

MCNPX Visual Editor Version X_23z

SAND2016-6469PE

```
250 0 -33 32 -6 607
251 0 -51 37 -6 607
256 0 -32 -6 607
276 0 -13 51 -6 607
1 0 -11 -2 202 $ tap target vac
2 0 -11 30 -3 2 $ top target cap
3 208 -2.71 -12 30 -31 3 $ top target cap
180 0 -30 -3 2
181 0 -30 -31 3
7 0 -89 91 -2 201
8 0 -14 12 -2 201 $ vac betw target and return
9 257 -1.85 -15 14 -3 203 $ return can
14 0 -12 -61 7
15 0 -67 81 -61 7
16 0 -68 67 -61 7
17 0 -12 -63 61
18 0 -65 12 -63 61
19 0 -68 65 -62 61
20 0 -66 65 -63 62
21 0 -12 -64 63
22 0 -66 12 -64 63
23 0 -82 66 -64 62
24 0 -83 -74 64
```

c

c what is material for target side walls?

```
25 0 -12 11 -3 202 $ SS target side walls
```

c

```
26 0 -83 16 -4 2
27 0 -83 68 -71 4
28 0 -82 68 -62 71
29 0 -83 82 -64 71
```

c

c BAD, get rid of #cell

```
30 0 -91 83 -29 2 #379
```

c

```
31 268 -8 -86 83 -71 29
32 426 -1.425 -86 83 -72 71
33 1 -8.96 -84 93 -73 72 $ Copper coil
34 426 -1.425 -86 83 -75 73
35 5 -0.93 -85 84 -73 72
36 0 -86 85 -73 72
37 426 -1.425 -93 83 -73 72
```

c

```
40 0 -89 86 -4 2
41 0 -89 86 -71 4
42 0 -89 86 -72 71
43 0 -89 86 -73 72
44 0 -89 86 -87 73
45 268 -8 -89 86 -25 87
46 268 -8 -86 83 -25 75
47 268 -8 -83 76 -25 74
48 0 -76 -25 74
49 0 -18 -26 25
50 0 -200 18 -26 25
54 0 -37 33 -6 607
55 268 -8 13 -57 -6 607
161 268 -8 -70 57 -6 607
59 268 -8 58 -60 -6 607
91 0 -611 52 -605 609
93 0 57 -52 -605 606
94 0 52 -611 -609 616
95 0 610 -60 -608 616
96 0 -18 60 -5 616
97 268 -8 -610 611 -609 616
98 0 -60 610 -605 608
```

```

99      268      -8 -610 611 -605 609
C
C *****
C **** 300 for bottom load hardware
C *****
303      268      -8 -234 230 -202 205
304          0      -230 -202 205
305          0      -234 231 -205 207
306          0      -230 -205 207
307      268      -8 -231 230 -205 207
308          0      -230 -207 208
309      268      -8 -231 230 -207 208
310      268      -8 -234 231 -207 208
311          0      -230 -208 211
312      268      -8 -231 230 -208 211
313      268      -8 -233 231 -208 211
314          0      -230 -211 212
315      268      -8 -231 230 -211 212
316      268      -8 -232 231 -211 212
317          0      -230 -212 213
318      268      -8 -231 230 -212 213
319      268      -8 -233 231 -212 213
320          0      -230 -213 609
321      268      -8 -231 230 -213 609
322      268      -8 -232 231 -213 609
323          0      -234 233 -208 211
324          0      -234 232 -211 212
325          0      -234 233 -212 213
326          0      -234 232 -213 214
327          0      -234 232 -214 605
328      268      -8 601 234 -202 215 -60
329          0      600 -601 -201 210
C
C BAD, get rid of #cell
C 330          0      -235 -600 -201 203 #9
C
C
C 331      268      -8 -235 -600 -203 206
332      268      -8 -82 -600 -206 210
333      268      -8 -82 -600 -210 952
334          0      -89 91 -201 216
335      268      -8 -92 235 -216 204
336      268      -8 -82 235 -204 206
337      426 -1.425 -86 91 -204 206
338          1      -8.96 -84 93 -206 209 $ Copper coil
339      426 -1.425 -83 82 -206 209
340          5      -0.93 -85 84 -206 209
341          0      -86 85 -206 209
342          0      -89 86 -204 210
343      426 -1.425 -86 82 -209 210
344      268      -8 -86 -600 82 -210 952
345          0      -89 86 -210 215
346          0      600 -601 -210 214
347          0      -952 -601 953 605 -214 -60
348          0      600 -601 -214 952 -86
349      268      -8 -953 -215 605 17 -60
350      268      -8 17 953 601 -215 -60
351      268      -8 -60 86 -215 952
C
C 352      268      -8 -17 234 -215 605
354          0      -200 89 -25 9 951
355          0      -200 -9 951
356          0      -89 60 -215 951
C
C 360          0      -89 92 -216 204
C

```

```

361      0      601 12 -201 202 -60
C
362    426 -1.425 -93 83 -206 209
C
C
370      0      -16 30 -95 31
371      0      -30 -95 31
372    268      -8 -16 94 -96 95
373      0      -94 -96 95
374    268      -8 -81 94 -7 96
375      0      -94 -7 96
376      0      -81 12 -61 7
377    268      -8 -16 81 -7 96
378      0      -68 16 -7 4
379    261    -4.54 -97 -29 216
C
380    268      -8 -233 32 -609 608
381    268      -8 -232 32 -608 612
382      0      -32 -608 612
383    268      -8 -233 32 -612 613
384      0      -32 -612 613
385    268      -8 -232 32 -613 614
386      0      -32 -613 614
387    268      -8 -233 32 -614 615
388      0      -32 -614 615
389      0      -57 232 -605 609
390      0      -57 233 -609 608
391      0      -57 232 -608 612
392      0      -57 233 -612 613
393      0      -57 232 -613 614
394      0      -57 233 -614 615
395      0      -57 -615 606
396      0      -32 -609 608
397      0      -52 -606 616
C
C
C *****
C **** 100-140 for side plates, side In sample assembly
C *****
100    268      -8 -105 106 102 -111 -122 123 110
101    268      -8 -110 102 -111
102      4    -7.31 -110 103 -102 $ SIDE IN SAMPLE
103    268      -8 110 103 -102 -105 106 123 -122
104    268      -8 -110 104 -103
105    268      -8 110 104 -103 -105 106 123 -122
C
C
C
C   FIX cell 110 for side CR-39
C
C   BAD, get rid of #cell
110      0      -104 -121 106 -950 #127
C
C
C   FIX cell 111 for side CR-39
C
C   BAD, get rid of #cell
111      0      -950 426 -106 127 #127
C
C
C
C   BAD, get rid of #cell
120      0      -426 101 -400 105 #850 $ vac above of In
C
C
121      0      426 -400 105 -950 $ vac to side of In

```

```

C
C
C   FIX cell 122 for side CR-39
C
C   BAD, get rid of #cell
122      0      -950 426 -408 400 #127
C
C
C   FIX cell 125 for side CR-39
C   125      0      -104 -950 -105 120 #127
125      0      -104 -950 -105 120 861 #127
C
C
C   FIX cell 126 for side CR-39
C   126      0      -104 -950 -120 121 #127
126      0      -104 -950 -120 121 861 #127
C
C
C
C
C   BAD, get rid of #cell
127      0      101 -950 -105 106 #100 #101 #102 #103 #104 #105 #850 #851
      #852 #853 #854 #855 #856 #857 #858 #859 #860 #861 #862 #863 #864
      #865 #866 #867
C
C
C *****
C *****
C ***** 200's for regions inside debris shield *****
C *****
201      208      -2.71 -16 12 -31 3
212      0      -200 18 -27 26
213      0      -200 18 -28 27
214      0      -200 18 -438 28
222      0      -18 -27 26
223      0      -18 -28 27
224      0      -18 -438 28
225      0      -100 200 -6 9
226      0      -100 200 -22 6
227      0      -100 200 -20 4
230      0      -100 200 -23 22
231      0      -100 200 -24 23
232      0      -100 200 -25 24
233      0      -100 200 -26 25
234      0      -100 200 -27 26
235      0      -100 200 -28 27
236      0      -100 200 -438 28
C
C
C   **** Void material for blast shield for initial side CR-39
237      0      -101 100 -400 128 $ debris shield wall
C
C
C
C
C   238      268      -8 -426 100 -128 127 951 $ bot overhang
239      0      -200 60 -952 953
C
C   BAD, get rid of #cell
240      0      -100 200 -9 606 #701 #702
C
C
C   241      0      -200 60 -954 955
C
C   BAD, get rid of #cell

```

```

C 242      0      -100 200 -606 732 955 #701 #702
C
C 243      268      -8 -100 -400 438
C *****
C **** 400's for top plates and top In sample assembly
C *****
C
C Replace former Cu top plate with SS material starting
C March 2014 for Roosevelt
C
C 400      268      -8 -100 435 572 -403 400 $ bottom SS top plate
C
C
C BAD, get rid of #cell
C 415      0      -100 435 576 -408 403 #500 #501 #502 #503 #508 #509 #510
C
C
C 420      268      -8 -426 100 -403 400 $$ SS debris shield
C
C BAD, get rid of #cell
C 421      0      -426 100 -408 403 #500 #501 #502 #503 #508 #509 #510
C
C
C Replace former Cu top plate with SS material starting
C March 2014 for Roosevelt
C 441      268      -8 -430 -431 400 $ bottom SS top plate
C
C 442      0      -430 -403 431 $ vacuum about 1/2" copper plate
C
C BAD, get rid of #cell
C 443      0      -430 -408 403 #500 #501 #502 $ vacuum hole in 1" SS pla
C #503 #503 #504 #505 #508 #509 #510
C
C
C
C Replace former Cu top plate with SS material starting
C March 2014 for Roosevelt
C 444      268      -8 -433 430 -403 400 -436 $ bottom SS top plate
C
C
C 445      268      -8 -434 433 -404 400 -436
C
C BAD, get rid of #cell
C 446      268      -8 -435 434 -408 400 -436 #441 #442 #443 #444 #445 #447 #448
C 447      0      -434 433 -408 404 -436 #441 #442 #443
C 448      0      -433 430 -408 403 -436 #441 #442 #443
C
C Replace former Cu top plate with SS material starting
C March 2014 for Roosevelt
C 449      268      -8 436 -435 -431 400 572
C
C
C Replace former Cu top plate with SS material starting
C March 2014 for Roosevelt
C 450      268      -8 436 -435 -403 431 576
C
C
C 451      268      -8 436 -435 -408 403 576
C
C Replace former Cu top plate with SS material starting
C March 2014 for Roosevelt
C 452      268      -8 -576 574 -403 431
C
C Replace former Cu top plate with SS material starting

```

```

c      March 2014 for Roosevelt
454 268 -8 -574 572 -403 431
c
c
c
c 404 4 -7.31 -570 -552 300 $ TOP INDIUM SAMPLE
c
c
c fill in cell 550 with SS
c
c BAD, get rid of #cell
550 268 -8 -572 -401 400 #444 #445 #446 #447 #448
c
c
c
c Replace former Cu top plate with SS material starting
c March 2014 for Roosevelt
c
c BAD, get rid of #cell
551 268 -8 -572 -402 401 -403 #214 #444 #445 #446 #447 #448 #243
c
577 0 -572 -403 404
c *****
c **** 500's for Rabbit assembly
c *****
516 0 -950 -500 408 $ vacuum below Rabbit
c
c
c ***** Rabbit Contents *****
c
c Order: SS - plastic - Cd - Cu - Cd - In
c
500 268 -8 500 -501 -515 $ SS Rabbit tube
501 5 -0.93 501 -502 -513 $ Plastic Rabbit
502 259 -8.65 502 -503 -513 $ Cadmium
503 1 -8.96 503 -504 -513 $ Copper
504 259 -8.65 504 -505 -513 $ Cadmium
505 4 -7.31 505 -506 -513 $ Indium
506 5 -0.93 506 -507 -513 $ Plastic Rabbit
507 0 507 -517 -515 $ void above Plastic Rabbit
c
c
508 5 -0.93 513 -514 -507 501
509 259 -8.65 514 -515 -507 501
510 268 -8 515 -516 -517 500
c
c
515 0 516 -517 500 408 -950
c
c
c *****
c **** 700's for cathode and anode parts below load
c *****
701 268 -8 -951 952 60 -997 -215
702 268 -8 -953 954 60 -997
703 0 -957 958 60 -997
704 268 -8 -997 60 -955 957
705 268 -8 -997 60 -958 956
c
740 0 -60 -616 732
741 0 -732 733 -725
742 0 -100 725 -732 733 #701 #702 #703 #704 #705
743 0 -725 -733 734
744 0 -100 725 -733 734 #703 #704 #705
745 0 -725 -734 735
746 0 -100 725 -734 735 #703 #704 #705

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747      0      -760 -735 736
748    268      -8 -764 760 -735 736
749      0      -100 764 -735 736 #703 #704 #705
750      0      -760 -736 737
751      0      -764 760 -736 737
752      0      -100 764 -736 737 #703 #704 #705
753    268      -8 -760 -737 738
754    268      -8 -764 760 -737 738
755      0      -100 764 -737 738 #703 #704 #705
756      0      -760 -738 739
757      0      -764 760 -738 739
758      0      -100 764 -738 739 #703 #704 #705
759    268      -8 -760 -739 740 $ no hole for SS plate
760    268      -8 -764 760 -739 740 $ SS plate
761      0      -100 764 -739 740 #703 #704 #705
762      0      -760 -740 741
763      0      -764 760 -740 741
764      0      -100 764 -740 741 #703 #704 #705
765    268      -8 -760 -741 742 $ no hole for SS plate
766    268      -8 -764 760 -741 742 $ SS plate
767      0      -100 764 -741 742 #703 #704 #705
768      0      -760 -742 743
769      0      -764 760 -768 743
770      0      -100 764 -742 743 #703 #704 #705
771      0      -760 -743 770
772    208     -2.71 -200 760 -743 770
773      0      -100 200 -743 746 #705
774      0      -100 200 -746 302
775      0      -200 763 -746 302 #784
777      0      -760 -746 747
778      0      -760 -747 748
779    258     -19.2 -763 761 -747 748 $ TUNGSTEN
780    258     -19.2 -763 760 -748 302 $ TUNGSTEN
781      0      -760 -748 302
782      0      -760 -302 751
783    258     -19.2 -762 760 -302 751 $ TUNGSTEN
784    268      -8 -767 -745 302 $ SS cover above bot In
785      4      -7.31 -765 -302 749 $ BOTTOM IN SAMPLE
786      0      -766 765 -302 749 $ vac around In sample
787      5      -0.93 -766 -749 750 $changed to plastic,
788      5      -0.93 -100 762 -302 751 #785 #786 #787
789      1      -8.96 -763 760 -746 747
790      1      -8.96 -761 760 -747 748
791    268      -8 -764 760 -742 768
792      0      -200 -770 746
c 750      0      -100 -9 125 $ TEMP space below load TEMP TEMP TEMP
c ***** CR-39 diagnostics *****
c
c *** TOP CR-39 ***
c
800    208     -2.71 -851 -301 800 -801 $ 1/2 Al foil in front of 1st 1/2 Ta
801    428    -16.65 -850 -301 801 -803 $ 1st 1/2 Ta foil
802      0      -851 301 800 -802 $ vac in front of 1st Al foil
803    208     -2.71 -850 301 802 -803 $ Al foil pre 1st CR-39
804    208     -2.71 -851 850 801 -803 -301 $ Al foil around 1/2 package
805    427     -1.3 -850 803 -804 $ 1st CR-39
806    428    -16.65 -850 804 -805 $ 2nd Ta foil
807    427     -1.3 -850 805 -806 $ 2nd CR-39
808    428    -16.65 -850 806 -807 $ 3rd Ta foil
809    427     -1.3 -850 807 -808 $ 3rd CR-39
810    428    -16.65 -850 808 -809 $ 4th Ta foil
c
c temp placeholder for CH foil (allow proton emission later)
811    429      -1 -850 809 -810 $ 1st CH foil
c
812    427     -1.3 -850 810 -811 $ 4th CR-39

```

```

c
c temp placeholder for CH foil (allow proton emission later)
813 429 -1 -850 811 -812 $ 2nd CH foil
c
814 428 -16.65 -850 812 -813 $ 5th Ta foil
815 208 -2.71 -850 813 -814 $ Back Al foil
816 208 -2.71 -851 850 803 -814 $ Al foil around package
817 208 -2.71 -851 850 802 -803 301 $ Al foil around 1/2 package
c
c 880 0 -572 402 -800 $ vac space below package
880 0 -572 402 -403 402 $ vac space below package
881 0 -576 851 403 -814 $ vac space around package
c 882 0 -851 402 403 -800 $ vac space below package (oops)
882 0 -851 403 -800 $ vac space below package (oops)
883 0 -576 814 -408 $ vac space above package
c
c
c
c *** SIDE CR-39 ***
850 268 -8 820 -821 -300 128 870 -871
851 208 -2.71 -840 -860 821 -822
852 428 -16.65 -840 -860 822 -1200
853 0 840 -860 821 -823
854 208 -2.71 840 -860 823 -1200 4
855 0 -861 860 821 -1200
856 427 -1.3 -860 1200 -825
857 428 -16.65 -860 825 -1201
858 427 -1.3 -860 1201 -827
859 428 -16.65 -860 827 -1202
860 427 -1.3 -860 1202 -829
861 428 -16.65 -860 829 -830
862 429 -1 -860 830 -1203
863 427 -1.3 -860 1203 -832
864 429 -1 -860 832 -833
865 428 -16.65 -860 833 -834
866 208 -2.71 -860 834 -835
867 208 -2.71 -861 860 1200 -835
c *****
c
c 940 0 -86 91 -29 2
c
c BAD, get rid of #cell
c 943 0 -91 83 -2 216 #379
c
c
c 944 0 -83 235 -2 216
945 0 -235 15 -2 201
946 426 -1.425 -91 82 -204 206
c
c 950 0 -950 -751
c
c
c BAD, get rid of #cell
c 951 0 -950 100 -127 751 #701 #702 #703 #704 #705
c
c
c 952 0 -950 517 408
c 953 268 -8 -100 -999 998 #236 #214 #224
c 953 268 -8 -100 -999 998
953 0 -952 127 100
c
c
c 955 0 -16 15 -3 2
956 0 -14 12 -3 2
c
c 960 0 -426 101 -106 128 #850

```


2 py 3.04 \$ top of liner
3 py 3.32 \$ middle-top of target
4 py 3.995 \$ top of castle
5 py 2.5 \$ bottom of liner
6 py -1.315 \$
7 py 4.57 \$ 0.85 thickness above surf 95
9 py -3.935 \$
11 cy 0.75 \$ rad of aperture below target
12 cy 0.85 \$ inner rad of top cap
13 cy 0.853 \$ outer rad of top cap, inner rad of bot cap
14 cy 1.3 \$ inner radius of return can
15 cy 1.377 \$ outer rad of return can
16 cy 1.8
17 cy 2.68 \$ bottom
18 cy 5.63 \$ outer rad of top cap
20 py 1.7 \$ bottom
22 py 3
23 py 4
24 py 5
25 py 8.53 \$ should be 1.14cm above 75
26 py 10
27 py 12
28 py 12.5
29 py 3.8
30 cy 0.4
31 py 3.57
32 cy 0.05
33 cy 0.16
36 py -12.83
37 cy 0.22
51 cy 0.53
52 cy 1.905
57 cy 0.9
58 cy 4.5
60 cy 6.69
61 py 5.308
62 py 5.67
63 py 6.65
64 py 6.94
65 cy 0.996
66 cy 1.223
67 cy 1.676
68 cy 1.9
70 cy 1.15
71 py 4.34 \$ thick~0.54cm,above surf 29
72 py 4.76 \$ should be ~ 0.42 above surf 71
73 py 6.755 \$ should be ~0.635cm below surf 75
74 py 7.176
75 py 7.39 \$ should be 1.202" above surf 71
76 cy 2.31
81 cy 1
82 cy 2.54
83 cy 2.67
84 cy 5.44
85 cy 6.432
86 cy 6.568
87 py 7.55
89 cy 8.72
91 cy 5.55
92 cy 6.63
93 cy 3.12 \$ inner radius of coils
94 cy 0.35
95 py 3.72
96 py 3.91

```

C
  97      c/y -4.9 1 0.508 $ Ti spacer partially blocking Indium
100      cy 26.505
C *****
C **** 100's for debris shield walls and side In sample holder
C *****
  101      cy 28.105 $ debris shield ID
  102      px -29 $ front of side Indium Roos Mix B
  103      px -30.27 $ for 1.27 thick Indium
  104      px -31.22
  105      py 6.617
  106      py -2.913
  110      c/x 1.145 0 1.27
  111      px -28.105
  120      py 1.857
  121      py -0.683
  122      pz 1.585
  123      pz -1.585
  127      py -12.19 $ 1.25" overhang above bottom of debris shield
  128      py -7.11
  200      cy 15
C *****
C **** 200's
C *****
  201      py 2.45
  202      py 2.2
  203      py 2.15
  204      py 1.389 $ top of coil assembly (1" to surf 210)
  205      py 2.064
  206      py 0.969
  207      py 1.864
  208      py 1.774
  209      py -0.516 $ should be 0.635cm above surf 210
  210      py -1.151 $ 1" below surf 204
  211      py 1
  212      py 0.14
  213      py -0.49
  214      py -1.58
  215      py -3.03
  216      py 1.77
C
C
  230      cy 0.05
  231      cy 0.159
  232      cy 0.362
  233      cy 0.544
  234      cy 0.634
  235      cy 2.26
C *****
C planes to mark sample positions
C *****
  302      py -44.47 $ Top of bottom Indium Roosevelt 2839
  301      px 7 $ radius of top In sample position
  303      py 15.415 $ bottom of top In sample
  306      py 22.88 $ TCC to mid-In side sample
C
  307      py 26.439 $ 8-25-15 height of Rabbit for Roosevelt 2839
C
C
  310      py 2.77 $ Center line of target for Roosevelt
C
  314      cy 15.475 $ approx radius of Rabbit tube (Roos 2839)
C *****
C **** 400's for top plates and top In sample assembly
C *****
  300      2 py 21.634 $ plane above debris shield

```

```

400      py 20.169  $ TCC to bot of 1" SS top plate
401      2 py 20.064
402      2 py 21.334
403      py 22.709
404      py 23.344
408      py 25.249
426      cy 30
430      c/y -7.94 0 6.57  $ new copper plate hole
431      py 21.439
433      cy 15.58
434      c/y -9.09 0 7.22
435      cy 18.415
436      px -1

C
438      py 19.869  $ for 3mm of SS "goo" below top samples
C
C
C
C *****
C **** 500's for Rabbit assembly
C *****
C
500      1 py 28.739
501      1 py 28.898
502      1 py 29.098
503      1 py 29.198
504      1 py 30.148
505      1 py 30.248
506      1 py 31.518
507      1 py 31.718

C
C
C
513      1 c/y -23 0 3.81
514      1 c/y -23 0 4.01
515      1 c/y -23 0 4.11
516      1 c/y -23 0 4.269
517      1 py 45.405

C
572      c/y 7 0 2.04
574      c/y 7 0 2.79
576      c/y 7 0 4.1
600      ty 0 2.77 0 10.3 8.4 9.1
601      ty 0 2.37 0 10 8.3 9.1
C *****
C **** 600's and 700's for cathode and anode parts
C *****
605      py -4.3

C
606      py -10.51
607      py -1.25
608      py -7.58
609      py -6.58
610      cy 5
611      cy 3.51
612      py -8.08
613      py -8.58
614      py -8.78
615      py -9
616      py -11.5
725      cy 5.4
732      py -12
733      py -20  $ est
734      py -30  $ should be around 9.155??
735      py -30.641
736      py -30.791

```

```

737      py -32.546
738      py -32.696
739      py -34.301
740      py -34.601
741      py -36.206
742      py -36.506
743      py -39.1
745      py -44.1525
746      py -42.49
747      py -43.16
748      py -44.1
749      py -45.74
750      py -50
751      py -55.04
760      cy 0.9
761      cy 3.65
762      cy 3.815
763      cy 5.05
764      cy 8.89
765      c/y 7.11 0 1.27
766      c/y 7.11 0 1.65
767      c/y 7.11 0 2
768      py -36.656
770      py -41.005

```

```

C
C *****
C ***** CR-39 diagnostics *****
C
C
C

```

```

C      ****      TOP CR-39      ****
C
C      800      py 22.7135 $ front of Ta foil
C                  surf 800 is 45 um above surf 403; 3x 15um Al foil
C      801      py 22.7185 $ front of 1st Ta foil
C      802      py 22.719 $ front of Al foil in front of bare 1st CR-39
C      803      py 22.7235 $ front of 1st CR-39
C      804      py $ back of 1st CR-39 (0.15cm thick); front of 2nd Ta foil
C                  22.8735
C      805      py 22.8785 $ front of 2nd CR-39
C      806      py 23.0285 $ front of 3rd Ta foil
C      807      py 23.0335 $ front of 3rd CR-39
C      808      py 23.1835 $ front of 4th Ta foil
C      809      py 23.1885 $ front of 1st CH foil
C      810      py 23.1935 $ front of 4th CR-39
C      811      py 23.3435 $ front of 2nd CH foil
C      812      py 23.3485 $ front of 5th Ta foil
C      813      py 23.3535 $ front of back Al foil
C      814      py 23.358 $ back of back Al foil 45 um
C
C
C

```

```

C      ****      SIDE CR-39      ****
C
C
C      820      px 28.105
C      821      px 29.0575
C      822      px 29.062
C      823      px 29.0625
C      c 824      px 29.067
C      1200      px 29.067
C      825      px 29.217
C      c 826      px 29.222
C      1201      px 29.222
C      827      px 29.372
C      c 828      px 29.377
C      1202      px 29.377
C      829      px 29.527
C      830      px 29.532

```

c 831 px 29.537
1203 px 29.537
832 px 29.687
833 px 29.692
834 px 29.697
835 px 29.7015

c
840 py 2.771

c
c **** TOP CR-39 ****

c
850 c/y 7 0 2.54
851 c/y 7 0 2.5445

c
c
c
c **** SIDE CR-39 ****

c
860 c/x 2.77 0 2.54
861 c/x 2.77 0 2.5445

c
870 pz -3.175
871 pz 3.175

c
c *****
c *****

c
950 so 70
951 ky 0 6 -1
952 ky -0.8 6 -1

c
953 ky -2 5.5 -1
954 ky -3.5 5 -1
955 ky -4.5 4.5 -1
956 ky -7 0.7 -1
957 ky -2 0.8 -1
958 ky -6.75 0.8 -1
959 ky -3.25 0.8 -1
960 ky -4.75 0.8 -1
997 cy 30.115
999 cy 10

mode	n					
m208	13027.60c	-1	\$aluminum			
m268	6000.60c	-0.0003	\$SS-316,SS-316L (with ENDF-VI)			
	14000.60c	-0.005	15031.60c	-0.000225	16000.60c	-0.00015
	24050.60c	-0.0070953	24052.60c	-0.142291	24053.60c	-0.016443
	24054.60c	-0.004171	25055.60c	-0.01	26054.60c	-0.038144
	26056.60c	-0.614907	26057.60c	-0.014331	26058.60c	-0.001944
	28058.60c	-0.080874	28060.60c	-0.031983	28061.60c	-0.001408
	28062.60c	-0.004546	28064.60c	-0.00119	42000.60c	-0.025
m1	29000.50c	1	\$Copper			
m2	29063.70c	1	\$Copper 63			
m3	29065.70c	1	\$Copper 65			
m4	49115.70c	1	\$Indium 115			
m5	1001.50c	2				
	6000.50c	1				
m272	74182.60c	-0.260586	\$Tungsten			
	74183.60c	-0.142269	74184.60c	-0.307531	74186.60c	-0.289615
m273	48000.51c	1	\$Cadmium			
m274	49115.70c	1	\$Indium			
m256	1001.60c	-0.143711	\$polyethylene			
	6000.60c	-0.856289				
m257	4007.42c	1	\$Be			
m258	74000.55c	1	\$Tungsten			
m259	48000.51c	1	\$Cadmium			

```

m260 28060.70c          1 $Nickel
m261 22000.62c          1 $Titanium
m426 1001.70c          -0.115476 $Nylon, Type 11 (Rilsan),
      6000.70c          -0.720819 7014.70c          -0.076417 8016.70c          -0.087289
m427 6000.70c          12 $CR-39
      1001.70c          18 8016.70c          7
m428 73181.70c         1 $Tantalum
m429 6000.70c          1 $CH foil placeholder
      1001.70c          1
*tr1 22.5 15.25 0 30 60 90 120 30 90 90 90 0
*tr2 0.25 1.95 0 -18.5 108.5 90 71.5 -18.5 90 90 90 0
*tr3 -3 -1 0 -18.5 108.5 90 71.5 -18.5 90 90 90 0
*tr4 0 -2.2 0 28 -62 90 118 28 90 90 90 0
*tr5 -2 -40 0 28 -62 90 118 28 90 90 90 0
imp:n 1 322r          0          $ 250, 999
c
c
c ***** VOID ALL MATERIALS *****
c void
c
c ***** Define Areas for Side CR-39 *****
c area 0 202i 0 20.2683 20.2683 20.2683 20.2683
c area 0 200i 0 20.2683 20.2683 20.2683 20.2683 20.2683 20.2683 20.2683 20.2683
c
c SOURCE DEFINITION
c
c          Monoenergetic DT source
c sdef          pos=0 2.77 0
c
c
c
c          DD source, Tion=2keV
c source at center of Roosevelt load @ y= 2.77 cm
c sdef par=1 erg=d2 pos=0 2.77 0
c sp2 -4 -0.002 -2
c
c
c nps 1e8
c
c
c
c
c Tallies
c *****
c Tallies
c *****
c f4:n 504
c   fm4 (0.05873 2 16)
c   fc4 Total (N,2N) reactions for Cu63
c   cf4 400 415
c f14:n 504
c   fm14 (0.02620 3 16)
c   fc14 Total (N,2N) reactions for Cu65
c   cf14 400 415
c f24:n 504
c   fm24 (0.05873 2 102)
c   fc24 Total (N,gamma) reactions for Cu63
c   cf24 400 415
c f34:n 504
c   fm34 (0.02620 3 102)
c   fc34 Total (N,gamma) reactions for Cu65
c   cf34 400 415
c f44:n 504
c   fc44 Total (N,2N) reactions for Cu63
c   cf44 400 415

```

e44	11.028	11.3	11.5	11.7	11.9	
	12.25	12.75	13.25	14.25	14.75	
	15.25	15.75	16.25	17.5	18.5	
	19.5	20				
em44	0	0.0045	0.0135	0.0325	0.0605	
		0.11264	0.21485	0.32363	0.4773	0.55244
		0.60882	0.66025	0.69682	0.74387	0.77854
		0.81486	0.81486			

f54:n 504

fc54 Total (N,2N) reactions for Cu63 Fitted X-sections

cf54 400 415

e54 11 89i 20

em54	0
	0.0012153
	0.0028577
	0.0045
	0.009
	0.0135
	0.023
	0.0325
	0.0465
	0.0605
	0.075397
	0.090294
	0.10519
	0.12286
	0.1433
	0.16375
	0.18419
	0.20463
	0.22573
	0.24748
	0.26924
	0.291
	0.31275
	0.33128
	0.34657
	0.36187
	0.37717
	0.39246
	0.40783
	0.42327
	0.4387
	0.45414
	0.46958
	0.48481
	0.49984
	0.51487
	0.5299
	0.54493
	0.55808
	0.56935
	0.58063
	0.59191
	0.60318
	0.61396
	0.62425
	0.63454
	0.64482
	0.65511
	0.66391
	0.67122
	0.67853
	0.68585
	0.69316
	0.69876

0.70263
0.70651
0.71038
0.71425
0.71804
0.72173
0.72542
0.72911
0.7328
0.73649
0.74018
0.74387
0.74734
0.7508
0.75427
0.75774
0.76121
0.76467
0.76814
0.77161
0.77507
0.77854
0.78217
0.7858
0.78944
0.79307
0.7967
0.80033
0.80396
0.8076
0.81123
0.81486
0.81486
0.81486
0.81486
0.81486
0.81486

f94:n 504

fc94 Total (N,2N) reactions for Cu65

cf94 400 415

e94 10.06 10.5 11 11.5 12

12.5 13 13.5 14 14.5

15 15.5 16 16.5

17 17.5 18 18.5 19

20

em94 0 0.02485 0.14367 0.2978 0.46466

0.61907 0.73295 0.82332 0.89531

0.94884 0.98255 1.013 1.0305 1.0628

1.0711 1.0758 1.0912 1.0767 1.0368

0.9588

f104:n 504

fm104 (0.05873 2 16)

fc104 Total (N,2N) reactions for Cu63

cf104 400 415

c *****

c CR-39 Top Package Tallies

c *****

f114:n 805

fc114 1st TOP CR-39 PACKAGE

e114 1e-6 1e-3 0.1 30i 3

f124:n 807

fc124 2nd TOP CR-39 PACKAGE

e124 1e-6 1e-3 0.1 30i 3

f134:n 809

fc134 3rd TOP CR-39 PACKAGE

e134 1e-6 1e-3 0.1 30i 3


```

f144:n 811
  fc144 4th TOP CR-39 PACKAGE
  e144 1e-6 1e-3 0.1 30i 3
C
C
f112:n 803
  fc112 Front face of 1st TOP CR-39 PACKAGE
  e112 1e-6 1e-3 0.1 30i 3
f122:n 805
  fc122 Front face of 2nd TOP CR-39 PACKAGE
  e122 1e-6 1e-3 0.1 30i 3
f132:n 807
  fc132 Front face of 3rd TOP CR-39 PACKAGE
  e132 1e-6 1e-3 0.1 30i 3
f142:n 810
  fc142 Front face of 4th TOP CR-39 PACKAGE
  e142 1e-6 1e-3 0.1 30i 3
C
C
f152:n 803
  fc152 Front face of 1st TOP CR-39 PACKAGE
  *c152 150 120 90 60 30 0
f162:n 805
  fc162 Front face of 2nd TOP CR-39 PACKAGE
  *c162 150 120 90 60 30 0
f172:n 807
  fc172 Front face of 3rd TOP CR-39 PACKAGE
  *c172 150 120 90 60 30 0
f182:n 810
  fc182 Front face of 4th TOP CR-39 PACKAGE
  *c182 150 120 90 60 30 0
C
C
C
f192:n 803
  fc192 Front face of 1st TOP CR-39 PACKAGE
  e192 1e-6 1e-3 0.1 30i 3
  *c192 150 120 90 60 30 0
f202:n 805
  fc202 Front face of 2nd TOP CR-39 PACKAGE
  e202 1e-6 1e-3 0.1 30i 3
  *c202 150 120 90 60 30 0
f212:n 807
  fc212 Front face of 3rd TOP CR-39 PACKAGE
  e212 1e-6 1e-3 0.1 30i 3
  *c212 150 120 90 60 30 0
f222:n 810
  fc222 Front face of 4th TOP CR-39 PACKAGE
  e222 1e-6 1e-3 0.1 30i 3
  *c222 150 120 90 60 30 0
C
C
C *****
C CR-39 Side Package Tallies
C *****
f314:n 856
  fc314 1st SIDE CR-39 PACKAGE
  e314 1e-6 1e-3 0.1 30i 3
f324:n 858
  fc324 2nd SIDE CR-39 PACKAGE
  e324 1e-6 1e-3 0.1 30i 3
f334:n 860
  fc334 3rd SIDE CR-39 PACKAGE
  e334 1e-6 1e-3 0.1 30i 3
f344:n 863
  fc344 4th SIDE CR-39 PACKAGE

```

```

e344 1e-6 1e-3 0.1 30i 3
c
c
f312:n 1200
fc312 Front face of 1st SIDE CR-39 PACKAGE
e312 1e-6 1e-3 0.1 30i 3
f322:n 1201
fc322 Front face of 2nd SIDE CR-39 PACKAGE
e322 1e-6 1e-3 0.1 30i 3
c f332:n 1202
c fc332 Front face of 3rd SIDE CR-39 PACKAGE
c e332 1e-6 1e-3 0.1 30i 3
c f342:n 1203
c fc342 Front face of 4th SIDE CR-39 PACKAGE
c e342 1e-6 1e-3 0.1 30i 3
c
c
f352:n 1200
fc352 Front face of 1st SIDE CR-39 PACKAGE
*c352 150 120 90 60 30 0
f362:n 1201
fc362 Front face of 2nd SIDE CR-39 PACKAGE
*c362 150 120 90 60 30 0
c f372:n 1202
c fc372 Front face of 3rd SIDE CR-39 PACKAGE
c *c372 150 120 90 60 30 0
c f382:n 1203
c fc382 Front face of 4th SIDE CR-39 PACKAGE
c *c382 150 120 90 60 30 0
c
c
c
f392:n 1200
fc392 Front face of 1st SIDE CR-39 PACKAGE
e392 1e-6 1e-3 0.1 30i 3
*c392 150 120 90 60 30 0
f402:n 1201
fc402 Front face of 2nd SIDE CR-39 PACKAGE
e402 1e-6 1e-3 0.1 30i 3
*c402 150 120 90 60 30 0
c f412:n 1202
c fc412 Front face of 3rd SIDE CR-39 PACKAGE
c e412 1e-6 1e-3 0.1 30i 3
c *c412 150 120 90 60 30 0
c f422:n 1203
c fc422 Front face of 4th SIDE CR-39 PACKAGE
c e422 1e-6 1e-3 0.1 30i 3
c *c322 150 120 90 60 30 0
c
c
c *****
c Indium tally bottom sample
c *****
f194:n 785
fc194 BOTTOM Indium Sample - flag MITLs
cf194 344 351 701 702 704 705
e194 0.339 0.34 0.35 0.36 0.37 0.38 0.39 0.4 0.41 0.42 0.43 0.44 0.45 0.5
0.53 0.54 0.55 0.56 0.6 0.63 0.65 0.67 0.7 0.75 0.8 0.85 0.9 0.92
0.94 0.96 1 1.02 1.05 1.07 1.1 1.12 1.14 1.16 1.18 1.2 1.22 1.25 1.3
1.5 1.55 1.75 1.8 1.85 2 2.1 2.15 2.25 2.35 2.45 2.6 2.7 2.8 3 3.1
3.5 3.65 3.75 4 4.15 4.25 4.4 4.6 5 5.25 5.5 5.75 6 6.25 6.35 6.5 7
em194 0 0.000001 0.0001 0.00049 0.000755 0.000951 0.00119 0.00139 0.00155
0.00172 0.00186 0.00201 0.00212 0.00252 0.00277 0.00297 0.00321
0.00356 0.00594 0.00891 0.0113 0.0134 0.0161 0.0212 0.0273 0.037
0.048 0.052 0.056 0.059 0.0625 0.064 0.063 0.065 0.068 0.075 0.0825
0.091 0.099 0.104 0.108 0.112 0.12 0.171 0.182 0.203 0.212 0.221

```

```

0.256 0.281 0.291 0.308 0.319 0.326 0.334 0.337 0.337 0.333 0.332
0.331 0.329 0.326 0.317 0.312 0.31 0.031 0.312 0.32
0.327 0.334 0.337 0.339 0.339 0.338 0.333 0.307
f244:n 503
fc244 Rabbit Indium Sample - 3" diameter sample substitute- flag Cu
cf244 504
e244 0.339 0.34 0.35 0.36 0.37 0.38 0.39 0.4 0.41 0.42 0.43 0.44 0.45 0.5
0.53 0.54 0.55 0.56 0.6 0.63 0.65 0.67 0.7 0.75 0.8 0.85 0.9 0.92
0.94 0.96 1 1.02 1.05 1.07 1.1 1.12 1.14 1.16 1.18 1.2 1.22 1.25 1.3
1.5 1.55 1.75 1.8 1.85 2 2.1 2.15 2.25 2.35 2.45 2.6 2.7 2.8 3 3.1
3.5 3.65 3.75 4 4.15 4.25 4.4 4.6 5 5.25 5.5 5.75 6 6.25 6.35 6.5 7
em244 0 0.000001 0.0001 0.00049 0.000755 0.000951 0.00119 0.00139 0.00155
0.00172 0.00186 0.00201 0.00212 0.00252 0.00277 0.00297 0.00321
0.00356 0.00594 0.00891 0.0113 0.0134 0.0161 0.0212 0.0273 0.037
0.048 0.052 0.056 0.059 0.0625 0.064 0.063 0.065 0.068 0.075 0.0825
0.091 0.099 0.104 0.108 0.112 0.12 0.171 0.182 0.203 0.212 0.221
0.256 0.281 0.291 0.308 0.319 0.326 0.334 0.337 0.337 0.333 0.332
0.331 0.329 0.326 0.317 0.312 0.31 0.031 0.312 0.32
0.327 0.334 0.337 0.339 0.339 0.338 0.333 0.307

c
c
c In116 tallies
f404:n 503
fc404 Rabbit In sample; In115(n,gamma)In116m
cf404 415
fm404 (0.03669 274 102)
c
f434:n 785
fc434 BOTTOM In sample; In115(n,gamma)In116m
cf434 789 790 780 779 783 787 788
fm434 (0.03669 274 102)
c
c *****
c
c *****
c ***** Simulation Time *****
c
ctme 10

```