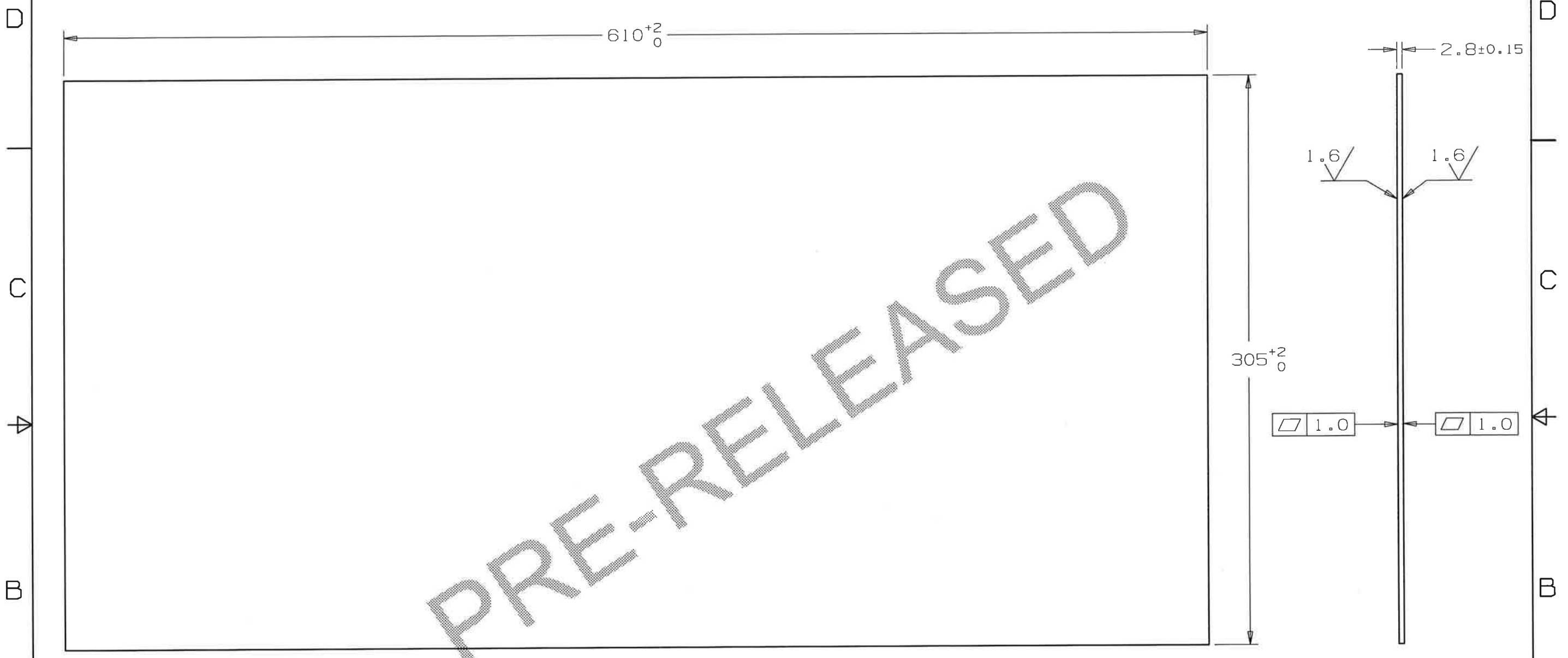


DESCRIPTION: RRR 300 NIOBIUM SHEET HALF-CELL
 CATEGORY: SHEET PROJECT: LCLS11Cryomodule

REV	REVISION CONTROL DOCUMENT	DATES	SIGNATURES	
-	F10050123---RCD		DRAWN	
			APPROVED	



NOTE (UNLESS OTHERWISE SPECIFIED):

- PART MUST BE FREE OF DIRT, GREASE, OIL & CHIPS.
- PART TO BE FREE OF ALL SHARP EDGES, CORNERS, AND BURRS.
- MATERIAL MUST CONFORM TO: "TECHNICAL SPECIFICATIONS, NIOBIUM MATERIAL" XFEL/007, REVISION C, MAY 7, 2010

UNLESS OTHERWISE SPECIFIED					DRAWN	G. LANGLOIS	DATE	11-Nov-2015
±X	±X.X	±X.XX	±X/X	±X°	CHECKED		DATE	
2	0.3	0.12	N/A	1*	APPROVED		DATE	
BREAK ALL SHARP EDGES 0.5 MAX. DO NOT SCALE DRAWING DIMENSIONS BASED ON ASME Y14.5-2009 MAX. ALL MACH SURFACES 3.2 DRAWING UNITS: MM					USED ON			
					MATERIAL			
					RRR 300 NIOBIUM			
					GROUP: Technical Division - Design and Drafting CAGE CODE: 0U5R6			

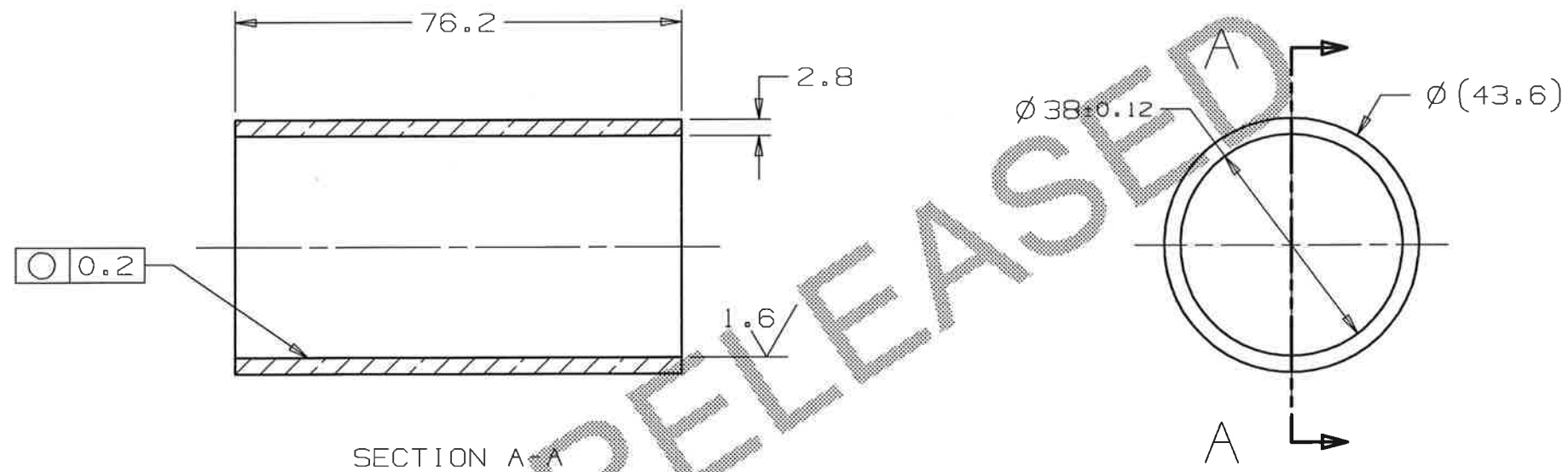
FERMI NATIONAL ACCELERATOR LABORATORY
 UNITED STATES DEPARTMENT OF ENERGY

NAME
 RRR 300 NIOBIUM SHEET
 HALF-CELL PRODUCTION

SCALE 1:2	SIZE A3	DRAWING NUMBER F10050123	SHEET 1 OF 1	REV -
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DESCRIPTION: 3.9GHZ END TUBE PRODUCTION
 CATEGORY: TUBE PROJECT: LCLS11Cryomodule

REV	REVISION CONTROL DOCUMENT	DATES	SIGNATURES	
-	F10050124---RCD		DRAWN	
			APPROVED	



PRE-RELEASED

NOTE (UNLESS OTHERWISE SPECIFIED):

1. PART MUST BE FREE OF DIRT, GREASE, OIL & CHIPS.
2. PART TO BE FREE OF ALL SHARP EDGES, CORNERS, AND BURRS.
3. TUBES TO BE FORMED BY THE METHOD OF CHOICE OF THE CONTRACTOR: SEAMLESS TUBES DRAWN FROM SHEET, EXTRUDED TUBING OR SPUN FORMED TUBES.
4. MATERIAL MUST CONFORM TO: "TECHNICAL SPECIFICATIONS, NIOBIUM MATERIAL" XFEL/007, REVISION C, MAY 7, 2010

UNLESS OTHERWISE SPECIFIED				
±X	±X.X	±X.XX	±X/X	±X°
2	0.3	0.12	N/A	1°

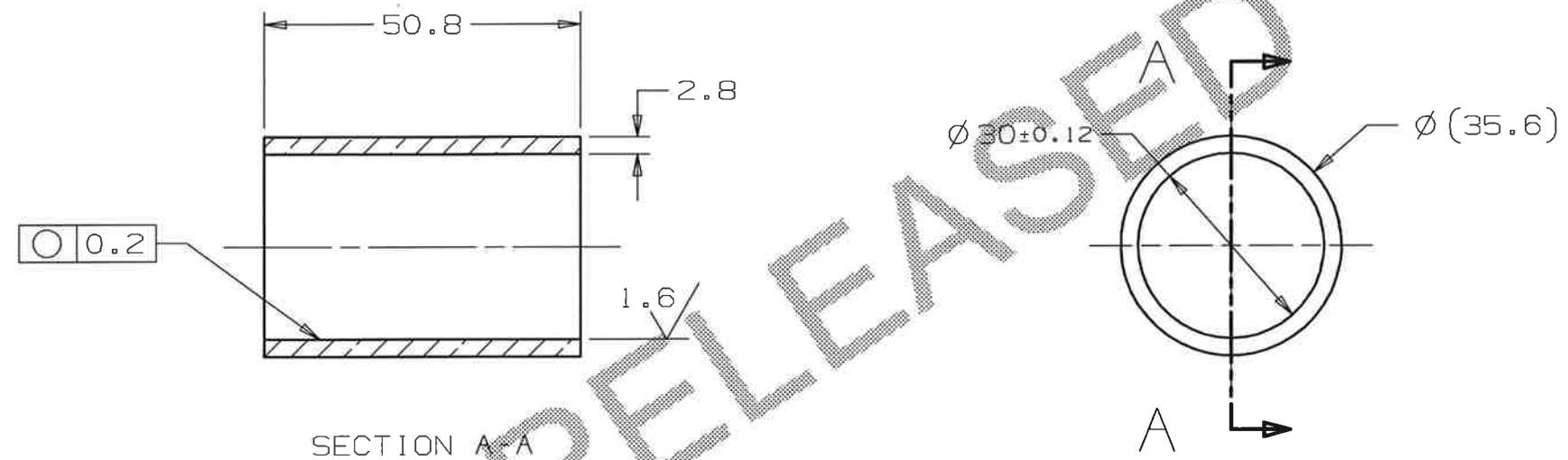
BREAK ALL SHARP EDGES 0.5 MAX.
 DO NOT SCALE DRAWING
 DIMENSIONS BASED ON ASME Y14.5-2009
 MAX. ALL MACH SURFACES 3.2
 DRAWING UNITS: MM

DRAWN	G. LANGLOIS	DATE	11-Nov-2015
CHECKED		DATE	
APPROVED		DATE	
USED ON			
MATERIAL	RRR 300 NIOBIUM		
GROUP: Technical Division - Design and Drafting	CAGE CODE: OUSR6		

FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY				
NAME				
3.9GHZ END TUBE PRODUCTION				
SCALE	SIZE	DRAWING NUMBER	SHEET	REV
1:1	A3	F10050124	1 OF 1	-

DESCRIPTION: 3.9 GHZ MAIN COUPLER TUBE PRODUCTION
 CATEGORY: TUBE PROJECT: LCLS11Cryomodule

REV	REVISION CONTROL DOCUMENT	DATES	SIGNATURES	
-	F10050125---RCD		DRAWN	
			APPROVED	



NOTE (UNLESS OTHERWISE SPECIFIED):

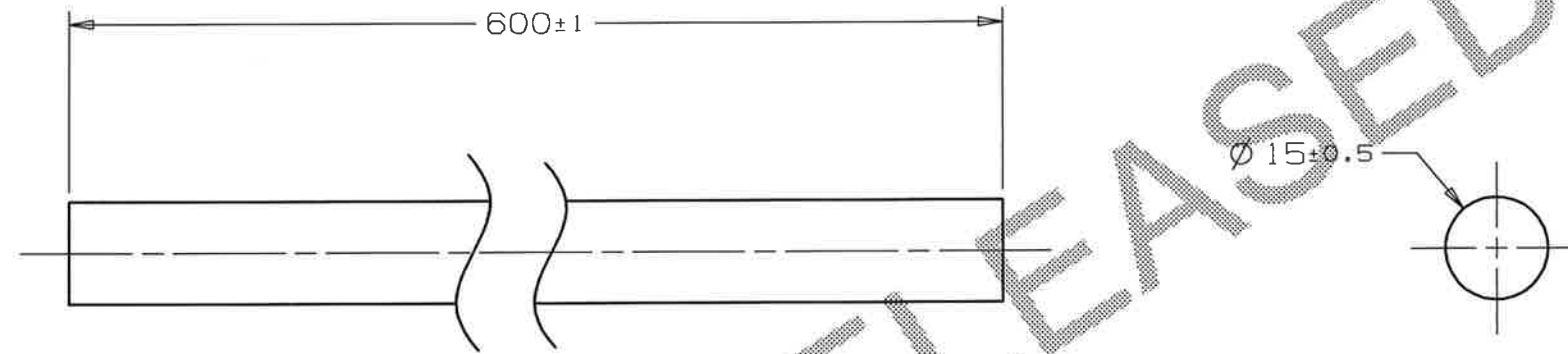
- PART MUST BE FREE OF DIRT, GREASE, OIL & CHIPS.
- PART TO BE FREE OF ALL SHARP EDGES, CORNERS, AND BURRS.
- TUBES TO BE FORMED BY THE METHOD OF CHOICE OF THE CONTRACTOR: SEAMLESS TUBES DRAWN FROM SHEET, EXTRUDED TUBING OR SPUN FORMED TUBES.
- MATERIAL MUST CONFORM TO: "TECHNICAL SPECIFICATIONS, NIOBIUM MATERIAL" XFEL/007, REVISION C, MAY 7, 2010

UNLESS OTHERWISE SPECIFIED					DRAWN	G. LANGLOIS	DATE	11-Nov-2015
±X	±X.X	±X.XX	±X/X	±X*	CHECKED		DATE	
2	0.3	0.12	N/A	1*	APPROVED		DATE	
BREAK ALL SHARP EDGES 0.5 MAX. DO NOT SCALE DRAWING DIMENSIONS BASED ON ASME Y14.5-2009 MAX. ALL MACH SURFACES 3.2 DRAWING UNITS: MM					USED ON			
					MATERIAL			
					RRR 300 NIOBIUM			
GROUP: Technical Division - Design and Drafting					CAGE CODE: 0U5R6			

					FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY				
NAME									
3.9 GHZ MAIN COUPLER TUBE PRODUCTION									
SCALE	SIZE	DRAWING NUMBER			SHEET	REV			
1:1	A3	F10050125			1 OF 1	-			

DESCRIPTION: 3.9GHZ FIELD PROBE TUBE PRODUCTION
 CATEGORY: TUBE PROJECT: LCLS11Cryomodule

REV	REVISION CONTROL DOCUMENT	DATES	SIGNATURES	
-	F10050127---RCD		DRAWN	
			APPROVED	



PRE-RELEASED

NOTE (UNLESS OTHERWISE SPECIFIED):

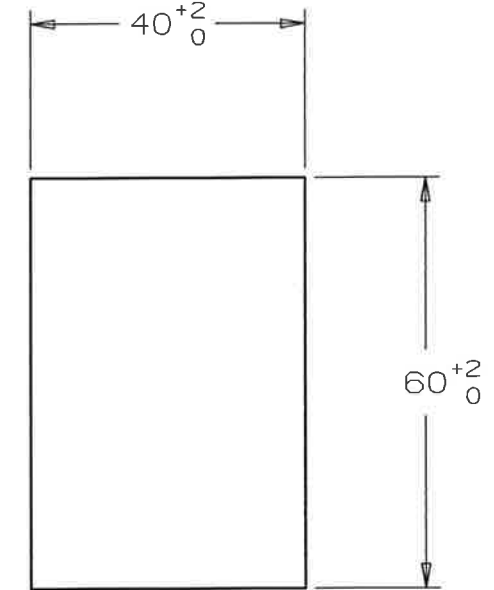
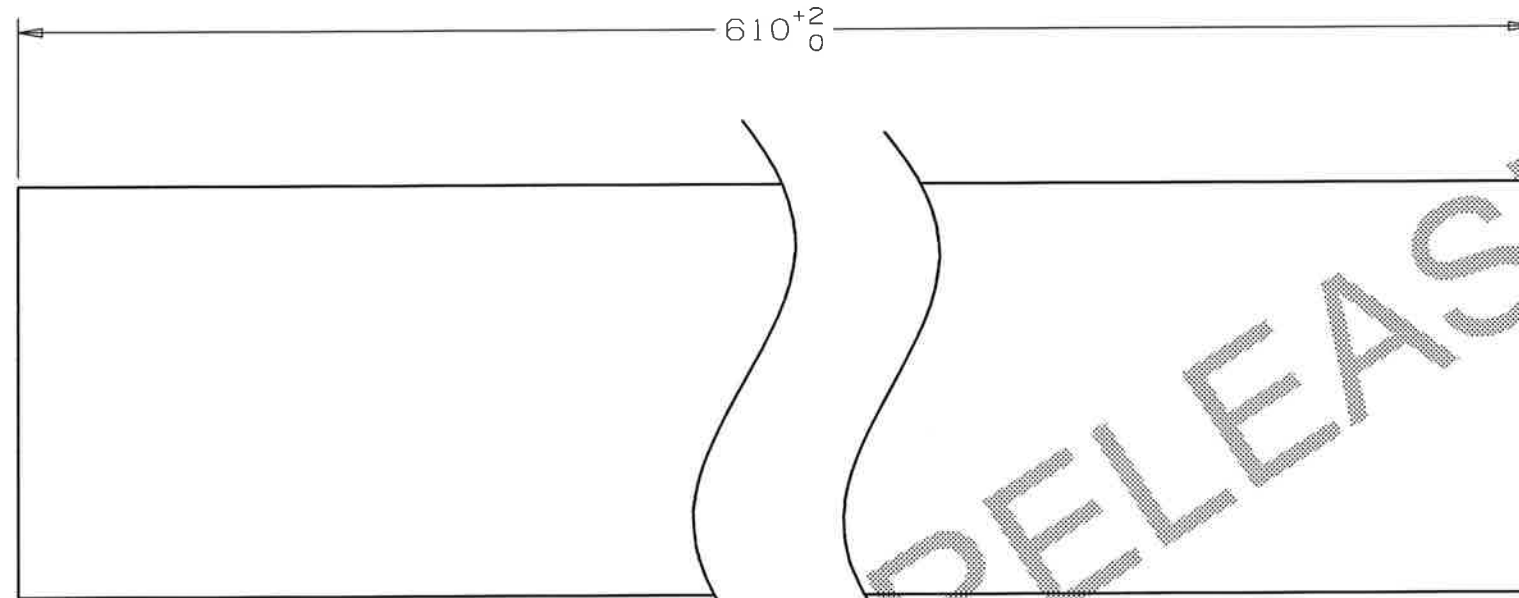
1. PART MUST BE FREE OF DIRT, GREASE, OIL & CHIPS.
2. PART TO BE FREE OF ALL SHARP EDGES, CORNERS, AND BURRS.
3. MATERIAL MUST CONFORM TO: "TECHNICAL SPECIFICATIONS, NIOBIUM MATERIAL" XFEL/007, REVISION C, MAY 7, 2010

UNLESS OTHERWISE SPECIFIED					DRAWN	G. LANGLOIS	DATE	11-Nov-2015
±X	±X.X	±X.XX	±X/X	±X°	CHECKED		DATE	
2	0.3	0.12	N/A	1°	APPROVED		DATE	
BREAK ALL SHARP EDGES 0.5 MAX. DO NOT SCALE DRAWING DIMENSIONS BASED ON ASME Y14.5-2009 MAX. ALL MACH SURFACES 3.2 DRAWING UNITS: MM					USED ON			
					MATERIAL			
					RRR 300 NIOBIUM			
					GROUP: Technical Division - Design and Drafting CAGE CODE: OUSR6			

		FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY		
		NAME		
		3.9GHZ FIELD PROBE TUBE PRODUCTION		
SCALE	SIZE	DRAWING NUMBER	SHEET	REV
1:1	A3	F10050127	1 OF 1	-

DESCRIPTION: 3.9GHZ HOM COUPLER PRODUCTION
 CATEGORY: BAR PROJECT: LCLS11Crygomodule

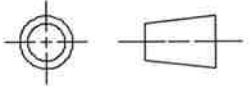
REV	REVISION CONTROL DOCUMENT	DATES	SIGNATURES	
-	F10050128---RCD		DRAWN	
			APPROVED	




PRE-RELEASED

NOTE (UNLESS OTHERWISE SPECIFIED):

1. PART MUST BE FREE OF DIRT, GREASE, OIL & CHIPS.
2. PART TO BE FREE OF ALL SHARP EDGES, CORNERS, AND BURRS.
3. MATERIAL MUST CONFORM TO: "TECHNICAL SPECIFICATIONS, NIOBIUM MATERIAL" XFEL/007, REVISION C, MAY 7, 2010

UNLESS OTHERWISE SPECIFIED					DRAWN	G. LANGLOIS	DATE	11-Nov-2015
±X	±X.X	±X.XX	±X/X	±X*	CHECKED		DATE	
2	0.3	0.12	N/A	1*	APPROVED		DATE	
BREAK ALL SHARP EDGES 0.5 MAX. DO NOT SCALE DRAWING DIMENSIONS BASED ON ASME Y14.5-2009 MAX. ALL MACH SURFACES 3.2 DRAWING UNITS: MM					USED ON			
					MATERIAL			
					RRR 300 NIOBIUM BAR STOCK			
GROUP: Technical Division - Design and Drafting					CAGE CODE: 0U5R6			

 FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY				NAME				
				3.9GHZ HOM COUPLER PRODUCTION				
SCALE	SIZE	DRAWING NUMBER	SHEET	REV				
1:1	A3	F10050128	1 OF 1	-				

DESCRIPTION: 3.9GHZ F-PART PRODUCTION
 CATEGORY: PLATE PROJECT: LCLS11Cryomodule

REV	REVISION CONTROL DOCUMENT	DATES	SIGNATURES	
-	F10050129---RCD		DRAWN	
			APPROVED	



NOTE (UNLESS OTHERWISE SPECIFIED):

- PART MUST BE FREE OF DIRT, GREASE, OIL & CHIPS.
- PART TO BE FREE OF ALL SHARP EDGES, CORNERS, AND BURRS.
- MATERIAL MUST CONFORM TO: "TECHNICAL SPECIFICATIONS, NIOBIUM MATERIAL" XFEL/007, REVISION C, MAY 7, 2010

UNLESS OTHERWISE SPECIFIED				
±X	±X.X	±X.XX	±X/X	±X°
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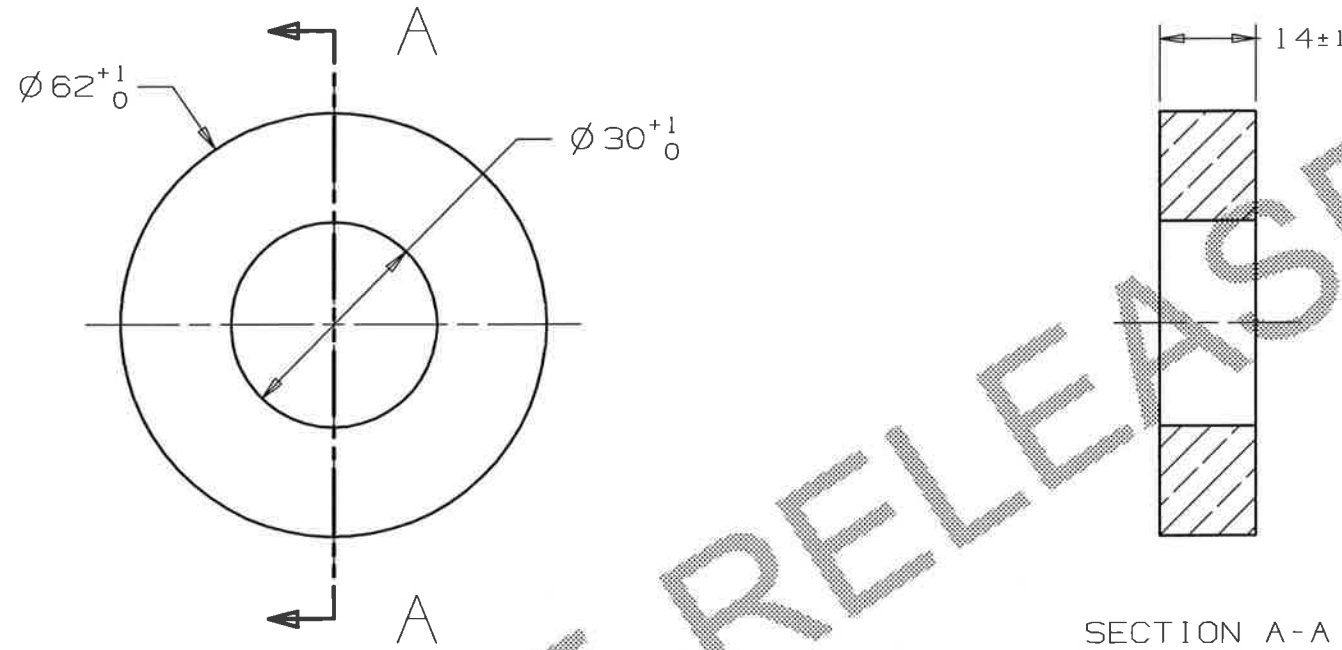
BREAK ALL SHARP EDGES 0.5 MAX.
 DO NOT SCALE DRAWING
 DIMENSIONS BASED ON ASME Y14.5-2009
 MAX. ALL MACH SURFACES 3.2
 DRAWING UNITS: MM

DRAWN	G. LANGLOIS	DATE	11-Nov-2015
CHECKED		DATE	
APPROVED		DATE	
USED ON			
MATERIAL	RRR 300 NIOBIUM		
GROUP: Technical Division - Design and Drafting	CAGE CODE: 0U5R6		

 FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY		NAME	
		3.9GHZ F-PART PRODUCTION	
SCALE 1:1	SIZE A3	DRAWING NUMBER F10050129	SHEET 1 OF 1
		REV -	

DESCRIPTION: 3.9 GHZ TRANSITION RING PRODUCTION
 CATEGORY: RING PROJECT: LCLS11Cryomodule

REV	REVISION CONTROL DOCUMENT	DATES	SIGNATURES	
-	F10050130---RCD		DRAWN	
			APPROVED	



NOTE (UNLESS OTHERWISE SPECIFIED):

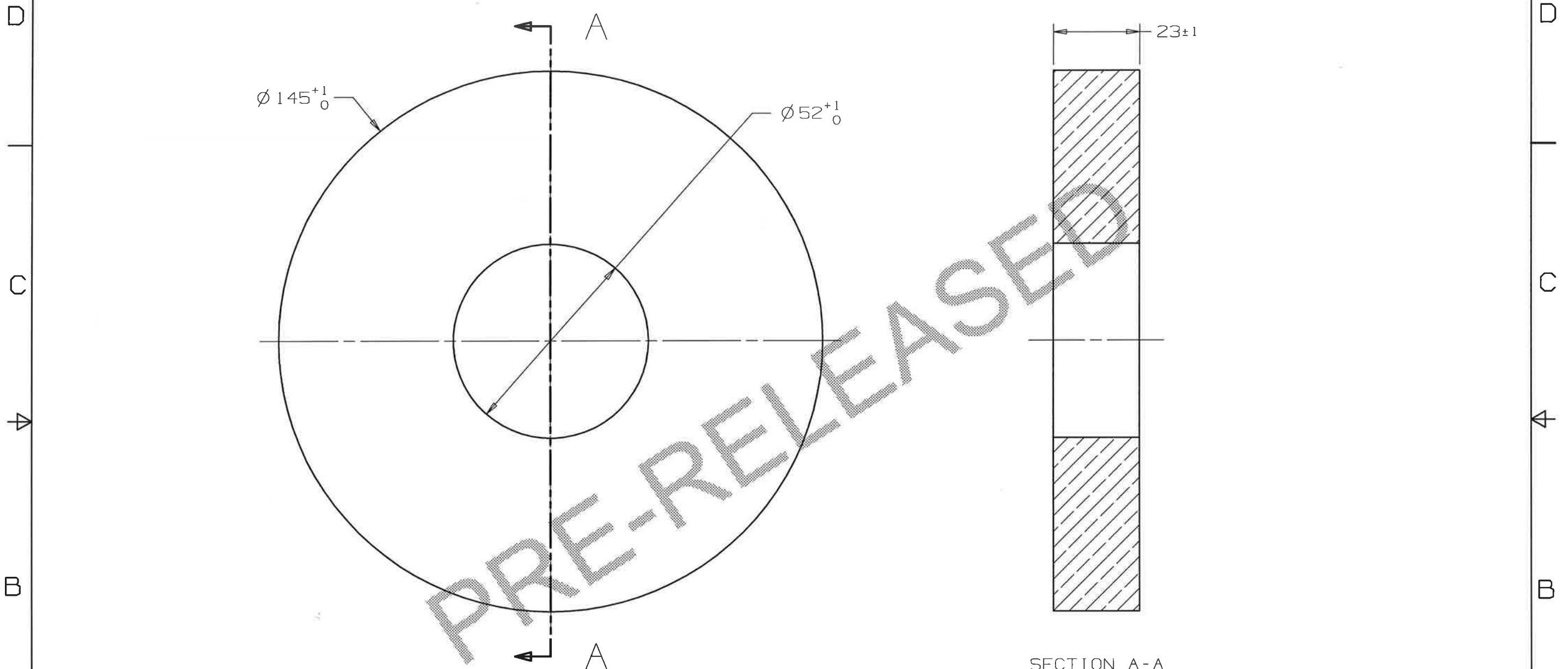
- PART MUST BE FREE OF DIRT, GREASE, OIL & CHIPS.
- PART TO BE FREE OF ALL SHARP EDGES, CORNERS, AND BURRS.
- MATERIAL MUST CONFORM TO: "TECHNICAL SPECIFICATIONS, NIOBIUM MATERIAL" XFEL/007, REVISION C, MAY 7, 2010

UNLESS OTHERWISE SPECIFIED					DRAWN	G. LANGLOIS	DATE	11-Nov-2015
$\pm X$	$\pm X.X$	$\pm X.XX$	$\pm X/X$	$\pm X^\circ$	CHECKED		DATE	
2	0.3	0.12	N/A	1*	APPROVED		DATE	
BREAK ALL SHARP EDGES 0.5 MAX. DO NOT SCALE DRAWING DIMENSIONS BASED ON ASME Y14.5-2009 MAX. ALL MACH SURFACES 3.2 DRAWING UNITS: MM					USED ON			
					MATERIAL			
					RRR 300 NIOBIUM			
GROUP: Technical Division - Design and Drafting					CAGE CODE: 0U5R6			

FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY				
NAME				
3.9 GHZ TRANSITION RING PRODUCTION				
SCALE	SIZE	DRAWING NUMBER	SHEET	REV
1:1	A3	F10050130	1 OF 1	-

DESCRIPTION: 3.9 GHZ CONICAL DISK: MC END PRODUCTION
 CATEGORY: DISK PROJECT: LCLS11Cryomodule

REV	REVISION CONTROL DOCUMENT	DATES	SIGNATURES	
-	F10050131---RCD		DRAWN	
			APPROVED	



NOTE (UNLESS OTHERWISE SPECIFIED):

- PART MUST BE FREE OF DIRT, GREASE, OIL & CHIPS.
- PART TO BE FREE OF ALL SHARP EDGES, CORNERS, AND BURRS.
- TRAILING ZEROS DENOTE TOLERANCE.
- MATERIAL MUST CONFORM TO: "TECHNICAL SPECIFICATIONS, Nb55Ti ALLOY", XFEL/008 REVISION B, JUNE 23, 2009.

UNLESS OTHERWISE SPECIFIED				
±X	±X.X	±X.XX	±X/X	±X*
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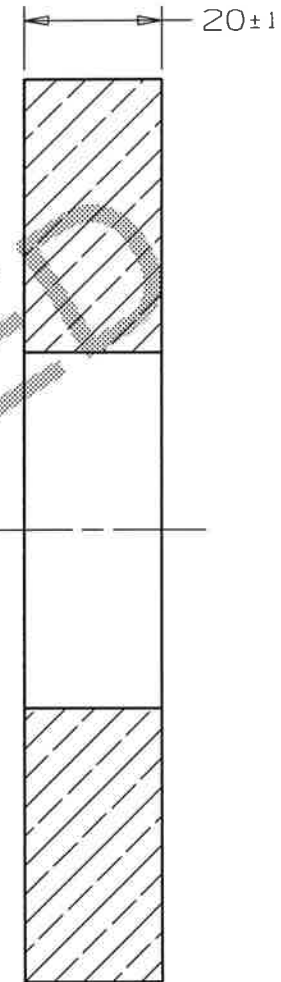
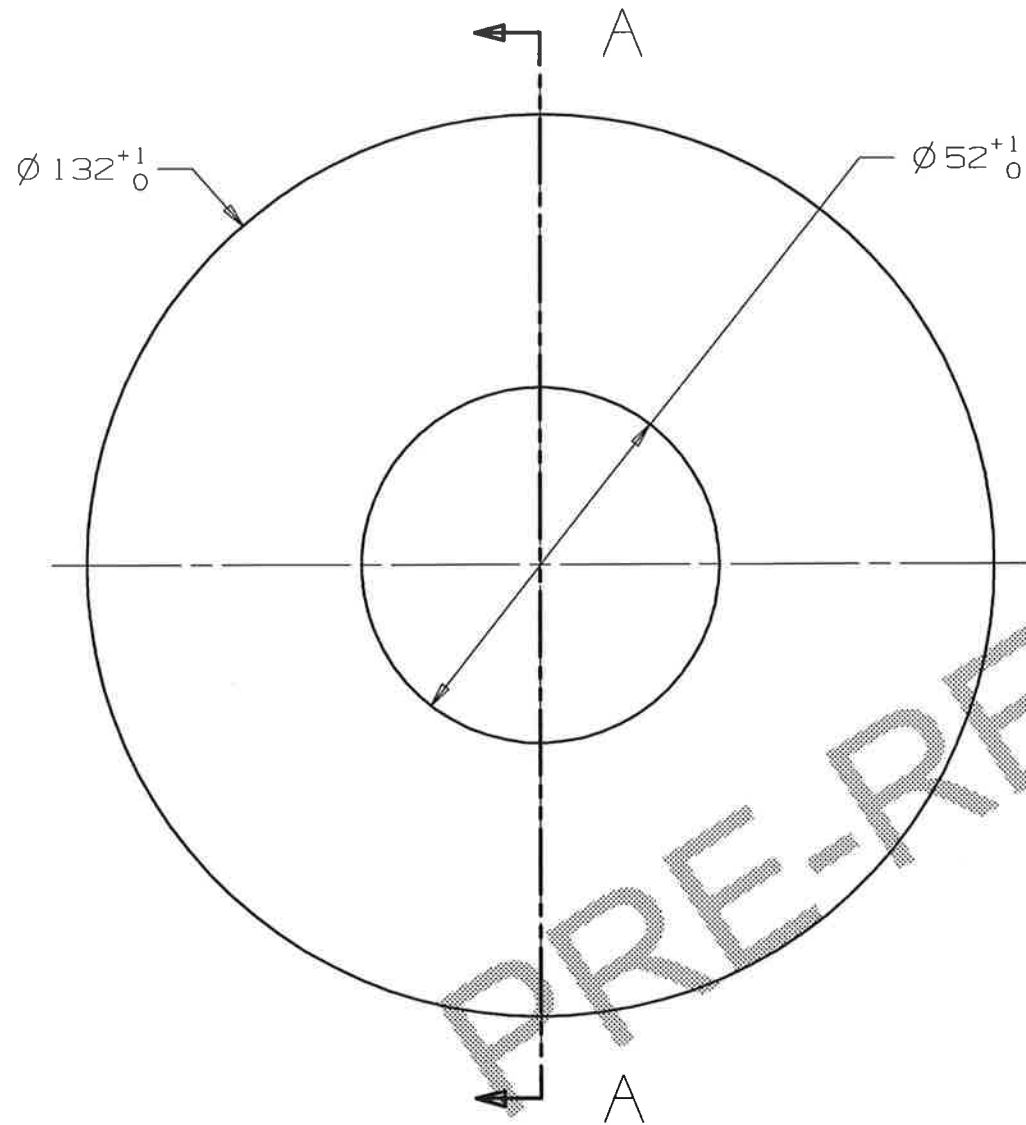
BREAK ALL SHARP EDGES 0.5 MAX.
 DO NOT SCALE DRAWING
 DIMENSIONS BASED ON ASME Y14.5-2009
 MAX. ALL MACH SURFACES 3.2
 DRAWING UNITS: MM

DRAWN	G. LANGLOIS	DATE	11-Nov-2015
CHECKED		DATE	
APPROVED		DATE	
USED ON			
MATERIAL	Nb55Ti		
GROUP: Technical Division - Design and Drafting	CAGE CODE: 0U5R6		

FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY				
NAME				
3.9 GHZ CONICAL DISK: MC END PRODUCTION				
SCALE	SIZE	DRAWING NUMBER	SHEET	REV
1:1	A3	F10050131	1 of 1	-

DESCRIPTION: 3.9 GHZ CONICAL DISK: FP END PRODUCTION
 CATEGORY: DISK PROJECT: LCLS11Cryomodule

REV	REVISION CONTROL DOCUMENT	DATES	SIGNATURES	
-	F10050132---RCD		DRAWN	
			APPROVED	



SECTION A-A

NOTE (UNLESS OTHERWISE SPECIFIED):

- PART MUST BE FREE OF DIRT, GREASE, OIL & CHIPS.
- PART TO BE FREE OF ALL SHARP EDGES, CORNERS, AND BURRS.
- TRAILING ZEROS DENOTE TOLERANCE.
- MATERIAL MUST CONFORM TO: "TECHNICAL SPECIFICATIONS, Nb55Ti ALLOY", XFEL/008 REVISION B, JUNE 23, 2009.

UNLESS OTHERWISE SPECIFIED				
±X	±X.X	±X.XX	±X/X	±X°
2	0.3	0.12	N/A	1°

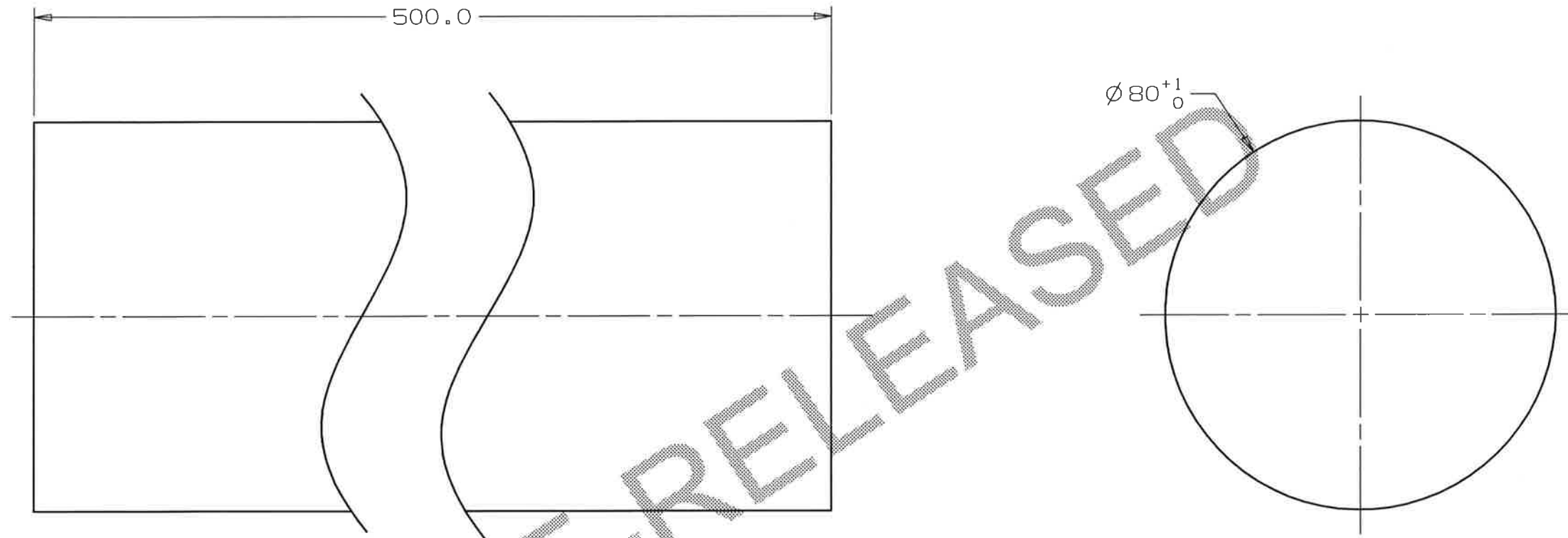
BREAK ALL SHARP EDGES 0.5 MAX.
 DO NOT SCALE DRAWING
 DIMENSIONS BASED ON ASME Y14.5-2009
 MAX. ALL MACH SURFACES 3.2
 DRAWING UNITS: MM

DRAWN	G. LANGLOIS	DATE	12-Nov-2015
CHECKED		DATE	
APPROVED		DATE	
USED ON			
MATERIAL	Nb55Ti		
GROUP: Technical Division - Design and Drafting	CAGE CODE: 0U5R6		

FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY				
NAME				
3.9 GHZ CONICAL DISK: FP END PRODUCTION				
SCALE	SIZE	DRAWING NUMBER	SHEET	REV
1:1	A3	F10050132	1 OF 1	-

DESCRIPTION: 3.9 GHZ NW-40 FLANGE PRODUCTION
 CATEGORY: TUBE PROJECT: LCLS11Cryomodule

REV	REVISION CONTROL DOCUMENT	DATES	SIGNATURES	
-	F10050133---RCD		DRAWN	
			APPROVED	



NOTE (UNLESS OTHERWISE SPECIFIED):

- PART MUST BE FREE OF DIRT, GREASE, OIL & CHIPS.
- PART TO BE FREE OF ALL SHARP EDGES, CORNERS, AND BURRS.
- TRAILING ZEROS DENOTE TOLERANCE.
- MATERIAL MUST CONFORM TO: "TECHNICAL SPECIFICATIONS, Nb55Ti ALLOY", XFEL/008 REVISION B, JUNE 23, 2009.

UNLESS OTHERWISE SPECIFIED				
±X	±X.X	±X.XX	±X/X	±X°
2	0.3	0.12	N/A	1°

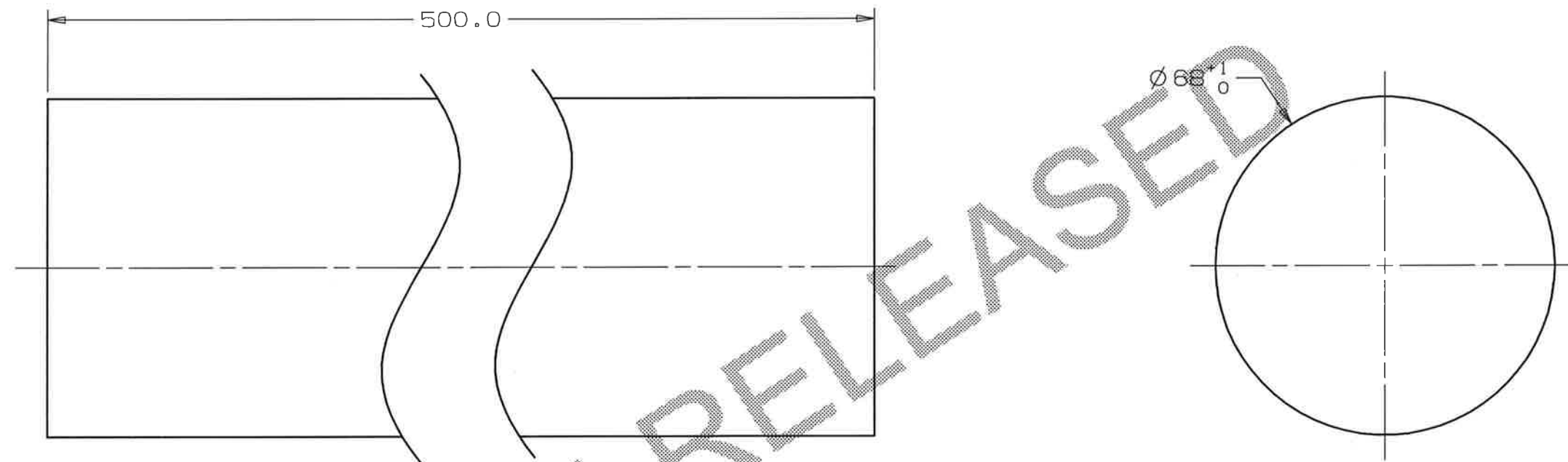
BREAK ALL SHARP EDGES 0.5 MAX.
 DO NOT SCALE DRAWING
 DIMENSIONS BASED ON ASME Y14.5-2009
 MAX. ALL MACH SURFACES 3.2
 DRAWING UNITS: MM

DRAWN	G. LANGLOIS	DATE	12-Nov-2015
CHECKED		DATE	
APPROVED		DATE	
USED ON			
MATERIAL	Nb55Ti		
GROUP: Technical Division - Design and Drafting	CAGE CODE: OUSR6		

 FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY		NAME	
		3.9 GHZ NW-40 FLANGE PRODUCTION	
SCALE 1:1	SIZE A3	DRAWING NUMBER F10050133	SHEET 1 of 1
		REV -	

DESCRIPTION: 3.9 GHZ NW-34 FLANGE PRODUCTION
 CATEGORY: TUBE PROJECT: LCLSII Cryomodule


REV	REVISION CONTROL DOCUMENT	DATES	SIGNATURES	
-	F10050134---RCD		DRAWN	
			APPROVED	



NOTE (UNLESS OTHERWISE SPECIFIED):

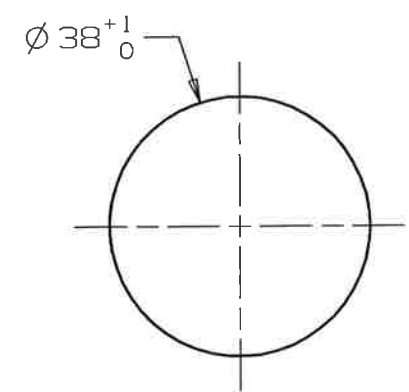
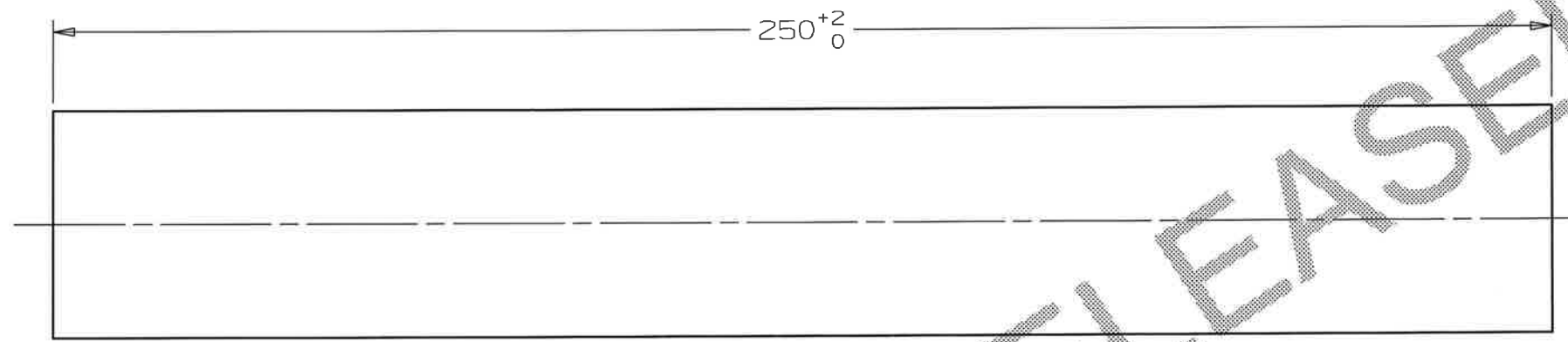
- PART MUST BE FREE OF DIRT, GREASE, OIL & CHIPS.
- PART TO BE FREE OF ALL SHARP EDGES, CORNERS, AND BURRS.
- TRAILING ZEROS DENOTE TOLERANCE.
- MATERIAL MUST CONFORM TO: "TECHNICAL SPECIFICATIONS, Nb55Ti ALLOY", XFEL/008 REVISION B, JUNE 23, 2009.

UNLESS OTHERWISE SPECIFIED					DRAWN	DATE
±X	±X.X	±X.XX	±X/X	±X°	G. LANGLOIS	12-Nov-2015
2	0.3	0.12	N/A	1°	CHECKED	DATE
BREAK ALL SHARP EDGES 0.5 MAX. DO NOT SCALE DRAWING DIMENSIONS BASED ON ASME Y14.5-2009 MAX. ALL MACH SURFACES 3.2 DRAWING UNITS: MM					APPROVED	DATE
					USED ON	
MATERIAL					Nb55Ti	
GROUP: Technical Division - Design and Drafting					CAGE CODE: QJ5R6	

 FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY				
NAME				
3.9 GHZ NW-34 FLANGE PRODUCTION				
SCALE	SIZE	DRAWING NUMBER	SHEET	REV
1:1	A3	F10050134	1 of 1	-

DESCRIPTION: 3.9 GHZ NW-6 FLANGE PRODUCTION
 CATEGORY: TUBE PROJECT: LCLS11Cryomodule

REV	REVISION CONTROL DOCUMENT	DATES	SIGNATURES	
-	F10050135---RCD		DRAWN	
			APPROVED	



PRE-RELEASED

NOTE (UNLESS OTHERWISE SPECIFIED):

- PART MUST BE FREE OF DIRT, GREASE, OIL & CHIPS.
- PART TO BE FREE OF ALL SHARP EDGES, CORNERS, AND BURRS.
- TRAILING ZEROS DENOTE TOLERANCE.
- MATERIAL MUST CONFORM TO: "TECHNICAL SPECIFICATIONS, Nb55Ti ALLOY", XFEL/008 REVISION B, JUNE 23, 2009.

UNLESS OTHERWISE SPECIFIED				
±X	±X.X	±X.XX	±X/X	±X°
2	0.3	0.12	N/A	1*

BREAK ALL SHARP EDGES 0.5 MAX.
 DO NOT SCALE DRAWING
 DIMENSIONS BASED ON ASME Y14.5-2009
 MAX. ALL MACH SURFACES 3.2
 DRAWING UNITS: MM

DRAWN	G. LANGLOIS	DATE	12-Nov-2015
CHECKED		DATE	
APPROVED		DATE	
USED ON			
MATERIAL	Nb55Ti		
GROUP: Technical Division - Design and Drafting	CAGE CODE: 0U5R6		

FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY				
NAME				
3.9 GHZ NW-6 FLANGE PRODUCTION				
SCALE	SIZE	DRAWING NUMBER	SHEET	REV
1:1	A3	F10050135	1 OF 1	-