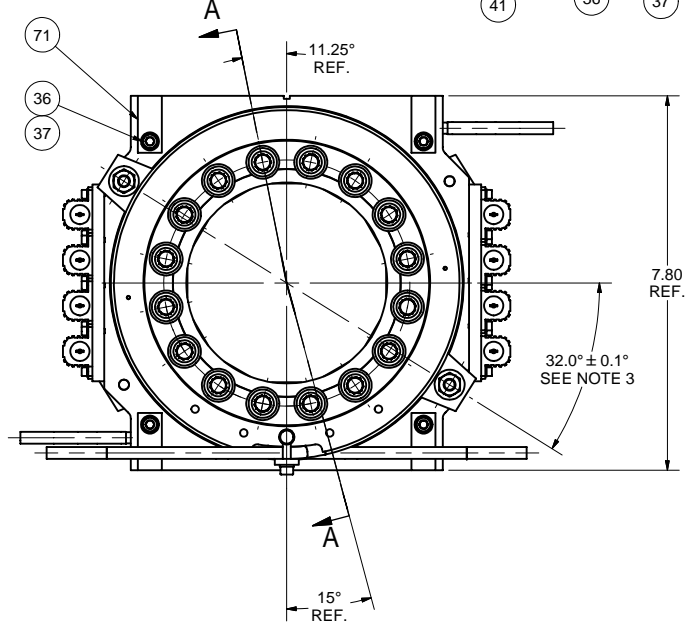
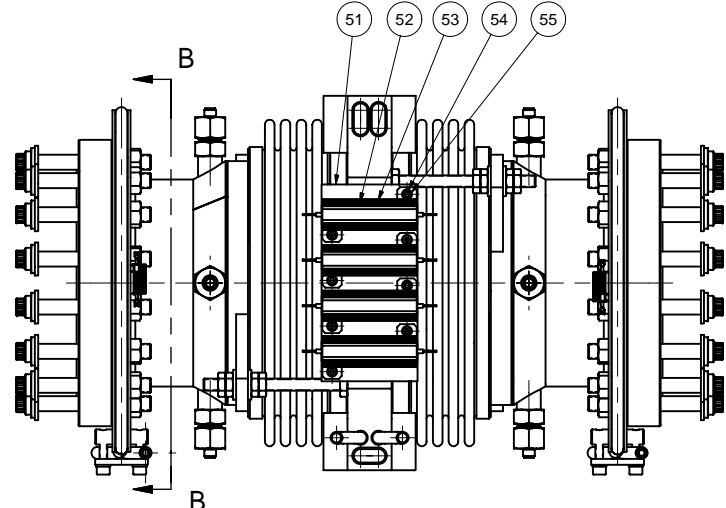
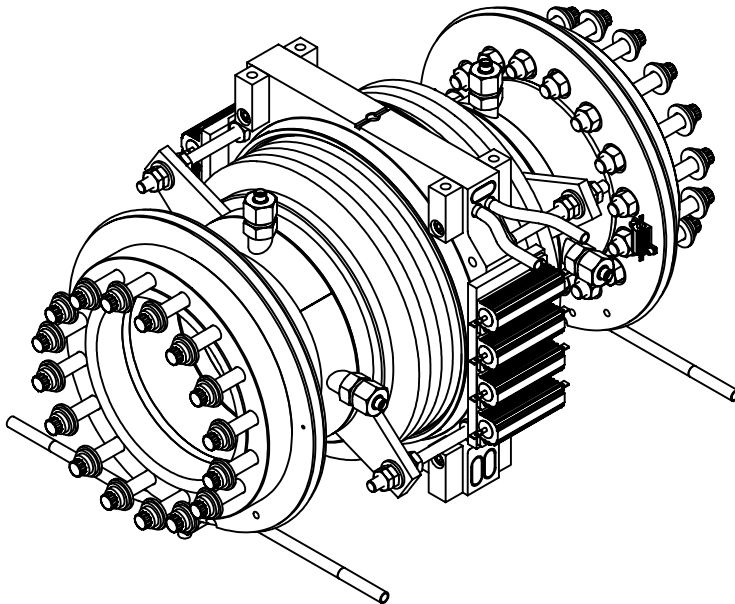
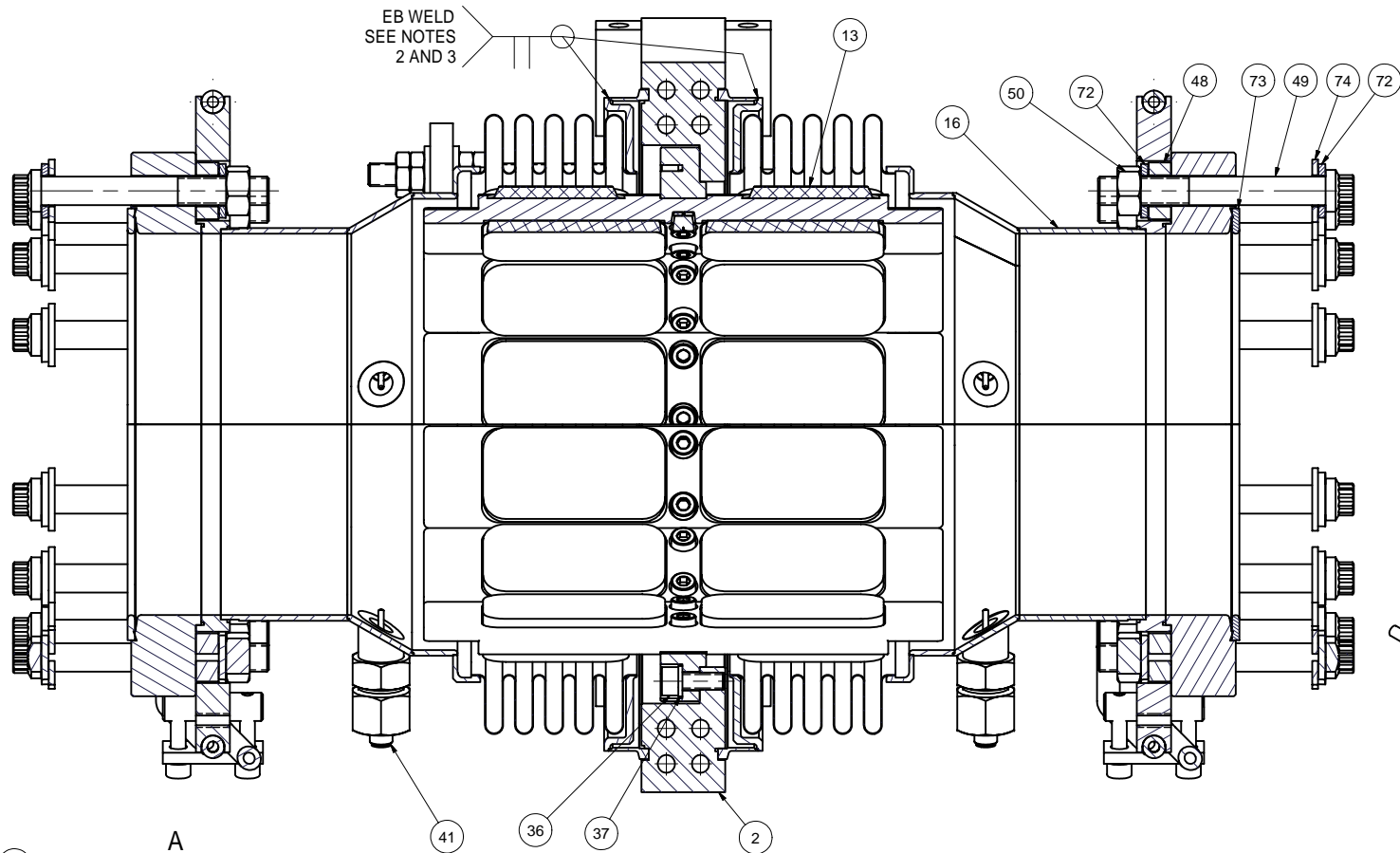
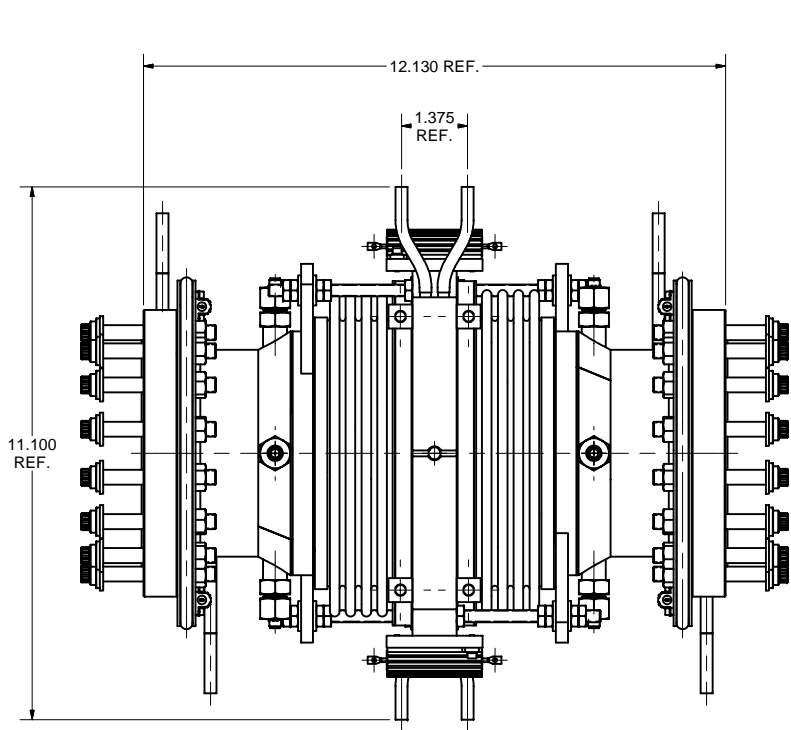
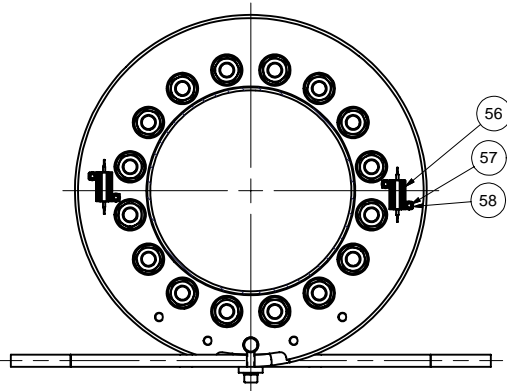


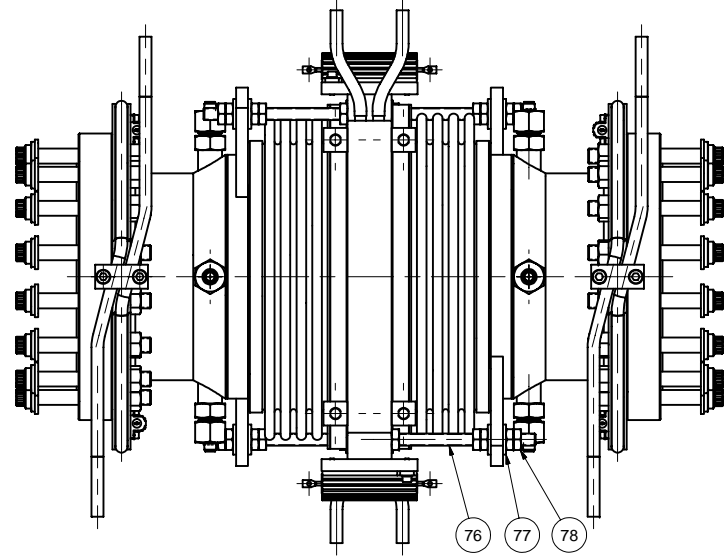
REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
A		BOM EDITED TO STANDARDIZE VENDOR PART #s. D.M.E.	6-14-06	TIO



SECTION A-A  
SCALE 1 : 1



SECTION B-B



- 1 106 MM HOM LOAD ASSEMBLY - Version 2
- FILE NAME: 7102-027  
SHEET NO.: 1  
DFT. SCALE: 1:2  
MATERIAL:  
QTY: 2 PER CRYOMODULE  
NOTES: 1. PAY ATTENTION ON SUBASSEMBLY ITEM 13 GROOVE POSITION.  
IT SHOULD BE ON TOP.  
2. WELDS TO CONFORM TO UHV SPEC.  
3. RODS ITEM 16 SHOULD BE IN CENTER OF BELLOWS BRACKET HOLES WITHIN 0.01 IN.  
4. LEAK RATE:  $\leq 1 \times 10^{-9}$  mbar x l/sec.

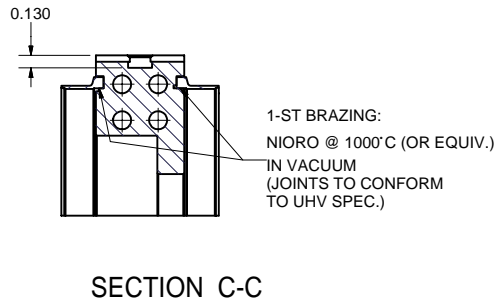
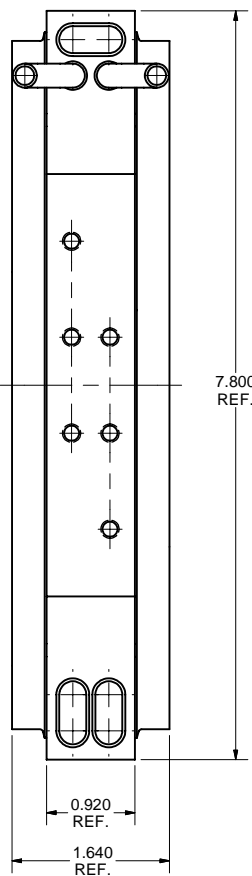
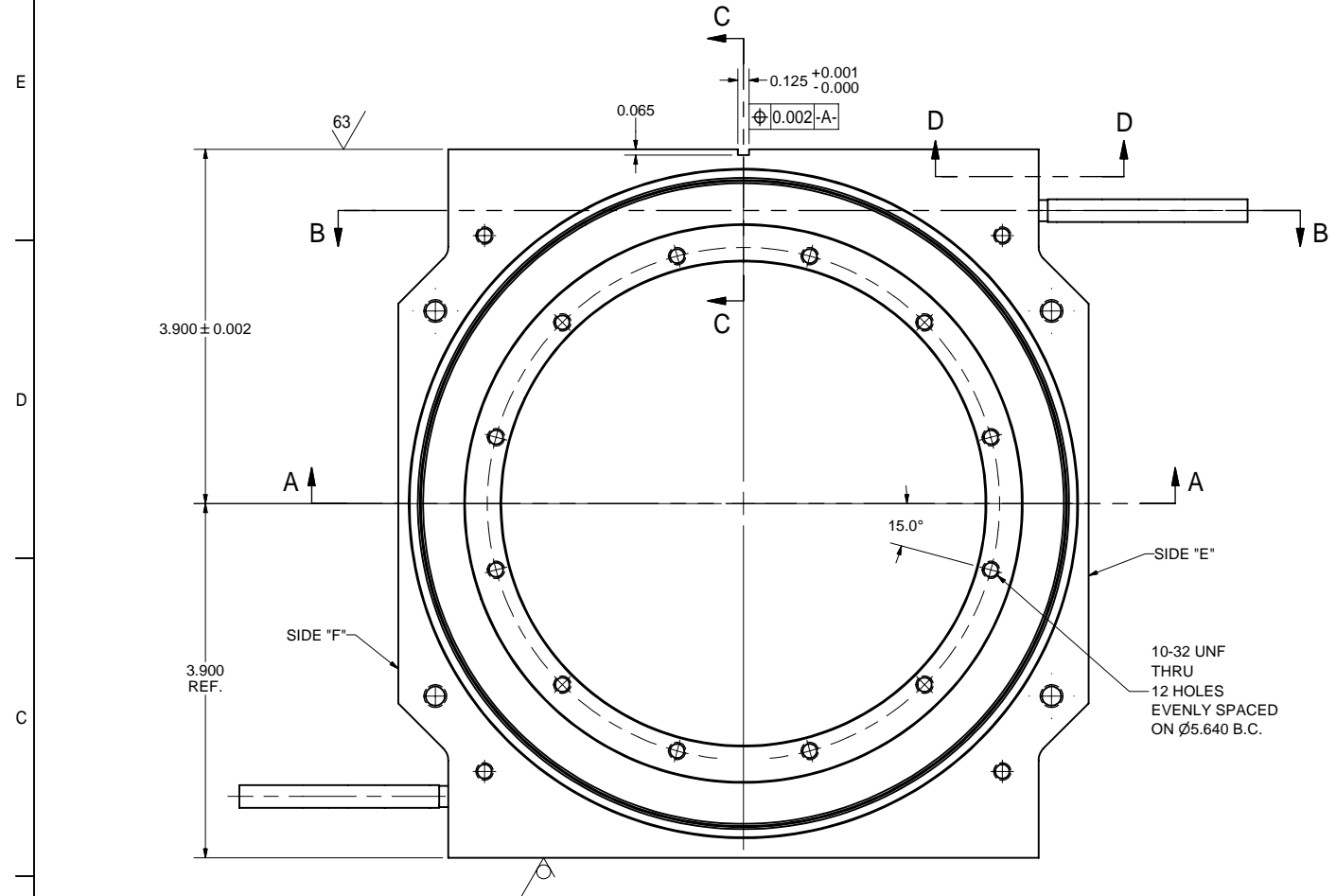
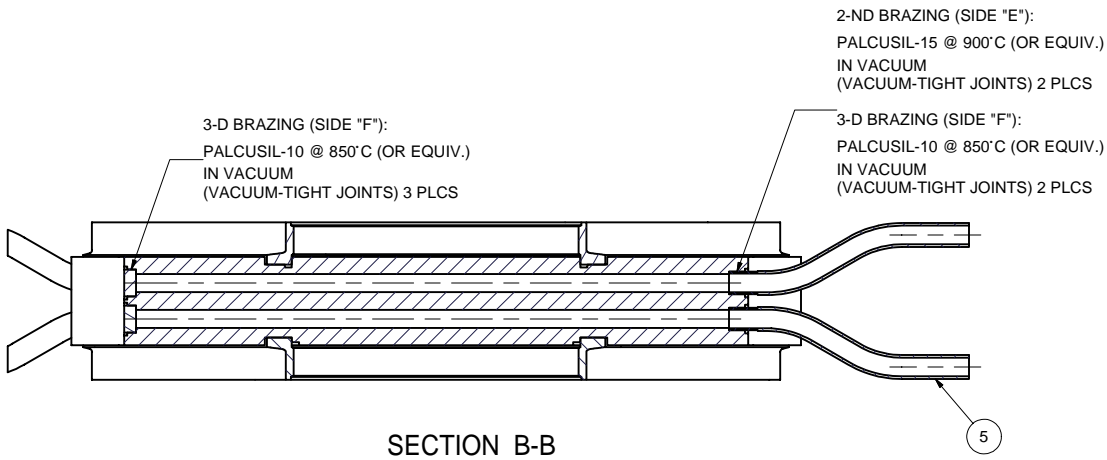
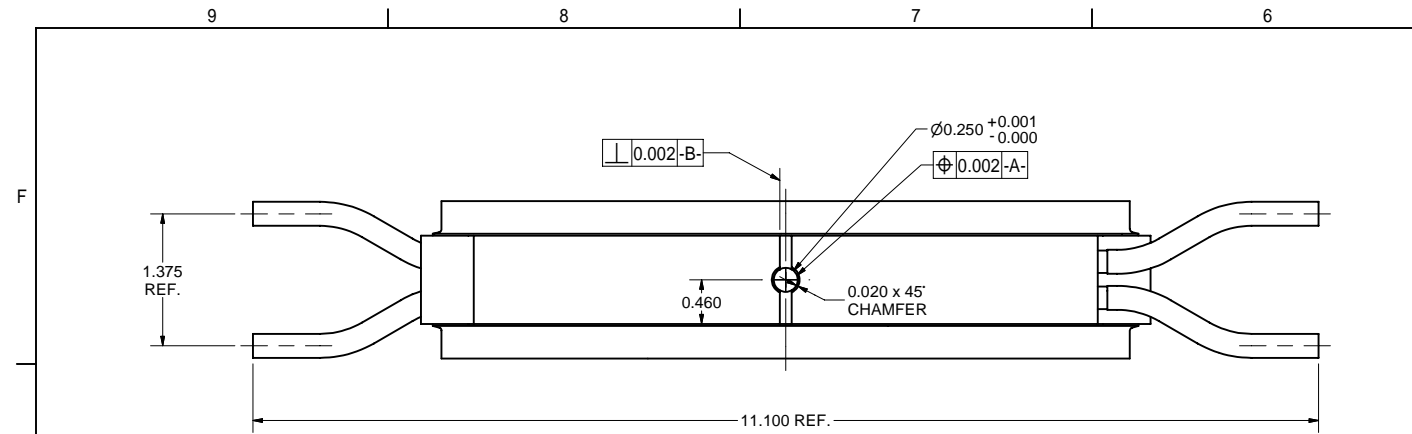
FOR MACHINING LUBRICANT USE ONLY  
ALKALINE DETERGENT LUBRICANT CIMSTAR 40  
OR EQUIVALENT APPROVED BY CORNELL LEPP

TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
DRAFTING (O'Connell):	OK	DATE	N/A
MACHINE SHOP (Kaminski):	TIO		
CHEMISTRY (Conklin):	JPK		
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):	JOS		
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

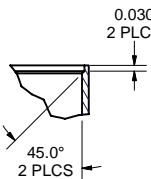
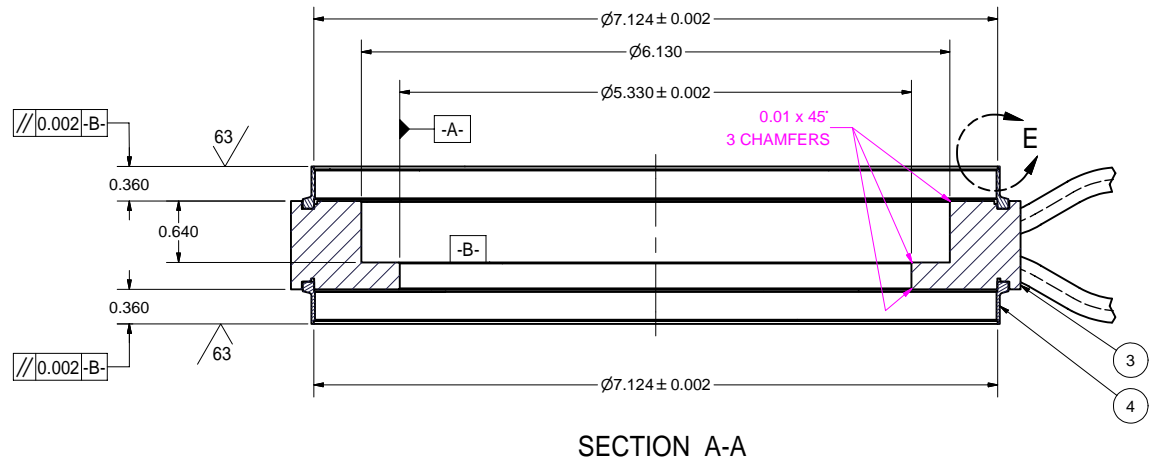
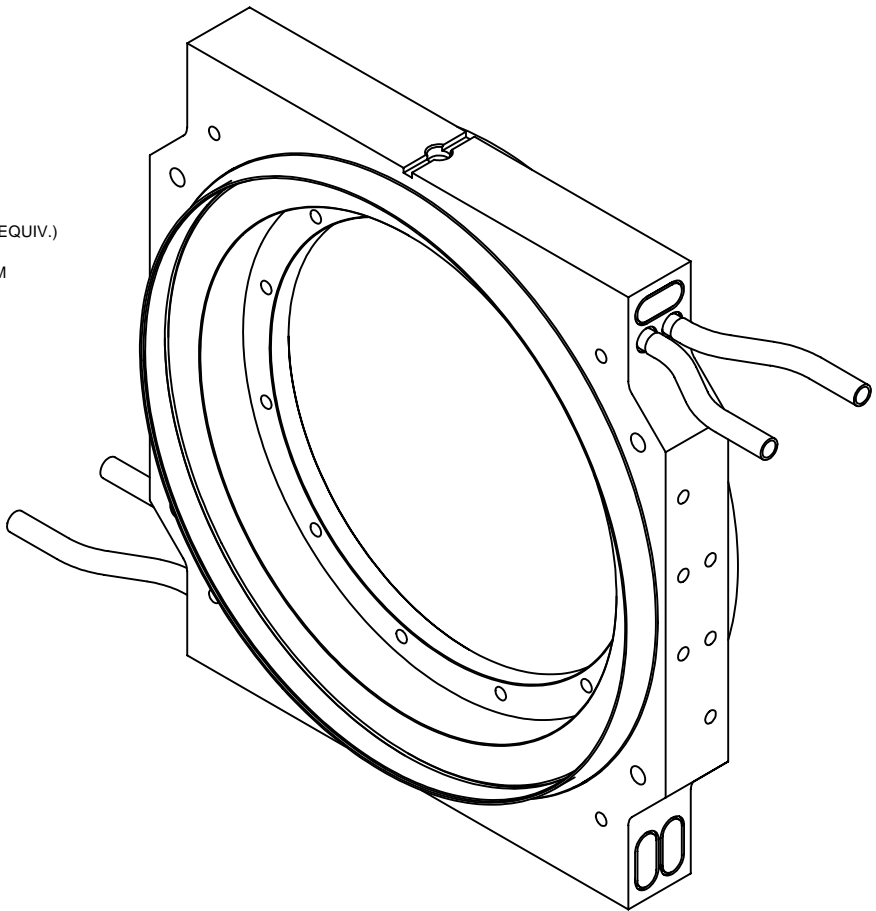
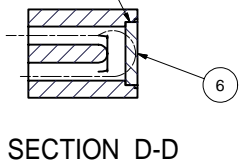
ITEM	DWG. NO.	DESCRIPTION	G1	G2	G3	REMARKS	REV.
78	-	1/4-28 Hex Jam Nut	20			MMc 94805A209 316 SST	
77	-	1/4 WASHER	8			MMC 90107A029 316 SST	
76	7102-026 (SH. 11)	1/4-28 THREADED ROD	4				
74	-	5/16 WASHER, SAE	32			MMC 91950A030 316 SST	
73	7102-024 (SH. 1)	6" CF GASKET MODIFICATION-106	2			-	
72	-	8 MM FLANGE INCONEL 718 BELLEVILLE WASHER	64			SOLON M8-F-2.0-718 316L SST	
71	7102-026 (SH. 9)	SUPPORT BAR	8			Autodesk Inc.	8
57	-	Hexagon Socket Head Cap Screw	8			Autodesk Inc.	8
58	-	Helical Spring Lock Washer	8			Autodesk Inc.	8
56	-	5 W RESISTOR (RH005 TYPE)	16			-	
55	-	Helical Spring Lock Washer	16			Autodesk Inc.	8
54	-	Hexagon Socket Head Cap Screw	16			Autodesk Inc.	8
52	-	Hexagon Socket Flat Countersunk Head Cap Screw	8			Autodesk Inc.	8
53	-	50 W RESISTOR (RH050 TYPE)	16			-	
51	7102-026 (SH. 9)	50 W RESISTORS PLATE	4			OFE COPPER	
50	-	5/16-24 HEX NUT	32			316 SST	
49	-	DICRONITED 5/16-24 x 2-1/2 12-POINT or HEX HD. BOLT	32			316 SST	
48	7102-026 (SH. 9)	THICK WASHER	32			316L SST	
41	7102-027 (SH. 9)	RF PROBE-106 SUBASM	8			-	
37	-	#10 SPRING WASHER	20			MMC 92147A430 316 SST	
36	-	10-32 x 1/2 SOCK. HD. CAP SCREW	20			MMC 92185A989 316 SST	
16	7102-027 (SH. 9)	OUTER HALF SUBASM-106	2			-	
13	7102-027 (SH. 4)	ABSORBERS SUBASSEMBLY-106	1			-	
2	7102-027 (SH. 2)	COPPER BASE SUBASM-106	1			-	
1	7102-027 (SH. 1)	106 MM HOM LOAD ASSEMBLY	X			-	

CR-1	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES	CORNELL UNIVERSITY LEPP LABORATORY FOR ELEMENTARY PARTICLE PHYSICS	CORNELL UNIVERSITY Floyd R. Newman Laboratory Ithaca, NY 14853
CHECKED BY: J. SEARS APPROVED BY: M. LIEPE	DRAWN BY: VM DRAWN FOR: M. LIEPE DATE: 5/5/2006 SCALE: -	7102-027 SH. NO. 1 OF 11	REV. A

REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
A		BOM EDITED TO STANDARDIZE VENDOR PART #'s. D.M.E.	6-14-06	TIO



2-ND BRAZING (SIDE "E"):  
PALCUSIL-15 @ 900°C (OR EQUIV.)  
IN VACUUM  
(VACUUM-TIGHT JOINTS) 3 PLCS



DETAIL E  
SCALE 2 : 1

2 COPPER BASE SUBASM-106  
FILE NAME: 7102-027  
SHEET NO.: 2  
DFT. SCALE: 1:1  
MATERIAL:  
QTY: 1 PER ASSEMBLY  
NOTES: 1. ALL MACHINING SHOULD BE DONE AFTER BRAZING.

FOR MACHINING LUBRICANT USE ONLY  
ALKALINE DETERGENT LUBRICANT CIMSTAR 40  
OR EQUIVALENT APPROVED BY CORNELL LEPP

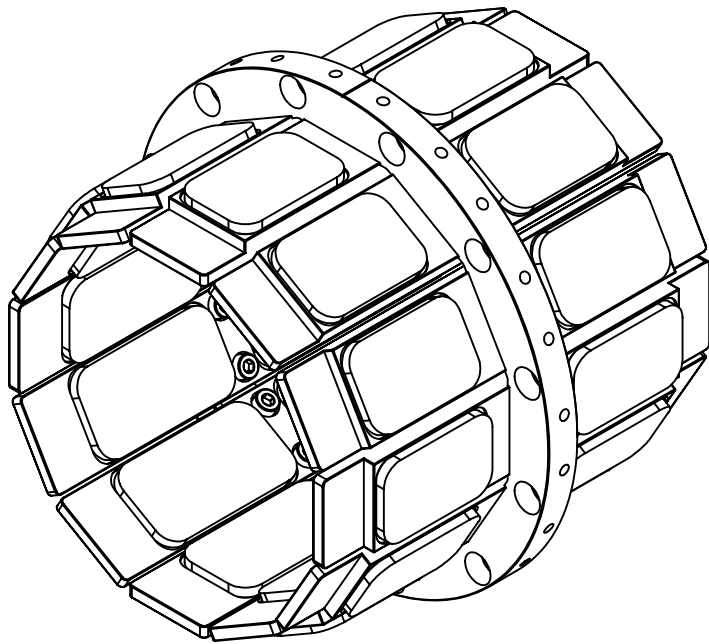
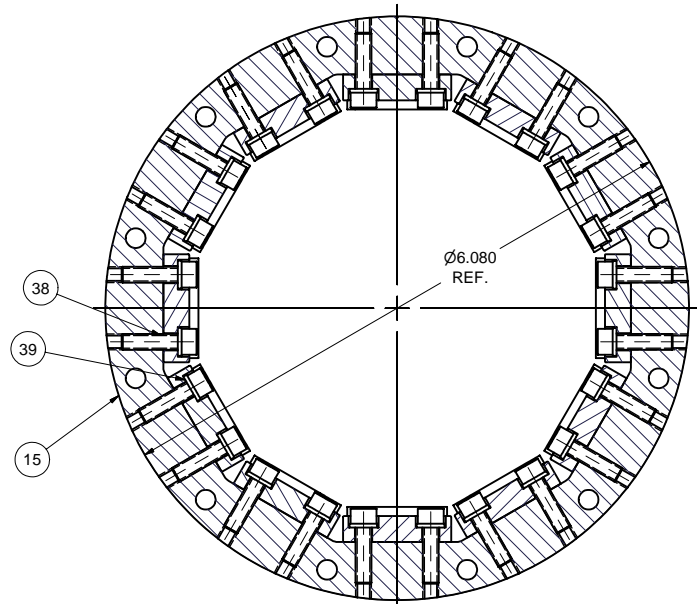
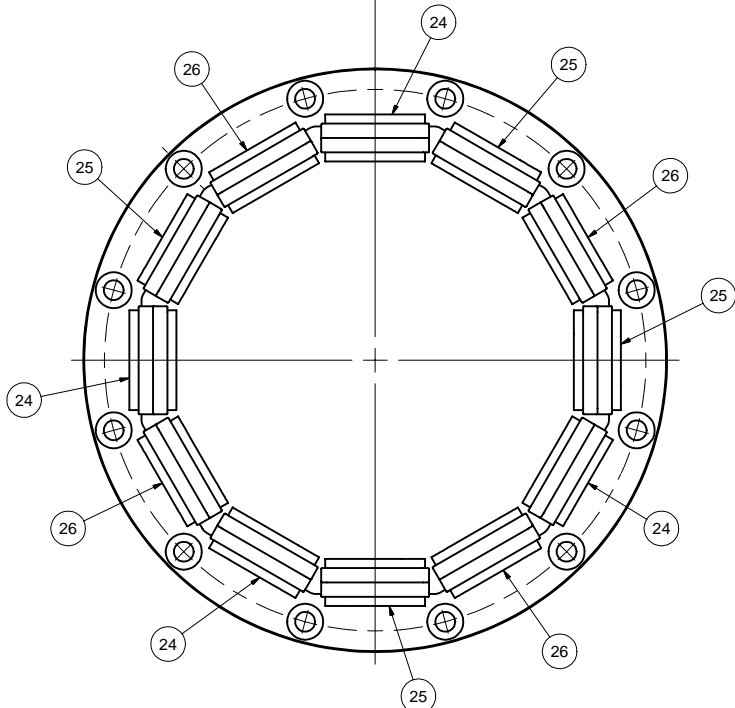
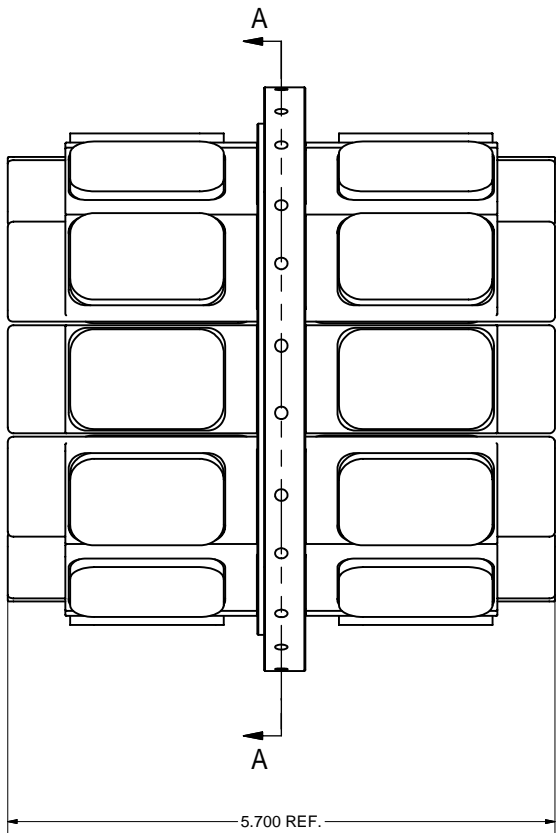
TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
	OK	DATE	N/A
DRAFTING (O'Connell):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

ITEM	DWG. NO.	DESCRIPTION	G1	G2	G3	QUANTITY	REMARKS	REV.
6	7102-026 (SH. 3)	CAP 1					OFE COPPER	
5	7102-026 (SH. 3)	80 K COOLING TUBE					MMC 89785K823 316L SST	
4	7102-027 (SH. 3)	CONNECTION RING-106					316L SST	A
3	7102-027 (SH. 3)	COPPER BASE-106					OFE COPPER	
2	7102-027 (SH. 1)	COPPER BASE SUBASM-106	X				-	
PLOT DATE: 8/29/2007 CAD FILE NAME: 7102-027.idw								
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES $\sqrt{0.002}$								
CORNELL UNIVERSITY LABORATORY FOR ELEMENTARY PARTICLE PHYSICS ERL INJECTOR CRYOMODULE 106 MM HOM LOAD VERSION-2: COPPER BASE SUBASM								
CHECKED BY: J. SEARS		DRAWN BY: VM		DRAWN FOR: M. LIEPE		DATE: 5/5/2006		SCALE: D
APPROVED BY: M. LIEPE						7102-027 SH. NO. 2 OF 11		REV. A





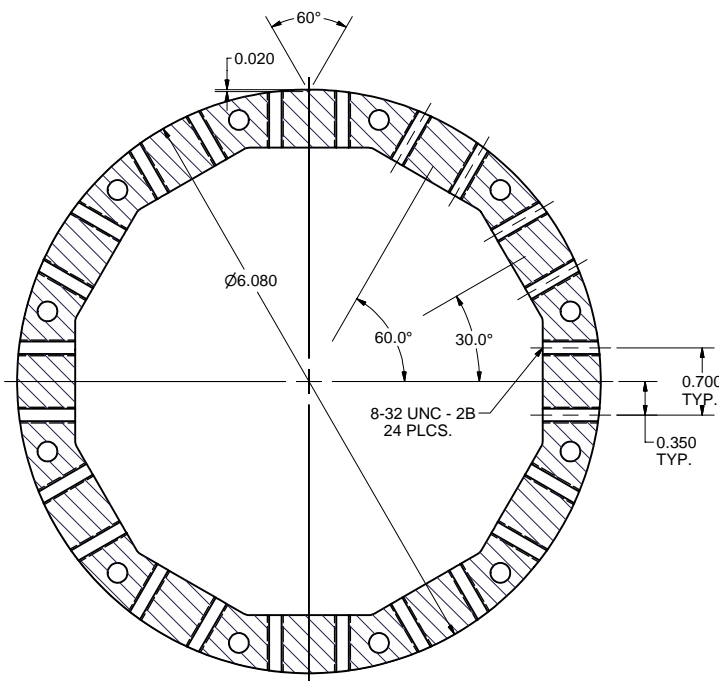
REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.



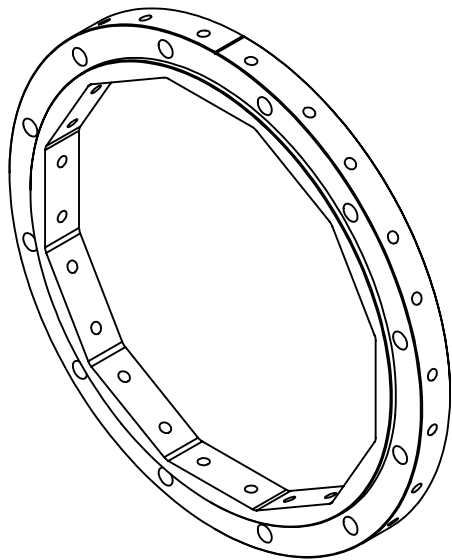
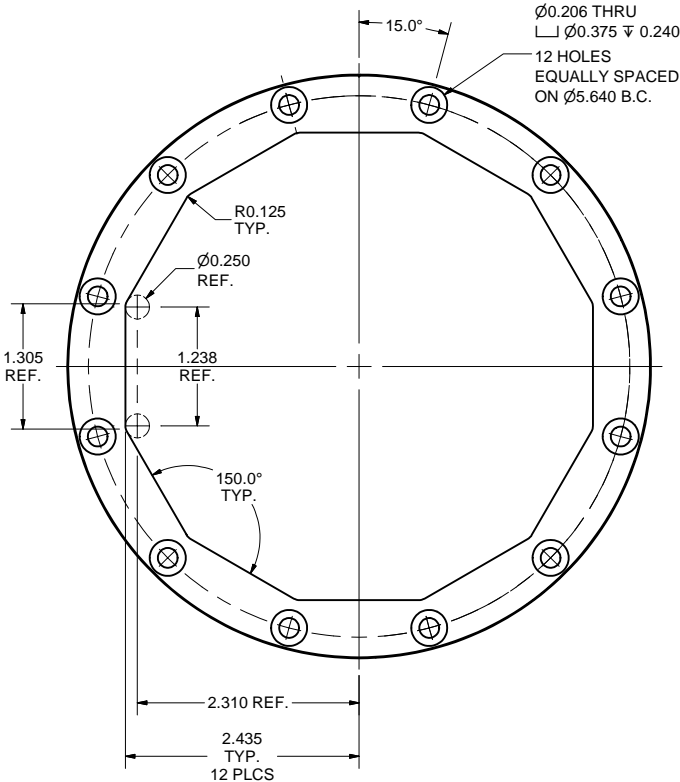
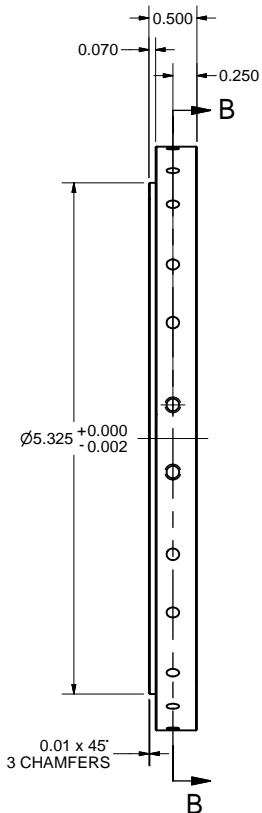
ABSORBERS MOUNTING LOCATIONS

13 ABSORBERS SUBASSEMBLY-106

FILE NAME: 7102-027  
SHEET NO.: 4  
DFT. SCALE: 1:1  
MATERIAL:  
QTY: 1 PER ASSEMBLY  
NOTES: 1. MAX. TORQUE ON SCREWS ITEM 38 : 75 in-lbs.



SECTION B-B








15 COPPER RING-106

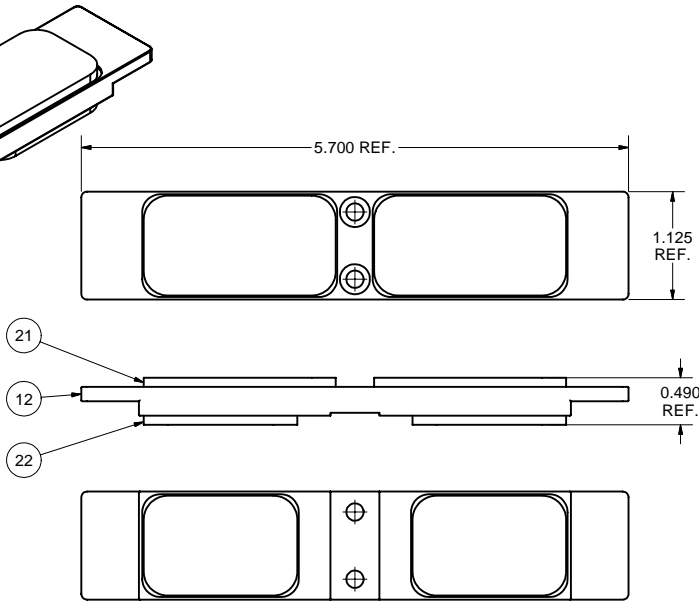
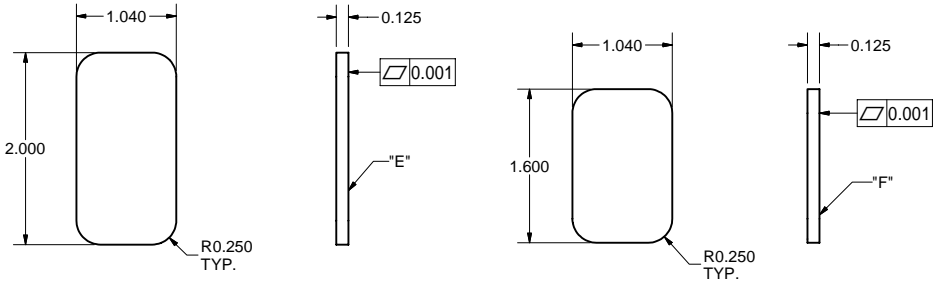
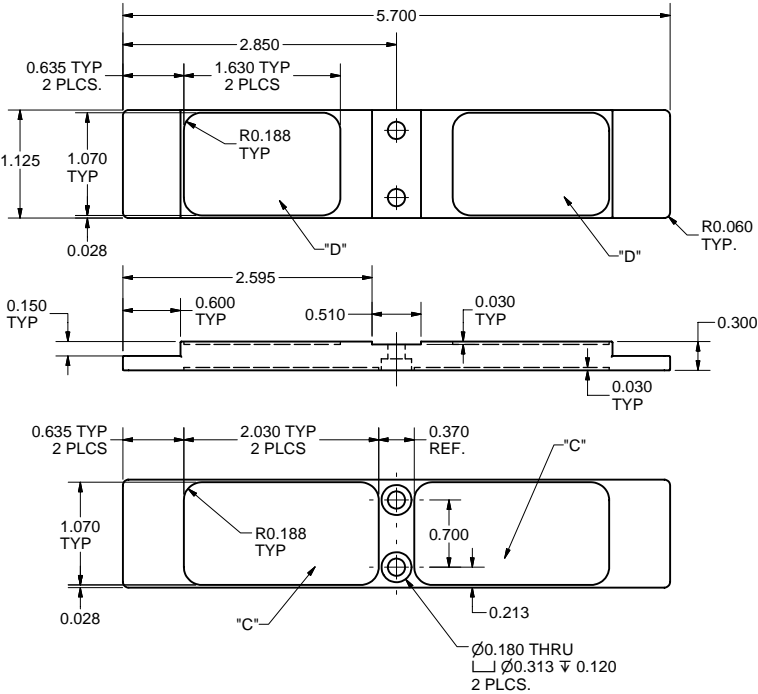
FILE NAME: 7102-027  
SHEET NO.: 4  
DFT. SCALE: 1:1  
MATERIAL: OFE C10100 COPPER (RRR-200 OR BETTER)  
QTY: 1 PER ASSEMBLY  
NOTES:

FOR MACHINING LUBRICANT USE ONLY  
ALKALINE DETERGENT LUBRICANT CIMSTAR 40  
OR EQUIVALENT APPROVED BY CORNELL LEPP

TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
	OK	DATE	N/A
DRAFTING (O'Connell):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

		ITEM	DWG. NO.	DESCRIPTION	G1	G2	G3	REMARKS	REV.							
					QUANTITY											
	PRINT DISTR.	PLOT DATE: 8/29/2007 CAD FILE NAME: 7102-027.idw														
	7102-027 SH NO. 4 OF 11	CR-1	UNLESS OTHERWISE SPECIFIED:  DIMENSIONS ARE IN INCHES; TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES 		<div><div>CORNELL UNIVERSITY Floyd R. Newman Laboratory Ithaca, NY 14853</div></div> <div>ERL INJECTOR CRYMODULE 106 MM HOM LOAD VERSION-2: ABSORBERS SUBASM &amp; DETAILS</div>											
CHECKED BY: J. SEARS										DRAWN BY	DRAWN FOR	DATE	SCALE		7102-027 SH. NO. 4 OF 11	REV.
APPROVED BY: M. LIEPE										VM	M. LIEPE	5/5/2006	-			

REVISIONS			
SYM.	ZONE	DESCRIPTION	DATE APP.



**26** **ABSORBER PLATE SUBASM 3-106**  
FILE NAME: 7102-027  
SHEET NO.: 5  
DFT. SCALE: 1:1  
MATERIAL:  
QTY: 4 PER ASSEMBLY  
NOTES: 1. BRAZE TILES 21 & 22 TO PLATE 12  
ACCORDING TO LEPP SPEC. NAS-01.

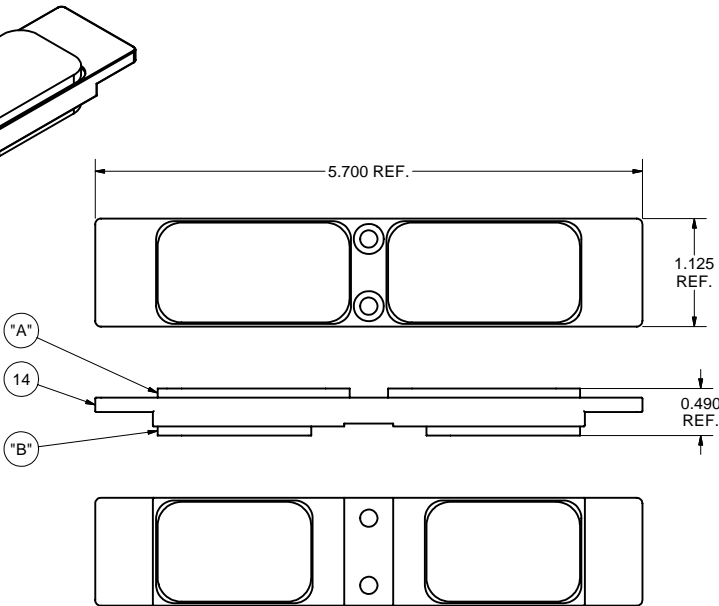
**14** **ABSORBER PLATE 1-106**  
FILE NAME: 7102-027  
SHEET NO.: 5  
DFT. SCALE: 1:1  
MATERIAL: 10W3 ELKONITE (W-75%, Cu-25%)  
QTY: 8 PER ASSEMBLY  
NOTES: 1. BREAK ALL SHARP EDGES R=0.01"  
EXCEPT MACHINED RECESSES.  
2. METALLIZE SURFACES "C" AND "D" PER LEPP SPEC. PEB-01.

**17** **LARGE ABSORBER TILE 1-106**  
FILE NAME: 7102-027  
SHEET NO.: 5  
DFT. SCALE: 1:1  
MATERIAL: Trans-Tech #TT2-111R or Equiv.  
QTY: 8 PER ASSEMBLY  
NOTES: 1. METALLIZE SURFACE "E"  
PER LEPP SPEC. PEB-02.

**18** **SMALL ABSORBER TILE 1-106**  
FILE NAME: 7102-027  
SHEET NO.: 5  
DFT. SCALE: 1:1  
MATERIAL: Trans-Tech #TT2-111R or Equiv.  
QTY: 8 PER ASSEMBLY  
NOTES: 1. METALLIZE SURFACE "F"  
PER LEPP SPEC. PEB-02.

**19** **LARGE ABSORBER TILE 2-106**  
FILE NAME: 7102-027  
SHEET NO.: 5  
DFT. SCALE: 1:1  
MATERIAL: Trans-Tech #Co2Z or Equiv.  
QTY: 8 PER ASSEMBLY  
NOTES: 1. METALLIZE SURFACE "E"  
PER LEPP SPEC. PEB-02.

**20** **SMALL ABSORBER TILE 2-106**  
FILE NAME: 7102-027  
SHEET NO.: 5  
DFT. SCALE: 1:1  
MATERIAL: Trans-Tech #Co2Z or Equiv.  
QTY: 8 PER ASSEMBLY  
NOTES: 1. METALLIZE SURFACE "F"  
PER LEPP SPEC. PEB-02.



**24** **ABSORBER PLATE SUBASM 1-106**  
FILE NAME: 7102-027  
SHEET NO.: 5  
DFT. SCALE: 1:1  
MATERIAL:  
QTY: 4 PER ASSEMBLY  
NOTES: 1. PARTS: "A" - ITEM 17, "B" - 18.  
2. SOLDER TILES "A" AND "B" TO PLATE 14  
ACCORDING TO LEPP SPEC. PEB-03.

**25** **ABSORBER PLATE SUBASM 2-106**  
FILE NAME: 7102-027  
SHEET NO.: 5  
DFT. SCALE: 1:1  
MATERIAL:  
QTY: 4 PER ASSEMBLY  
NOTES: 1. PARTS: "A" - ITEM 19, "B" - 20.  
2. SOLDER TILES "A" AND "B" TO PLATE 14  
ACCORDING TO LEPP SPEC. PEB-03.

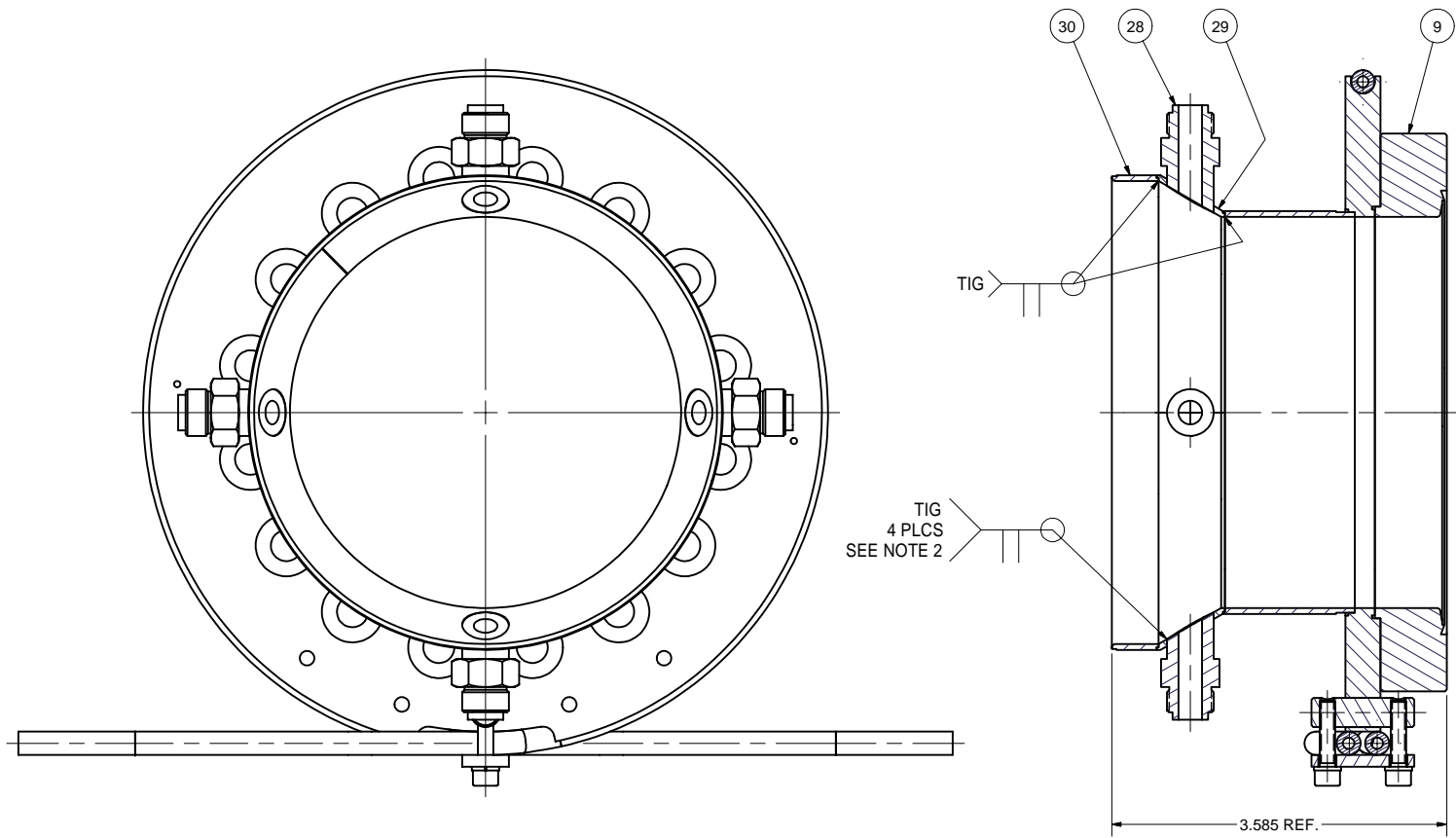
**12** **ABSORBER PLATE 2-106**  
FILE NAME: 7102-027  
SHEET NO.: 5  
DFT. SCALE: 1:1  
MATERIAL: TUNGSTEN ALLOY 18 (W-95%, Ni-3.5%, Cu-1.5%), NONMAGNETIC  
QTY: 4 PER ASSEMBLY  
NOTES: 1. ALL DIMENSIONS ARE SAME AS FOR ITEM 14.  
2. BREAK ALL SHARP EDGES R=0.01"  
EXCEPT MACHINED RECESSES.

FOR MACHINING LUBRICANT USE ONLY  
ALKALINE DETERGENT LUBRICANT CIMSTAR 40  
OR EQUIVALENT APPROVED BY CORNELL LEPP

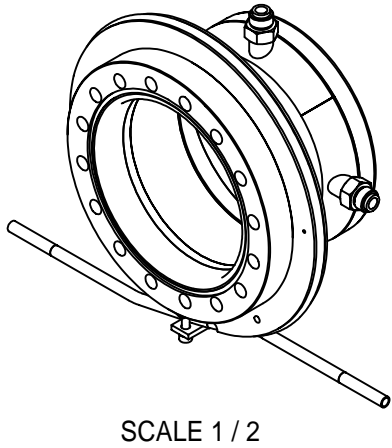
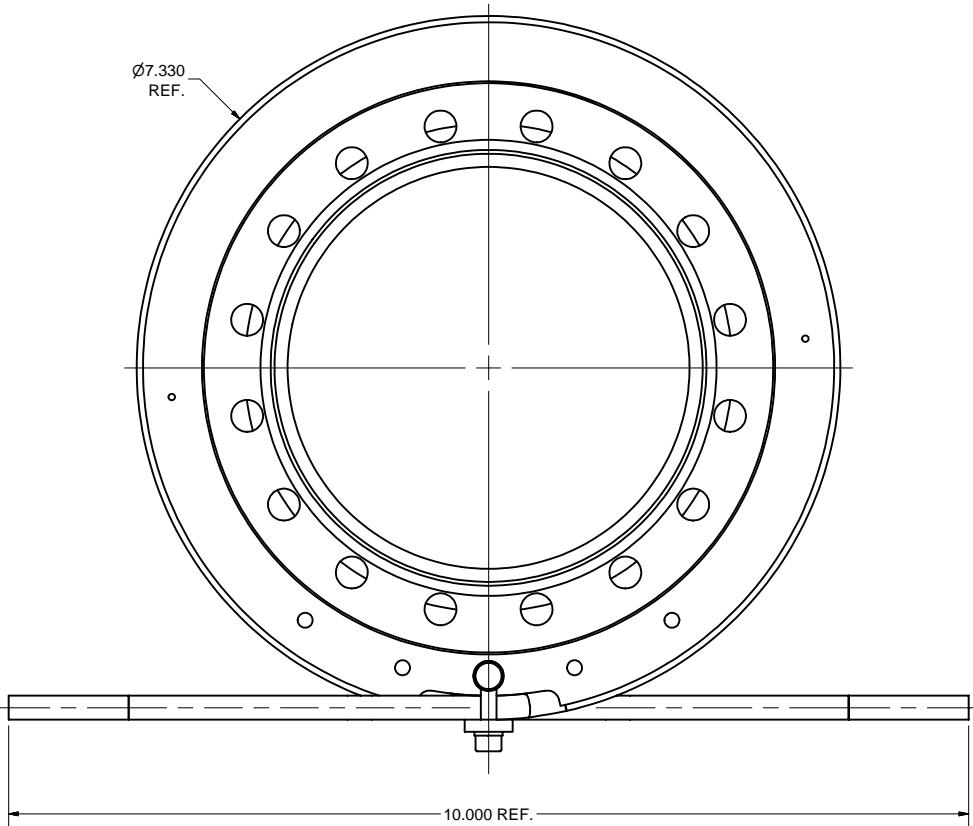
TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
	OK	DATE	N/A
DRAFTING (O'Connell):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

ITEM	DWG. NO.	DESCRIPTION	G1	G2	G3	QUANTITY	REMARKS	REV.
22	7102-027 (SH. 5)	SMALL ABSORBER TILE 3-106			2	CERADINE		
21	7102-027 (SH. 5)	LARGE ABSORBER TILE 3-106			2	CERADINE		
12	7102-027 (SH. 5)	ABSORBER PLATE 2-106			1	W-18		
20	7102-027 (SH. 5)	SMALL ABSORBER TILE 2-106		2		Co2Z		
19	7102-027 (SH. 5)	LARGE ABSORBER TILE 2-106		2		Co2Z		
18	7102-027 (SH. 5)	SMALL ABSORBER TILE 1-106	2			TT-2		
17	7102-027 (SH. 5)	LARGE ABSORBER TILE 1-106	2			TT-2		
14	7102-027 (SH. 5)	ABSORBER PLATE 1-106	1	1		10W3 ELKONITE		
26	7102-027 (SH. 5)	ABSORBER PLATE SUBASM 3-106			X	-		
25	7102-027 (SH. 5)	ABSORBER PLATE SUBASM 2-106		X		-		
24	7102-027 (SH. 5)	ABSORBER PLATE SUBASM 1-106		X		-		
PLOT DATE: 8/29/2007 CAD FILE NAME: 7102-027.idw								
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES								
CORNELL UNIVERSITY FLOYD R. NEWMAN LABORATORY ITHACA, NY 14853								
ERL INJECTOR CRYOMODULE 106 MM HOM LOAD VERSION-2: ABSORBER PLATE SUBASMS & DETAILS								
CHECKED BY: J. SEARS		DRAWN BY	DRAWN FOR	DATE	SCALE	7102-027	REV.	
APPROVED BY: M. LIEPE		VM	M. LIEPE	5/5/2006	-	SH. NO. 5 OF 11		

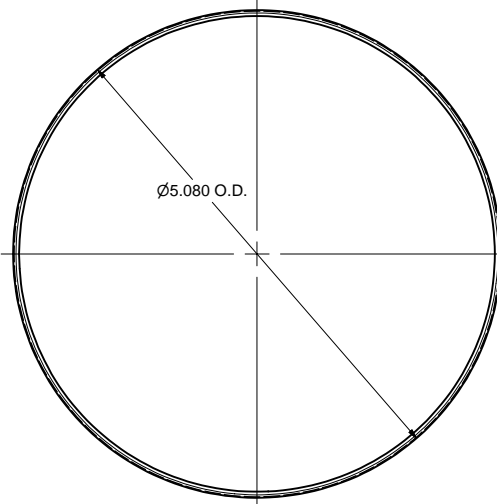
REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.



**27 FLANGE UNIT SUBASSEMBLY-106**  
FILE NAME: 7102-027  
SHEET NO.: 6  
DFT. SCALE: 1:1  
MATERIAL:  
QTY: 2 PER ASSEMBLY  
NOTES: 1. ALL WELDS TO CONFORM TO UHV SPEC.  
2. WELD RF PROBE HOUSING (ITEM 28) LAST.

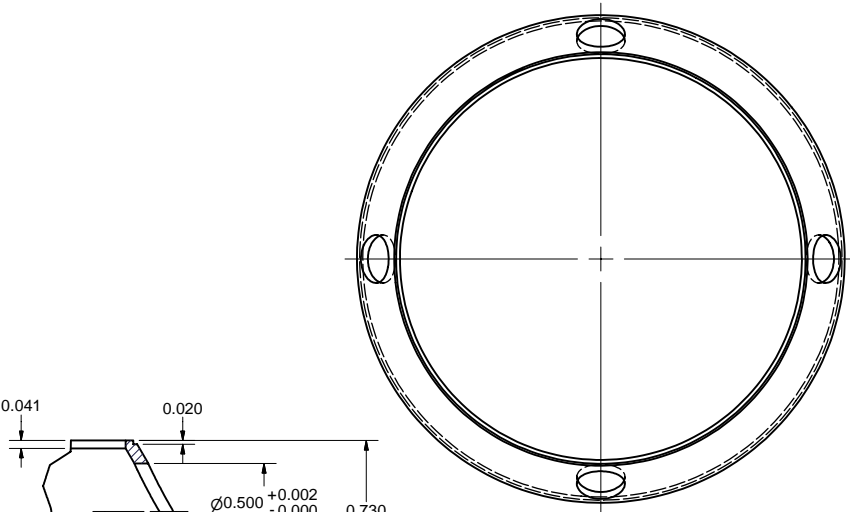


SCALE 1 / 2

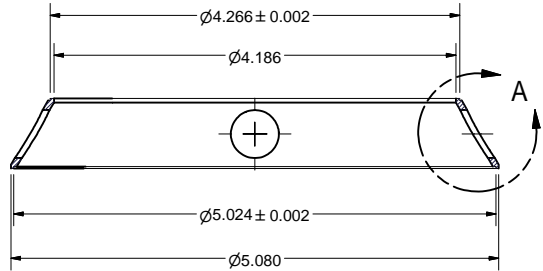


CONE BLANK

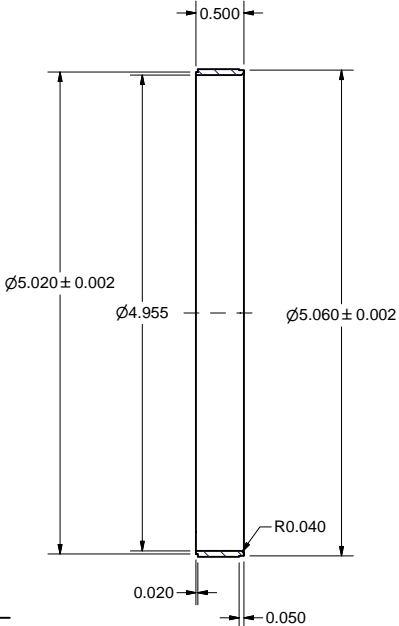
**29 CONE-106**  
FILE NAME: 7102-027  
SHEET NO.: 6  
DFT. SCALE: 1:1  
MATERIAL: 316L STAINLESS STEEL  
QTY: 2 PER ASSEMBLY  
NOTES:



DETAIL A  
SCALE 2 : 1



**30 LARGE TUBE-106**  
FILE NAME: 7102-027  
SHEET NO.: 6  
DFT. SCALE: 1:1  
MATERIAL: 316L STAINLESS STEEL  
QTY: 2 PER ASSEMBLY  
NOTES:



ITEM	DWG. NO.	DESCRIPTION	Q1	Q2	Q3	REMARKS	REV.
30	7102-027 (SH. 6)	LARGE TUBE-106	1			316L SST	
29	7102-027 (SH. 6)	CONE-106	1			316L SST	
28	7102-026 (SH. 9)	RF PROBE HOUSING	4			316L SST	
9	7102-027 (SH. 7)	5 K HEAT SINK SUBASM-106	1			-	
27	7102-027 (SH. 6)	FLANGE UNIT SUBASSEMBLY-106	X			-	

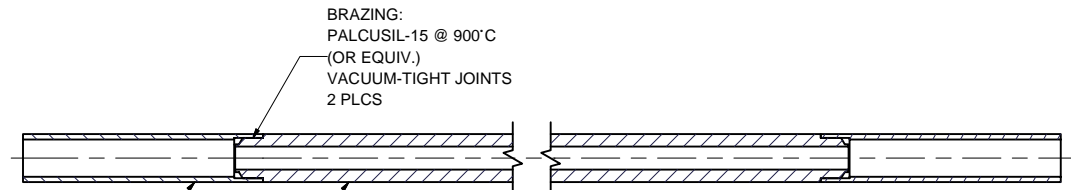
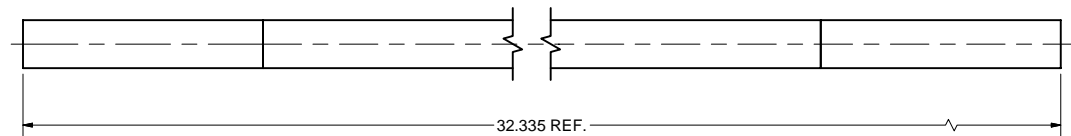
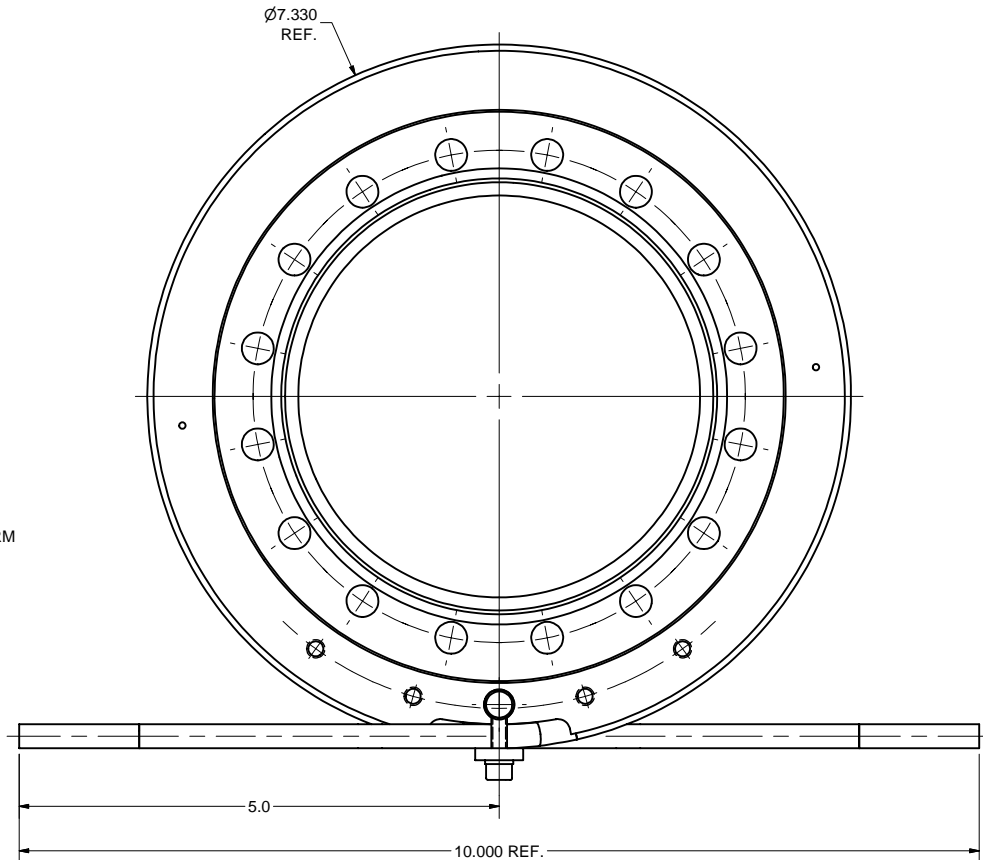
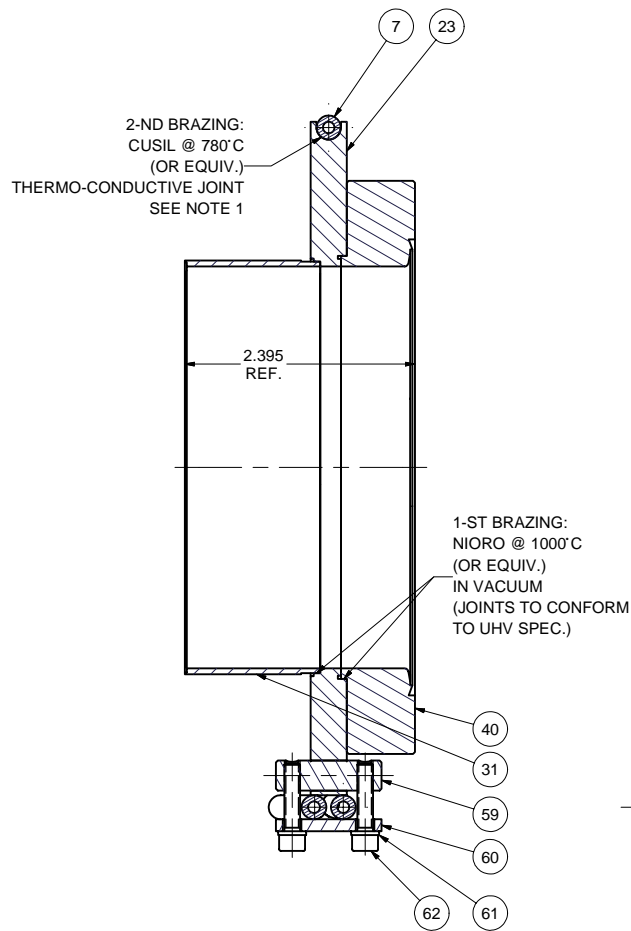
FOR MACHINING LUBRICANT USE ONLY  
ALKALINE DETERGENT LUBRICANT CIMSTAR 40  
OR EQUIVALENT APPROVED BY CORNELL LEPP

TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
	OK	DATE	N/A
DRAFTING (O'Connell):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

REV.	PRINT DISTR.	CR-1
7102-027	SH. NO. 6 OF 11	

PLOT DATE: 8/29/2007 CAD FILE NAME: 7102-027.idw		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES		CORNELL UNIVERSITY FLOYD R. NEWMAN LABORATORY ITHACA, NY 14853	
CHECKED BY: J. SEARS APPROVED BY: M. LIEPE		DRAWN BY: VM DRAWN FOR: M. LIEPE		DATE: 5/5/2006 SCALE: -	
7102-027 SH. NO. 6 OF 11		ERL INJECTOR CRYOMODULE 106 MM HOM LOAD VERSION-2: FLANGE UNIT SUBASM & DETAILS		REV.	

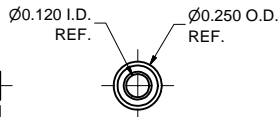
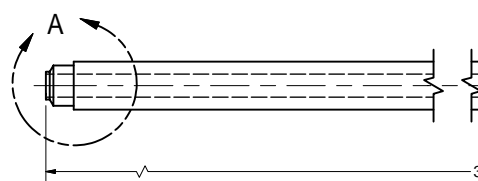
REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
A		BOM EDITED TO STANDARDIZE VENDOR PART #s. D.M.E.	6-14-06	TIO



7 5 K COOLING TUBE SUBASM-106

---

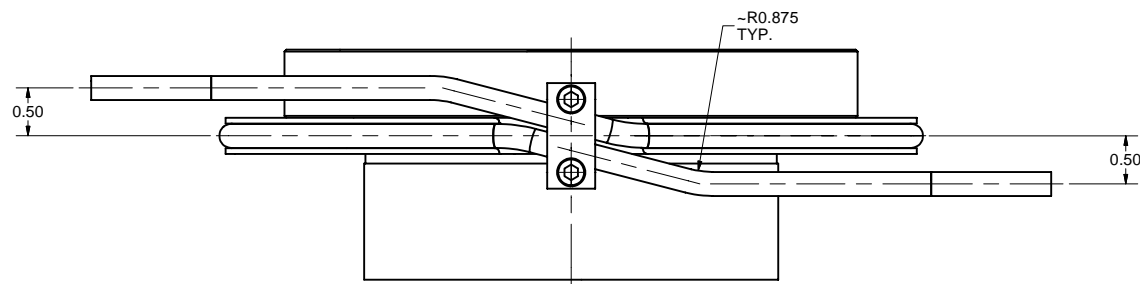
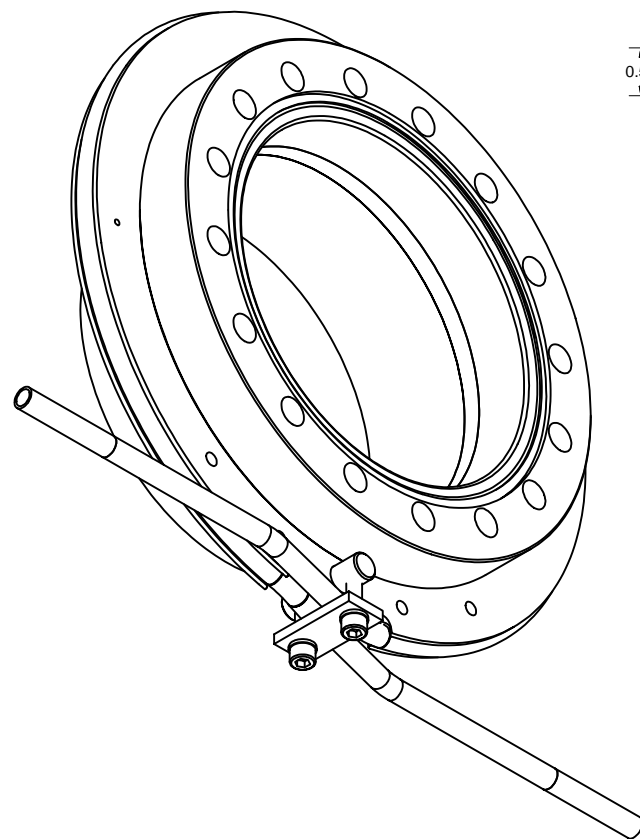
FILE NAME: 7102-027  
 SHEET NO.: 7  
 DFT. SCALE: 2:1  
 MATERIAL:  
 QTY: 2 PER ASSEMBLY  
 NOTES:



63 **5 K COOLING TUBE-106**

---

FILE NAME: 7102-027  
 SHEET NO.: 7  
 DFT. SCALE: 2:1  
 MATERIAL: 1/4" OD x 0.065" W OFE C101 COPPER TUBE  
 QTY: 2 PER ASSEMBLY  
 NOTES:









9 5 K HEAT SINK SUBASM-106

---

FILE NAME: 7102-027  
SHEET NO.: 7  
DFT. SCALE: 1:1  
MATERIAL:  
QTY: 2 PER ASSEMBLY  
NOTES: 1. TENSION TUBE ITEM 7 BEFORE 2-ND BRAZING.  
USE TENSION DEVICE (ITEM 65, SEE SHEET 11).

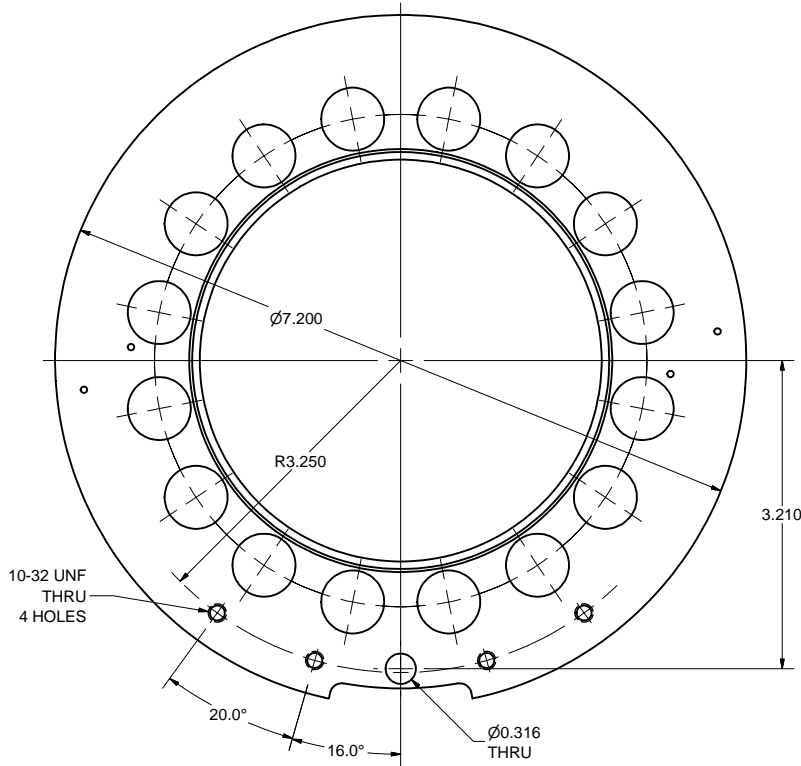
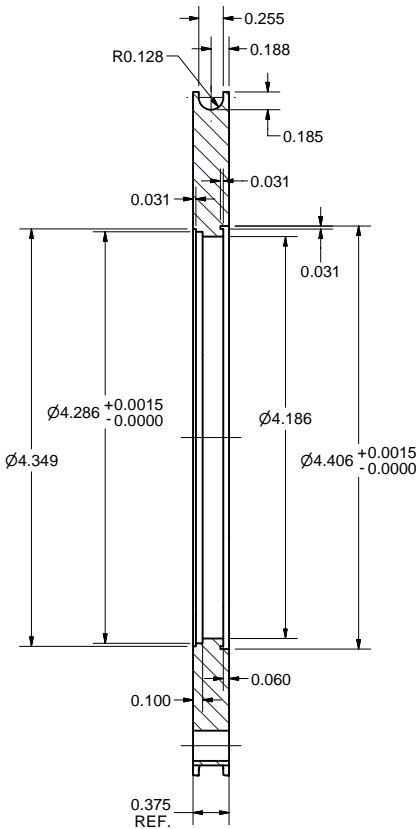
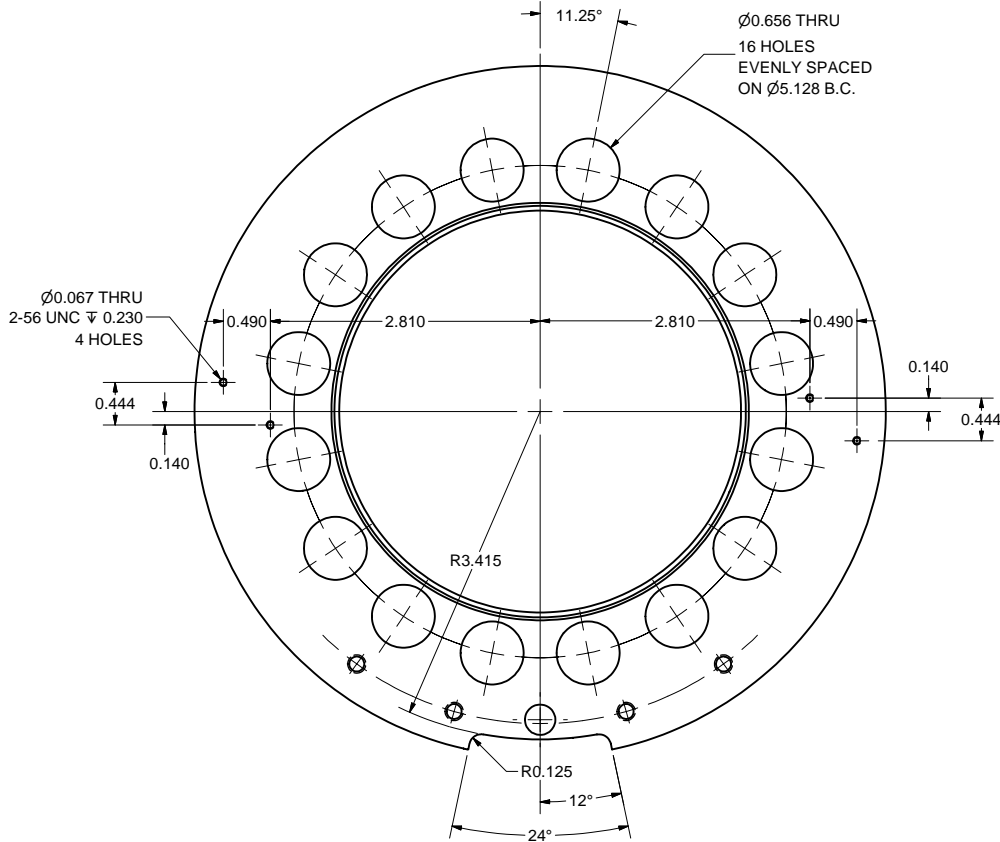
DETAIL A  
SCALE 4 : 1

64	7102-026 (SH. 7)	5 K END TUBE		2		MMC 89785K823 316L SST	
63	7102-027 (SH. 7)	5 K COOLING TUBE-106		1		OFE COPPER	
62	-	8-32 x 3/4 Socket Hd. Cap Screw	2			MMC 92185A197 316 SST	
61	-	#8 Spring Lock Washer	2			MMC 92147A425 316 SST	
60	7102-026 (SH. 8)	CLAMP PLATE	1			316L SST	
59	7102-026 (SH. 8)	CLAMP ROD	1			316L SST	
40	7102-027 (SH. 8)	6" CF FLANGE MODIFICATION	1			-	
31	7102-027 (SH. 8)	SMALL TUBE-106	1			316L SST	
23	7102-027 (SH. 8)	5 K HEAT SINK PLATE-106	1			OFE COPPER	
7	7102-027 (SH. 7)	5 K COOLING TUBE SUBASM-106	1	X		-	
9	7102-027 (SH. 7)	5 K HEAT SINK SUBASM-106	X			-	

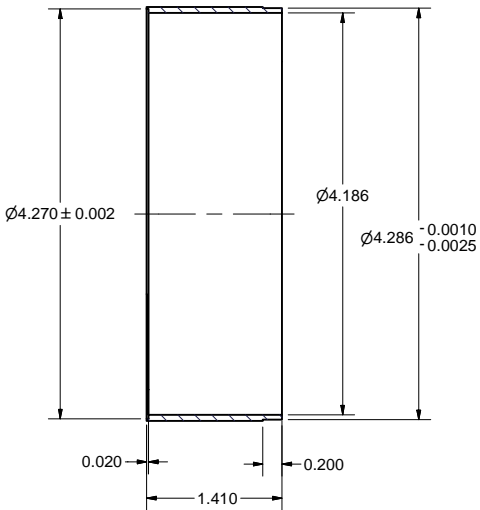
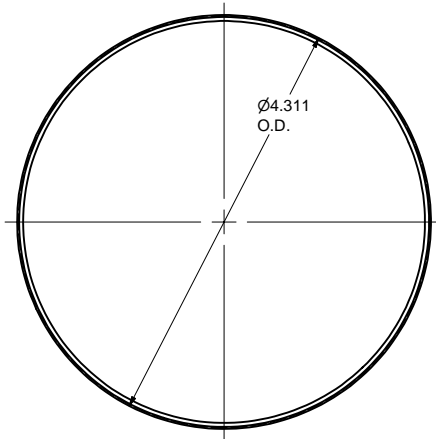
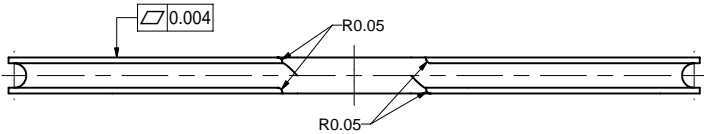
FOR MACHINING LUBRICANT USE ONLY ALKALINE DETERGENT LUBRICANT CIMSTAR 40 OR EQUIVALENT APPROVED BY CORNELL LEPP						ITEM		DWG. NO.		DESCRIPTION		G1		G2		G3		REMARKS		REV.			
TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION						PRINT DISTR.		PLOT DATE: 8/29/2007 CAD FILE NAME: 7102-027.idw		<div><div>CORNELL UNIVERSITY Floyd R. Newman Laboratory Ithaca, NY 14853</div><div> LABORATORY FOR ELEMENTARY PARTICLE PHYSICS</div></div> <div>ERL INJECTOR CRYOMODULE 106 MM HOM LOAD VERSION-2: SUBASMS, 5K COOLING TUBE &amp; HEAT SINK</div>													
DRAFTING (O'Connell):				OK		DATE		N/A		CR-1		UNLESS OTHERWISE SPECIFIED:  DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES 											
MACHINE SHOP (Kaminski):																							
CHEMISTRY (Conklin):																							
ELECTRONICS SHOP (Barley):																							
FURNACE BRAZING (Sherwood):																							
BEAM WELDING (Sears):																							
WELDING OTHER (Gallagher):										SH NO. 7 OF 11		REV.											
UTILITIES INTEGRATION (Gallagher):																							
STOCKROOMS (Lockwood):																							
										DRAWN BY		DRAWN FOR		DATE		SCALE		7102-027		REV.			
										VM		M. LIEPE		5/5/2006		-				A			
																		SH NO. 7 OF 11					



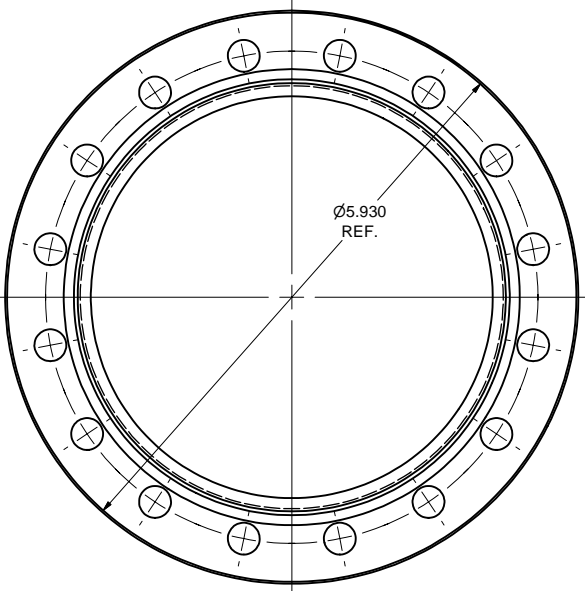
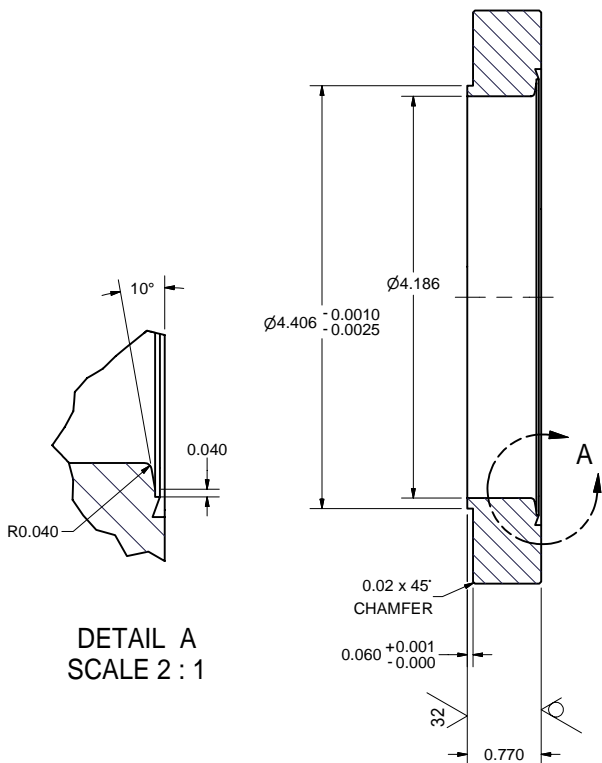
REVISIONS			
SYM.	ZONE	DESCRIPTION	DATE APP.



23 5 K HEAT SINK PLATE PLATE-106  
FILE NAME: 7102-027  
SHEET NO.: 8  
DFT. SCALE: 1:1  
MATERIAL: 3/8" OFE C10100 COPPER SHEET (RRR-200 OR BETTER)  
QTY: 2 PER ASSEMBLY  
NOTES:



31 SMALL TUBE-106  
FILE NAME: 7102-027  
SHEET NO.: 8  
DFT. SCALE: 1:1  
MATERIAL: 316L STAINLESS STEEL  
QTY: 2 PER ASSEMBLY  
NOTES:



40 6" CF FLANGE MODIFICATION  
FILE NAME: 7102-027  
SHEET NO.: 8  
DFT. SCALE: 1:1  
MATERIAL: SEE NOTE 1  
QTY: 2 PER ASSEMBLY  
NOTES: 1. MAKE FROM VACUUM GENERATORS #ZFL100A OR EQUIV.  
MATERIAL: 316LN STAINLES STEEL

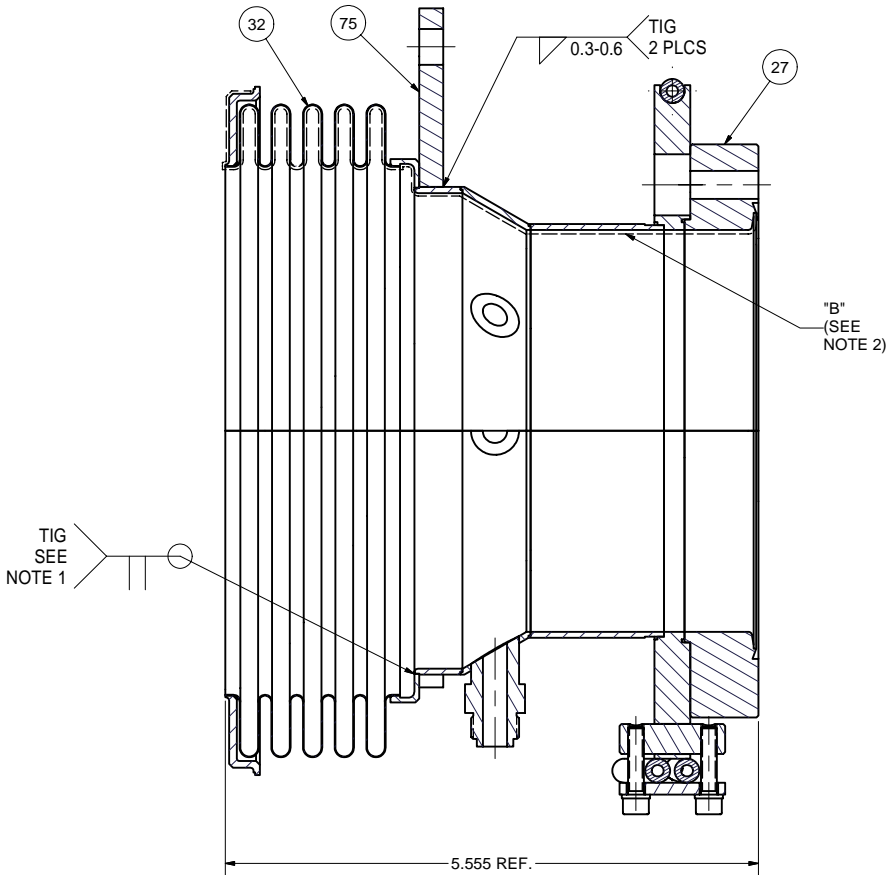
FOR MACHINING LUBRICANT USE ONLY  
ALKALINE DETERGENT LUBRICANT CIMSTAR 40  
OR EQUIVALENT APPROVED BY CORNELL LEPP

TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
OK	DATE	N/A	
DRAFTING (O'Connel):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

		ITEM	DWG. NO.	DESCRIPTION			G1	G2	G3	REMARKS		REV.
							QUANTITY					
D	PRINT DISTR.	PLOT DATE: 8/29/2007 CAD FILE NAME: 7102-027.idw										
7102-027 SH. NO. 8 OF 11	CR-1	UNLESS OTHERWISE SPECIFIED:  DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES		<div> CORNELL UNIVERSITY Floyd R. Newman Laboratory Ithaca, NY 14853  LABORATORY FOR ELEMENTARY-PARTICLE PHYSICS</div>								
		ERL INJECTOR CRYOMODULE 106 MM HOM LOBE VERSION-2: 10K COOLING TUBE & HEAT SINK DETAILS										
		CHECKED BY: J. SEARS  APPROVED BY: M. LIEPE		DRAWN BY VM	DRAWN FOR M. LIEPE	DATE 5/5/2006	SCALE -	D	7102-027 SH. NO. 8 OF 11		REV.	

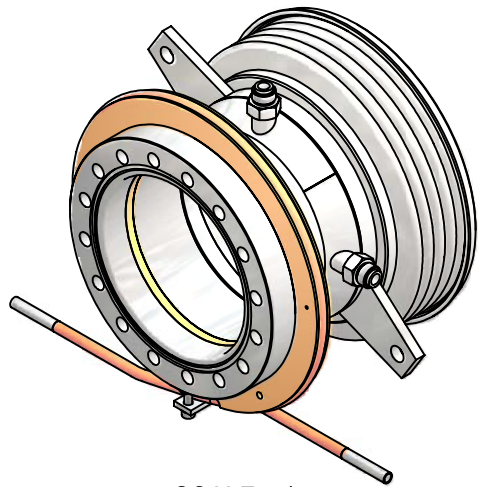
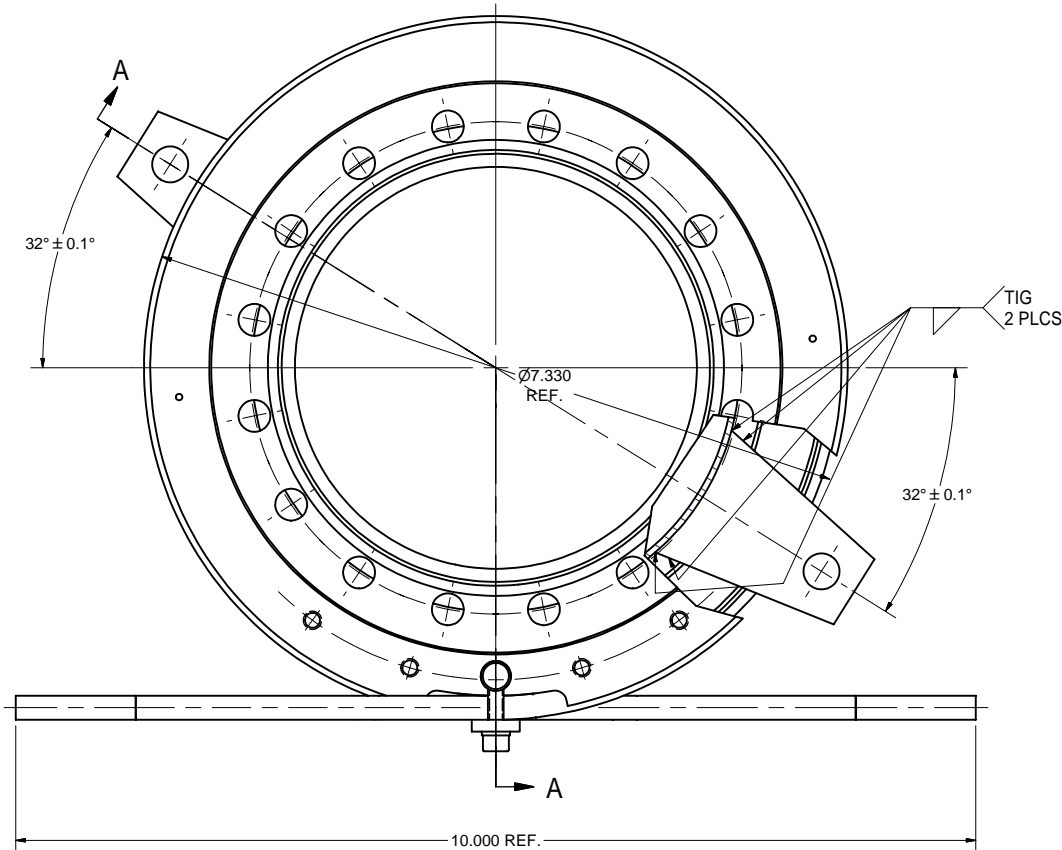


REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
A		ITEM 41: 1.385 WAS 1.625 PROBE TIP IS .800 LONG.	8-29-07	JOS

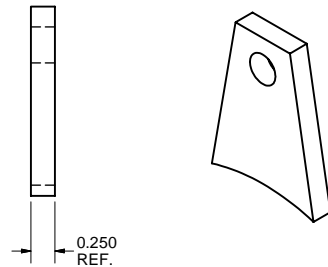
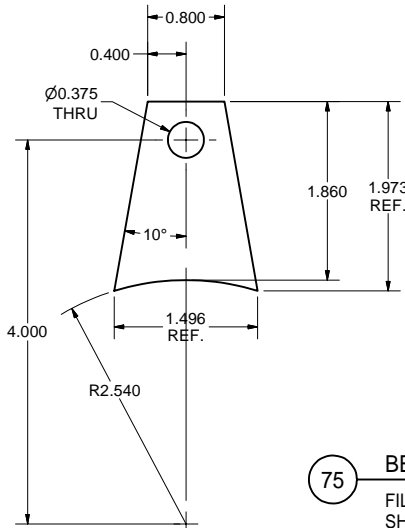


SECTION A-A

TIG  
SEE  
NOTE 1



SCALE 1 / 2



75 BELLOWS BRACKET-106

FILE NAME: 7102-027  
SHEET NO.: 9  
DFT. SCALE: 1:1  
MATERIAL: 1/4" 316L STAINLESS STEEL SHEET  
QTY: 4 PER ASSEMBLY  
NOTES:

47	-	PARKER ULTRA SEAL #QO-55	1		SEE NOTE 2	
46	7102-027 (SH. 9)	RF PROBE TIP-106	1		COPPER	
45	7102-026 (SH. 11)	RF PROBE WASHER	1		AMPCO 18	
44	7102-026 (SH. 11)	RF PROBE SEAT NUT	1		316L SST	
43	7102-026 (SH. 11)	RF CONNECTOR MODIFICATION	1		-	
41	7102-027 (SH. 9)	RF PROBE-106 SUBASM	X		-	
75	7102-027 (SH. 9)	BELLOWS BRACKET-106	2		316L SST	
32	7102-027 (SH. 10)	BELLOWS SUBASM-106	1		-	
27	7102-027 (SH. 6)	FLANGE UNIT SUBASSEMBLY-106	1		-	
16	7102-027 (SH. 9)	OUTER HALF SUBASM-106	X		-	

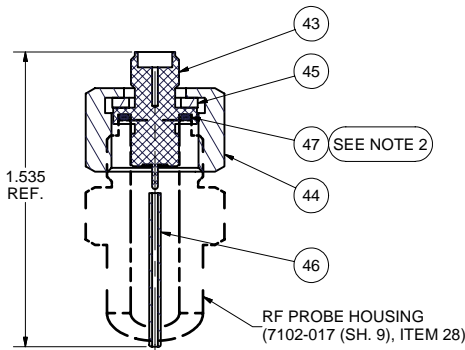
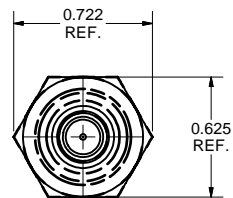
FOR MACHINING LUBRICANT USE ONLY  
ALKALINE DETERGENT LUBRICANT CIMSTAR 40  
OR EQUIVALENT APPROVED BY CORNELL LEPP

TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
OK	DATE	N/A	
DRAFTING (O'Connell):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

PRINT DISTR.	CR-1	7102-027 SH. NO. 9 OF 11	REV. A
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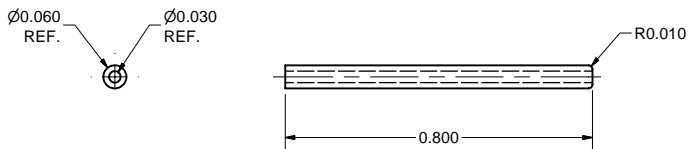
PLOT DATE: 8/29/2007  
CAD FILE NAME: 7102-027.idw

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES		CORNELL UNIVERSITY Floyd R. Newman Laboratory Ithaca, NY 14853	
ERL INJECTOR CRYOMODULE 106 MM HOM LOAD VERSION-2: OUTER HALF SUBASM, RF PROBE SUBASM, & DETAILS			
CHECKED BY: J. SEARS APPROVED BY: M. LIEPE	DRAWN BY: VM	DRAWN FOR: M. LIEPE	DATE: 5/5/2006
SCALE: D	7102-027 SH. NO. 9 OF 11	REV. A	



41 RF PROBE-106 SUBASM

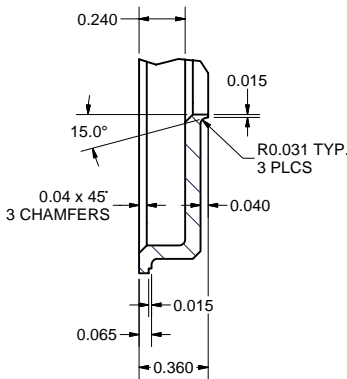
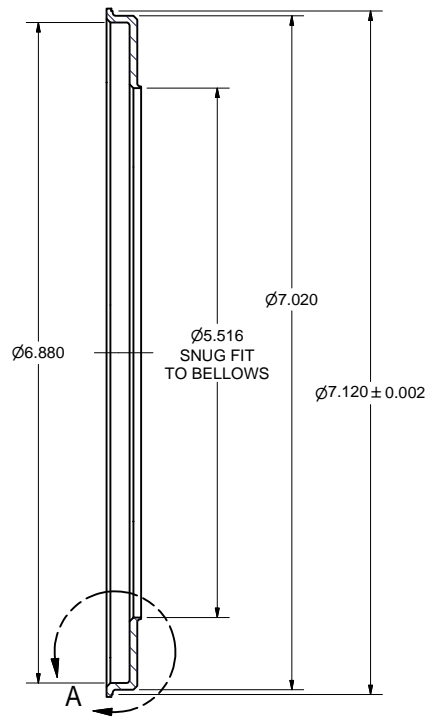
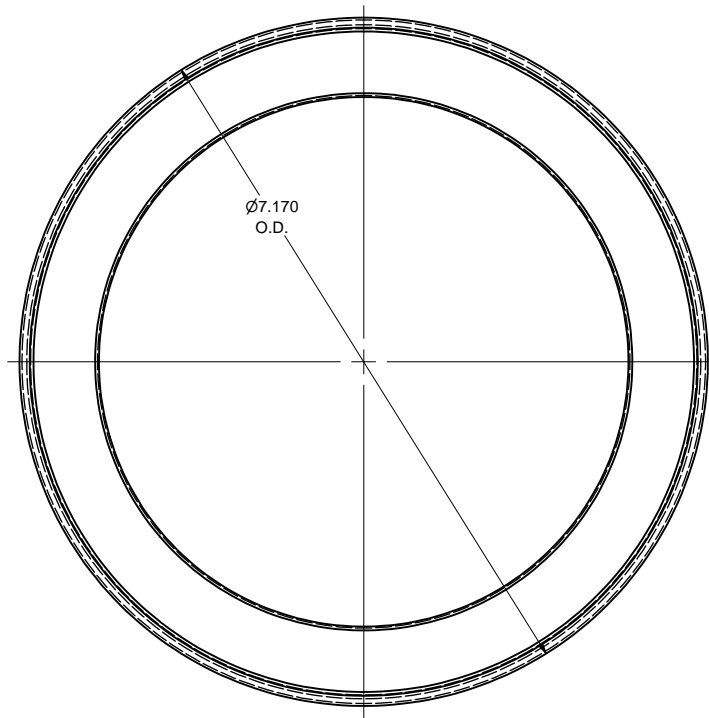
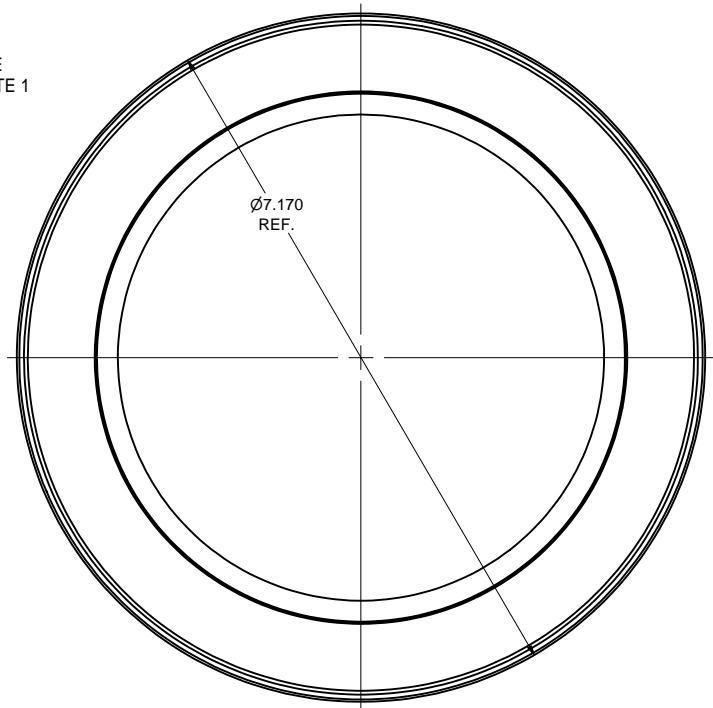
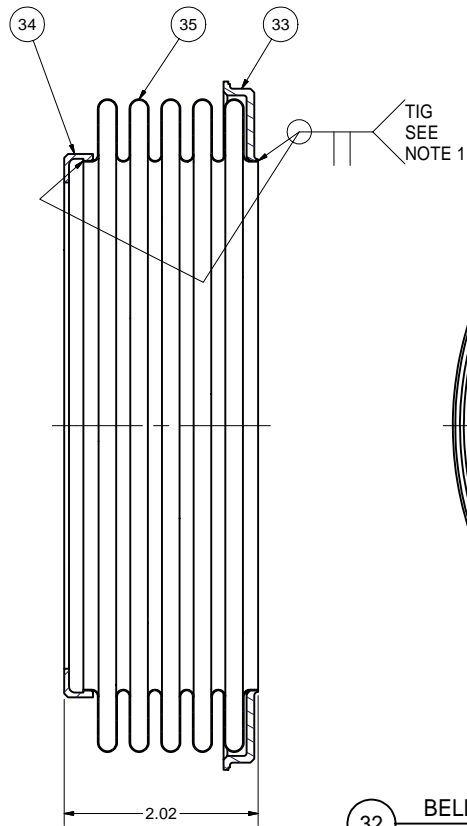
FILE NAME: 7102-027  
SHEET NO.: 9  
DFT. SCALE: 4:1  
MATERIAL:  
QTY: 8 PER ASSEMBLY  
NOTES: 1. USE OMNI-SPECTRA CRIMPER, 76873-2,  
SETTING #3 TO FIX TIP 46 ON CONNECTOR 43.  
2. MAY USE 0.060 DIA. INDIUM INSTEAD OF PARKER SEAL.



46 RF PROBE TIP-106

FILE NAME: 7102-027  
SHEET NO.: 9  
DFT. SCALE: 4:1  
MATERIAL: 1/16 O.D. COPPER TUBE. K+S ENGINEERING #117 OR EQUIV.  
QTY: 8 PER ASSEMBLY  
NOTES:

		1		
REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.



DETAIL A  
SCALE 2 : 1

22 LARGE BELLOWS RING-106

FILE NAME: 7102-027  
SHEET NO.: 10  
DFT. SCALE: 1:1  
MATERIAL: 316L STAINLESS STEEL  
QTY: 2 PER ASSEMBLY  
NOTES:

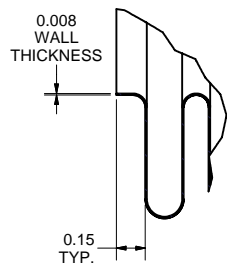
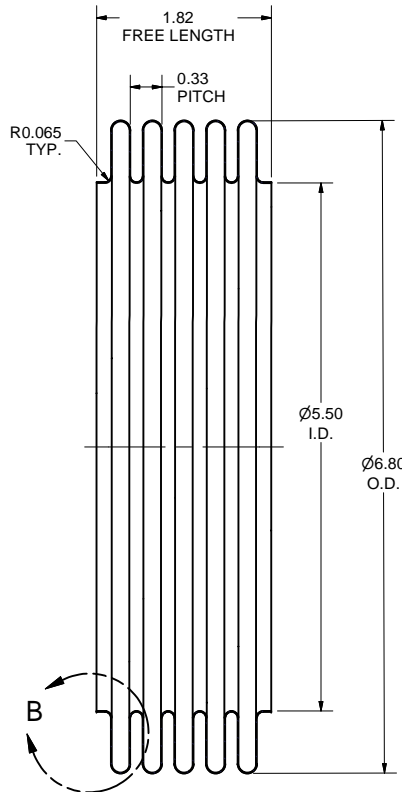
**OPERATING CONDITIONS:**

Temperature: 5 K to 77 K across bellows  
Vacuum inside and outside  
Stroke: 2 mm (0.08 inch)  
Shift: 1 mm (0.04 inch)  
Maximum temperature: 200 C (473 K)  
Minimum temperature: -268 C (5 K)  
**Leak Rate:** < 1E-9 mbar x l/sec

### DESIGN SPECIFICATION:

Burst Pressure, Internal:  $\geq 30$  psia (2 bar) @ 293 K  
 External:  $\geq 22.5$  psia (1.5 bar) @ 293 K  
 Working Pressure:  $> 15$  psia (1 bar) @ 293 K

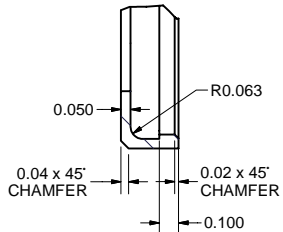
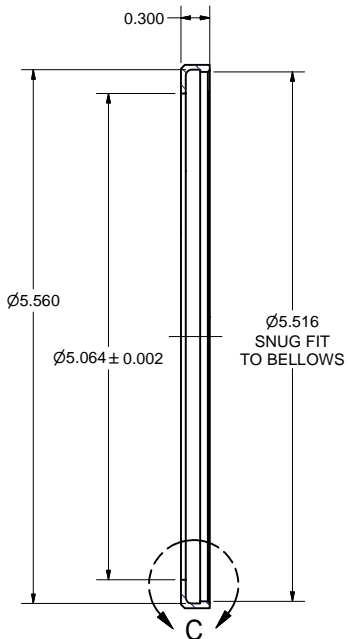
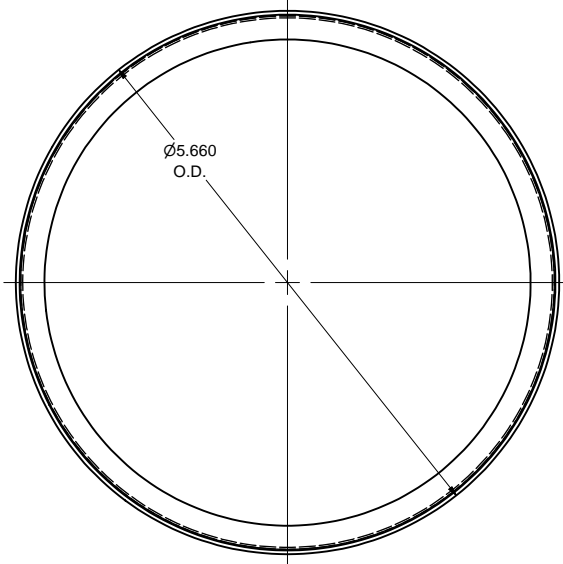
**Size:**  
O.D.: 6.8 inch (172.7 mm)  
I.D.: 5.5 inch (139.7 mm)  
Overall Length: 1.82 inch (46.2 mm)  
Pitch: 0.33 inch (8.4 mm)  
Minimum Stroke:  $\pm 0.250$  inch (6.4 mm)  
Minimum Lateral Shift: 0.08 inch (2 mm)  
Minimum Cycle Life: 10000



DETAIL B  
SCALE 2 : 1

25 BELLOWS 5.5 x 6.8 x 0.008 x 5

FILE NAME: 7102-027  
SHEET NO.: 10  
DFT. SCALE: 1:1  
MATERIAL: 316L STAINLESS STEEL  
QTY: 2 PER ASSEMBLY  
NOTES: 1. NO. OF CONVOLUTIONS: N = 5  
2. MANUFACTURER: AMERIFLEX INC. (OR EQUIV)






DETAIL C  
SCALE 2 : 1

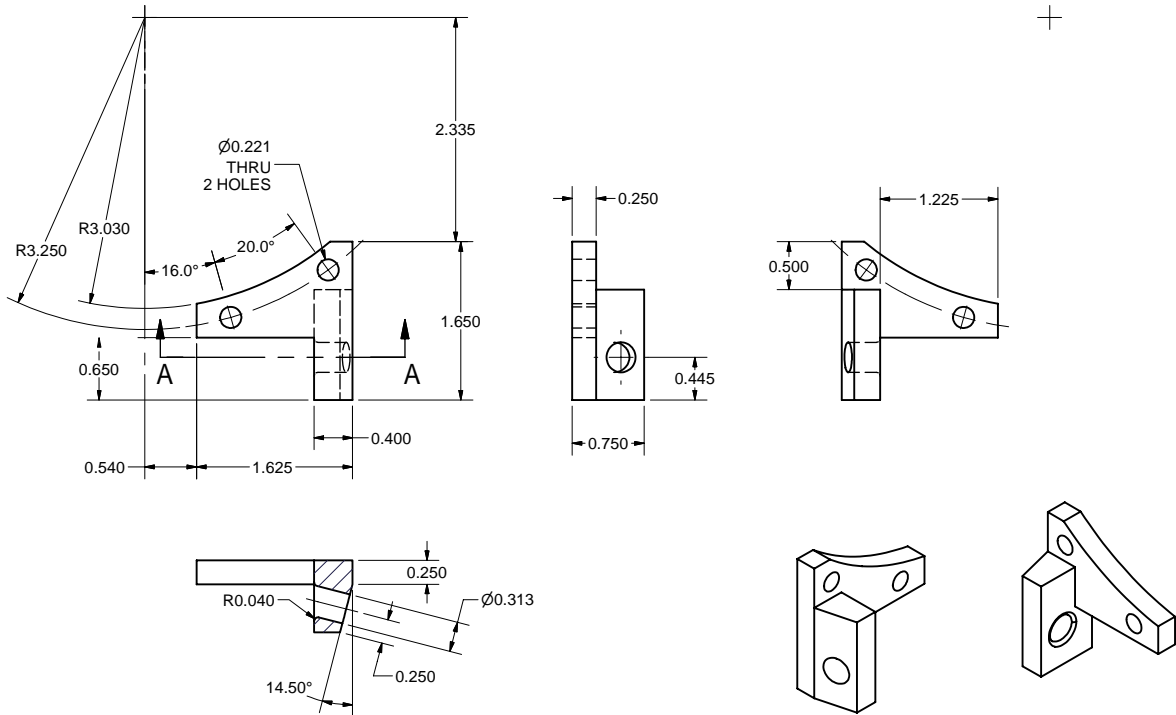
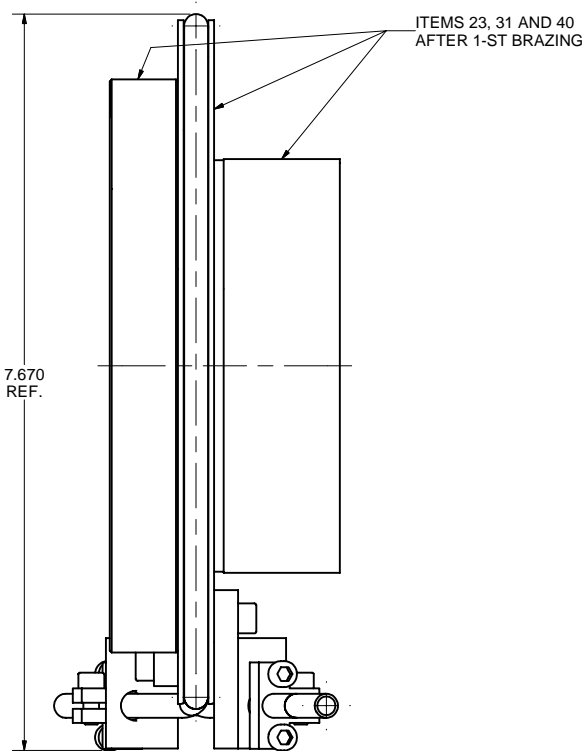
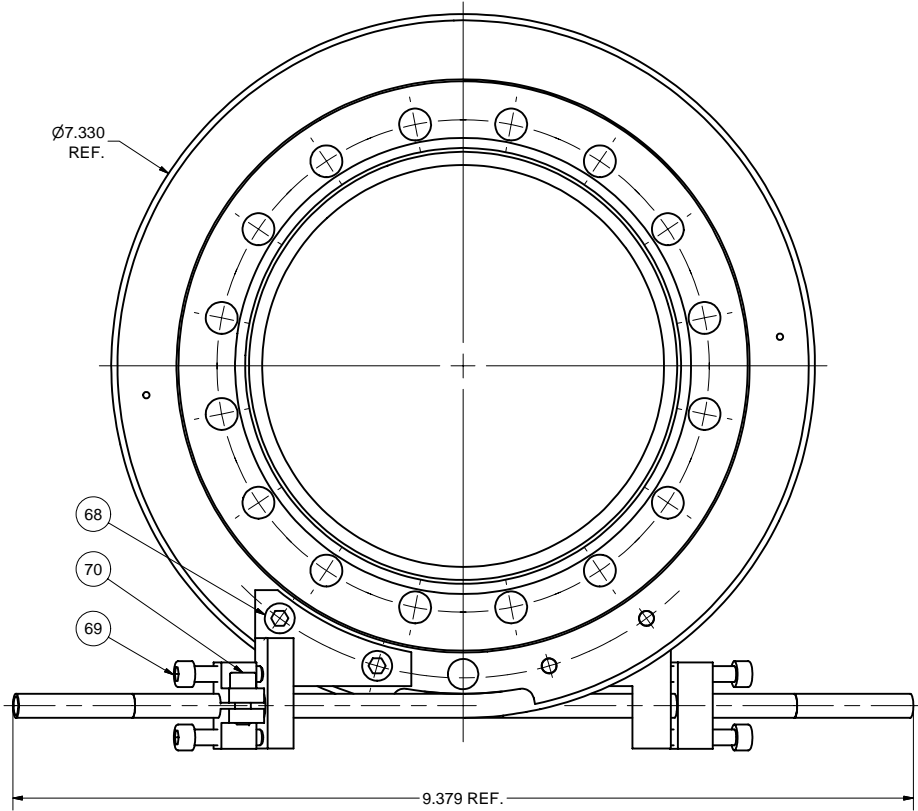
24 SMALL BELLOWS RING-106

FILE NAME: 7102-027  
SHEET NO.: 10  
DFT. SCALE: 1:1  
MATERIAL: 316L STAINLESS STEEL  
QTY: 2 PER ASSEMBLY  
NOTES:

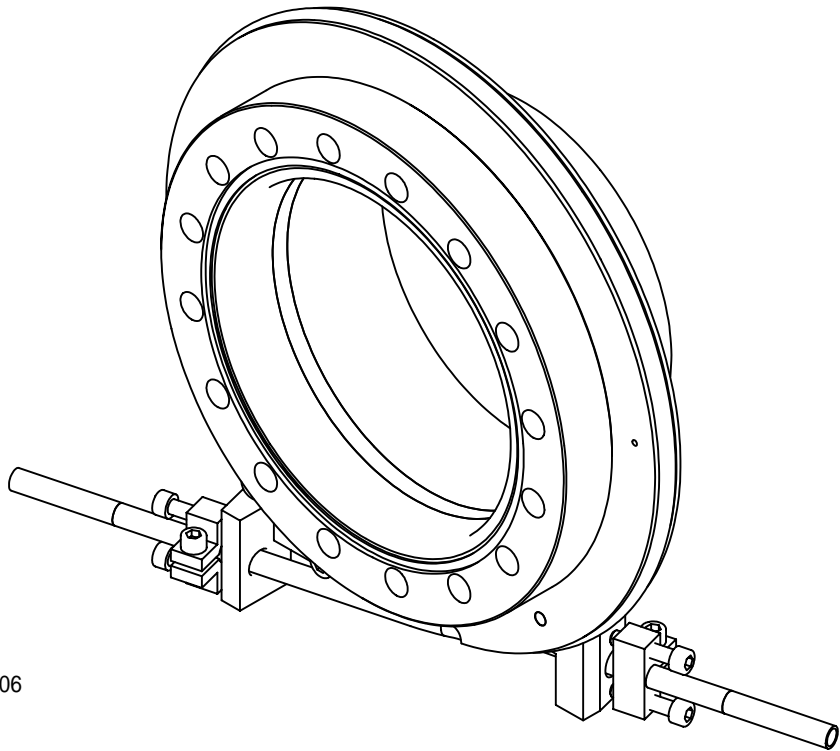
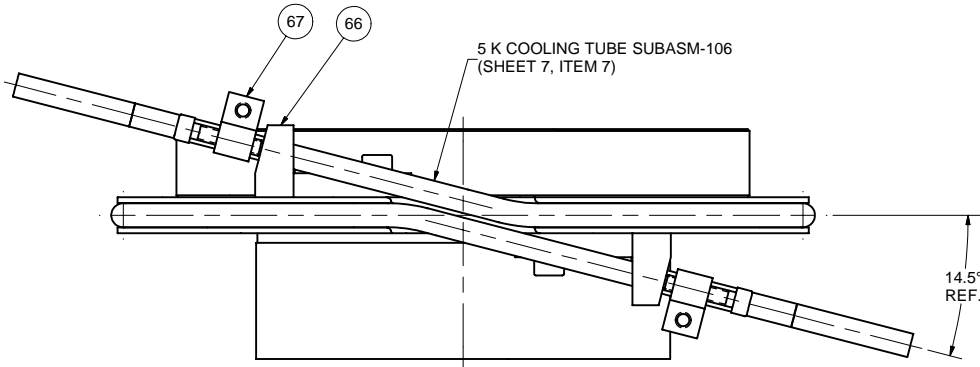
35	7102-027 (SH. 10)	BELLOWS 5.5 x 6.8 x 0.008 x 5	1		316L SST		
34	7102-027 (SH. 10)	SMALL BELLOWS RING-106	1		316L SST		
33	7102-027 (SH. 10)	LARGE BELLOWS RING-106	1		316L SST		
32	7102-027 (SH. 10)	BELLOWS SUBASM-106	X		AMERIFLEX		
ITEM	DWG. NO.	DESCRIPTION	G1	G2	G3	REMARKS	REV.
			QUANTITY				

FOR MACHINING LUBRICANT USE ONLY ALKALINE DETERGENT LUBRICANT CISMSTAR 40 OR EQUIVALENT APPROVED BY CORNELL LEPP						ITEM		DWG. NO.		DESCRIPTION				G1		G2		G3		REMARKS		REV.																																							
TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION				D		PRINT DISTR.		PLOT DATE: 8/29/2007 CAD FILE NAME: 7102-027.idw																																																					
				CR-1		UNLESS OTHERWISE SPECIFIED:  DIMENSIONS ARE IN INCHES:  TOLERANCES ON: .00 ± 0.10 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES 																																																							
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REV.		CHECKED BY: J. SEARS		DRAWN BY VM		DRAWN FOR M. LIEPE		DATE 5/5/2006		SCALE -		D		7102-027		SH NO. 10 OF 11		REV.																																											
		APPROVED BY: M. LIEPE																																																											

REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
A		BOM EDITED TO STANDARDIZE VENDOR PART #s. D.M.E.	6-14-06	TIO



SECTION A-A



**65 5 K COOLING TUBE TENSION DEVICE-106**  
FILE NAME: 7102-027  
SHEET NO.: 11  
DFT. SCALE: 1:1  
MATERIAL:  
QTY: 1 PER PROJECT  
NOTES:

**66 TENSION BRACKET-106**  
FILE NAME: 7102-027  
SHEET NO.: 11  
DFT. SCALE: 1:1  
MATERIAL: 304 STAINLESS STEEL  
QTY: 2 PER PROJECT  
NOTES:

70	-	8-32 x 3/8 Socket Head Cap Screw	2			MMC 92185A192 316 SST	
69	-	8-32 x 3/4 Socket Head Cap Screw	4			MM 92185A197 316 SST	
68	-	10-32 x 5/8 Socket Head Cap Screw	4			MMC 92185A990 316 SST	
67	7102-026 (SH. 12)	TUBE CLAMP	2			304 SST	
66	7102-027 (SH. 11)	TENSION BRACKET-106	2			304 SST	
65	7102-027 (SH. 11)	5 K COOLING TUBE TENSION DEVICE-106	X			-	

FOR MACHINING LUBRICANT USE ONLY  
ALKALINE DETERGENT LUBRICANT CIMSTAR 40  
OR EQUIVALENT APPROVED BY CORNELL LEPP

TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
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DRAFTING (O'Connell):			
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WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

ITEM	DWG. NO.	DESCRIPTION	G1	G2	G3	REMARKS	REV.
PLOT DATE: 8/29/2007 CAD FILE NAME: 7102-027.idw			QUANTITY				
CR-1			UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES			CORNELL UNIVERSITY FLOYD R. NEWMAN LABORATORY ITHACA, NY 14853	
ERL INJECTOR CRYOMODULE 106 MM HOM LOAD VERSION-2: 5K COOLING TUBE TENSION DEVICE			DRAWN BY VM			DATE 5/5/2006	
CHECKED BY: J. SEARS APPROVED BY: M. LIEPE			SCALE -			7102-027 SH. NO. 11 OF 11	