VARIAN
medical systems

Monte Carlo Data Package

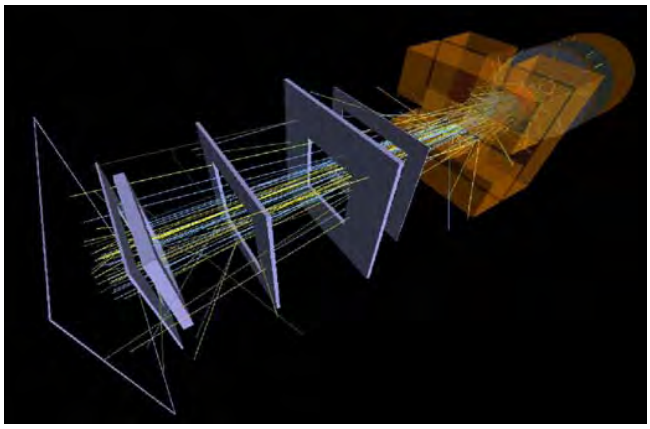
High Energy Accelerator

Monte Carlo Modeling

Monte Carlo simulation of radiation transport involves tracking individual particles including electron and photons through an idealized geometry. Interaction with the material that comprises the geometry is based on physical principles and includes energy loss, scatter and energy transfer to new or existing particles such as bremsstrahlung photons and delta rays. Monte Carlo tracks the location of the last interaction for each particle as it is transported. Since it is not generally possible to physically separate transmitted and scattered-dose, or photon and electron dose components with measurements, Monte Carlo provides the only basis for analyzing these quantities. It is highly accurate and detailed method for calculating fluence and dose distribution in radiotherapy.[1] Monte Carlo treatment head simulation results in unprecedented accuracy and detail of the character of the radiotherapy beam and has proved instrumental in treatment head design. It is essential that the model of the clinical electron and x-ray sources used in dose calculation be accurate as well since the planning system is physically based.[2]

Basic Steps for treatment head simulation[3]:

1) Acquire the Monte Carlo code based and taking a training course as required.
2) Draw up the idealized schematic of the treatment head based on manufacture specifications. Include geometry, material specification and physical properties so that calculation matches measurement.
3) Start with realistic parameters and then adjust the parameters based on the results. This will ensure that the source and geometry parameters give a reasonable fit to measurement.
4) Perform a sensitivity analysis and adjust the nominal parameters over an acceptable range or find a sensitivity analysis in literature for your particular machine.



Monte Carlo geometric model of Clinac™2100C linear accelerator

1. J. V. Siebers, P. J. Keall, J.O. Kim & R. Mohan "A method for photon beam Monte Carlo multileaf collimator particle transport" Phys. Med. Biol 47, 3225-3249 (2002)
2. D. W. O. Rogers, B.A. Faddegon, G. X. Ding, C.-M. Ma, J. We, and T. R. Mackie, BEAM: A Monte Carlo code to simulate radiotherapy treatment units. Med. Phys. 22(5):503, 1995
3. B. Faddegon, C. Ma & B. Curran AAPM 2005 Continuing Education Course Wednesday, July 27, 8:30-9:25

Introduction

Monte Carlo can realistically model radiation transport and interaction process through the accelerator head, beam modifiers and phantom or patient. Accurate source modeling is a pre-requisite to accurate results with Monte Carlo methods. The purpose of this package is to provide geometric data, material specifications and physical properties for accelerator head components and accessories for accurate Monte Carlo modeling. Requests for this package are primarily from research students for thesis work, researchers dedicated to this field of study and for those who are pursuing more accurate dosimetric modeling.

This new package of data and drawings of the Varian High-Energy Clinac machines is valid only for Novalis TX, Trilogy, Clinac iX, DX, C/D, EX & cX linear accelerators. This package contains recent bibliography, geometrical information on accelerator head and accessories involved in the beam attenuation, additional material specification and physical properties for components.

Basic Beamline: Phantom therapy

- The electron beam strikes a target button usually composed of two layers (some target are copper only). The first layer is made of tungsten (most of the bremsstrahlung photon production occurs here). The second is made of copper (for fast heat dissipation).
- The bremsstrahlung beam from the x-ray target is limited in maximum field size by the primary collimator which is made out of tungsten.
- Below the primary collimator lies an energy dependent beam flattener. These filters rest on a carousel made of aluminum. The carousel is rotated to bring the appropriate x-ray flattening filter into position. The filter is thicker in the center than on the outer edges in order to produce a radiation field of uniform intensity at depth.
- The ion chamber monitors the flattened x-ray field and can be modeled as several equidistant parallel plates.
- The secondary collimator jaws are made of tungsten and are set to the correct field size. The upper jaws (Y) travel along an arc of radius 28 cm centered approximately on the target. The lower jaws (X) travel in a linear fashion while pivoting to keep the jaws faces focused on the target.
- Any necessary wedge, block, or compensator is mounted in the appropriate accessory mounting slot.
- Other than the initial electron beam energy, the most dominant factors which influence the exciting energy spectrum and angular distribution are the target and the flattening filter.

Basic Beamline: Electron therapy

- The requisite beam current for electron therapy is several orders of magnitude less than for x-ray therapy.
- The electron beam leaving the bend magnet is approximately 2-3 mm in diameter
- The x-ray target is retracted and the carousel is rotated to the appropriate scattering foil position for the electron energy to be used.
- The scattering foils are used to spread this beam to a much larger area required for therapy.
- The ion chamber monitors dose delivery and regulates beam symmetry.
- The accessory mount is attached to the radiation head together with the electron applicator for the field size chosen into which a shaped cut-out is inserted.

Varian Monte Carlo Package Policy

The information contained within this Monte Carlo Data Package is considered to be Varian Confidential information. Distribution of this information is controlled under the terms of the Non-Disclosure Agreement signed by the principal investigator and/or institution in conjunction with Varian Medical Systems.

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- Users of this information shall not attempt to reverse engineer the Confidential Information for any other purpose
- The Confidential Information may not be disclosed to any third party without the express written permission of Varian
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If there are questions regarding the terms under which this Monte Carlo Data Package is being provided, users are advised to review the terms of their Non-Disclosure Agreement. Any further questions should be directed to the Manager of Translational Research for Varian Medical Systems.

Bibliography (Partial list)

For a more comprehensive list of publications including medical physics journals, books, reports and newsletter visit The American Association of Physicist in Medicine (AAPM) website: http://www.aapm.org/pubs/default.asp

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VARIAN
medical systems

Monte Carlo
High Energy Accelerator

Accelerator Head and Components

Varian High Enegy Accelerator: Photon Mode

X-ray target	Material	Thickness (cm)	Notes
4mv 6mV 8mV 10mV 15mV 18mV 20mV	Tungsten, Copper Tungsten, Copper Copper Copper Tungsten, Copper Tungsten, Copper Tungsten, Copper	0.00254 W, 0.1575 Cu 0.0889 W, 0.1575 Cu 0.508 Cu 0.508 Cu 0.0635 W, 0.79248 Cu 0.0635 W, 1.016 Cu 0.0889 W, 0.1524 Cu	·Tungsten button embedded on top of a copper base · The target should be asssumed as a semi-infinite slab
Primary Collimator Upper Surface Lower Surface	Tungsten		·The target and primary collimator are in vacuum ·Conical opening as shown in 100040467 ρ =18g/cm3
Vacuum Window		Top of 0.00254 thick	ρ =1.85g/cm^3
Ion Chamber Upper Surface Lower Surface	Kapton®	0.0127 x 0.983 Dia Kapton 0.00508 x 0.983 Dia Kapton	
Secondary collimator	Tungsten		Used for shielding, very complex geometry that is outside of the beam
Field light mirror	Mylar®	0.00508	Angled at 35° relative to the x- axis
Lead shielding plate Upper Surface Lower Surface	Tungsten		Used for shielding, very complex geometry that is outside of the beam
Y jaws	Tungsten Block		
X jaws	Tungsten block		
MLC MLC leaf			92.5% Tungsten and alloy of Nickel, Copper & Iron

Kapton® and Mylar ® are registered trademarks of DuPont

DASH	MODEL	NEXT ASSEMBLY
–	H.E.	100040466

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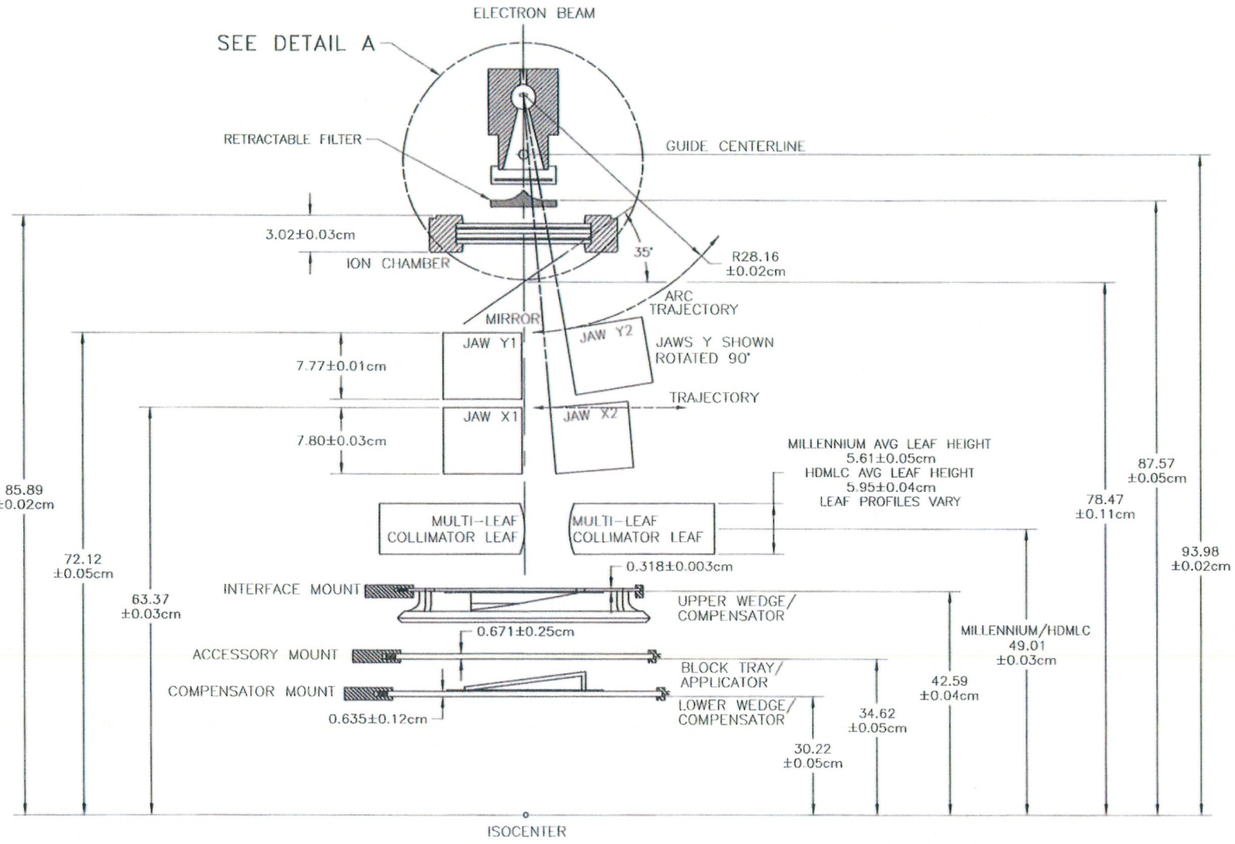
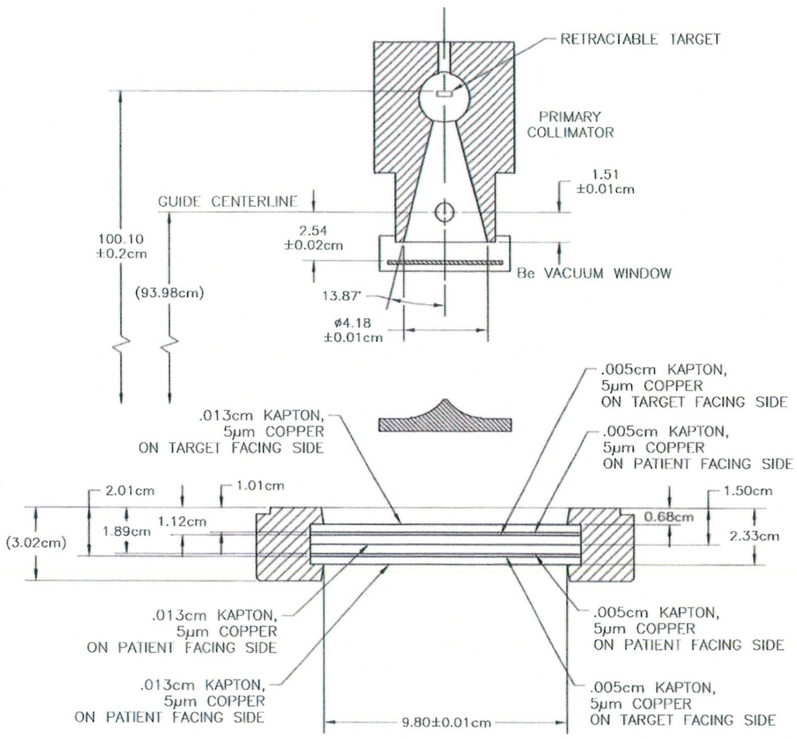


HIGH ENERGY
X-RAY MODE



DETAIL A
SCALE: NONE

METRIC
DIMENSIONS ARE IN MILLIMETERS (mm)

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED:
SURFACE TEXTURE PER ISO 1302, GRADE N8 (Ra=3.2 μm)
GENERAL TOLERANCES PER ISO 2768-1m

BASIC SIZE RANGE	LINEAR	RADII AND CHAMFERS
0.5..... ≤3	±0.1	±0.2
>3..... ≤6	±0.1	±0.5
>6..... ≤30	±0.2	±1
>30..... ≤120	±0.3	
>120..... ≤400	±0.5	
>400..... ≤1000	±0.8	
>1000..... ≤2000	±1.2	
>2000..... ≤4000	±2	

SHORT LEG	A°
>10..... ≤50	±0°30'
>50..... ≤120	±0°20'
>120..... ≤400	±0°10'
>400	±0°5'

	DESCRIPTION OF CHANGE	ENGINEERING RELEASE
APVD		
ECO		
DFT	A VON BORSTEL	A VON BORSTEL
CHK		
DATE		4/26/11
REV	1	2

REV 1: NOT RELEASED REVISED TO SCHEME ADDED SHEET 2

DASH NO.	DESCRIPTION

VARIAN medical systems | ONCOLOGY SYSTEMS

DRAWN	DATE	APPROVED	DATE	SCALE
ALEX VON BORSTEL	10-6-08			NONE
CHECKED	DATE	APPROVED	DATE	SHEET
–	–	–	–	1 OF 2

ACCELERATOR HEAD, H.E., 65.4, MLC

DO NOT SCALE DRAWING

SIZE	DRAWING NUMBER	REV
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SIMILAR TO 1106021 2

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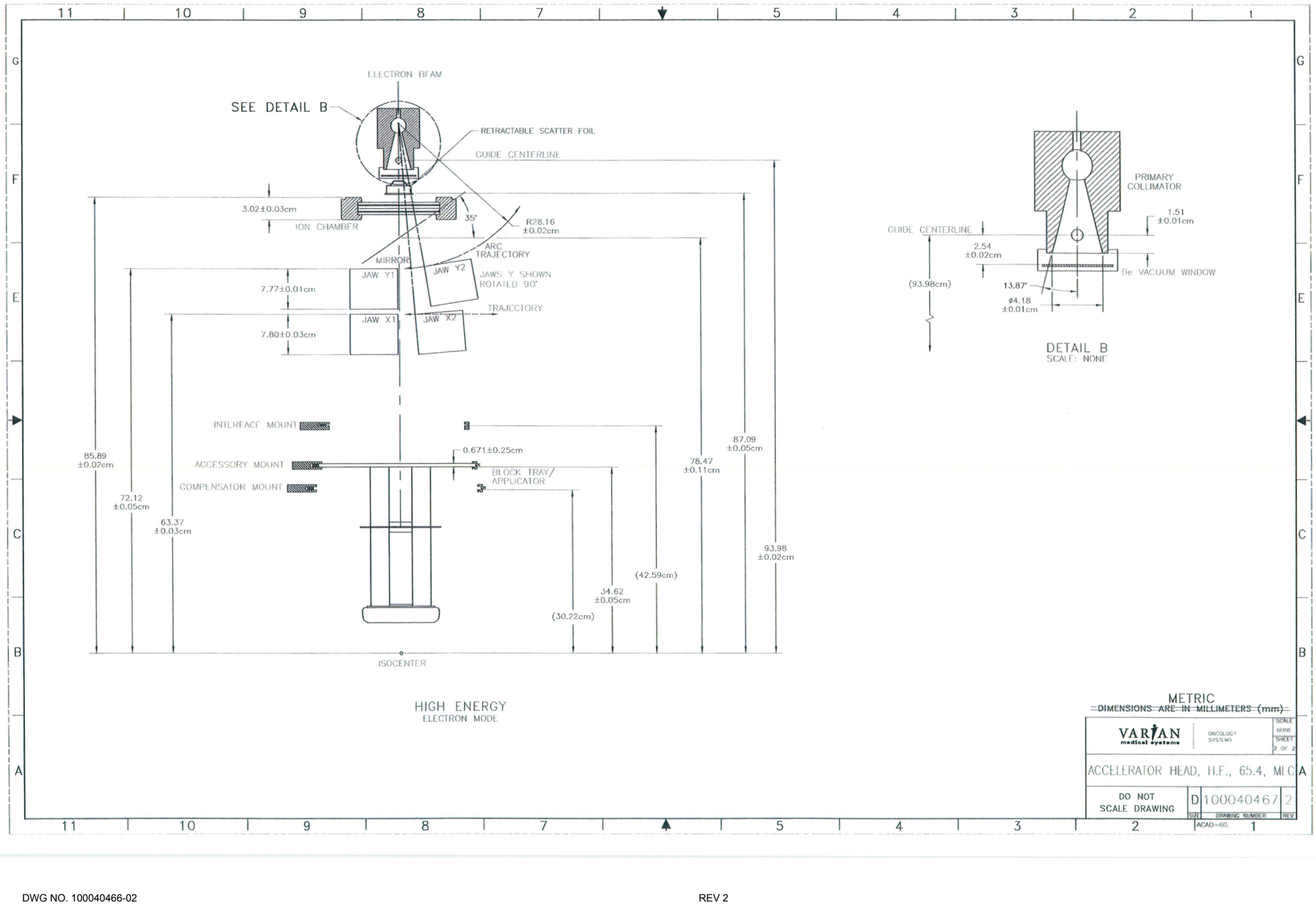

HIGH ENERGY
ELECTRON MODE

METRIC
~~DIMENSIONS ARE IN MILLIMETERS (mm)~~

VARIAN medical systems — ONCOLOGY SYSTEMS		SCALE NONE; SHEET 2 OF 2
ACCELERATOR HEAD, H.F., 65.4, MLC		
DO NOT SCALE DRAWING	D 100040467	2
	SIZE DRAWING NUMBER	REV

ACAD=60.

Flattening Filters

This section contains information for Varian's flattening filters of energy levels 4X, 6X, 8X, 10X, 15X, 18X, 20X. The filter includes a solid generally conical filter member, of semi-permeable to x-rays, and having an accurately define surface configuration symmetrically oriented about a central axis. The filter member is affixed to a base which is designed for mounting external of the x-ray beam emergence outlet of a linear accelerator for completely intercepting the x-ray beam produced, to accurately and selectively filter x-rays of the beam for producing uniform radiation intensity across the x-ray therapy fields of the accelerator apparatus.

Energy Level	Material	Density
4X	OFE Cu grade 101	8.92 g/cm^3
6X	OFE Cu grade 101	8.92 g/cm^3
8X	OFE Cu grade 101	8.92 g/cm^3
10X	OFE Cu grade 101	8.92 g/cm^3
15X	Tungsten	16.9 g/cm^3
18X	SAE 12L14[1] Free Machining Steel	7.83344 g/cm^3
20X	SAE 12L14[1] Free Machining Steel	7.83344 g/cm^3
Conical Insert	Unalloyed Tantalum	16.6g/cm^3

[1] SAE 12L14: 0.15% Cu, 0.85-1.15% Mn, 0.04-0.09% P, 0.26-0.35% S, 0.15-0.35% Pb, ρ= 7.7-8.03g/cm^3

©Varian Medical Systems Flattening Filter 18X

©Varian Medical Systems Flattening Filter 4X

ORDR NO	TYPE OR MODEL	NEXT ASSEMBLY
	CL2100C	D882526
	REF	100040466

REQ	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
REF	DT80715	DRILL FIXTURE	1
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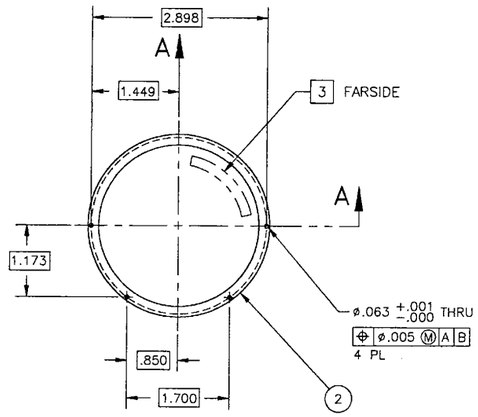

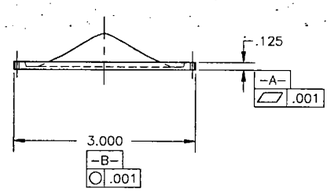

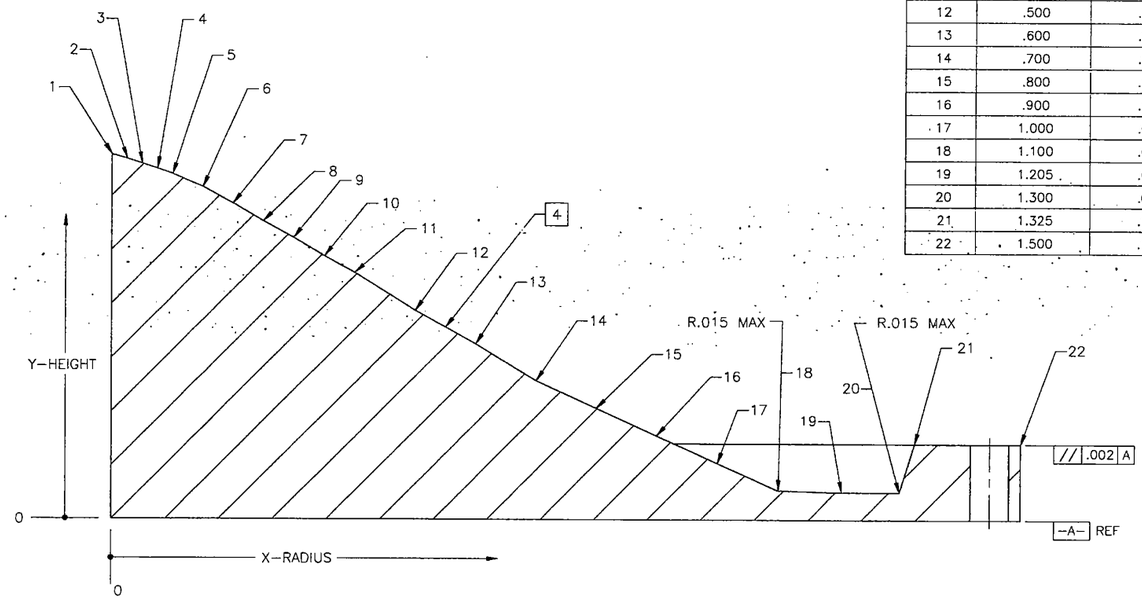

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1	0.0	.598
2	.025	.591
3	.050	.583
4	.075	.575
5	.100	.566
6	.150	.545
7	.200	.518
8	.250	.489
9	.300	.462
10	.350	.432
11	.400	.405
12	.500	.343
13	.600	.288
14	.700	.228
15	.800	.183
16	.900	.138
17	1.000	.093
18	1.100	.048
19	1.205	.045
20	1.300	.045
21	1.325	.125
22	1.500	.125

SECTION A-A

SCALE 10/1

4 X-RADIUS DIMENSIONS ARE BASIC TO -A- AND -B-. THE PROFILE IS A SERIES OF POINT-TO-POINT SURFACES (NOT A SMOOTH CURVE). PROFILE SHALL NOT VARY MORE THAN ±.002 FROM A STRAIGHT LINE INTERPOLATION BETWEEN ADJACENT POINTS.

3 IDENTIFY PART NO. REV LETTER, SERIAL NO & ENERGY (4X) PER M70-8010 WITH ELECTRIC PENCIL USING .12 HIGH CHARACTERS.

2. PARTS SHALL BE PROTECTED AT ALL TIMES FROM DENTS, NICKS AND SCRATCHES.

1. MFR PER M7-8000.

NOTES:

DO NOT SCALE DRAWING

DESCRIPTION OF CHANGE	ENG RELEASE	CHANGE NOTE 4	CHANGE NOTE 4 CHANGE Y-HEIGHTS UPDATE PICTURE	MFG RELEASE
APVD	DEP	DEP	CJH	GK
ECO				KLT
DFT	SAM	SAM	SAM	RAY
CHK				CJ
DATE	4-15-91	9-19-91	2-10-92	3-3-92
REV	1	2	3	A

SIMILAR TO: 876099

-01	SHOWN
PART NO.	DESCRIPTION

DRAWN	DATE	APPROVED	DATE
S MERICS	3-25-91	D PENNING	4-15-91
CHECKED JACOBSON	3-3-92	APPROVED G. KOSSMAN	3/4/92

FLATTENER-FILTER 4X

NOT OTHERWISE SPEC: ANGS ± --
FIN. √ DEC .X ± -- .XX ± .03 .XXX ± .005

SCALE 1/1 | SHEET 1 of 1

varian medical equipment

D | 882621 | A

SIZE | DRAWING NO | REV

ACAD= 60 i2621-A1

D882621

DASH NO	TYPE OR MODEL	NEXT ASSEMBLY
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	CL1800	876349
	CL2100C	1100948
	CL2300C	882620
	REF	1000404660

QTY	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
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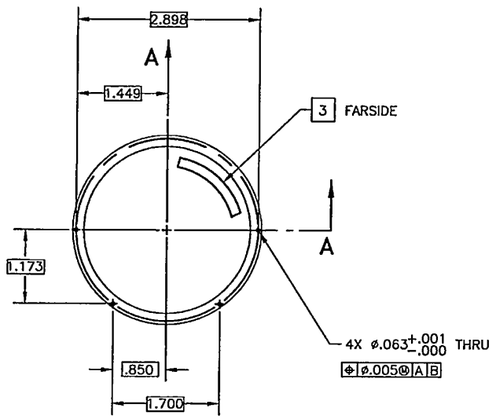

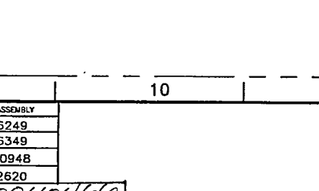

4

OUTSIDE PROFILE		
POINT	X–RADIUS (BASIC)	Y–HEIGHT ±.002
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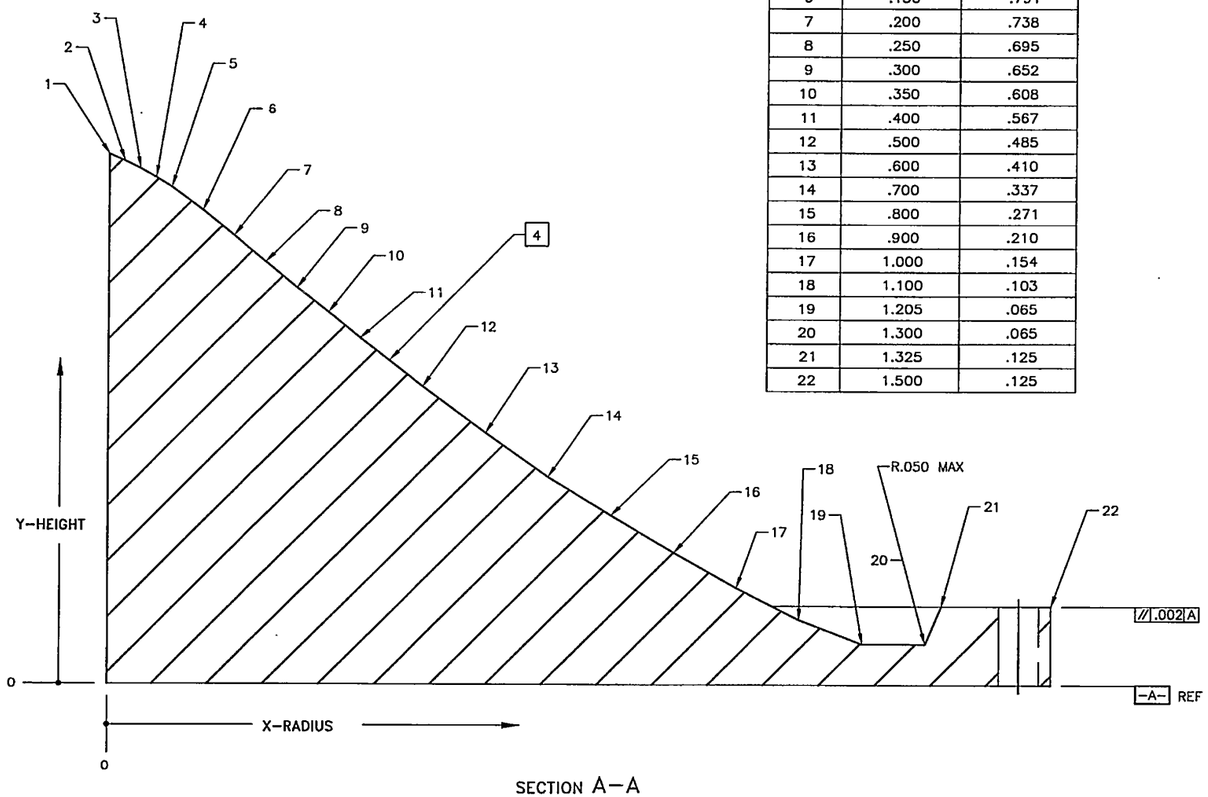
2	.025	.862
3	.050	.851
4	.075	.836
5	.100	.820
6	.150	.791
7	.200	.738
8	.250	.695
9	.300	.652
10	.350	.608
11	.400	.567
12	.500	.485
13	.600	.410
14	.700	.337
15	.800	.271
16	.900	.210
17	1.000	.154
18	1.100	.103
19	1.205	.065
20	1.300	.065
21	1.325	.125
22	1.500	.125



SECTION A–A
SCALE 10/1

NOTES:

1. MANUFACTURE PER M7–8000.
2. PARTS SHALL BE PROTECTED AT ALL TIMES FROM DENTS, NICKS, & SCRATCHES.
3. IDENTIFY WITH PART NO., REV. LEVEL & SERIAL NO. PER M70–8010 WITH ELECTRIC PENCIL, USING .12 HIGH CHARACTERS IN APPROXIMATE AREA SHOWN.
4. X–RADIUS DIMENSIONS ARE BASIC TO –A– & –B–. THE PROFILE IS A SERIES OF POINT TO POINT SURFACES (NOT A SMOOTH CURVE). PROFILE SHALL NOT VARY MORE THAN ±.002 FROM A STRAIGHT LINE INTERPOLATION BETWEEN ADJACENT POINTS.

DO NOT SCALE DRAWING

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APVD	A.K.		A.K.	
ECO				1011705
DFT	PAUL	H. BRADY	MARCO	P. NGO
CHK	BIA		BIA	
DATE	3-7-95		7-14-95	1-30-02
REV	1	2	A	B

SIMILAR TO: H6099-D1

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PART NO.	DESCRIPTION

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P.CUTTING	3/7/95	A. KHAN	3/7/95
CHECKED	DATE	APPROVED	DATE
M. BIAGINI	3/7/95	G.AHLSTRON	6-27-95

FIELD FLATTENER, 6X (67.0%)

NOT OTHERWISE SPEC: ANG± --
FIN. √DEC .X± -- .XX± .03 .XXX± .005

SCALE 1/1 | SHEET 1 OF 1

varian oncology systems

D 1103282 B

SIZE | DRAWING NO | REV

ACAD=60.

D 1103282

DASH NO	TYPE OR MODEL	MDT ASSEMBLY
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-01	CL 18	A856695
-01	CL 12/10	E853430
-01	CL 12/10	A856695
	REF	100040466

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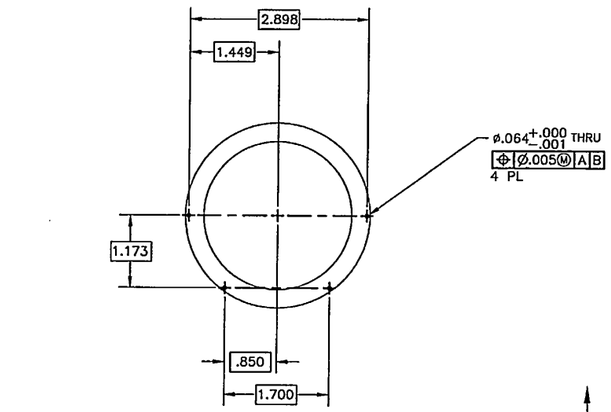

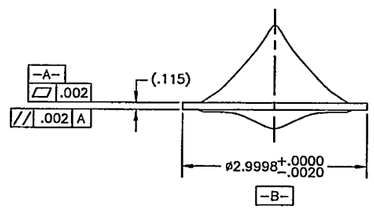

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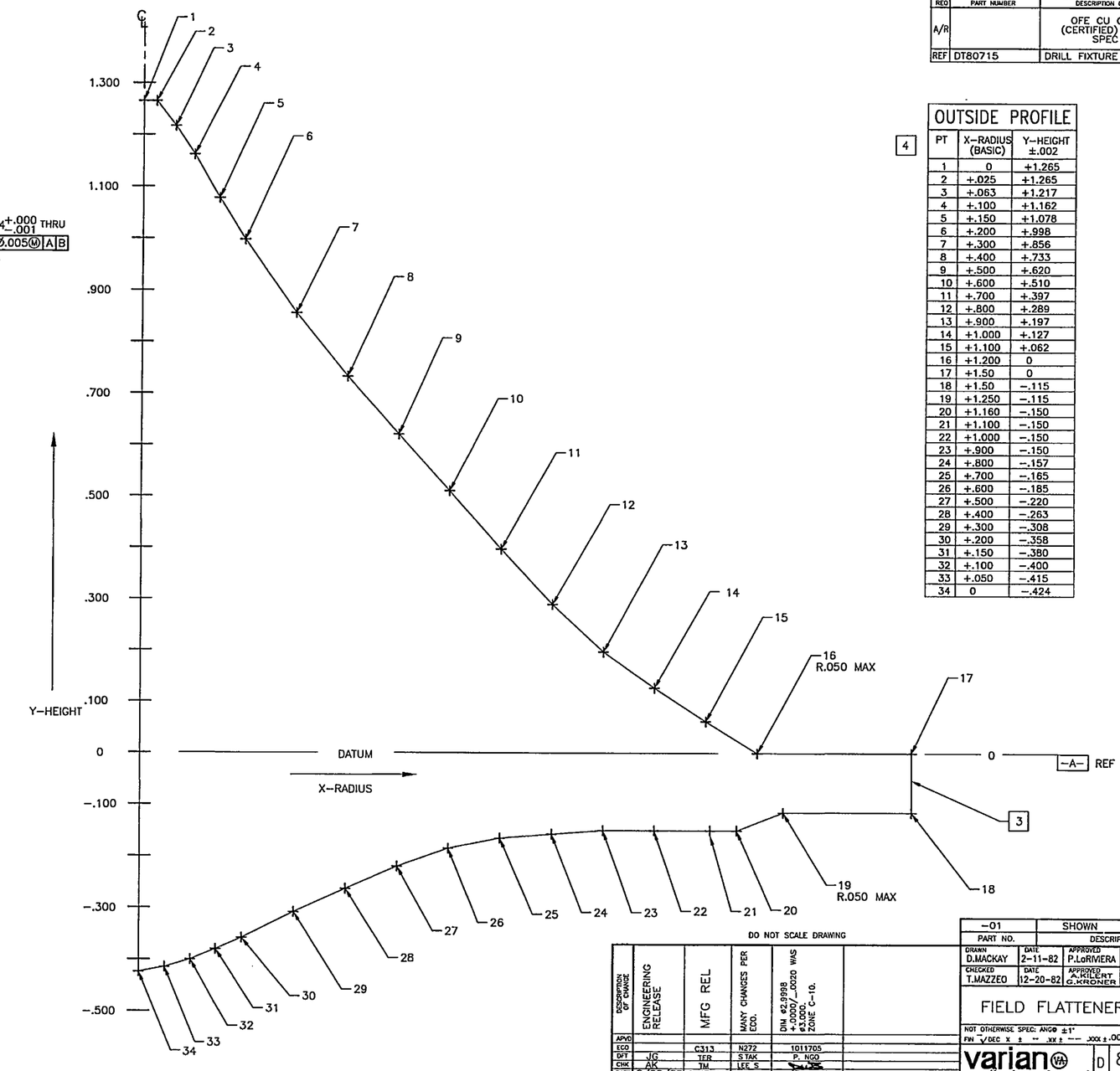


OUTSIDE PROFILE		
PT	X-RADIUS (BASIC)	Y-HEIGHT ±.002
1	0	+1.265
2	+.025	+1.265
3	+.063	+1.217
4	+.100	+1.162
5	+.150	+1.078
6	+.200	+.998
7	+.300	+.856
8	+.400	+.733
9	+.500	+.620
10	+.600	+.510
11	+.700	+.397
12	+.800	+.289
13	+.900	+.197
14	+1.000	+.127
15	+1.100	+.062
16	+1.200	0
17	+1.50	0
18	+1.50	-.115
19	+1.250	-.115
20	+1.160	-.150
21	+1.100	-.150
22	+1.000	-.150
23	+.900	-.150
24	+.800	-.157
25	+.700	-.165
26	+.600	-.185
27	+.500	-.220
28	+.400	-.263
29	+.300	-.308
30	+.200	-.358
31	+.150	-.380
32	+.100	-.400
33	+.050	-.415
34	0	-.424

4 X-RADIUS DIMENSIONS ARE BASIC TO -A- & -B-. PROFILE IS A SERIES OF POINT TO POINT SURFACES (NOT A SMOOTH CURVE). PROFILE SHALL NOT VARY MORE THAN ±.002 FROM A STRAIGHT LINE INTERPOLATION BETWEEN ADJACENT POINTS.

3 MARK PART NO., REV LETTER, & SERIAL NO. PER M70-8010 USING ELECTRIC PENCIL, .12 HIGH CHARACTERS.

2. PARTS SHALL BE PROTECTED AT ALL TIMES FROM DENTS, NICKS, & SCRATCHES.

1. MFR PER M7-8000.

NOTES:

DO NOT SCALE DRAWING

DESCRIPTION OF CHANGE	ENGINEERING RELEASE	MFG REL	MANY CHANGES PER ECO.	DIM Ø2.9998 +.0000/-.0020 WAS Ø3.000/-.0020 ZONE C-10.
APVD				
ECO		C313	N272	1011705
DFT	JG	TER	S TAK	P. NOO
CHK	AK	TM	LEE S	
DATE	2/22/82	12-17-82	5-8-92	1-20-97
REV		A	B	C

-01	SHOWN
PART NO.	DESCRIPTION

DRAWN	DATE	APPROVED	DATE
D.MACKAY	2-11-82	P.LaRIVIERA	12-22-82
CHECKED	DATE	APPROVED	DATE
T.MAZZEO	12-20-82	A.HILBERT C.KRONER	12-22-83 1-3-97

FIELD FLATTENER - 10X

NOT OTHERWISE SPEC: ANG± ±1° FIN √ DEC X ± .XX ± .XXX ± .005 | SCALE 10/1 | SHEET 1 OF 1

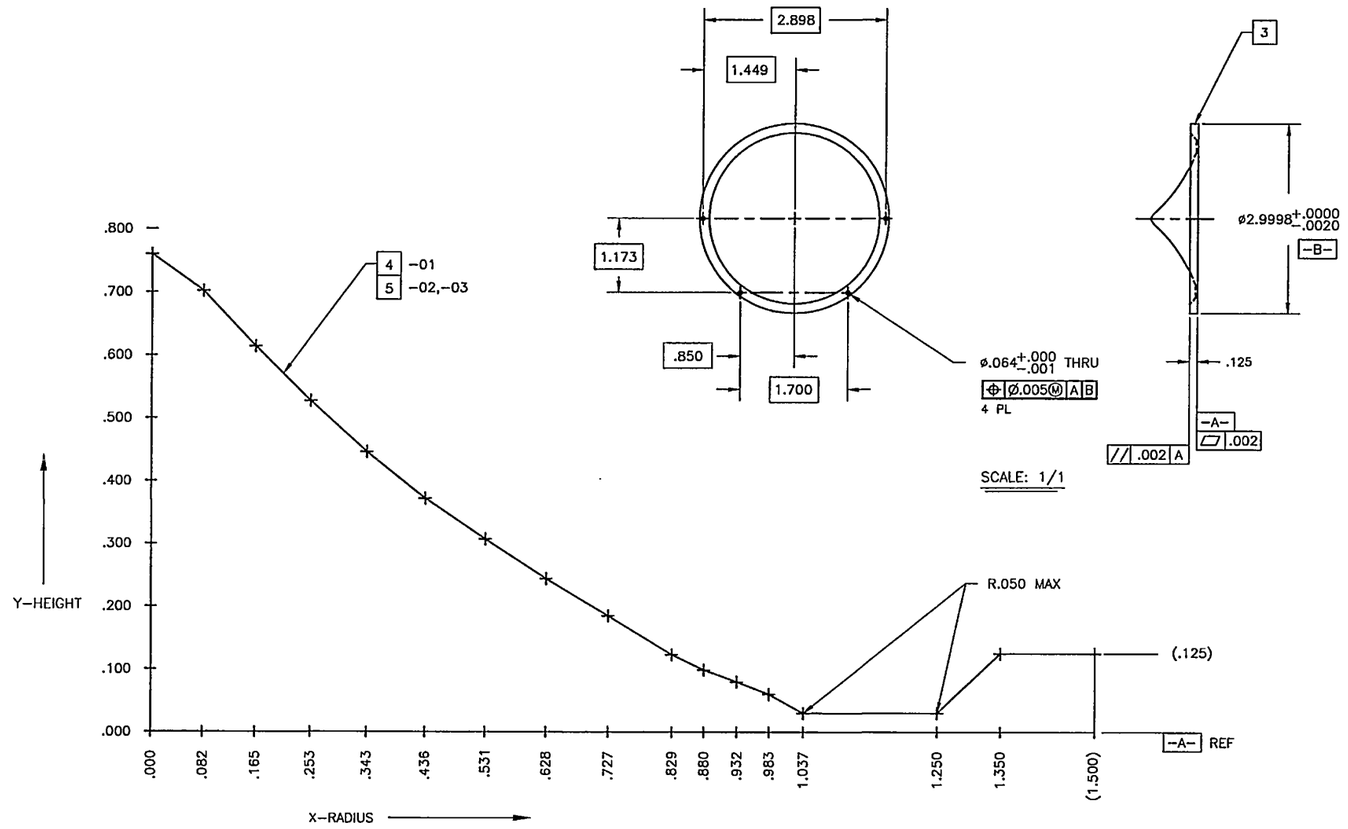
varian medical equipment | D | 859002 | C

SIZE | DRAWING NO | REV

ACAD=60.

DASH NO	TYPE OR MODEL	NEXT ASSEMBLY
	CL1800	D876062
	CL20	A856695
	CL1800	D876249
	REF	100040466

REQ	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
1	B832518-01	TUNGSTEN, DENS 16.9 +.3 -.8 G/CC	1
REF	DT80715	DRILL FIXTURE	2



SCALE: 1/1

OUTSIDE PROFILE

X–RADIUS (BASIC)	Y–HEIGHT –01 [4] ±.002	Y–HEIGHT –02 [5] ±.002	Y–HEIGHT –03 [5] ±.002
.000	.760	.760	.744
.040	---	---	.718
.078	---	---	.682
.082	.702	.702	---
.105	---	---	.653
.131	---	---	.622
.160	---	---	.593
.165	.614	.610	---
.205	---	---	.547
.248	---	---	.506
.253	.527	.521	---
.343	.446	.441	.427
.436	.372	.369	.354
.531	.307	.298	.287
.628	.244	.236	.225
.727	.185	.176	.168
.829	.123	.119	.119
.880	.099	.090	.090
.932	.080	.067	.067
.983	.060	.047	.047
1.037	.030	.030	.030
1.250	.030	.030	.030

[5] X–RADIUS DIMENSIONS ARE BASIC TO –A– & –B–. PROFILE IS A SERIES OF POINT TO POINT SURFACES (NOT A SMOOTH CURVE). PROFILE SHALL NOT VARY MORE THAN ±.002 FROM A STRAIGHT LINE INTERPOLATION BETWEEN ADJACENT POINTS.

[4] X–RADIUS DIMENSIONS ARE BASIC TO –A– & –B–. PROFILE IS A CONTINUOUS CURVE TO 1.037 RADIUS.

[3] IDENTIFY WITH PART NO., REV LETTER & SERIAL NO. PER M70–8010 USING ELECTRIC PENCIL, .12 HIGH CHARACTERS.

2. PARTS SHALL BE PROTECTED AT ALL TIMES FROM DENTS, NICKS, & SCRATCHES.

1. MFR PER M7–8000.

NOTES:

DO NOT SCALE DRAWING

DESCRIPTION OF CHANGE	REDRAWN & REVISED ON ACAD. MANY CHANGES PER ECO	DIM ø2.9998 +.0000/–.0020 WAS ø3.000±.005. ZONE F–4.			
APVD					
ECO	N272	1011705			
DFT	S.TAK	P. NGO			
CHK	LEE S				
DATE	5–8–92	1–30–92			
REV	E	F			

PART NO.	DESCRIPTION
–03	SHOWN
–02	DISCONTINUED
–01	DISCONTINUED

DRAWN (BIAGINI)	DATE (9–4–80)	APPROVED (G.McHENNY)	DATE (9–5–80)
CHECKED (SCHONFELDER)	DATE (9–5–80)	APPROVED (DM.ROBERTSON)	DATE (9–5–80)

FIELD FLATTENER – 15X

NOT OTHERWISE SPEC: ANGS 0°–30' | FIN. √DEC .X ± –– xx ± .01 .XXX ± .001 | SCALE 10/1 | SHEET 1 OF 1

varian medical equipment | SIZE D | DRAWING NO 850616 | REV F

ACAD=60.

D 850616

DASH NO	TYPE OR MODEL	NEXT ASSEMBLY
	CL1800	876234
	REF	100040466

QTY	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
		SAE 12L14 FREE-MACHINING STEEL	

ø.140 THRU
CSINK ø.230 X 82°
ON ø 2.600 BC
⌖ ø.005 A B
3 PL

3 NEARSIDE

A

A

120° 3 PL

POINT RELIEF
ø.030 X .008 DEEP

(ø1.050)
(ø2.798)
(ø2.9995)

(.525)

Y-HEIGHT

0

0

X-RADIUS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

41 R.050 MAX

4

6

6

6

45°

ø1.050±.001
/ .001 B

/ .001 A

ø2.798 +.000 −.001
/ .001 B

ø2.9995 +.0000 −.0040
−B−
○ .001

// .001 A

(.093)
.050±.002

−A−
▱ .001

4

OUTSIDE PROFILE			
POINT	X-RADIUS (BASIC)	Y-HEIGHT ±.0020 (BEFORE PLATING)	Y-HEIGHT ±.0020 (AFTER PLATING)
1	0	1.3650	1.3656
2	.012	1.3630	1.3636
3	.025	1.3600	1.3606
4	.033	1.3550	1.3557
5	.040	1.3490	1.3498
6	.050	1.3400	1.3408
7	.058	1.3320	1.3329
8	.068	1.3200	1.3209
9	.075	1.3100	1.3111
10	.090	1.2720	1.2736
11	.100	1.2460	1.2477
12	.125	1.1940	1.1954
13	.150	1.1550	1.1561
14	.175	1.1220	1.1230
15	.200	1.0940	1.0949
16	.250	1.0400	1.0409
17	.300	.9940	.9948
18	.350	.9570	.9578
19	.360	.9500	.9507
20	.370	.9460	.9467
21	.380	.9420	.9427
22	.390	.9380	.9387
23	.400	.9270	.9279
24	.410	.9160	.9169
25	.420	.9050	.9059
26	.430	.8860	.8873
27	.450	.8490	.8503
28	.475	.8090	.8101
29	.500	.7690	.7701
30	.550	.6910	.6921
31	.600	.6290	.6300
32	.650	.5740	.5749
33	.700	.5240	.5249
34	.750	.4770	.4778
35	.800	.4250	.4259
36	.850	.3700	.3709
37	.900	.3130	.3139
38	.950	.2540	.2549
39	1.000	.1950	.1959
40	1.050	.1360	.1369
41	1.100	.0930	.0938

6 DO NOT PLATE SURFACES NOTED.

5 FINISH: ELECTROLESS NICKEL PLATE PER MIL-C-26074, CLASS 2, GRADE B (.0005-.0007 THK).

4 X-RADIUS DIMENSIONS ARE BASIC TO −A− & −B− PROFILE IS A SERIES OF POINT TO POINT SURFACES (NOT A SMOOTH CURVE). PROFILE SHALL NOT VARY MORE THAN ±.002 FROM A STRAIGHT LINE INTERPOLATION BETWEEN ADJACENT POINTS.

3 IDENTIFY WITH PART NO., REV LETTER, & SERIAL NO. PER M70-8010 USING ELECTRIC PENCIL, .12 HIGH CHARACTERS. DEBURR HIGH SPOTS MADE BY ELECTRIC PENCIL.

2. PART SHALL BE PROTECTED AT ALL TIMES FROM DENTS, NICKS & SCRATCHES.

1. MFR PER M7-8000.

NOTES:

SECTION A-A
SCALE: 10/1

DO NOT SCALE DRAWING

DESCRIPTION OF CHANGE	PRELIMINARY RELEASE	-02 SHOWN -01 DISCONTINUED	UPDATED NOTES 3 & 4, ADDED NOTE 5, ADDED 5 PTS TO CHART AND PROFILE -02 SHOWN -01 DISCONTINUED	ADDED (.050R MAX) TO PT 41 (.100R MAX) WAS .030±.005 MFG REL CLASS B	CG2 X-RADIUS WAS 0.0005 & Y-HEIGHT WAS .0020 WAS CLASS B	MANY CHANGES PER ECO.	DIM ø2.9995 WAS ø3.000, ZONE C-10. DIM ø2.9995 +.0000/-.0040 WAS ø3.000, ZONE B-6.
APVD		JRM					
ECO					K779	N272	1011705
DFT		JNG	JNG	JNG	D CHAN	S.TAK	P. NGO
CHK		JOE P.	DLO	DLO	WDD	LEE S.	
DATE		11-15-84	2-20-85	3-18-85	8-12-89	5-8-92	1-30-02
REV	1	2	3	A	B	C	D

-03	SHOWN
-02	DISCONTINUED
-01	DISCONTIUNED
DASH	DESCRIPTION

VARIAN medical systems | ONCOLOGY SYSTEMS

DRAWN	DATE	APPROVED	DATE	SCALE
J.NG	10-30-84	P. La RIVIERE J.MORISON	11-14-84 11-14-84	1/1
CHECKED	DATE	APPROVED	DATE	SHEET
J.PATEREWIC	11-14-84	G.ANDERSON	3-15-85	1 OF 1

FIELD FLATTENER, TOP 18X

UNLESS OTHERWISE SPEC: ANG±=--- FIN 63 XX±=--- XXX±=.003

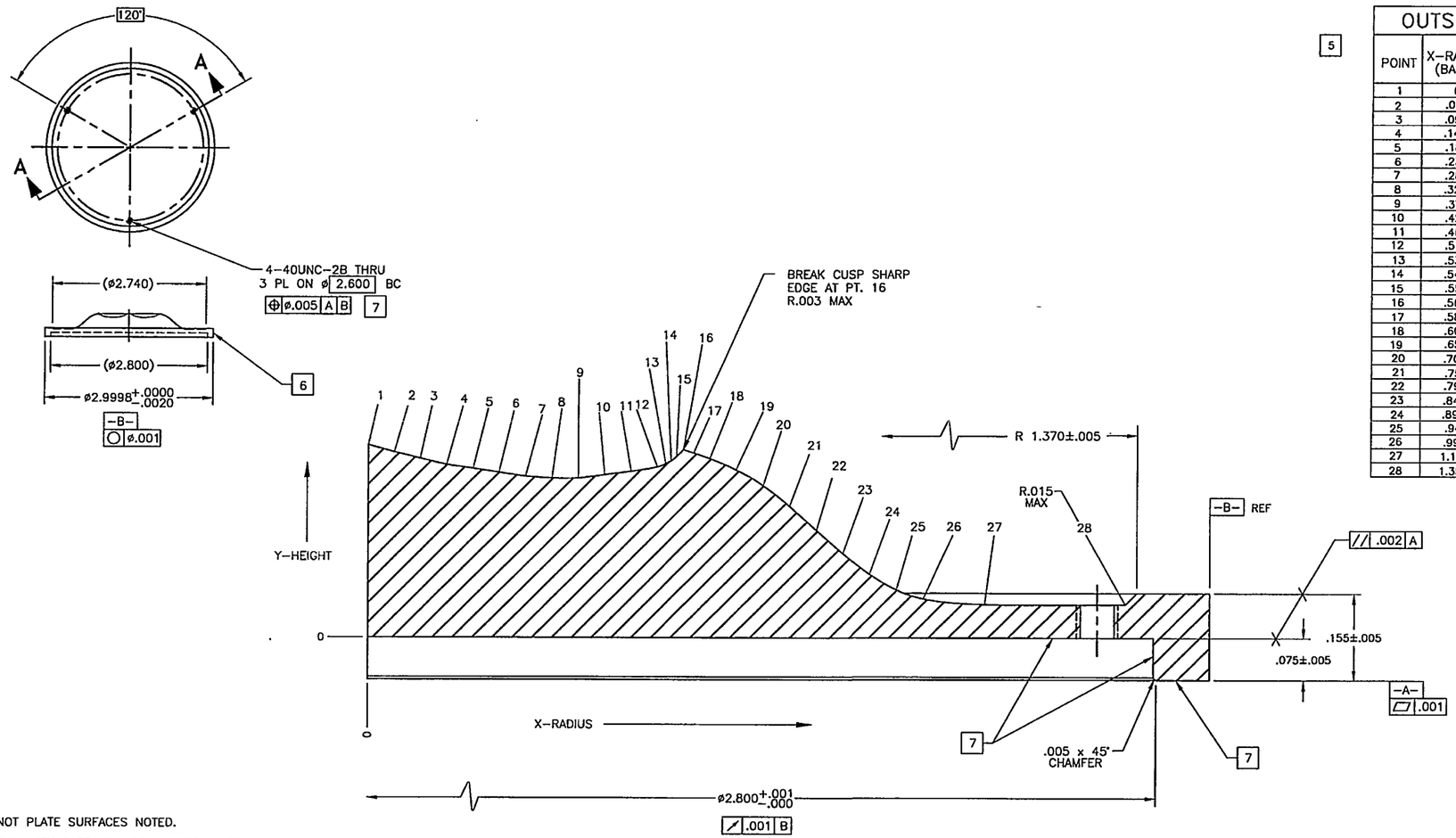
D 876084 D
SIZE DRAWING NUMBER REV

SIMILAR TO: ACAD=60.

D 876084

DASH NO	TYPE OR MODEL	NEXT ASSEMBLY
	CL20X	C850667
	CL1800	C876234
	REF	100040466

REQ	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
		SAE 12L14 FREE MACHINING STEEL	



OUTSIDE PROFILE			
POINT	X-RADIUS (BASIC)	Y-HEIGHT ±.0020 (BEFORE PLATING)	Y-HEIGHT ±.0020 (AFTER PLATING)
1	0	.3440	.3446
2	.047	.3310	.3316
3	.093	.3200	.3206
4	.140	.3090	.3096
5	.187	.3020	.3026
6	.233	.2950	.2956
7	.280	.2880	.2886
8	.327	.2850	.2856
9	.374	.2850	.2856
10	.421	.2910	.2916
11	.468	.2970	.2976
12	.515	.3050	.3057
13	.530	.3110	.3117
14	.540	.3160	.3168
15	.550	.3240	.3249
16	.562	.3360	.3366
17	.580	.3300	.3306
18	.609	.3200	.3206
19	.656	.3000	.3007
20	.704	.2720	.2727
21	.751	.2350	.2358
22	.799	.1920	.1928
23	.846	.1510	.1518
24	.894	.1140	.1148
25	.942	.0860	.0867
26	.990	.0700	.0706
27	1.100	.0600	.0606
28	1.350	.0600	.0609

5

SECTION A-A
SCALE 10/1

7 DO NOT PLATE SURFACES NOTED.

6 IDENTIFY WITH PART NO., REV LETTER & SERIAL NO. PER M70-8010 USING ELECTRIC PENCIL, .12 HIGH CHARACTERS.

5 X-RADIUS DIMENSIONS ARE BASIC TO -A- & -B- PROFILE IS A SERIES OF POINT TO POINT SURFACES (NOT A SMOOTH CURVE). PROFILE SHALL NOT VARY MORE THAN ±.002 FROM A STRAIGHT LINE INTERPOLATION BETWEEN ADJACENT POINTS.

4. PARTS SHALL BE PROTECTED AT ALL TIMES FROM DENTS, NICKS & SCRATCHES.

3 POINT 16 IS BEFORE BREAKING OF CUSP SHARP EDGE.

2. FINISH: ELECTROLESS NICKEL PLATE PER MIL-C-26074, CLASS 2, GRADE B, (.0005-.0007 THK)

1. MFR PER M7-8000.

NOTES:

DO NOT SCALE DRAWING

DESCRIPTION OF CHANGE	REVISED AND REDRAWN	SEE ECO E879	XFER TO ACAD. 1.4000 WAS ±.002 B/4.	MANY CHANGES PER ECO.	DIM ø2.9998 +.0005/-.0020 WAS ø3.000, ZONE D-10.
APVD					
ECO	C270	E879	K426	N272	1011705
DFT	BIAGINI	JNG	DEC	S.TAK	P. NGO
CHK	TM	LEE S		LEE S	
DATE	3-22-83	4-20-89	6-10-89	5-8-92	12-8-92
REV	B	C	D	E	F

-02	SHOWN
-01	DISCONTINUED
PART NO.	DESCRIPTION

DRAWN	DATE	APPROVED	DATE
M.BIAGINI	3-22-83	P.LARIVIERE	3-24-83
CHECKED	DATE	APPROVED	DATE
T.MAZZO	3-24-83	L.DOOCY	3-23-83

FIELD FLATTENER, BOTTOM 18X

UNLESS OTHERWISE SPEC: ANG ±0°-30' FIN √ DEC .X ± .— .XX ± .— .XXX ± .003 | SCALE 1/1 | SHEET 1 OF 1

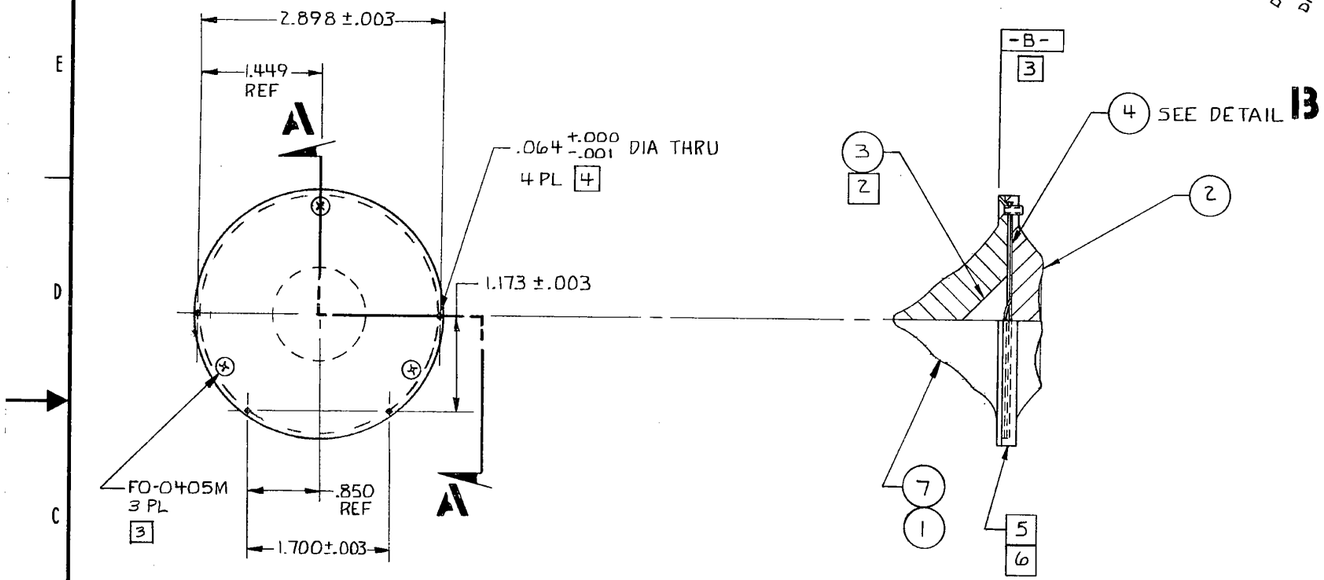
varian medical equipment | SIZE D | DRAWING NO 850663 | REV F

ACAD=60.

DASH NO.	TYPE OR MODEL	NEXT ASSEMBLY	
	CL1800	A876062	MICA
	CL1800	D876249	KAPTON
	REF	100040466	

REQ	REQ	REQ	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
/	/	1	D876084-01	FIELD FLATTENER, TOP	1
1	1	1	D850663-02	FIELD FLATTENER, BOTT.	2
/	1	1	B850664-01	CONICAL INSERT (TUNGSTEN)	3
1	1	1	B850665-01	SHIM, FIELD FLATTENER	4
					5
REF	REF	REF	TD80715-01	DRILL FIXTURE FLATTENER	6
1	1	/	D876084-03	FIELD FLATTENER, TOP	7
1	/	/	B876350-01	CONICAL INSERT (TANTALUM)	8

-03 DISCON
-02 DISCON
-01



[7] HARDWARE CODES PER 828000.

[6] MARK PART NO. & SERIAL NO. WITH ELECTRIC PENCIL IN AREA SHOWN.

[5.] WEIGH ASSY & MARK WEIGHT IN AREA SHOWN WITH ELECTRIC PENCIL. WEIGHT MUST BE WITHIN 435-461 GRAMS.

[4.] .064 DIA HOLES TO BE DRILLED AFTER ASSY. USING DRILL FIXTURE TD80715.

[3.] FLAT HEAD SCREWS MUST NOT PROTRUDE ABOVE SURFACE "B".

[2.] ITEM (3) CONICAL INSERT MUST FIT SECURELY IN PLACE USING ITEM (4).

1. PARTS TO BE PROTECTED FROM DENTS, NICKS & SCRATCHES.

NOTES:

-03 SHOWN
-02 DISCONTINUED
-01 DISCONTINUED

DO NOT SCALE DRAWING

DESCRIPTION OF CHANGE	ENG REL	MFG RELEASE	ADD ITEMS 7&8. ADD DASH NOS. D876148-01, WAS -01. SHOWN, ADD -02 & -03.	CLASS B TO CLASS A	CL4 ADD BALLOON 7 NEXT TO 1.	
NUM			C.O. E-7278			
EO			EG16	F095	4923	
DFT	MS			CRD	AVS	
CHK	[illegible]		MJS	WO	[illegible]	
DATE	7-12-84	7-19-84	9-21-84	5-3-85	12-7-87	
REV	1	A	B	C	D	

DRAWN	DATE	APPROVED	DATE	CODE
M. SUDA	6-29-84	[illegible]	7-12-84	N
CHECKED	DATE	APPROVED	DATE	CLASS
PETERSON	7.11.84	[illegible]	7/19/84	A

FIELD FLATTENER ASSY (18X)

varian — NOT OTHERWISE SPEC: FRAC ± —— ANG ± —— FIN. ✓ DEC .X ± —— .XX ± —— .XXX ± —— SCALE 1/1

RADIATION DIVISION | C SIZE | 876234 DRAWING NO. | D REV

0441-08-05 APRIL 66 PB/83 LITHO IN U.S.A.

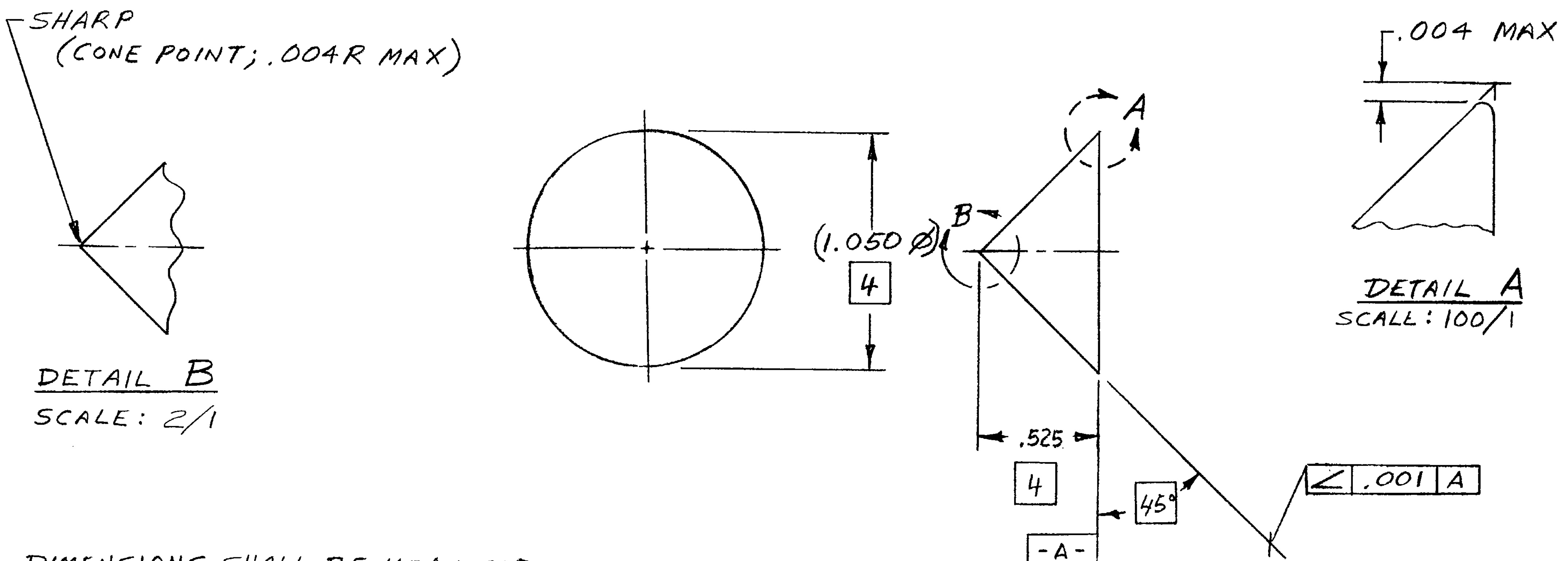
SIMILIAR 2 TO B850667 REV B

C 876234

B 876350

DASH NO	TYPE OR MODEL	NEXT ASSEMBLY
	CL1800	C876234
	REF	100040466

REQ	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
		UNALLOYED TANTALUM, VACUUM ARC-CAST ASTM B365 CERTIFIED	



DO NOT SCALE DRAWING

NOTES:

1. MFR PER M7-8000.
2. PART TO BE PROTECTED FROM DENTS, NICKS AND SCRATCHES.
3. PART TO BE INDIVIDUALLY BOXED. MARK BOX WITH PART NO. & REV. LETTER.
4. ALL DIMENSIONS SHALL BE MEASURED FROM THE INTERSECTION OF THE SURFACE PLANES.

-01 SHOWN

DESCRIPTION OF CHANGE	ENG. RELEASE	REVISED MATERIAL CALLOUT (WAS "MG TANTALUM ROD, UNANNEALED 16.6 G/CC"	ADDED .XXX ±.001 TOLERANCE	ADDED DETAIL "A"	SURFACE ROUGHNESS WAS 125	MFG. REL	ZONE B-2 DIM .525 WAS REF ZONE C-3 1.050 WAS NOT REF	ZONE C-4 .004R WAS .001R ZONE D-1 .004R WAS .0015	RECLASSIFY DWG FROM "B" TO "A"
NUM									
EO							F035	F219	F469
DFT	DO	OLSON							
CHK		JOE R. 2.21.85					CULEST	CULEST	ANNE B.
DATE	11-9-84	2-20-85					8-22-85	8-22-85	4-24-86
REV	1	A					B	C	D

DRAWN	DATE	APPROVED	DATE	CODE
OLSON	11-9-84		11/9/84	N
CHECKED	DATE	APPROVED	DATE	CLASS
PATERENWIC	2-21-85		2/20/85	A

CONICAL INSERT, FIELD FLATTENER

NOT OTHERWISE SPEC: FRAC ± ANG ± SCALE 1/1
FIN. 63√ DEC .X ± .XX ± .XXX ± .001

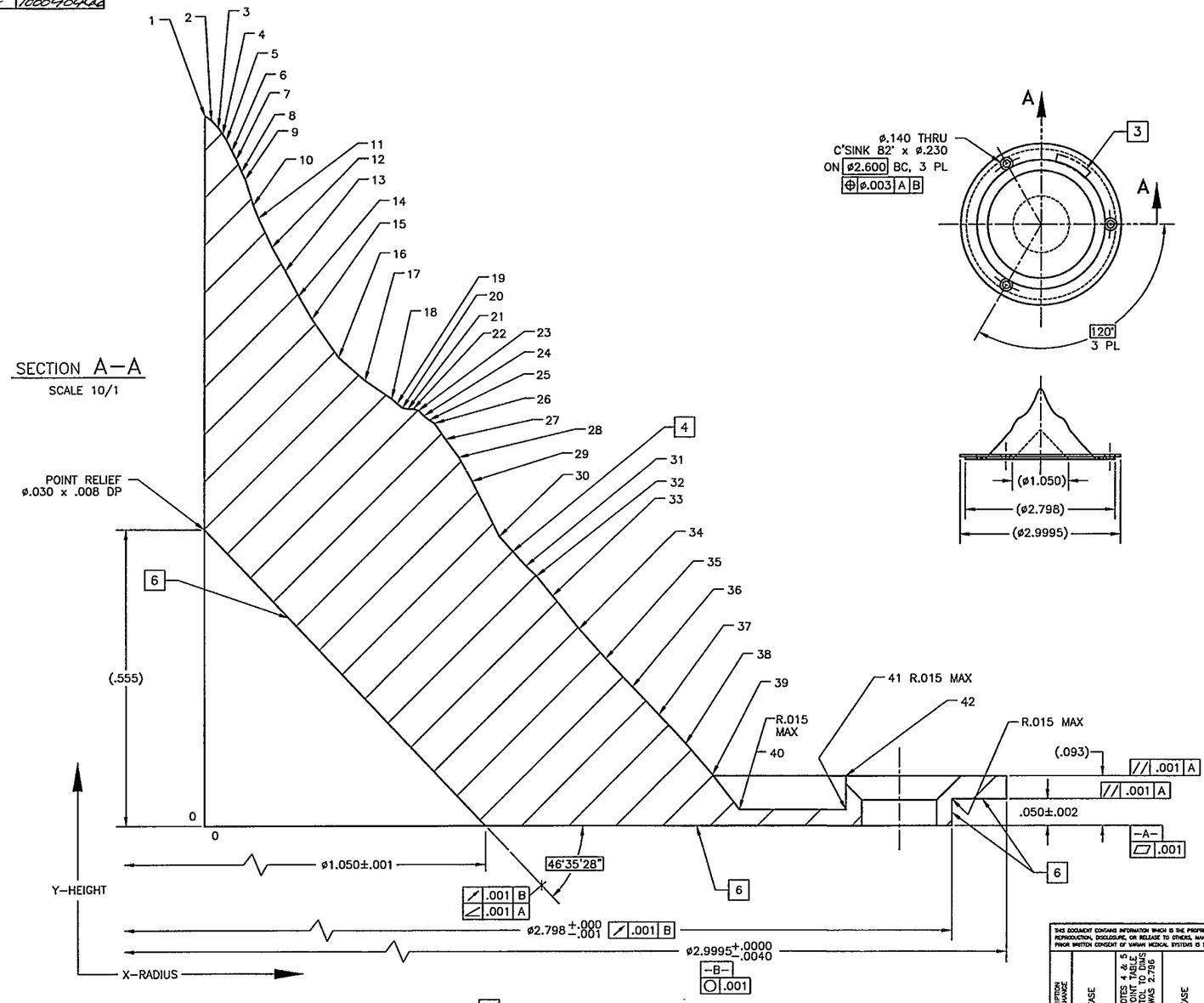
varian — RADIATION DIVISION | SIZE B | DRAWING NO. 876350 | REV D

0441-06-04 JUNE 66 P8/83 LITHO IN U.S.A.

SIMILAR TO B850664 REV C

DASH NO	TYPE OR MODEL	NEXT ASSEMBLY
	REF	1000404466

QTY	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
		SAE 12L14 FREE-MACHINING STEEL	



5 4 POINTS	X–RADIUS BASIC	Y–HEIGHT BEFORE PLATING ±.0020 REF	Y–HEIGHT AFTER PLATING ±.0020
1	.000	1.3270	1.3277
2	.012	1.3190	1.3197
3	.025	1.3050	1.3059
4	.033	1.2930	1.2941
5	.040	1.2820	1.2831
6	.050	1.2620	1.2633
7	.058	1.2460	1.2473
8	.068	1.2230	1.2245
9	.075	1.2090	1.2103
10	.090	1.1610	1.1630
11	.100	1.1370	1.1386
12	.125	1.0830	1.0844
13	.150	1.0390	1.0402
14	.175	.9920	.9933
15	.200	.9490	.9502
16	.250	.8770	.8781
17	.300	.8340	.8348
18	.350	.8000	.8007
19	.360	.7910	.7918
20	.370	.7830	.7838
21	.380	.7810	.7816
22	.390	.7810	.7816
23	.400	.7780	.7786
24	.410	.7680	.7689
25	.420	.7600	.7608
26	.430	.7540	.7547
27	.450	.7240	.7251
28	.475	.6900	.6910
29	.500	.6450	.6462
30	.550	.5420	.5434
31	.600	.4860	.4869
32	.620	.4670	.4678
33	.650	.4300	.4310
34	.700	.3680	.3690
35	.750	.3120	.3129
36	.800	.2590	.2599
37	.850	.2070	.2079
38	.900	.1530	.1539
39	.950	.0950	.0959
40	1.000	.0300	.0310
41	1.200	.0300	.0306
42	1.200	.0930	.0936

3 IDENTIFY WITH PART NO. & REV LEVEL, SERIAL NO. & ENERGY (20X) PER M70–8010 WITH ELECTRIC PENCIL USING .125 HIGH CHARACTERS.

2. PART SHALL BE PROTECTED AT ALL TIMES FROM DENTS, NICKS & SCRATCHES.

1. MFR PER M7–8000.

NOTES:

6 DO NOT PLATE SURFACES NOTED.

5 ELECTROLESS NICKEL PLATE PER MIL–C–26074, CLASS 2, GRADE B (.0005–.0007 THK).

4 X–RADIUS DIMENSIONS ARE BASIC TO –A– AND –B–. PROFILE IS A SERIES OF POINT–TO–POINT SURFACES (NOT A SMOOTH CURVE). PROFILE SHALL NOT VARY MORE THAN ±.002 FROM A STRAIGHT LINE INTERPOLATION BETWEEN ADJACENT POINTS.

DO NOT SCALE DRAWING

DESCRIPTION OF CHANGE	ENG RELEASE	UPDATE NOTES 4 & 5 UPDATE POINT TABLE ADD CED TOL TO DIMS AZB DIM WAS 2.796	MFG RELEASE	BZ4 ADD R.015 DIM BZ4 ADD .030 CHAM	ZONE B–5 CHAMFER WAS REMOVED FROM ø2.798	DIM ø2.9995 +.0000/ -.0040 WAS ø3.000.
APVD	CJH	CJH	CJH/LD			
ECO				N383	N912	1011705
DFT	SAM	SAM	SAM	SAM	MARCO	P. NGO
CHK			TER	LEE S.	TER	DJB
DATE	1-23-92	3-20-92	4-23-92	5-19-92	12-8-92	1-30-02
REV	1	2	A	B	C	D

SIMILAR TO:

DASH	DESCRIPTION
-01	SHOWN

VARIAN medical systems | ONCOLOGY SYSTEMS

DRAWN	DATE	APPROVED	DATE	SCALE
S MERICS	11-25-91	C HUNTZINGER	1-23-92	1/1
CHECKED	DATE	APPROVED	DATE	SHEET
T MCFALL	4-23-92	L DOOCY	4-23-92	1 OF 1

FLATTENER, TOP, 20X

UNLESS OTHERWISE SPEC: ANG± --- FIN 63 .XX± --- .XXX± --- .XXXX±.003

D 890176 D

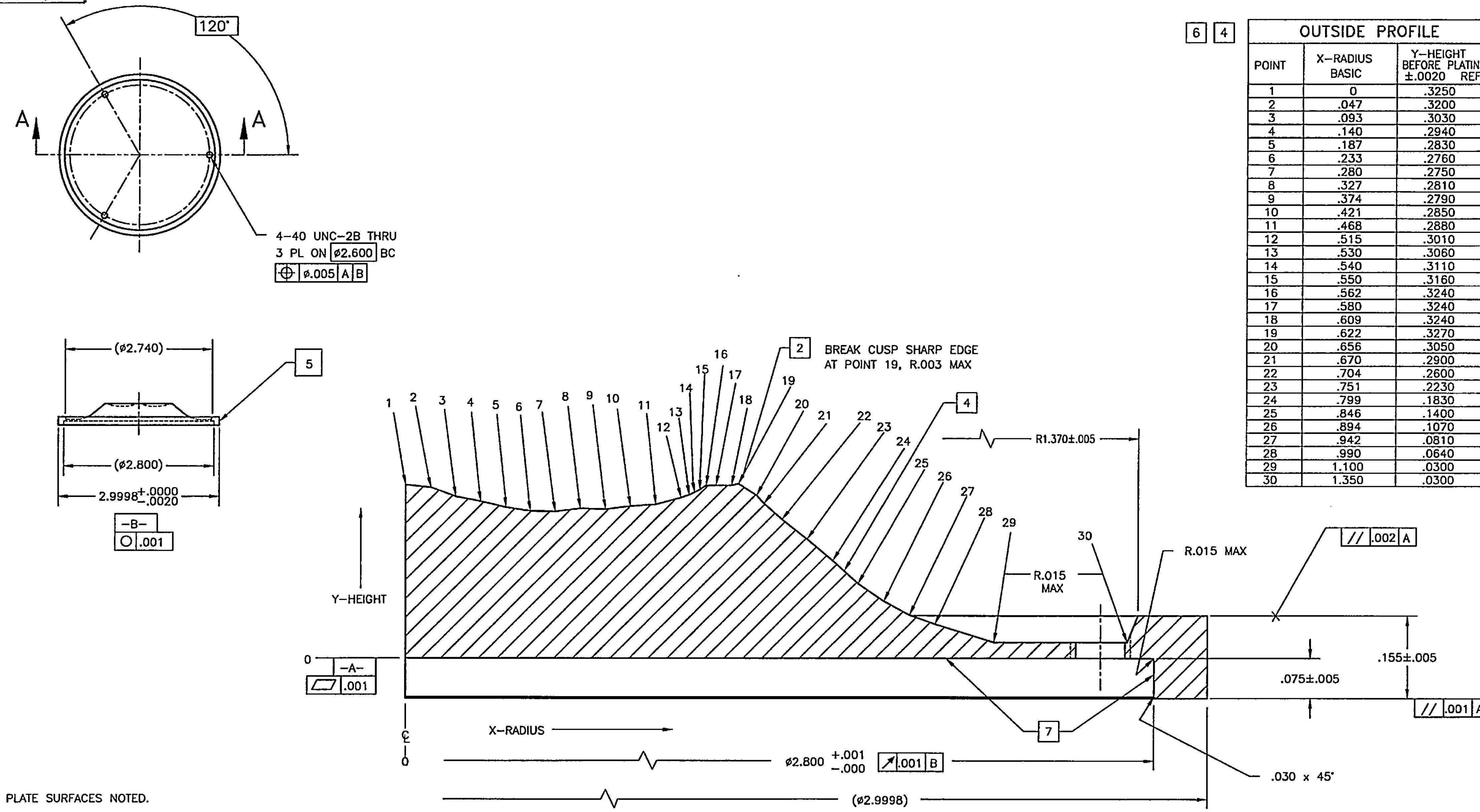
SIZE | DRAWING NUMBER | REV

D 890176

ACAD=60.

DASH NO	TYPE OR MODEL	NEXT ASSEMBLY
CL2300C	890175	
REF	100040466	

QTY	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
		SAE 12L14 FREE-MACHINING STEEL	



6 4

OUTSIDE PROFILE			
POINT	X-RADIUS BASIC	Y-HEIGHT BEFORE PLATING ±.0020 REF	Y-HEIGHT AFTER PLATING ±.0020
1	0	.3250	.3256
2	.047	.3200	.3206
3	.093	.3030	.3036
4	.140	.2940	.2946
5	.187	.2830	.2836
6	.233	.2760	.2776
7	.280	.2750	.2756
8	.327	.2810	.2816
9	.374	.2790	.2796
10	.421	.2850	.2856
11	.468	.2880	.2886
12	.515	.3010	.3016
13	.530	.3060	.3067
14	.540	.3110	.3117
15	.550	.3160	.3167
16	.562	.3240	.3246
17	.580	.3240	.3246
18	.609	.3240	.3246
19	.622	.3270	.3276
20	.656	.3050	.3057
21	.670	.2900	.2908
22	.704	.2600	.2608
23	.751	.2230	.2238
24	.799	.1830	.1838
25	.846	.1400	.1408
26	.894	.1070	.1077
27	.942	.0810	.0817
28	.990	.0640	.0646
29	1.100	.0300	.0306
30	1.350	.0300	.0316

NOTES:

1. MFR PER M7-8000.
2. POINT 16 IS BEFORE BREAKING OF CUSP SHARP EDGE.
3. PARTS SHALL BE PROTECTED AT ALL TIMES FROM DENTS, NICKS & SCRATCHES.
4. X-RADIUS DIMENSIONS ARE BASIC TO -A- AND -B-. PROFILE IS A SERIES OF POINT-TO-POINT SURFACES (NOT A SMOOTH CURVE). PROFILE SHALL NOT VARY MORE THAN ±.002 FROM A STRAIGHT LINE INTERPOLATION BETWEEN ADJACENT POINTS.
5. IDENTIFY WITH PART NO., REV LETTER, ENERGY (20X) & SERIAL NO. PER M70-8010 WITH ELECTRIC PENCIL USING .125 HIGH CHARACTERS.
6. ELECTROLESS NICKEL PLATE PER MIL-C-26074, CLASS 2, GRADE B (.0005-.0007 THK).
7. DO NOT PLATE SURFACES NOTED.

DO NOT SCALE DRAWING

DESCRIPTION OF CHANGE	ENG RELEASE	UPDATE NOTES 4 & 6 UPDATE POINTS TABLE ADD GEO TOL TO DIMS BZ5 DIM WAS R1.400 ADD NOTE 7	MFG RELEASE	CZ3 ADD R.015 DIM CZ3 .030 WAS .005	DIM ⌀2.9998 +.0000/-.0020 WAS ⌀3.000.
APVD	CJH	CJH	CJH/LD		
ECO				N383	1011705
DFT	SAM	SAM	SAM	SAM	P. NGO
CHK			TM	LEE S	[illegible]
DATE	1-23-92	3-20-92	4-23-92	5-14-92	1-36-02
REV	1	2	A	B	C

DASH	DESCRIPTION
-01	SHOWN

VARIAN medical systems — ONCOLOGY SYSTEMS

DRAWN	DATE	APPROVED	DATE	SCALE
S MERICS	11-25-91	C HUNTZINGER	1-23-92	1/1
CHECKED	DATE	APPROVED	DATE	SHEET
T McFALL	4-23-92	L DOOCY	4-23-92	1 OF 1

FLATTENER BOTTOM 20X

UNLESS OTHERWISE SPEC: ANG±=0°30' .X±= — .XX±= — .XXX±= .003 63 √

SIZE	DRAWING NUMBER	REV
D	890177	C

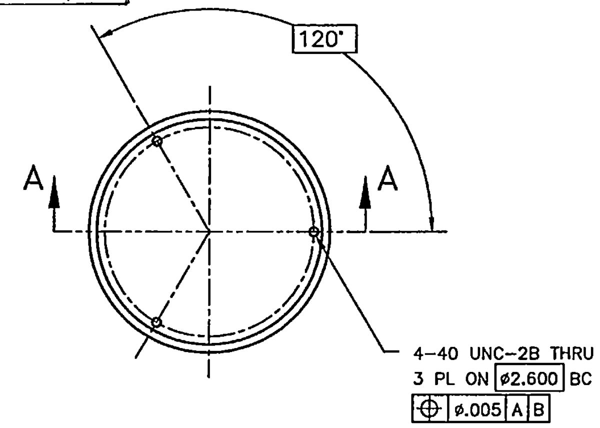
SIMILAR TO: 850663

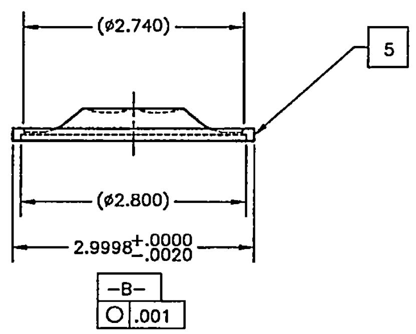
ACAD=60.

D 890177

DASH NO	TYPE OR MODEL	NEXT ASSEMBLY
	CL2300C	890175
	REF	100040466

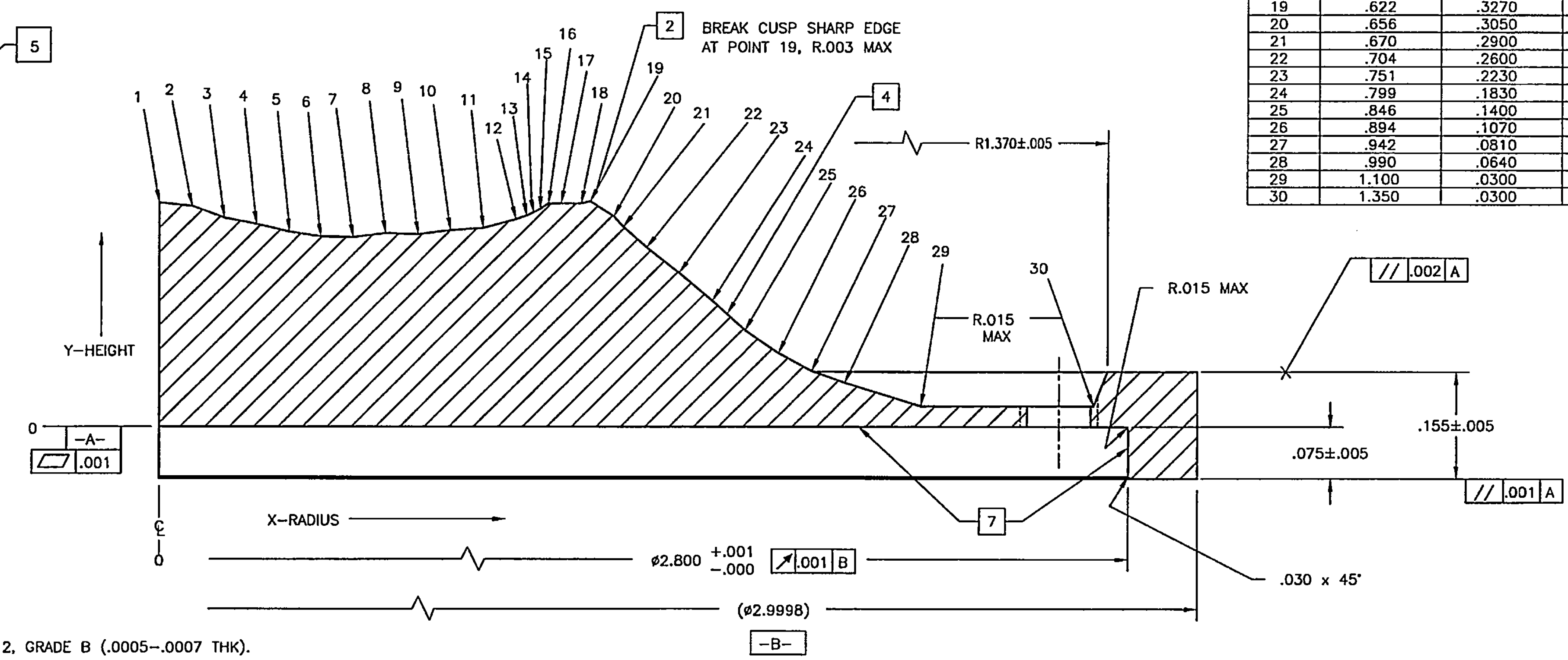
QTY	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
		SAE 12L14 FREE-MACHINING STEEL	





6 4

POINT	X-RADIUS BASIC	Y-HEIGHT BEFORE PLATING ±.0020 REF	Y-HEIGHT AFTER PLATING ±.0020
1	0	.3250	.3256
2	.047	.3200	.3206
3	.093	.3030	.3036
4	.140	.2940	.2946
5	.187	.2830	.2836
6	.233	.2760	.2776
7	.280	.2750	.2756
8	.327	.2810	.2816
9	.374	.2790	.2796
10	.421	.2850	.2856
11	.468	.2880	.2886
12	.515	.3010	.3016
13	.530	.3060	.3067
14	.540	.3110	.3117
15	.550	.3160	.3167
16	.562	.3240	.3246
17	.580	.3240	.3246
18	.609	.3240	.3246
19	.622	.3270	.3276
20	.656	.3050	.3057
21	.670	.2900	.2908
22	.704	.2600	.2608
23	.751	.2230	.2238
24	.799	.1830	.1838
25	.846	.1400	.1408
26	.894	.1070	.1077
27	.942	.0810	.0817
28	.990	.0640	.0646
29	1.100	.0300	.0306
30	1.350	.0300	.0316



PATRIAL SECTION A–A
SCALE 1/10

7 DO NOT PLATE SURFACES NOTED.

6 ELECTROLESS NICKEL PLATE PER MIL-C-26074, CLASS 2, GRADE B (.0005-.0007 THK).

5 IDENTIFY WITH PART NO., REV LETTER, ENERGY (20X) & SERIAL NO. PER M70-8010 WITH ELECTRIC PENCIL USING .125 HIGH CHARACTERS.

4 X-RADIUS DIMENSIONS ARE BASIC TO -A- AND -B-. PROFILE IS A SERIES OF POINT-TO-POINT SURFACES (NOT A SMOOTH CURVE). PROFILE SHALL NOT VARY MORE THAN ±.002 FROM A STRAIGHT LINE INTERPOLATION BETWEEN ADJACENT POINTS.

3. PARTS SHALL BE PROTECTED AT ALL TIMES FROM DENTS, NICKS & SCRATCHES.

2 POINT 16 IS BEFORE BREAKING OF CUSP SHARP EDGE.

1. MFR PER M7-8000.

NOTES:

DO NOT SCALE DRAWING

DESCRIPTION OF CHANGE	ENG RELEASE	UPDATE NOTES 4, & 6 UPDATE POINTS TABLE ADD GEO TOL TO DIMS B25 DIM WAS R1.400 ADD NOTE 7	MFG RELEASE	C23 ADD R.015 DIM C23 .030 WAS .005	DIM ⌀2.9998 +.0000/-.0020 WAS ⌀3.000
APVD	CJH	CJH	CJH/LD		
ECO				N383	1011705
DFT	SAM	SAM	SAM	SAM	P. NGO
CHK			TM	LEE S	[signature]
DATE	1-23-92	3-20-92	4-23-92	5-14-92	1-30-02
REV	1	2	A	B	C

-01	SHOWN
DASH	DESCRIPTION

VARIAN medical systems — ONCOLOGY SYSTEMS

DRAWN	DATE	APPROVED	DATE	SCALE
S MERICS	11-25-91	C HUNTZINGER	1-23-92	1/1
CHECKED	DATE	APPROVED	DATE	SHEET
T McFALL	4-23-92	L DOOCY	4-23-92	1 OF 1

FLATTENER BOTTOM 20X

UNLESS OTHERWISE SPEC: ANG±0°30' .X±— .XX±— .XXX±.003 63 √

SIZE D DRAWING NUMBER 890177 REV C

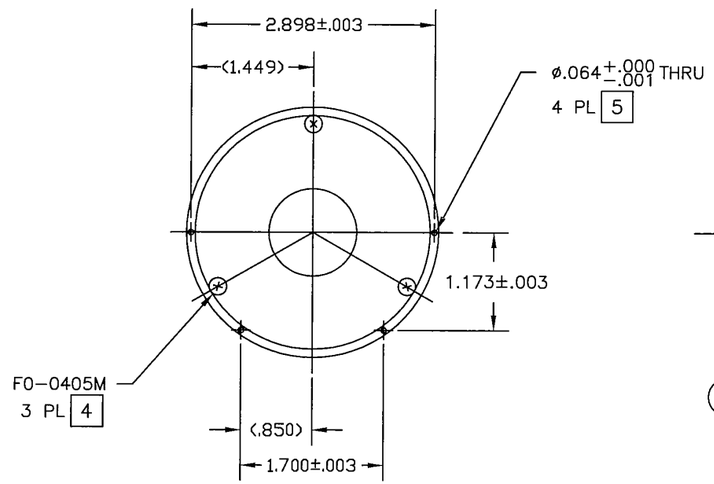
SIMILAR TO: 850663

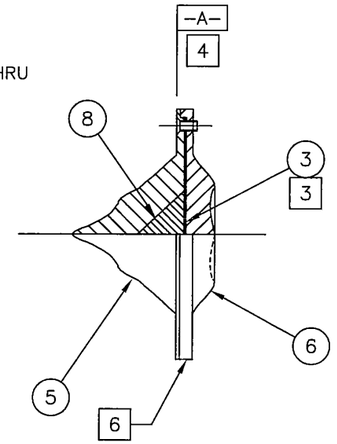
ACAD=60.

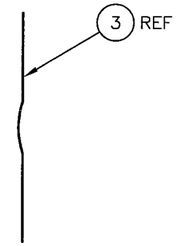
D 890177

DASH NO	TYPE OR MODEL	NEXT ASSEMBLY
	CL2300C	D882620
	REF	1000404466

	QTY	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
5	REF	TD80715-01	DRILL, FIXTURE FLATTENER	1
				2
	1	B850665-01	SHIM, FIELD FLATTENER	3
				4
	1	D890176-01	FLATTENER, TOP, 20X	5
	1	D890177-01	FLATTENER, BOTTOM, 20X	6
				7
	1	B890178-01	CONICAL INSERT, FLATTENER, 20X	8







DETAIL B
SCALE: NONE

NOTES:

1. MFR PER M7-8000.
2. PART TO BE PROTECTED FROM DENTS, NICKS & SCRATCHES.

[3] CONICAL INSERT, ITEM 8, MUST FIT SECURELY IN PLACE USING SHIM, ITEM 3.

[4] FLAT HEAD SCREWS MUST NOT PROTRUDE ABOVE SURFACE [-A-] .

[5] ø.064 HOLES TO BE DRILLED AFTER ASSEMBLY.

[6] IDENTIFY PART NO. & REV LEVEL, SERIAL NO. & ENERGY (20X) WITH ELECTRIC PENCIL IN AREA SHOWN.

7. HARDWARE CODES PER 828000.

DO NOT SCALE DRAWING

DESCRIPTION OF CHANGE	ENG RELEASE	MFG RELEASE	ZONE D-3,4 BALLOOM 5 WAS ADDED BALLOOM 6 WAS ADDED
ASVD	CJH	CJH/LD	
ECO			N912
DFT	SAM	SAM	MARCO
CHK		TER	TER
DATE	1-23-92	4-23-92	12-8-92
REV	1	A	B

-01	SHOWN
PART NO.	DESCRIPTION

DRAWN	DATE	APPROVED	DATE
S. MERICS	11-25-91	C. HUNTZINGER	1-23-92
CHECKED	DATE	APPROVED	DATE
T. MCFALL	4-23-92	L. DOOCY	1-23-92

FLATTENER, FILTER ASSEMBLY 20X

NOT OTHERWISE SPEC: ANG± -- FIN. √DEC .XX± -- .XXX± -- .XXXX± --

SCALE 1/1 SHEET 1 OF 1

varian oncology systems

C 890175 B

SIZE DRAWING NO REV

ACAD=60. J0175-B1

DASH NO	TYPE OR MODEL	NEXT ASSEMBLY
	CL2300C	C890175
	REF	100040466

B 890178

REQ	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
		UNALLOYED TANTALUM, VACUUM ARC-CAST ASTM B365 CERTIFIED	

SHARP (CONE POINT; R.004 MAX)

DETAIL A
SCALE 10/1

(ø1.050)
4

.555
4

⌭ .001 A

46°35'28"

-A-

.004 MAX

DETAIL B
SCALE 50/1

4 ALL DIMENSIONS SHALL BE MEASURED FROM THE INTERSECTION OF THE SURFACE PLANES.

3. PART TO BE INDIVIDUALLY BOXED. MARK BOX WITH PART NO. AND REV LETTER.

2. PART TO BE PROTECTED FROM DENTS, NICKS AND SCRATCHES.

1. MFR PER M7-8000.

NOTES:

DO NOT SCALE DRAWING

DESCRIPTION OF CHANGE	ENG RELEASE	MFG RELEASE
APVD	CJH	
ECO		
DFT	SAM	SAM
CHK		
DATE	1-23-92	4-23-92
REV	1	A

-01	SHOWN
PART NO.	DESCRIPTION

DRAWN	DATE	APPROVED	DATE
S MERICS	11-25-91	C HUNTZINGER	1-23-92
CHECKED	DATE	APPROVED	DATE
	4-23-92		4-23-92

CONICAL INSERT, FLATTENER, 20X

NOT OTHERWISE SPEC: ANG± ---
FIN. 63 DEC .X ± --- .XX ± --- .XXX ±.001

SCALE 1/1 | SHEET 1 of 1

varian medical equipment

SIZE	DRAWING NO	REV
B	890178	A

4MATB 5 4 3 SIMILAR TO: 876350 2 ACAD=60 J0178-A1

Physical Wedge Filter

This section includes outline drawings and specification information of the upper and lower wedges for different field sizes. Wedge filters are employed in such situations to modify the incident beam by preferentially attenuating the intensity across the beam.

Wedge filters are usually in the form of a 1-D absorbing wedges which tilt the isodose distribution through a given angle at a specific depth. Wedges are commonly used for two fields at 90° to each other but at larger and smaller angles as well.

Current Type III* accessories:
15°, 30° wedges are steel (ρ=7.8 g/cm^3), 45°, 60° wedges are lead (ρ= 11.3 g/cm^3)
The 20 cm/3 set includes 15 cm 60° wedges. The 30 cm set includes 15cm 60° wedges and 20cm 45 °wedges.

		MLC Wedge Filter Upper		
Dimensions	**Angle (°)**	**Material**	**Composition**	**Density (g/cm^3)**
20 cm x 40 cm	15	ASI Type 1018/1020 low carbon		7.86
20 cm x 40 cm	30	ASI Type 1018/1020 low carbon		7.86
20 cm x 40 cm	45	Ca/Sn Alloy Lead	0.065%/1.5%	11.2
15 cm x 40 cm	60	Ca/Sn Alloy Lead	0.065%/1.5%	11.2
30 cm x 40 cm	15	ASI Type 1018/1020 low carbon		7.86
30 cm x 40 cm	30	ASI Type 1018/1020 low carbon		7.86

		MLC Wedge Filter Lower		
Dimensions	**Angle (°)**	**Material**	**Composition**	**Density (g/cm^3)**
20 cm x 40 cm	15	ASI Type 1018/1020 low carbon		7.86
20 cm x 40 cm	30	ASI Type 1018/1020 low carbon		7.86
20 cm x 40 cm	45	Ca/Sn Alloy Lead	0.065%/ 1.5%	11.2
15 cm x 40 cm	60	Ca/Sn Alloy Lead	0.065%/ 1.5%	11.2
30 cm x 40 cm	15	ASI Type 1018/1020 low carbon		7.86
30 cm x 40 cm	30	ASI Type 1018/1020 low carbon		7.86

© Varian Medical Systems MLC Wedge Filter and Tray for 30 cm X 40 cm field size
*Varian begin producing type III accessories in November 1991

DASH	MODEL	NEXT ASSEMBLY
	REF	100040466

QTY	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM

METRIC
DIMENSIONS ARE IN MILLIMETERS (mm)

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

REV	DESCRIPTION OF CHANGE	APVD	ECO	DFT	CHK	DATE
1	ENGN RELEASE	DCP		JTM	AFS	9-20-00
2	PER SHT 3, REF DRWG 889488, DIM 10.1 BTM ARROW EXTENDED TO BTM OF PART; WAS TO TOP OF 3.5 DIM	AFS		JTM	A.F. SORENSEN	4-30-01
3	ADDED SHEET 1 WITH NOTE UPDATED SHEET SEQUENCE ACCORDINGLY: SEE SHEET 3 WAS 2, 2A9 ... SHT 2 WAS 1, 3C4 SEE SHEET 5 WAS 4, 4A10 ... SHT 4 WAS 3, 5B4	[illegible]		KIM TRAN	[illegible]	6/22/05

DASH	DESCRIPTION

VARIAN medical systems | ONCOLOGY SYSTEMS

DRAWN	DATE	APPROVED	DATE	SCALE
J.MAGUIRE	9-18-00	PAWLAK	9-20-00	NONE
CHECKED	**DATE**	**APPROVED**	**DATE**	**SHEET**
A.F.SORENSEN	9-20-00			1 OF 5

MLC WEDGES OUTLINE DRAWINGS

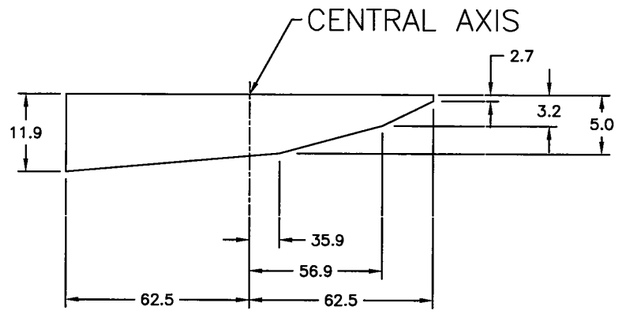
NOT OTHERWISE SPEC: AND ±
SURFACE TEXTURE, VALUES IN µm FIN. ✓
TOLERANCES LINEAR: UP TO 100, ± 0.25 100 TO 300, ± 0.5 300 TO 1800, ± 0.75

SIZE	DRAWING NUMBER	REV
D	100011615	3

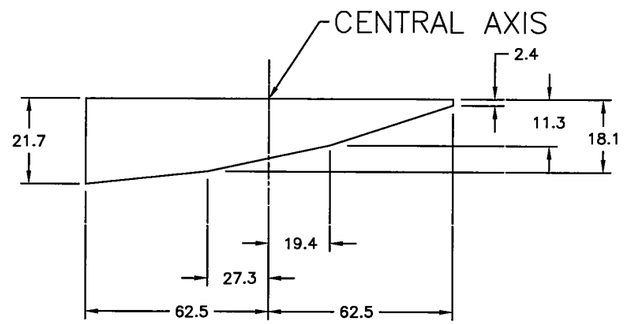
SIMILAR TO:

ACAD=60. 100011615-3-1

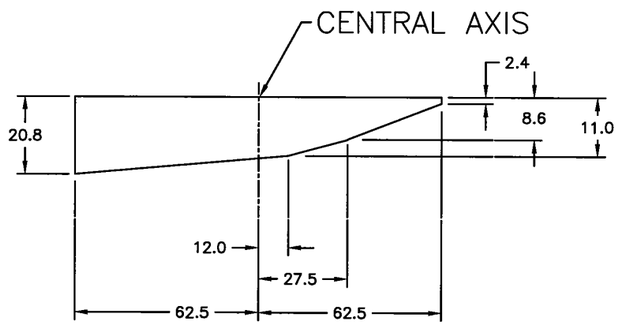
D 100011615



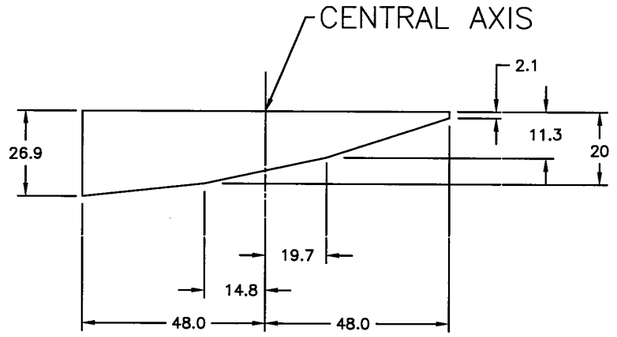
MLC WEDGE FILTER, UPPER 20cm X 40cm 15° DRWG NO. 889482	MATERIAL: ASI TYPE 1018/1020 LOW CARBON STEEL: ρ = 7.86g/cc
REF: BEAM DATA WEDGE 01	



MLC WEDGE FILTER, UPPER 20cm X 40cm 30° DRWG NO. 889483	MATERIAL: ASI TYPE 1018/1020 LOW CARBON STEEL: ρ = 7.86g/cc
REF: BEAM DATA WEDGE 02	



MLC WEDGE FILTER, UPPER 20cm X 40cm 45° DRWG NO. 892174	MATERIAL: Ca/Sn ALLOY LEAD (0.065%/1.5%) ρ = 11.20g/cc
REF: BEAM DATA WEDGE 03	



MLC WEDGE FILTER, UPPER 15cm X 40cm 60° DRWG NO. 892173	MATERIAL: Ca/Sn ALLOY LEAD (0.065%/1.5%) ρ = 11.20g/cc
REF: BEAM DATA WEDGE 04	

LENGTH OF ALL UPPER WEDGES 253.4mm
SEE SHEET 3

NOTE: DRAWING NOT TO SCALE

METRIC
DIMENSIONS ARE IN MILLIMETERS (mm)

THIRD ANGLE PROJECTION

VARIAN medical systems | ONCOLOGY SYSTEMS

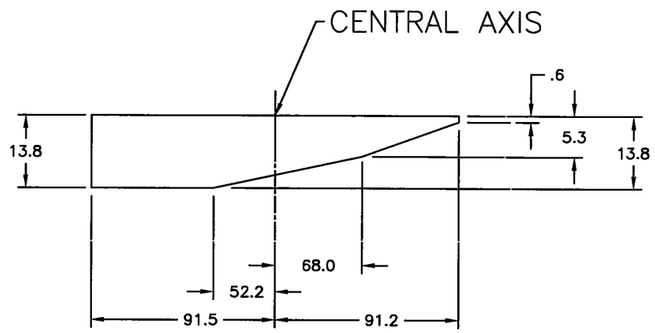
SCALE NONE | SHEET 2 OF 5

MLC WEDGES
OUTLINE DRAWINGS

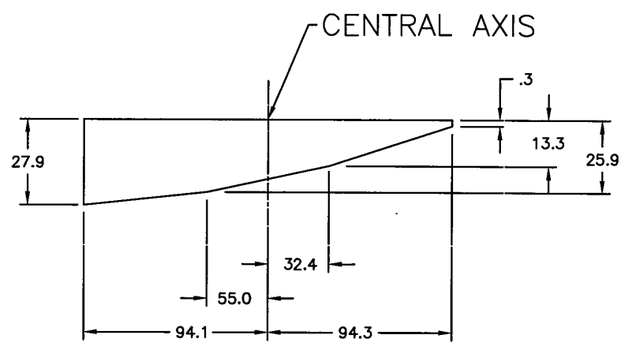
D100011615 | 3

ACAD=50. 100011615-3-2

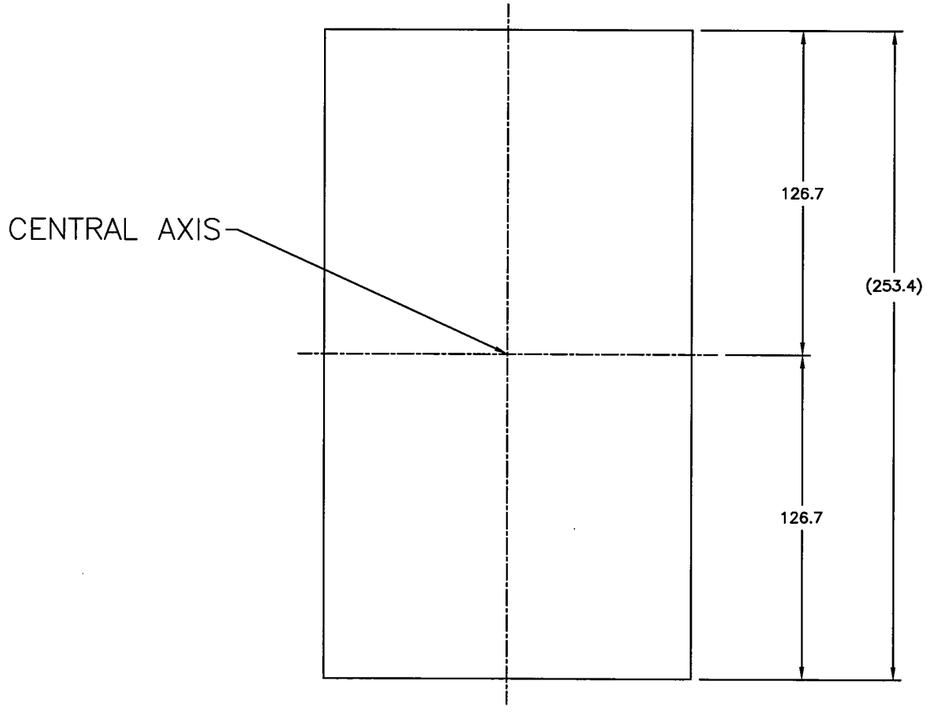
D100011615



MLC WEDGE FILTER, UPPER 30cm X 40cm 15° DRWG NO. 1106087	MATERIAL: ASI TYPE 1018/1020 LOW CARBON STEEL: ρ = 7.86g/cc
REF: EX BEAM DATA WEDGE 09	



MLC WEDGE FILTER, UPPER 30cm X 40cm 30° DRWG NO. 1106088	MATERIAL: ASI TYPE 1018/1020 LOW CARBON STEEL: ρ = 7.86g/cc
REF: EX BEAM DATA WEDGE 10	



(253.4) LENGTH OF ALL MLC UPPER WEDGES ON THIS SHT & SHT 2

NOTE: DRAWING NOT TO SCALE

METRIC
DIMENSIONS ARE IN MILLIMETERS (mm)

THIRD ANGLE PROJECTION

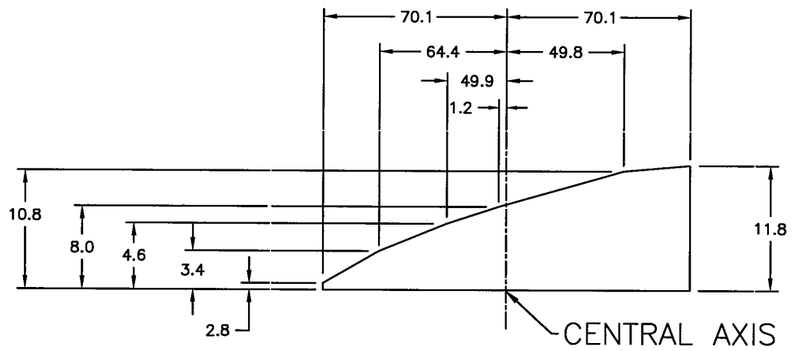
VARIAN medical systems | ONCOLOGY SYSTEMS

SCALE NONE | SHEET 3 OF 5

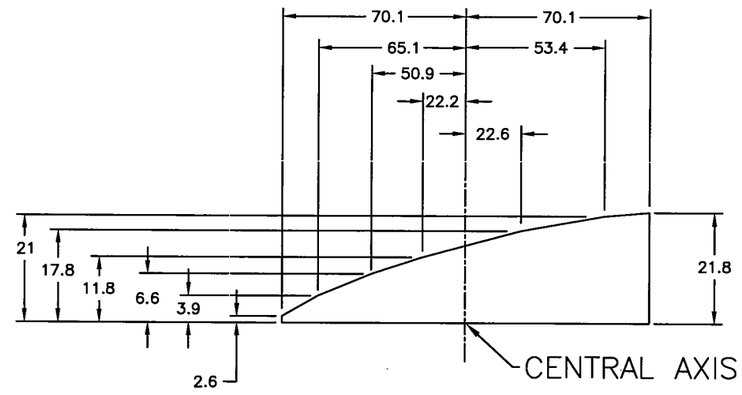
MLC WEDGES
OUTLINE DRAWINGS

D 100011615 3

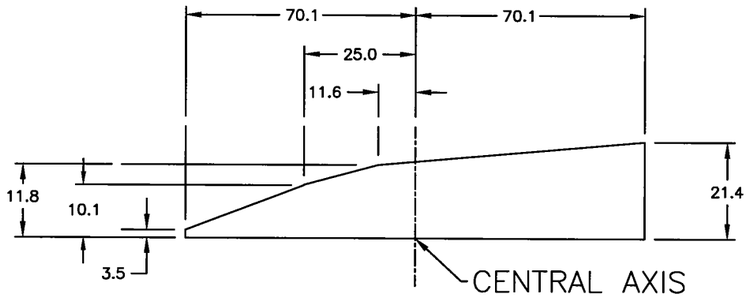
ACAD=60. 100011615-3-3



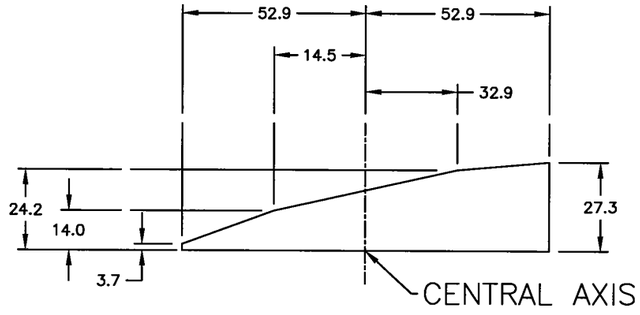
MLC WEDGE FILTER, LOWER 20cm X 40cm 15° DRWG NO. 889486	MATERIAL: ASI TYPE 1018/1020 LOW CARBON STEEL: ρ = 7.86g/cc
REF: EX BEAM DATA WEDGE 05	



MLC WEDGE FILTER, LOWER 20cm X 40cm 30° DRWG NO. 889487	MATERIAL: ASI TYPE 1018/1020 LOW CARBON STEEL: ρ = 7.86g/cc
REF: EX BEAM DATA WEDGE 06	



MLC WEDGE FILTER, LOWER 20cm X 40cm 45° DRWG NO. 889488	MATERIAL: Ca/Sn ALLOY LEAD (0.065%/1.5%) ρ = 11.20g/cc
REF: EX BEAM DATA WEDGE 07	



MLC WEDGE FILTER, LOWER 15cm X 40cm 60° DRWG NO. 889485	MATERIAL: Ca/Sn ALLOY LEAD (0.065%/1.5%) ρ = 11.20g/cc
REF: EX BEAM DATA WEDGE 08	

LENGTH OF ALL LOWER WEDGES 300.0
SEE SHEET 5

NOTE: DRAWING NOT TO SCALE

METRIC
DIMENSIONS ARE IN MILLIMETERS (mm)

THIRD ANGLE PROJECTION

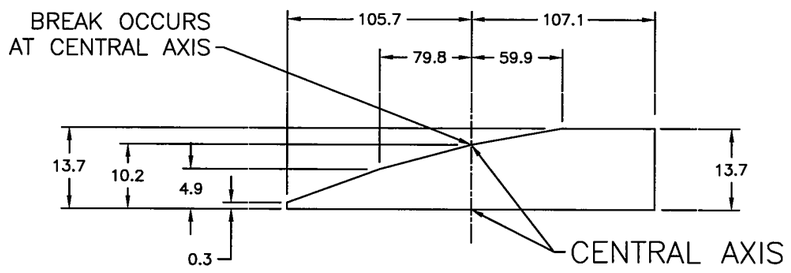
VARIAN medical systems | ONCOLOGY SYSTEMS

SCALE NONE | SHEET 4 OF 5

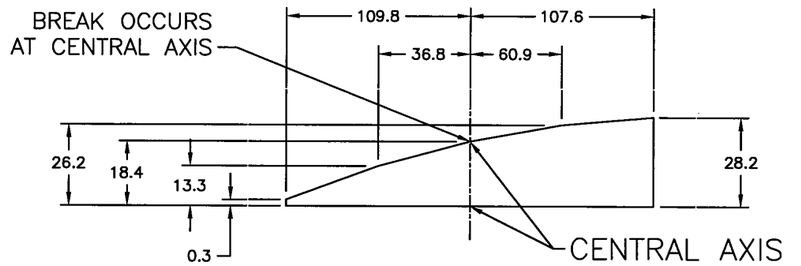
MLC WEDGES
OUTLINE DRAWINGS

D100011615 | 3

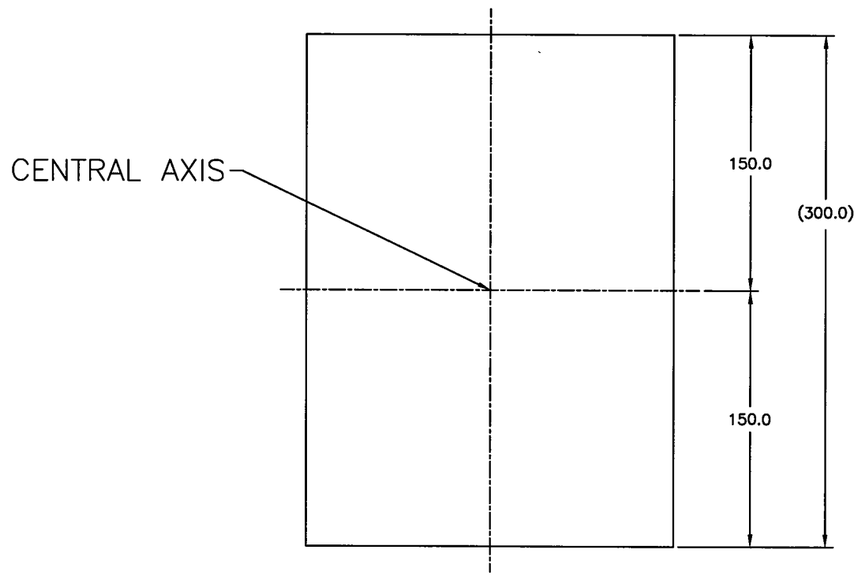
ACAD=60. 100011615-3-4



MLC WEDGE FILTER, LOWER 30cm X 40cm 15° DRWG NO. 1106089	MATERIAL: ASI TYPE 1018/1020 LOW CARBON STEEL: ρ = 7.86g/cc
REF: EX BEAM DATA WEDGE 11	



MLC WEDGE FILTER, LOWER 30cm X 40cm 30° DRWG NO. 1106090	MATERIAL: ASI TYPE 1018/1020 LOW CARBON STEEL: ρ = 7.86g/cc
REF: EX BEAM DATA WEDGE 12	



NOTE: DRAWING NOT TO SCALE

METRIC
DIMENSIONS ARE IN MILLIMETERS (mm)

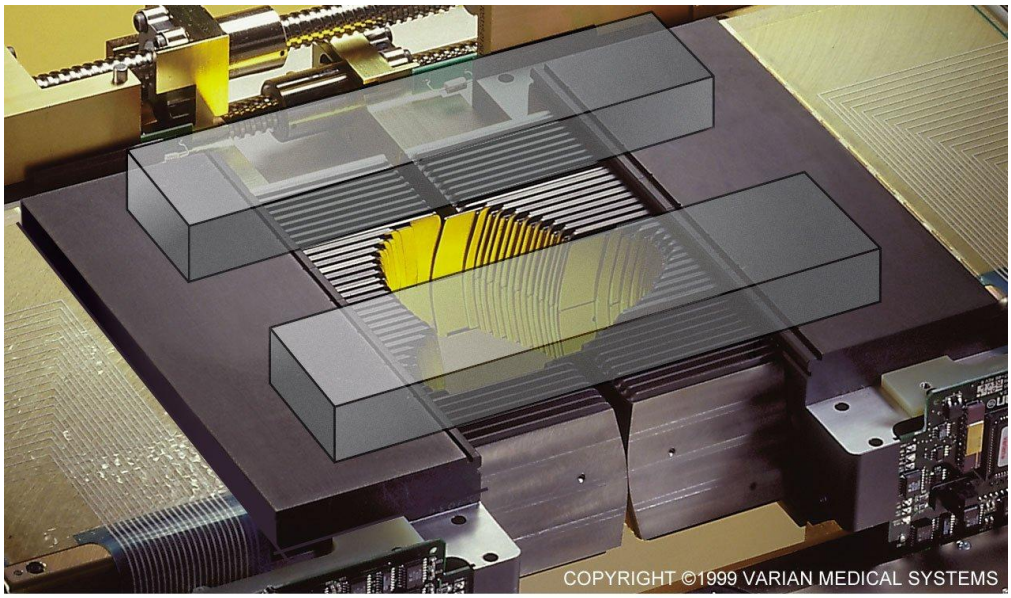
THIRD ANGLE PROJECTION	VARIAN medical systems / ONCOLOGY SYSTEMS	SCALE NONE SHEET 5 OF 5
	MLC WEDGES OUTLINE DRAWINGS	
	UNLESS OTHERWISE SPEC: ANSI ± SURFACE TEXTURE, VALUES IN µm RMS ✓ TOLERANCES LINEAR: UP TO 100, ± 0.25 / 100 TO 300, ± 0.5 / 300 TO 1000, ± 0.75	SIZE D / DRAWING NUMBER 100011615 / REV 3
	ACAD=60. 100011615-3-5	

D100011615

Millennium MLC

This section includes detailed drawings of the Millennium 80 leaf and 120 leaf MLC . There are three distinct leaf types which make up the MLC: target, isocenter + full. Drawings of the leaf half, target and isocenter are included. Additionally, detailed information about the leaf geometry and specifications are listed.

The inner leaves are arranged in an alternating pattern of thick end toward the target ("target leaf") and thick end towards isocentre ("isocentre leaf"). The lead ends are rounded to maintain a fairly constant penumbra size as a function of the leaf position. The leaves are driven linearly in and out of the field by a motor driven lead screw which extend to within approximately 2cm of the leaf end. The leaf movement is supported by a rail on which the leaves slide and the leaf has a small tip on the opposite side to compensate for the missing material due to the railing groove. Adjacent leaves are separated by an air gap which is designated as the interleaf airgap allows for minimal friction and allows the leave to move freely. Due to its complex geometry, full Monte Carlo modeling of transport through the MLC can be time consuming. The most important geometric properties for radiation transmitted through the MLC are leaf edge and tongue and groove effect (superposition of fields in which the adjacent leaves alternately block the field leads to an under dosing of the region where the tongue and groove overlap). The smaller leaf-widths provide higher resolution for delivery of smaller fields. Each leaf and carriage drive is independently controlled.



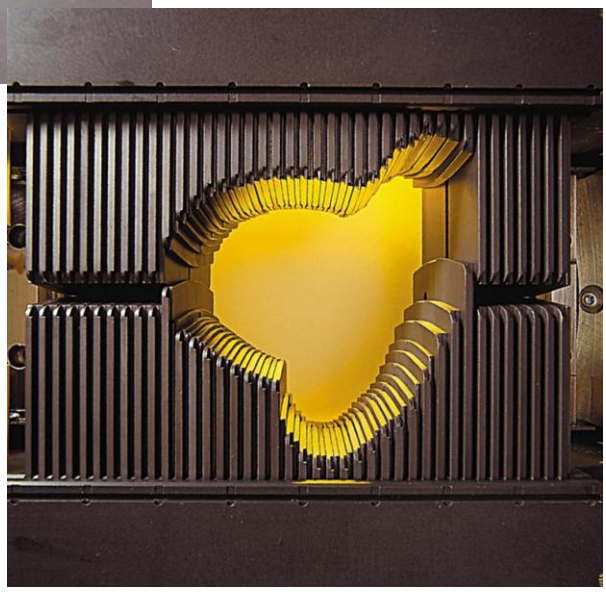
Millennium MLC: MLC-120
"The design of the Millennium MLC reduces out-of-field leakage."

Specifications:

- 80 leaf Millennium MLC
  - Maximum field size 40x40 cm
  - Leaf width 10 mm
- 120 leaf Millennium MLC
  - Maximum Field size 40x40cm
  - Central 20cm of the field: 5 mm leaf width
  - Outer 20cm of the field: 10 mm leaf width

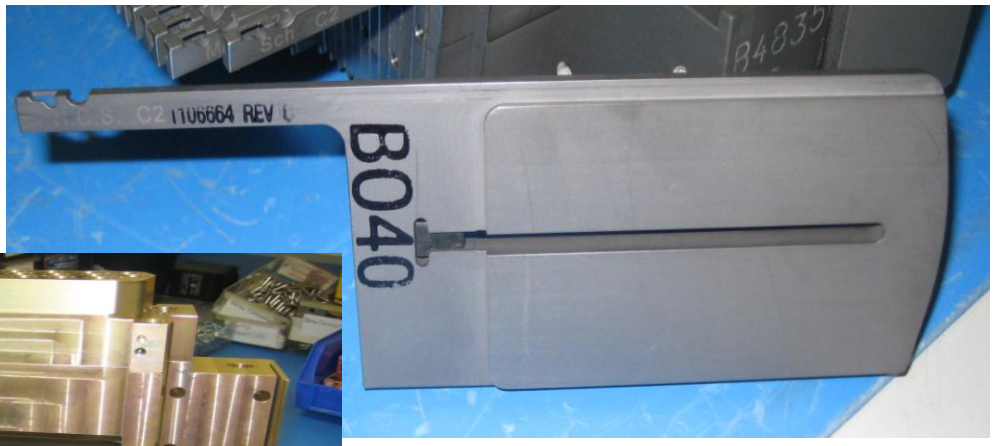
- Maximum leaf retract position: 20.1 cm (from beam centerline)
- Maximum leaf extend position: -20 cm (over beam centerline)
- Maximum distance adjacent leave on some carriage: 15.0 cm
- Maximum field length “X” direction: 40.0 cm
- Leaf end radius: 80.0 mm
- Leaf tongue and groove offsets:0.4 mm

Millennium MLC: MLC -120



Multileaf Collimator (MLC): Additional Specs

Leaf Composition: 92.5% Tungsten (Balance: Copper,
Leaf density: 17.15-17.85 g/cm^3
Leaf tips, curvature: Radius of the front of Millennium leaves is 80 mm.
Interleaf gap space: 0.025 to 0.125 mm.
Screw material:17-4 Stainless Steel[1]and diameter is 1.8 mm for half leaves and 3.0 mm for full leaves.
Leaf motion: Travel 20cm past isocenter for a total of 40cm of travel to close the field entirely (carriage movement). The leaves themselves travel 15 cm at isocenter. The leaves travel at maximum of 25 mm/s nominal at isocenter
Carriage: 6061 T6 Aluminium[2] and has protective plating of anodize plus Teflon.



© Varian Medical Systems
Millennium MLC 120 Leaf

© Varian Medical Systems
120 Millennium MLC 120 Leaf

1. 17-4 Stainless Steel
   Composition: 15.5% Cr, 0.04 % C, 0.02 % K, 4.5% Ni, 3.5% Cu. Density: 7.75g/cm^3

2. 6061 T6 Aluminium
   Composition: Al (95.8-98.6%), Cr (0.04-0.35%), Cu (0.15-0.4%), Fe (max 0.7%). Density: 2.7g/cm^3

MLC Model:	Varian Millennium MLC		HDMLC	Notes/Explanation
Number of leaves	80	120	120	
For MLC leaf position, the Top (Y2) jaw is:	Y	Y	X	Direction of upper jaw travel towards clock with the collimator at 0 degrees
Minimum tip position (cm):	-20	-20	-20	This is how far the leaves can go across the center of the beam.
Maximum tip position (cm):	20	20	20	This is how far the leaves may be opened (retracted).
Minimum opposing leaf gap (static only!)(cm)	0	0	0	This is the minimum end gap distance for leaves for static treatments.
Minimum opposing leaf gap (dynamic only!)(cm)	0.5	0.5	0.5	This is the minimum end gap distance for leaves for dynamic treatments.
Maximum tip difference for adjacent leaves (cm)**	15	15	15	This is the max difference in distance between 2 adjacent leaves on the
				same carriage given one leaf is fully extended and the other leaf is fully retracted.
Leaf length (2)	~201	~180		
Max plan retract (3)	201	201		
Max plan overcenter	-200	-200		
Reach	150	150		

DASH	TYPE OR MODEL	NEXT ASSEMBLY
	H.E	100040466

QTY	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
REF	1105333	LEAF, HALF, TARGET	1
REF	1105334	LEAF, HALF, ISOCENTER	2
REF	1105335	LEAF, FULL	3
REF	1106664-07	LEAF, OUTBOARD	4
REF	1106664-09	LEAF, OUTBOARD	5

DIMENSION TABLE

		LEAF TYPE				
DIM	DESCRIPTION	FULL	HALF, TARGET	HALF, ISOCENTER	OUTBOARD #1	OUTBOARD #60
WIDTHS						
WL	LEAF WIDTH, EXCLUDING TONGUE	0.535	0.249	0.250	0.690	0.528
WT	TONGUE WIDTH	0.040	0.040	0.040	0.040	0.173
WG	GROOVE WIDTH	0.040	0.040	0.040	0.170	0.040
WTIP	LEAF TIP WIDTH	0.135	0.105	0.075	0.135	0.135
WTS	TOP SUPPORT RAIL WIDTH	0.369	0.138	0.140	0.369	0.581
WBS	BOTTOM SUPPORT RAIL WIDTH	0.140	0.139	0.140	0.140	0.140
Z POSITION						
ZTIP	LEAF TIP	6.66	6.50	6.50	6.65	6.66
ZL	LEAF TOP	0.28	6.38	0.12	0.28	0.28
ZT	BOTTOM OF TONGUE	3.27	3.37	3.22	3.27	0.28
ZG	BOTTOM OF GROOVE	3.48	3.38	3.32	6.27	3.48
ZTS	TOP OF SUPPORT RAIL	6.28	0.10	6.14	6.28	6.28
ZBS	BOTTOM OF SUPPORT RAIL	6.56	0.36	6.40	6.56	6.56
ZTH	TOP OF DRIVE SCREW HOLE	4.66	1.26	4.90	3.30	1.89
		3.30	1.72	3.92	--	--
		1.89	2.70	3.72	--	--
		--	3.10	--	--	--
ZBH	BOTTOM OF DRIVE SCREW HOLE	5.09	1.59	5.23	3.73	2.32
		3.73	2.05	4.25	--	--
		2.32	3.03	4.05	--	--
		--	3.43	--	--	--

3

NOTES: UNLESS OTHERWISE SPECIFIED.

1. DIMENSIONS SHOWN ARE FOR REFERENCE PURPOSES ONLY.

2 DIMENSIONS NOTED ORIGINATE AT TARGET DATUM, 100cm ABOVE ISOCENTER. ACTUAL TARGET SURFACE VARIES WITH ENERGY MODE.

3 LEAF DRIVE SCREW HOLES HAVE MULTIPLE ELEVATIONS FOR HALF AND FULL LEAF TYPES. THE HOLE IS NOMINALLY 0.33cm WIDE FOR HALF LEAVES AND 0.43cm WIDE FOR FULL AND OUTBOARD LEAVES.

METRIC

DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~ CENTIMETERS (cm)

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED:
SURFACE TEXTURE PER ISO 1302, GRADE N8 (Ra=3.2 µm)
GENERAL TOLERANCES PER ISO 2768-1m

BASIC SIZE RANGE	LINEAR	RADII AND CHAMFERS
>0.5..... ≤3	±0.1	±0.2
>3..... ≤6	±0.1	±0.5
>6..... ≤30	±0.2	±1
>30.....≤120	±0.3	
>120.....≤400	±0.5	
>400.....≤1000	±0.8	
>1000.....≤2000	±1.2	
>2000.....≤4000	±2	

A° — SHORT LEG

SHORT LEG	A°
≤10	±1°
>10.....≤50	±0°30'
>50.....≤120	±0°20'
>120.....≤400	±0°10'
>400	±0°5'

DESCRIPTION OF CHANGE	ENGINEERING RELEASE				
APVD	-	-	-	-	
ECO	-	-	-	-	
DFT	A. VON BORSTEL	-	-	-	
CHK	-	-	-	-	
DATE	-	-	-	-	
REV	1	-	-	-	

-01	SHOWN
DASH NO.	DESCRIPTION

VARIAN medical systems — ONCOLOGY SYSTEMS

DRAWN	DATE	APPROVED	DATE	SCALE
ALEX VON BORSTEL	9-25-08	-	-	5:1
CHECKED	DATE	APPROVED	DATE	SHEET
-	-	-	-	1 OF 5

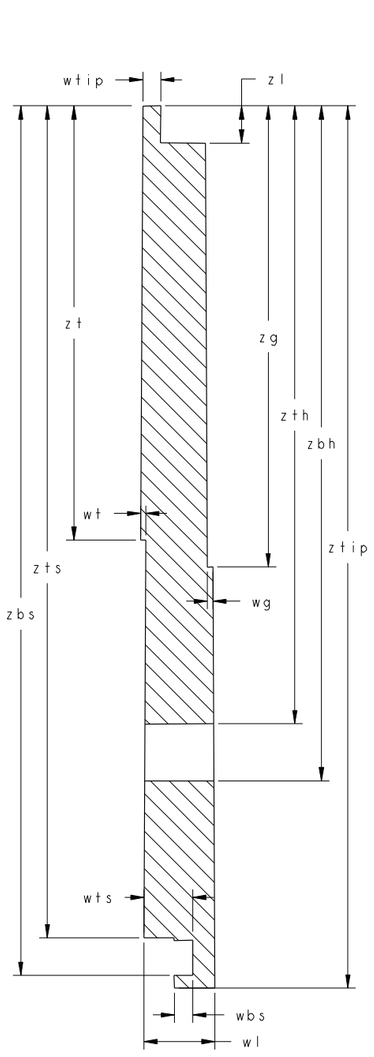
120 LEAF MLC MONTE CARLO LAYOUT

DO NOT SCALE DRAWING

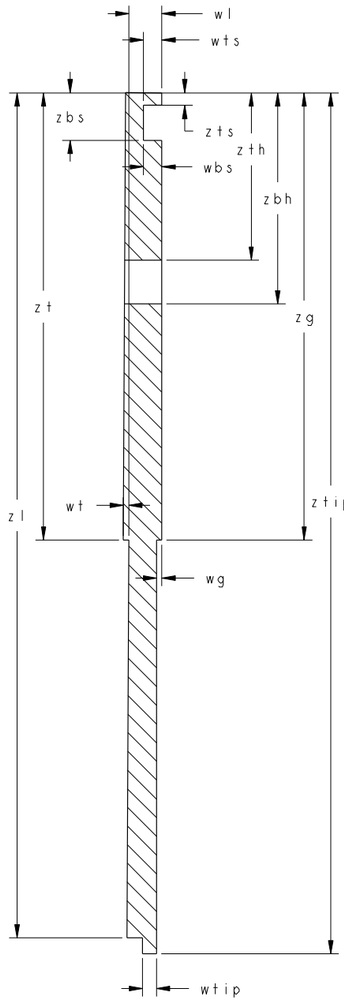
D | 100040469 | -
SIZE | DRAWING NO | REV

SIMILAR TO: NONE

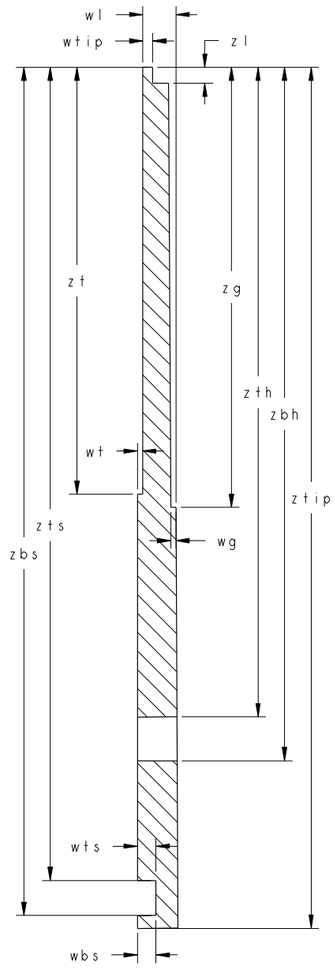
Pro-E



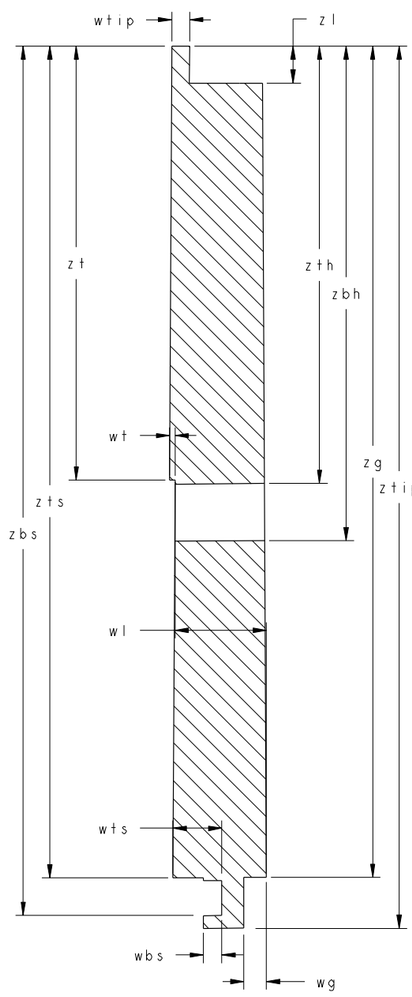
FULL LEAF



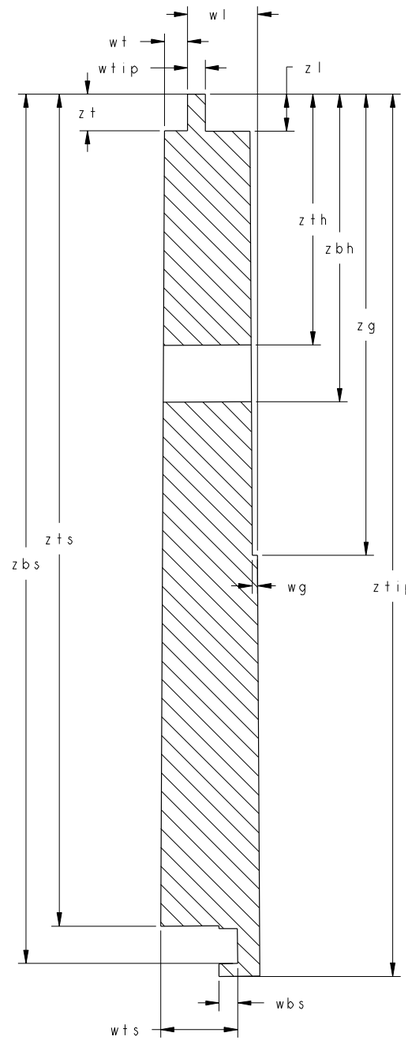
HALF-LEAF TARGET



HALF-LEAF ISOCENTER



OUTBOARD LEAF #1

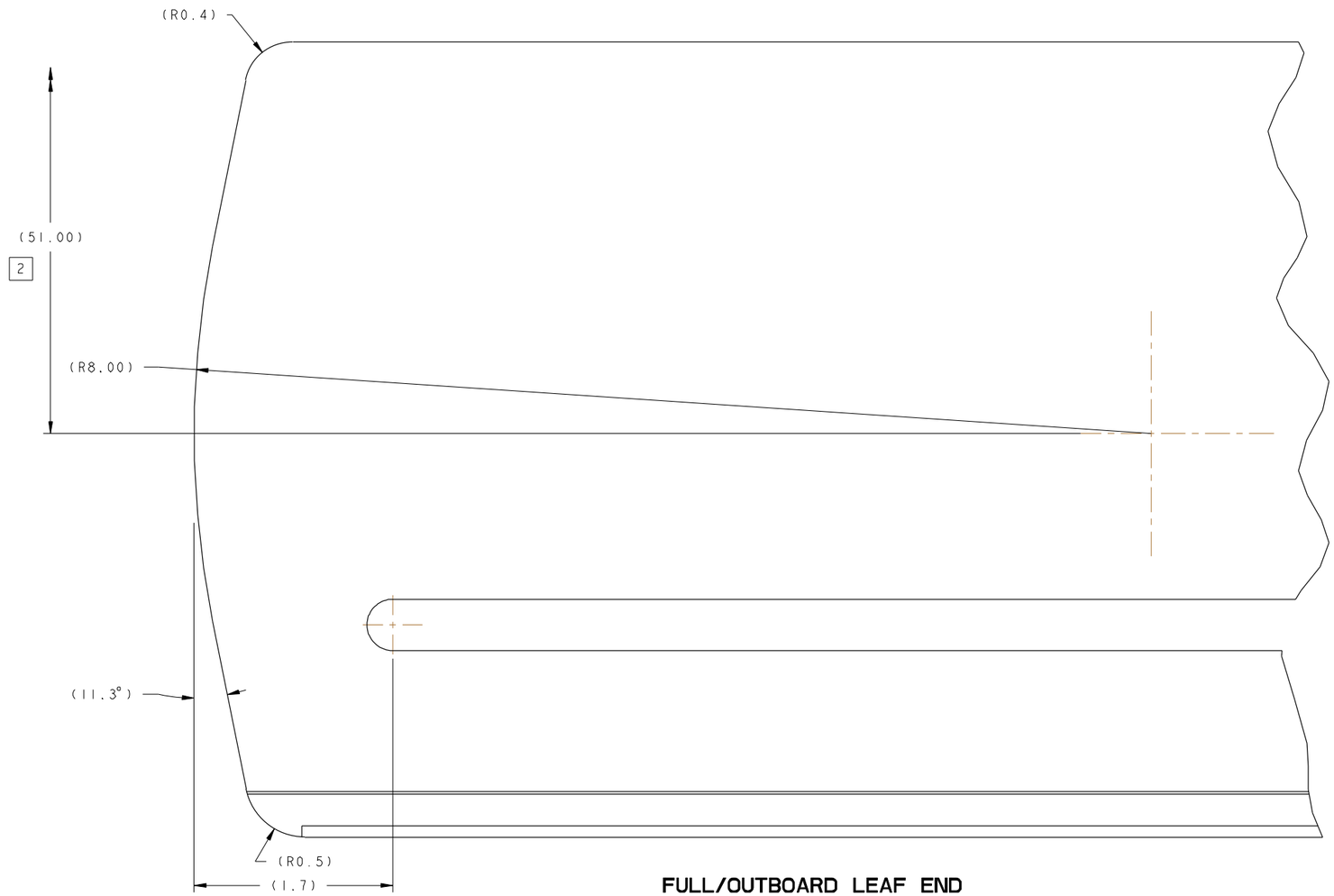


OUTBOARD LEAF #60

METRIC CENTIMETERS (cm)
DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~

VARIAN medical systems | ONCOLOGY SYSTEMS		SCALE 5:1 SHEET 2 OF 5
120 LEAF MLC MONTE CARLO LAYOUT		
DO NOT SCALE DRAWING	D SIZE	100040469 DRAWING NO - REV

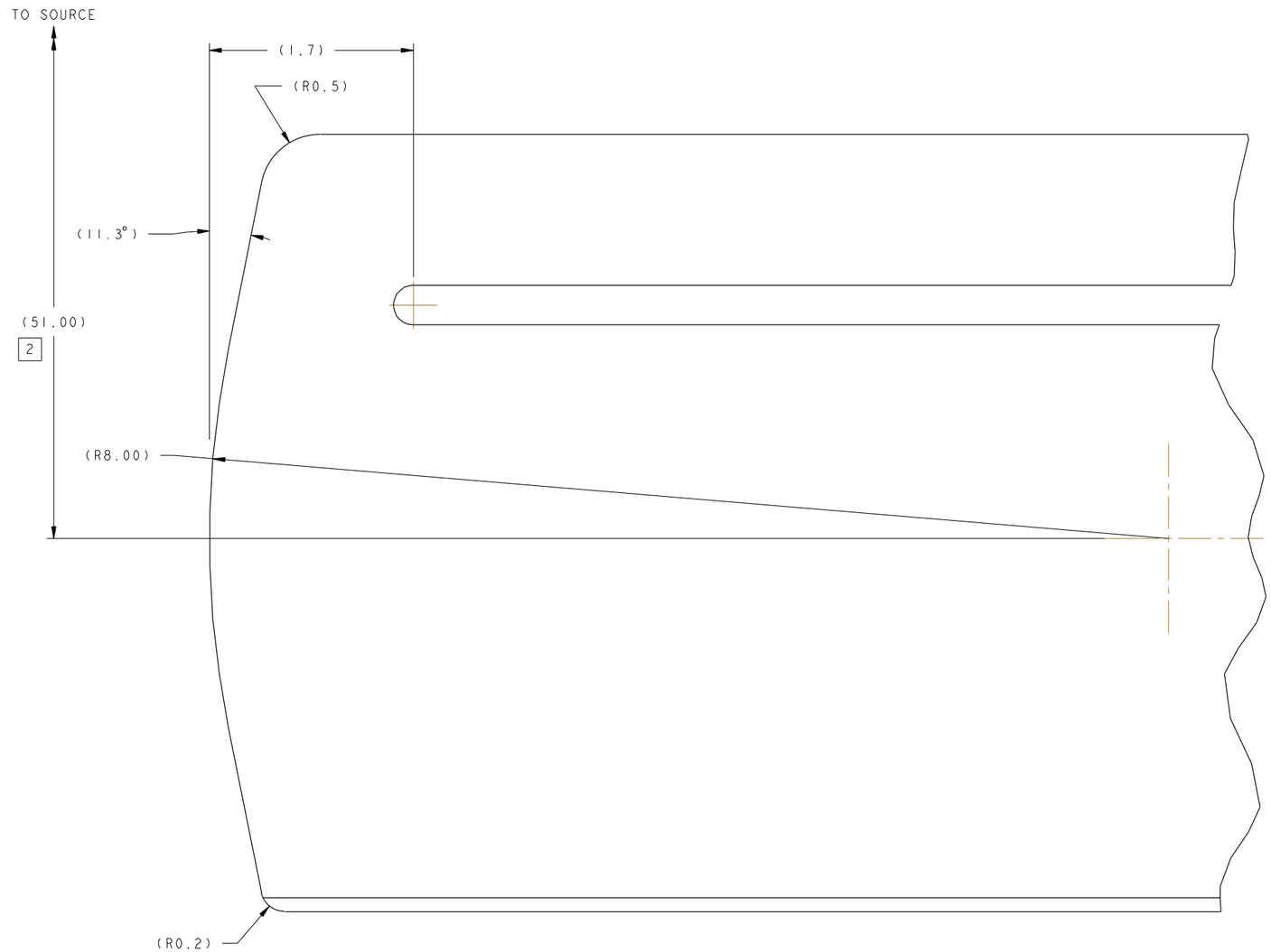
Pro-E



FULL/OUTBOARD LEAF END

METRIC CENTIMETERS (cm)
DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~

VARIAN medical systems | ONCOLOGY SYSTEMS		SCALE 5:1 SHEET 3 OF 5
120 LEAF MLC MONTE CARLO LAYOUT		
DO NOT SCALE DRAWING	D SIZE	100040469 DRAWING NO - REV
		Pro-E

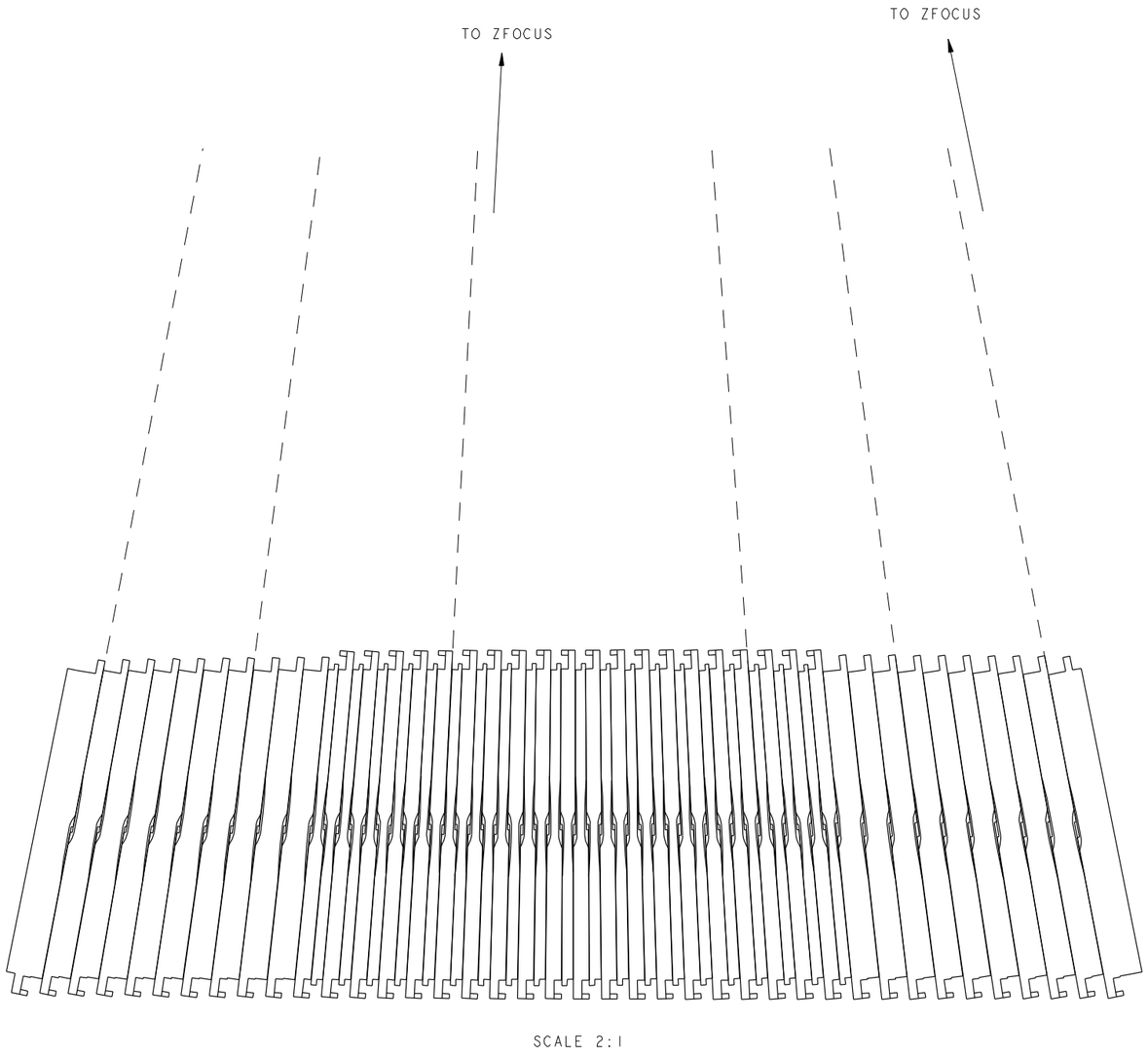


HALF LEAF END

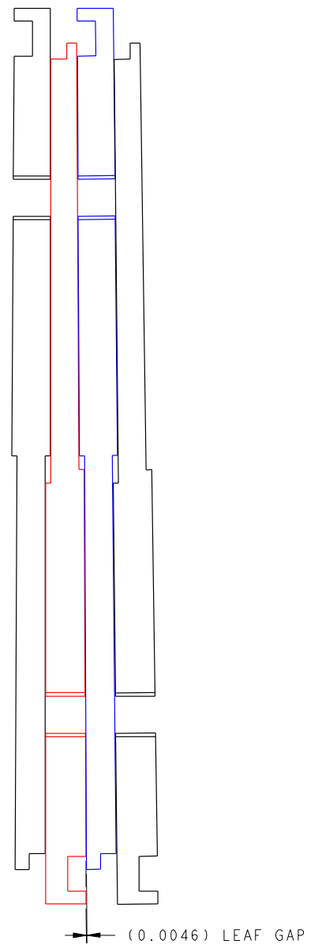
METRIC CENTIMETERS (cm)
DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~

VARIAN medical systems	ONCOLOGY SYSTEMS	SCALE 5:1 SHEET 4 OF 5
120 LEAF MLC MONTE CARLO LAYOUT		
DO NOT SCALE DRAWING	D (SIZE)	100040469 (DRAWING NO) - (REV)

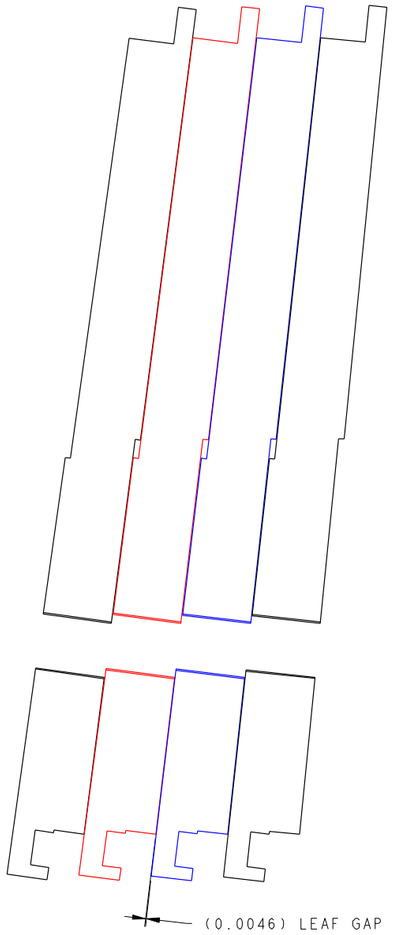
Pro-E



SCALE 2:1



HALF LEAF PAIR



FULL LEAF PAIR

METRIC CENTIMETERS (cm)
DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~

VARIAN medical systems | ONCOLOGY SYSTEMS		SCALE 5:1 SHEET 5 OF 5
120 LEAF MLC MONTE CARLO LAYOUT		
DO NOT SCALE DRAWING	D (SIZE)	100040469 (DRAWING NO) - (REV)

Pro-E

Leaf Sequence Millennium MLC 120 Leaf: A side & B side

Leaf Bank A Leaf #	Type Code
1	AO
2	AF
3	AF
4	AF
5	AF
6	AF
7	AF
8	AF
9	AF
10	AF
11	AT
12	AI
13	AT
14	AI
15	AT
16	AI
17	AT
18	AI
19	AT
20	AI
21	AT
22	AI
23	AT
24	AI
25	AT
26	AI
27	AT
28	AI
29	AT
30	AI
31	AT
32	AI
33	AT
34	AI
35	AT
36	AI
37	AT
38	AI
39	AT
40	AI
41	AT
42	AI
43	AT
44	AI
45	AT
46	AI
47	AT
48	AI
49	AT
50	AI
51	AF
52	AF
53	AF
54	AF
55	AF
56	AF
57	AF
58	AF
59	AF
60	AO60

Leaf Bank B Leaf #	Type Code
1	BO
2	BF
3	BF
4	BF
5	BF
6	BF
7	BF
8	BF
9	BF
10	BF
11	BT
12	BI
13	BT
14	BI
15	BT
16	BI
17	BT
18	BI
19	BT
20	BI
21	BT
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46	BI
47	BT
48	BI
49	BT
50	BI
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55	BF
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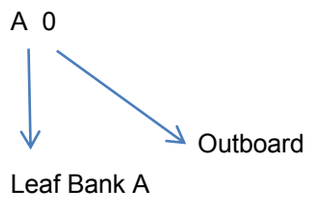
58	BF
59	BF
60	BO60

Code Definitions



I: Isocenter
T: Target
F: Full
O: Outboard
A: Leaf Bank A
B: Leaf Bank B

Monte Carlo Data Package

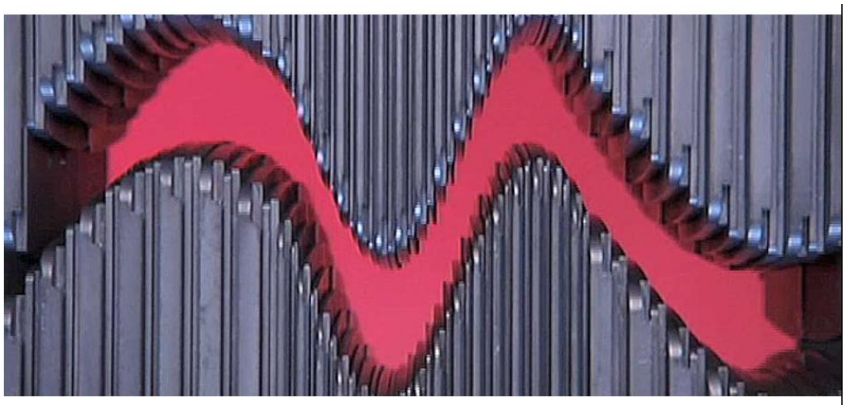
HD120 MLC

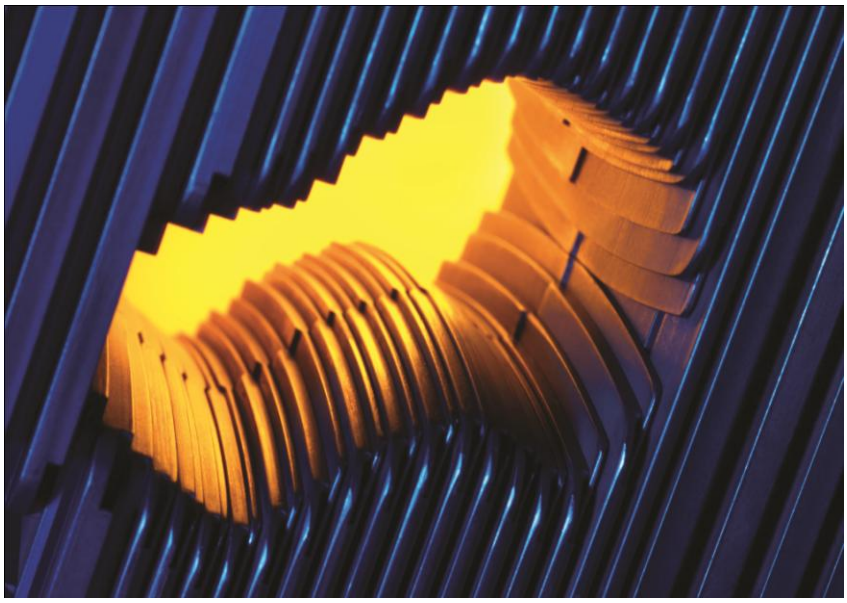
High Definition Multileaf Collimator (HD120™ MLC)

The HD120 MLC is a high definition multi-leaf collimator providing a 2.5 mm leaf resolution at isocenter for a stereotactic radiosurgery and stereotactic body radiotherapy applications. Each side of the Varian HD 120 MLC is configured with 60 leaves distributed in an 8 cm wide central region with 32 x 2.5 mm leaves, flanked by two 7 cm wide side regions with 14 x 5.0 mm leaves, for a total width of 22 cm. The leaf composition is 95% Tungsten (balance: nickel, copper & iron).

The HD120 MLC achieves new levels of precision and accuracy in the delivery of high-dose stereotactic treatments to a wide range of disease sites. The HD120 MLC allows clinicians to spare the greatest amount of normal tissue possible by combining the extreme dose conformality with narrow beam penumbra and minimal inter-leaf leakage.

Leaf interdigitation allows adjacent, opposite-side leaves to slide past one another, providing the flexibility of creating multiple simultaneous beam apertures.





HD™120 MLC

HD120™ MLC Specifications

Properties	Dimension (cm)	Notes
Geometry		
Minimum tip position :	-20	This is how far the leaves can go across the center of the beam.
Maximum tip position :	20	This is how far the leaves may be opened (retracted).
Minimum opposing leaf gap (static only)	0	This is the minimum end gap distance for leaves for static treatments.
Minimum opposing leaf gap (dynamic only)	0.5	This is the minimum end gap distance for leaves for dynamic treatments.
Maximum dynamic beam length	22	Perpendicular to leaf motion.
Maximum dynamic beam width	40.0	Parallel to leaf motion. Deliverable in multiple carriage segments.
MLC cover diameters	80.9, 71.9	Upper and lower respectively.
Interface mount to isocenter clearance	41.5	
Max beam size (static non modulated)	22 x 40	
Max beam size (intensity modulated)	22 x 32	
Mechanical		
Max leaf retract position	20.1	From beamline centerline
Max leaf extend position	-20	Over beam centerline
Max beam width	22	
Max beam length	40	Parallel to leaf motion.
Leaf Configuration		
Central high-resolution leaf width	0.25	
Central high-resolution beam width	8	32 leaves on each carriage
Outboard leaf width	0.5	
Outboard beam width	7	14 leaves on each side
Overall beam width	22	
Movement		
Maximum carriage speed	1.2cm/sec	Same as collimator jaws
Maximum leaf speed	2.5cm/sec	

DASH	TYPE OR MODEL	NEXT ASSEMBLY
	H.E.	FINAL

QTY	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
REF	100022025	LEAF, QUARTER, TARGET	1
REF	100022026	LEAF, QUARTER, ISOCENTER	2
REF	100022596	LEAF, HALF, TARGET	3
REF	100022597	LEAF, HALF, ISOCENTER	4
REF	100025506-13	LEAF, HALF, OUTBOARD, #1 TARGET	5
REF	100025507-13	LEAF, HALF, OUTBOARD, #60 ISOCENTER	6

DIMENSION TABLE

		LEAF TYPE					
DIM	DESCRIPTION	QUARTER, ISOCENTER	QUARTER, TARGET	HALF, TARGET	HALF, ISOCENTER	OUTBOARD #1	OUTBOARD #60
WIDTHS							
WL	LEAF WIDTH, EXCLUDING TONGUE	0.122	0.122	0.249	0.250	0.272	0.390
WT	TONGUE WIDTH	0.040	0.040	0.040	0.040	0.158	0.040
WG	GROOVE WIDTH	0.040	0.040	0.040	0.040	0.040	0.152
WTIP	LEAF TIP WIDTH	0.035	0.050	0.105	0.075	0.105	0.075
WOS	OUTBOARD STEP WIDTH	--	--	--	--	0.225	0.194
WTS	TOP SUPPORT RAIL WIDTH	0.090	0.089	0.137	0.141	0.137	0.141
WBS	BOTTOM SUPPORT RAIL WIDTH	0.090	0.089	0.138	0.141	0.137	0.141
Z POSITION							
ZTIP	LEAF TIP	6.75	6.75	6.70	6.70	6.70	6.69
ZL	LEAF TOP	0.12	6.63	6.58	0.12	0.67	0.39
ZT	BOTTOM OF TONGUE	3.295	3.488	3.47	3.25	6.37	3.24
ZG	BOTTOM OF GROOVE	3.283	3.488	3.48	3.29	3.48	6.09
ZTS	TOP OF SUPPORT RAIL	6.41	0.10	0.10	6.34	0.36	6.34
ZBS	BOTTOM OF SUPPORT RAIL	6.65	0.33	0.36	6.60	0.10	6.60
ZOS	OUTBOARD STEP	--	--	--	--	6.58	0.12
ZTH	TOP OF DRIVE SCREW HOLE	5.63	0.92	2.09	4.48	2.09	3.63
		4.99	1.60	1.14	3.63	--	--
		4.20	2.39	2.14	3.55	--	--
		3.55	3.05	3.04	5.43	--	--
		--	--	3.21	--	--	--
ZBH	BOTTOM OF DRIVE SCREW HOLE	5.83	1.12	2.42	4.81	2.42	3.96
		5.19	1.80	1.47	3.96	--	--
		4.40	2.59	2.47	3.88	--	--
		3.75	3.25	3.37	5.76	--	--
		--	--	3.54	--	--	--

3

NOTES: UNLESS OTHERWISE SPECIFIED.

1. DIMENSIONS SHOWN ARE FOR REFERENCE PURPOSES ONLY.

2 DIMENSIONS NOTED ORIGINATE AT TARGET DATUM, 100cm ABOVE ISOCENTER. ACTUAL TARGET SURFACE VARIES WITH ENERGY MODE.

3 LEAF DRIVE SCREW HOLES HAVE MULTIPLE ELEVATIONS FOR QUARTER AND HALF LEAF TYPES. THE HOLE IS NOMINALLY 0.20cm WIDE FOR QUARTER LEAVES AND 0.33cm WIDE FOR HALF LEAVES AND OUTBOARD LEAVES.

METRIC

DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~ CENTIMETERS (cm)

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED:
SURFACE TEXTURE PER ISO 1302, GRADE N8 (Ra=3.2 µm)
GENERAL TOLERANCES PER ISO 2768-1m

BASIC SIZE RANGE	LINEAR	RADII AND CHAMFERS
>0.5 ..... ≤3	±0.1	±0.2
>3 ..... ≤6	±0.1	±0.5
>6 ..... ≤30	±0.2	±1
>30 ..... ≤120	±0.3	
>120 ..... ≤400	±0.5	
>400 ..... ≤1000	±0.8	
>1000 ..... ≤2000	±1.2	
>2000 ..... ≤4000	±2	

A° SHORT LEG

SHORT LEG	A°
≤10	±1°
>10 ..... ≤50	±0°30′
>50 ..... ≤120	±0°20′
>120 ..... ≤400	±0°10′
>400	±0°5′

DESCRIPTION OF CHANGE	ENGINEERING RELEASE.				
APVD	-	-	-	-	-
ECO		-	-	-	-
DFT	A. VON BORSTEL	-	-	-	-
CHK		-	-	-	-
DATE	-	-	-	-	-
REV	1	-	-	-	-

DASH NO.	DESCRIPTION

VARIAN medical systems — ONCOLOGY SYSTEMS

DRAWN	DATE	APPROVED	DATE	SCALE
ALEX VON BORSTEL	10-31-08	-	-	5:1
CHECKED	DATE	APPROVED	DATE	SHEET
-	-	-	-	1 OF 5

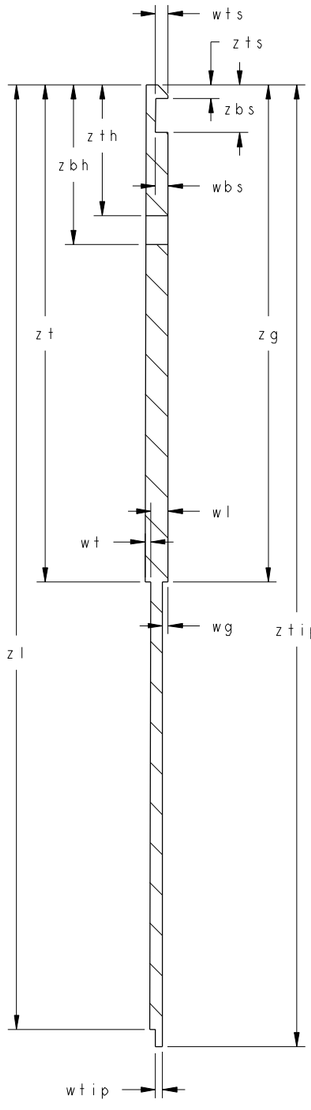
120 LEAF HDMLC MONTE CARLO LAYOUT

DO NOT SCALE DRAWING

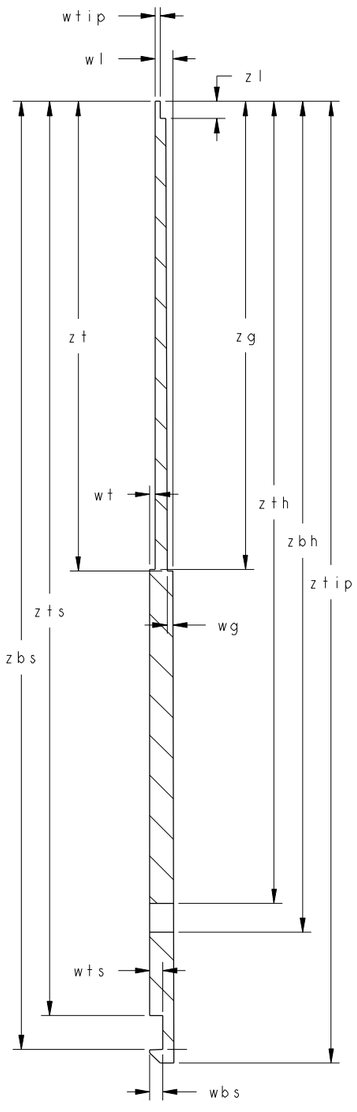
SIZE	DRAWING NO	REV
D	100040900	-

SIMILAR TO: NONE

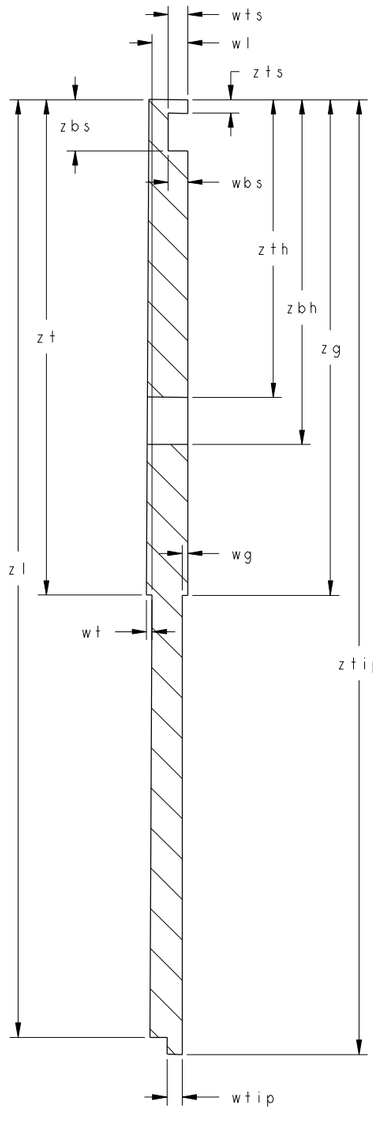
DWG NO. 100040466-02 REV 2



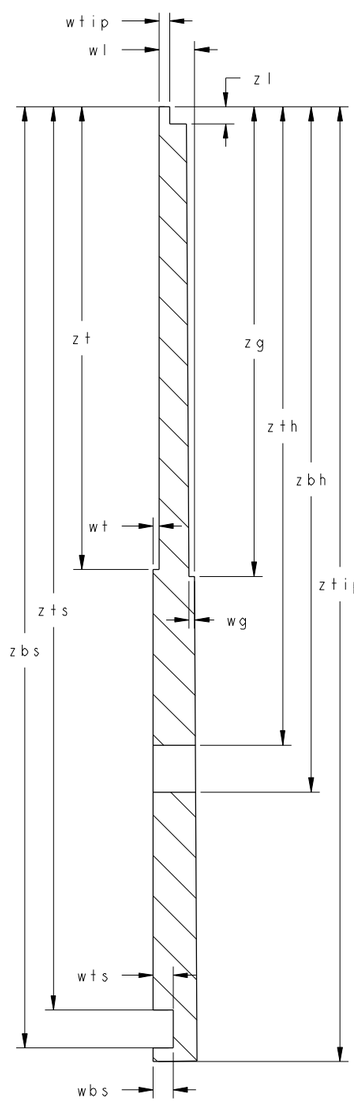
QUARTER-LEAF TARGET



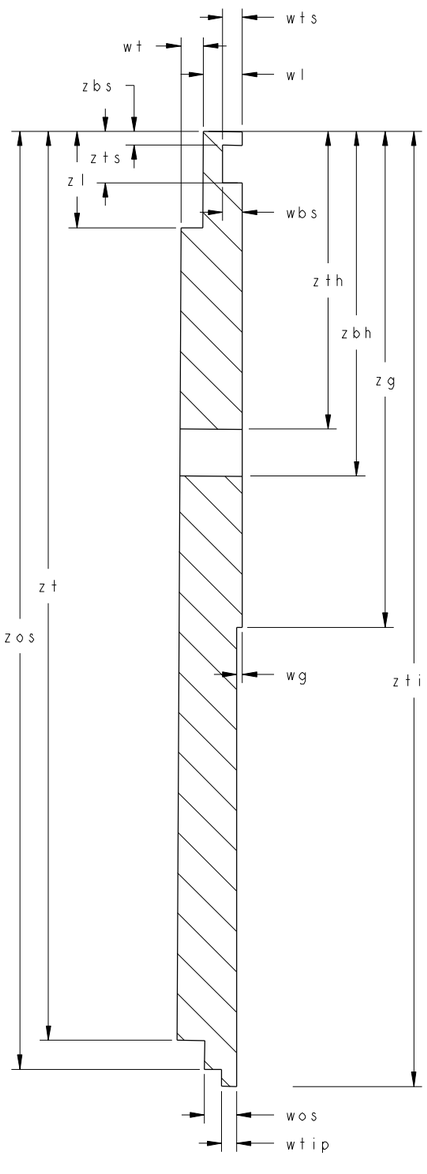
QUARTER-LEAF ISOCENTER



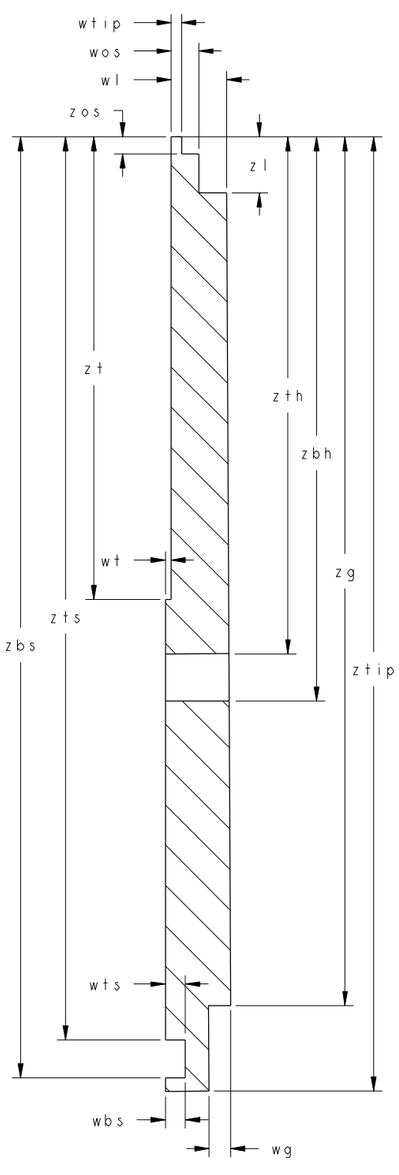
HALF-LEAF TARGET



HALF-LEAF ISOCENTER



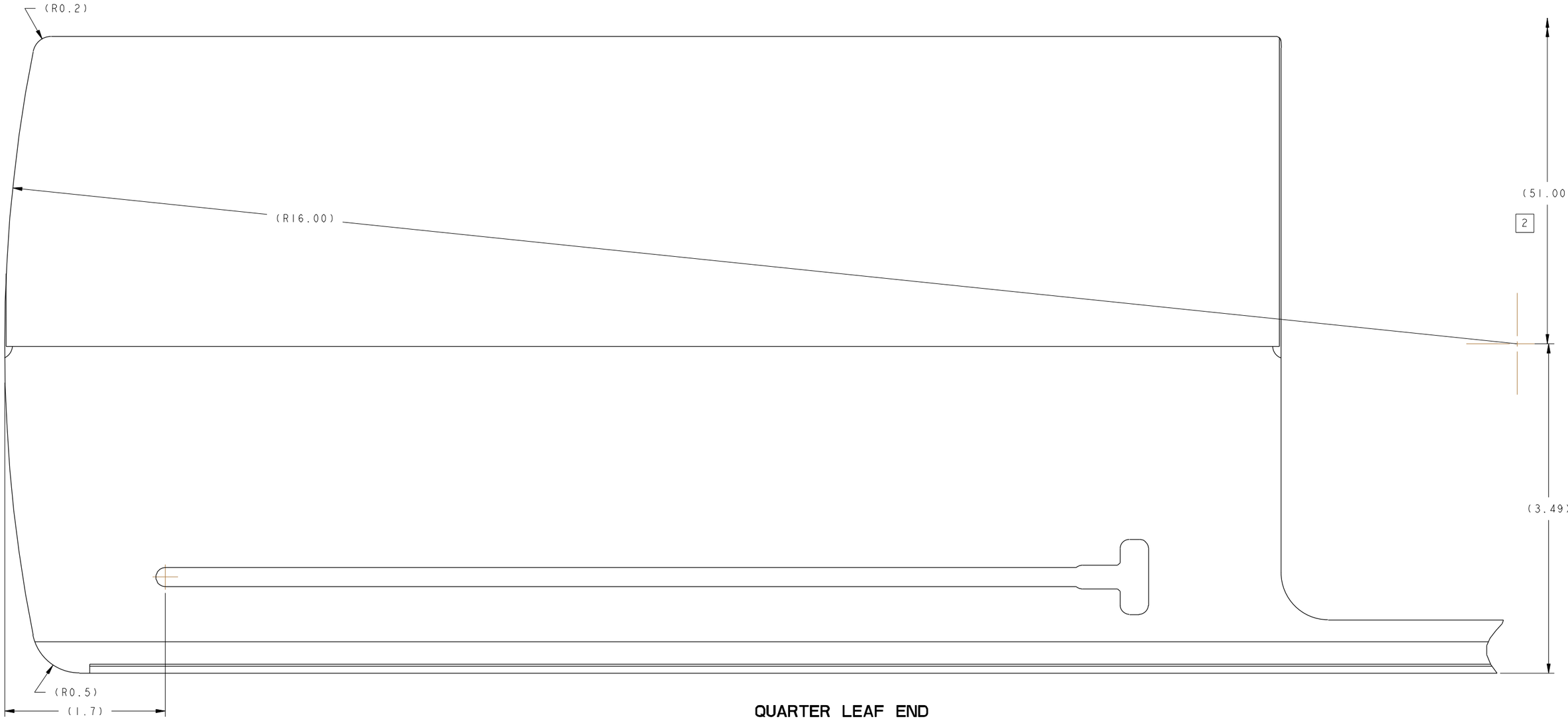
OUTBOARD LEAF #1



OUTBOARD LEAF #60

METRIC CENTIMETERS (cm)
DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~

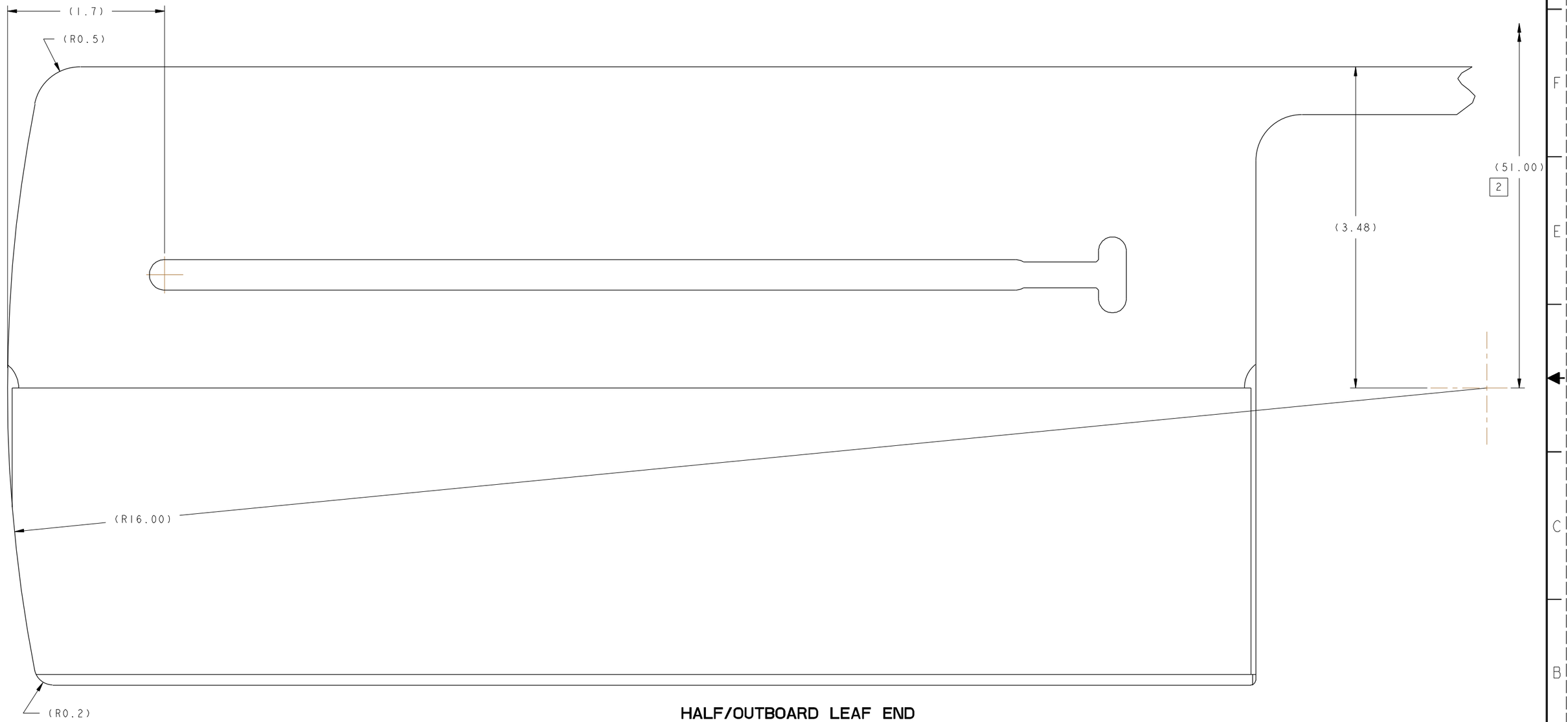
VARIAN medical systems | ONCOLOGY SYSTEMS		SCALE 5:1 SHEET 2 OF 5
120 LEAF HDMLC MONTE CARLO LAYOUT		
DO NOT SCALE DRAWING	D SIZE	100040900 DRAWING NO - REV



QUARTER LEAF END

METRIC CENTIMETERS (cm)
DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~

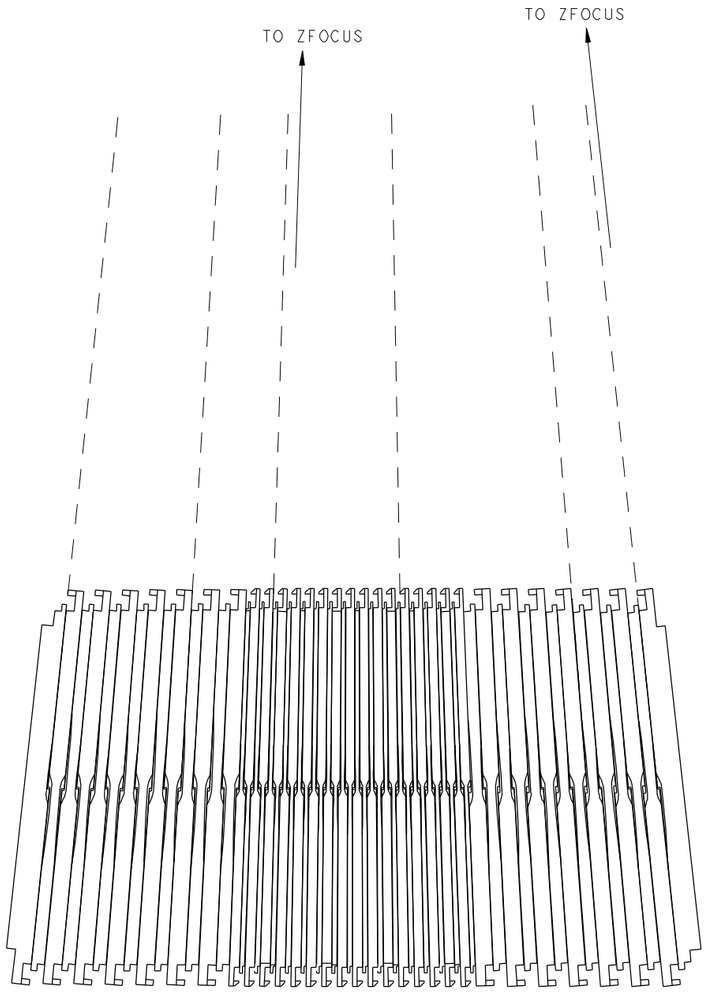
VARIAN medical systems	ONCOLOGY SYSTEMS	SCALE 5:1	SHEET 3 OF 5
120 LEAF HDMLC MONTE CARLO LAYOUT			
DO NOT SCALE DRAWING	D SIZE	100040900 DRAWING NO	- REV



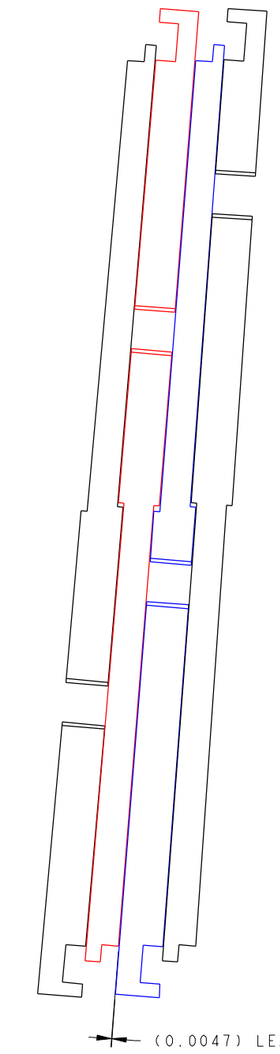
HALF/OUTBOARD LEAF END

METRIC CENTIMETERS (cm)
DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~

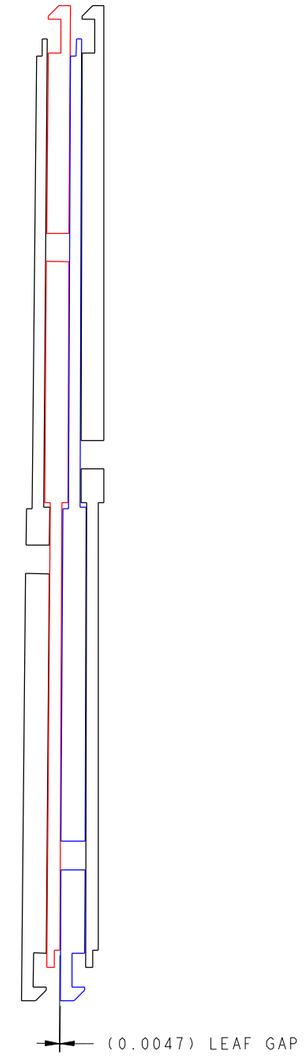
VARIAN medical systems ‖ ONCOLOGY SYSTEMS		SCALE 5:1
		SHEET 4 OF 5
120 LEAF HDMLC MONTE CARLO LAYOUT		
DO NOT SCALE DRAWING	D SIZE	100040900 DRAWING NO - REV



SCALE 2:1



HALF LEAF PAIR



QUARTER LEAF PAIR

METRIC CENTIMETERS (cm)
DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~

VARIAN medical systems ‖ ONCOLOGY SYSTEMS		SCALE 5:1 / SHEET 5 OF 5
120 LEAF HDMLC MONTE CARLO LAYOUT		
DO NOT SCALE DRAWING	D SIZE	100040900 DRAWING NO. – REV

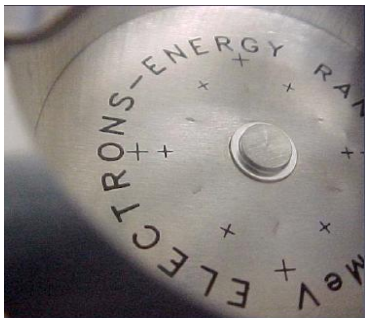
VARIAN
medical systems

Monte Carlo
High Energy Accelerator

Electron Section

Electron Foils

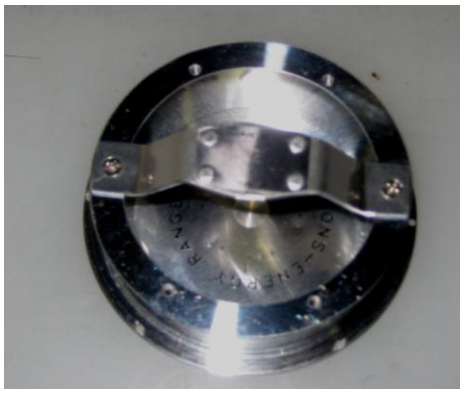
This section includes information on the electron scattering foils for beam energies of 4Mev, 6Mev, 9Mev, 12Mev, 15Mev, 16Mev, 18Mev, 20Mev and 22Mev.
The primary foils are made of tantalum (ρ=16.65g/cm^3) and the secondary foils are made of Aluminum 6061-T6[1]. The foil bracket is made of 6061-T6 Aluminum and the insert button is made of Aluminum 6061-T6. The upper foil tolerances are ± 0.0005 cm.



Scattering foils are placed at the position occupied by the target during photon treatments. They may be mounted, with the target on a slide or carrousel systems that move one out and the other in as energies and modes are changed. Scattering foils are designed to scatter the fine beam of electrons across the irradiated volume. They are usually manufactured from thin foils of aluminum or copper designed to scatter the electrons without generating X-rays. Scatter characteristics of the different electron energies will differ and foils are made specifically for each.

Foil	Energy Level (MeV)	Material
Upper Foil	6,9	Tantalum
	12	Tantalum
	15	Tantalum
	16	Tantalum
	18	Tantalum
	20	Tantalum
	22	Tantalum
Lower Foil	6,9	Aluminum
	12	Aluminum
	15,16,18	Aluminum
	20,22	Aluminum

* This table is for type III accessories. For the lower foil, the support plate is made of Aluminum and is 0.01524 cm thick.
1. Composition: Al (95.8-98.6%), Cr (0.04-0.35%), Cu (0.15-0.4%), Fe (max 0.7%). Density: 2.7g/cm^3



DASH	TYPE OR MODEL	NEXT ASSEMBLY
	H.E	100040466

QTY	PART NUMBER	DESCRIPTION OR MATERIAL	ITEM
REF	859955-10	SCATTERING & FLATTENING FOIL ASSEMBLY	1
REF	887575-14	SCATTERING & FLATTENING FOIL ASSEMBLY	2
REF	887575-15	SCATTERING & FLATTENING FOIL ASSEMBLY	3
REF	887575-16	SCATTERING & FLATTENING FOIL ASSEMBLY	4
REF	887575-17	SCATTERING & FLATTENING FOIL ASSEMBLY	5
REF	887575-20	SCATTERING & FLATTENING FOIL ASSEMBLY	6
REF	887575-21	SCATTERING & FLATTENING FOIL ASSEMBLY	7
REF	887575-22	SCATTERING & FLATTENING FOIL ASSEMBLY	8

NOTES: UNLESS OTHERWISE SPECIFIED.

1. DIMENSIONS SHOWN ARE FOR REFERENCE PURPOSES ONLY.

[2] DIMENSIONS NOTED ORIGINATE AT TARGET DATUM, 100cm ABOVE ISOCENTER. ACTUAL TARGET SURFACE VARIES WITH ENERGY MODE.

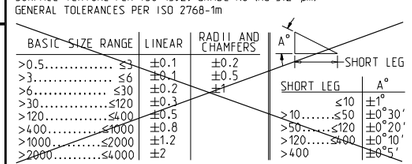
METRIC

DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~ CENTIMETERS (cm)

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED:
SURFACE TEXTURE PER ISO 1302, GRADE N8 (Ra=3.2 µm)
GENERAL TOLERANCES PER ISO 2768-1m

BASIC SIZE RANGE	LINEAR	RADII AND CHAMFERS
>0.5..... ≤3	±0.1	±0.2
>3..... ≤6	±0.1	±0.5
>6..... ≤30	±0.2	±1
>30.....≤120	±0.3	
>120.....≤400	±0.5	
>400.....≤1000	±0.8	
>1000.....≤2000	±1.2	
>2000.....≤4000	±2	



SHORT LEG	A°
≤10	±1°
>10.....≤50	±0°30'
>50.....≤120	±0°20'
>120.....≤400	±0°10'
>400	±0°5'

DESCRIPTION OF CHANGE ENGINEERING RELEASE.					
APVD	-	-	-	-	-
ECO	-	-	-	-	-
DFT	A.VON BORSTEL	-	-	-	-
CHK	-	-	-	-	-
DATE	-	-	-	-	-
REV	-	-	-	-	-

VARIAN CONFIDENTIAL

DASH NO.	DESCRIPTION
-01	SHOWN

VARIAN medical systems — ONCOLOGY SYSTEMS

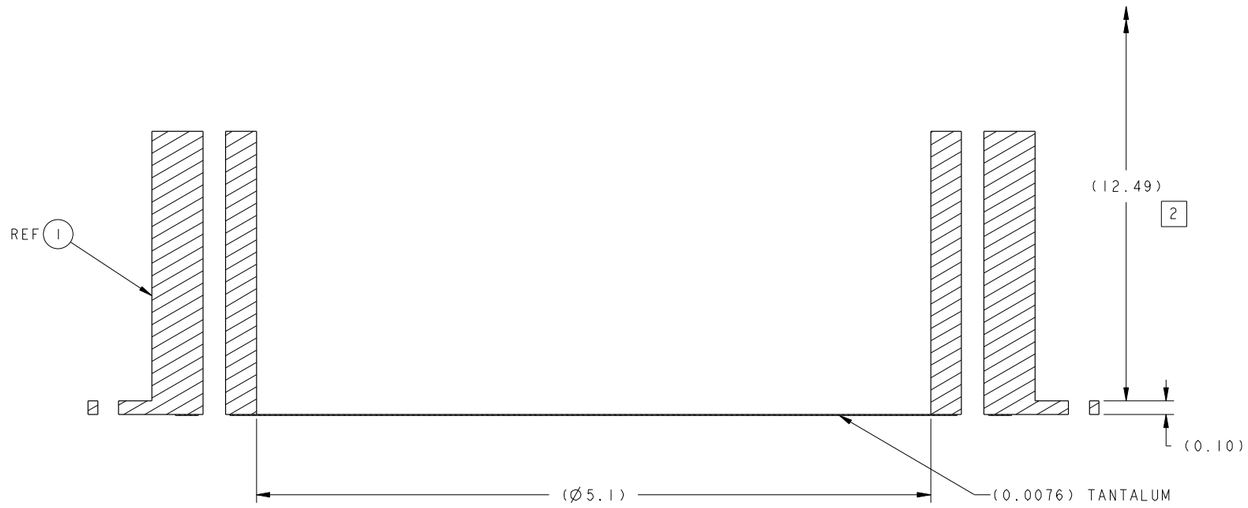
DRAWN	DATE	APPROVED	DATE	SCALE
ALEX VON BORSTEL	9-22-08	-	-	5:1
CHECKED	DATE	APPROVED	DATE	SHEET
-	-	-	-	1 OF 5

ELECTRON FOILS MONTE CARLO LAYOUT

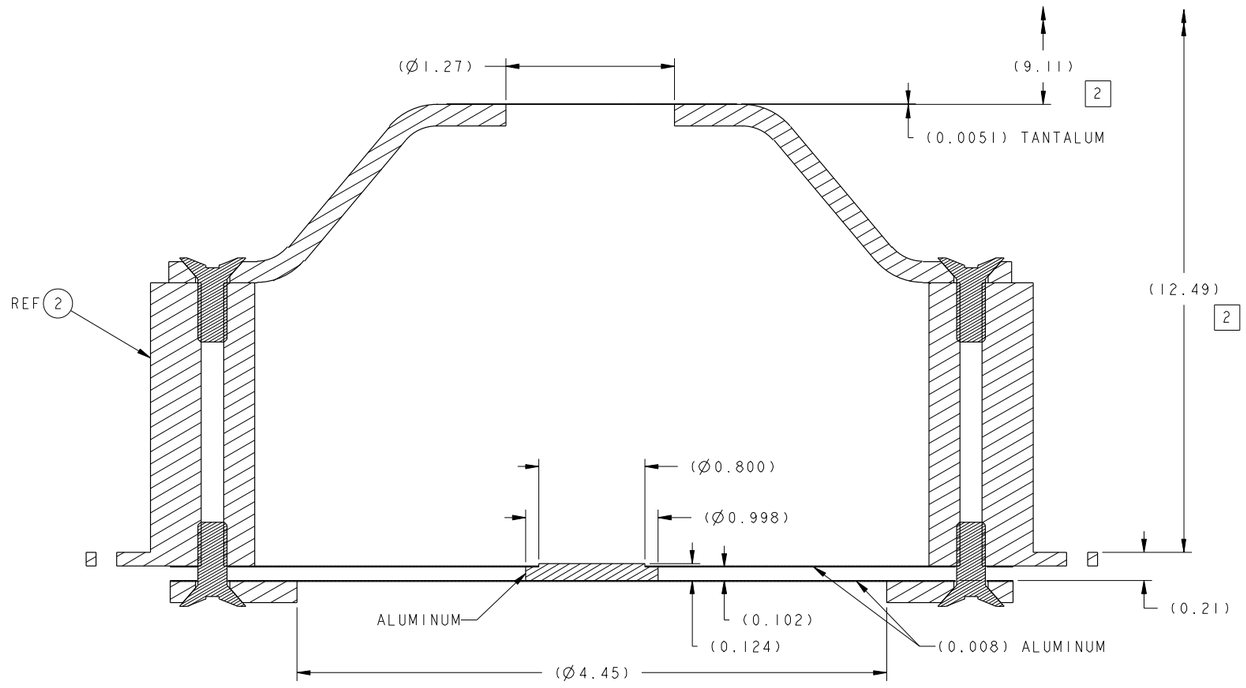
DO NOT SCALE DRAWING

SIZE	DRAWING NO	REV
D	100040470	-

SIMILAR TO: 100034443 | 2 | Pro-E



4e

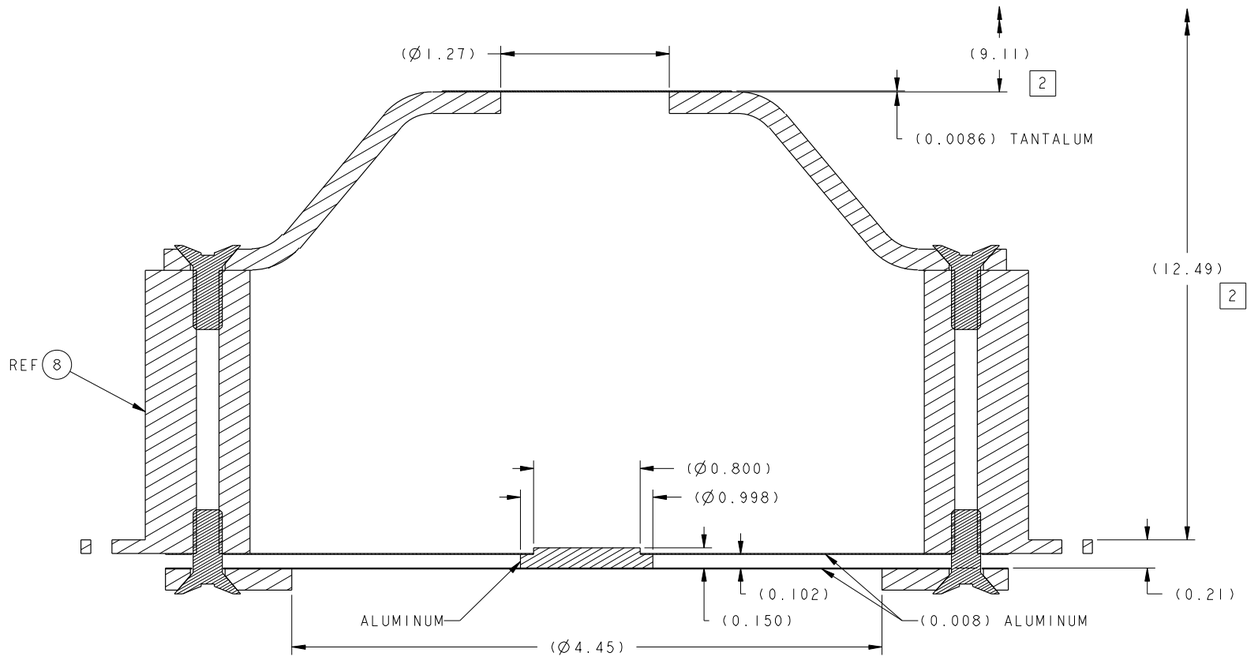


6/9e

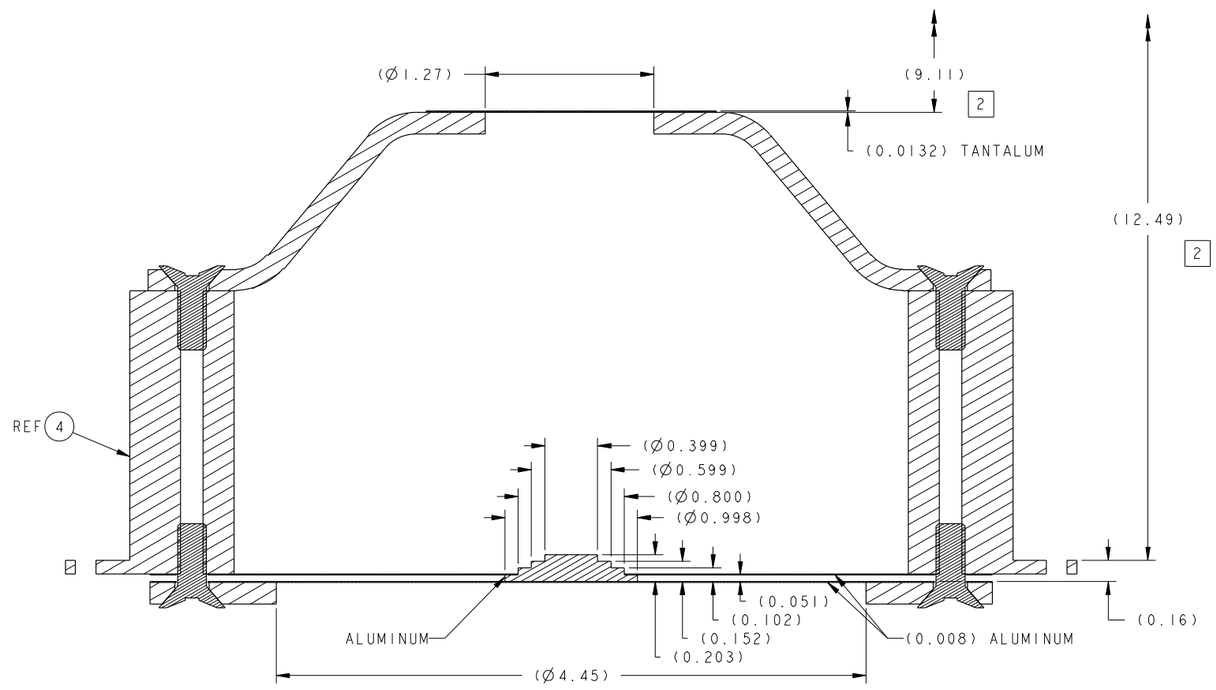
METRIC CENTIMETERS (cm)
DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~

VARIAN medical systems | ONCOLOGY SYSTEMS		SCALE 5:1 SHEET 2 OF 5
ELECTRON FOILS MONTE CARLO LAYOUT		
DO NOT SCALE DRAWING	D SIZE	100040470 DRAWING NO - REV

Pro-E



12e

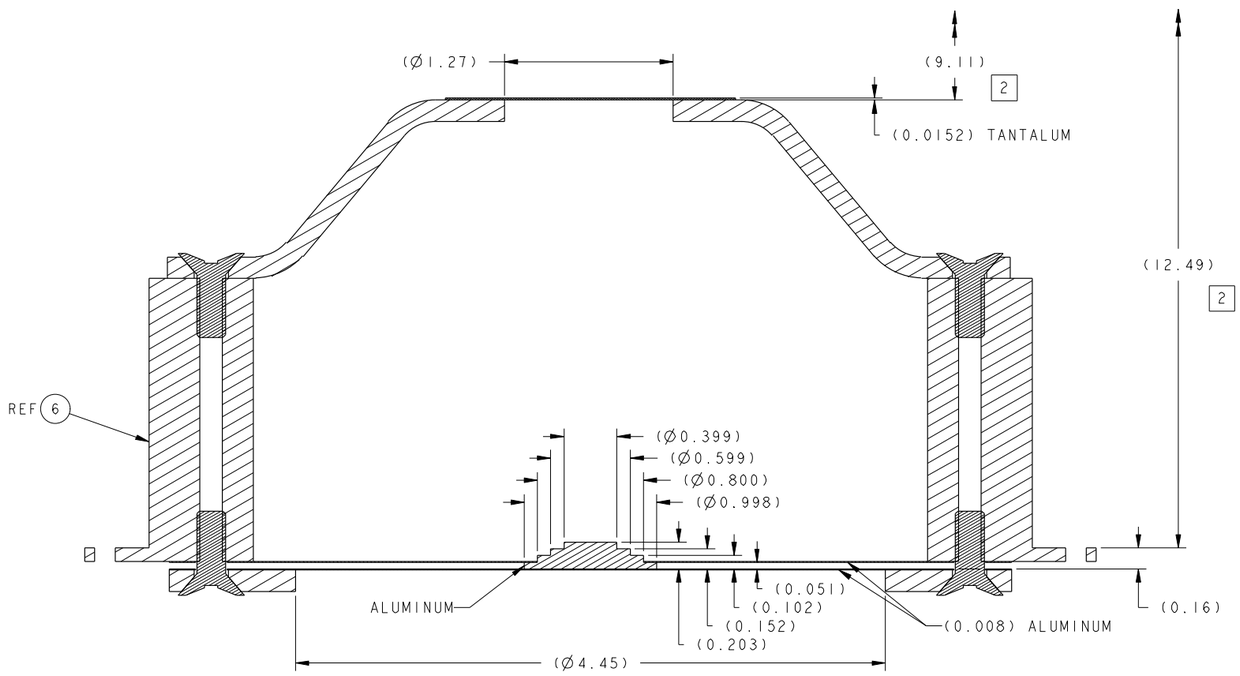


15e

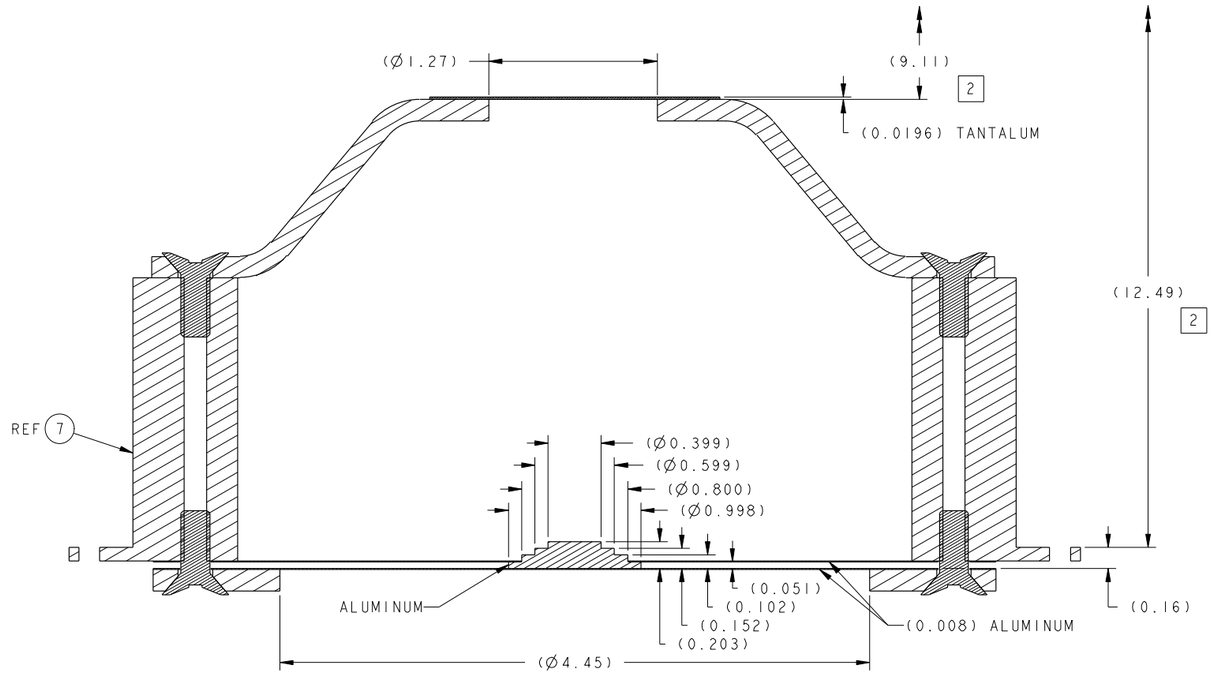
METRIC CENTIMETERS (cm)
DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~

VARIAN medical systems | ONCOLOGY SYSTEMS		SCALE 5:1 SHEET 3 OF 5
ELECTRON FOILS MONTE CARLO LAYOUT		
DO NOT SCALE DRAWING	D SIZE | 100040470 DRAWING NO	- REV

Pro-E



16e

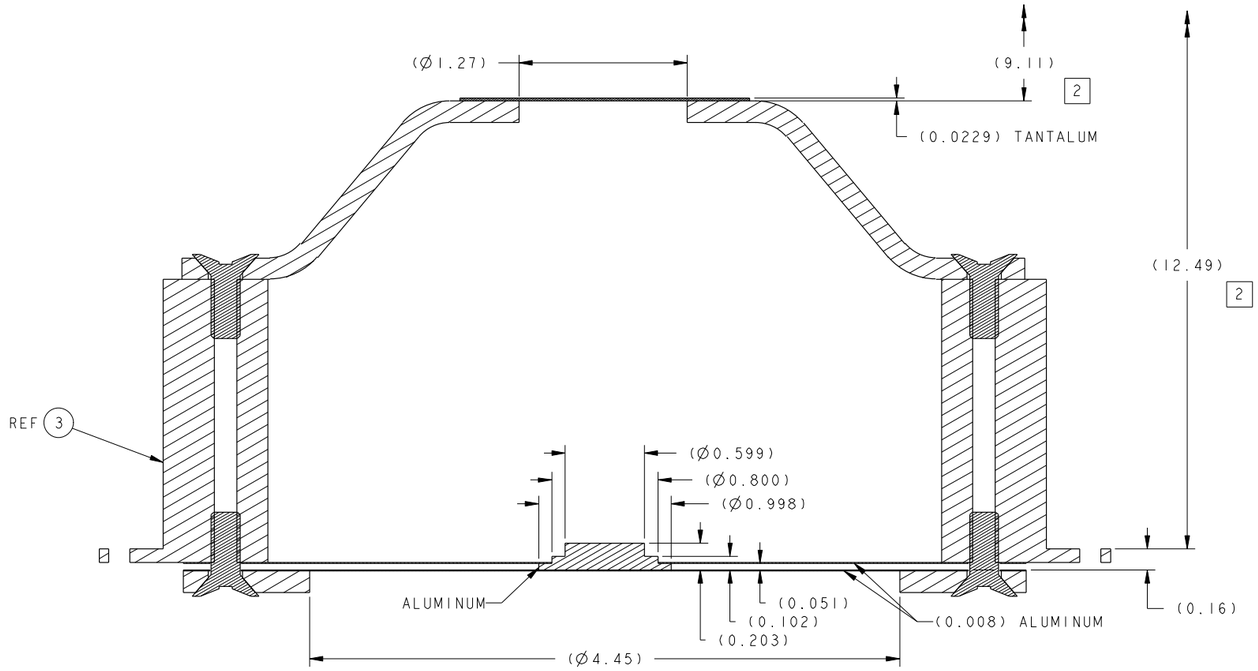


18e

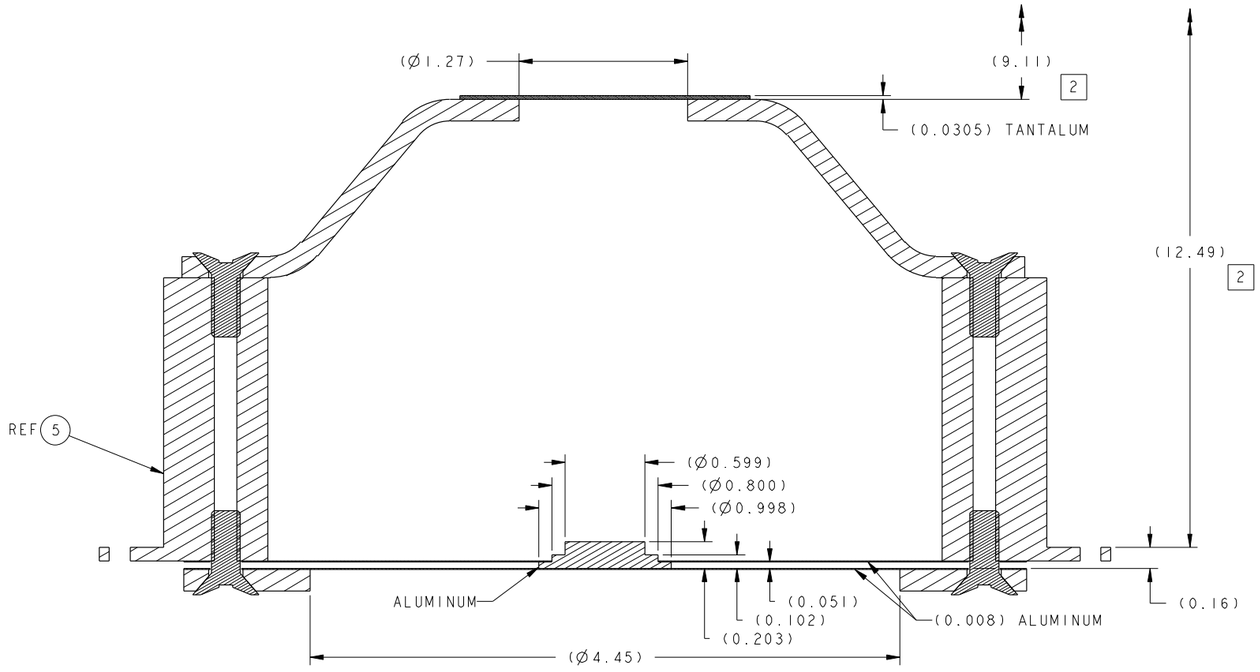
METRIC CENTIMETERS (cm)
DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~

VARIAN medical systems | ONCOLOGY SYSTEMS		SCALE 5:1 SHEET 4 OF 5
ELECTRON FOILS MONTE CARLO LAYOUT		
DO NOT SCALE DRAWING	D SIZE	100040470 DRAWING NO - REV

Pro-E



20e



22e

METRIC CENTIMETERS (cm)
DIMENSIONS ARE IN ~~MILLIMETERS (mm)~~

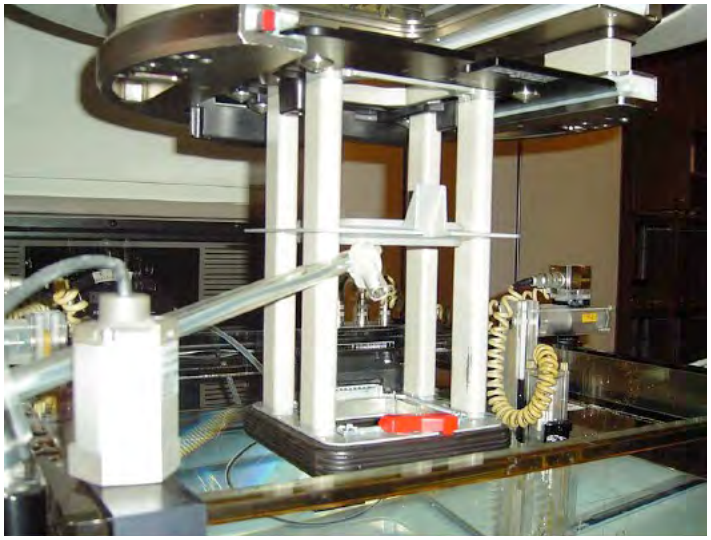
VARIAN medical systems | ONCOLOGY SYSTEMS		SCALE 5:1 SHEET 5 OF 5
ELECTRON FOILS MONTE CARLO LAYOUT		
DO NOT SCALE DRAWING	D SIZE	100040470 DRAWING NO - REV

Pro-E

Electron Applicators

Electron applicators attach to the accessory mount and provide a range of discrete field sizes from about 5x5 cm to 25x25 cm. This section includes applicator outline drawings for field sizes of 6X6 cm, 10X6 cm, 10X10 cm, 15X15 cm, and 20X20 cm and 25X25 cm. The material and composition used for all applicators consist of 8.4% aluminum, 1% copper, 0.02% manganese zinc alloy and remainder zinc. Tolerances are specified on the applicator outline drawings attached in this section.

Scattered radiation from the electron applicator influences the dose distribution in the patient. As the field size and distances from the applicator changes, the scattered radiation from the applicator changes. The amount of scattered radiation depends on the applicator design and on the formation of the electron beam in the treatment head. Electrons which scatter off the applicator walls improve flatness at the periphery of the field at a shallow depth, but with less penetrating electrons. For each electron energy and applicator the machine sets the jaw opening. A table of jaw opening is given on the following page.



Electron Applicators

C-Series Type3 Jaw Settings for Electron Applicators

	Field Size (cm)					
Mode/App	25x25	20x20	15x15	10x10	6x6	10x6
4 MEV	30x30	25x25	20x20	20x20	20x20	X=16, Y=13
6 MeV	30x30	25x25	20x20	20x20	20x20	X=16, Y=13
9 MeV	30x30	25x25	20x20	20x20	20x20	X=16, Y=13
12 MeV	30x30	25x25	17x17	14x14	11x11	X=16, Y=11
15 MeV	28x28	23x23	17x17	14x14	11x11	X=16, Y=10
16 MeV	28x28	23x23	17x17	14x14	11x11	X=16, Y=10
18 MeV	27x27	22x22	17x17	14x14	11x11	X=16, Y=10
20 MeV	27x27	22x22	17x17	14x14	11x11	X=16, Y=10
22 MeV	27x27	22x22	17x17	14x14	11x11	X=16, Y=10

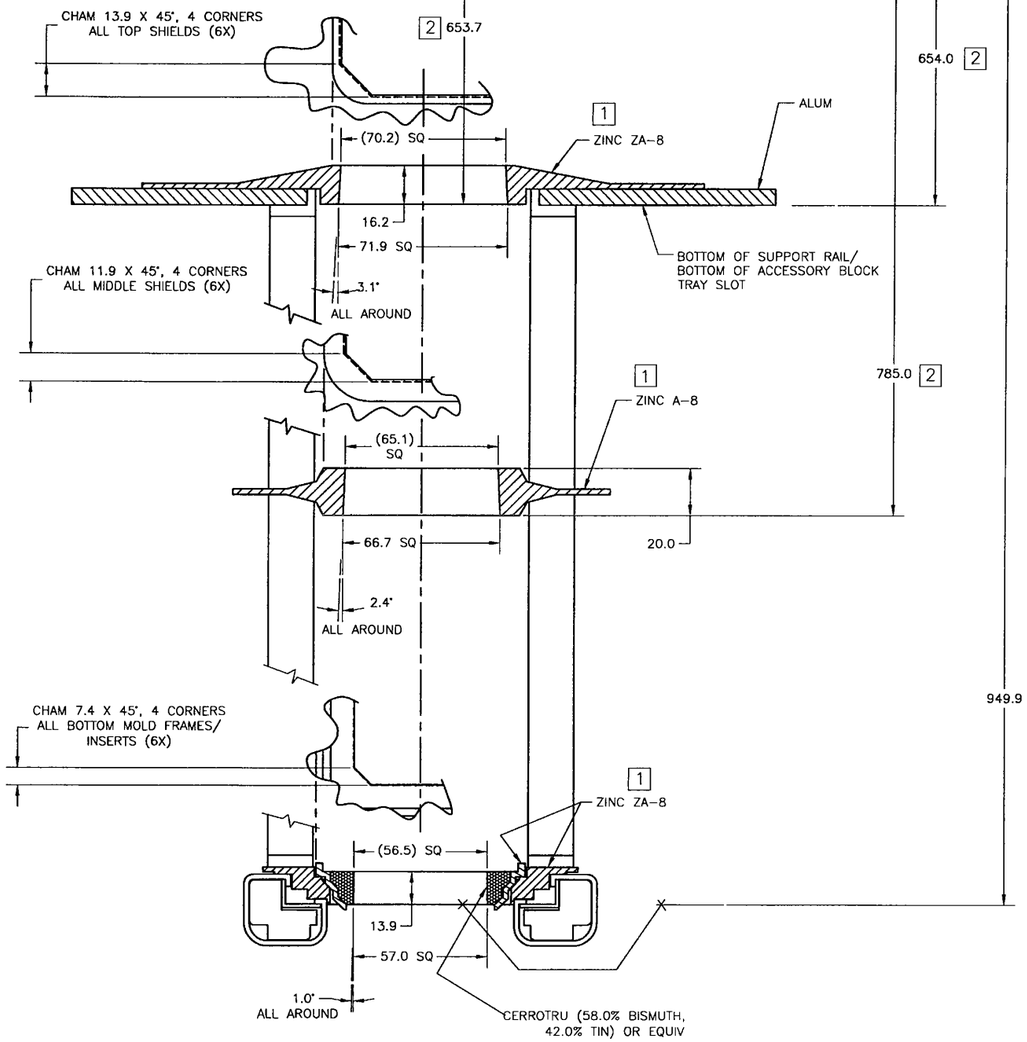
* All units are in cm

DASH	MODEL	NEXT ASSEMBLY
–	Ref	100040466

CHAM 13.9 X 45°, 4 CORNERS
ALL TOP SHIELDS (6X)

CHAM 11.9 X 45°, 4 CORNERS
ALL MIDDLE SHIELDS (6X)

CHAM 7.4 X 45°, 4 CORNERS
ALL BOTTOM MOLD FRAMES/
INSERTS (6X)



1 8.4%Al, 1%Cu, 0.02%MgZn ALLOY, REMAINDER ZINC.

2 DIMENSIONS DESIGNATED ARE MEASURED FROM TARGET.

TOLERANCES:
ALL (6X) TOP & MIDDLE SHIELDS: THICKNESS ± 1.0, ANGLES ± 0.5°
APERTURES OPENINGS +1.0, –1.5
ALL (6X) BOTTOM MOLD FRAMES/INSERTS: THICKNESS ± 0.5, ANGLES ± 1.0°
APERTURES OPENINGS, UP TO 100, ± 0.5, OVER 100, ± 1.0

TARGET TO SHIELDS: ±3.0

6 x 6 cm
MLC/65.4cm

METRIC
DIMENSIONS ARE IN MILLIMETERS (mm)

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

DESCRIPTION OF CHANGE	ENG RELEASE
APVD	2/14/03
ECO	
DFT	JTM
CHK	2-14-03
DATE	2-14-03
REV	1

DASH	DESCRIPTION
–06	SHOWN 25 x 25 cm SHT 6
–05	SHOWN 20 x 20 cm SHT 5
–04	SHOWN 15 x 15 cm SHT 4
–03	SHOWN 10 x 10 cm SHT 3
–02	SHOWN 10 x 6 cm SHT 2
–01	SHOWN 6 x 6 cm SHT 1

VARIAN medical systems | ONCOLOGY SYSTEMS

DRAWN	DATE	APPROVED	DATE	SCALE
J.MAGUIRE	2–14–03		2/14/03	1/1
CHECKED	DATE	APPROVED	DATE	SHEET
–	–	–	–	1 OF 6

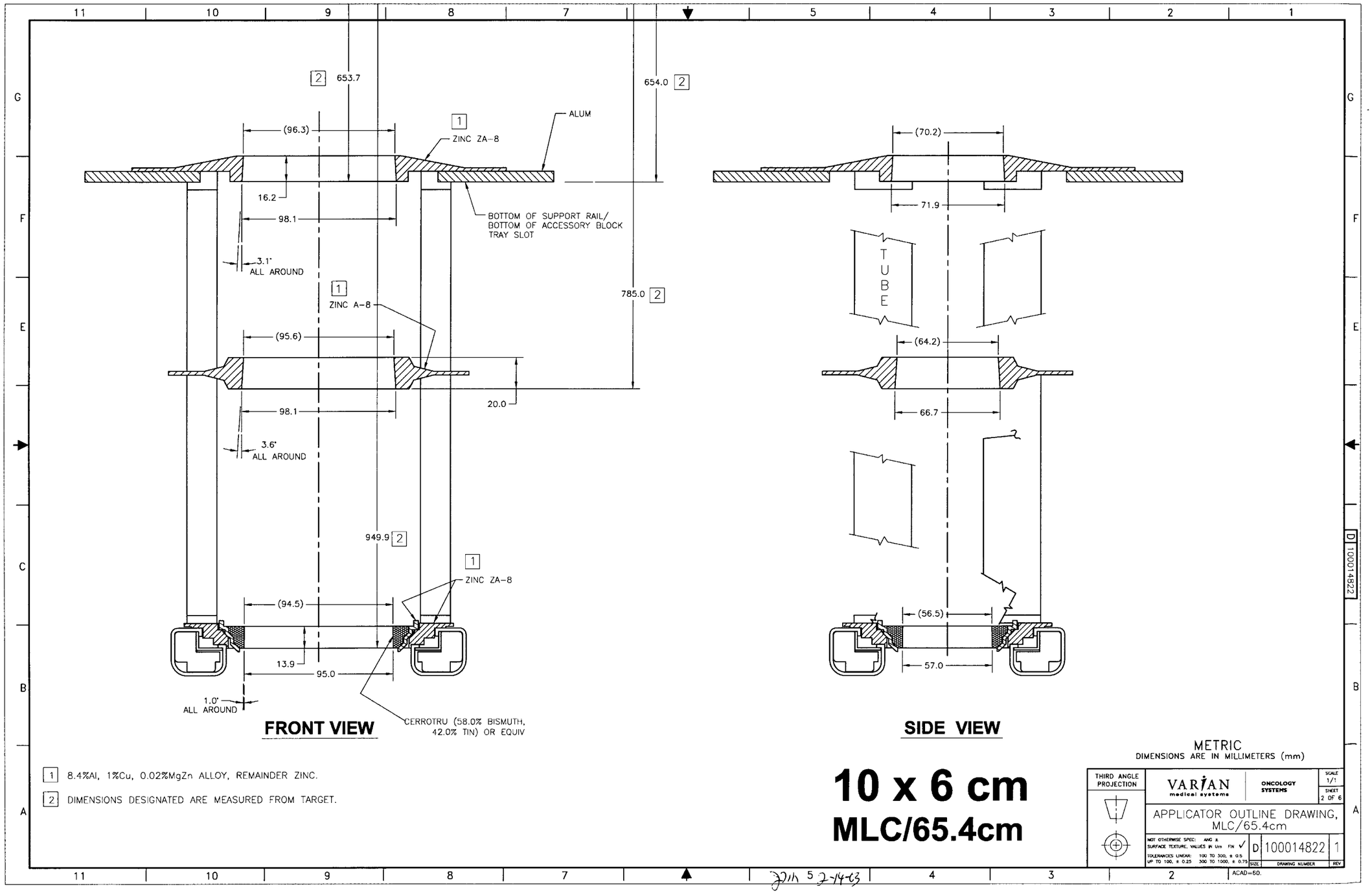
APPLICATOR OUTLINE DRAWING,
MLC/65.4cm

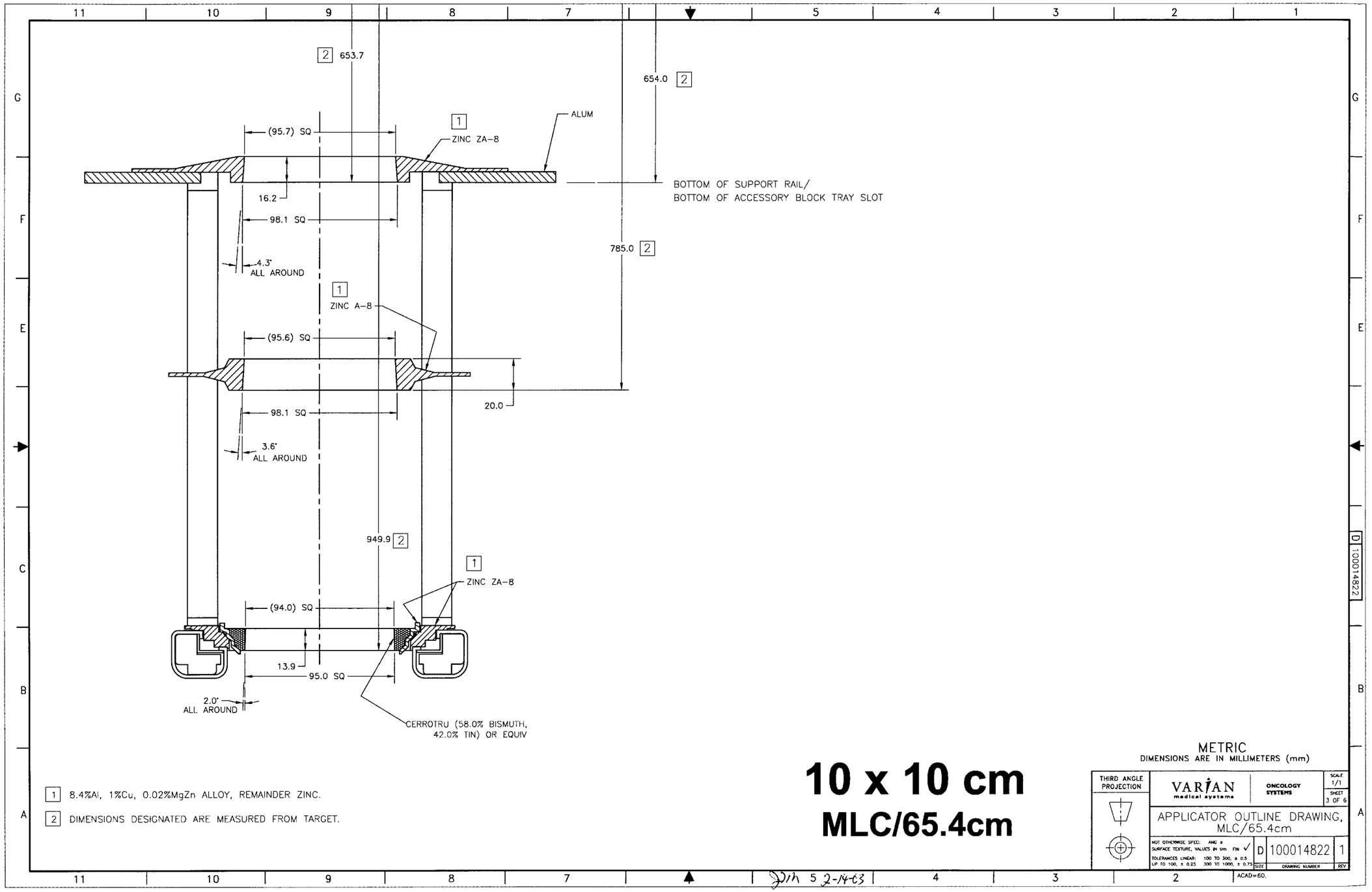
NOT OTHERWISE SPEC: ANG ± SURFACE TEXTURE, VALUES IN Um FIN ✓
TOLERANCES LINEAR: 100 TO 300, ± 0.5; UP TO 100, ± 0.25; 300 TO 1000, ± 0.75

SIZE	DRAWING NUMBER	REV
D	100014822	1

SIMILAR TO: | ACAD=60. | PLOT/LIMITS:0,0/863.6,558.8

D 100014822


2 653.7
654.0 2
(96.3)
1
ZINC ZA-8
ALUM
16.2
98.1
BOTTOM OF SUPPORT RAIL/
BOTTOM OF ACCESSORY BLOCK
TRAY SLOT
3.1"
ALL AROUND
1
ZINC A-8
785.0 2
(95.6)
20.0
98.1
3.6"
ALL AROUND
949.9 2
1
ZINC ZA-8
(94.5)
13.9
95.0
1.0"
ALL AROUND
CERROTRU (58.0% BISMUTH,
42.0% TIN) OR EQUIV
FRONT VIEW
(70.2)
71.9
TUBE
(64.2)
66.7
(56.5)
57.0
SIDE VIEW
1 8.4%Al, 1%Cu, 0.02%MgZn ALLOY, REMAINDER ZINC.
2 DIMENSIONS DESIGNATED ARE MEASURED FROM TARGET.
10 x 6 cm
MLC/65.4cm
METRIC
DIMENSIONS ARE IN MILLIMETERS (mm)
THIRD ANGLE PROJECTION
VARIAN medical systems
ONCOLOGY SYSTEMS
SCALE 1/1
SHEET 2 OF 6
APPLICATOR OUTLINE DRAWING, MLC/65.4cm
D 100014822 1
ACAD=60.



1 8.4%Al, 1%Cu, 0.02%MgZn ALLOY, REMAINDER ZINC.

2 DIMENSIONS DESIGNATED ARE MEASURED FROM TARGET.

10 x 10 cm
MLC/65.4cm

METRIC
DIMENSIONS ARE IN MILLIMETERS (mm)

THIRD ANGLE PROJECTION

VARIAN medical systems | ONCOLOGY SYSTEMS | SCALE 1/1 | SHEET 3 OF 6

APPLICATOR OUTLINE DRAWING, MLC/65.4cm

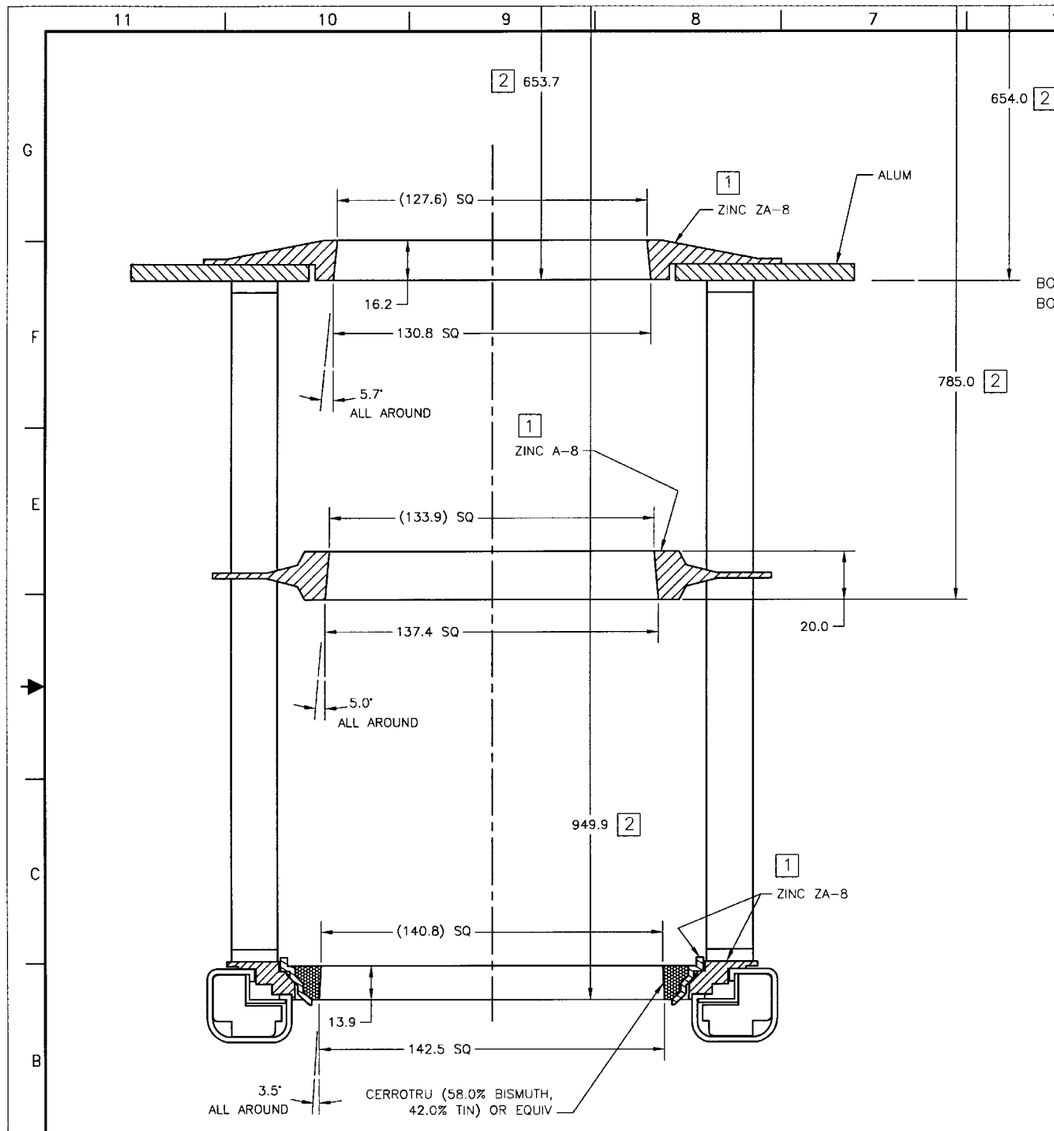
NOT OTHERWISE SPEC: ANG ± SURFACE TEXTURE, VALUES IN Um FIN ✓
TOLERANCES LINEAR: UP TO 100, ± 0.25 | 100 TO 300, ± 0.5 | 300 TO 1000, ± 0.75

D | 100014822 | 1
SIZE | DRAWING NUMBER | REV

ACAD=60.

Dim 52-1463

D 100014822



1 8.4%Al, 1%Cu, 0.02%MgZn ALLOY, REMAINDER ZINC.

2 DIMENSIONS DESIGNATED ARE MEASURED FROM TARGET.

15 x 15 cm
MLC/65.4cm

METRIC
DIMENSIONS ARE IN MILLIMETERS (mm)

THIRD ANGLE PROJECTION

VARIAN medical systems | ONCOLOGY SYSTEMS | SCALE 1/1 | SHEET 4 OF 6

APPLICATOR OUTLINE DRAWING, MLC/65.4cm

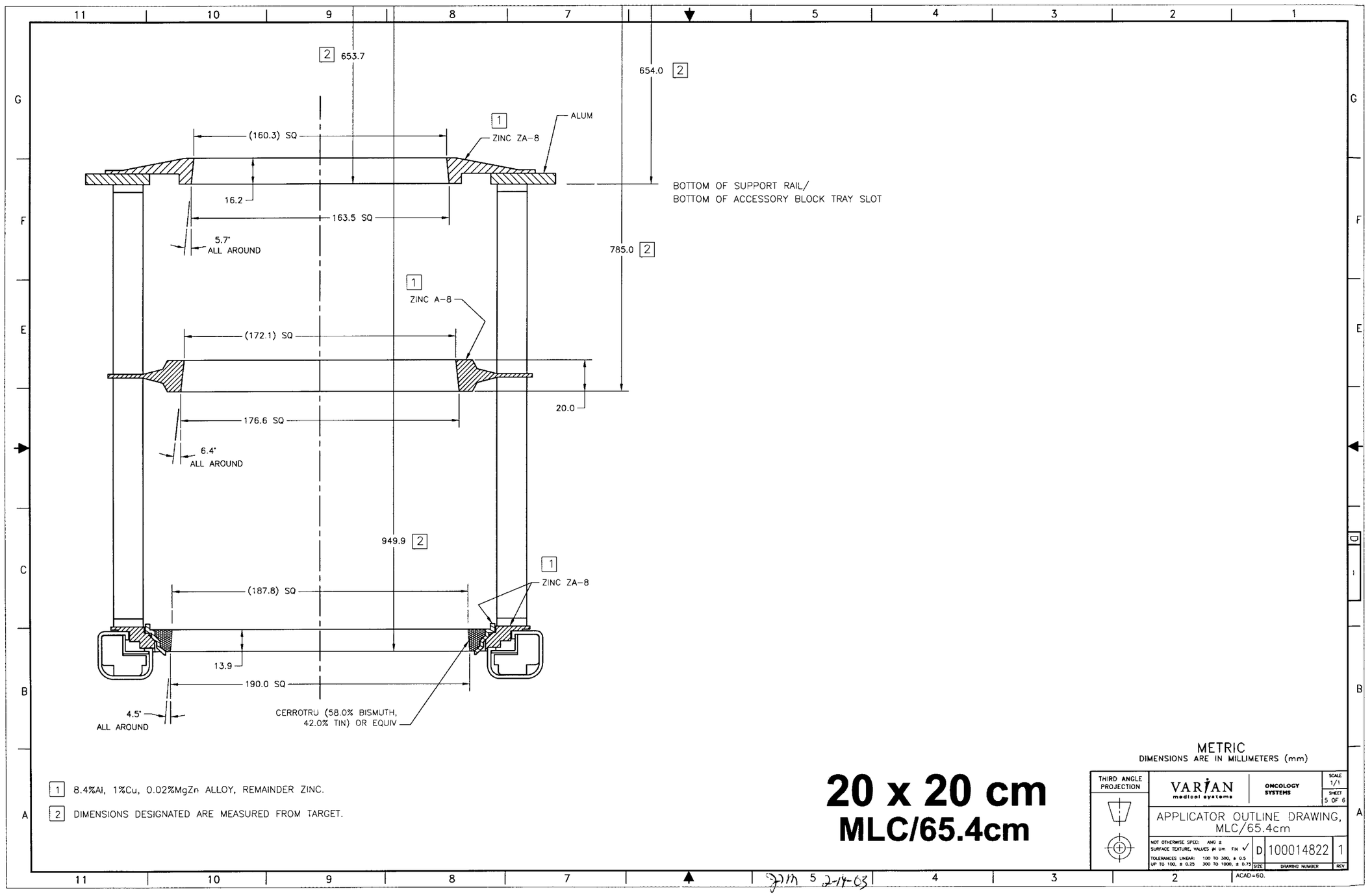
NOT OTHERWISE SPEC: ANG ± SURFACE TEXTURE, VALUES IN Um FIN ✓
TOLERANCES: LINEAR: 100 TO 300, ± 0.5; UP TO 100, ± 0.25; 300 TO 1000, ± 0.75

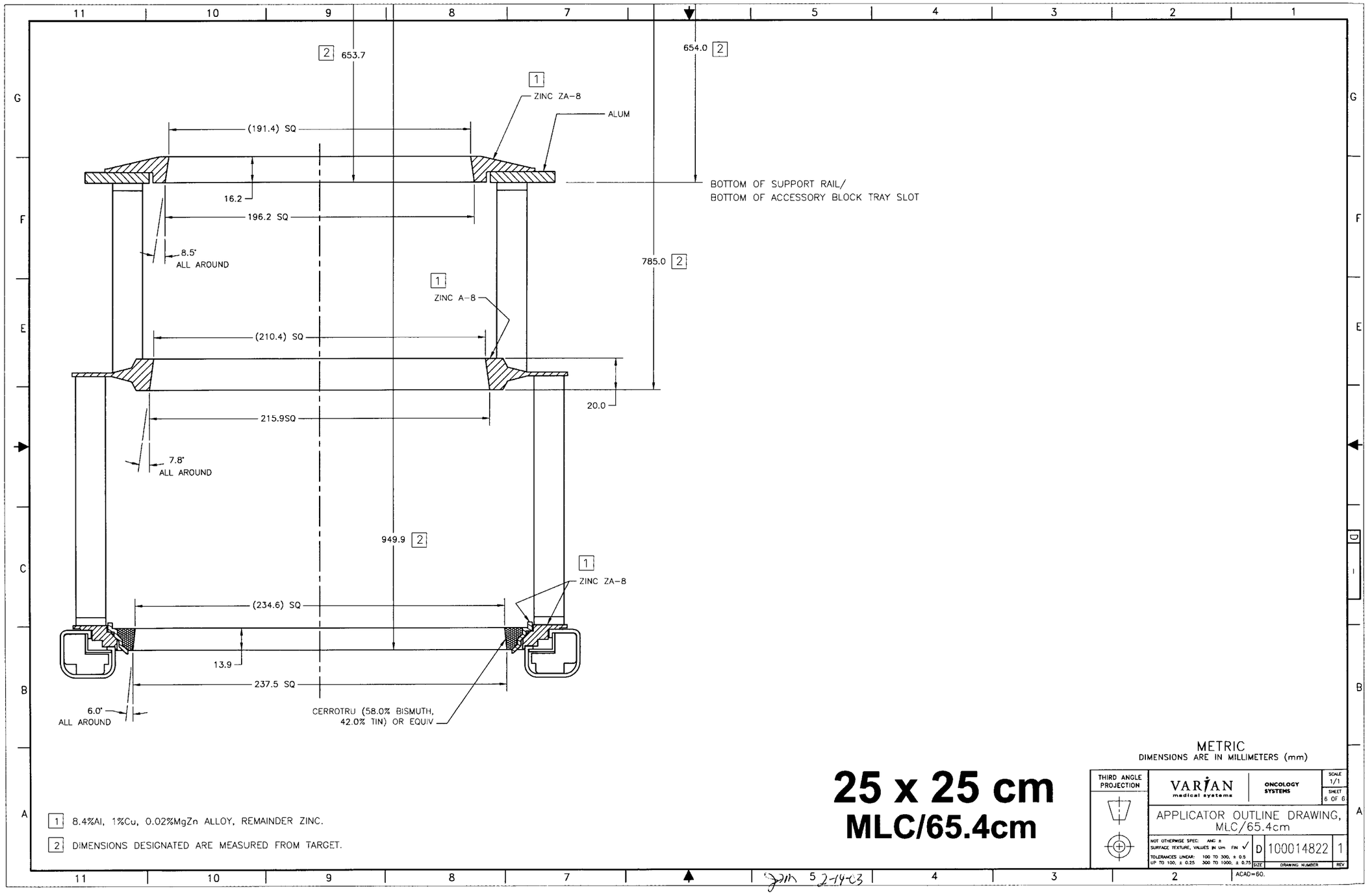
SIZE	DRAWING NUMBER	REV
D	100014822	1

ACAD=60.

jm 5 2-14-03

D 100014822


2 653.7
654.0 2
1
ALUM
ZINC ZA-8
(160.3) SQ
16.2
163.5 SQ
5.7°
ALL AROUND
BOTTOM OF SUPPORT RAIL/
BOTTOM OF ACCESSORY BLOCK TRAY SLOT
785.0 2
1
ZINC A-8
(172.1) SQ
20.0
176.6 SQ
6.4°
ALL AROUND
949.9 2
1
ZINC ZA-8
(187.8) SQ
13.9
190.0 SQ
4.5°
ALL AROUND
CERROTRU (58.0% BISMUTH,
42.0% TIN) OR EQUIV
1 8.4%Al, 1%Cu, 0.02%MgZn ALLOY, REMAINDER ZINC.
2 DIMENSIONS DESIGNATED ARE MEASURED FROM TARGET.
20 x 20 cm
MLC/65.4cm
METRIC
DIMENSIONS ARE IN MILLIMETERS (mm)
THIRD ANGLE PROJECTION
VARIAN medical systems
ONCOLOGY SYSTEMS
SCALE 1/1
SHEET 5 OF 6
APPLICATOR OUTLINE DRAWING, MLC/65.4cm
NOT OTHERWISE SPEC: ANG ±
SURFACE TEXTURE, VALUES IN Um FIN ✓
TOLERANCES LINEAR: 100 TO 300, ± 0.5
UP TO 100, ± 0.25 300 TO 1000, ± 0.75
D
100014822
1
SIZE
DRAWING NUMBER
REV
ACAD-60.


2 653.7
654.0 2
1
ZINC ZA-8
ALUM
(191.4) SQ
16.2
196.2 SQ
8.5°
ALL AROUND
BOTTOM OF SUPPORT RAIL/
BOTTOM OF ACCESSORY BLOCK TRAY SLOT
785.0 2
1
ZINC A-8
(210.4) SQ
20.0
215.9SQ
7.8°
ALL AROUND
949.9 2
1
ZINC ZA-8
(234.6) SQ
13.9
237.5 SQ
6.0°
ALL AROUND
CERROTRU (58.0% BISMUTH,
42.0% TIN) OR EQUIV
1 8.4%Al, 1%Cu, 0.02%MgZn ALLOY, REMAINDER ZINC.
2 DIMENSIONS DESIGNATED ARE MEASURED FROM TARGET.
25 x 25 cm
MLC/65.4cm
METRIC
DIMENSIONS ARE IN MILLIMETERS (mm)
THIRD ANGLE PROJECTION
VARIAN medical systems
ONCOLOGY SYSTEMS
SCALE 1/1
SHEET 6 OF 6
APPLICATOR OUTLINE DRAWING, MLC/65.4cm
NOT OTHERWISE SPEC: ANG ±
SURFACE TEXTURE, VALUES IN Um FIN ✓
TOLERANCES LINEAR: 100 TO 300, ± 0.5
UP TO 100, ± 0.25 300 TO 1000, ± 0.75
D
100014822
1
SIZE
DRAWING NUMBER
REV
ACAD-60.
52-14-03