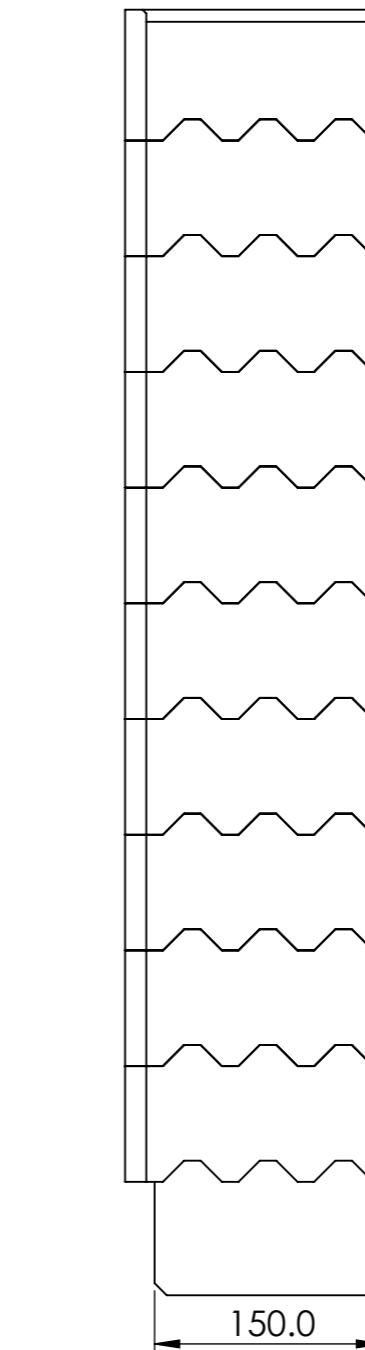
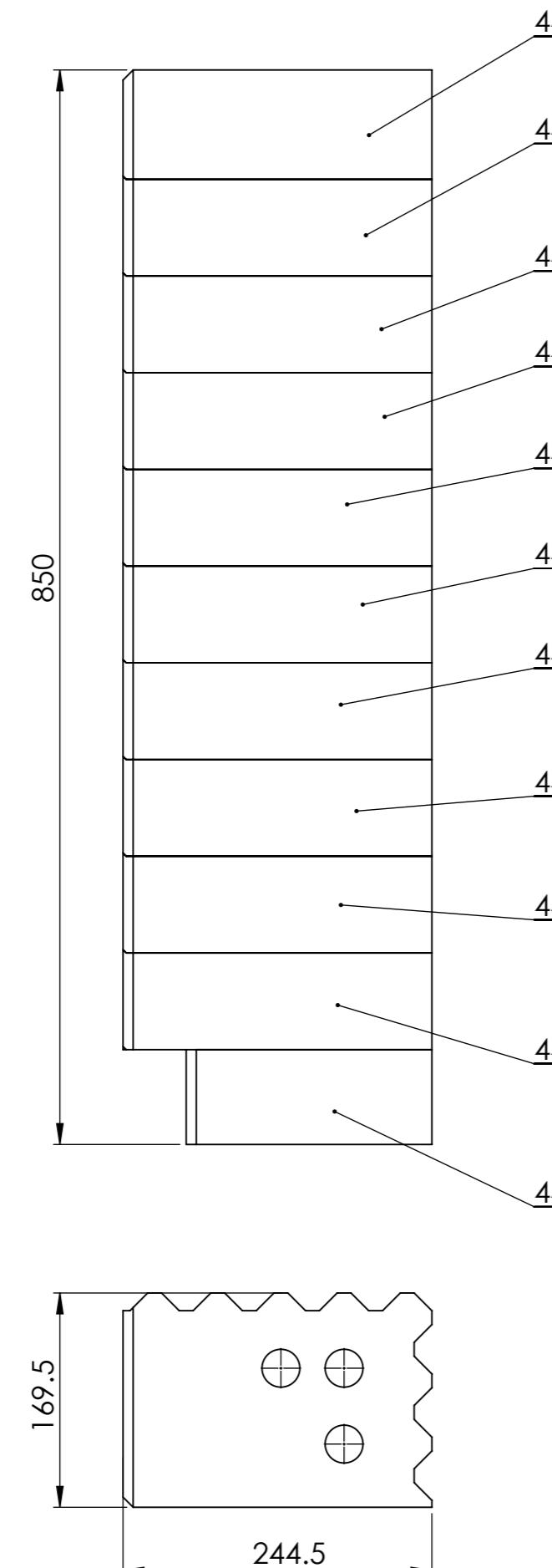
ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
FREE  
DIMENSION

- ±0.5 ±1 ±1.5 ±2.5 ±4 ±6  
±0.2 ±0.3 ±0.5 ±1.2 ±2 ±3  
±0.1 ±0.2 ±0.3 ±0.5 ±0.8 ±1.2  
±0.05 ±0.05 ±0.05 ±0.1 ±0.2 ±0.3  
from 0.5 from 3 from 6 from 120 from 400 from 1000  
to 3 to 3 to 6 to 30 to 120 to 400 to 1000 to 2000 to 4000



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Front bottom plate 4</b>
1	43.4	BurnGuard / 1		Project: <b>CSC neutron shielding</b>
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:10 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 59 / 99 Mass (kg): 5
				Belongs to: FRS/SFRS
				File name: Front - Brown bar.SLDPR
		ISO 128		

ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 FREE  
 DIMENSION



Pos.	Qua.	Name and dimensions	drawing nr./standard	Material	Mass
44.3	1	Front left corner 3 245x150x75	Front - Corner_3_left	BurnGuard	3
44.2	9	Front left corner 2 245x150x75	Front - Corner_2_left	BurnGuard	3
44.1	1	Front left corner 1 195x150x75	Front - Corner_1_left	BurnGuard	2
Pos. Qua. Name and dimensions			drawing nr./standard	Material	Mass
Ver. no.:	Part. no.	Quantity:	Title:	Front left corner block	
1	44	1	Project:	CSC neutron shielding	
	Date	Name	Signature		
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale:	1:5
GSI Helmholtzzentrum für Schwerionenforschung			Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Format: A3
				Dwg. / Dwg. no: 60 / 99	Mass (kg): 31
			Belongs to:	FRS/SFRS	
			File name:	corner_set_2.SLDASM	

4

3

2

1

F

F

E

E

D

D

C

C

B

B

A

A

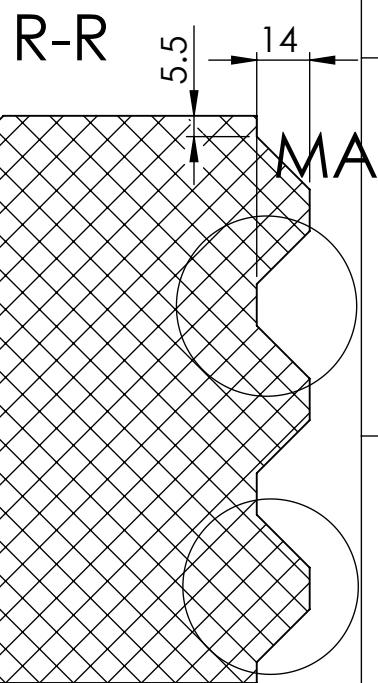
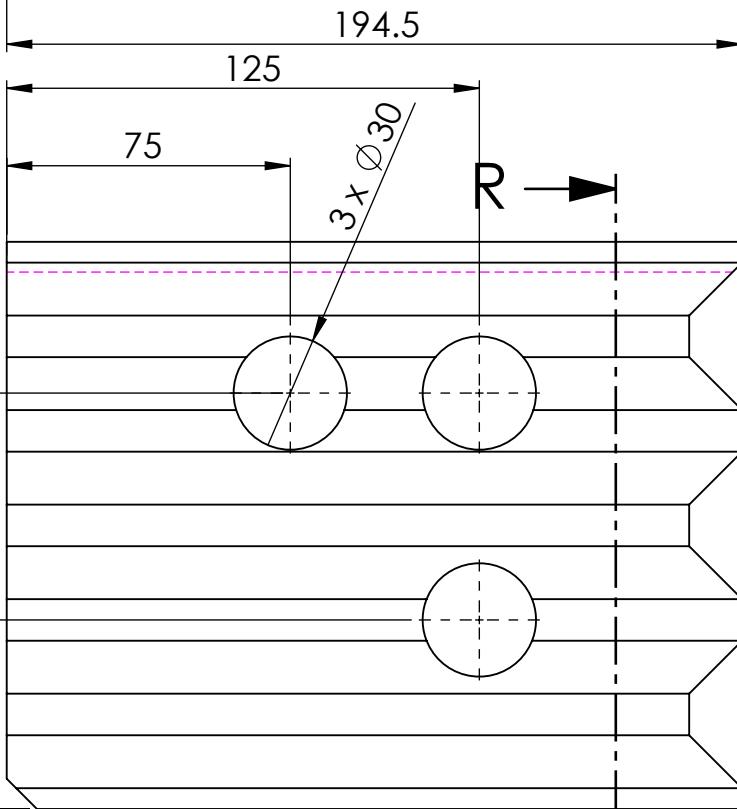
ISO 2768-v	-	$\pm 0.5$	$\pm 1$	$\pm 1.5$	$\pm 2.5$	$\pm 4$	$\pm 6$	$\pm 8$
ISO 2768-c	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$	$\pm 3$	$\pm 4$
ISO 2768-m	$\pm 0.1$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$
ISO 2768-f	$\pm 0.05$	$\pm 0.05$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$
DIMENSION	from 3 to 30	from 3 to 30	from 6 to 30	from 12 to 30	from 20 to 40	from 30 to 60	from 50 to 100	from 100 to 2000

150

100

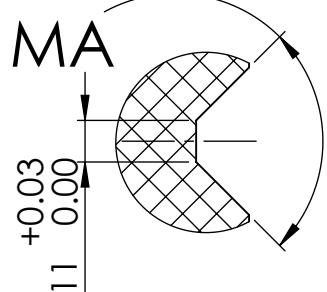
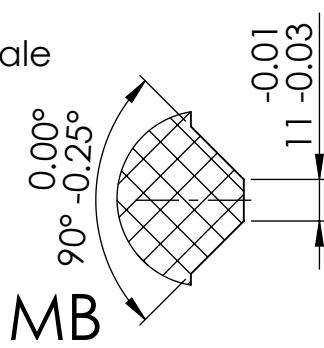
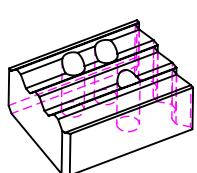
40

8 x 45°



MB

Repeating patterns of male and female chevrons



Ver. no.:	Part. no.	Material / quantity:	Title: Front left corner 1		
1	43.1	BurnGuard / 1	Project: CSC neutron shielding		
	Date	Name	Signature		
Drawn:	11/02/2024	Gasper Bizjan			
Checked:					
GSI Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Scale: 1:2	Format: A4
				Dwg. / Dwg. no: 61 / 99	Mass (kg): 2
				Belongs to: FRS/SFRS	
				File name: Front - Corner_1_left.SLDPR	

4

3

2

1

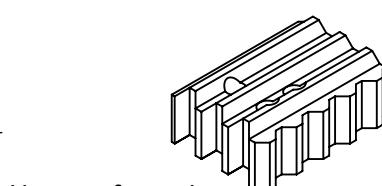
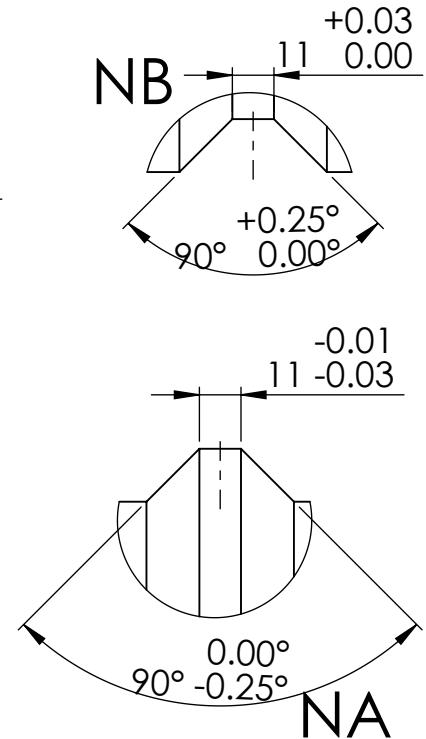
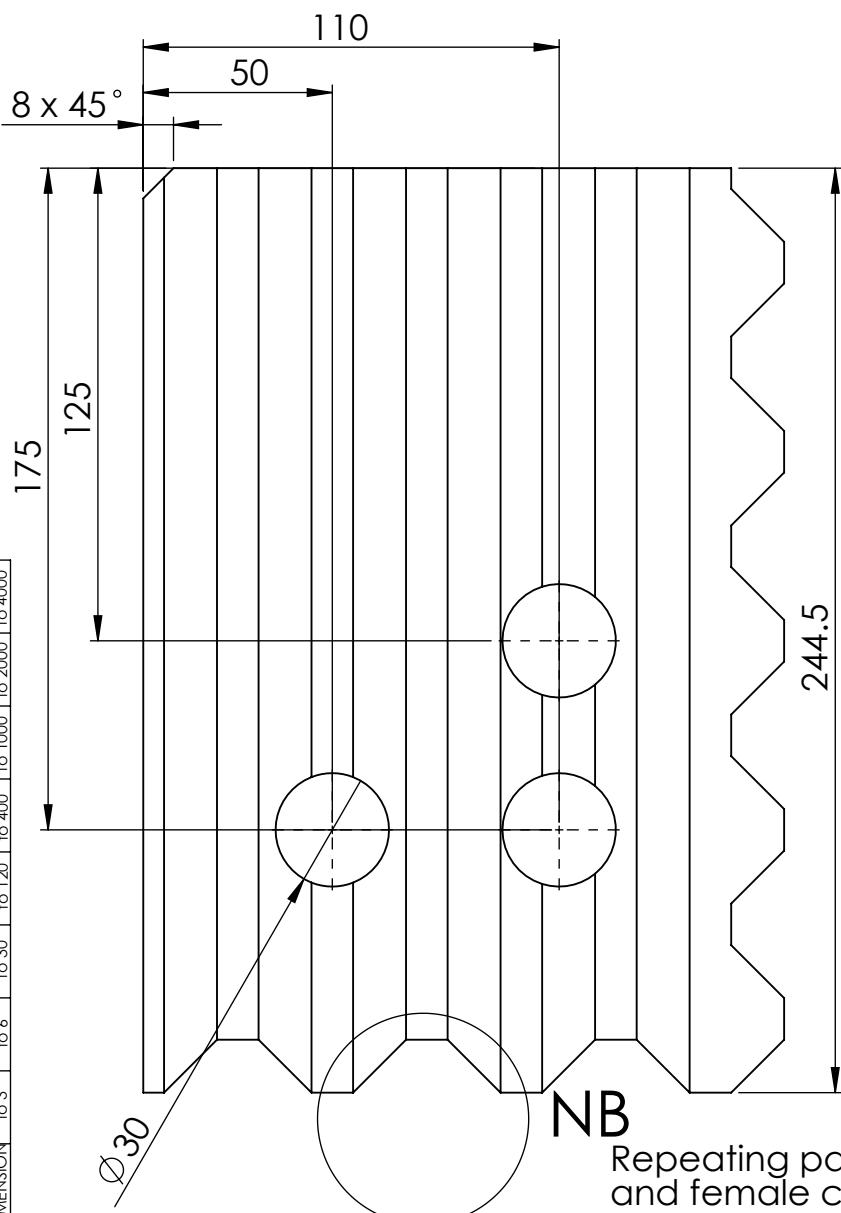
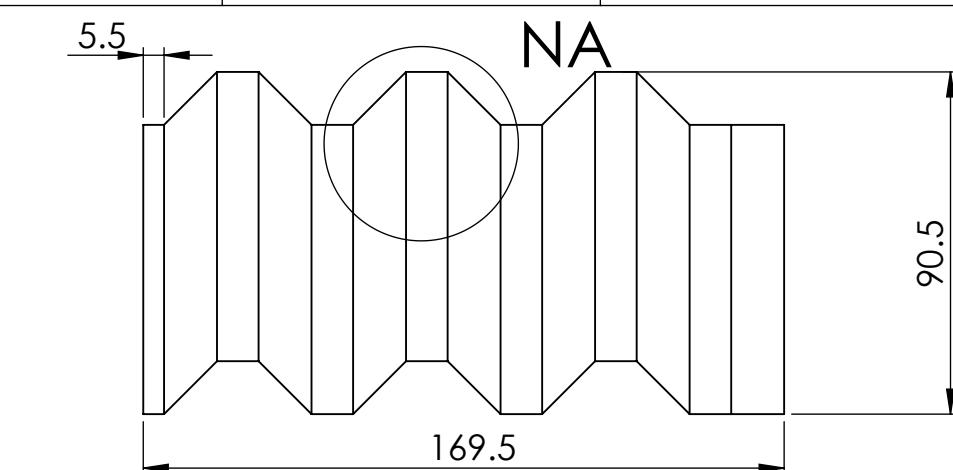
ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
FREE DIMENSION

from 3 to 6 from 3 to 6

to 3 to 6 to 3 to 6 to 3 to 6 to 3 to 6 to 3 to 6 to 3 to 6 to 3 to 6

fr. 1000 fr. 2000 fr. 1000 fr. 2000

fr. 4000 fr. 4000



Repeating patterns of male and female chevrons

Ver. no.:	Part. no.	Material / quantity:		Title: <b>Front left corner 2</b>	
1	43.2	BurnGuard / 9			
	Date	Name	Signature	Project: <b>CSC neutron shielding</b>	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale: 1:2	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 62 / 99	Mass (kg): 3
				Belongs to: FRS/SFRS	
				File name: Front - Corner_2_left.SLDPR	

4

3

2

1

F

E

D

C

B

F

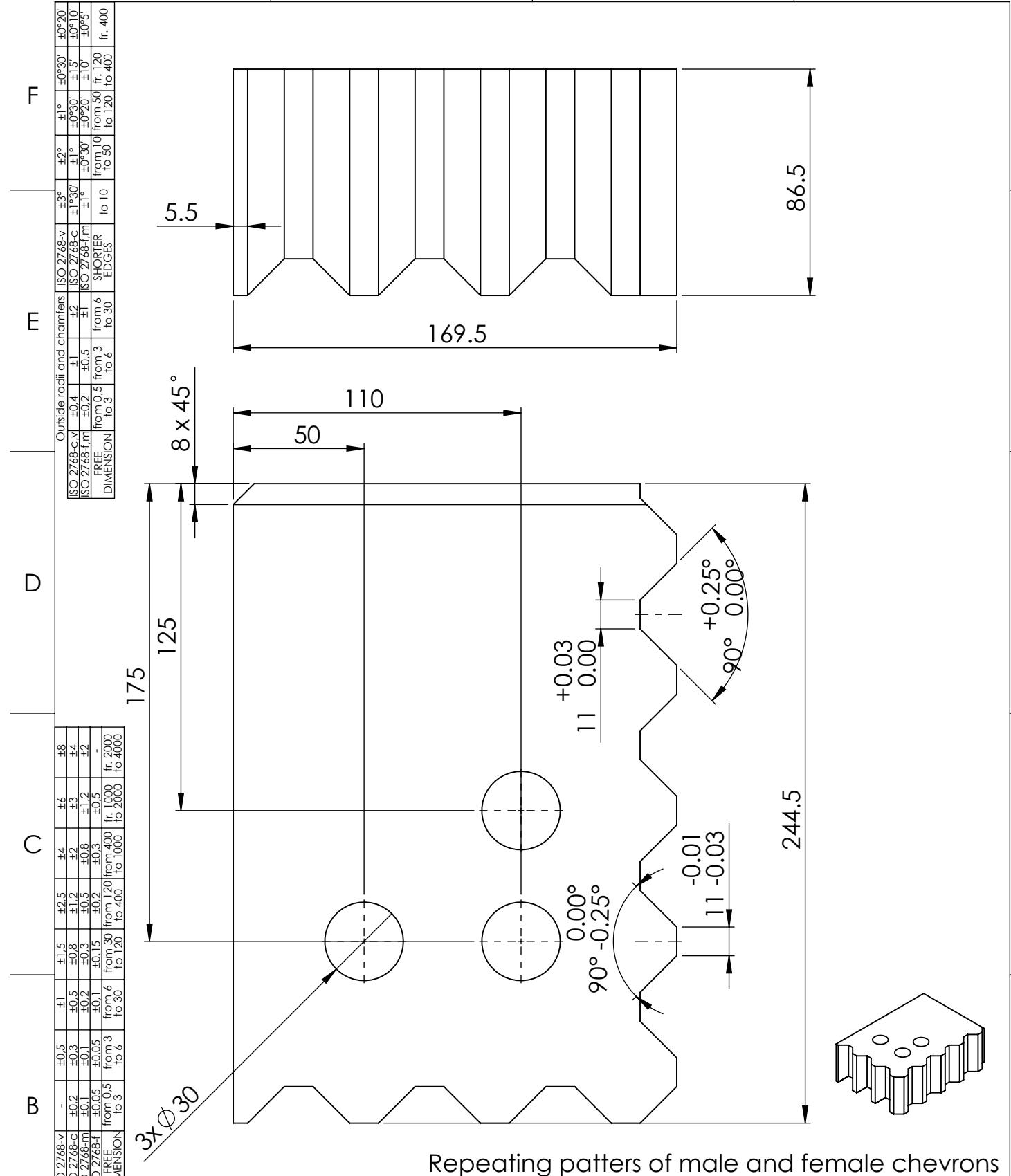
E

D

C

B

A



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Front left corner 3</b>
1	43.3	BurnGuard / 1		
	Date	Name	Signature	Project: <b>CSC neutron shielding</b>
Drawn:	11/02/2024	Gasper Bizjan		Scale: 1:2
Checked:				Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 63 / 99 Mass (kg): 3
				Belongs to: FRS/SFRS
				File name: Front - Corner_3_left.SLDPR

4

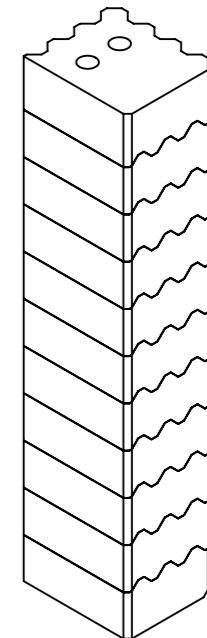
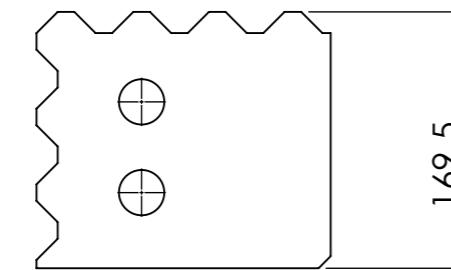
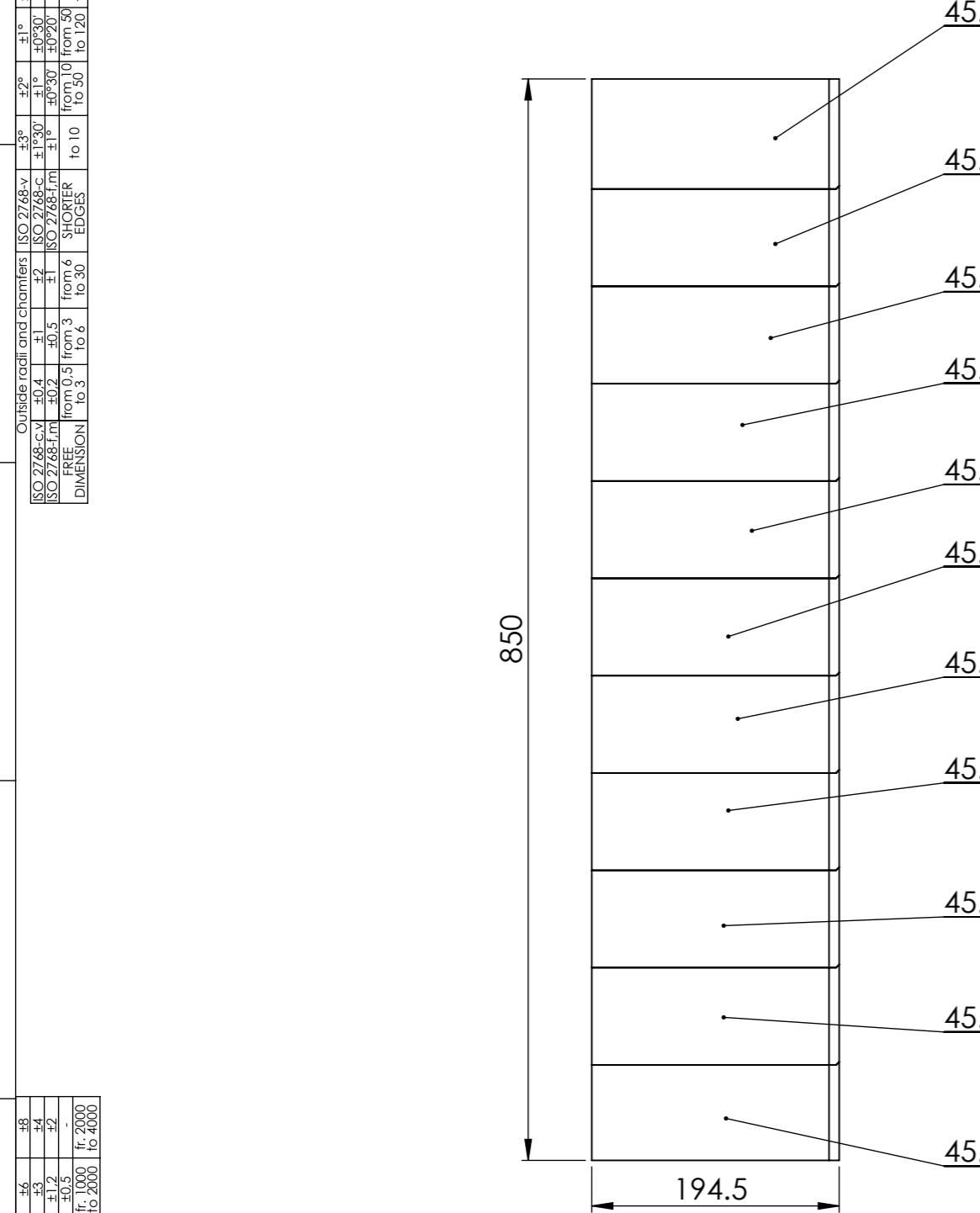
3

2

1

ISO 2768-v Outside radii and chamfers ISO 2768-v  
 ISO 2768-cv ISO 2768-cv  
 ISO 2768-m ISO 2768-m  
 ISO 2768-f ISO 2768-f  
 FREE from 0.5 to 3  
 DIMENSION from 3 to 10  
 to 30 to 120 to 400

8 7 6 5 4 3 2 1



Pos.	Qua.	Name and dimensions	drawing nr./standard	Material	Mass
45.3	1	Front right corner 3 245x170x75	Front - Corner_3_right	BurnGuard	2
45.2	9	Front right corner 2 245x170x75	Front - Corner_2_right	BurnGuard	2
45.1	1	Front right corner 1 195x170x75	Front - Corner_1_right	BurnGuard	2
Pos. Qua. Name and dimensions			drawing nr./standard	Material	Mass
Ver. no.: 1 Part. no. 45 Quantity: 1			Title: Front right corner block		
			Project: CSC neutron shielding		
Drawn: 11/02/2024 Date Gasper Bizjan Signature					
Checked:			Scale: 1:5	Format: A3	
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung			Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 64 / 99 Mass (kg): 25
					Belongs to: FRS/SFRS
					File name: corner_set_1.SLDASM
			ISO 128		

ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 FREE DIMENSION

from 3 to 6 from 3 to 6 from 3 to 6 from 3 to 6 from 3 to 6

194.5

89

5.5

8x45°

150

**GSI**  
Helmholtzzentrum für  
Schwerionenforschung

4

3

2

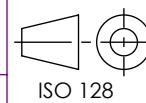
1

Repeating patterns of male and female chevrons

Title:  
**Front right corner 1**

Project:  
**CSC neutron shielding**

Scale: 1:2 Format: A4



Dwg. / Dwg. no: 65 / 99 Mass (kg): 2  
Belongs to: FRS/SFRS  
File name: Front - Corner\_1\_right.SLDPRT

F

E

D

C

B

A

F

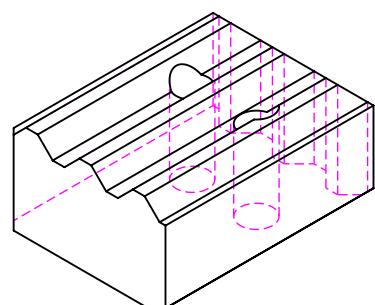
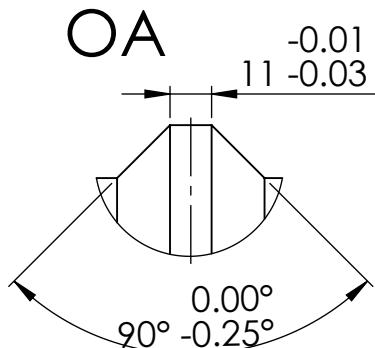
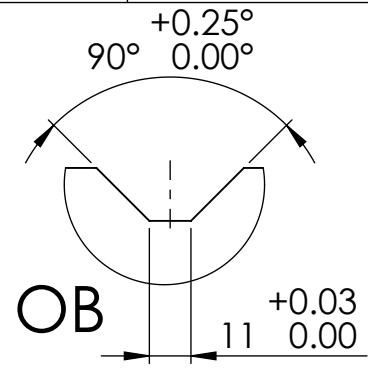
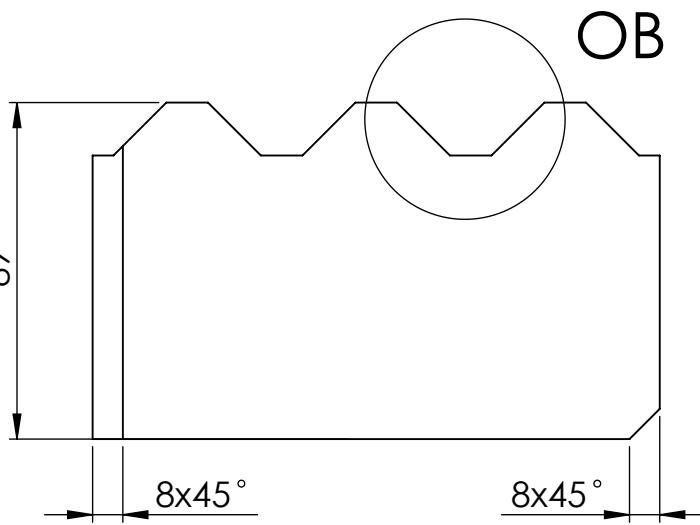
E

D

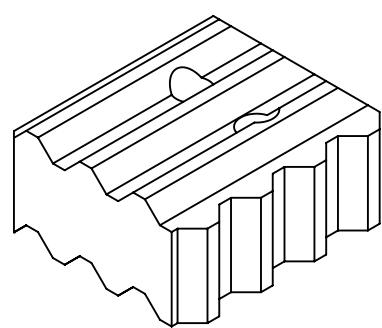
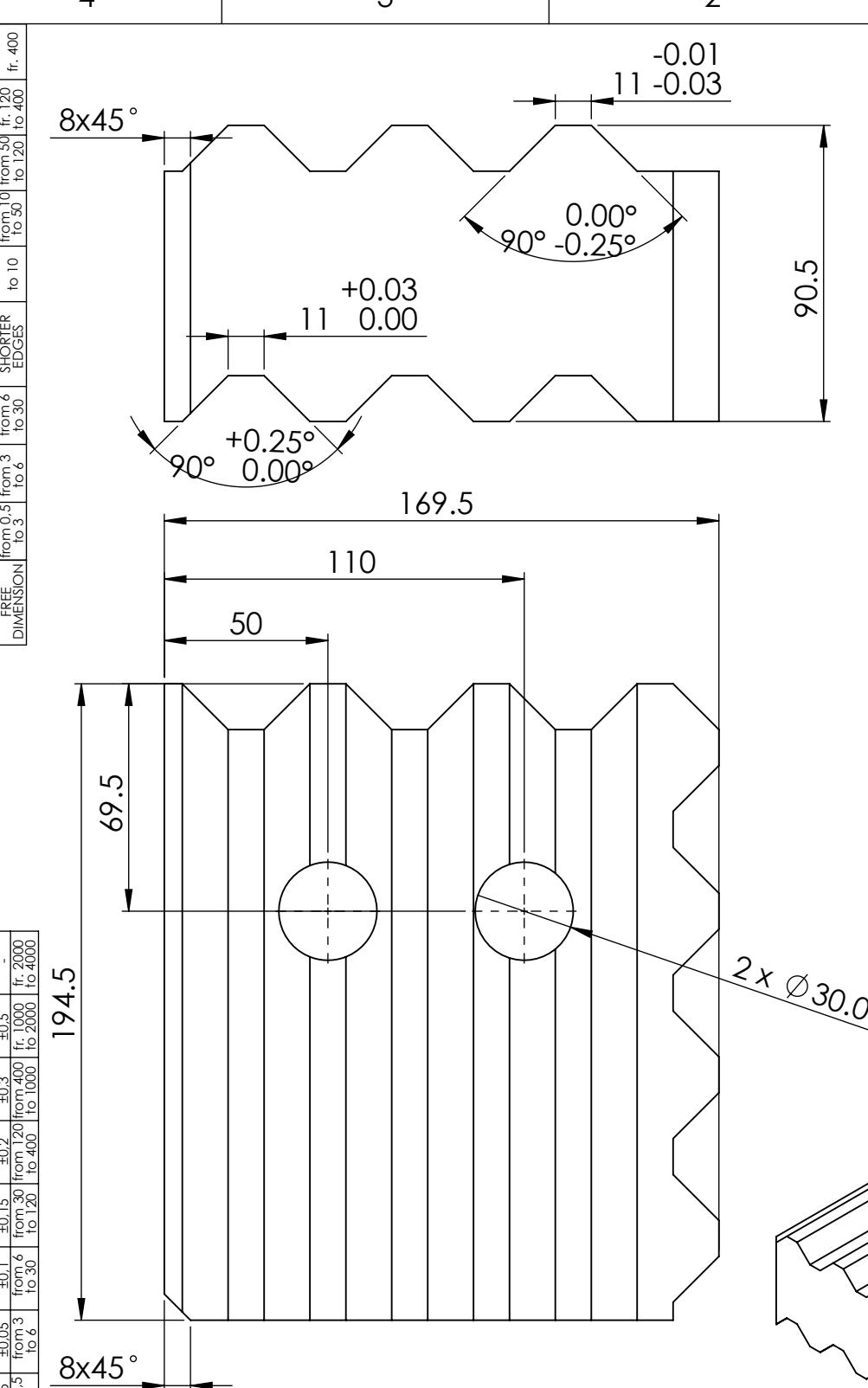
C

B

A



ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 FREE DIMENSION



Repeating patterns of male and female chevrons

ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 FREE DIMENSION

1

45.2

Material / quantity:

BurnGuard / 9

Title:  
Front right corner 2

Project:  
CSC neutron shielding

Scale: 1:2

Format: A4

**GSI**

Helmholtzzentrum für  
Schwerionenforschung

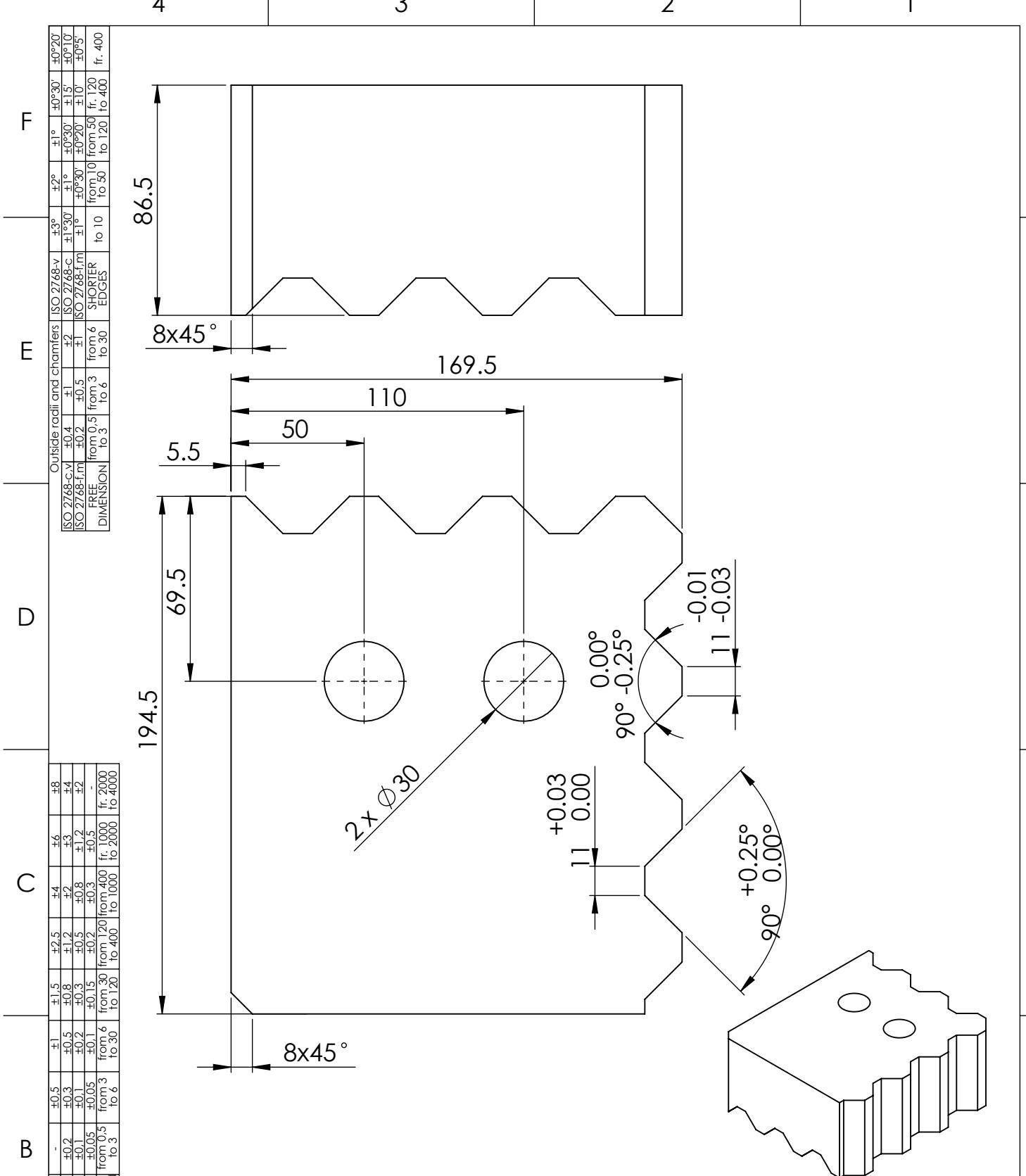
Tolerance principles  
ISO 8015

Tolerances:  
ISO 2768-m  
ISO 128

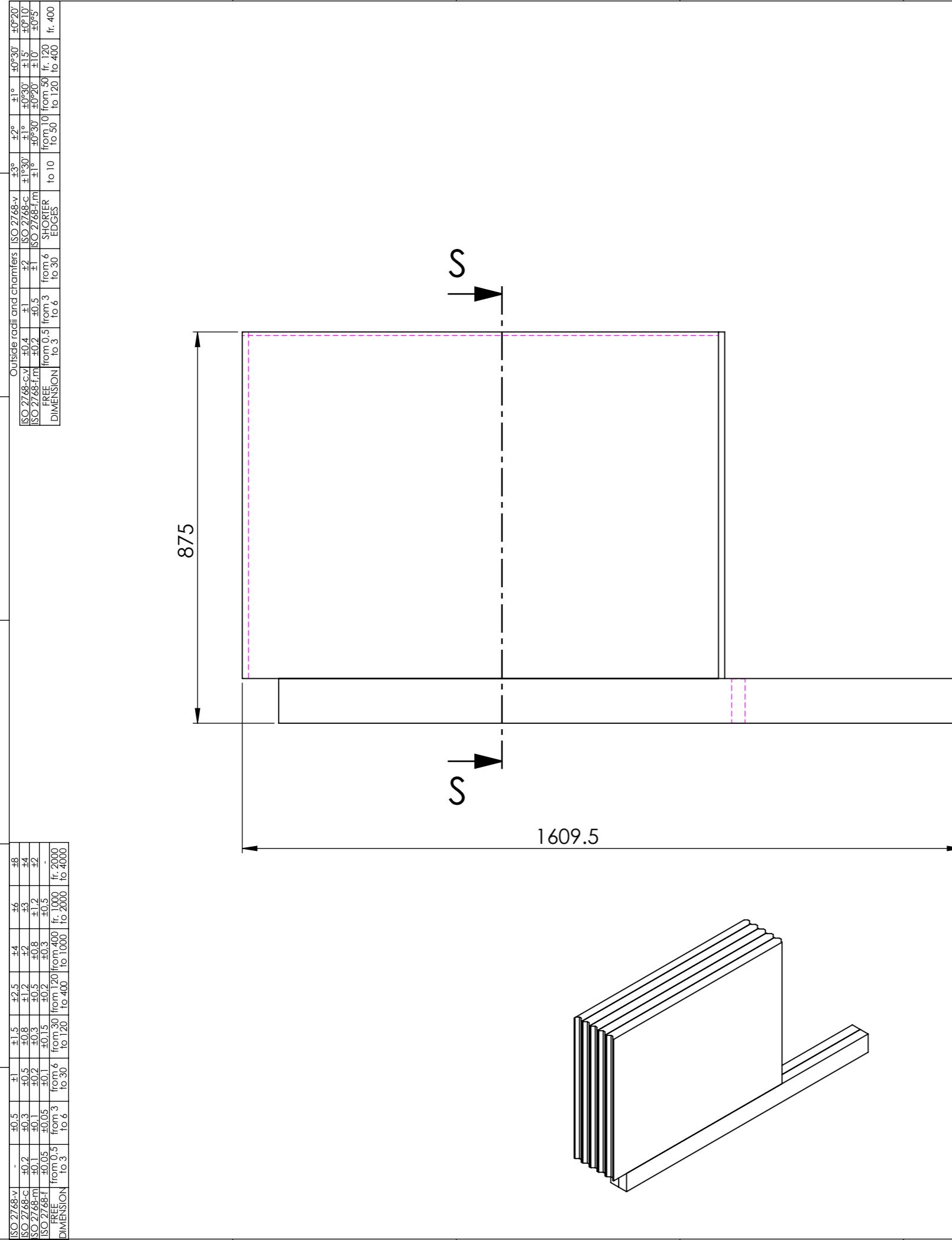
Dwg. / Dwg. no: 66 / 99 Mass (kg): 2

Belongs to: FRS/SFRS

File name: Front - Corner\_2\_right.SLDPRT



Ver. no.:	Part. no.	Material / quantity:	Title: <b>Front right corner 3</b>	
1	45.3	BurnGuard / 1		
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Scale: 1:2 Format: A4
				Dwg. / Dwg. no: 67 / 99 Mass (kg): 2
				Belongs to: FRS/SFRS
				File name: Front - Corner_3_right.SLDPRT



Pos.	Qua.	Name and dimensions	drawing nr./standard	Material	Mass
46.4	4	Left verticle plate 1065x775x50	Left bottom - 1	BurnGuard	42
46.3	1	Left verticle plate (outer) 1065x775x50	Left bottom - 1	BurnGuard	42
46.2	1	Bottom left block (hole) 1528x100x50	Left bottom - 1	BurnGuard	8
46.1	1	Bottom left block (no hole) 1528x100x50	Left bottom - 1	BurnGuard	8
Pos. Qua. Name and dimensions			drawing nr./standard	Material	Mass
Ver. no.:	Part. no.	Quantity:	Title:		
1	46	1	Left front block		
	Date	Name	Project:		
Drawn:	11/02/2024	Gasper Bizjan	CSC neutron shielding		
Checked:			Scale:	1:10	Format: A3
GSI		Tolerance principles ISO 8015	Tolerances:	68 / Dwg. no:	Mass (kg): 224
		ISO 2768-m	ISO 128	Belongs to: FRS/SFRS	
				File name:	left bottom-1.SLDASM

F

F

E

E

D

D

C

C

B

B

A

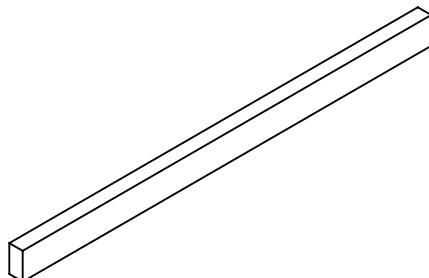
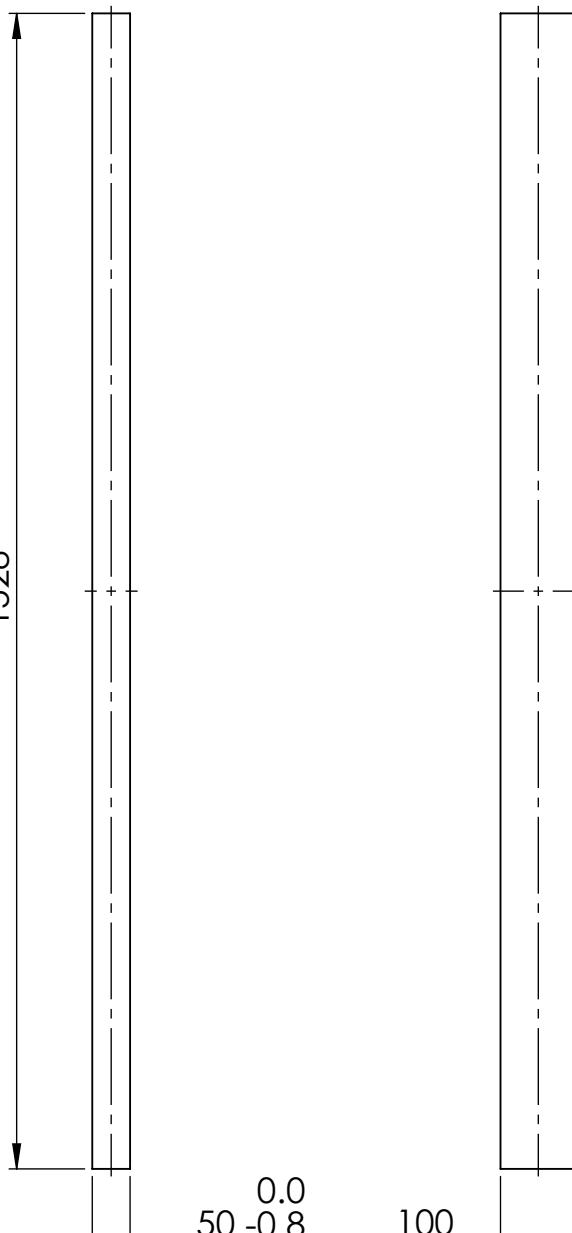
A

ISO 2768-v	-	$\pm 0.5$	$\pm 1.5$	$\pm 2.5$	$\pm 4$	$\pm 6$	$\pm 8$
ISO 2768-c	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 1.2$	$\pm 2$	$\pm 3$	$\pm 4$
ISO 2768-m	$\pm 0.1$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 1.2$	$\pm 2$
ISO 2768-f	$\pm 0.05$	$\pm 0.05$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$
DIMENSION	from 3 to 3	from 3 to 3	from 6 to 30	from 120 to 400	from 200 to 1000	fr. 1000 to 2000	fr. 2000 to 4000

1528

50 -0.8

100



Ver. no.:	Part. no.	Material / quantity:		Title: Bottom left block (no hole)		
1	46.1	BurnGuard / 1				
	Date	Name	Signature	Project: CSC neutron shielding		
Drawn:	11/02/2024	Gasper Bizjan				
Checked:				Scale:	1:10	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no:	69 / 99	Mass (kg): 8
				Belongs to:	FRS/SFRS	
				File name:	Left bottom-1.SLDPRT	

4

3

2

1

F

E

D

C

B

A

F

E

D

C

B

A

ISO 2768-v	-	±0.5	±1.0	±2.5	±4	±6	±8	Outside radii and chamfers	ISO 2768-v	±2°	±3°	±2°	±1°	±0°30'	±0°20'
ISO 2768-c	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3	ISO 2768-c	±0.4	±1	ISO 2768-c	±1°	±1°	±0°30'	±0°10'
ISO 2768-m	±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	ISO 2768-m	±0.2	±0.5	ISO 2768-m	±1°	±1°	±0°30'	±0°10'
ISO 2768-f	±0.05	±0.05	±0.1	±0.15	±0.2	±0.3	±0.5	ISO 2768-f	±0.2	±0.5	ISO 2768-f	±1°	±1°	±0°30'	±0°10'
DIMENSION	from 0.5 to 3	from 0.5 to 3	from 0.5 to 3	from 0.5 to 3	from 0.5 to 3	from 0.5 to 3	from 0.5 to 3	from 0.5 to 3							

1528

500

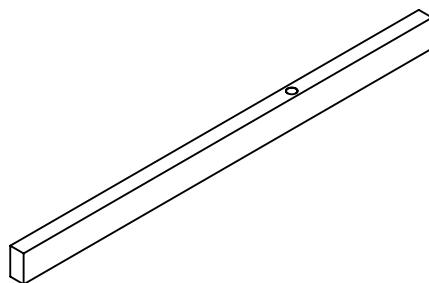
50 -0.8



T-T

 $\varnothing 30$ 

100



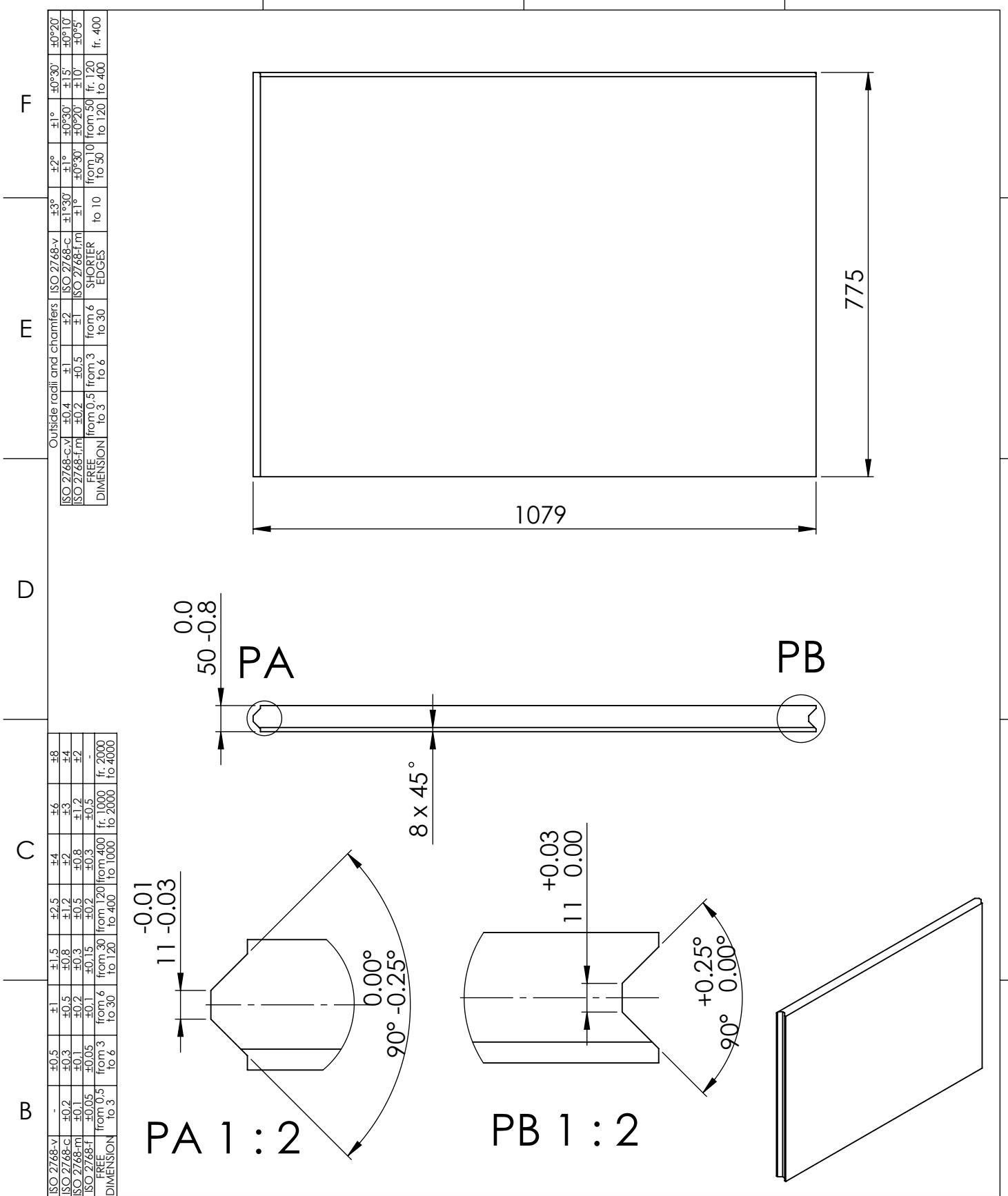
Ver. no.:	Part. no.	Material / quantity:		Title: Bottom left block
1	46.2	BurnGuard / 1		Project: CSC neutron shielding
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		Scale: 1:10 Format: A4
Checked:				
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 70 / 99 Mass (kg): 8 Belongs to: FRS/SFRS File name: Left bottom-1.SLDPRT
		ISO 128		

4

3

2

1



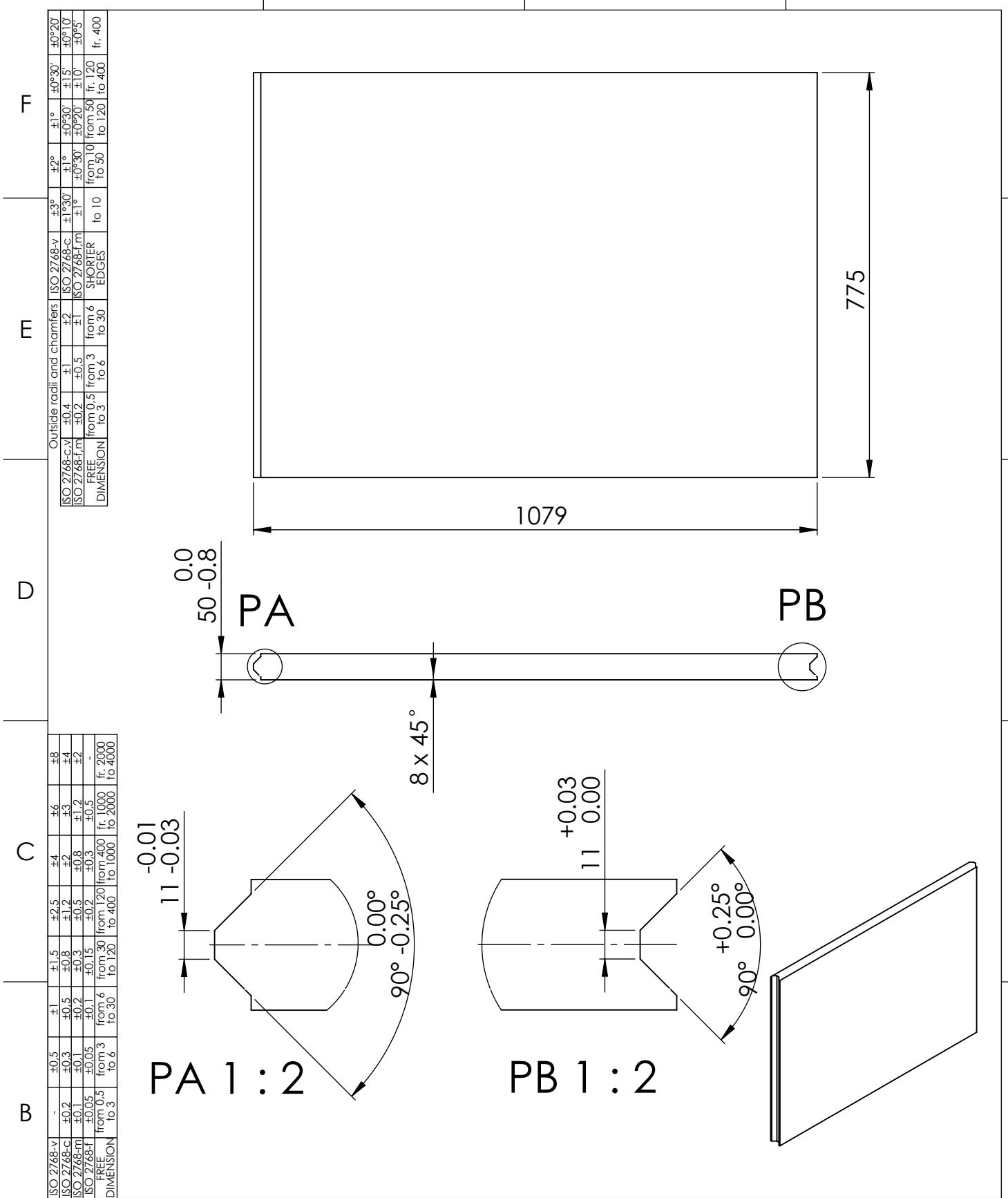
Ver. no.:	Part. no.	Material / quantity:		Title: Left verticle plate (outer)		
1	46.3	BurnGuard / 1				
	Date	Name	Signature	Project: CSC neutron shielding		
Drawn:	11/02/2024	Gasper Bizjan				
Checked:				Scale: 1:10		
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Format: A4	Dwg. / Dwg. no: 71 / 99	Mass (kg): 42
				Belongs to: FRS/SFRS		
				File name: Left bottom-1.SLDPRT		

4

3

2

1



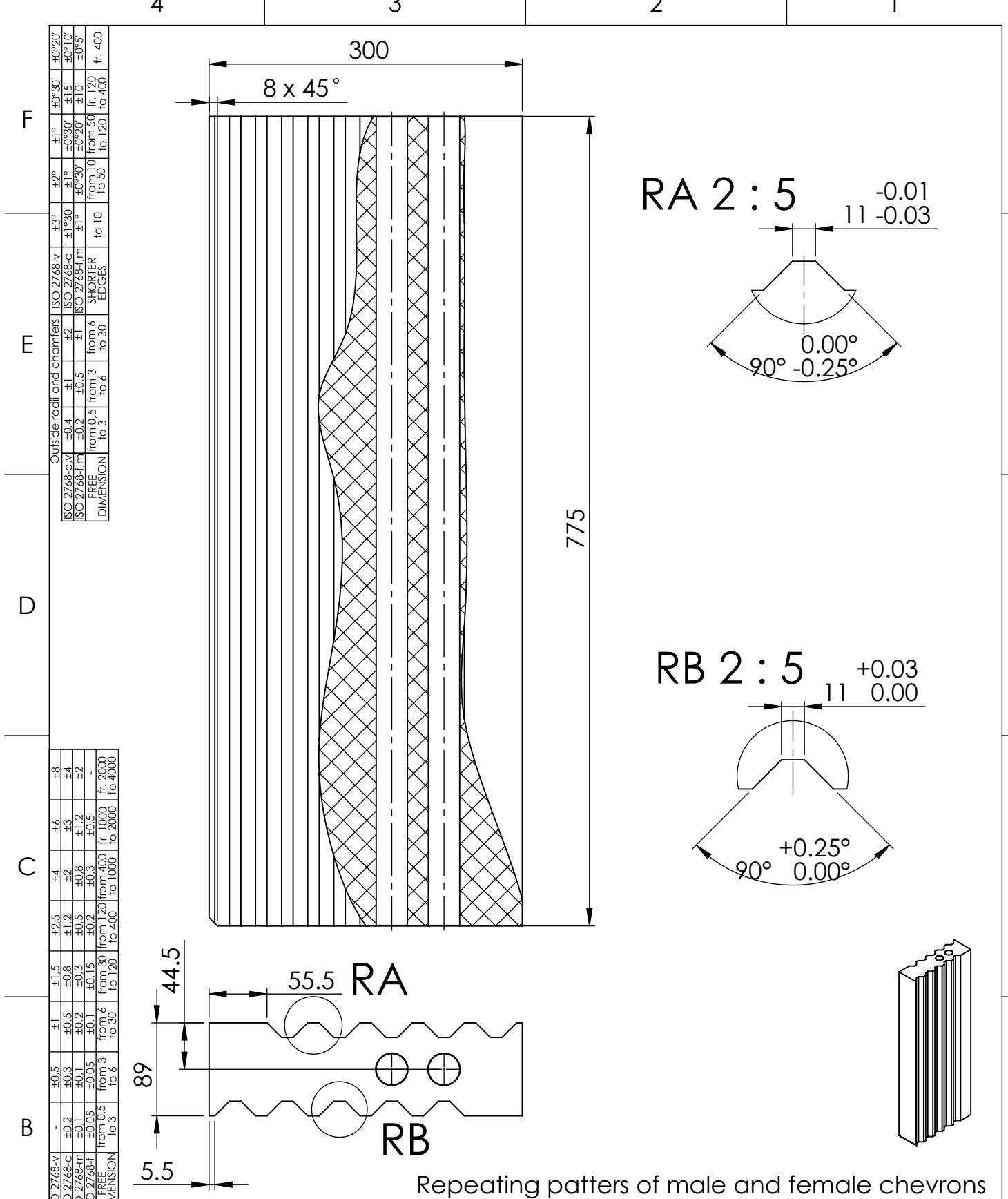
Ver. no.:	Part. no.	Material / quantity:		Title: Left verticle plate
1	46.4	BurnGuard / 4		
	Date	Name	Signature	Project: CSC neutron shielding
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:10 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 72 / 99 Mass (kg): 42
				Belongs to: FRS/SFRS
				File name: Left bottom-1.SLDPRT

4

3

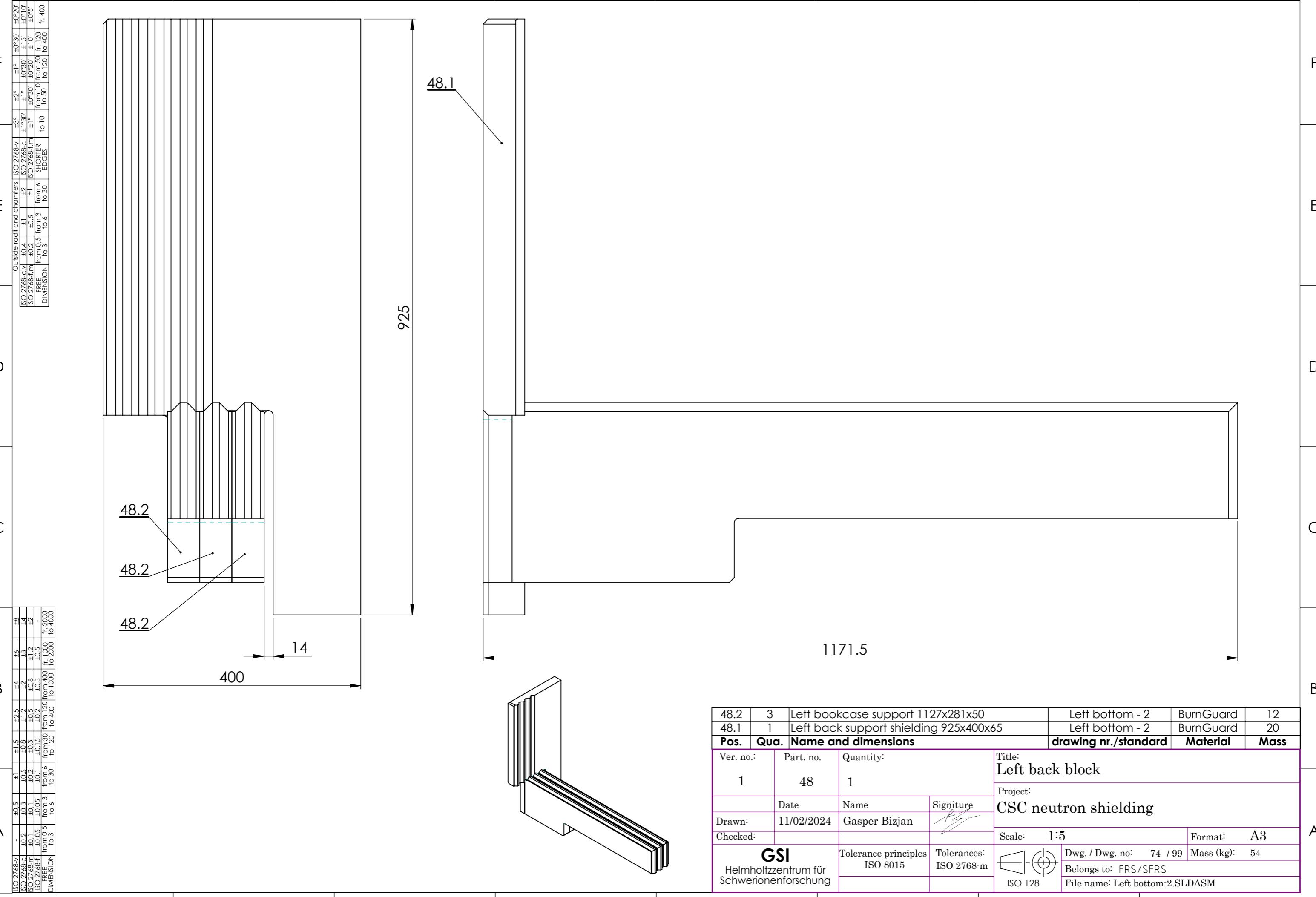
2

1



Ver. no.:	Part. no.	Material / quantity:		Title: Left support shielding	
1	47	BurnGuard / 1			
	Date	Name	Signature	Project: CSC neutron shielding	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale: 1:5	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 73 / 99 Belongs to: FRS/SFRS File name: Left bottom-1.SLDPRT	Mass (kg): 17

8 7 6 5 4 3 2 1



Pos.	Qua.	Name and dimensions	drawing nr./standard	Material	Mass
		48.2   3   Left bookcase support 1127x281x50	Left bottom - 2	BurnGuard	12
		48.1   1   Left back support shielding 925x400x65	Left bottom - 2	BurnGuard	20
Pos. Qua. Name and dimensions			drawing nr./standard	Material	Mass
Ver. no.: 1 Part. no. 48 Quantity: 1			Title: Left back block		
			Project: CSC neutron shielding		
			Date: 11/02/2024	Name: Gasper Bizjan	Signature:
			Drawn: 11/02/2024	Gasper Bizjan	
			Checked:		
			Scale: 1:5	Format: A3	
			Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 74 / 99 Mass (kg): 54
				Belongs to: FRS/SFRS	File name: Left bottom-2.SLDASM
			ISO 128		



4

3

2

1

F

F

E

E

D

D

C

C

B

B

A

A

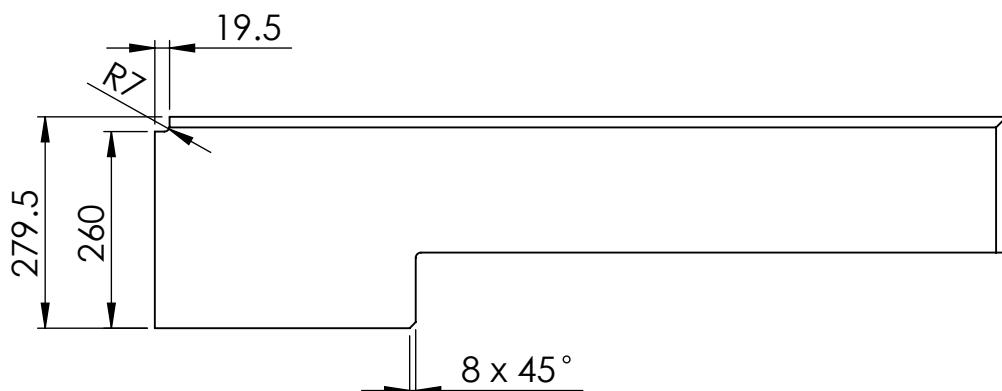
4

3

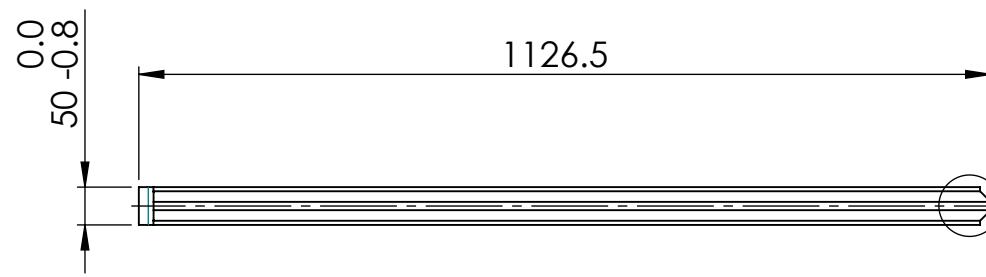
2

1

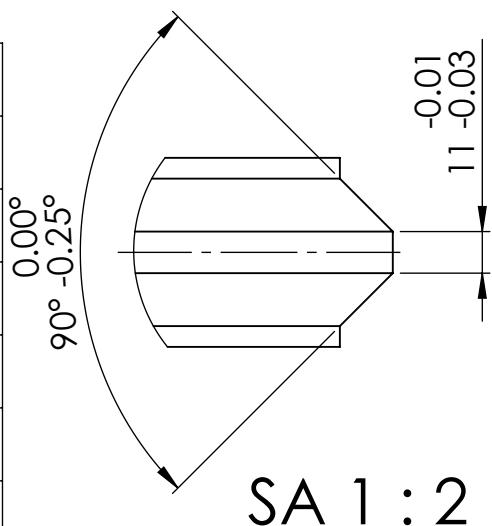
ISO 2768-v	-	$\pm 0.5$	$\pm 1.5$	$\pm 2.5$	$\pm 6$	$\pm 2$	$\pm 2^{\circ}$	$\pm 1^{\circ}$	$\pm 0^{\circ}20'$
ISO 2768-c	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 1.2$	$\pm 2$	$\pm 1$	$\pm 1^{\circ}$	$\pm 0^{\circ}30'$	$\pm 15'$
ISO 2768-m	$\pm 0.1$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.8$	$\pm 0.5$	$\pm 1^{\circ}$	$\pm 0^{\circ}10'$	$\pm 0^{\circ}5^{\circ}$
ISO 2768-f	$\pm 0.05$	$\pm 0.05$	$\pm 0.1$	$\pm 0.2$	$\pm 0.5$	$\pm 0.2$	$\pm 0.5$	$\pm 0^{\circ}20'$	$\pm 10'$
DIMENSION	from 3	from 3	from 6	from 120	from 400	from 3	from 6	from 10	from 50 to 400
	to 3	to 3	to 30	to 120	to 400	to 30	to 6	to 50	fr. 120 to 400



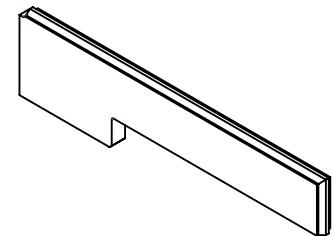
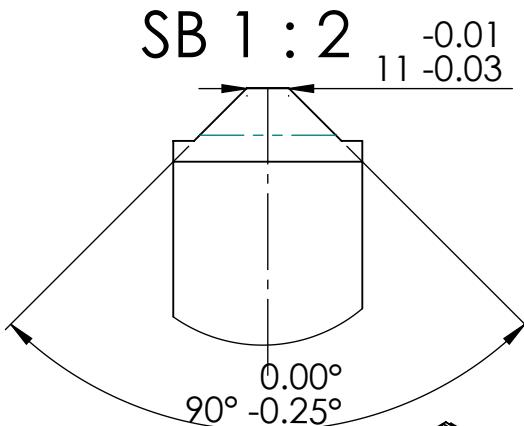
SB



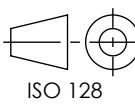
SA



SA 1 : 2



Ver. no.:	Part. no.	Material / quantity:	Title: Left bookcase support		
1	48.2	BurnGuard / 3	Project: CSC neutron shielding		
	Date	Name	Signature		
Drawn:	11/02/2024	Gasper Bizjan			
Checked:			Scale: 1:10		
GSI Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no:	Mass (kg):
				76 / 99	12
				Belongs to:	FRS/SFRS
				File name: Left bottom-2.SLDPRT	



8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

1121

F  
E  
D  
C  
B  
A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
DIMENSION

Outside radii and chamfers  
ISO 2768-c/v  
ISO 2768-m  
FREE  
DIMENSION

$\pm 0.5$   
 $\pm 0.3$   
 $\pm 0.2$   
 $\pm 0.1$   
 $\pm 0.05$   
 $\pm 0.05$   
 $\pm 0.05$   
 $\pm 0.05$   
 $\pm 0.05$

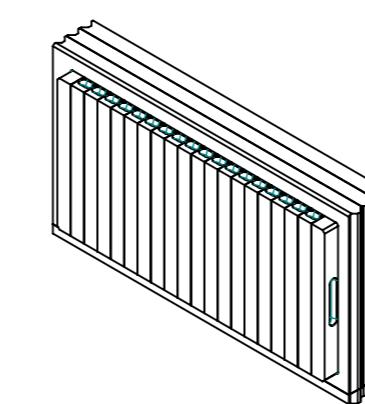
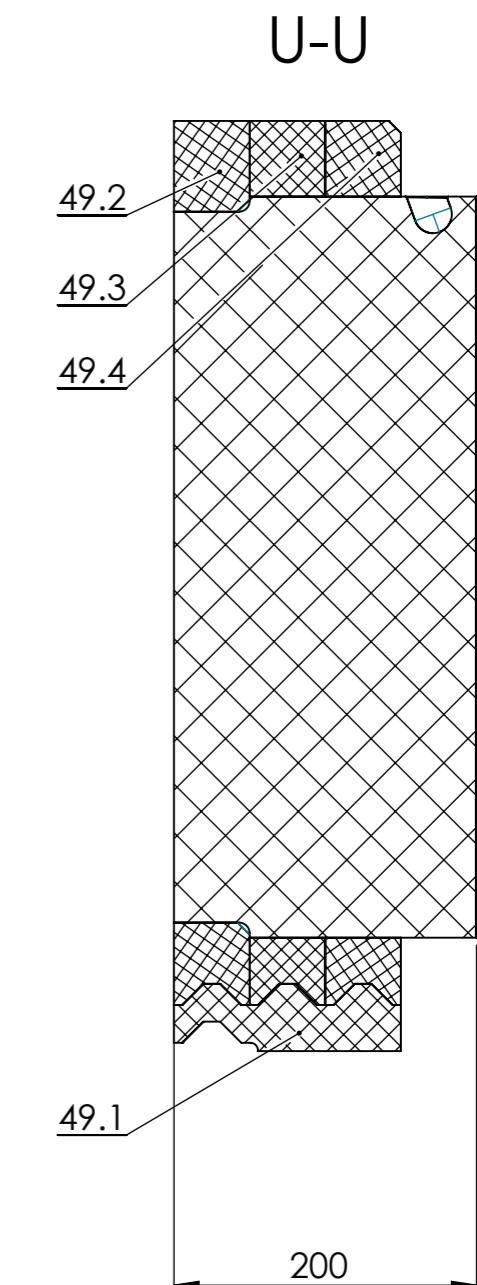
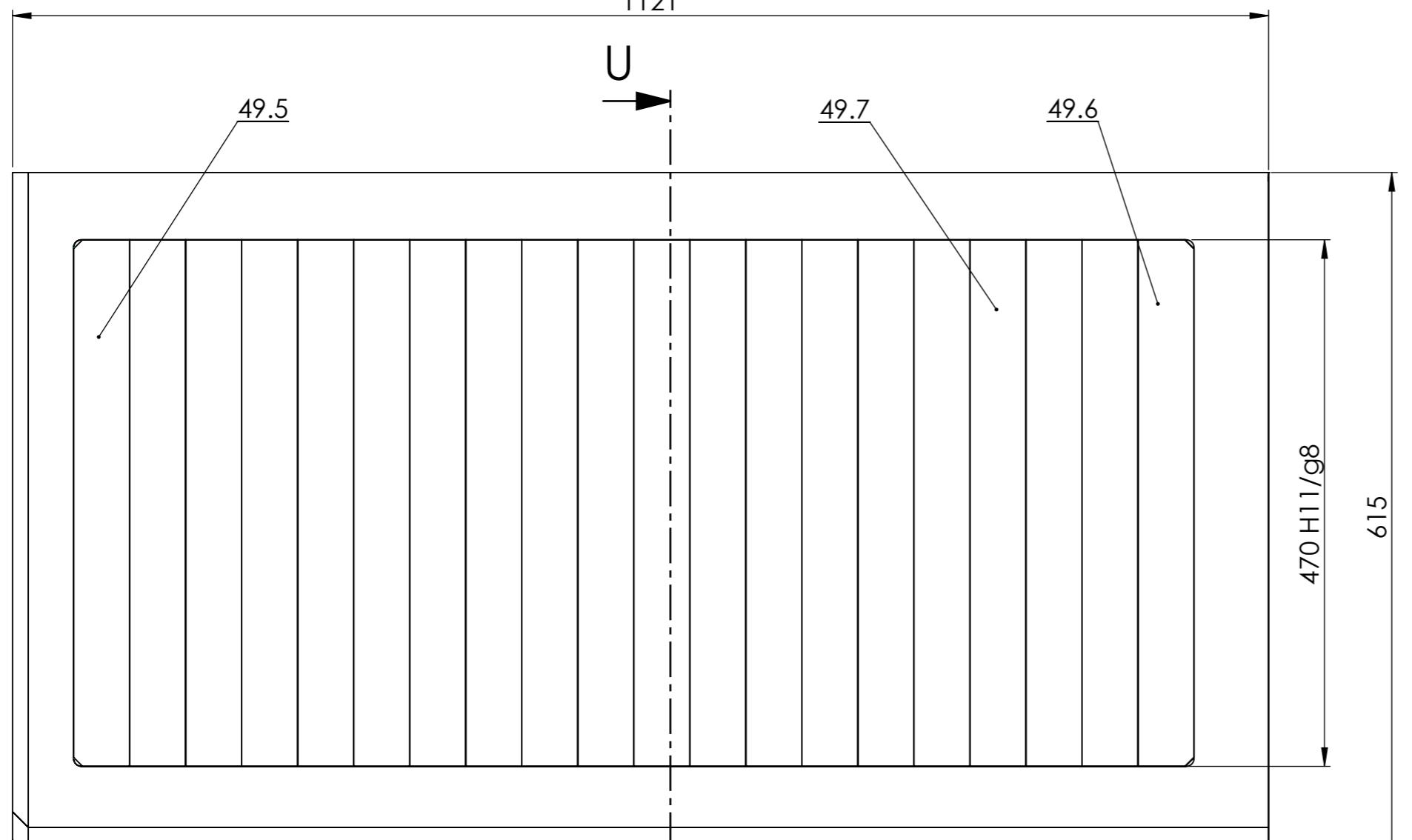
$+0.5$   
 $+0.3$   
 $+0.2$   
 $+0.1$   
 $+0.05$   
 $+0.05$   
 $+0.05$   
 $+0.05$   
 $+0.05$

$-0.5$   
 $-0.3$   
 $-0.2$   
 $-0.1$   
 $-0.05$   
 $-0.05$   
 $-0.05$   
 $-0.05$   
 $-0.05$

$\pm 1.0$   
 $\pm 0.8$   
 $\pm 0.6$   
 $\pm 0.4$   
 $\pm 0.2$   
 $\pm 0.1$   
 $\pm 0.05$   
 $\pm 0.05$   
 $\pm 0.05$

$\pm 1.5$   
 $\pm 1.0$   
 $\pm 0.5$   
 $\pm 0.2$   
 $\pm 0.1$   
 $\pm 0.05$   
 $\pm 0.05$   
 $\pm 0.05$   
 $\pm 0.05$

$\pm 2.0$   
 $\pm 1.5$   
 $\pm 1.0$   
 $\pm 0.5$   
 $\pm 0.2$   
 $\pm 0.1$   
 $\pm 0.05$   
 $\pm 0.05$   
 $\pm 0.05$



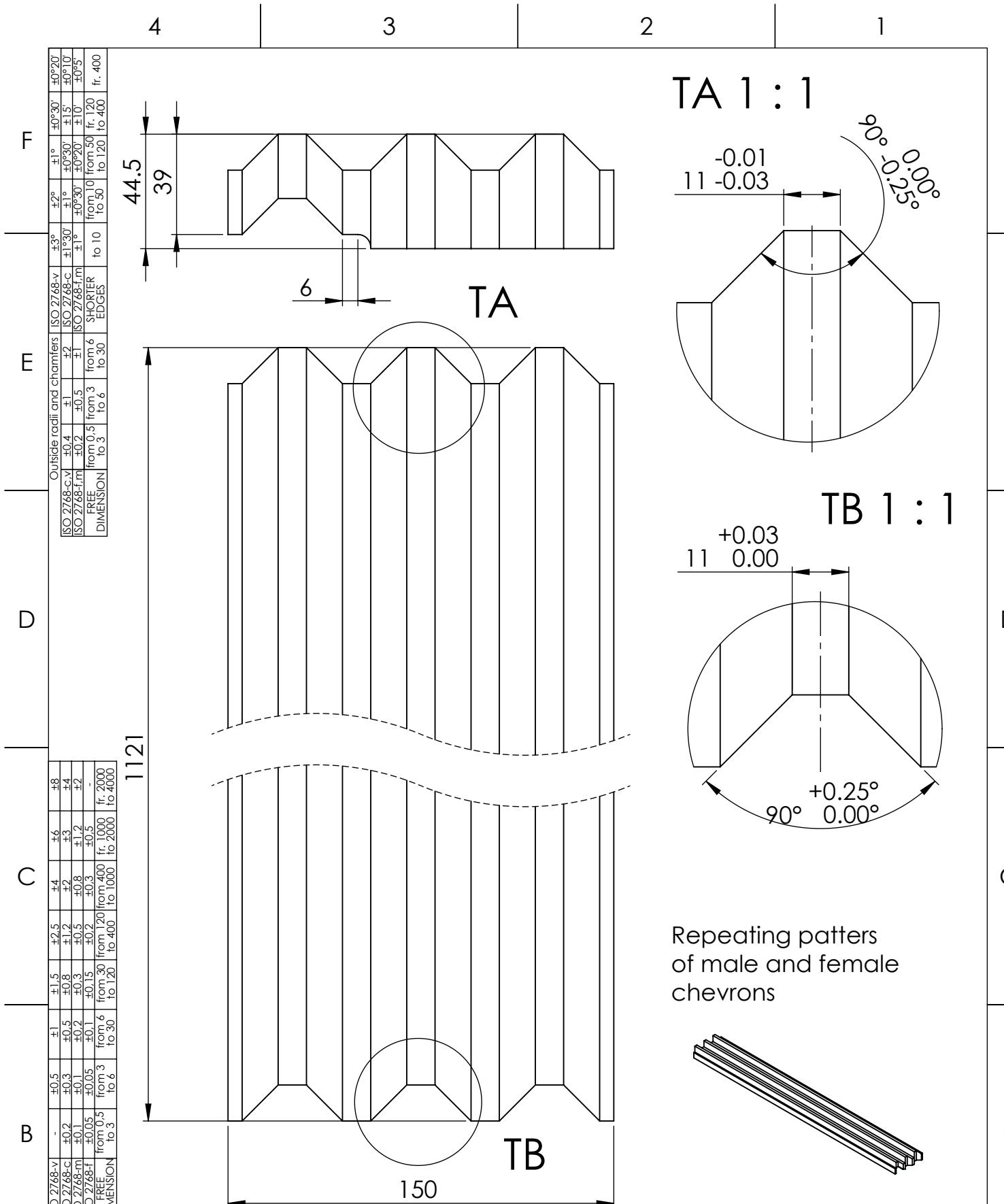
Pos.	Qua.	Name and dimensions	drawing nr./standard	Material	Mass
49.7	18	Book 490 x 200 x 50	book_2_new	BurnGuard	5
49.6	1	Right book 490 x 200 x 50	book_3_new	BurnGuard	5
49.5	1	Left book 490 x 200 x 50	book_1_new	BurnGuard	5
49.4	1	Bookcase outer 1127 x 615 x 50	bookcase_1	BurnGuard	9
49.3	1	Bookcase middle 1127 x 615 x 50	bookcase_3	BurnGuard	9
49.2	1	Bookcase inner 1127 x 615 x 50	bookcase_2	BurnGuard	9
49.1	1	Left block plate 1121 x 150 x 50	block_plate_left	BurnGuard	6
Pos. Qua. Name and dimensions			Title:	Bookcase assembly	
Ver. no.: 1 Part. no. 49 Quantity: 1			Project:	CSC neutron shielding	
			Date:	11/02/2024	Name: Gasper Bizjan Signature:
			Drawn:		
			Checked:		
			Scale:	1:5	Format: A3
			Dwg. / Dwg. no:	77 / 99	Mass (kg): 125
			Belongs to:	FRS/SFRS	
			File name:	block_set_left.SLDASM	
			ISO 128		

8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

F  
E  
D  
C  
B  
A

A



Ver. no.:	Part. no.:	Material / quantity:		Title: Left block plate
1	49.1	BurnGuard / 1		Project: CSC neutron shielding
	Date:	Name:	Signature:	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:2 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m	 ISO 128	Dwg. / Dwg. no: 78 / 99 Mass (kg): 6 Belongs to: FRS/SFRS File name: Block_plate_left.SLDPR

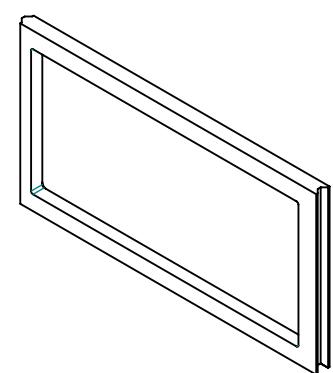
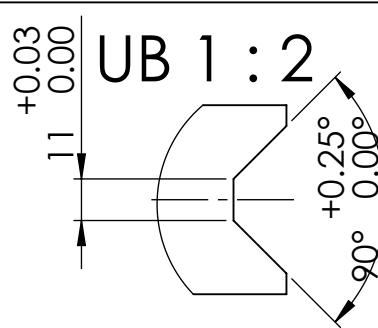
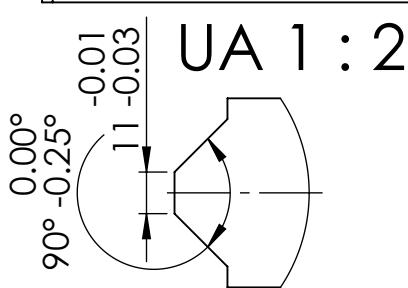
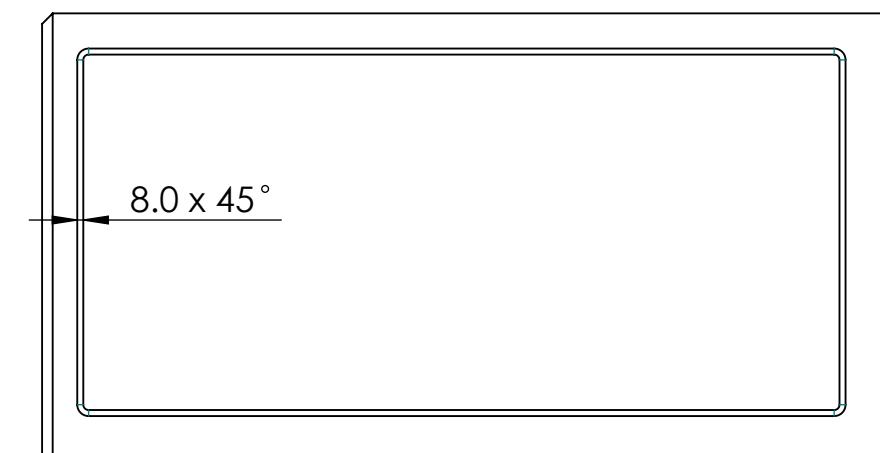
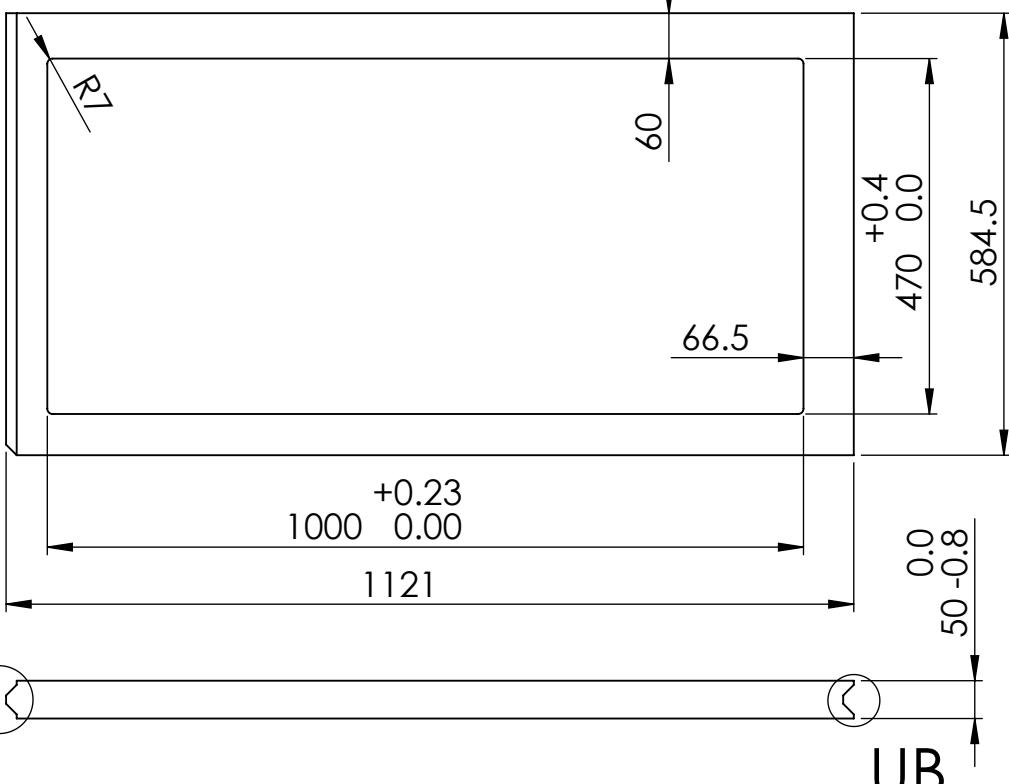
ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 FREE  
 DIMENSION

Outside radii and chamfers  
 ISO 2768-c-v  
 ISO 2768-f-mm  
 from 0.5 to 3  
 to 30

±0.4  
 ±0.2  
 ±0.5  
 ±0.3  
 ±0.2  
 ±0.1  
 ±0.05  
 from 0.5 to 3  
 to 30

±1  
 ±0.5  
 ±0.3  
 ±0.2  
 ±0.1  
 ±0.05  
 from 0.5 to 3  
 to 30

±2°  
 ±1°  
 ±30°  
 ±1°  
 ±30°  
 ±1°  
 ±10°



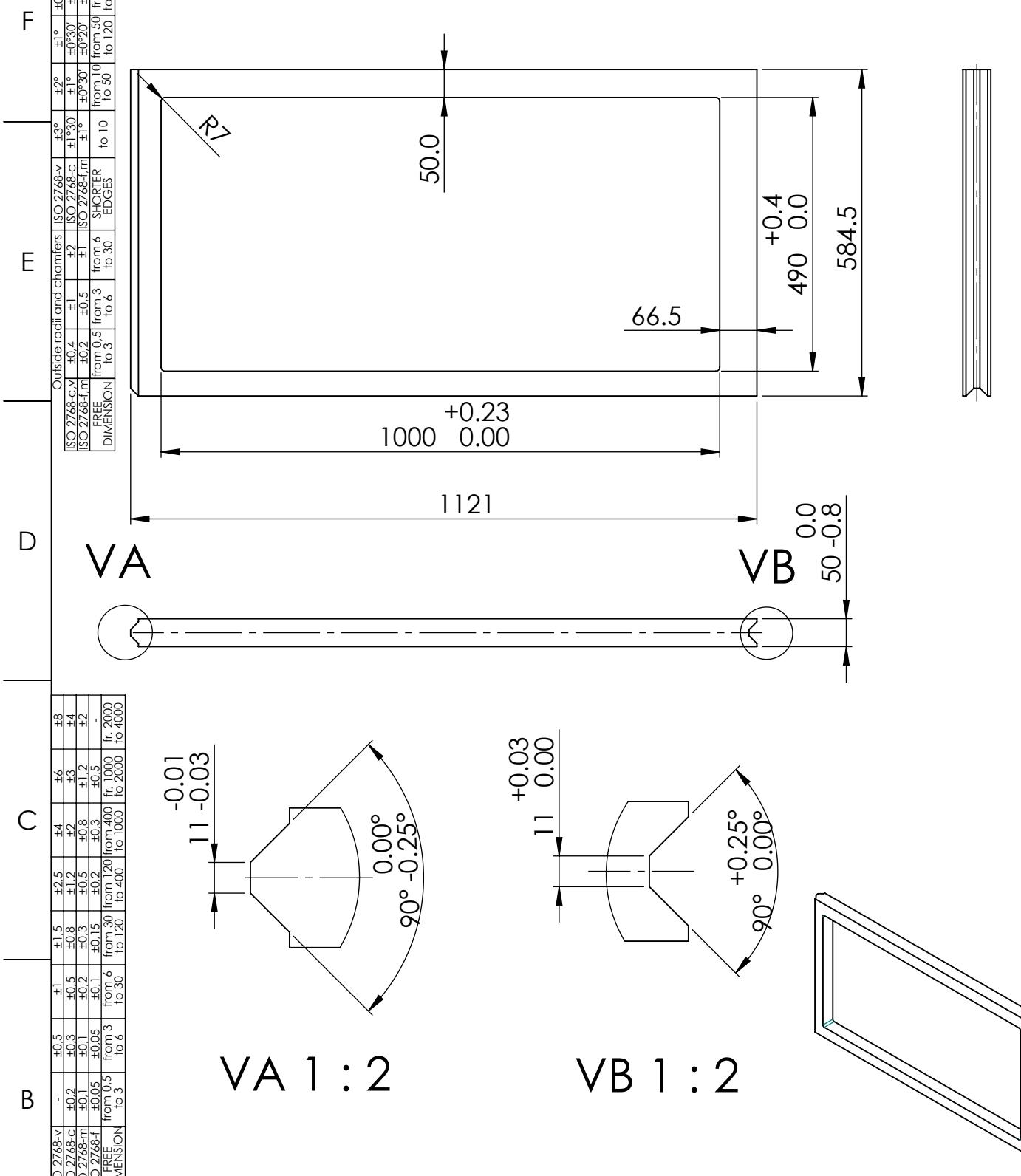
Ver. no.:	Part. no.	Material / quantity:		Title: Bookcase inner
1	49.2	BurnGuard / 1		
	Date	Name	Signature	Project: CSC neutron shielding
Drawn:	11/02/2024	Gasper Bizjan		Scale: 1:10
Checked:				Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 79 / 99 Mass (kg): 9
				Belongs to: FRS/SFRS
				File name: bookcase_2.SLDPRT

4

3

2

1



Ver. no.:	Part. no.	Material / quantity:		Title: Bookcase middle
1	49.3	BurnGuard / 1		Project: CSC neutron shielding
	Date	Name	Signature	Scale: 1:10 Format: A4
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 80 / 99 Mass (kg): 9 Belongs to: FRS/SFRS File name: bookcase_3.SLDPRT

4

3

2

1

4

3

2

1

F

F

D

C

B

A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
FREE DIMENSION

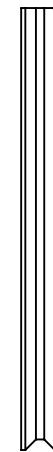
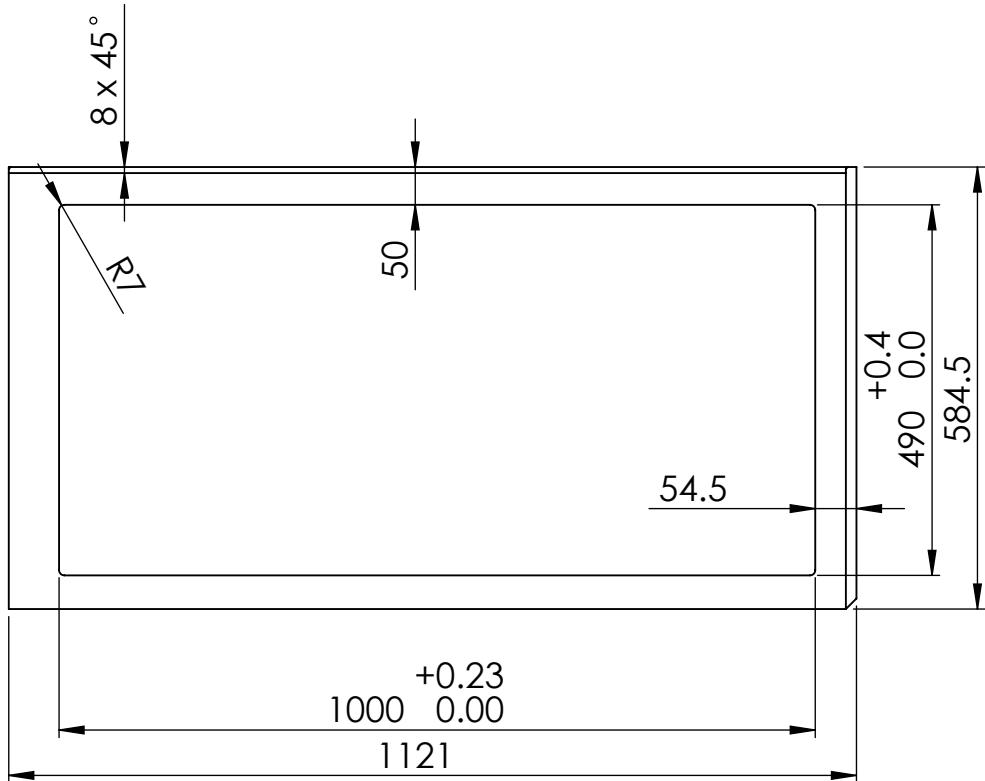
Outside radii and chamfers  
ISO 2768-c,v  
ISO 2768-f,m  
from 0.5 to 3  
to 30

±0.4  
±0.2  
±0.5  
from 0.5 to 3  
to 30

±1  
±0.2  
±0.5  
from 0.5 to 3  
to 30

±2°  
±1°  
±1°  
from 6 to 10  
from 10 to 50

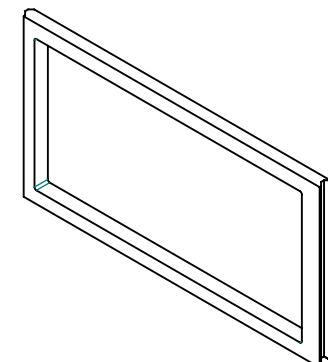
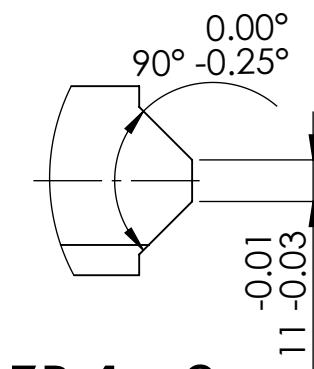
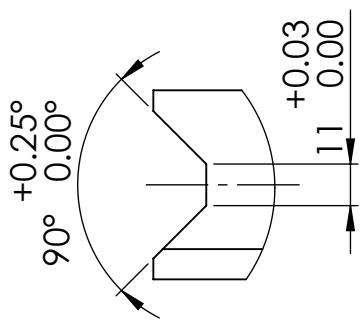
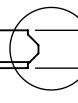
±0.30  
±0.20  
±0.20  
from 10 to 50  
from 50 to 120  
fr. 120 to 400



ZA



ZB



Ver. no.:	Part. no.	Material / quantity:		Title: Bookcase outer
1	49.4	BurnGuard / 1		Project: CSC neutron shielding
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		Scale: 1:10 Format: A4
Checked:				
GSI Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 81 / 99 Mass (kg): 9 Belongs to: FRS/SFRS File name: bookcase_1.SLDPRT

4

3

2

1

A

4

3

2

1

F

F

E

E

D

D

C

C

B

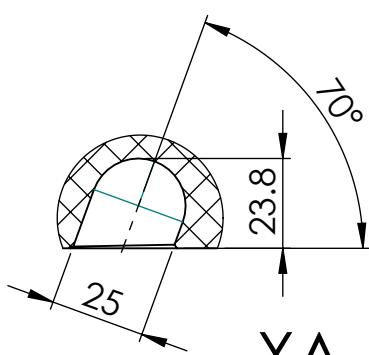
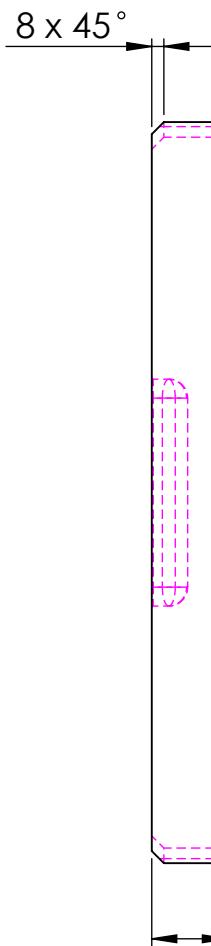
B

A

A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
FREE DIMENSION to 3 from 0.5 to 3 from 6 to 30 from 20 to 400 from 100 to 1000 from 2000 to 4000

Outside radii and chamfers ISO 2768-c,v ISO 2768-f,m ISO 2768-t,m from 0.5 to 3 from 6 to 30 from 10 to 50 from 50 to 120 from 100 to 200 from 1000 to 4000

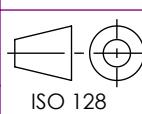


XA 1 : 2

Title:  
**Left book**

Project:  
**CSC neutron shielding**

Scale: 1:5 Format: A4

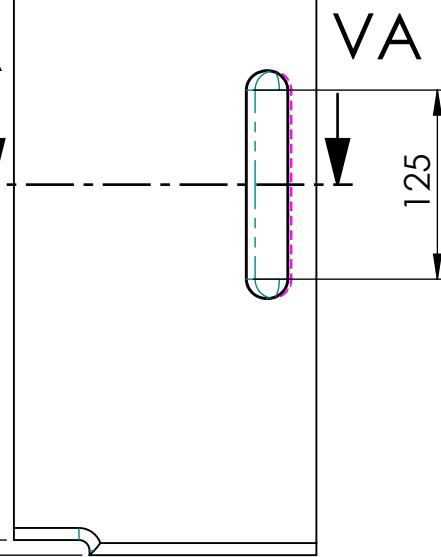


Dwg. / Dwg. no: 82 / 99 Mass (kg): 5

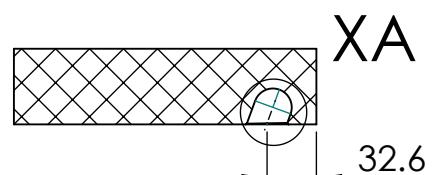
Belongs to: FRS/SFRS

File name: book\_1\_new.SLDPRT

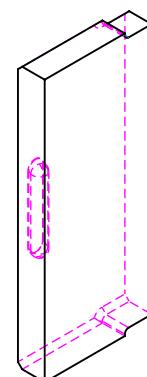
ISO 128



VA-VA



No sharp edges  
at handles.  
R1 fillet at outer  
handle edges.



Ver. no.:	Part. no.	Material / quantity:	Title: <b>Left book</b>		
1	49.5	BurnGuard / 1	Project: <b>CSC neutron shielding</b>		
Drawn:	Date	Name	Signature	Scale: 1:5	Format: A4
Checked:	11/02/2024	Gasper Bizjan	<i>[Signature]</i>		
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 82 / 99 Belongs to: FRS/SFRS File name: book_1_new.SLDPRT	Mass (kg): 5

4

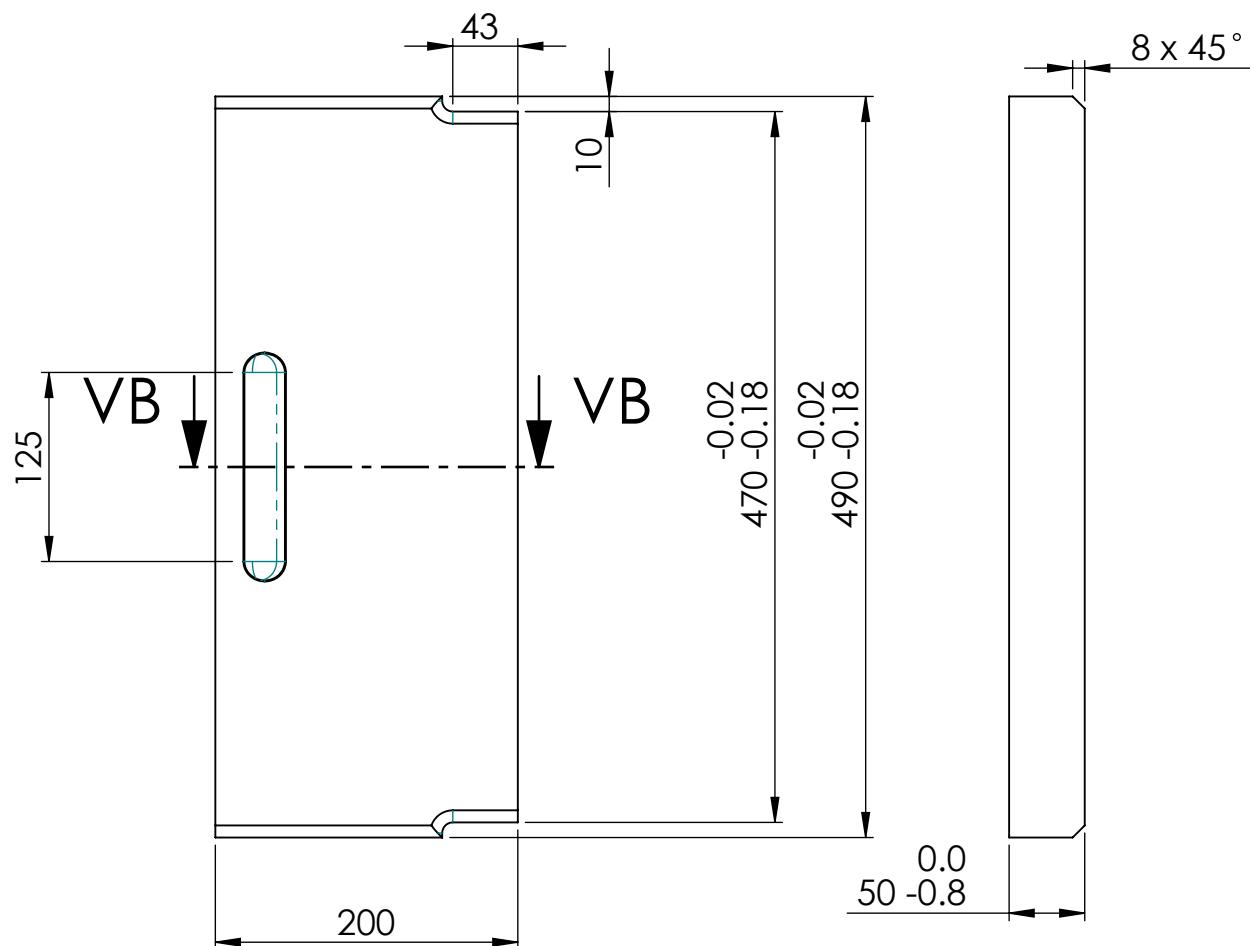
3

2

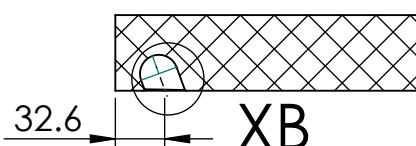
1

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
DIMENSION

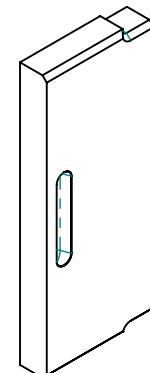
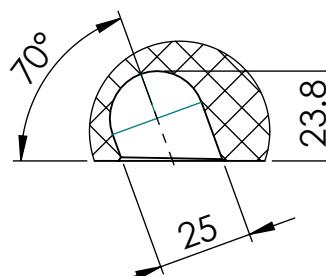
Outside radii and chamfers  
ISO 2768-c,v ±0.4 ±1 ±3° ±2° ±1° ±0°  
ISO 2768-f,m ±0.5 ±0.2 ±0.5 ±1° ±0.30 ±0.10  
FREE from 0.5 from 3 from 6 from 10 to 120  
from 0.5 to 6 to 30 to 100 to 120 to 400  
EDGES to 30 to 30 to 30 to 100 to 120 to 400



VB-VB



XB 1 : 2



No sharp edges  
at handles.  
R1 fillet at outer  
handle edges.

Ver. no.:

Part. no.:

Material / quantity:

1

49.6

BurnGuard / 1

Title:  
Right book

Project:

CSC neutron shielding

Scale: 1:5

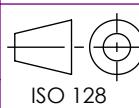
Format: A4

GSI

Helmholtzzentrum für  
Schwerionenforschung

Tolerance principles  
ISO 8015

Tolerances:  
ISO 2768-m



Dwg. / Dwg. no: 83 / 99

Mass (kg): 5

Belongs to: FRS/SFRS

File name: book\_3\_new.SLDPRT

ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 FREE DIMENSION  
 from 0.5 to 3

Outside radii and chamfers  
 ISO 2768-c-v  
 ISO 2768-f-m  
 ±0.4  
 ±0.5  
 ±0.2  
 ±0.3  
 ±0.1  
 ±0.05  
 from 0.5 to 3

ISO 2768-v  
 ISO 2768-c  
 ISO 2768-m  
 ISO 2768-f  
 FREE DIMENSION  
 from 0.5 to 3

VC1

50 -0.8

-0.02  
490 -0.18  
-0.02  
470 -0.18

10  
43

VC1-VC1

XC1

VC2

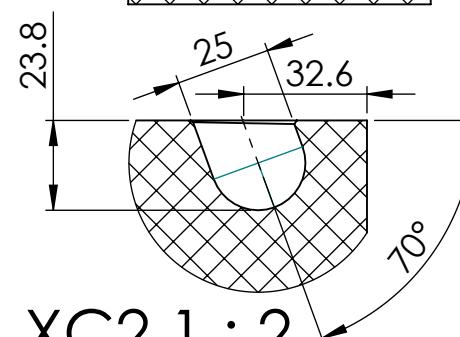
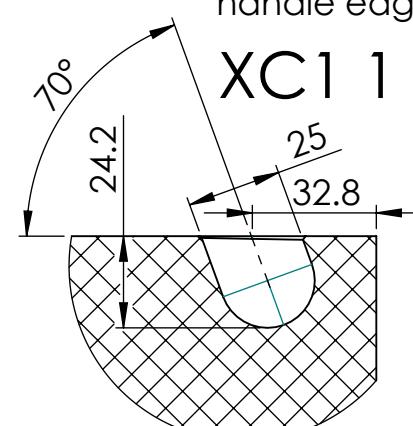
VC2

VC2-VC2

XC2

VC1

No sharp edges at handles.  
R1 fillet at outer handle edges.



XC2 1 : 2

Title:

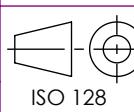
Left book

Project:

CSC neutron shielding

Scale:

1:5 Format: A4



Dwg. / Dwg. no: 84 / 99 Mass (kg): 5

Belongs to: FRS/SFRS

File name: book\_2\_new.SLDPRT

**GSI**  
Helmholtzzentrum für  
Schwerionenforschung

Tolerance principles  
ISO 8015

Tolerances:  
ISO 2768-m

4

3

2

1

F

E

D

C

B

A

F

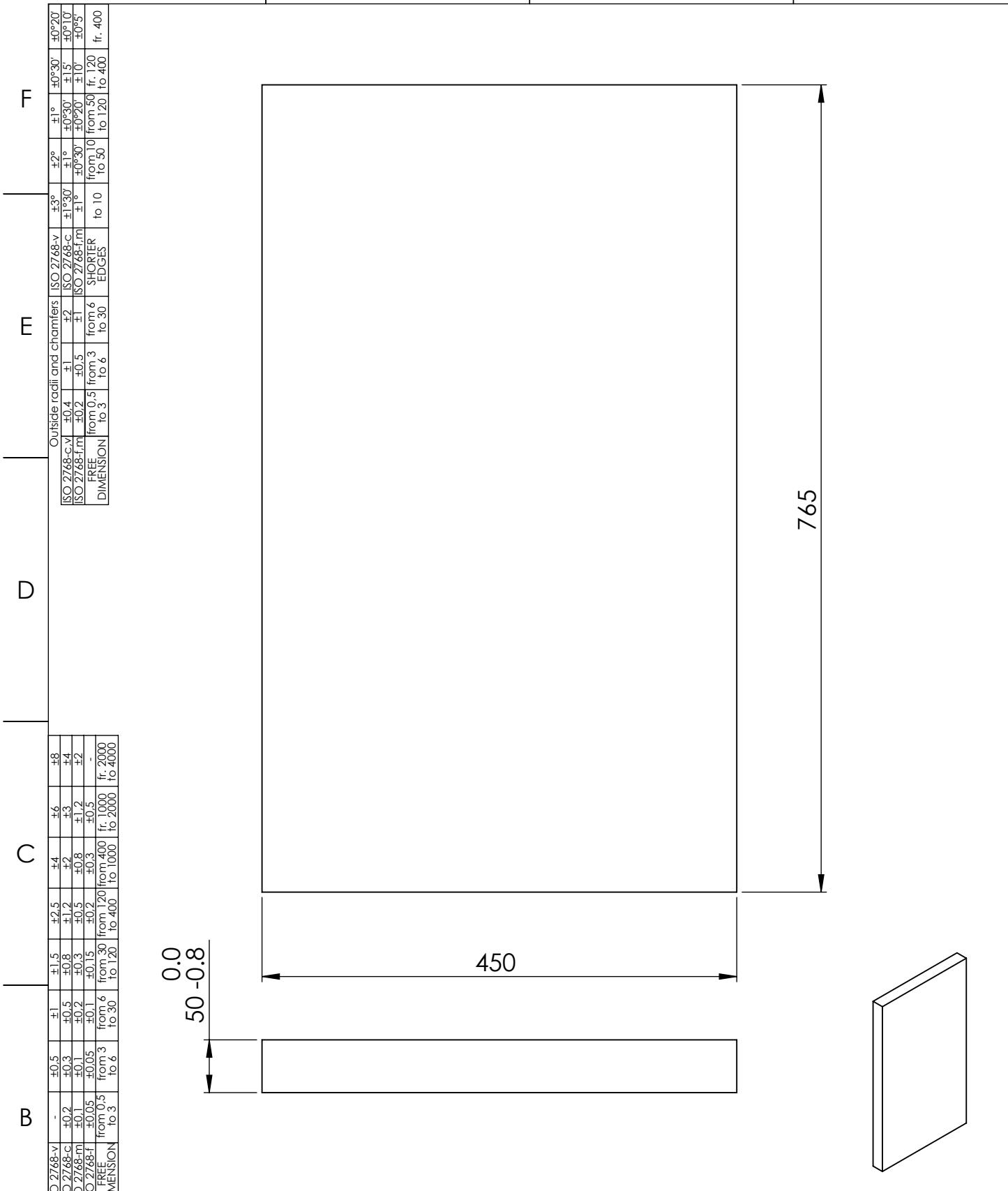
E

D

C

B

A



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Inner shield</b>	
1	50	BurnGuard / 2			
	Date	Name	Signature	Project: <b>CSC neutron shielding</b>	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale: 1:5	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 85 / 99	Mass (kg): 5
				Belongs to: FRS/SFRS	
				File name: inner_shield_borated.SLDPR	

4

3

2

1

F

F

E

E

D

D

C

C

B

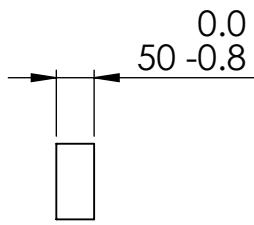
B

A

A

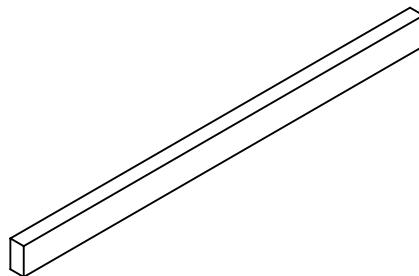
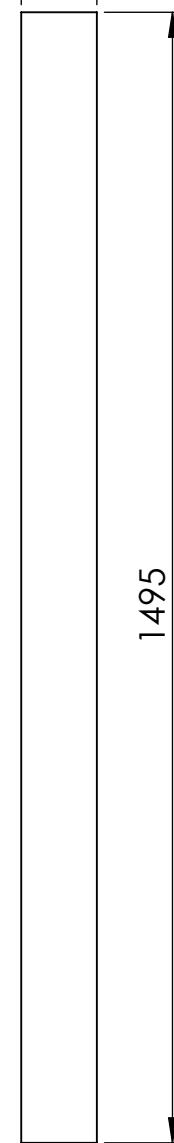
ISO 2768-v	-	±0.5	±1	±1.5	±2.5	±4	±6	±8
ISO 2768-c	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3	±4
ISO 2768-m	±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2
ISO 2768-f	±0.05	±0.05	±0.1	±0.15	±0.2	±0.3	±0.5	±0.8
DIMENSION	from 3	from 3	from 6	from 120	from 400	from 120	from 6	from 400
	to 3	to 3	to 6	to 120	to 400	to 1000	to 2000	to 4000

Ver. no.:	Part. no.	Material / quantity:	Title:	
1	51	BurnGuard / 1	Right side smaller pin	
	Date	Name	Signature	Project:
Drawn:	11/02/2024	Gasper Bizjan	CSC neutron shielding	
Checked:			Scale: 1:10	
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 86 / 99 Mass (kg): 8
				Belongs to: FRS/SFRS
				File name: Right-bottom-1.SLDPR



100

1495

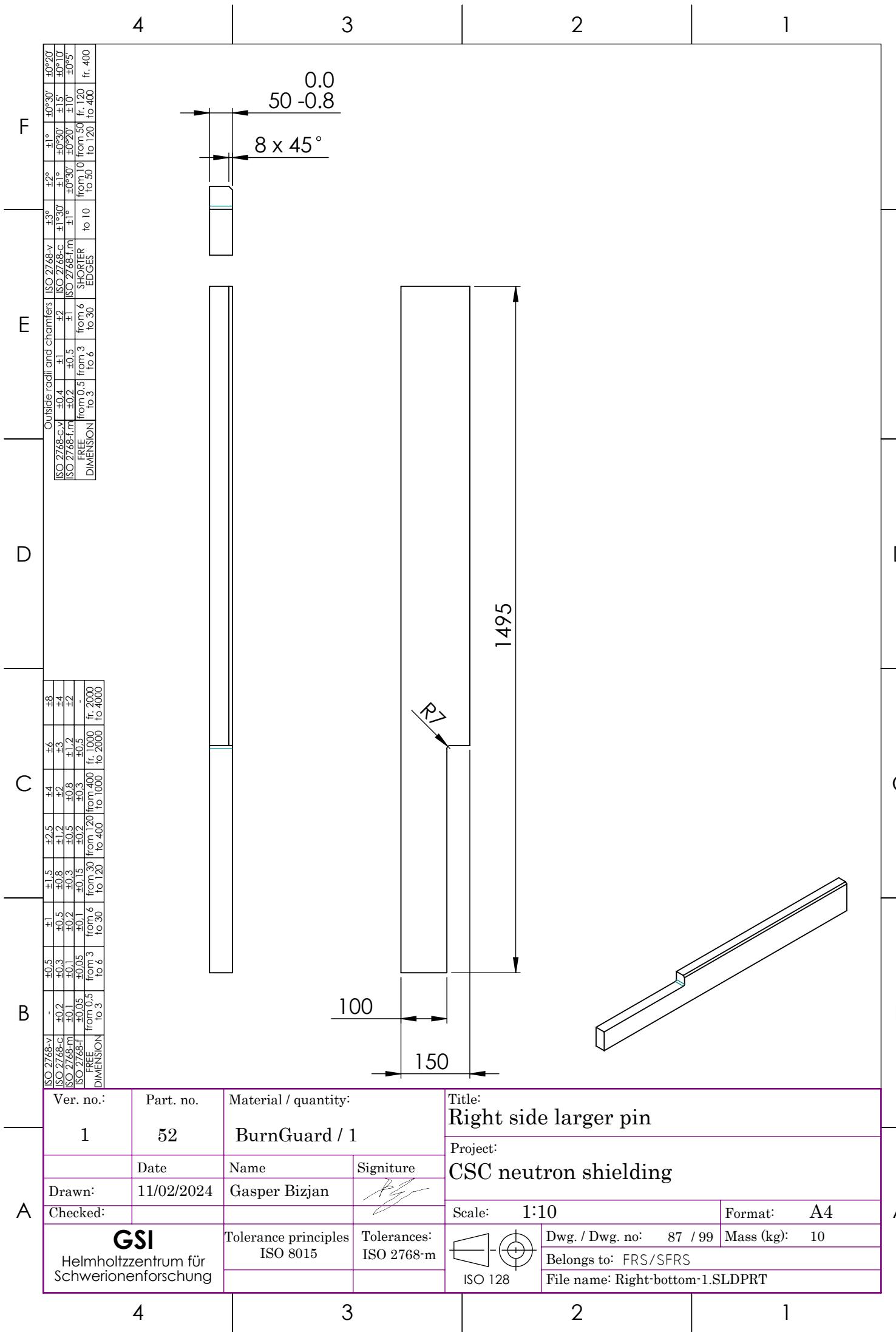


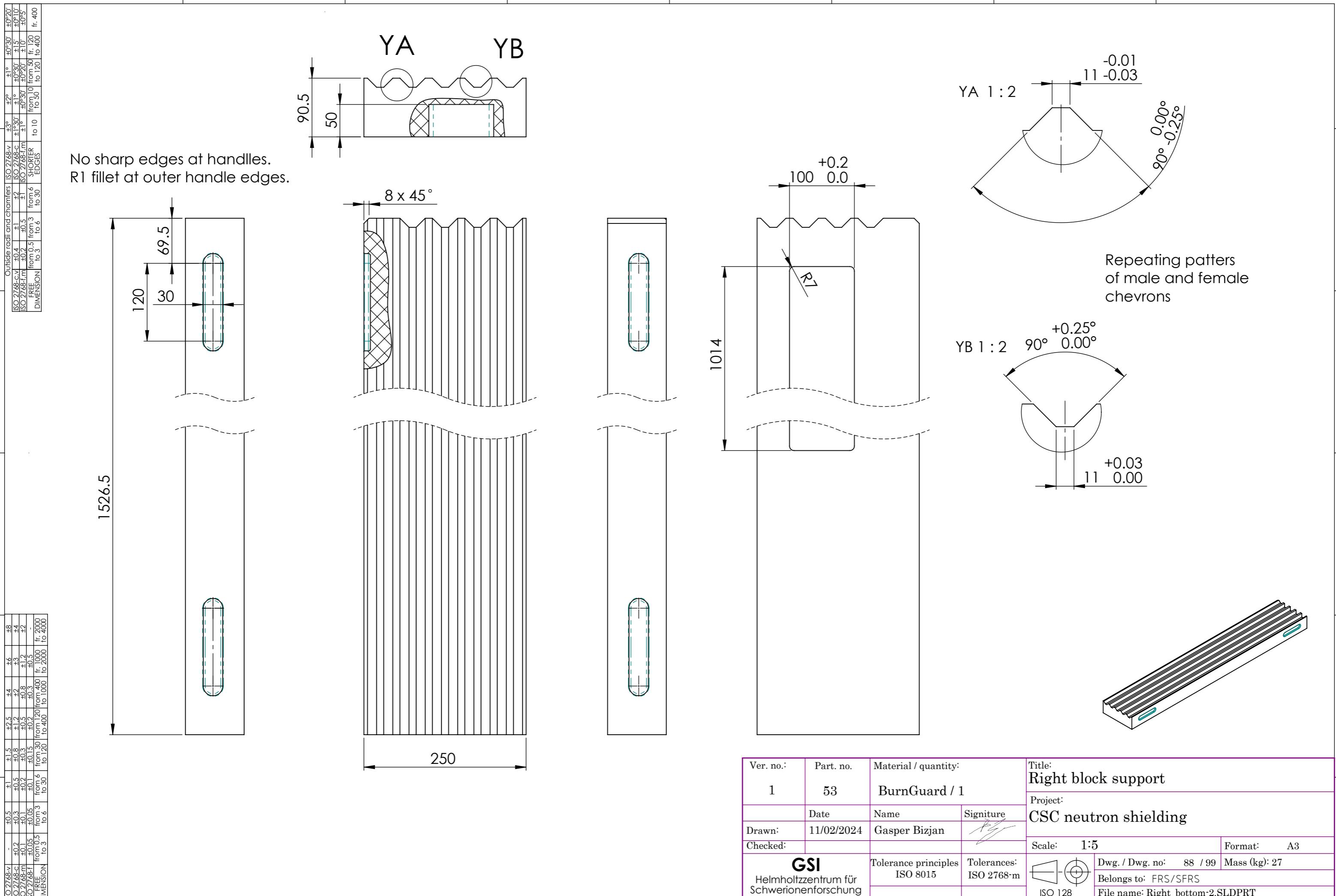
4

3

2

1





8

7

6

5

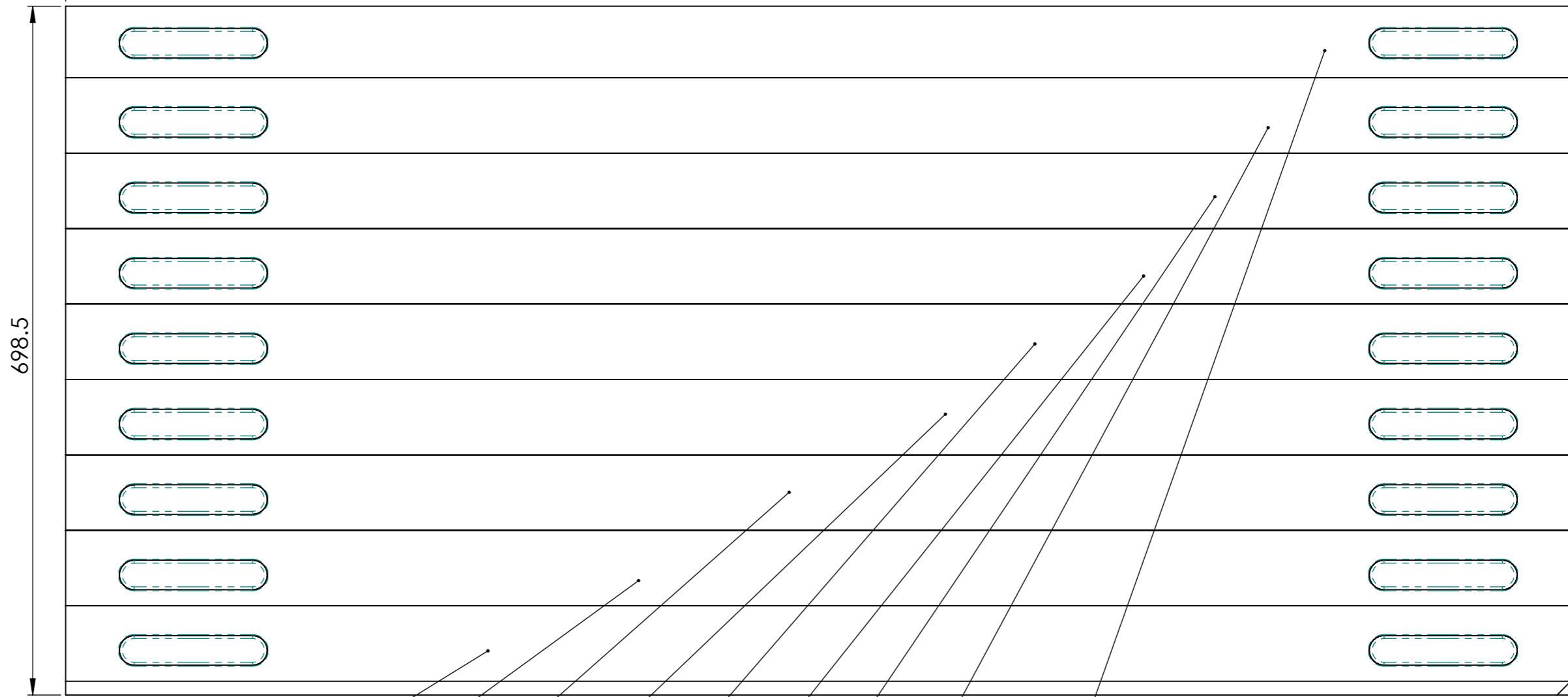
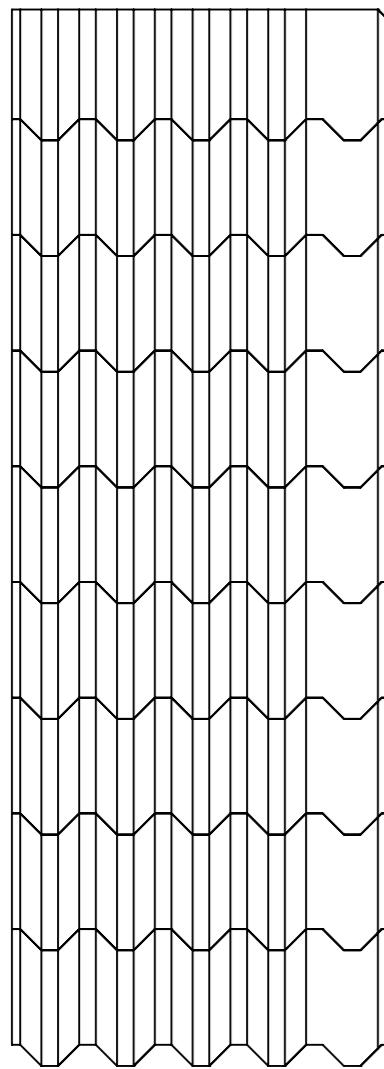
4

3

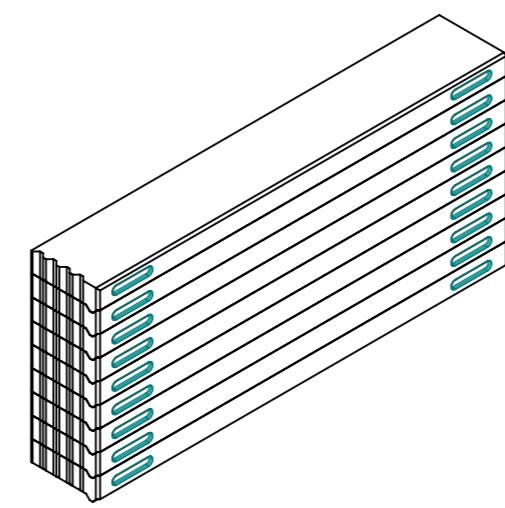
2

1

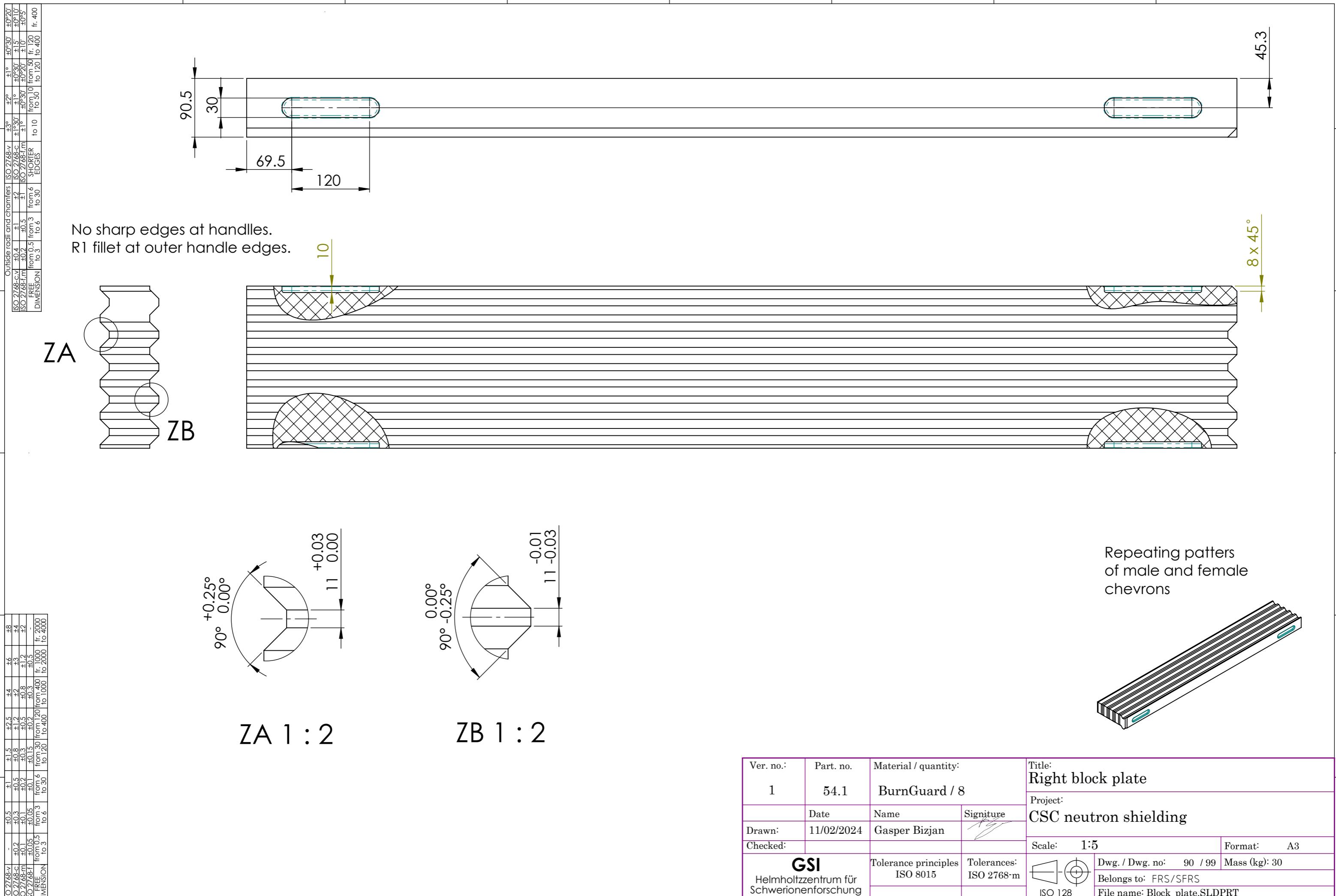
ISO 2768-v Outside radii and chamfers  
ISO 2768-c Y +0.4 +2 ISO 2768-c +3° +2° +1° +0.3° +0.2°  
ISO 2768-m Y +0.5 +1 ISO 2768-m +1° +0° +0.3° +0.2° +0.1°  
ISO 2768-f Y +0.2 +0.5 +0.3 +0.2 +0.1 +0.5 +0.3 +0.2 +0.1  
DIMENSION from 3 to 6 from 6 to 120 from 3 to 120 from 0 to 120 from 0 to 120 to 400 ft. 400

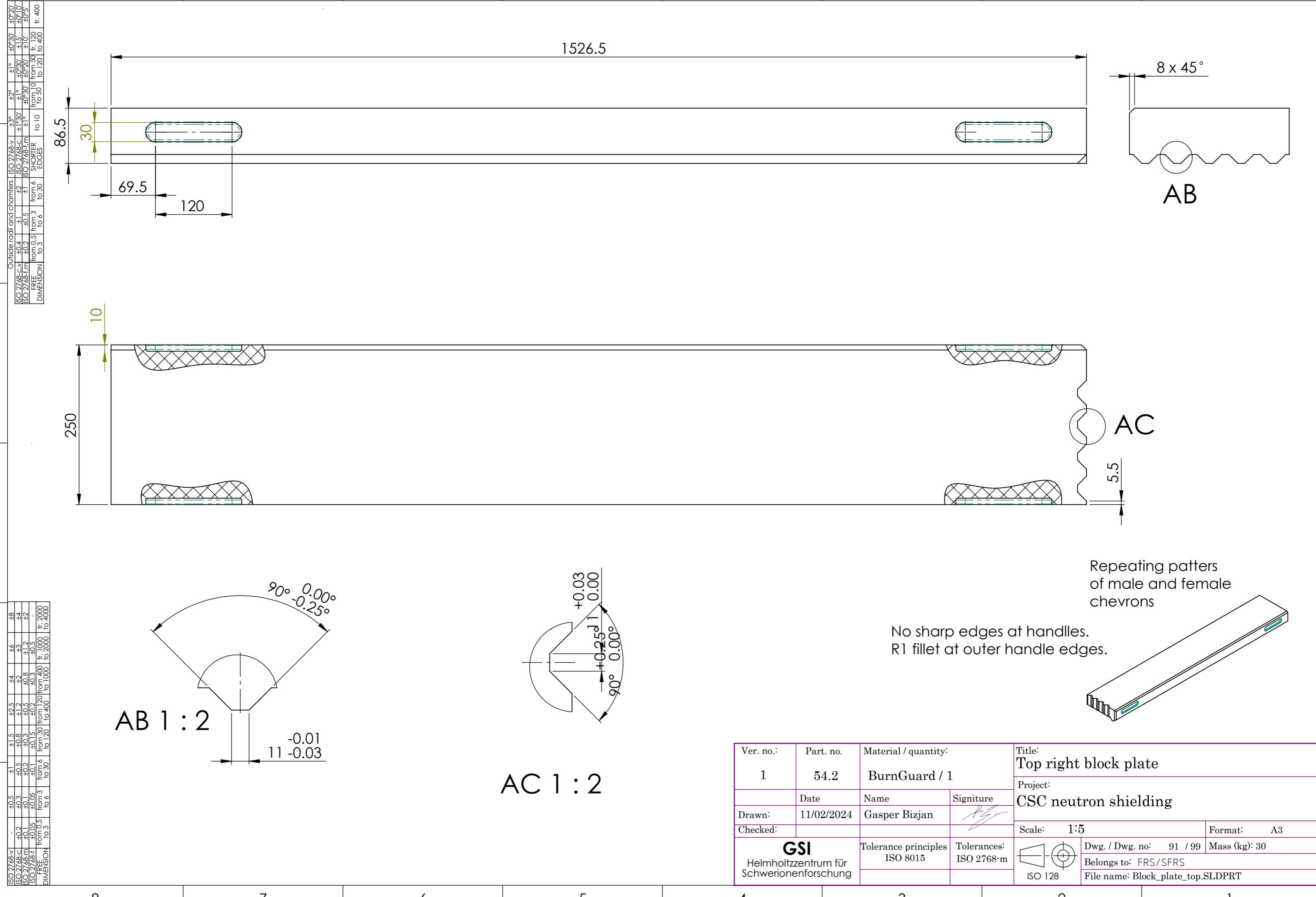


ISO 2768-v Y -0.2 +0.3 +0.5 +1.0 +2.5 +4 +6 +8  
ISO 2768-c Y +0.2 +0.3 +0.5 +1.0 +1.2 +3 +4 +2  
ISO 2768-m Y +0.1 +0.2 +0.3 +0.5 +0.8 +1.2 +2 +2  
ISO 2768-f Y +0.05 +0.05 +0.05 +0.15 +0.2 +0.5 +2 +2  
DIMENSION from 3 to 6 from 6 to 30 from 30 to 120 from 120 to 400 ft. 400



Pos.	Qua.	Name and dimensions	drawing nr./standard	Material	Mass
54.2	1	Top right block plate 1527 x 250 x 50	Block_plate_top	BurnGuard	30
54.1	8	Right block plate 1527 x 250 x 50	Block_plate	BurnGuard	30
Ver. no.:		Quantity:	Title:	Right block set	
1		1	Project:	CSC neutron shielding	
		Date	Name	Signature	
Drawn:		11/02/2024	Gasper Bizjan		
Checked:					
		Scale:	1:5	Format: A3	
		Tolerance principles	Tolerances:		
		ISO 8015	ISO 2768-m		
				Dwg. / Dwg. no:	89 / 99
				Mass (kg):	264
				Belongs to:	FRS/SFRS
				File name:	Right_block_set.SLDASM





ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
FREE  
DIMENSION

±0.5  
±0.2  
±0.1  
±0.05  
±0.05  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

±1  
±0.5  
±0.2  
±0.1  
±0.05  
±0.05  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

±1.5  
±0.8  
±0.5  
±0.3  
±0.2  
±0.1  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

±2.5  
±1.2  
±0.8  
±0.5  
±0.3  
±0.2  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

±4  
±2  
±1.2  
±0.8  
±0.5  
±0.3  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

±6  
±3  
±2  
±1.2  
±0.8  
±0.5  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

±8  
±4  
±2  
±1.2  
±0.8  
±0.5  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

ISO 2768-cv  
ISO 2768-fm  
ISO 2768-m  
ISO 2768-f  
FREE  
DIMENSION

±0.4  
±0.2  
±0.1  
±0.05  
±0.05  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

±1  
±0.5  
±0.3  
±0.2  
±0.1  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

±1.5  
±1  
±0.8  
±0.5  
±0.3  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

±2  
±1  
±0.5  
±0.3  
±0.2  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

±3°  
±1°  
±0.8°  
±0.5°  
±0.3°  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

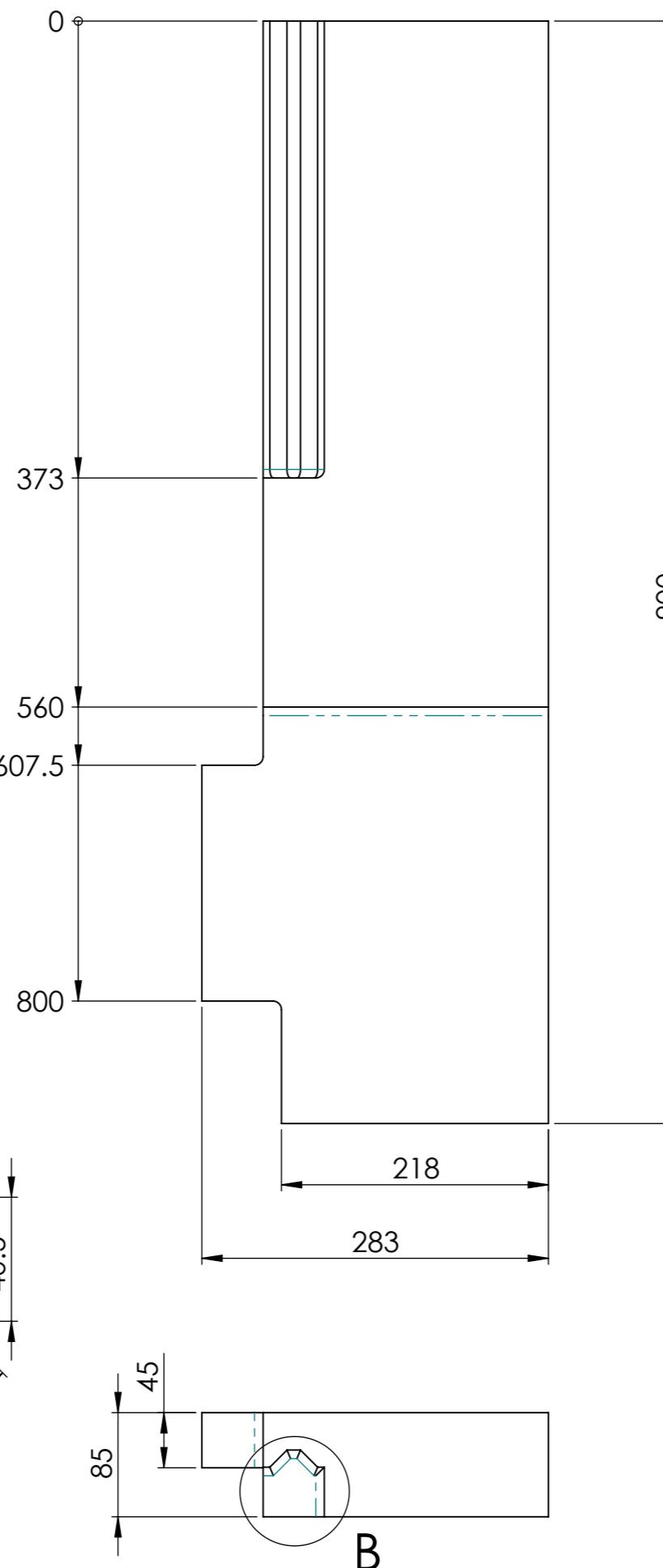
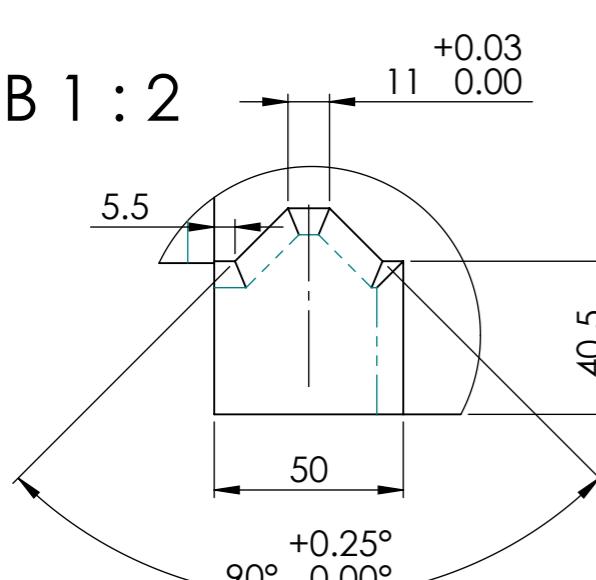
±2°  
±1°  
±0.8°  
±0.5°  
±0.3°  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

±1°  
±0.8°  
±0.5°  
±0.3°  
±0.2°  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

±0.8°  
±0.5°  
±0.3°  
±0.2°  
±0.1°  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

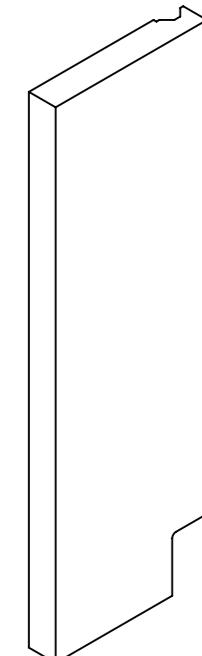
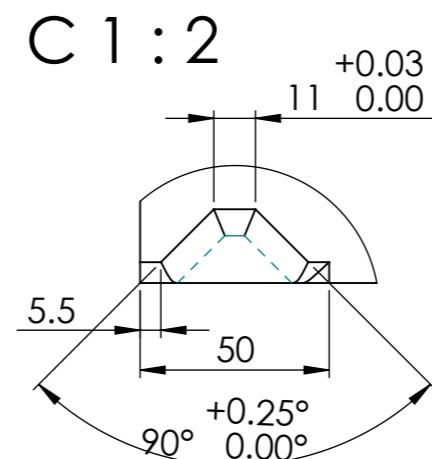
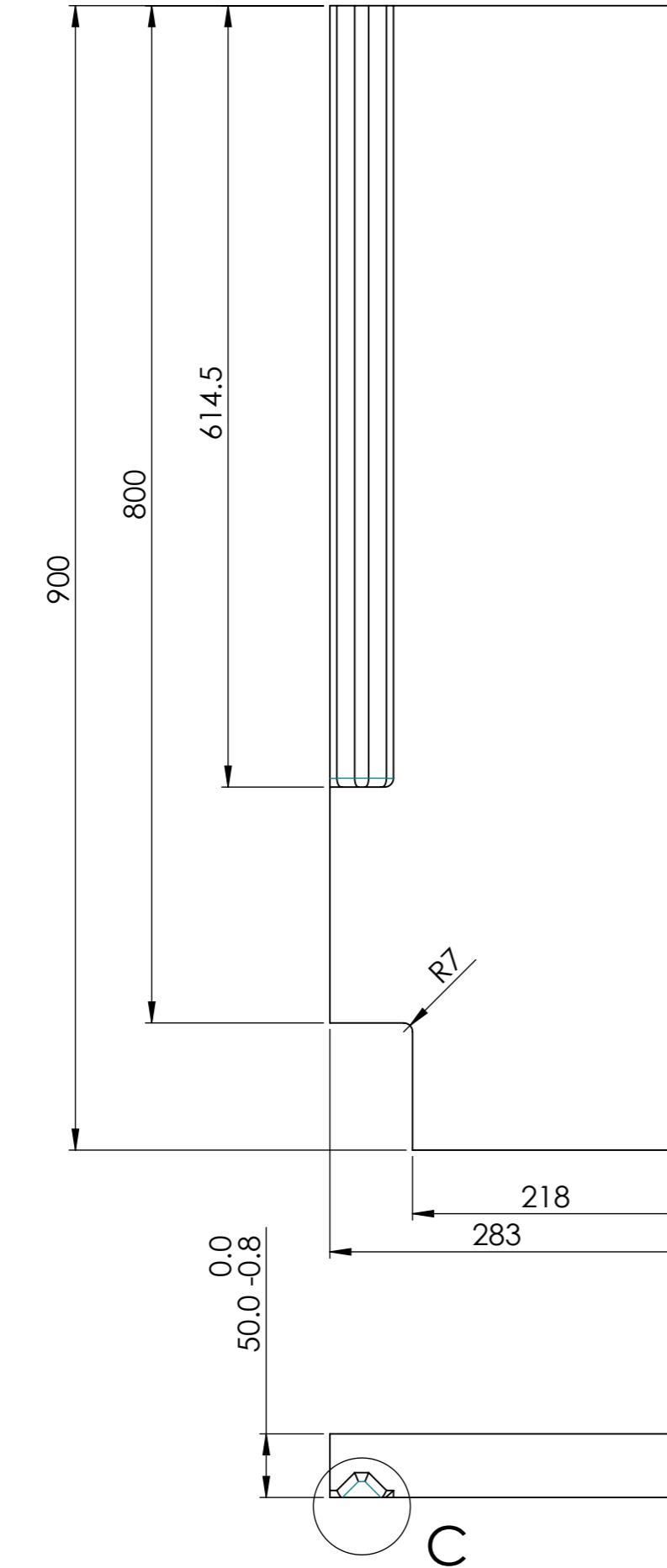
±0.3°  
±0.2°  
±0.1°  
±0.05°  
±0.05°  
from 3  
from 6  
from 3  
from 6  
from 3  
to 30  
to 60  
to 120  
to 2000  
to 4000

B 1 : 2



Ver. no.:	Part. no.	Material / quantity:	Title:
1	55	BurnGuard / 1	Right inner pipe plate
Date	Name	Signature	Project:
11/02/2024	Gasper Bizjan		CSC neutron shielding
Drawn:	Checked:		Scale:
			1:5
			Format: A3
GSI		Tolerance principles: ISO 8015	Tolerances: ISO 2768-m
Helmholtzzentrum für Schwerionenforschung			
ISO 128		ISO 128	Dwg. / Dwg. no: 92 / 99 Mass (kg): 14
Belongs to: FRS/SFRS			
File name: pipe_plate_22.SLDPRT			

ISO 2768-v	-	$\pm 0.5$	$\pm 1$	$\pm 1.5$	$\pm 2.5$	$\pm 4$	$\pm 6$	$\pm 8$
ISO 2768-c	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$	$\pm 3$	$\pm 4$
ISO 2768-m	$\pm 0.05$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 2$
ISO 2768-f	$\pm 0.05$	$\pm 0.05$	$\pm 0.1$	$\pm 0.15$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$
FREE DIMENSION	from 3 to 6	from 3 to 6	from 10 to 20					
to 30	to 30	to 40	to 40	to 40	to 40	to 40	to 40	to 4000



Ver. no.:	Part. no.	Material / quantity:	Title:
1	56	BurnGuard / 1	Right middle pipe plate
	Date	Name	Project:
	11/02/2024	Gasper Bizjan	CSC neutron shielding
Checked:			
GSI	Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Scale: 1:5 Format: A3
			Dwg. / Dwg. no: 93 / 99 Mass (kg): 12
			Belongs to: FRS/SFRS
			File name: pipe_plate_2.SLDPRT

4

3

2

1

F

E

D

C

B

F

E

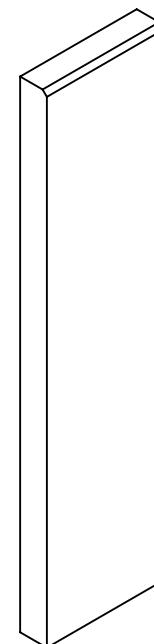
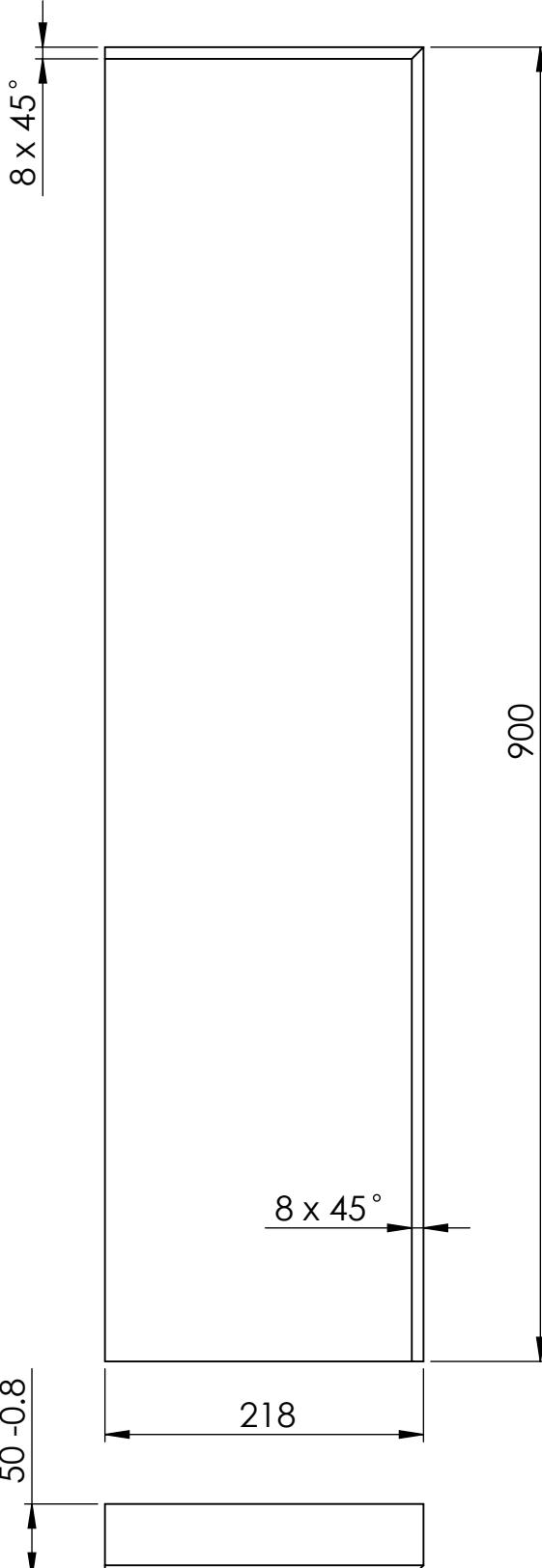
D

C

B

A

ISO 2768-v	-	±0.5	±1	±1.5	±2.5	±4	±6	±8
ISO 2768-c	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3	±4
ISO 2768-m	±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2
ISO 2768-f	±0.05	±0.05	±0.1	±0.15	±0.2	±0.3	±0.5	±0.8
FREE DIMENSION	from 0.5 to 3	from 0.5 to 3	from 0.6 to 30	from 1.20 to 30	from 2.00 to 30	from 3.0 to 30	from 5.0 to 30	from 8.0 to 400

50 -0.8  
0.0

Ver. no.:	Part. no.:	Material / quantity:		Title: <b>Right outer pipe plate</b>
1	57	BurnGuard / 1		Project: <b>CSC neutron shielding</b>
	Date:	Name:	Signature:	
Drawn:	11/02/2024	Gasper Bizjan		
Checked:				Scale: 1:5 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Dwg. / Dwg. no: 94 / 99 Mass (kg): 10
				Belongs to: FRS/SFRS
				File name: pipe_plate_3.SLDPRT

4

3

2

1

4

3

2

1

F

F

E

E

D

D

C

C

B

B

A

A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
FREE DIMENSION

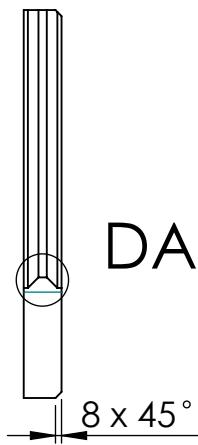
Outside radii and chamfers  
ISO 2768-c-v  
ISO 2768-f-mm  
from 0.5 to 3  
from 0.5 to 6  
from 0.5 to 30

±0.4  
±0.5  
±0.5  
±0.2  
±0.5  
to 10  
to 30  
to 6  
to 30

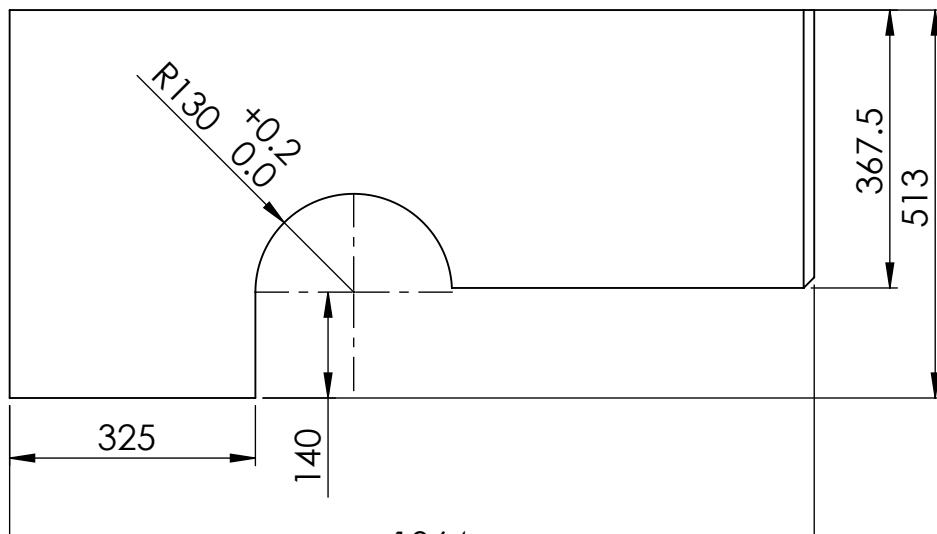
±1  
±0.5  
±1  
±1  
±1  
from 10 to 50  
from 50 to 120  
from 120 to 400

±2°  
±1°  
±1°  
±1°  
±1°  
fr. 120  
fr. 100  
fr. 50  
fr. 30  
fr. 20

±0°30' ±0°30' ±0°30' ±0°30' ±0°30'

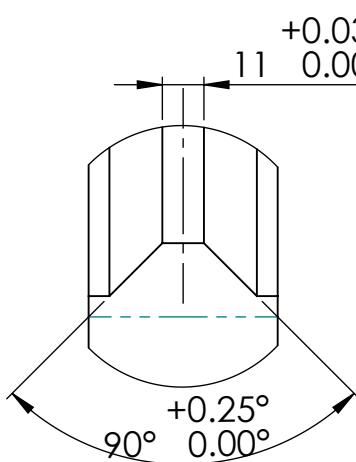


DA

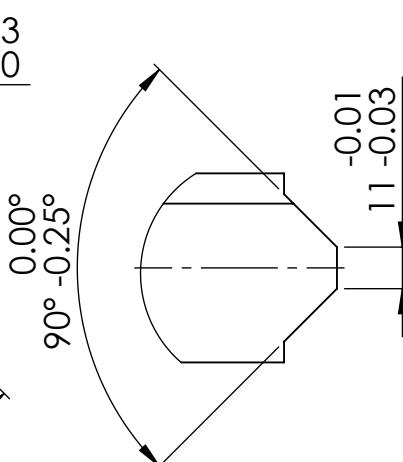


DB

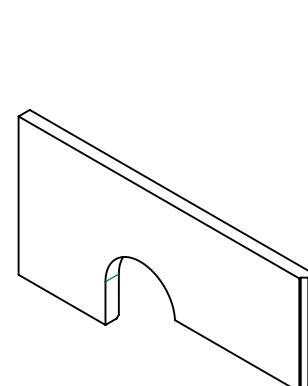
0.0  
50 - 0.8  
8 x 45°



DA 1 : 2



DB 1 : 2



Ver. no.:	Part. no.:	Material / quantity:		Title: <b>MR-TOF outer shield</b>	
1	58	BurnGuard / 1			
	Date:	Name:	Signature:	Project: <b>CSC neutron shielding</b>	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale:	1:10
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no:	95 / 99
				Mass (kg):	19
				Belongs to:	FRS/SFRS
				File name:	Above_pipe_main.SLDPRT

4

3

2

1

4

3

2

1

F

E

D

C

B

A

F

E

D

C

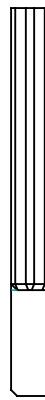
B

A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
FREE DIMENSION to 3 from 0.5 to 6  
from 0.5 to 3 from 0.5 to 30  
from 0.5 to 3 from 0.5 to 300  
from 0.5 to 3 from 0.5 to 3000  
fr. 1000 fr. 2000 fr. 10000  
fr. 2000 fr. 10000 fr. 20000  
fr. 40000

Outside radii and chamfers ISO 2768-v  
ISO 2768-c, v ISO 2768-f, m ISO 2768-t, m  
±0.4 ±0.2 ±0.5  
±1.0 ±0.2 ±0.5  
±30° ±30° ±30°  
±1° ±1° ±1°  
±0.10' ±0.20' ±0.30'  
±0.5' ±1.0' ±1.5'

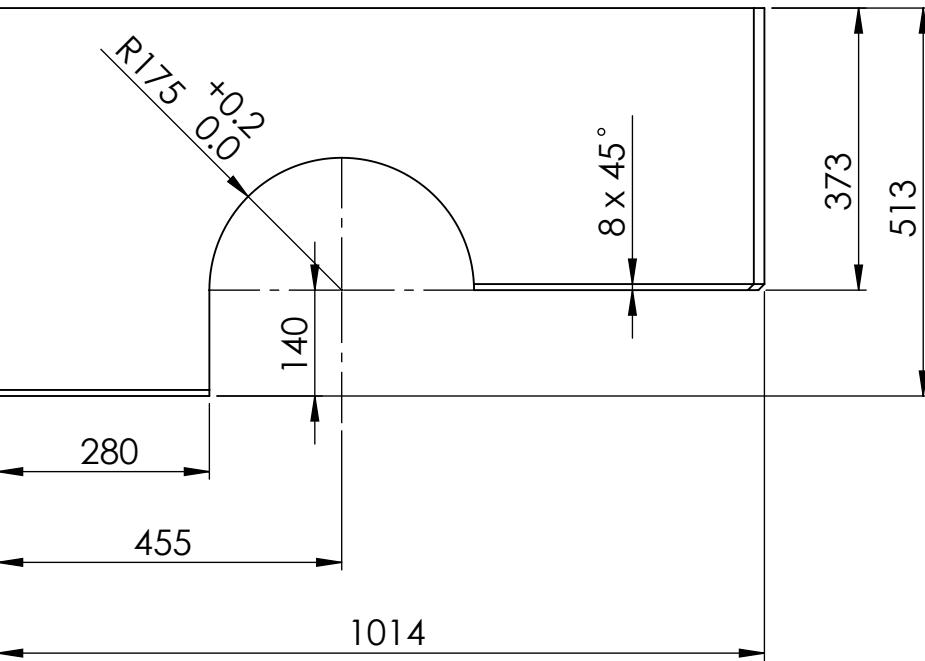
SHORER to 10 from 30  
EDGES to 120 from 500  
fr. 120 fr. 500  
fr. 400



8 x 45°

50 - 0.8

0.0



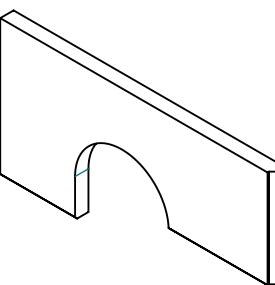
90° - 0.25°

0.00

-0.01

11 - 0.03

E 1 : 2



E

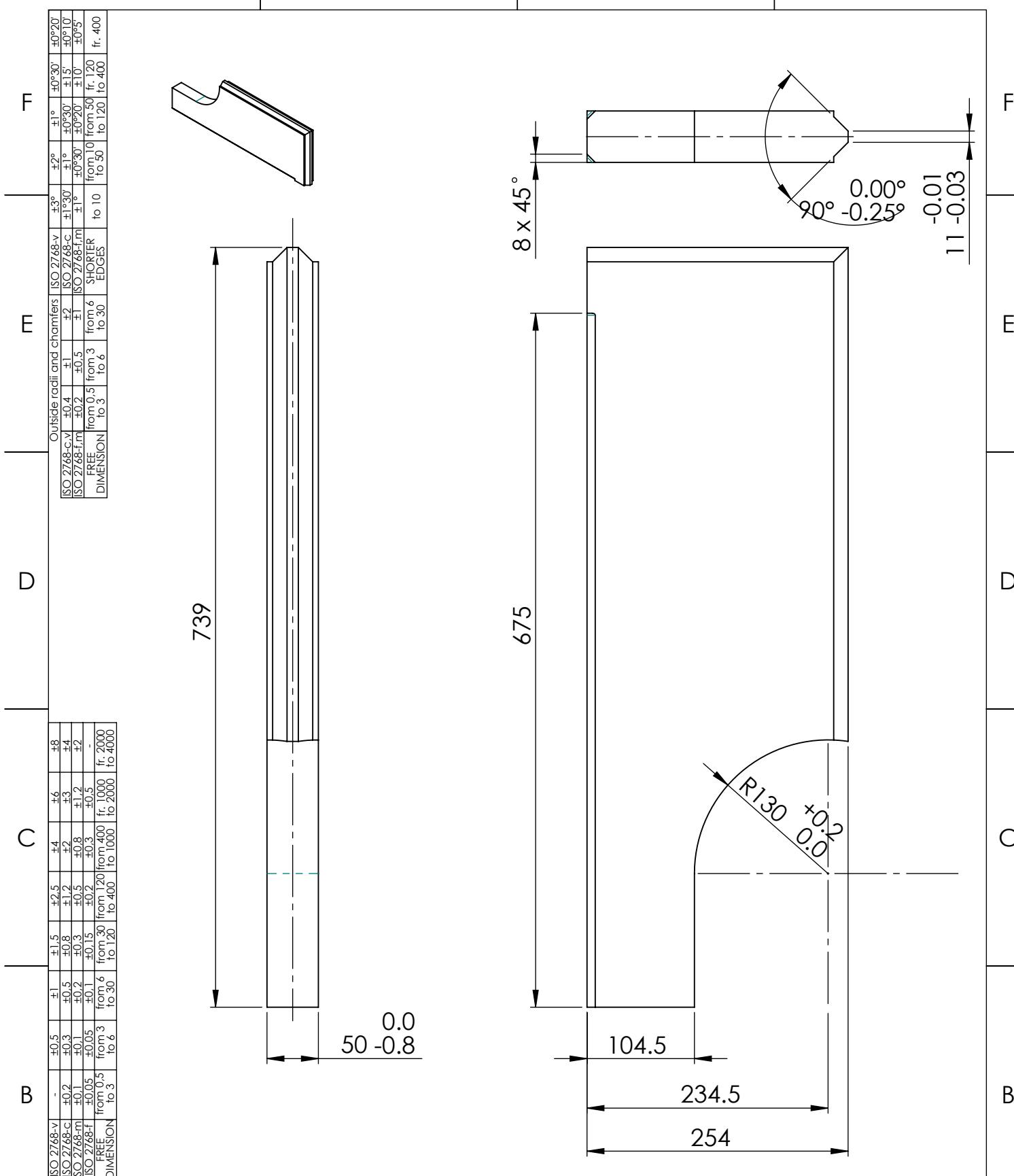
Ver. no.:	Part. no.	Material / quantity:	Title: <b>MR-TOF inner shield</b>		
1	59	BurnGuard / 1	Project: <b>CSC neutron shielding</b>		
	Date	Name	Signature		
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale: 1:10	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 96 / 99 Belongs to: FRS/SFRS File name: Above_pipe_main.SLDPRT	Mass (kg): 18

4

3

2

1



Ver. no.:	Part. no.	Material / quantity:		Title: MR-TOF lower shield	
1	60	BurnGuard / 1			
	Date	Name	Signature	Project: CSC neutron shielding	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale: 1:5	Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no: 97 / 99 Belongs to: FRS/SFRS File name: Under pipe_right.SLDPRT	Mass (kg): 7

F

E

D

C

B

A

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
FREE  
DIMENSION

- ±0.5 ±0.5 ±1.5 ±2.5 ±4 ±6  
±0.2 ±0.3 ±0.5 ±1.2 ±2 ±3  
±0.1 ±0.1 ±0.2 ±0.3 ±1.2 ±2  
±0.05 ±0.05 ±0.05 ±0.1 ±0.2 ±0.5  
from 0.5 from 3 from 6 from 120 from 400 from 1000  
to 3 to 30 to 30 to 120 to 400 to 2000 to 4000

Outside radii and chamfers  
ISO 2768-c-v  
ISO 2768-f-m  
FREE  
DIMENSION

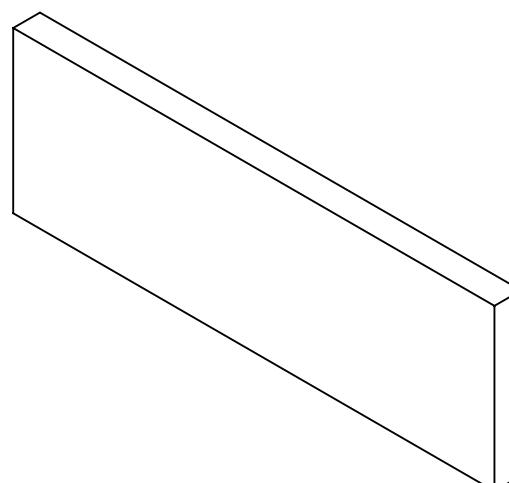
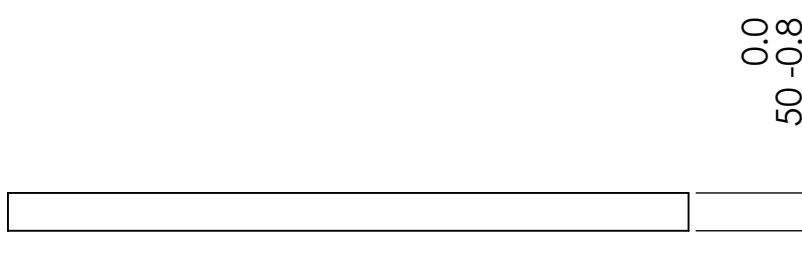
±0.4 ±1 ±2  
±0.2 ±0.5 ±1  
from 0.5 from 3 from 6  
to 3 to 6 to 30

ISO 2768-c-m  
ISO 2768-f-m  
FREE  
DIMENSION

±1.5 ±1.2 ±0.5 ±0.3 ±0.2 ±0.1  
±1.2 ±1.2 ±0.8 ±0.8 ±0.5 ±0.3  
±1.2 ±1.2 ±1.2 ±1.2 ±0.5 ±0.5  
±1.2 ±1.2 ±1.2 ±1.2 ±0.5 ±0.5  
from 120 from 400 from 30 from 6 from 120 from 400  
to 120 to 400 to 30 to 6 to 120 to 400

±0.30 ±0.10 ±0.20 ±0.10 ±0.30 ±0.10  
±0.15 ±0.10 ±0.15 ±0.10 ±0.20 ±0.10  
±0.10 ±0.10 ±0.10 ±0.10 ±0.10 ±0.10  
±0.10 ±0.10 ±0.10 ±0.10 ±0.10 ±0.10  
from 10 from 30 from 6 from 120 from 400 from 120  
to 10 to 30 to 6 to 120 to 400 to 120

±0.30 ±0.10 ±0.20 ±0.10 ±0.30 ±0.10  
±0.15 ±0.10 ±0.15 ±0.10 ±0.20 ±0.10  
±0.10 ±0.10 ±0.10 ±0.10 ±0.10 ±0.10  
±0.10 ±0.10 ±0.10 ±0.10 ±0.10 ±0.10  
from 10 from 30 from 6 from 120 from 400 from 120  
to 10 to 30 to 6 to 120 to 400 to 120



Ver. no.:	Part. no.	Material / quantity:	Title: <b>Rear bottom shield</b>		
1	61	BurnGuard / 2			
	Date	Name	Signature	Project: <b>CSC neutron shielding</b>	
Drawn:	11/02/2024	Gasper Bizjan			
Checked:				Scale:	1:10 Format: A4
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung	Tolerance principles ISO 8015	Tolerances: ISO 2768-m		Dwg. / Dwg. no:	98 / 99 Mass (kg): 13
				Belongs to:	FRS/SFRS
				File name:	Bottom_part.SLDPR

F

E

D

C

B

A

F

E

D

C

B

ISO 2768-v  
ISO 2768-c  
ISO 2768-m  
ISO 2768-f  
ISO 2768-t  
FREE DIMENSION

±0.5 ±0.5 ±0.5 ±0.2 ±0.5  
±0.2 ±0.3 ±0.1 ±0.2 ±0.3  
±0.1 ±0.05 ±0.05 ±0.1 ±0.15  
from 0.5 from 3 from 6 from 120 from 400  
to 3 to 6 to 30 to 120 to 400

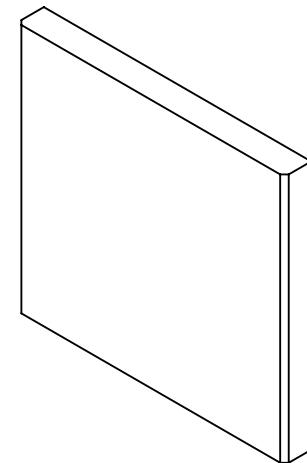
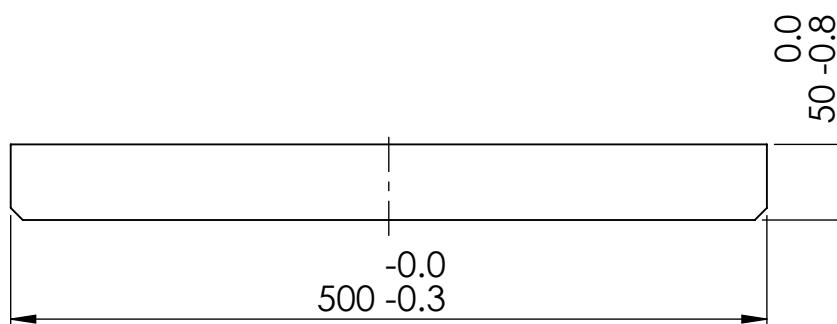
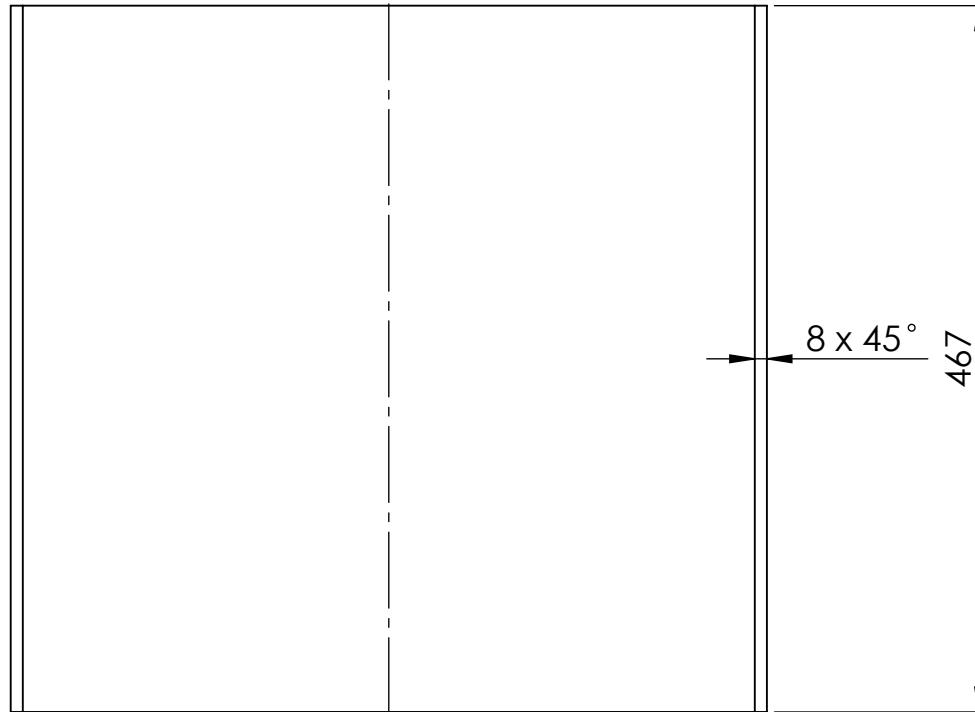
±1 ±1 ±1 ±0.2 ±1  
±0.3 ±0.3 ±0.1 ±0.2 ±0.3  
±0.1 ±0.05 ±0.05 ±0.1 ±0.15  
from 0.5 from 3 from 6 from 120 from 400  
to 3 to 6 to 30 to 120 to 400

±1.5 ±1.5 ±1.5 ±0.5 ±1.5  
±0.8 ±1.2 ±0.3 ±0.2 ±1.2  
±0.1 ±0.1 ±0.1 ±0.1 ±0.1  
from 3 from 6 from 120 from 400 from 1000  
to 6 to 30 to 120 to 400 to 2000

±2.5 ±2.5 ±2.5 ±0.5 ±2.5  
±1.2 ±1.2 ±0.5 ±0.2 ±1.2  
±0.5 ±0.5 ±0.2 ±0.1 ±0.5  
from 6 from 120 from 400 from 1000 from 2000  
to 30 to 120 to 400 to 1000 to 2000

±4 ±3 ±3 ±2 ±4  
±2 ±2 ±1 ±0.5 ±2  
±1.2 ±1.2 ±0.5 ±0.2 ±1.2  
from 120 from 400 from 1000 from 2000 from 4000  
to 300 to 1000 to 2000 to 4000 to 4000

±6 ±6 ±6 ±2 ±6  
±3 ±2 ±1 ±0.5 ±3  
±1.2 ±1.2 ±0.5 ±0.2 ±1.2  
from 300 from 1000 from 2000 from 4000 from 4000  
to 1000 to 2000 to 4000 to 1000 to 2000



Ver. no.:	Part. no.	Material / quantity:		Title: <b>Rear insert shield</b>
1	62	BurnGuard / 1		Project: <b>CSC neutron shielding</b>
	Date	Name	Signature	
Drawn:	11/02/2024	Gasper Bizjan		Scale: 1:5 Format: A4
Checked:				Dwg. / Dwg. no: 99 / 99 Mass (kg): 12
<b>GSI</b> Helmholtzzentrum für Schwerionenforschung		Tolerance principles ISO 8015	Tolerances: ISO 2768-m	Belongs to: FRS/SFRS
				File name: bottom_part_short.SLDprt
			ISO 128	