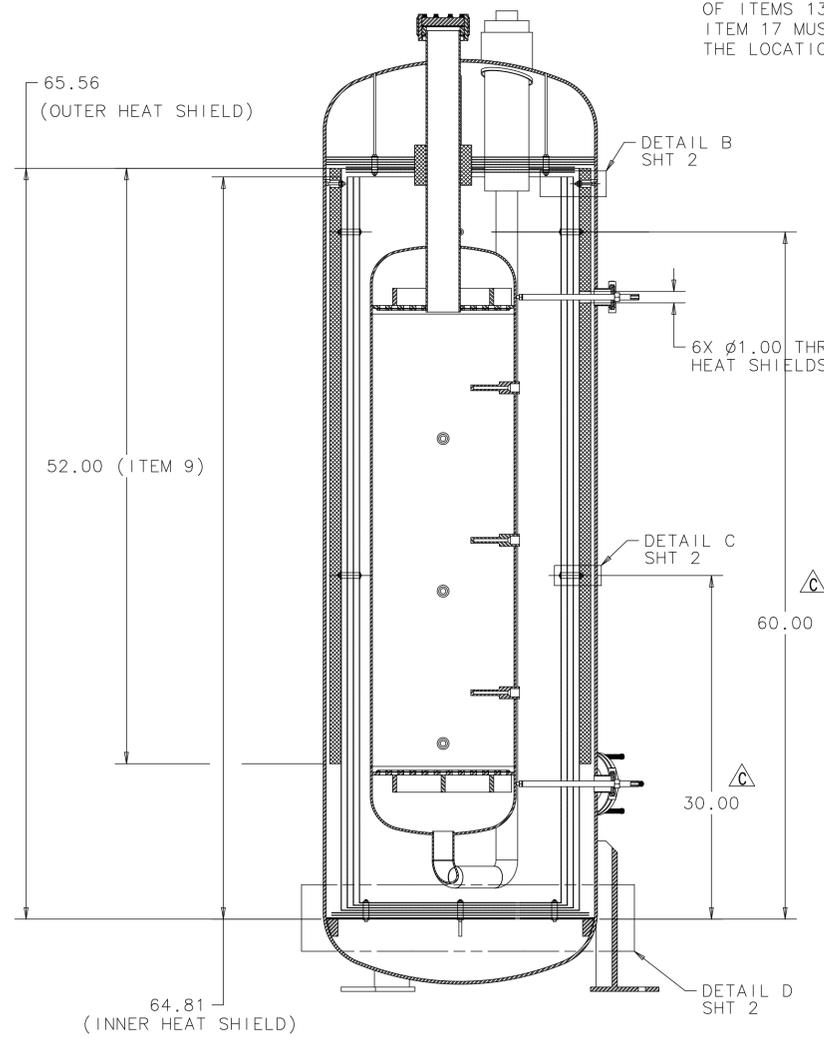
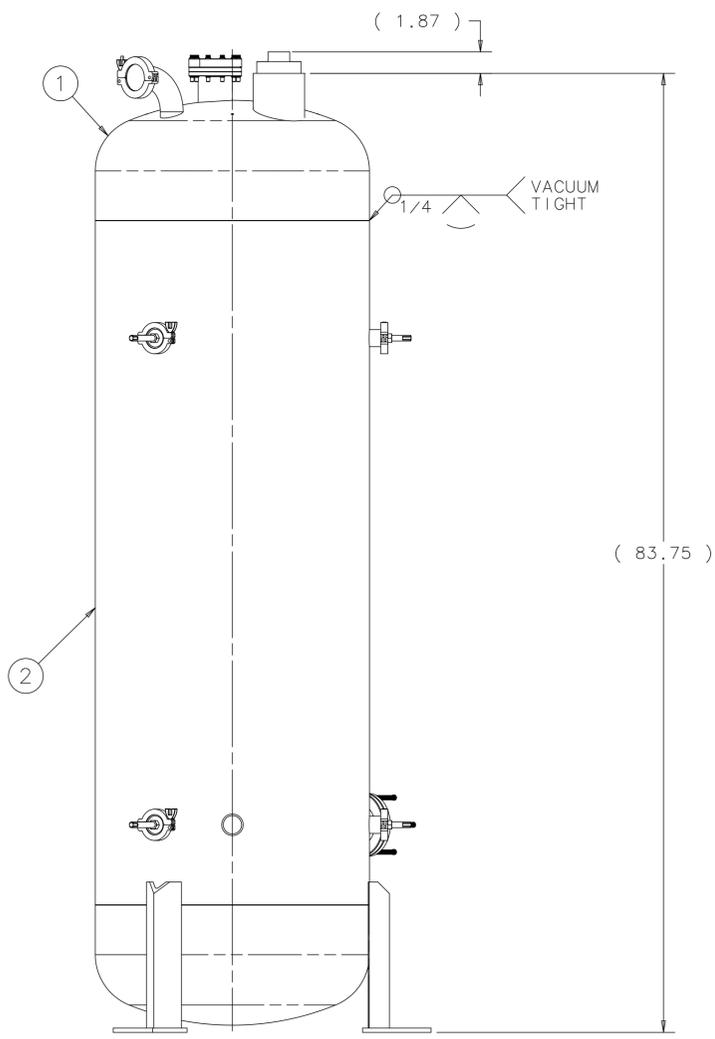
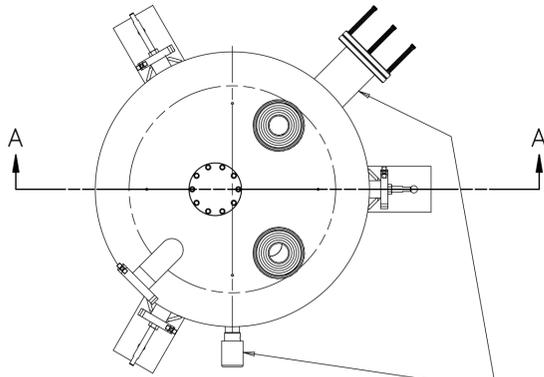


NOTES:

- VENDOR DETERMINES SEQUENCE OF WELDING TO MINIMIZE DISTORTION AND ASSUMES RESPONSIBILITY FOR STRESS RELIEVING AND STRAIGHTENING. WELDING SHALL BE INSPECTED ACCORDING TO ASME B31.3, SECTION 344.
- WRAP 25 - 30 MM OF PYROGEL XT (ITEM 9) AROUND HEAT SHIELDS AS SHOWN TO OBTAIN THE GAP SHOWN IN DETAIL B. SECURE THE INSULATION TO THE HEAT SHIELDS WITH .02 AL WIRE (ITEM 9) BANDED AROUND 3 PLACES EQUALLY SPACED ALONG THE LENGTH OF INSULATION. WIRE SHOULD NOT COMPRESS THE INSULATION MORE THAN 1/8".
- FOR ITEMS 5, 6, 7, & 8, SEAMS ARE TO BUTT TOGETHER AND BE TACK WELDED. WHEN POSITIONING THESE ITEMS, SEAMS ARE TO BE OFFSET BY A MINIMUM OF 10° FROM THE NEAREST ADJACENT CYLINDER.
- THE OUTER 24" JACKET MUST BE DESIGNED AND FABRICATED IN ACCORDANCE WITH THE ASME BOILER AND PRESSURE VESSEL CODE FOR A MAXIMUM EXTERNAL PRESSURE OF 15PSI. JACKET SHALL HAVE A NON-CODE MANUFACTURE STAMP SHOWING VACUUM AND PRESSURE RATING. ACTUAL JACKET WALL THICKNESS AND NOZZLE REINFORCEMENTS MUST BE AS REQUIRED BY THE ASME BOILER AND PRESSURE VESSEL CODE. REFER TO PRINT MC-489652 FOR NOZZLE FORCES AND BENDING MOMENTS ON NOZZELS.
- ITEMS 15, 17 & 18 MUST BE TIGHT IN THE DIRECTION OF THEIR CENTER AXIS SO AS TO KEEP THE METAL RADIATION SHIELDS IN A FIXED POSITION, EVEN DURING SHIPPING. THE CENTERLINES OF ITEMS 13, 15 & 20 ARE NOT REQUIRED TO BE CONCENTRIC. ITEM 17 MUST BE SECURELY WELDED TO ITEM 1 AND/OR ITEM 2. THE LOCATION OF ITEM 17 IS NOT CRITICAL.

PYROGEL MUST NOT BLOCK AIRFLOW TO THESE 2 ITEMS.



SECTION A-A

ITEM	PART NO.	DESCRIPTION OR SIZE	QTY.	ITEM	PART NO.	DESCRIPTION OR SIZE	QTY.
15	COML	CERAMIC SPACER; .38X.50X.50 LG MCDANEL CERAMICS: 98A310430-06-12 SUPPLIED BY FERMI LAB	24	15	COML	CERAMIC SPACER; .38X.50X.19 LG MCDANEL CERAMICS: 98A310430-06-12 SUPPLIED BY FERMI LAB	24
14	COML	BHCS; 8-32UNC-2B X 2.00 SS MCMaster CARR: 92949A207	8	12	COML	WASHER FLAT #10, USS STD STN STL MCMaster CARR: 93852A101	32
13	COML	CERAMIC SPACER; .38X.50X.19 LG MCDANEL CERAMICS: 98A310430-06-12 SUPPLIED BY FERMI LAB	24	11	COML	HEX NUT; 8-32UNC-2B SS MCMaster CARR: 91841A009	12
12	COML	WASHER FLAT #10, USS STD STN STL MCMaster CARR: 93852A101	32	10	COML	SHCS; 8-32UNC-2B X 1.75 SS MCMaster CARR: 92185A206	4
11	COML	HEX NUT; 8-32UNC-2B SS MCMaster CARR: 91841A009	12	9	COML	PYROGEL XT; SHEET VENDOR: ASPEN AEROGELS SUPPLIED BY FERMI LAB	A.R.
10	COML	SHCS; 8-32UNC-2B X 1.75 SS MCMaster CARR: 92185A206	4	8	COML	HEAT SHIELD; FORMED; 17.62 I.D. .032" SHEET; 1100 AL.	1
9	COML	PYROGEL XT; SHEET VENDOR: ASPEN AEROGELS SUPPLIED BY FERMI LAB	A.R.	7	COML	HEAT SHIELD; FORMED; 18.69 I.D. .032" SHEET; 1100 AL.	1
8	COML	HEAT SHIELD; FORMED; 17.62 I.D. .032" SHEET; 1100 AL.	1	6	COML	HEAT SHIELD; FORMED; 19.75 I.D. .032" SHEET; 1100 AL.	1
7	COML	HEAT SHIELD; FORMED; 18.69 I.D. .032" SHEET; 1100 AL.	1	5	COML	HEAT SHIELD; FORMED; 20.81 I.D. .032" SHEET; 1100 AL.	1
19	COML	CERAMIC SLEEVE; .197X.276X1.44 LG MCDANEL CERAMICS: 98A310130-13-18 SUPPLIED BY FERMI LAB	4	4	COML	DISC, .032 X Ø22.5; 1100 AL	2
18	COML	SHCS; 10-24UNC-2B X 1.50 SS MCMaster CARR: 92185A251	4	3	COML	PLATE, 1/8"; 304SS	1
17	COML	HEX NUT, #10-24UNC SS MCMaster CARR: 91841A011	8	2	MD-489564	MICROBOONE FILTER OUTER VESSEL	1
16	COML	CERAMIC SLEEVE; .197X.276X1.63 LG MCDANEL CERAMICS: 98A310130-13-18 SUPPLIED BY FERMI LAB	8	1	MD-489563	MICROBOONE FILTER INNER VESSEL ASSY	1

PARTS LIST

PARTS LIST

UNLESS OTHERWISE SPECIFIED	ORIGINATOR	R.SANDERS	29-FEB-2012
.XX .XXX ANGLES	DRAWN	J.TILLMAN	15-MAR-2012
± .13 ± --- ± ---	CHECKED	J.RAUCH	27-APR-2012
	APPROVED	R.SANDERS	27-APR-2012

1. BREAK ALL SHARP EDGES .02 MAX.  
 2. DO NOT SCALE DRAWING.  
 3. DIMENSIONS BASED UPON ASME Y14.5M-1994  
 4. MAX. ALL MACH. SURFACES 250  
 5. DRAWING UNITS: U.S. INCH

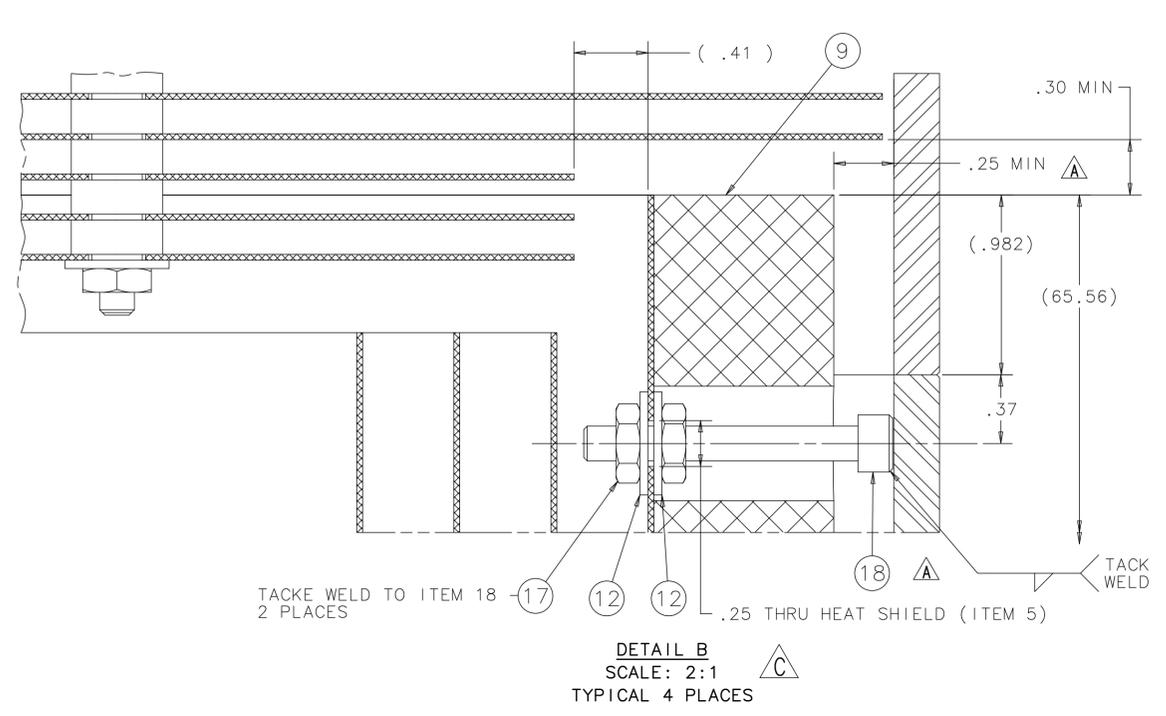
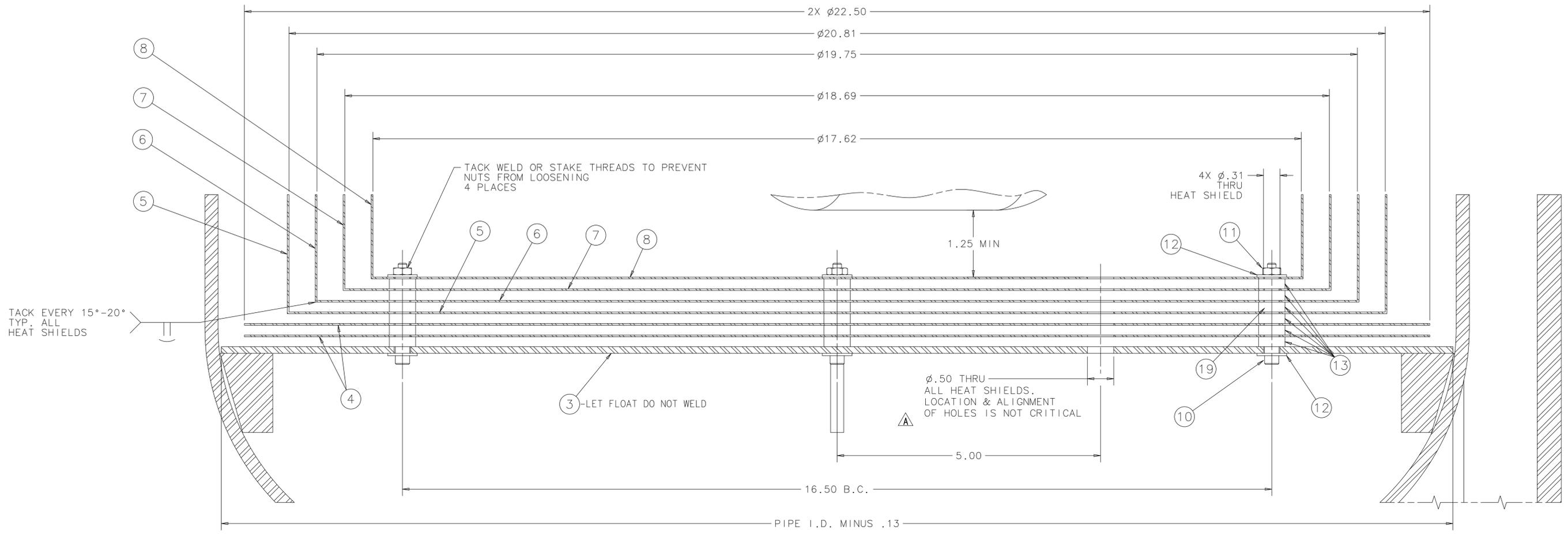
USED ON: ME-489577  
 MATERIAL: SEE PARTS LIST ON SHEET 1

**FERMI NATIONAL ACCELERATOR LABORATORY**  
 UNITED STATES DEPARTMENT OF ENERGY

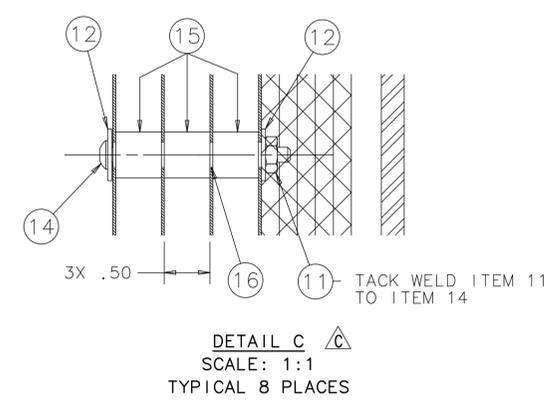
**E974-MICROBOONE - INFRASTRUCTURE SERVICE EQUIPMENT**  
**MICROBOONE FILTER VESSEL**

SCALE	DRAWING NUMBER	SHEET	REV
1:8 & AS NOTED	3974.220-MD-489597	1 OF 2	C
CREATED WITH: Ideas12NXSeries	GROUP: PPD/MECHANICAL DEPARTMENT		

REV	DESCRIPTION	DRAWN	DATE
		APPROVED	DATE
A	GENERAL REVISIONS	J. TILLMAN	26-JUL-2012
		M. ZUCKERBROT	01-AUG-2012
B	CHANGED THICKNESS AND/OR MATERIAL IN BOM	J. TILLMAN	03-AUG-2012
		M. ZUCKERBROT	03-AUG-2012
C	REVISED TO AS BUILT, BOM CHG TO ITEM 10,11,12,14,17 & 18	J. RAUCH	21-FEB-2013
		R. SANDERS	03-MAR-2013



DETAIL D  
SCALE 1:1



UNLESS OTHERWISE SPECIFIED	ORIGINATOR	R. SANDERS	29-FEB-2012
.XX .XXX ANGLES	DRAWN	J. TILLMAN	15-MAR-2012
± .13 ± --- ± ---	CHECKED	J. RAUCH	27-APR-2012
1. BREAK ALL SHARP EDGES .02 MAX.	APPROVED	R. SANDERS	27-APR-2012
2. DO NOT SCALE DRAWING.	USED ON	ME-489577	
3. DIMENSIONS BASED UPON ASME Y14.5M-1994	MATERIAL	SEE PARTS LIST ON SHEET 1	
4. MAX. ALL MACH. SURFACES 250			
5. DRAWING UNITS: U.S. INCH			

**FERMI NATIONAL ACCELERATOR LABORATORY**  
**UNITED STATES DEPARTMENT OF ENERGY**

**E974-MICROBOONE - INFRASTRUCTURE SERVICE EQUIPMENT**  
**MICROBOONE FILTER VESSEL**

SCALE 1:8 & AS NOTED	DRAWING NUMBER <b>3974.220-MD-489597</b>	SHEET 2 OF 2	REV C
CREATED WITH : Ideas12NXSeries		GROUP: PPD/MECHANICAL DEPARTMENT	