framatome

June 12, 2018
TJT:18:024

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Director, Division of Spent Fuel Management
Office of Nuclear Material Safety and Safeguards
11555 Rockville Pike
One White Flint North
Rockville MD 20852

SUBJECT: Request for Amendment of Docket No. 71-9319, Framatome MAP-12 and MAP-13 Shipping Container, Application for Approval.

References: (1) Docket No. 71-9319, Framatome MAP-12 and MAP-13 Shipping Container Safety Analysis Report.
(2) NRC Certificate of Compliance Number 9319 Revision 9

By this letter, Framatome Inc. (Framatome), per the provisions of 10 CFR 71.38, formally requests an amendment to Certificate of Compliance 9319 for the MAP-12 packaging.

Framatome has a commercial need to make shipments of fuel assemblies to a commercial U.S. Reactor beginning June 20, 2018.

We are submitting this application for changes to the Certificate of Compliance (CoC) and Safety Analysis Report (SAR) as the result of an internal review of the drawings associated with this certificate that identified 3 classes of changes that are needed to assure compliance with the SAR drawings.

These identified issues are:

General Discrepancy Description	Extent of Condition	Disposition	Comments
Fabrication tolerance mismatch	Test units and 1st 70 MAP-12s	The NCSA provided with the SAR includes a sensitivity study supports these fabrication tolerances although that was not the purpose of the original study. Confirmatory sensitivity calculations were also completed to support this conclusion.	Tolerances for nylon associated with the flux trap. The first 85 manufactured were to a drawing that allowed ± 0.03 inches while the SAR drawings specify a minimum dimension.

Framatome Inc.
2101 Horn Rapids Road
Richland, WA 99354
Tel: (509) 375-8100

www.framatome.com

NMSS20
NMSS

General Discrepancy Description	Extent of Condition	Disposition	Comments
Weld symbols on SAR don't match as-built/as-tested containers	Test units and all MAP-12s	Update SAR drawings	Align SAR drawing to match as-tested / as-built configuration. Examples include weld type or prep callout.
Minor SAR discrepancies	Test units and all MAP-12s	Update SAR drawings	Align SAR drawing to match as-tested / as-built configuration Examples: part quantities wrong, or incorrect item number callout

Included in this application are three attachments that support the requested amendment.

Attachment A is a Table that summarizes the 39 drawing changes that need to be made and provides a justification for the changes.

Attachment B is a drawing package that shows redline changes with a reference back to the items listed in Attachment A and a final copy of the approved drawing changes made.

Attachment C is a copy of the COC changes that are being requested.

Attachment D is a copy of page 1-15 of the SAR that will change drawing version numbers.

Attachment E is a copy of the computer inputs used in the sensitivity calculations to support the conclusions that the manufacturing tolerances used in the first set of MAP-12 packages have a negligible effect on keff compared to the reference case from the SAR.

As previously stated, Framatome requests NRC action on this letter to support fuel shipments on June 20th of 2018. Please feel free to contact me at (509) 375-8550 if you have questions or need additional information.

Very truly yours

Timothy J. Tate, Manager
Environmental, Health, Safety and Licensing

c:

Bernard White
US Nuclear Regulatory Commission
Two White Flint North
Mail Stop 4 B34
11545 Rockville Pike
Rockville, MD 20852-2738
(w attachments)

US Nuclear Regulatory Commission
Attn: Kevin Ramsey
Two White Flint North, 4 A60
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(w/o attachments)

Attachments

A. Table of Changes
B. Drawing Package Changes
C. COC Changes
D. SAR Changes (Limited to Drawing Number Changes)
E. Computer Input and Criticality Safety Discussion

ATTACHMENT A

Table of MAP-12 Drawing Changes

Item #	Drawing	Location	Change	Justification
1	02-9045393	BOM, Item 18	Change part dimensions to: 3.5 x 5.2	Editorial Error. Actual part is larger than dimensions listed.
2	02-9045393	BOM, Item 23	Add new part: QTY 1, PLATE, .25 THK, ASTM A240, A276 Type 304	Error in SAR drawing. As-tested and as-built conditions all utilized .25 inch thick plate for the impact limiter base plate (rather than Item 3, 0.14"). The thicker material is conservative over what was originally specified.
3	02-9045393	BOM, Item 29	Change part dimension to: 2.0 x 4.0 x 11 GA THK	Editorial Error. Actual length of "Z-Bracket" is approximately 4.0 long.
4	02-9045393	BOM, Item 44	Change quantity to 2	Error in SAR drawing. Specification of part only matched a quantity of 2. New part # 68 added to address second item.
5	02-9045393	BOM, Item 68	Add new part: QTY 2, 525 OR 625 EXTREN FIBERGLASS, 2.0 X ¼	Error in SAR drawing. This angle call-out was not clearly identified.
6	02-9045393	BOM, Item 63	Change material specification to: ASTM F436	Editorial Error. Original call-out left off the "F".
7	02-9045393	BOM, Item 64	Change material specification to: ASTM A194	Editorial Error. Original call-out left off the "A".
8	02-9045393	Note 14	Change name to Framatome	Editorial change. Name changed from AREVA NP Inc. to Framatome
9	02-9045393	Note 18	Change to 1800°F	Editorial error. Changed from 1800$F.
10	02-9045393	Note 20	Add "," after "THE NUMBER"	Editorial error. Added comma for grammatical clarification.

Item #	Drawing	Location	Change	Justification
11	02-9045393	Flag Note 26	New flag note: ACTUAL WIDTH OF NYLON MAY BE UP TO 0.03 INCHES LESS THAN SPECIFIED	Note added to allow as-built condition of Nylon plate in existing packages. Criticality sensitivity study provided on pg 15 of 51-9026593-001 (NRC Question 6-3) indicates the model was very conservative relative to the amounts of nylon present. Sensitivity evaluations by Framatome NCS group: Base Case Random seed = 100 0.9386 0.0007 Base Case Random seed = 1 0.9374 0.0006 Base Case Random seed = 36 0.9397 0.0007 0.1 cm nylon removed from block 0.9375 0.0007 0.2 cm nylon removed from block 0.9388 0.0006
12	02-9045397	ISO View, zone A-3	Add 2X after bubble item 56	Editorial Clarification. Added quantity of item 56 for clarification.
13	02-9045399	Table	Add Flag Note 26 to Nylon dimension table	See justification of Item 11
14	02-9045399	Detail E	Change quantity of bubble item 5 to A/R (as required)	Editorial Error. Quantity is 28 (not 20). Revised to as required to eliminate error.
15	02-9045402	Detail CG, zone C-6	Change groove weld note to: Item 24, 25 & 28 (a total of 32 welds)	Editorial Error. Clarification, Item 25 originally missing from note.
16	02-9045402	Detail Rear View, Zone B-5	Change single bevel groove weld to fillet weld.	Correct Error in SAR drawing. The correct weld is a fillet weld based on lap joint and as-built conditions.
17	02-9045402	Detail Rear View, Zone B-4	Change bubble item 19 to item 20 and bubble item 20 to item 19	Editorial Error. Correction of item call-outs.

Item #	Drawing	Location	Change	Justification
18	02-9045402	Detail CH, Zone C-2	Change bubble item 19 to item 20	Editorial Error. Correction of item call-out.
19	02-9045402	Detail CH, Zone C-1	Remove 3/8 fillet weld between items 17 and 20	Corrected drawing error. The weld was called out in two drawing details, CH and CM. Location CH is deleted in to match the as-tested configuration.
20	02-9045402	Detail CH, Zone B-1	Remove two of the four arrows associated with the 1/8 groove weld and locate arrows at the center of the vertical weld joint.	Editorial Error. Clarification of the weld symbol.
21	02-9045402	Detail CJ, Zone D-1	Change bubble item 20 to item 19	Editorial Error. Correction of item call-out.
22	02-9045403, sheet 1	Detail CU	Revise slot dimension to: 3.2 TYP.	Dimension Error in SAR drawing corrected to match the as-built condition of the test units and production units.
23	02-9045403, sheet 1	Detail CR	Revise fillet weld note to remove "3 SIDES TYP". Keep "4X".	Weld symbol error in SAR drawing corrected to match the as-built condition of the test units and production units.
24	02-9045403, sheet 1	Detail CM	Change reference bubble item 17 to item 20	Editorial Error. Correction of item call-out.
25	02-9045403, sheet 2	Isometric view, Zone D-6	Change bubble item 6 to item 1	Editorial Error. Correction of item call-out.
26	02-9045403, sheet 2	Front view, Zone B-6	Offset fillet weld note: Change Item 6 to Item 1	Editorial Error. Correction of item call-out.

Item #	Drawing	Location	Change	Justification
27	02-9045403, sheet 2	Front view, Zone B-5	Change bubble item 44 to item 68	Editorial Error. Correction of item call-out.
28	02-9045404	Top view, Zone D-5	Change fillet weld to single bevel groove weld	Weld symbol error in SAR drawing corrected to match the as-built condition of the test units and production units.
29	02-9045404	Top view, Zone D-4	Change bubble item 69 quantity from 40X to A/R (as required)	Editorial Error. Actual quantity is not 40. The drawings clearly indicate 4 latches on end doors and 2 latches on middle doors. Revised to as required to eliminate error.
30	02-9045404	Top view, Zone C-6	Change overall length of MAP-13 dimension from 35.50 to 35.00	MAP-13 dimension error in SAR drawing corrected to match the as-built condition of the test units.
31	02-9045404	Front view, Zone C-6	Bevel groove symbol note: Change item 31 to item 27	Editorial Error. Correction of item call-out.
32	02-9045405	Detail ED, Zone D-7	Change double bevel groove weld to remove grind flush note and add 1/8 bevel depth	Weld symbol error in SAR drawing corrected to match the as-built condition of the test units and production units.
33	02-9045405	Top View Lid Assembly, Zone D-6	Change name of section view label EL to EK	Editorial Error. Correction of view call-out.
34	02-9045405	Top View Lid Assembly, Zone C-8	Change name of section view label EK to EL	Editorial Error. Correction of view call-out.

Item #	Drawing	Location	Change	Justification
35	02-9045405	Top View Lid Assembly, Zone D-5	Change bubble item 1 to item 2	Editorial Error. Correction of item call-out.
36	02-9045405	Detail EL, Zone B-1	Change reference item 3 to item 23	Editorial Error. Correction of item call-out.
37	02-9045405	Detail EK, Zone A-8	Change view note to read: SECTION EK-EK, AFT IMPACT LIMITER	Editorial Error. Correction of view call-out from top impact limiter to aft impact limiter.
38	02-9045405	Detail EL, Zone A-2	Add "FWD IMPACT LIMITER" to label	Editorial Clarification. Clarification added to Detail View EL.
39	02-9045393	BOM Item 5	Revised specification to read: "ASTM B209 OR B211 2024-T351"	Editorial Error. Correction of allowable material standard.

ATTACHMENT C

NRC FORM 618
(8-2000)
10 CFR 71

U.S. NUCLEAR REGULATORY COMMISSION

CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE		PAGES
9319	~~9~~	71-9319	USA/9319/B(U)F-96	1	OF	6

change to "10"

2. PREAMBLE

a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."

b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

a. ISSUED TO *(Name and Address)*

Framatome Inc.
2101 Horn Rapids Road
Richland, WA 99354

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

TN Americas LLC, application dated November 8, 2017.

4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

(1) Model Nos.: MAP-12 and MAP-13

(2) Description

The MAP package is designed to transport unirradiated uranium fuel assemblies with enrichment up to 5.0 weight percent. The package is designed to carry two fuel assemblies with core components. The package consists of two components: a base and lid. The containment system of the MAP package is the fuel rod cladding.

The base consists of a fixed stainless steel strong-back which supports the fuel assemblies. A series of inner stiffeners are secured to the underside of the strong-back to support the fuel assemblies. A neutron moderator and absorber are positioned directly beneath the strong-back between each inner stiffener. The base inner stiffeners are retained by a stainless steel cover. Exterior to the cover is a layer of rigid polyurethane foam and an outer shell of ~~11 gauge~~ stainless steel. A ~~12-gauge~~ stainless steel sheet is provided between the two middle stiffeners. Four stainless steel outer stiffeners support the package base. The payload rests on the "W" shaped strong-back (referred to as a W-plate) and is held in place with hinged and latched aluminum doors. The lid is very similar to that of the base – a "W" shaped stainless steel inner shell is fitted with a series of inner stiffeners, neutron moderator and absorbers, and a stainless steel cover is fitted over the stiffeners. The lid is fitted with trapezoidal impact limiters at each end. The impact limiters are constructed from rigid polyurethane foam encased by the package outer stainless shell skin. The base and lid include end plates with interlocking, interfacing angles.

Remove material thickness.
Justification: remove unneeded level of detail

change to "second"
Justification: remove unneeded level of detail. As-built and as-tested configuration included 0.12" thick material, not 12-gauge.

5.(a) (2) Description (continued)

There are two models of the MAP package, the MAP-12 and MAP-13. The weights and dimensions of the package are as follows:

MAP-12 (for 144-in Maximum Nominal Active Fuel Length):

Maximum Gross Weight	8,630 lbs
Maximum Payload Weight	3,400 lbs
Outer Dimensions	
Length	208 in
Width	45 in
Height	31 in

MAP-13 (for 150-in Maximum Nominal Active Fuel Length):

Maximum Gross Weight	8,630 lbs
Maximum Payload Weight	3,400 lbs
Outer Dimensions	
Length	221 in
Width	45 in
Height	31 in

change to "Framatome Inc."

Each drawing has been revised, so each revision value needs to be increased by 1

(3) Drawings

The MAP-12 and MAP-13 packages are fabricated and assembled in accordance with the following ~~AREVA NP, Inc.~~ Drawing Nos.:

9045393, Rev. 6;	9045402, Rev. 4;
9045397, Rev. 1;	9045403, Rev. 3;
9045399, Rev. 2;	9045404, Rev. 3;
9045401, Rev. 3;	9045405, Rev. 3.

(b) Contents

(1) Type and Form of Material

Enriched commercial grade uranium or enriched reprocessed uranium, as defined in ASTM C996-04, oxide fuel rods enriched to no more than 5.0 weight percent in the U-235 isotope, with limits specified in Table 1 below.

5.(b) Contents (continued)

(2) Maximum Quantity of Material per Package

Table 1: Maximum Authorized Concentrations

Isotope	**Maximum Content**
U-232	2.00×10^{-9} g/g U
U-234	2.00×10^{-3} g/g U
U-235	5.00×10^{-2} g/g U
U-236	2.50×10^{-2} g/g U
U-238	Balance of Uranium
Np-237	1.66×10^{-6} g/g U
Pu-238	6.20×10^{-11} g/g U
Pu-239	3.04×10^{-9} g/g U
Pu-240	3.04×10^{-9} g/g U
Gamma Emitters	5.18×10^{5} MeV – Bq/kg U

5.(b) Contents (continued)

(3) Fuel Assembly

(i) The parameters of the fuel assemblies that are permitted are specified in the table below.

Fuel Rod Array	**14x14**		**15x15**					**16x16**	**17x17**	
Assembly Type	1	2	1			2	3	1	1	2
No. of Fuel Rods	176	179	208			216	204	236	264	264
No. of Non-Fuel Cells	20	17	17			9	21	20	25	25
Nominal Fuel Rod Pitch (in)	0.580	0.556	0.568			0.550	0.563	0.506	0.502	0.496
Maximum Pellet Outer Diameter (in)	0.3812	0.3682	0.3622	0.3707	0.3742	0.3617	0.3682	0.3282	0.3252	0.3232
Minimum Fuel Rod Outer Diameter (in)	0.438	0.422	0.414	0.428	0.428	0.414	0.422	0.380	0.377	0.372
Minimum Clad Wall Thickness (in)	0.0245	0.0230	0.0220	0.0245	0.0230	0.0220	0.0230	0.0220	0.0220	0.0205
Minimum Guide Tube Wall Thickness (in)	N/A	N/A	0.0140	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Minimum Guide Tube Outer Diameter (in)	N/A	N/A	0.528	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of Guide Tubes	N/A	N/A	16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Minimum Instrument Tube Wall Thickness (in)	N/A	N/A	0.0240	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Minimum Instrument Tube Outer Diameter (in)	N/A	N/A	0.491	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of Instrument Tubes	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clad/Tube Material Type	Zr Alloy	Zr Alloy	Zr Alloy			Zr Alloy	Zr Alloy	Zr Alloy	Zr Alloy	Zr Alloy
Maximum Active Fuel Length (in)	160	160	160			160	160	160	160	160

5.(b) Contents (continued)

(3) Fuel Assembly (continued)

(ii) Non-fissile base-plate mounted and spider body core components are permitted.

(iii) Fuel rods assembled into the fuel assemblies are those loaded with sintered pellets of uranium oxides and/or with sintered pellets of uranium oxides mixed with various additives (e.g., Chromium, Boron, Gadolinium, and Europium).

(c) Criticality Safety Index: 2.8

6. In addition to the requirements of Subpart G of 10 CFR Part 71:

(a) The package shall be prepared for shipment and operated in accordance with the Package Operations in Section 7 of the application, as supplemented.

(b) Each package must meet the Acceptance Tests and Maintenance Program of Section 8 of the application, as supplemented.

(c) Each fuel assembly must be unsheathed or must be enclosed in an unsealed, polyethylene or polypropylene sheath, which may not extend beyond the ends of the fuel assembly. The ends of the sheath may not be folded or taped in any manner that would prevent the flow of liquids into or out of the sheathed fuel assembly.

(d) The fuel rods must be leak tested after fabrication to ensure that the leakage rate of the containment boundary is less than 1E-7 ref cc/sec.

7. Transport by air of fissile material is not authorized.

8. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.

9. Expiration date: February 28, 2023.

REFERENCES

TN Americas LLC, application dated November 8, 2017.

Framatome Inc., name change request dated January 17, 2018.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

John McKirgan, Chief
Spent Fuel Licensing Branch
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

Date: 3/1/18

ATTACHMENT D

1.3 APPENDICES

1.3.1 Package Drawings

Drawing Number	Revision	Drawing Number	Revision
9045393	7	9045402	5
9045397	2	9045403	4
9045399	3	9045404	4
9045401	4	9045405	4

ATTACHMENT E

This Attachment contains a side by side comparison of key SCALE input files of :

MAP12_Base.inp (Case 2) against MAP12_0_1.in (Case 3)

MAP12_0_1.in (Case 3) against MAP12_0.05_1_.in (Case 7)

- MAP12_Base.inp (Case 2) is based on Delrin plate comparison to the HAC case (Case 1) in Table 6.11 of the SAR.
- MAP12_0_1.in (Case 3) is the modified Base file to run in SCALE 6.2.2.
- MAP12_0.05_1_.in (Case 7) is half a mm removed from each edge of the nylon plates (total of 1 mm removed per plate).
- MAP12_0.1_1_.in (Case 8) is a mm removed from each edge of the nylon plates (total of 2mm removed per plate).
- Machine Tolerance for the nylon plates is 0.03 inches or 0.0762 mm based on drawing 50499.210.S.

	Case	k-eff	Sigma	k-eff+2sigma	File Name
1	Reported in SAR (51-9026593-001 Table 6-11 on page 6-37) as HAC, Run in SCALE 4.4a	0.9380	0.0009	0.9398	
2	Comparison case that used delrin in the doors, most recent Framatome model of the package) Run in SCALE 4.4a (Framatome Document 32-9115032-000 Table 5-1)	0.9375	0.0010	0.9395	15T3-40581-FL1_Door.out (MAP12_Base)
3	Re-run of the above model using Random seed=default in SCALE 6.2.2	0.9372	0.0007	0.9386	MAP12_0_1_.out
4	Re-run of the above case 3 using Random seed=1 in SCALE 6.2.2	0.9374	0.0006	0.9386	
5	Re-run of the above case 3 using Random seed=36 in SCALE 6.2.2	0.9397	0.0007	0.9411	
6	Re-run of the above case 3 using Random seed=100 in SCALE 6.2.2	0.9386	0.0007	0.9400	
7	Re-run of above case 3 with 1 mm nylon removed (Exceeds Tolerance)	0.9375	0.0007	0.9389	MAP12_0.05_1_.out
8	Re-run of above case 3 with 2 mm nylon removed (Exceeds Tolerance by ~2.6)	0.9388	0.0006	0.9400	MAP12_0.1_1_.out

The differences in k-eff are negligible, even exceeding the machine tolerance of 0.03 inches by 2.6 times. This has no impact on CSI.

```
map12 stacked 6 high no IM
#
cat >this_case <<!eof
=csas26      parm='size=900000'
MAP12_Base
44groupndf5    latticecell
'read composition
'-----------------------------------------------------------------------
' Mehmet Saglam 2/2016
' Original 15T3-40-5x8x1-163in-GT-FL1_Door.in from HRR Calc MAP-12-0600 (see below)
' Changes:
' runs with scale 4.4a 44 group library
' arbmnyl used instead of  atomnyl (use 6012 instead of 6000 for carbon-12)
' water between arrays (mixture 16) set to 1e-08
' Global Array 2000 is set to 3x6x1
' Update Unit 2000 with +45.72cm bounds on x and z sides (3 ft spacing)
' periodic boundary condition on x and z sides. Concrete on -y, h2o on +y
' Internal moderators set to 1e-20
'-----------------------------------------------------------------------
' Travis Smith 5/2015
' Original 15T1c-40581-FL1_Door.in from 32-9115032-000/-001 converted from SCALE 4.4a to 6
'
'   #Door In (0.325" Delrin)
'   #Guide tube cladding
'   #163 in Active Fuel Length
'   #15x15 Type 3 Fuel (Adv. W15 HTP) Drawing 02-9077630-000
'
'
' *******  Corrections are shown below
' *******
' *******
'-----------------------------------------------------------------------
' Original 32-9115032-000 and 32-9115032-001 did not update lattice parameters for new
' fuel types, had overlaping geometries, and void in fuel gap (not updated in lattice parameters).
'
' These were corrected as follows:
'
' Corrections due to geometery overlap in original 4.4a file:
'1   Origi: Unit 200: cubo 100  10.79500 -10.79500 0.31750 -0.31750 207.01000 -207.01000
'    Alter: Unit 200: cuboid 100   10.795  -10.795   0.3174  -0.3174   207.01  -207.01
'2   Origi: Unit 900: cubo  20 23.8633 -0.635 23.8633 -0.635 2p207.01
'    Alter: Unit 900: cuboid 20  23.863   -0.635  23.863   -0.635   207.01  -207.01
'3   Origi: Units 400,402,404,406,410,412,414,416,420,422,424,426,430,432,434,436,440,
'           442,444,446,450,452,454,456  had +y of 0.15113 and -y of 0.15113
'    Alter: Changed +y to 0.1511 and -y to 0.1511
'4   Origi: Unit 1000, hole 900 origin x=19.304 y=1.36500 z=0 rotate a3=45
'                     hole 900 origin x=-19.304 y=1.36500 z=0  rotate a3=45
'    Alter: Changed   hole 900 origin x=19.304 y=1.36501 z=0 rotate a3=45
'                     hole 900 origin x=-19.304 y=1.36501 z=0  rotate a3=45
'
' Corrections to Lattice Parameter:
'  Original:
'   squarepitch 1.44272 0.91999 1 3 1.05156 2 0.93980 0 end
'   more data dab=2000 res=6 slab 0.3302 res=10 slab 0.2159 res=11 slab 0.2921 res=14 cyli 1.563 end more
'   read parm tme=120 gen=1000 nsk=3 run=yes plt=yes npg=1000 far=yes plt=yes lng=3000000 nb8=1200 end parm
'  Corrections:
'   latticecell squarepitch fueld=0.94692 1 gapd=0.97028 12 cladd=1.08712 2 pitch=1.44272 3 end
'   more data  dab=2000 res=6 slab 0.3302  res=10 slab 0.2159  res=11 slab 0.2921  res=14 cylinder 1.563  end more
'   read parameter gen=1500 npg=1000 nsk=5 htm=no far=yes run=yes lng=3000000 nb8=1200 end parameter
'
'
'
'-----------------------------------------------------------------------
'
' (1) UO2 100% td and 5.0 w/o
' (2) Zircaloy
' (3) Water in Assembly Lattice
' (4) Volume in Container External to Bundles
' (5) Rubber
' (6) SS Plate, 0.13"(0.3302 cm) thick
' (7) Boral, minimum areal density (at min thk)=0.024 gm B-10/sqcm
'     minimum thickness = 0.119" = 0.30226 cm
'     volume density = 0.0240/(0.30226*0.18431) =0.4308 gm natural b/cucm
'     we use only 75%, 0.75 * 0.4308 = 0.3231 gm natural b/cucm
```

```
=csas6      parm=size=900000
MAP12_Base
v7-238

' WORM CALCS
' TOLERANCE = 0
' IM = 1

read composition
'-----------------------------------------------------------------------
' Mehmet Saglam 2/2016
' Original 15T3-40-5x8x1-163in-GT-FL1_Door.in from HRR Calc MAP-12-0600 (see below)
' Changes:
' runs with scale 4.4a 44 group library
' arbmnyl used instead of  atomnyl (use 6012 instead of 6000 for carbon-12)
' water between arrays (mixture 16) set to 1e-08
' Global Array 2000 is set to 3x6x1
' Update Unit 2000 with +45.72cm bounds on x and z sides (3 ft spacing)
' periodic boundary condition on x and z sides. Concrete on -y, h2o on +y
' Internal moderators set to 1e-20
'-----------------------------------------------------------------------
' Travis Smith 5/2015
' Original 15T1c-40581-FL1_Door.in from 32-9115032-000/-001 converted from SCALE 4.4a to 6
'
'   #Door In (0.325" Delrin)
'   #Guide tube cladding
'   #163 in Active Fuel Length
'   #15x15 Type 3 Fuel (Adv. W15 HTP) Drawing 02-9077630-000
'
'
' *******  Corrections are shown below
' *******
' *******
'-----------------------------------------------------------------------
' Original 32-9115032-000 and 32-9115032-001 did not update lattice parameters for new
' fuel types, had overlaping geometries, and void in fuel gap (not updated in lattice parameters).
'
' These were corrected as follows:
'
' Corrections due to geometery overlap in original 4.4a file:
'1   Origi: Unit 200: cubo 100  10.79500 -10.79500 0.31750 -0.31750 207.01000 -207.01000
'    Alter: Unit 200: cuboid 100   10.795  -10.795   0.3174  -0.3174   207.01  -207.01
'2   Origi: Unit 900: cubo  20 23.8633 -0.635 23.8633 -0.635 2p207.01
'    Alter: Unit 900: cuboid 20  23.863   -0.635  23.863   -0.635   207.01  -207.01
'3   Origi: Units 400,402,404,406,410,412,414,416,420,422,424,426,430,432,434,436,440,
'           442,444,446,450,452,454,456  had +y of 0.15113 and -y of 0.15113
'    Alter: Changed +y to 0.1511 and -y to 0.1511
'4   Origi: Unit 1000, hole 900 origin x=19.304 y=1.36500 z=0 rotate a3=45
'                     hole 900 origin x=-19.304 y=1.36500 z=0  rotate a3=45
'    Alter: Changed   hole 900 origin x=19.304 y=1.36501 z=0 rotate a3=45
'                     hole 900 origin x=-19.304 y=1.36501 z=0  rotate a3=45
'
' Corrections to Lattice Parameter:
'  Original:
'   squarepitch 1.44272 0.91999 1 3 1.05156 2 0.93980 0 end
'   more data dab=2000 res=6 slab 0.3302 res=10 slab 0.2159 res=11 slab 0.2921 res=14 cyli 1.563 end more
'   read parm tme=120 gen=1000 nsk=3 run=yes plt=yes npg=1000 far=yes plt=yes lng=3000000 nb8=1200 end parm
'  Corrections:
'   latticecell squarepitch fueld=0.94692 1 gapd=0.97028 12 cladd=1.08712 2 pitch=1.44272 3 end
'   more data  dab=2000 res=6 slab 0.3302  res=10 slab 0.2159  res=11 slab 0.2921  res=14 cylinder 1.563  end more
'   read parameter gen=1500 npg=1000 nsk=5 htm=no far=yes run=yes lng=3000000 nb8=1200 end parameter
'
'
'
'-----------------------------------------------------------------------
'
' (1) UO2 100% td and 5.0 w/o
' (2) Zircaloy
' (3) Water in Assembly Lattice
' (4) Volume in Container External to Bundles
' (5) Rubber
' (6) SS Plate, 0.13"(0.3302 cm) thick
' (7) Boral, minimum areal density (at min thk)=0.024 gm B-10/sqcm
'     minimum thickness = 0.119" = 0.30226 cm
'     volume density = 0.0240/(0.30226*0.18431) =0.4308 gm natural b/cucm
'     we use only 75%, 0.75 * 0.4308 = 0.3231 gm natural b/cucm
```

```
' (8) Nylon 66
' (9) Water Reflector
'(10) SS Plate, 0.085"(0.2159cm) thick
'(11) SS Plate, 0.115"(0.2921cm) thick
'(12) Water in Gap
'(13) Aluminium for Doors
'(14) SS Bar at Center
'(15) Delrin
'
 uo2          1 1 293
                                  92235 5
                                  92238 95   end
 zr           2 1 293   end
 h2o          3 1e-20 293   end
 h2o          4 1e-20 293   end
 h2o          5 1e-20 293   end
 ss304        6 1 293   end
 b            7 den=0.3231 1 293   end
' atomnyl      8  1.14  4
'                                  6000 6
'                                  7014 1
'                                  8016 1
'                                  1001 11
'                          1 293   end
'nylon 66
arbmnyl 1.14 4 0 1 0 6012 6 7014 1 8016 1 1001 11 8 1.0 293 end

 h2o          9 1e-20 293   end
 ss304        10 1 293   end
 ss304        11 1 293   end
 h2o          12 1e-20 293   end
 al           13 1 293   end
 ss304        14 1 293   end
 h            15 0 0.0574 293   end
 o            15 0 0.0287 293   end
 c            15 0 0.0287 293   end

' water between arrays
 h2o          16 1e-08 293   end
end composition
' read celldata latticecell squarepitch fueld=0.90374 1 gapd=0.95504 12 cladd=1.07188 2 pitch=1.43002 3 end
squarepitch 1.43002 0.90374 1 3 1.07188 2 0.95504 0 end
    more data
    dab=2000
    res=6 slab 0.3302
    res=10 slab 0.2159
    res=11 slab 0.2921
    res=14 cylinder 1.563
    end more
' end celldata

read parameter
 gen=1500
 npg=1000
 nsk=5
' htm=no
 far=yes
 run=yes
 lng=3000000
 nb8=1200
end parameter
read geometry

'-----------------------------------------------------------------
'Fuel Assembly Creation for Unit 900
'-------
unit 10
com="wet fuel pin cell"
' [10] Fuel Stack   UO2          (1)
' [20] Clad ID      Water Gap    (3)
' [30] Clad OD      Zircaloy     (2)
' [40] Unit Cell    Water        (3)
 cylinder 10  0.45187    207.01  -207.01
 cylinder 20  0.47752    207.01  -207.01
 cylinder 30  0.53594    207.01  -207.01
 cuboid 40  0.71501  -0.71501  0.71501  -0.71501   207.01  -207.01
 media 1 1 10
 media 12 1 20 -10
 media 2 1 30 -20
```

```
' (8) Nylon 66
' (9) Water Reflector
'(10) SS Plate, 0.085"(0.2159cm) thick
'(11) SS Plate, 0.115"(0.2921cm) thick
'(12) Water in Gap
'(13) Aluminium for Doors
'(14) SS Bar at Center
'(15) Delrin
'
 uo2          1 1 293
                                  92235 5
                                  92238 95   end
 zr           2 1 293   end
 h2o          3 1 293   end
 h2o          4 1e-8 293   end
 h2o          5 1 293   end
 ss304        6 1 293   end
 b            7 den=0.3231 1 293   end
' atomnyl      8  1.14  4
'                                  6000 6
'                                  7014 1
'                                  8016 1
'                                  1001 11
'                          1 293   end
'nylon 66
arbmnyl 1.14 4 0 1 0 6012 6 7014 1 8016 1 1001 11 8 1.0 293 end

 h2o          9 1 293   end
 ss304        10 1 293   end
 ss304        11 1 293   end
 h2o          12 1 293   end
 al           13 1 293   end
 ss304        14 1 293   end
 h            15 0 0.0574 293   end
 o            15 0 0.0287 293   end
 c            15 0 0.0287 293   end

' water between arrays FWR not 1e-08
 h2o          16 1 293   end
end composition
read celldata latticecell squarepitch fueld=0.90374 1 gapd=0.95504 12 cladd=1.07188 2 pitch=1.43002 3 end
'squarepitch 1.43002 0.90374 1 3 1.07188 2 0.95504 0 end
    more data
    dab=2000
    res=6 slab 0.3302
'    res=10 slab 0.2159
'    res=11 slab 0.2921
'    res=14 cylinder 1.563
    end more
 end celldata

read parameter
 gen=1500
 npg=1000
 nsk=5
 htm=no
 far=yes
 run=yes
' lng=3000000
 nb8=1200
end parameter
read geometry

'-----------------------------------------------------------------
'Fuel Assembly Creation for Unit 900
'-------
unit 10
com="wet fuel pin cell"
' [10] Fuel Stack   UO2          (1)
' [20] Clad ID      Water Gap    (3)
' [30] Clad OD      Zircaloy     (2)
' [40] Unit Cell    Water        (3)
 cylinder 10  0.45187    207.01  -207.01
 cylinder 20  0.47752    207.01  -207.01
 cylinder 30  0.53594    207.01  -207.01
 cuboid 40  0.71501  -0.71501  0.71501  -0.71501   207.01  -207.01
 media 1 1 10
 media 12 1 20 -10
 media 2 1 30 -20
```

```
 media 3 1 40 -30
 boundary 40

unit 30
com="Wet Instrument/Guide Tube with cladding"
' [10] Clad ID      Water       (3)
' [20] Clad OD      Zircaloy    (2)
' [30] Unit Cell    Water       (3)
 cylinder 10  0.65151    207.01  -207.01
 cylinder 20  0.68834    207.01  -207.01
 cuboid 30  0.71501  -0.71501  0.71501  -0.71501   207.01  -207.01
 media 3 1 10
 media 2 1 -10 20
 media 3 1 -20 30
 boundary 30


'-----------------------------------------------------------------
'Resting Pads for Assembly Unit 900- Assumed to be Water
'-------
unit 200
com="Pad Base Inner Full- Water (5)"
 cuboid 100   10.795  -10.795   0.3174  -0.3174   207.01  -207.01
 media 5 1 100
 boundary 100

unit 210
com="Pad Base Outer Full- Water (5)"
 cuboid 100   10.795  -10.795   0.3175  -0.3175   207.01  -207.01
 media 5 1 100
 boundary 100


'-----------------------------------------------------------------
'Stainless Steel Plates
'-------
unit 300
com="Base Inner Full- Steel (6)"
 cuboid 100  11.60249  -11.60249   0.1651  -0.1651   207.01  -207.01
 media 6 1 100
 boundary 100

unit 310
com="Base Outer Full- Steel (6)"
 cuboid 100  10.91999  -10.91999   0.1651  -0.1651   207.01  -207.01
 media 6 1 100
 boundary 100

unit 320
com="Lid Inner Lower- Steel (10)"
 cuboid 100   6.2738  -6.2738  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

unit 330
com="Lid Inner Upper- Steel (10)"
 cuboid 100   5.1308  -5.1308  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

unit 340
com="Lid Outer Upper- Steel (10)"
 cuboid 100   6.1595  -6.1595  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

unit 350
com="Lid Outer Lower- Steel (10)"
 cuboid 100   6.5151  -6.5151  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100


'-----------------------------------------------------------------
'Boral 406 Array Base Inner Full
'-----------
unit 400
com="Edge: Base Inner Full; Axial Lower1- BORAL"
' [100] Boral Plate     Boral   (7)
```


```
 media 3 1 40 -30
 boundary 40

unit 30
com="Wet Instrument/Guide Tube with cladding"
' [10] Clad ID      Water       (3)
' [20] Clad OD      Zircaloy    (2)
' [30] Unit Cell    Water       (3)
 cylinder 10  0.65151    207.01  -207.01
 cylinder 20  0.68834    207.01  -207.01
 cuboid 30  0.71501  -0.71501  0.71501  -0.71501   207.01  -207.01
 media 3 1 10
 media 2 1 -10 20
 media 3 1 -20 30
 boundary 30


'-----------------------------------------------------------------
'Resting Pads for Assembly Unit 900- Assumed to be Water
'-------
unit 200
com="Pad Base Inner Full- Water (5)"
 cuboid 100   10.795  -10.795   0.3174  -0.3174   207.01  -207.01
 media 5 1 100
 boundary 100

unit 210
com="Pad Base Outer Full- Water (5)"
 cuboid 100   10.795  -10.795   0.3175  -0.3175   207.01  -207.01
 media 5 1 100
 boundary 100


'-----------------------------------------------------------------
'Stainless Steel Plates
'-------
unit 300
com="Base Inner Full- Steel (6)"
 cuboid 100  11.60249  -11.60249   0.1651  -0.1651   207.01  -207.01
 media 6 1 100
 boundary 100

unit 310
com="Base Outer Full- Steel (6)"
 cuboid 100  10.91999  -10.91999   0.1651  -0.1651   207.01  -207.01
 media 6 1 100
 boundary 100

unit 320
com="Lid Inner Lower- Steel (10)"
 cuboid 100   6.2738  -6.2738  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

unit 330
com="Lid Inner Upper- Steel (10)"
 cuboid 100   5.1308  -5.1308  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

unit 340
com="Lid Outer Upper- Steel (10)"
 cuboid 100   6.1595  -6.1595  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

unit 350
com="Lid Outer Lower- Steel (10)"
 cuboid 100   6.5151  -6.5151  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100


'-----------------------------------------------------------------
'Boral 406 Array Base Inner Full
'-----------
unit 400
com="Edge: Base Inner Full; Axial Lower1- BORAL"
' [100] Boral Plate     Boral   (7)
```

```
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200    9.525   -9.525  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 402
com="Edge: Base Inner Full; Axial Main9- BORAL"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511   19.177  -19.177
 cuboid 200    9.525   -9.525  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 404
com="Edge: Base Inner Full; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200    9.525   -9.525  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 406
com="Edge: Base Inner Full; Axial Array- Boral"
' [10] Boral Plate Array
' 400.402.402.402.402.402.402.402.402.402.404
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    9.525   -9.525  0.1511  -0.1511   207.01  -207.01
 array 406 10  place 1 1 1 0 0 -192.5828
 boundary 10


'-----------------------------------------------------------------
'Boral 416 Array Base Outer Full
'-----------
unit 410
com="Edge: Base Outer Full; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200    9.525   -9.525  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 412
com="Edge: Base Outer Full; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511   19.177  -19.177
 cuboid 200    9.525   -9.525  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 414
com="Edge: Base Outer Full; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200    9.525   -9.525  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 416
com="Edge: Base Outer Full; Axial Array- Boral"
' [10] Boral Plate Array
' 410.412.412.412.412.412.412.412.412.412.414
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    9.525   -9.525  0.1511  -0.1511   207.01  -207.01
 array 416 10  place 1 1 1 0 0 -192.5828
```


```
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200    9.525   -9.525  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 402
com="Edge: Base Inner Full; Axial Main9- BORAL"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511   19.177  -19.177
 cuboid 200    9.525   -9.525  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 404
com="Edge: Base Inner Full; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200    9.525   -9.525  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 406
com="Edge: Base Inner Full; Axial Array- Boral"
' [10] Boral Plate Array
' 400.402.402.402.402.402.402.402.402.402.404
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    9.525   -9.525  0.1511  -0.1511   207.01  -207.01
 array 406 10  place 1 1 1 0 0 -192.5828
 boundary 10


'-----------------------------------------------------------------
'Boral 416 Array Base Outer Full
'-----------
unit 410
com="Edge: Base Outer Full; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200    9.525   -9.525  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 412
com="Edge: Base Outer Full; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511   19.177  -19.177
 cuboid 200    9.525   -9.525  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 414
com="Edge: Base Outer Full; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200    9.525   -9.525  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 416
com="Edge: Base Outer Full; Axial Array- Boral"
' [10] Boral Plate Array
' 410.412.412.412.412.412.412.412.412.412.414
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    9.525   -9.525  0.1511  -0.1511   207.01  -207.01
 array 416 10  place 1 1 1 0 0 -192.5828
```

```
 boundary 10

'-----------------------------------------------------------------
'Boral 426 Array Lid Inner Lower
'----------
unit 420
com="Edge: Lid Inner Lower; Axial Lower1- Boral"
' [100] Boral Plate      Boral    (7)
' [200] Unit Cell        Water    (4)
 cuboid 100    6.0325  -6.0325  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200    6.0325  -6.0325  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 422
com="Edge: Lid Inner Lower; Axial Main9- Boral"
' [100] Boral Plate      Boral    (7)
' [200] Unit Cell        Water    (4)
 cuboid 100    6.0325  -6.0325  0.1511  -0.1511   19.177  -19.177
 cuboid 200    6.0325  -6.0325  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 424
com="Edge: Lid Inner Lower; Axial Upper1- Boral"
' [100] Boral Plate      Boral    (7)
' [200] Unit Cell        Water    (4)
 cuboid 100    6.0325  -6.0325  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200    6.0325  -6.0325  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 426
com="Edge: Lid Inner Lower; Axial Array- Boral"
' 420.422.422.422.422.422.422.422.422.422.424
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    6.0325  -6.0325  0.1511  -0.1511   207.01  -207.01
 array 426 10  place 1 1 1 0 0 -192.5828
 boundary 10

'-----------------------------------------------------------------
'Boral 436 Array Lid Inner Upper
'-----------
unit 430
com="Edge: Lid Inner Upper; Axial Lower1- Boral"
' [100] Boral Plate      Boral    (7)
' [200] Unit Cell        Water    (4)
 cuboid 100     4.953   -4.953  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200     4.953   -4.953  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 432
com="Edge: Lid Inner Upper; Axial Main9- Boral"
' [100] Boral Plate      Boral    (7)
' [200] Unit Cell        Water    (4)
 cuboid 100     4.953   -4.953  0.1511  -0.1511   19.177  -19.177
 cuboid 200     4.953   -4.953  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 434
com="Edge: Lid Inner Upper; Axial Upper1- Boral"
' [100] Boral Plate      Boral    (7)
' [200] Unit Cell        Water    (4)
 cuboid 100     4.953   -4.953  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200     4.953   -4.953  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200
```


```
 boundary 10

'-----------------------------------------------------------------
'Boral 426 Array Lid Inner Lower
'----------
unit 420
com="Edge: Lid Inner Lower; Axial Lower1- Boral"
' [100] Boral Plate      Boral    (7)
' [200] Unit Cell        Water    (4)
 cuboid 100    6.0325  -6.0325  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200    6.0325  -6.0325  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 422
com="Edge: Lid Inner Lower; Axial Main9- Boral"
' [100] Boral Plate      Boral    (7)
' [200] Unit Cell        Water    (4)
 cuboid 100    6.0325  -6.0325  0.1511  -0.1511   19.177  -19.177
 cuboid 200    6.0325  -6.0325  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 424
com="Edge: Lid Inner Lower; Axial Upper1- Boral"
' [100] Boral Plate      Boral    (7)
' [200] Unit Cell        Water    (4)
 cuboid 100    6.0325  -6.0325  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200    6.0325  -6.0325  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 426
com="Edge: Lid Inner Lower; Axial Array- Boral"
' 420.422.422.422.422.422.422.422.422.422.424
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    6.0325  -6.0325  0.1511  -0.1511   207.01  -207.01
 array 426 10  place 1 1 1 0 0 -192.5828
 boundary 10

'-----------------------------------------------------------------
'Boral 436 Array Lid Inner Upper
'-----------
unit 430
com="Edge: Lid Inner Upper; Axial Lower1- Boral"
' [100] Boral Plate      Boral    (7)
' [200] Unit Cell        Water    (4)
 cuboid 100     4.953   -4.953  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200     4.953   -4.953  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 432
com="Edge: Lid Inner Upper; Axial Main9- Boral"
' [100] Boral Plate      Boral    (7)
' [200] Unit Cell        Water    (4)
 cuboid 100     4.953   -4.953  0.1511  -0.1511   19.177  -19.177
 cuboid 200     4.953   -4.953  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 434
com="Edge: Lid Inner Upper; Axial Upper1- Boral"
' [100] Boral Plate      Boral    (7)
' [200] Unit Cell        Water    (4)
 cuboid 100     4.953   -4.953  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200     4.953   -4.953  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200
```

```
unit 436
com="Edge: Lid Inner Upper; Axial Array- Boral"
' 430.432.432.432.432.432.432.432.432.432.434
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    4.953   -4.953  0.1511  -0.1511   207.01  -207.01
 array 436 10  place 1 1 1 0 0 -192.5828
 boundary 10


'-----------------------------------------------------------------
'Boral 446 Array Lid Outer Upper
'-----------
unit 440
com="Edge: Lid Outer Upper; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 442
com="Edge: Lid Outer Upper; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511   19.177  -19.177
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 444
com="Edge: Lid Outer Upper; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 446
com="Edge: Lid Outer Upper; Axial Array- Boral"
' 440.442.442.442.442.442.442.442.442.442.444
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10   6.0325  -6.0325  0.1511  -0.1511   207.01  -207.01
 array 446 10  place 1 1 1 0 0 -192.5828
 boundary 10


'-----------------------------------------------------------------
'Boral 456 Array Lid Outer Lower
'-----------
unit 450
com="Edge: Lid Outer Lower; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   5.8801  -5.8801  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200   5.8801  -5.8801  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 452
com="Edge: Lid Outer Lower; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   5.8801  -5.8801  0.1511  -0.1511   19.177  -19.177
 cuboid 200   5.8801  -5.8801  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 454
com="Edge: Lid Outer Lower; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
```


```
unit 436
com="Edge: Lid Inner Upper; Axial Array- Boral"
' 430.432.432.432.432.432.432.432.432.432.434
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    4.953   -4.953  0.1511  -0.1511   207.01  -207.01
 array 436 10  place 1 1 1 0 0 -192.5828
 boundary 10


'-----------------------------------------------------------------
'Boral 446 Array Lid Outer Upper
'-----------
unit 440
com="Edge: Lid Outer Upper; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 442
com="Edge: Lid Outer Upper; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511   19.177  -19.177
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 444
com="Edge: Lid Outer Upper; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 446
com="Edge: Lid Outer Upper; Axial Array- Boral"
' 440.442.442.442.442.442.442.442.442.442.444
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10   6.0325  -6.0325  0.1511  -0.1511   207.01  -207.01
 array 446 10  place 1 1 1 0 0 -192.5828
 boundary 10


'-----------------------------------------------------------------
'Boral 456 Array Lid Outer Lower
'-----------
unit 450
com="Edge: Lid Outer Lower; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   5.8801  -5.8801  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200   5.8801  -5.8801  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 452
com="Edge: Lid Outer Lower; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   5.8801  -5.8801  0.1511  -0.1511   19.177  -19.177
 cuboid 200   5.8801  -5.8801  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 454
com="Edge: Lid Outer Lower; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
```

```
' [200] Unit Cell       Water   (4)
 cuboid 100   5.8801  -5.8801  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200   5.8801  -5.8801  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 456
com="Edge: Lid Outer Lower; Axial Array- Boral"
' 450.452.452.452.452.452.452.452.452.454
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10   5.8801  -5.8801  0.1511  -0.1511   207.01  -207.01
 array 456 10  place 1 1 1 0 0 -192.5828
 boundary 10

'-----------------------------------------------------------------
'1166 Plastic/Nylon Blocks Array: Base Inner Full
'-----------
unit 1160
com="part 16 plastic block; Edge: Base Inner Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                        (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1162
com="part 16 plastic block; Edge: Base Inner Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                        (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1164
com="part 16 plastic block; Edge: Base Inner Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                        (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1166
com="Base Inner Full Plastic Array 1166"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.8116  -206.8116
 array 1166 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2166 Plastic/Nylon Blocks Array: Base Inner Full
'-----------
unit 2160
com="part 16 plastic block (right); Edge: Base Inner Full; Axial Lower1"
```

```
' [200] Unit Cell       Water   (4)
 cuboid 100   5.8801  -5.8801  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200   5.8801  -5.8801  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 456
com="Edge: Lid Outer Lower; Axial Array- Boral"
' 450.452.452.452.452.452.452.452.452.454
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10   5.8801  -5.8801  0.1511  -0.1511   207.01  -207.01
 array 456 10  place 1 1 1 0 0 -192.5828
 boundary 10

'-----------------------------------------------------------------
'1166 Plastic/Nylon Blocks Array: Base Inner Full
'-----------
unit 1160
com="part 16 plastic block; Edge: Base Inner Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                        (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.22876        -14.22876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1162
com="part 16 plastic block; Edge: Base Inner Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                        (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.97856        -18.97856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1164
com="part 16 plastic block; Edge: Base Inner Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                        (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.31436        -13.31436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1166
com="Base Inner Full Plastic Array 1166"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.8116  -206.8116
 array 1166 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2166 Plastic/Nylon Blocks Array: Base Inner Full
'-----------
unit 2160
com="part 16 plastic block (right); Edge: Base Inner Full; Axial Lower1"
```

```
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2162
com="part 16 plastic block (right); Edge: Base Inner Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2164
com="part 16 plastic block (right); Edge: Base Inner Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2166
com="Plastic block right 2166 array"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.7837  -206.7837
 array 2166 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'1176 Array 17L Plastic/Nylon Blocks Array: Base Outer Full
'-----------
unit 1170
com="part 171 plastic block; Edge: Base Outer Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=0.31512 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1172
com="part 171 plastic block; Edge: Base Outer Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=0.31512 z=0   rotate  a1=0 a2=0 a3=45
```

```
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437       y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.22876       -14.22876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2162
com="part 16 plastic block (right); Edge: Base Inner Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437       y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.97856       -18.97856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2164
com="part 16 plastic block (right); Edge: Base Inner Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437       y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.31436       -13.31436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2166
com="Plastic block right 2166 array"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.7837  -206.7837
 array 2166 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'1176 Array 17L Plastic/Nylon Blocks Array: Base Outer Full
'-----------
unit 1170
com="part 171 plastic block; Edge: Base Outer Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437       y=0.31512 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.22876       -14.22876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1172
com="part 171 plastic block; Edge: Base Outer Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437       y=0.31512 z=0   rotate  a1=0 a2=0 a3=45
```

```
 plane 20  xpl=1   origin  x=9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1174
com="part 17l plastic block; Edge: Base Outer Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=0.31512 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1176
com="part 17L plastic block 1176 Array"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.8116  -206.8116
 array 1176 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-------------------------------------------------------------
'2176 Array 17R Plastic/Nylon Blocks Array: Base Outer Full
'-----------
unit 2170
com="part 17r plastic block;Edge: Base Outer Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=0.31512 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2172
com="part 17r plastic block; Edge: Base Outer Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=0.31512 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2174
com="part 17r plastic block; Edge: Base Outer Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=0.31512 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
```


```
 plane 20  xpl=1   origin  x=9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1174
com="part 17l plastic block; Edge: Base Outer Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=0.31512 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1176
com="part 17L plastic block 1176 Array"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.8116  -206.8116
 array 1176 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-------------------------------------------------------------
'2176 Array 17R Plastic/Nylon Blocks Array: Base Outer Full
'-----------
unit 2170
com="part 17r plastic block;Edge: Base Outer Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=0.31512 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2172
com="part 17r plastic block; Edge: Base Outer Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=0.31512 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2174
com="part 17r plastic block; Edge: Base Outer Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437 y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437 y=0.31512 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
```

```
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2176
com="Array 2176 Part 17R plastic block; Base outer full"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.8116  -206.8116
 array 2176 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'1556 Array 55L Plastic/Nylon Blocks Array: Lid Inner Lower
'-----------
unit 1550
com="part 55l plastic block; Edge: Lid Inner Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps     (8)
' [200] thinned block without bevels, with axial gaps        (4)
 cuboid 100  4.51326  -4.51326  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  4.51326  -4.51326  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 1552
com="part 55l plastic block; Edge: Lid Inner Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps     (8)
' [200] thinned block without bevels, with axial gaps        (4)
 cuboid 100  4.51326  -4.51326  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  4.51326  -4.51326  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 1554
com="part 55l plastic block; Edge: Lid Inner Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps     (8)
' [200] thinned block without bevels, with axial gaps        (4)
 cuboid 100  4.51326  -4.51326  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  4.51326  -4.51326  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 1556
com="Array 1556 Part 55L plastic block; Lid Inner Lower"
 cuboid 10  4.51326  -4.51326  1.48828  -1.48828  206.8116  -206.8116
 array 1556 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2556 Array 55R Plastic/Nylon Blocks Array: Lid Inner Lower
'-----------
unit 2550
com="part 55r plastic block; Edge: Lid Inner Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps
' [200] thinned block without bevels, with axial gaps
 cuboid 100  6.16426  -6.3627  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  6.16426  -6.3627  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 2552
com="part 55r plastic block; Edge: Lid Inner Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps
' [200] thinned block without bevels, with axial gaps
 cuboid 100  6.16426  -6.3627  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  6.16426  -6.3627  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 2554
```

```
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2176
com="Array 2176 Part 17R plastic block; Base outer full"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.8116  -206.8116
 array 2176 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'1556 Array 55L Plastic/Nylon Blocks Array: Lid Inner Lower
'-----------
unit 1550
com="part 55l plastic block; Edge: Lid Inner Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps     (8)
' [200] thinned block without bevels, with axial gaps        (4)
 cuboid 100  4.51326  -4.51326  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  4.51326  -4.51326  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 1552
com="part 55l plastic block; Edge: Lid Inner Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps     (8)
' [200] thinned block without bevels, with axial gaps        (4)
 cuboid 100  4.51326  -4.51326  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  4.51326  -4.51326  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 1554
com="part 55l plastic block; Edge: Lid Inner Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps     (8)
' [200] thinned block without bevels, with axial gaps        (4)
 cuboid 100  4.51326  -4.51326  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  4.51326  -4.51326  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 1556
com="Array 1556 Part 55L plastic block; Lid Inner Lower"
 cuboid 10  4.51326  -4.51326  1.48828  -1.48828  206.8116  -206.8116
 array 1556 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2556 Array 55R Plastic/Nylon Blocks Array: Lid Inner Lower
'-----------
unit 2550
com="part 55r plastic block; Edge: Lid Inner Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps
' [200] thinned block without bevels, with axial gaps
 cuboid 100  6.16426  -6.3627  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  6.16426  -6.3627  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 2552
com="part 55r plastic block; Edge: Lid Inner Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps
' [200] thinned block without bevels, with axial gaps
 cuboid 100  6.16426  -6.3627  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  6.16426  -6.3627  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 2554
```

```
com="part 55r plastic block; Edge: Lid Inner Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps
' [200] thinned block without bevels, with axial gaps
 cuboid 100  6.16426  -6.3627  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  6.16426  -6.3627  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 2556
com="Array 2556 Part 55R plastic block; Lid Inner Lower"
 cuboid 10  6.16426  -6.3627  1.48828  -1.48828  206.8116  -206.8116
 array 2556 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'1576 Array 57L Plastic/Nylon Blocks Array: Lid Inner Upper
'-----------
unit 1570
com="part 571 plastic block; Edge: Lid Inner Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  10.49496  0.28063  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  10.49496  0.28063  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1572
com="part 571 plastic block; Edge: Lid Inner Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  10.49496  0.28063  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  10.49496  0.28063  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1574
com="part 571 plastic block; Edge: Lid Inner Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  10.49496  0.28063  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  10.49496  0.28063  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1576
com="Array 1576 Part 57L plastic block; Lid Inner Upper"
 cuboid 10  10.49496  0.28063  1.48828  -1.48828  206.8116  -206.8116
 array 1576 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2576 Array 57R Plastic/Nylon Blocks Array: Lid Inner Upper
'-----------
unit 2570
com="part 57r plastic block; Edge: Lid Inner Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
```

```
com="part 55r plastic block; Edge: Lid Inner Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps
' [200] thinned block without bevels, with axial gaps
 cuboid 100  6.16426  -6.3627  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  6.16426  -6.3627  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 2556
com="Array 2556 Part 55R plastic block; Lid Inner Lower"
 cuboid 10  6.16426  -6.3627  1.48828  -1.48828  206.8116  -206.8116
 array 2556 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'1576 Array 57L Plastic/Nylon Blocks Array: Lid Inner Upper
'-----------
unit 1570
com="part 571 plastic block; Edge: Lid Inner Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063  y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  10.49496  0.28063  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  10.49496  0.28063  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1572
com="part 571 plastic block; Edge: Lid Inner Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063  y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  10.49496  0.28063  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  10.49496  0.28063  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1574
com="part 571 plastic block; Edge: Lid Inner Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063  y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  10.49496  0.28063  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  10.49496  0.28063  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1576
com="Array 1576 Part 57L plastic block; Lid Inner Upper"
 cuboid 10  10.49496  0.28063  1.48828  -1.48828  206.8116  -206.8116
 array 1576 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2576 Array 57R Plastic/Nylon Blocks Array: Lid Inner Upper
'-----------
unit 2570
com="part 57r plastic block; Edge: Lid Inner Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.28063  y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
```

```
cuboid 100  -0.28063  -10.49496  1.48828  -1.48828  14.22876  -14.22876
cuboid 200  -0.28063  -10.49496  1.48828  -1.48828  15.0749  -14.4272
media 8 1 -10 100
media 4 1 10 100
media 4 1 -100 200
boundary 200

unit 2572
com="part 57r plastic block; Edge: Lid Inner Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
plane 10  xpl=1   origin  x=-0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
cuboid 100  -0.28063  -10.49496  1.48828  -1.48828  18.97856  -18.97856
cuboid 200  -0.28063  -10.49496  1.48828  -1.48828  19.8247  -19.8247
media 8 1 -10 100
media 4 1 10 100
media 4 1 -100 200
boundary 200

unit 2574
com="part 57r plastic block; Edge: Lid Inner Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
plane 10  xpl=1   origin  x=-0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
cuboid 100  -0.28063  -10.49496  1.48828  -1.48828  13.31436  -13.31436
cuboid 200  -0.28063  -10.49496  1.48828  -1.48828  13.5128  -14.1605
media 8 1 -10 100
media 4 1 10 100
media 4 1 -100 200
boundary 200

unit 2576
com="Array 2576 Part 57R plastic block; Lid Inner Upper"
cuboid 10  -0.28063  -10.49496  1.48828  -1.48828  206.8116  -206.8116
array 2576 10  place 1 1 1 0 0 -192.3844
boundary 10


'-----------------------------------------------------------------
'1598 Plastic/Nylon Lid Outer Upper
'-----------
unit 1598
com="part 591w plastic block"
' plastic thickness removed=0.0781 inch =0.19844 cm        Nylon (8)
wedge 10  1.38799  1.38799  2.97656  28.45753   origin  x=0 y=0 z=0.19844
wedge 20  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=30.34824
wedge 30  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=69.99764
wedge 40  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=109.647
wedge 50  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=149.2964
wedge 60  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=188.9458
wedge 70  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=228.5952
wedge 80  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=268.2446
wedge 90  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=307.894
wedge 100  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=347.5434
wedge 110  1.38799  1.38799  2.97656  26.62873   origin  x=0 y=0 z=387.1928
wedge 120  1.38799  1.38799  2.97656   414.02
media 8 1 10
media 8 1 20
media 8 1 30
media 8 1 40
media 8 1 50
media 8 1 60
media 8 1 70
media 8 1 80
media 8 1 90
media 8 1 100
media 8 1 110
media 4 1 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 120
boundary 120


'-----------------------------------------------------------------
'2598 Plastic/Nylon Lid Outer Upper
'-----------
unit 2598
```

```
cuboid 100  -0.28063  -10.49496  1.48828  -1.48828  14.22876  -14.22876
cuboid 200  -0.28063  -10.49496  1.48828  -1.48828  15.0749  -14.4272
media 8 1 -10 100
media 4 1 10 100
media 4 1 -100 200
boundary 200

unit 2572
com="part 57r plastic block; Edge: Lid Inner Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
plane 10  xpl=1   origin  x=-0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
cuboid 100  -0.28063  -10.49496  1.48828  -1.48828  18.97856  -18.97856
cuboid 200  -0.28063  -10.49496  1.48828  -1.48828  19.8247  -19.8247
media 8 1 -10 100
media 4 1 10 100
media 4 1 -100 200
boundary 200

unit 2574
com="part 57r plastic block; Edge: Lid Inner Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
plane 10  xpl=1   origin  x=-0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
cuboid 100  -0.28063  -10.49496  1.48828  -1.48828  13.31436  -13.31436
cuboid 200  -0.28063  -10.49496  1.48828  -1.48828  13.5128  -14.1605
media 8 1 -10 100
media 4 1 10 100
media 4 1 -100 200
boundary 200

unit 2576
com="Array 2576 Part 57R plastic block; Lid Inner Upper"
cuboid 10  -0.28063  -10.49496  1.48828  -1.48828  206.8116  -206.8116
array 2576 10  place 1 1 1 0 0 -192.3844
boundary 10


'-----------------------------------------------------------------
'1598 Plastic/Nylon Lid Outer Upper
'-----------
unit 1598
com="part 591w plastic block"
' plastic thickness removed=0.0781 inch =0.19844 cm        Nylon (8)
wedge 10  1.38799  1.38799  2.97656  28.45753   origin  x=0 y=0 z=0.19844
wedge 20  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=30.34824
wedge 30  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=69.99764
wedge 40  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=109.647
wedge 50  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=149.2964
wedge 60  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=188.9458
wedge 70  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=228.5952
wedge 80  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=268.2446
wedge 90  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=307.894
wedge 100  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=347.5434
wedge 110  1.38799  1.38799  2.97656  26.62873   origin  x=0 y=0 z=387.1928
wedge 120  1.38799  1.38799  2.97656   414.02
media 8 1 10
media 8 1 20
media 8 1 30
media 8 1 40
media 8 1 50
media 8 1 60
media 8 1 70
media 8 1 80
media 8 1 90
media 8 1 100
media 8 1 110
media 4 1 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 120
boundary 120


'-----------------------------------------------------------------
'2598 Plastic/Nylon Lid Outer Upper
'-----------
unit 2598
```

```
com="part 59rw plastic block"
' plastic thickness removed=0.0781 inch =0.19844 cm          Nylon(8)
 wedge 10  1.38799        0  2.97656  28.45753   origin  x=0 y=0 z=0.19844
 wedge 20  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=30.34824
 wedge 30  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=69.99764
 wedge 40  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=109.647
 wedge 50  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=149.2964
 wedge 60  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=188.9458
 wedge 70  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=228.5952
 wedge 80  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=268.2446
 wedge 90  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=307.894
 wedge 100  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=347.5434
 wedge 110  1.38799        0  2.97656  26.62873   origin  x=0 y=0 z=387.1928
 wedge 120  1.38799        0  2.97656   414.02
 media 8 1 10
 media 8 1 20
 media 8 1 30
 media 8 1 40
 media 8 1 50
 media 8 1 60
 media 8 1 70
 media 8 1 80
 media 8 1 90
 media 8 1 100
 media 8 1 110
 media 4 1 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 120
 boundary 120


'-----------------------------------------------------------------
'1596 Array 59L Plastic/Nylon Blocks Array: Lid Outer Upper
'-----------
unit 1590
com="part 591 plastic block; Edge: Lid Outer Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -11.37245  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  -0.28063  -11.37245  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 1592
com="part 591 plastic block; Edge: Lid Outer Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -11.37245  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  -0.28063  -11.37245  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 1594
com="part 591 plastic block; Edge: Lid Outer Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -11.37245  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  -0.28063  -11.37245  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 1596
com="Array 1596 Part 59R plastic block; Lid Outer Upper"
 cuboid 10  -0.28063  -11.37245  1.48828  -1.48828  206.8116  -206.8116
 array 1596 10  place 1 1 1 0 0 -192.3844
 boundary 10
```

```
com="part 59rw plastic block"
' plastic thickness removed=0.0781 inch =0.19844 cm          Nylon(8)
 wedge 10  1.38799        0  2.97656  28.45753   origin  x=0 y=0 z=0.19844
 wedge 20  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=30.34824
 wedge 30  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=69.99764
 wedge 40  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=109.647
 wedge 50  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=149.2964
 wedge 60  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=188.9458
 wedge 70  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=228.5952
 wedge 80  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=268.2446
 wedge 90  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=307.894
 wedge 100  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=347.5434
 wedge 110  1.38799        0  2.97656  26.62873   origin  x=0 y=0 z=387.1928
 wedge 120  1.38799        0  2.97656   414.02
 media 8 1 10
 media 8 1 20
 media 8 1 30
 media 8 1 40
 media 8 1 50
 media 8 1 60
 media 8 1 70
 media 8 1 80
 media 8 1 90
 media 8 1 100
 media 8 1 110
 media 4 1 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 120
 boundary 120


'-----------------------------------------------------------------
'1596 Array 59L Plastic/Nylon Blocks Array: Lid Outer Upper
'-----------
unit 1590
com="part 591 plastic block; Edge: Lid Outer Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.28063       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -11.37245       1.48828  -1.48828  14.22876       -14.22876
 cuboid 200  -0.28063  -11.37245  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 1592
com="part 591 plastic block; Edge: Lid Outer Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.28063       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -11.37245       1.48828  -1.48828  18.97856       -18.97856
 cuboid 200  -0.28063  -11.37245  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 1594
com="part 591 plastic block; Edge: Lid Outer Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.28063       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -11.37245       1.48828  -1.48828  13.31436       -13.31436
 cuboid 200  -0.28063  -11.37245  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 1596
com="Array 1596 Part 59R plastic block; Lid Outer Upper"
 cuboid 10  -0.28063  -11.37245  1.48828  -1.48828  206.8116  -206.8116
 array 1596 10  place 1 1 1 0 0 -192.3844
 boundary 10
```

```
'-----------------------------------------------------------------
'2596 Array 59R Plastic/Nylon Blocks Array: Lid Outer Upper
'-----------
unit 2590
com="part 59r plastic block; Edge: Lid Outer Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  11.37245  0.28063  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  11.37245  0.28063  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 2592
com="part 59r plastic block; Edge: Lid Outer Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  11.37245  0.28063  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  11.37245  0.28063  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 2594
com="part 59r plastic block; Edge: Lid Outer Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  11.37245  0.28063  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  11.37245  0.28063  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 2596
com="Array 2596 Part 59R plastic block; Lid Outer Upper"
 cuboid 10  11.37245  0.28063  1.48828  -1.48828  206.8116  -206.8116
 array 2596 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'1616 Array 61L Plastic/Nylon Blocks Array: Lid Outer Lower
'-----------
unit 1610
com="part 611 plastic block; Edge: Lid Outer Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-10.71083 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-20
 cuboid 100  -0.19844  -10.71083  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  -0.19844  -10.71083  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1612
com="part 611 plastic block; Edge: Lid Outer Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-10.71083 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-20
 cuboid 100  -0.19844  -10.71083  1.48828  -1.48828  18.97856  -18.97856
```

```
'-----------------------------------------------------------------
'2596 Array 59R Plastic/Nylon Blocks Array: Lid Outer Upper
'-----------
unit 2590
com="part 59r plastic block; Edge: Lid Outer Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  11.37245       0.28063  1.48828  -1.48828  14.22876       -14.22876
 cuboid 200  11.37245  0.28063  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 2592
com="part 59r plastic block; Edge: Lid Outer Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  11.37245       0.28063  1.48828  -1.48828  18.97856       -18.97856
 cuboid 200  11.37245  0.28063  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 2594
com="part 59r plastic block; Edge: Lid Outer Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  11.37245       0.28063  1.48828  -1.48828  13.31436       -13.31436
 cuboid 200  11.37245  0.28063  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 2596
com="Array 2596 Part 59R plastic block; Lid Outer Upper"
 cuboid 10  11.37245  0.28063  1.48828  -1.48828  206.8116  -206.8116
 array 2596 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'1616 Array 61L Plastic/Nylon Blocks Array: Lid Outer Lower
'-----------
unit 1610
com="part 611 plastic block; Edge: Lid Outer Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-10.71083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-20
 cuboid 100  -0.19844       -10.71083  1.48828  -1.48828  14.22876       -14.22876
 cuboid 200  -0.19844  -10.71083  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1612
com="part 611 plastic block; Edge: Lid Outer Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-10.71083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-20
 cuboid 100  -0.19844       -10.71083  1.48828  -1.48828  18.97856       -18.97856
```

```
 cuboid 200  -0.19844  -10.71083  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1614
com="part 61l plastic block; Edge: Lid Outer Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-10.71083 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-20
 cuboid 100  -0.19844  -10.71083  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  -0.19844  -10.71083  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1616
com="Array 1616 Part 61L plastic block; Lid Outer Lower"
 cuboid 10  -0.19844  -10.71083  1.48828  -1.48828  206.8116  -206.8116
 array 1616 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'2616 Array 61R Plastic/Nylon Blocks Array: Lid Outer Lower
'-----------
unit 2610
com="part 61r plastic block; Edge: Lid Outer Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=10.71083 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=20
 cuboid 100  10.71083  0.19844  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  10.71083  0.19844  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2612
com="part 61r plastic block; Edge: Lid Outer Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=10.71083 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=20
 cuboid 100  10.71083  0.19844  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  10.71083  0.19844  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2614
com="part 61r plastic block; Edge: Lid Outer Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=10.71083 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=20
 cuboid 100  10.71083  0.19844  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  10.71083  0.19844  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2616
com="Array 2616 Part 61R plastic block; Lid Outer Lower"
 cuboid 10  10.71083  0.19844  1.48828  -1.48828  206.8116  -206.8116
 array 2616 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'2 Array 61R Plastic/Nylon Blocks Array: Lid Outer Lower
```


```
 cuboid 200  -0.19844  -10.71083  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1614
com="part 61l plastic block; Edge: Lid Outer Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-10.71083 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-20
 cuboid 100  -0.19844  -10.71083  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  -0.19844  -10.71083  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1616
com="Array 1616 Part 61L plastic block; Lid Outer Lower"
 cuboid 10  -0.19844  -10.71083  1.48828  -1.48828  206.8116  -206.8116
 array 1616 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'2616 Array 61R Plastic/Nylon Blocks Array: Lid Outer Lower
'-----------
unit 2610
com="part 61r plastic block; Edge: Lid Outer Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=10.71083 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=20
 cuboid 100  10.71083  0.19844  1.48828  -1.48828  14.22876  -14.22876
 cuboid 200  10.71083  0.19844  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2612
com="part 61r plastic block; Edge: Lid Outer Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=10.71083 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=20
 cuboid 100  10.71083  0.19844  1.48828  -1.48828  18.97856  -18.97856
 cuboid 200  10.71083  0.19844  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2614
com="part 61r plastic block; Edge: Lid Outer Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=10.71083 y=-1.48828 z=0   rotate  a1=0 a2=0 a3=20
 cuboid 100  10.71083  0.19844  1.48828  -1.48828  13.31436  -13.31436
 cuboid 200  10.71083  0.19844  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2616
com="Array 2616 Part 61R plastic block; Lid Outer Lower"
 cuboid 10  10.71083  0.19844  1.48828  -1.48828  206.8116  -206.8116
 array 2616 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'2 Array 61R Plastic/Nylon Blocks Array: Lid Outer Lower
```

```
'-----------
unit 810
com="aluminum door and rubber at upper edge of assy"
' nominal aluminum dims: 0.25" thk by 7.9" wide by 35.0" long
' tolerances: 0.03" by 0.1" by 0.1"
' dimensions modeled: 0.22" by 7.8" by 34.9"
' there is a nominal 0.25" axial gap, modeled as 0.25 + 0.03(gap tol) + .1 (half of alum length tol times two)
' axial gap modeled as 0.38"
' [20]  this is a rubber layer, modeled as 0.325" of Delrin                    Delrin      (15)
' [40]  this is aluminum                                                       Aluminum    (13)
' [60]  gap                                                                    Water       (9)
 cuboid 20    9.906   -9.906   0.8255        0   44.323  -44.323
 cuboid 40    9.906   -9.906   1.3843        0   44.323  -44.323
 cuboid 60    9.906   -9.906   1.3843        0  44.8056  -44.8056
 media 15 1 20
 media 13 1 40 -20
 media 9 1 60 -40
 boundary 60

unit 820
com="aluminum door and rubber at upper edge of assy"
' there are 4 units 810, unit 820 is at -z end
' 4 * 44.8056 = 179.2224
' total length here is 207.01 - 179.2224 = 27.7876
' gap is final 0.19" (0.4826 cm) of the length
' [20]  this is a rubber layer, modeled as 0.325" of Delrin                    Delrin      (15)
' [40] this is aluminum                                                        aluminum    (13)
' [60] gap                                                                     Water       (9)
 cuboid 20    9.906   -9.906   0.8255        0   27.305        0
 cuboid 40    9.906   -9.906   1.3843        0   27.305        0
 cuboid 60    9.906   -9.906   1.3843        0  27.7876        0
 media 15 1 20
 media 13 1 40 -20
 media 9 1 60 -40
 boundary 60

unit 830
com="same as unit 820 except gap at -z end"
' [20]  this is a rubber layer, modeled as 0.325" of Delrin                    Delrin      (15)
' [40] this is aluminum                                                        aluminum    (13)
' [60] gap                                                                     Water       (9)
 cuboid 20    9.906   -9.906   0.8255        0  27.7876   0.4846
 cuboid 40    9.906   -9.906   1.3843        0  27.7876   0.4846
 cuboid 60    9.906   -9.906   1.3843        0  27.7876        0
 media 15 1 20
 media 13 1 40 -20
 media 9 1 60 -40
 boundary 60

unit 840
com="axial 2 array of doors"
 cuboid 10    9.906   -9.906   1.3843        0   207.01  -207.01
 array 2 10  place 1 1 1 0 0 -207.01
 boundary 10


'-----------------------------------------------------------------
'--------
unit 860
com="steel bar at center of package"
 cuboid 20    2.159   -2.159    1.778        0   207.01  -207.01
 media 14 1 20
 boundary 20

'-----------------------------------------------------------------
' Fuel Assembly Unit
'--------
unit 900
com="fuel assembly, not rotated"
 cuboid 10  21.4503        0  21.4503        0    207.01  -207.01
 array 1 10  place 1 1 1 0.71501 0.71501 0
 cuboid 15  21.4503       -0  21.4503       -0    207.01  -207.01
 cuboid 20  23.863     -0.635  23.863     -0.635 207.01  -207.01
 hole 840 origin x=11.5443 y=21.4503
 hole 840 origin x=21.4503 y=11.5443 rotate a3=-90
 hole 200   origin  x=10.795 y=-0.3175 z=0
 hole 200   origin  x=-0.3175 y=10.795 z=0   rotate  a1=0 a2=0 a3=90
 media 15 1 -10 15
 media  9 1 -15 20
```


```
'-----------
unit 810
com="aluminum door and rubber at upper edge of assy"
' nominal aluminum dims: 0.25" thk by 7.9" wide by 35.0" long
' tolerances: 0.03" by 0.1" by 0.1"
' dimensions modeled: 0.22" by 7.8" by 34.9"
' there is a nominal 0.25" axial gap, modeled as 0.25 + 0.03(gap tol) + .1 (half of alum length tol times two)
' axial gap modeled as 0.38"
' [20]  this is a rubber layer, modeled as 0.325" of Delrin                    Delrin      (15)
' [40]  this is aluminum                                                       Aluminum    (13)
' [60]  gap                                                                    Water       (9)
 cuboid 20    9.906   -9.906   0.8255        0   44.323  -44.323
 cuboid 40    9.906   -9.906   1.3843        0   44.323  -44.323
 cuboid 60    9.906   -9.906   1.3843        0  44.8056  -44.8056
 media 15 1 20
 media 13 1 40 -20
 media 9 1 60 -40
 boundary 60

unit 820
com="aluminum door and rubber at upper edge of assy"
' there are 4 units 810, unit 820 is at -z end
' 4 * 44.8056 = 179.2224
' total length here is 207.01 - 179.2224 = 27.7876
' gap is final 0.19" (0.4826 cm) of the length
' [20]  this is a rubber layer, modeled as 0.325" of Delrin                    Delrin      (15)
' [40] this is aluminum                                                        aluminum    (13)
' [60] gap                                                                     Water       (9)
 cuboid 20    9.906   -9.906   0.8255        0   27.305        0
 cuboid 40    9.906   -9.906   1.3843        0   27.305        0
 cuboid 60    9.906   -9.906   1.3843        0  27.7876        0
 media 15 1 20
 media 13 1 40 -20
 media 9 1 60 -40
 boundary 60

unit 830
com="same as unit 820 except gap at -z end"
' [20]  this is a rubber layer, modeled as 0.325" of Delrin                    Delrin      (15)
' [40] this is aluminum                                                        aluminum    (13)
' [60] gap                                                                     Water       (9)
 cuboid 20    9.906   -9.906   0.8255        0  27.7876   0.4846
 cuboid 40    9.906   -9.906   1.3843        0  27.7876   0.4846
 cuboid 60    9.906   -9.906   1.3843        0  27.7876        0
 media 15 1 20
 media 13 1 40 -20
 media 9 1 60 -40
 boundary 60

unit 840
com="axial 2 array of doors"
 cuboid 10    9.906   -9.906   1.3843        0   207.01  -207.01
 array 2 10  place 1 1 1 0 0 -207.01
 boundary 10


'-----------------------------------------------------------------
'--------
unit 860
com="steel bar at center of package"
 cuboid 20    2.159   -2.159    1.778        0   207.01  -207.01
 media 14 1 20
 boundary 20

'-----------------------------------------------------------------
' Fuel Assembly Unit
'--------
unit 900
com="fuel assembly, not rotated"
 cuboid 10  21.4503        0  21.4503        0    207.01  -207.01
 array 1 10  place 1 1 1 0.71501 0.71501 0
 cuboid 15  21.4503       -0  21.4503       -0    207.01  -207.01
 cuboid 20  23.863     -0.635  23.863     -0.635 207.01  -207.01
 hole 840 origin x=11.5443 y=21.4503
 hole 840 origin x=21.4503 y=11.5443 rotate a3=-90
 hole 200   origin  x=10.795 y=-0.3175 z=0
 hole 200   origin  x=-0.3175 y=10.795 z=0   rotate  a1=0 a2=0 a3=90
 media 15 1 -10 15
 media  9 1 -15 20
```

```
boundary 20

'-----------------------------------------------------------------
' Package of two fuel assemblies
'--------
unit 1000
com="one package"
' bundle c-c spacing is 15.2"
' diamond is 10.03" x 9.86" (across outer steel surfaces)
' diamond diagonal is 14.0649"
' distance to spacers from diagonal: 8.10" (lower) and 8.62" (upper)
' vertical sum is 30.78"
' distance to outer surface of steel wall is 4.10" (lower) and 4.62" (upper)
' horizontal span across outer steel surfaces: 41.95"
' model steel as 0.115" thick
' base is 21.5" tall, including spacer height (54.61 cm)
' top of base is at y= 54.61 - 20.574 = 34.036 cm
' [2]   inner steel surface hanging central blocks with steel carriers
' [4]   outer steel surface hanging central blocks with steel carriers
' [580] inner surface of steel
' [590] outer surface of steel
' [600] package is 44.98" wide by 30.78" high by 207.98" long modeled as 42.98" by 28.78" by 163
' [860] top of bar is 0.25" below bottom of steel carrier 14.7707 - 0.25 * 2.54 - 0.7 * 2.54 = 12.3577
' [hole 300] Steel Base Inner Full
' [hole 310] Steel Base Outer Full
' [hole 320] Steel Lid Inner Full
' [hole 330] Steel Lid Inner Upper
' [hole 340] Steel Lid Outer Upper
' [hole 350] Steel Lid Outer Lower
' [hole 406] Boral Base Inner Full
' [hole 416] Boral Base Outer Full
' [hole 426] Boral Lid Inner Lower
' [hole 436] Boral Lid Inner Upper
' [hole 446] Boral Lid Outer Upper
' [hole 456] Boral Lid Outer Lower
' [hole 1166] Plastic Base Inner Full
' [hole 2166] Plastic Base Inner Full
' [hole 1166] Plastic Base Outer Full
' [hole 2166] Plastic Base Outer Full
' [hole 1556] Plastic Lid Inner Lower
' [hole 2556] Plastic Lid Inner Lower
' [hole 1576] Plastic Lid Inner Upper
' [hole 2576] Plastic Lid Inner Upper
' [hole 1596] Plastic Lid Outer Upper
' [hole 2596] Plastic Lid Outer Upper
' [hole 1598] Plastic Lid Outer Upper Wedge
' [hole 2598] Plastic Lid Outer Upper Wedge
' [hole 1616] Plastic Lid Outer Lower
' [hole 2616] Plastic Lid Outer Lower

cuboid 2   1.6256  -1.6256    22.45  14.9866   207.01  -207.01
cuboid 4   1.8415  -1.8415    22.45  14.7707   207.01  -207.01
wedge 6   1.4018        0   1.4018   414.02   origin  x=-1.4018 y=20.3255 z=-207.01
wedge 8   1.4018   1.4018   1.4018   414.02   origin  x=0 y=20.3255 z=-207.01
cuboid 10   1.4018  -1.4018  20.3255  14.9866   207.01  -207.01
plane 11  zpl=1   origin  x=0 y=0 z=-195.4197
plane 12  zpl=1   origin  x=0 y=0 z=-164.0411
plane 13  zpl=1   origin  x=0 y=0 z=-105.5545
plane 14  zpl=1   origin  x=0 y=0 z=-74.17587
plane 15  zpl=1   origin  x=0 y=0 z=-15.68933
plane 16  zpl=1   origin  x=0 y=0 z=15.68933
plane 17  zpl=1   origin  x=0 y=0 z=74.17587
plane 18  zpl=1   origin  x=0 y=0 z=105.5545
plane 19  zpl=1   origin  x=0 y=0 z=164.0411
plane 20  zpl=1   origin  x=0 y=0 z=195.4197
plane 31  ypl=1   origin  x=0 y=16 z=0
cuboid 32      -17    -30.5     34.5       26   207.01  -207.01   rotate  a1=0 a2=0 a3=20
cuboid 33     30.5       17     34.5       26   207.01  -207.01   rotate  a1=0 a2=0 a3=-20
cuboid 34      3.2       -5     24.5        0   207.01  -207.01   origin  x=-1.828 y=17.942 z=0   rotate  a1=0 a2=0 a
cuboid 35        5     -3.2     24.5        0   207.01  -207.01   origin  x=1.828 y=17.942 z=0   rotate  a1=0 a2=0 a3
cuboid 36       41      -41       22       16   207.01  -207.01
cuboid 580  52.9844  -52.9844  47.1675  -10.1981   207.01  -207.01
cuboid 590  53.2765  -53.2765  47.4596  -10.414   207.01  -207.01
cuboid 600  54.5846  -54.5846  47.4596  -18.034   207.01  -207.01
hole 860  origin x=0          y=12.3577   z=0
hole 900  origin x=19.304     y=1.36501   z=0   rotate  a1=0 a2=0 a3=45
hole 900  origin x=-19.304    y=1.36501   z=0   rotate  a1=0 a2=0 a3=45
hole 300  origin x=-10.73161  y=8.80588   z=0   rotate  a1=0 a2=0 a3=45
```

```
boundary 20

'-----------------------------------------------------------------
' Package of two fuel assemblies
'--------
unit 1000
com="one package"
' bundle c-c spacing is 15.2"
' diamond is 10.03" x 9.86" (across outer steel surfaces)
' diamond diagonal is 14.0649"
' distance to spacers from diagonal: 8.10" (lower) and 8.62" (upper)
' vertical sum is 30.78"
' distance to outer surface of steel wall is 4.10" (lower) and 4.62" (upper)
' horizontal span across outer steel surfaces: 41.95"
' model steel as 0.115" thick
' base is 21.5" tall, including spacer height (54.61 cm)
' top of base is at y= 54.61 - 20.574 = 34.036 cm
' [2]   inner steel surface hanging central blocks with steel carriers
' [4]   outer steel surface hanging central blocks with steel carriers
' [580] inner surface of steel
' [590] outer surface of steel
' [600] package is 44.98" wide by 30.78" high by 207.98" long modeled as 42.98" by 28.78" by 163
' [860] top of bar is 0.25" below bottom of steel carrier 14.7707 - 0.25 * 2.54 - 0.7 * 2.54 = 12.3577
' [hole 300] Steel Base Inner Full
' [hole 310] Steel Base Outer Full
' [hole 320] Steel Lid Inner Full
' [hole 330] Steel Lid Inner Upper
' [hole 340] Steel Lid Outer Upper
' [hole 350] Steel Lid Outer Lower
' [hole 406] Boral Base Inner Full
' [hole 416] Boral Base Outer Full
' [hole 426] Boral Lid Inner Lower
' [hole 436] Boral Lid Inner Upper
' [hole 446] Boral Lid Outer Upper
' [hole 456] Boral Lid Outer Lower
' [hole 1166] Plastic Base Inner Full
' [hole 2166] Plastic Base Inner Full
' [hole 1166] Plastic Base Outer Full
' [hole 2166] Plastic Base Outer Full
' [hole 1556] Plastic Lid Inner Lower
' [hole 2556] Plastic Lid Inner Lower
' [hole 1576] Plastic Lid Inner Upper
' [hole 2576] Plastic Lid Inner Upper
' [hole 1596] Plastic Lid Outer Upper
' [hole 2596] Plastic Lid Outer Upper
' [hole 1598] Plastic Lid Outer Upper Wedge
' [hole 2598] Plastic Lid Outer Upper Wedge
' [hole 1616] Plastic Lid Outer Lower
' [hole 2616] Plastic Lid Outer Lower

cuboid 2   1.6256  -1.6256    22.45  14.9866   207.01  -207.01
cuboid 4   1.8415  -1.8415    22.45  14.7707   207.01  -207.01
wedge 6   1.4018        0   1.4018   414.02   origin  x=-1.4018 y=20.3255 z=-207.01
wedge 8   1.4018   1.4018   1.4018   414.02   origin  x=0 y=20.3255 z=-207.01
cuboid 10   1.4018  -1.4018  20.3255  14.9866   207.01  -207.01
plane 11  zpl=1   origin  x=0 y=0 z=-195.4197
plane 12  zpl=1   origin  x=0 y=0 z=-164.0411
plane 13  zpl=1   origin  x=0 y=0 z=-105.5545
plane 14  zpl=1   origin  x=0 y=0 z=-74.17587
plane 15  zpl=1   origin  x=0 y=0 z=-15.68933
plane 16  zpl=1   origin  x=0 y=0 z=15.68933
plane 17  zpl=1   origin  x=0 y=0 z=74.17587
plane 18  zpl=1   origin  x=0 y=0 z=105.5545
plane 19  zpl=1   origin  x=0 y=0 z=164.0411
plane 20  zpl=1   origin  x=0 y=0 z=195.4197
plane 31  ypl=1   origin  x=0 y=16 z=0
cuboid 32      -17    -30.5     34.5       26   207.01  -207.01   rotate  a1=0 a2=0 a3=20
cuboid 33     30.5       17     34.5       26   207.01  -207.01   rotate  a1=0 a2=0 a3=-20
cuboid 34      3.2       -5     24.5        0   207.01  -207.01   origin  x=-1.828 y=17.942 z=0   rotate  a1=0 a2=0 a
cuboid 35        5     -3.2     24.5        0   207.01  -207.01   origin  x=1.828 y=17.942 z=0   rotate  a1=0 a2=0 a3
cuboid 36       41      -41       22       16   207.01  -207.01
cuboid 580  52.9844  -52.9844  47.1675  -10.1981   207.01  -207.01
cuboid 590  53.2765  -53.2765  47.4596  -10.414   207.01  -207.01
cuboid 600  54.5846  -54.5846  47.4596  -18.034   207.01  -207.01
hole 860  origin x=0          y=12.3577   z=0
hole 900  origin x=19.304     y=1.36501   z=0   rotate  a1=0 a2=0 a3=45
hole 900  origin x=-19.304    y=1.36501   z=0   rotate  a1=0 a2=0 a3=45
hole 300  origin x=-10.73161  y=8.80588   z=0   rotate  a1=0 a2=0 a3=45
```

```
hole 300  origin x=10.73161   y=8.80588   z=0   rotate  a1=0 a2=0 a3=-45
hole 310  origin x=-27.39379  y=8.32328   z=0   rotate  a1=0 a2=0 a3=-45
hole 310  origin x=27.39379   y=8.32328   z=0   rotate  a1=0 a2=0 a3=45
hole 320  origin x=-4.86824   y=25.67904  z=0   rotate  a1=0 a2=0 a3=-45
hole 320  origin x=4.86824    y=25.67904  z=0   rotate  a1=0 a2=0 a3=45
hole 330  origin x=-15.05185  y=31.62397  z=0   rotate  a1=0 a2=0 a3=-45
hole 330  origin x=15.05185   y=31.62397  z=0   rotate  a1=0 a2=0 a3=45
hole 340  origin x=-23.67289  y=30.89657  z=0   rotate  a1=0 a2=0 a3=45
hole 340  origin x=23.67289   y=30.89657  z=0   rotate  a1=0 a2=0 a3=-45
hole 350  origin x=-34.23368  y=24.21537  z=0   rotate  a1=0 a2=0 a3=20
hole 350  origin x=34.23368   y=24.21537  z=0   rotate  a1=0 a2=0 a3=-20
hole 406  origin x=-11.31247  y=7.7778    z=0   rotate  a1=0 a2=0 a3=45
hole 406  origin x=11.31247   y=7.7778    z=0   rotate  a1=0 a2=0 a3=-45
hole 416  origin x=-27.29553  y=7.7778    z=0   rotate  a1=0 a2=0 a3=-45
hole 416  origin x=27.29553   y=7.7778    z=0   rotate  a1=0 a2=0 a3=45
hole 426  origin x=-4.85567   y=26.03286  z=0   rotate  a1=0 a2=0 a3=-45
hole 426  origin x=4.85567    y=26.03286  z=0   rotate  a1=180 a2=0 a3=45
hole 436  origin x=-15.2099   y=32.14842  z=0   rotate  a1=0 a2=0 a3=-45
hole 436  origin x=15.2099    y=32.14842  z=0   rotate  a1=180 a2=0 a3=45
hole 446  origin x=-23.87405  y=31.06181  z=0   rotate  a1=0 a2=0 a3=45
hole 446  origin x=23.87405   y=31.06181  z=0   rotate  a1=180 a2=0 a3=-45
hole 456  origin x=-33.78217  y=24.66807  z=0   rotate  a1=0 a2=0 a3=20
hole 456  origin x=33.78217   y=24.66807  z=0   rotate  a1=180 a2=0 a3=-20
hole 1166 origin x=-10.15323  y=6.61856   z=0   rotate  a1=0 a2=0 a3=45
hole 2166 origin x=10.15323   y=6.61856   z=0   rotate  a1=0 a2=0 a3=-45
hole 1166 origin x=-28.45477  y=6.61856   z=0   rotate  a1=0 a2=0 a3=-45
hole 2166 origin x=28.45477   y=6.61856   z=0   rotate  a1=0 a2=0 a3=45
hole 1556 origin x=-4.63037   y=28.12605  z=0   rotate  a1=0 a2=0 a3=-45
hole 2556 origin x=3.46294    y=26.95862  z=0   rotate  a1=0 a2=0 a3=45
hole 1576 origin x=-17.87625  y=37.13325  z=0   rotate  a1=0 a2=0 a3=-45
hole 2576 origin x=17.87625   y=37.13325  z=0   rotate  a1=0 a2=0 a3=45
hole 1596 origin x=-20.1918   y=37.20396  z=0   rotate  a1=0 a2=0 a3=45
hole 2596 origin x=20.1918    y=37.20396  z=0   rotate  a1=0 a2=0 a3=-45
hole 1598 origin x=-28.09172  y=27.05787  z=-207.01   rotate  a1=0 a2=0 a3=45
hole 2598 origin x=27.11026   y=28.03933  z=-207.01   rotate  a1=0 a2=0 a3=-45
hole 1616 origin x=-29.12357  y=28.13077  z=0   rotate  a1=0 a2=0 a3=20
hole 2616 origin x=29.12357   y=28.13077  z=0   rotate  a1=0 a2=0 a3=-20
media 9 1 32 31
media 9 1 33 31
media 4 1 32 -31
media 4 1 33 -31
media 9 1 34 -4
media 9 1 35 -34 -4
media 9 1 36 -35 -34 -33 -32 -4
media 9 1 4 -11 31
media 4 1 4 -11 -31
media 10 1 4 -2 11 -12
media 8 1 6 11 -12
media 8 1 8 11 -12
media 8 1 10 11 -12
media 9 1 2 -6 -8 -10 11 -12
media 9 1 4 12 -13 31
media 4 1 4 12 -13 -31
media 10 1 4 -2 13 -14
media 8 1 6 13 -14
media 8 1 8 13 -14
media 8 1 10 13 -14
media 9 1 2 -6 -8 -10 13 -14
media 9 1 4 14 -15 31
media 4 1 4 14 -15 -31
media 10 1 4 -2 15 -16
media 8 1 6 15 -16
media 8 1 8 15 -16
media 8 1 10 15 -16
media 9 1 2 -6 -8 -10 15 -16
media 9 1 4 16 -17 31
media 4 1 4 16 -17 -31
media 10 1 4 -2 17 -18
media 8 1 6 17 -18
media 8 1 8 17 -18
media 8 1 10 17 -18
media 9 1 2 -6 -8 -10 17 -18
media 9 1 4 18 -19 31
media 4 1 4 18 -19 -31
media 10 1 4 -2 19 -20
media 8 1 6 19 -20
media 8 1 8 19 -20
media 8 1 10 19 -20
media 9 1 2 -6 -8 -10 19 -20
```

```
hole 300  origin x=10.73161   y=8.80588   z=0   rotate  a1=0 a2=0 a3=-45
hole 310  origin x=-27.39379  y=8.32328   z=0   rotate  a1=0 a2=0 a3=-45
hole 310  origin x=27.39379   y=8.32328   z=0   rotate  a1=0 a2=0 a3=45
hole 320  origin x=-4.86824   y=25.67904  z=0   rotate  a1=0 a2=0 a3=-45
hole 320  origin x=4.86824    y=25.67904  z=0   rotate  a1=0 a2=0 a3=45
hole 330  origin x=-15.05185  y=31.62397  z=0   rotate  a1=0 a2=0 a3=-45
hole 330  origin x=15.05185   y=31.62397  z=0   rotate  a1=0 a2=0 a3=45
hole 340  origin x=-23.67289  y=30.89657  z=0   rotate  a1=0 a2=0 a3=45
hole 340  origin x=23.67289   y=30.89657  z=0   rotate  a1=0 a2=0 a3=-45
hole 350  origin x=-34.23368  y=24.21537  z=0   rotate  a1=0 a2=0 a3=20
hole 350  origin x=34.23368   y=24.21537  z=0   rotate  a1=0 a2=0 a3=-20
hole 406  origin x=-11.31247  y=7.7778    z=0   rotate  a1=0 a2=0 a3=45
hole 406  origin x=11.31247   y=7.7778    z=0   rotate  a1=0 a2=0 a3=-45
hole 416  origin x=-27.29553  y=7.7778    z=0   rotate  a1=0 a2=0 a3=-45
hole 416  origin x=27.29553   y=7.7778    z=0   rotate  a1=0 a2=0 a3=45
hole 426  origin x=-4.85567   y=26.03286  z=0   rotate  a1=0 a2=0 a3=-45
hole 426  origin x=4.85567    y=26.03286  z=0   rotate  a1=180 a2=0 a3=45
hole 436  origin x=-15.2099   y=32.14842  z=0   rotate  a1=0 a2=0 a3=-45
hole 436  origin x=15.2099    y=32.14842  z=0   rotate  a1=180 a2=0 a3=45
hole 446  origin x=-23.87405  y=31.06181  z=0   rotate  a1=0 a2=0 a3=45
hole 446  origin x=23.87405   y=31.06181  z=0   rotate  a1=180 a2=0 a3=-45
hole 456  origin x=-33.78217  y=24.66807  z=0   rotate  a1=0 a2=0 a3=20
hole 456  origin x=33.78217   y=24.66807  z=0   rotate  a1=180 a2=0 a3=-20
hole 1166 origin x=-10.15323  y=6.61856   z=0   rotate  a1=0 a2=0 a3=45
hole 2166 origin x=10.15323   y=6.61856   z=0   rotate  a1=0 a2=0 a3=-45
hole 1166 origin x=-28.45477  y=6.61856   z=0   rotate  a1=0 a2=0 a3=-45
hole 2166 origin x=28.45477   y=6.61856   z=0   rotate  a1=0 a2=0 a3=45
hole 1556 origin x=-4.63037   y=28.12605  z=0   rotate  a1=0 a2=0 a3=-45
hole 2556 origin x=3.46294    y=26.95862  z=0   rotate  a1=0 a2=0 a3=45
hole 1576 origin x=-17.87625  y=37.13325  z=0   rotate  a1=0 a2=0 a3=-45
hole 2576 origin x=17.87625   y=37.13325  z=0   rotate  a1=0 a2=0 a3=45
hole 1596 origin x=-20.1918   y=37.20396  z=0   rotate  a1=0 a2=0 a3=45
hole 2596 origin x=20.1918    y=37.20396  z=0   rotate  a1=0 a2=0 a3=-45
hole 1598 origin x=-28.09172  y=27.05787  z=-207.01   rotate  a1=0 a2=0 a3=45
hole 2598 origin x=27.11026   y=28.03933  z=-207.01   rotate  a1=0 a2=0 a3=-45
hole 1616 origin x=-29.12357  y=28.13077  z=0   rotate  a1=0 a2=0 a3=20
hole 2616 origin x=29.12357   y=28.13077  z=0   rotate  a1=0 a2=0 a3=-20
media 9 1 32 31
media 9 1 33 31
media 4 1 32 -31
media 4 1 33 -31
media 9 1 34 -4
media 9 1 35 -34 -4
media 9 1 36 -35 -34 -33 -32 -4
media 9 1 4 -11 31
media 4 1 4 -11 -31
media 10 1 4 -2 11 -12
media 8 1 6 11 -12
media 8 1 8 11 -12
media 8 1 10 11 -12
media 9 1 2 -6 -8 -10 11 -12
media 9 1 4 12 -13 31
media 4 1 4 12 -13 -31
media 10 1 4 -2 13 -14
media 8 1 6 13 -14
media 8 1 8 13 -14
media 8 1 10 13 -14
media 9 1 2 -6 -8 -10 13 -14
media 9 1 4 14 -15 31
media 4 1 4 14 -15 -31
media 10 1 4 -2 15 -16
media 8 1 6 15 -16
media 8 1 8 15 -16
media 8 1 10 15 -16
media 9 1 2 -6 -8 -10 15 -16
media 9 1 4 16 -17 31
media 4 1 4 16 -17 -31
media 10 1 4 -2 17 -18
media 8 1 6 17 -18
media 8 1 8 17 -18
media 8 1 10 17 -18
media 9 1 2 -6 -8 -10 17 -18
media 9 1 4 18 -19 31
media 4 1 4 18 -19 -31
media 10 1 4 -2 19 -20
media 8 1 6 19 -20
media 8 1 8 19 -20
media 8 1 10 19 -20
media 9 1 2 -6 -8 -10 19 -20
```

```
 media 9 1 4 20 31
 media 4 1 4 20 -31
 media 4 1 580 -32 -33 -34 -35 -36 -4
 media 11 1 -580 590
 media 4 1 -590 600
 boundary 600


'-----------------------------------------------------------------
' Single Package of two fuel assemblies flipped
'--------
unit 1001
com="single container flipped"
 cuboid 600  54.5846  -54.5846  47.4596  -18.034   207.01  -207.01
 hole 1000   origin  x=0 y=29.4256 z=0   rotate  a1=0 a2=0 a3=180
 boundary 600


'-----------------------------------------------------------------
' 3x6x1 Packages of two fuel assemblies flipped
'--------
global unit 2000
com="global unit 2000 references array 2000"
 cuboid 1  272.923  -54.5846  374.9276  -18.034   207.01  -207.01
 array 2000 1  place 1 1 1 0 0 0
 cuboid 2  318.643  -100.305  374.9276  -18.034   252.73  -252.73
 media 16 1 2 -1
 boundary 2
end geometry

read array
'-----------------------------------------------------------------
' Aluminum Door Array
'--------
ara=2 nux=1 nuy=1 nuz=6 typ=square
 fill
  820
  810
  810
  810
  810
  830  end fill


'-----------------------------------------------------------------
' Fuel Rod Array
'--------
ara=1 nux=15 nuy=15 nuz=1 typ=square
 fill
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 30 10 10 30 10 10 10 30 10 10 30 10 10
10 10 10 10 10 10 10 30 10 10 10 10 10 10 10
10 10 10 10 30 10 10 10 10 10 30 10 10 10 10
10 10 30 10 10 10 10 10 10 10 10 10 30 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 30 10 10 10 30 10 10 10 30 10 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 30 10 10 10 10 10 10 10 10 10 30 10 10
10 10 10 10 30 10 10 10 10 10 30 10 10 10 10
10 10 10 10 10 10 10 30 10 10 10 10 10 10 10
10 10 30 10 10 30 10 10 10 30 10 10 30 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
end fill

'-----------------------------------------------------------------
' Boral Base Inner Full
'--------
ara=406 nux=1 nuy=1 nuz=11 typ=square
 fill
  400
  402
  402
  402
  402
  402
  402
  402
```

```
 media 9 1 4 20 31
 media 4 1 4 20 -31
 media 4 1 580 -32 -33 -34 -35 -36 -4
 media 11 1 -580 590
 media 4 1 -590 600
 boundary 600


'-----------------------------------------------------------------
' Single Package of two fuel assemblies flipped
'--------
unit 1001
com="single container flipped"
 cuboid 600  54.5846  -54.5846  47.4596  -18.034   207.01  -207.01
 hole 1000   origin  x=0 y=29.4256 z=0   rotate  a1=0 a2=0 a3=180
 boundary 600


'-----------------------------------------------------------------
' 3x6x1 Packages of two fuel assemblies flipped
'--------
global unit 2000
com="global unit 2000 references array 2000"
 cuboid 10  545.846        0  523.9488        0   414.02        0
 array 2000 10  place 1 1 1 54.5846 18.034 207.01
 cuboid 20  575.846      -30  553.9488      -30   444.02      -30
 media 9 1 -10 20
 boundary 20
end geometry

read array
'-----------------------------------------------------------------
' Aluminum Door Array
'--------
ara=2 nux=1 nuy=1 nuz=6 typ=square
 fill
  820
  810
  810
  810
  810
  830  end fill


'-----------------------------------------------------------------
' Fuel Rod Array
'--------
ara=1 nux=15 nuy=15 nuz=1 typ=square
 fill
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 30 10 10 30 10 10 10 30 10 10 30 10 10
10 10 10 10 10 10 10 30 10 10 10 10 10 10 10
10 10 10 10 30 10 10 10 10 10 30 10 10 10 10
10 10 30 10 10 10 10 10 10 10 10 10 30 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 30 10 10 10 30 10 10 10 30 10 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 30 10 10 10 10 10 10 10 10 10 30 10 10
10 10 10 10 30 10 10 10 10 10 30 10 10 10 10
10 10 10 10 10 10 10 30 10 10 10 10 10 10 10
10 10 30 10 10 30 10 10 10 30 10 10 30 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
end fill

'-----------------------------------------------------------------
' Boral Base Inner Full
'--------
ara=406 nux=1 nuy=1 nuz=11 typ=square
 fill
  400
  402
  402
  402
  402
  402
  402
  402
```

```
 402
 402
 404  end fill

'-----------------------------------------------------------------
' Boral Base Outer Full
'--------
ara=416 nux=1 nuy=1 nuz=11 typ=square
 fill
  410
  412
  412
  412
  412
  412
  412
  412
  412
  412
  414  end fill

'-----------------------------------------------------------------
' Boral Lid Inner Lower
'--------
ara=426 nux=1 nuy=1 nuz=11 typ=square
 fill
  420
  422
  422
  422
  422
  422
  422
  422
  422
  422
  424  end fill

'-----------------------------------------------------------------
' Boral Lid Inner Upper
'--------
ara=436 nux=1 nuy=1 nuz=11 typ=square
 fill
  430
  432
  432
  432
  432
  432
  432
  432
  432
  432
  434  end fill

'-----------------------------------------------------------------
' Boral Lid Outer Upper
'--------
ara=446 nux=1 nuy=1 nuz=11 typ=square
 fill
  440
  442
  442
  442
  442
  442
  442
  442
  442
  442
  444  end fill

'-----------------------------------------------------------------
' Boral Lid Outer Lower
'--------
```

```
 402
 402
 404  end fill

'-----------------------------------------------------------------
' Boral Base Outer Full
'--------
ara=416 nux=1 nuy=1 nuz=11 typ=square
 fill
  410
  412
  412
  412
  412
  412
  412
  412
  412
  412
  414  end fill

'-----------------------------------------------------------------
' Boral Lid Inner Lower
'--------
ara=426 nux=1 nuy=1 nuz=11 typ=square
 fill
  420
  422
  422
  422
  422
  422
  422
  422
  422
  422
  424  end fill

'-----------------------------------------------------------------
' Boral Lid Inner Upper
'--------
ara=436 nux=1 nuy=1 nuz=11 typ=square
 fill
  430
  432
  432
  432
  432
  432
  432
  432
  432
  432
  434  end fill

'-----------------------------------------------------------------
' Boral Lid Outer Upper
'--------
ara=446 nux=1 nuy=1 nuz=11 typ=square
 fill
  440
  442
  442
  442
  442
  442
  442
  442
  442
  442
  444  end fill

'-----------------------------------------------------------------
' Boral Lid Outer Lower
'--------
```

```
ara=456 nux=1 nuy=1 nuz=11 typ=square
 fill
  450
  452
  452
  452
  452
  452
  452
  452
  452
  452
  454  end fill

'-----------------------------------------------------------------
' Plastic Base Inner Full
'--------
ara=1166 nux=1 nuy=1 nuz=11 typ=square
 fill
 1160
 1162
 1162
 1162
 1162
 1162
 1162
 1162
 1162
 1162
 1164  end fill

'-----------------------------------------------------------------
' Plastic Base Inner Full
'--------
ara=2166 nux=1 nuy=1 nuz=11 typ=square
 fill
 2160
 2162
 2162
 2162
 2162
 2162
 2162
 2162
 2162
 2162
 2164  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=1176 nux=1 nuy=1 nuz=11 typ=square
 fill
 1170
 1172
 1172
 1172
 1172
 1172
 1172
 1172
 1172
 1172
 1174  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=2176 nux=1 nuy=1 nuz=11 typ=square
 fill
 2170
 2172
 2172
 2172
 2172
 2172
 2172
```

```
ara=456 nux=1 nuy=1 nuz=11 typ=square
 fill
  450
  452
  452
  452
  452
  452
  452
  452
  452
  452
  454  end fill

'-----------------------------------------------------------------
' Plastic Base Inner Full
'--------
ara=1166 nux=1 nuy=1 nuz=11 typ=square
 fill
 1160
 1162
 1162
 1162
 1162
 1162
 1162
 1162
 1162
 1162
 1164  end fill

'-----------------------------------------------------------------
' Plastic Base Inner Full
'--------
ara=2166 nux=1 nuy=1 nuz=11 typ=square
 fill
 2160
 2162
 2162
 2162
 2162
 2162
 2162
 2162
 2162
 2162
 2164  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=1176 nux=1 nuy=1 nuz=11 typ=square
 fill
 1170
 1172
 1172
 1172
 1172
 1172
 1172
 1172
 1172
 1172
 1174  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=2176 nux=1 nuy=1 nuz=11 typ=square
 fill
 2170
 2172
 2172
 2172
 2172
 2172
 2172
```

```
 2172
 2172
 2172
 2174  end fill

'-----------------------------------------------------------------
' Plastic Lid Inner Lower
'--------
ara=1556 nux=1 nuy=1 nuz=11 typ=square
 fill
 1550
 1552
 1552
 1552
 1552
 1552
 1552
 1552
 1552
 1554  end fill

'-----------------------------------------------------------------
' Plastic Lid Inner Lower
'--------
ara=2556 nux=1 nuy=1 nuz=11 typ=square
 fill
 2550
 2552
 2552
 2552
 2552
 2552
 2552
 2552
 2552
 2554  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=1576 nux=1 nuy=1 nuz=11 typ=square
 fill
 1570
 1572
 1572
 1572
 1572
 1572
 1572
 1572
 1572
 1574  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=2576 nux=1 nuy=1 nuz=11 typ=square
 fill
 2570
 2572
 2572
 2572
 2572
 2572
 2572
 2572
 2572
 2574  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Upper
```

```
 2172
 2172
 2172
 2174  end fill

'-----------------------------------------------------------------
' Plastic Lid Inner Lower
'--------
ara=1556 nux=1 nuy=1 nuz=11 typ=square
 fill
 1550
 1552
 1552
 1552
 1552
 1552
 1552
 1552
 1552
 1554  end fill

'-----------------------------------------------------------------
' Plastic Lid Inner Lower
'--------
ara=2556 nux=1 nuy=1 nuz=11 typ=square
 fill
 2550
 2552
 2552
 2552
 2552
 2552
 2552
 2552
 2552
 2554  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=1576 nux=1 nuy=1 nuz=11 typ=square
 fill
 1570
 1572
 1572
 1572
 1572
 1572
 1572
 1572
 1572
 1574  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=2576 nux=1 nuy=1 nuz=11 typ=square
 fill
 2570
 2572
 2572
 2572
 2572
 2572
 2572
 2572
 2572
 2574  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Upper
```

```
'--------
ara=1596 nux=1 nuy=1 nuz=11 typ=square
 fill
 1590
 1592
 1592
 1592
 1592
 1592
 1592
 1592
 1592
 1592
 1594  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Upper
'--------
ara=2596 nux=1 nuy=1 nuz=11 typ=square
 fill
 2590
 2592
 2592
 2592
 2592
 2592
 2592
 2592
 2592
 2592
 2594  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Lower
'--------
ara=1616 nux=1 nuy=1 nuz=11 typ=square
 fill
 1610
 1612
 1612
 1612
 1612
 1612
 1612
 1612
 1612
 1612
 1614  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Lower
'--------
ara=2616 nux=1 nuy=1 nuz=11 typ=square
 fill
 2610
 2612
 2612
 2612
 2612
 2612
 2612
 2612
 2612
 2612
 2614  end fill

'-----------------------------------------------------------------
' Facility
'--------
ara=2000 nux=3 nuy=6 nuz=1 typ=square gbl=2000
 fill
 1001 1001 1001
 1000 1000 1000
 1001 1001 1001
 1000 1000 1000
```

```
'--------
ara=1596 nux=1 nuy=1 nuz=11 typ=square
 fill
 1590
 1592
 1592
 1592
 1592
 1592
 1592
 1592
 1592
 1592
 1594  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Upper
'--------
ara=2596 nux=1 nuy=1 nuz=11 typ=square
 fill
 2590
 2592
 2592
 2592
 2592
 2592
 2592
 2592
 2592
 2592
 2594  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Lower
'--------
ara=1616 nux=1 nuy=1 nuz=11 typ=square
 fill
 1610
 1612
 1612
 1612
 1612
 1612
 1612
 1612
 1612
 1612
 1614  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Lower
'--------
ara=2616 nux=1 nuy=1 nuz=11 typ=square
 fill
 2610
 2612
 2612
 2612
 2612
 2612
 2612
 2612
 2612
 2612
 2614  end fill

'-----------------------------------------------------------------
' Facility
'--------
ara=2000 nux=5 nuy=8 nuz=1
fill 5r1001
5r1000
5r1001
5r1000
5r1001
```

```
 1001 1001 1001
 1000 1000 1000  end fill

end array
read bnds
    XFC=periodic
    YFC=periodic
    +ZB=h2o
    -ZB=conc-4
  end bnds

read start
 nst=1
end start


end data
end
!eof
nice -30 scale44a -o  this_case
```

```
5r1000
5r1001
5r1000  end fill
end array
'read bnds
'    XFC=periodic
'    YFC=periodic
'    +ZB=h2o
'    -ZB=conc-4
'  end bnds

read start
 nst=1
end start


end data
end
!eof
nice -30 scale44a -o  this_case
```

```
=csas6     parm=size=900000
MAP12_Base
v7-238

' WORM CALCS
' TOLERANCE = 0.05
' IM = 1

read composition
'-----------------------------------------------------------------------------
' Mehmet Saglam 2/2016
' Original 15T3-40-5x8x1-163in-GT-FL1_Door.in from HRR Calc MAP-12-0600 (see below)
' Changes:
' runs with scale 4.4a 44 group library
' arbmnyl used instead of  atomnyl (use 6012 instead of 6000 for carbon-12)
' water between arrays (mixture 16) set to 1e-08
' Global Array 2000 is set to 3x6x1
' Update Unit 2000 with +45.72cm bounds on x and z sides (3 ft spacing)
' periodic boundary condition on x and z sides. Concrete on -y, h2o on +y
' Internal moderators set to 1e-20
'-----------------------------------------------------------------------------
' Travis Smith 5/2015
' Original 15T1c-40581-FL1_Door.in from 32-9115032-000/-001 converted from SCALE 4.4a to 6
'
'   #Door In (0.325" Delrin)
'   #Guide tube cladding
'   #163 in Active Fuel Length
'   #15x15 Type 3 Fuel (Adv. W15 HTP) Drawing 02-9077630-000
'
'
' *******  Corrections are shown below
' *******
' *******
'-----------------------------------------------------------------------------
' Original 32-9115032-000 and 32-9115032-001 did not update lattice parameters for new
' fuel types, had overlaping geometries, and void in fuel gap (not updated in lattice parameters).
'
' These were corrected as follows:
'
' Corrections due to geometery overlap in original 4.4a file:
'1   Origi: Unit 200: cubo 100  10.79500 -10.79500 0.31750 -0.31750 207.01000 -207.01000
'    Alter: Unit 200: cuboid 100   10.795  -10.795   0.3174  -0.3174   207.01  -207.01
'2   Origi: Unit 900: cubo  20 23.8633 -0.635 23.8633 -0.635 2p207.01
'    Alter: Unit 900: cuboid 20  23.863   -0.635  23.863   -0.635   207.01  -207.01
'3   Origi: Units 400,402,404,406,410,412,414,416,420,422,424,426,430,432,434,436,440,
'           442,444,446,450,452,454,456  had +y of 0.15113 and -y of 0.15113
'    Alter: Changed +y to 0.1511 and -y to 0.1511
'4   Origi: Unit 1000, hole 900 origin x=19.304 y=1.36500 z=0 rotate a3=45
'                     hole 900 origin x=-19.304 y=1.36500 z=0  rotate a3=45
'    Alter: Changed   hole 900 origin x=19.304 y=1.36501 z=0 rotate a3=45
'                     hole 900 origin x=-19.304 y=1.36501 z=0  rotate a3=45
'
' Corrections to Lattice Parameter:
'  Original:
'   squarepitch 1.44272 0.91999 1 3 1.05156 2 0.93980 0 end
'   more data dab=2000 res=6 slab 0.3302 res=10 slab 0.2159 res=11 slab 0.2921 res=14 cyli 1.563 end more
'   read parm tme=120 gen=1000 nsk=3 run=yes plt=yes npg=1000 far=yes plt=yes lng=3000000 nb8=1200 end parm
'  Corrections:
'   latticecell squarepitch fueld=0.94692 1 gapd=0.97028 12 cladd=1.08712 2 pitch=1.44272 3 end
'   more data  dab=2000 res=6 slab 0.3302  res=10 slab 0.2159  res=11 slab 0.2921  res=14 cylinder 1.563  end more
'   read parameter gen=1500 npg=1000 nsk=5 htm=no far=yes run=yes lng=3000000 nb8=1200 end parameter
'
'
'
'-----------------------------------------------------------------------------
'
' (1) UO2 100% td and 5.0 w/o
' (2) Zircaloy
' (3) Water in Assembly Lattice
' (4) Volume in Container External to Bundles
' (5) Rubber
' (6) SS Plate, 0.13"(0.3302 cm) thick
' (7) Boral, minimum areal density (at min thk)=0.024 gm B-10/sqcm
'     minimum thickness = 0.119" = 0.30226 cm
'     volume density = 0.0240/(0.30226*0.18431) =0.4308 gm natural b/cucm
'     we use only 75%, 0.75 * 0.4308 = 0.3231 gm natural b/cucm
' (8) Nylon 66
' (9) Water Reflector
'(10) SS Plate, 0.085"(0.2159cm) thick
```

```
=csas6     parm=size=900000
MAP12_Base
v7-238

' WORM CALCS
' TOLERANCE = 0
' IM = 1

read composition
'-----------------------------------------------------------------------------
' Mehmet Saglam 2/2016
' Original 15T3-40-5x8x1-163in-GT-FL1_Door.in from HRR Calc MAP-12-0600 (see below)
' Changes:
' runs with scale 4.4a 44 group library
' arbmnyl used instead of  atomnyl (use 6012 instead of 6000 for carbon-12)
' water between arrays (mixture 16) set to 1e-08
' Global Array 2000 is set to 3x6x1
' Update Unit 2000 with +45.72cm bounds on x and z sides (3 ft spacing)
' periodic boundary condition on x and z sides. Concrete on -y, h2o on +y
' Internal moderators set to 1e-20
'-----------------------------------------------------------------------------
' Travis Smith 5/2015
' Original 15T1c-40581-FL1_Door.in from 32-9115032-000/-001 converted from SCALE 4.4a to 6
'
'   #Door In (0.325" Delrin)
'   #Guide tube cladding
'   #163 in Active Fuel Length
'   #15x15 Type 3 Fuel (Adv. W15 HTP) Drawing 02-9077630-000
'
'
' *******  Corrections are shown below
' *******
' *******
'-----------------------------------------------------------------------------
' Original 32-9115032-000 and 32-9115032-001 did not update lattice parameters for new
' fuel types, had overlaping geometries, and void in fuel gap (not updated in lattice parameters).
'
' These were corrected as follows:
'
' Corrections due to geometery overlap in original 4.4a file:
'1   Origi: Unit 200: cubo 100  10.79500 -10.79500 0.31750 -0.31750 207.01000 -207.01000
'    Alter: Unit 200: cuboid 100   10.795  -10.795   0.3174  -0.3174   207.01  -207.01
'2   Origi: Unit 900: cubo  20 23.8633 -0.635 23.8633 -0.635 2p207.01
'    Alter: Unit 900: cuboid 20  23.863   -0.635  23.863   -0.635   207.01  -207.01
'3   Origi: Units 400,402,404,406,410,412,414,416,420,422,424,426,430,432,434,436,440,
'           442,444,446,450,452,454,456  had +y of 0.15113 and -y of 0.15113
'    Alter: Changed +y to 0.1511 and -y to 0.1511
'4   Origi: Unit 1000, hole 900 origin x=19.304 y=1.36500 z=0 rotate a3=45
'                     hole 900 origin x=-19.304 y=1.36500 z=0  rotate a3=45
'    Alter: Changed   hole 900 origin x=19.304 y=1.36501 z=0 rotate a3=45
'                     hole 900 origin x=-19.304 y=1.36501 z=0  rotate a3=45
'
' Corrections to Lattice Parameter:
'  Original:
'   squarepitch 1.44272 0.91999 1 3 1.05156 2 0.93980 0 end
'   more data dab=2000 res=6 slab 0.3302 res=10 slab 0.2159 res=11 slab 0.2921 res=14 cyli 1.563 end more
'   read parm tme=120 gen=1000 nsk=3 run=yes plt=yes npg=1000 far=yes plt=yes lng=3000000 nb8=1200 end parm
'  Corrections:
'   latticecell squarepitch fueld=0.94692 1 gapd=0.97028 12 cladd=1.08712 2 pitch=1.44272 3 end
'   more data  dab=2000 res=6 slab 0.3302  res=10 slab 0.2159  res=11 slab 0.2921  res=14 cylinder 1.563  end more
'   read parameter gen=1500 npg=1000 nsk=5 htm=no far=yes run=yes lng=3000000 nb8=1200 end parameter
'
'
'
'-----------------------------------------------------------------------------
'
' (1) UO2 100% td and 5.0 w/o
' (2) Zircaloy
' (3) Water in Assembly Lattice
' (4) Volume in Container External to Bundles
' (5) Rubber
' (6) SS Plate, 0.13"(0.3302 cm) thick
' (7) Boral, minimum areal density (at min thk)=0.024 gm B-10/sqcm
'     minimum thickness = 0.119" = 0.30226 cm
'     volume density = 0.0240/(0.30226*0.18431) =0.4308 gm natural b/cucm
'     we use only 75%, 0.75 * 0.4308 = 0.3231 gm natural b/cucm
' (8) Nylon 66
' (9) Water Reflector
'(10) SS Plate, 0.085"(0.2159cm) thick
```

```
'(11) SS Plate, 0.115"(0.2921cm) thick
'(12) Water in Gap
'(13) Aluminium for Doors
'(14) SS Bar at Center
'(15) Delrin
'
 uo2          1 1 293
                                  92235 5
                                  92238 95   end
 zr           2 1 293   end
 h2o          3 1 293   end
 h2o          4 1e-8 293   end
 h2o          5 1 293   end
 ss304        6 1 293   end
 b            7 den=0.3231 1 293   end
' atomnyl      8  1.14  4
'                                  6000 6
'                                  7014 1
'                                  8016 1
'                                  1001 11
'                        1 293   end
'nylon 66
arbmnyl 1.14 4 0 1 0 6012 6 7014 1 8016 1 1001 11 8 1.0 293 end

 h2o          9 1 293   end
 ss304        10 1 293   end
 ss304        11 1 293   end
 h2o          12 1 293   end
 al           13 1 293   end
 ss304        14 1 293   end
 h            15 0 0.0574 293   end
 o            15 0 0.0287 293   end
 c            15 0 0.0287 293   end

' water between arrays FWR not 1e-08
 h2o          16 1 293   end
end composition
read celldata latticecell squarepitch fueld=0.90374 1 gapd=0.95504 12 cladd=1.07188 2 pitch=1.43002 3 end
'squarepitch 1.43002 0.90374 1 3 1.07188 2 0.95504 0 end
    more data
    dab=2000
    res=6 slab 0.3302
'    res=10 slab 0.2159
'    res=11 slab 0.2921
'    res=14 cylinder 1.563
    end more
 end celldata

read parameter
 gen=1500
 npg=1000
 nsk=5
 htm=no
 far=yes
 run=yes
' lng=3000000
 nb8=1200
end parameter
read geometry

'-----------------------------------------------------------------
'Fuel Assembly Creation for Unit 900
'-------
unit 10
com="wet fuel pin cell"
' [10] Fuel Stack   UO2         (1)
' [20] Clad ID      Water Gap   (3)
' [30] Clad OD      Zircaloy    (2)
' [40] Unit Cell    Water       (3)
 cylinder 10  0.45187    207.01  -207.01
 cylinder 20  0.47752    207.01  -207.01
 cylinder 30  0.53594    207.01  -207.01
 cuboid 40  0.71501  -0.71501  0.71501  -0.71501   207.01  -207.01
 media 1 1 10
 media 12 1 20 -10
 media 2 1 30 -20
 media 3 1 40 -30
 boundary 40
```

```
'(11) SS Plate, 0.115"(0.2921cm) thick
'(12) Water in Gap
'(13) Aluminium for Doors
'(14) SS Bar at Center
'(15) Delrin
'
 uo2          1 1 293
                                  92235 5
                                  92238 95   end
 zr           2 1 293   end
 h2o          3 1 293   end
 h2o          4 1e-8 293   end
 h2o          5 1 293   end
 ss304        6 1 293   end
 b            7 den=0.3231 1 293   end
' atomnyl      8  1.14  4
'                                  6000 6
'                                  7014 1
'                                  8016 1
'                                  1001 11
'                        1 293   end
'nylon 66
arbmnyl 1.14 4 0 1 0 6012 6 7014 1 8016 1 1001 11 8 1.0 293 end

 h2o          9 1 293   end
 ss304        10 1 293   end
 ss304        11 1 293   end
 h2o          12 1 293   end
 al           13 1 293   end
 ss304        14 1 293   end
 h            15 0 0.0574 293   end
 o            15 0 0.0287 293   end
 c            15 0 0.0287 293   end

' water between arrays FWR not 1e-08
 h2o          16 1 293   end
end composition
read celldata latticecell squarepitch fueld=0.90374 1 gapd=0.95504 12 cladd=1.07188 2 pitch=1.43002 3 end
'squarepitch 1.43002 0.90374 1 3 1.07188 2 0.95504 0 end
    more data
    dab=2000
    res=6 slab 0.3302
'    res=10 slab 0.2159
'    res=11 slab 0.2921
'    res=14 cylinder 1.563
    end more
 end celldata

read parameter
 gen=1500
 npg=1000
 nsk=5
 htm=no
 far=yes
 run=yes
' lng=3000000
 nb8=1200
end parameter
read geometry

'-----------------------------------------------------------------
'Fuel Assembly Creation for Unit 900
'-------
unit 10
com="wet fuel pin cell"
' [10] Fuel Stack   UO2         (1)
' [20] Clad ID      Water Gap   (3)
' [30] Clad OD      Zircaloy    (2)
' [40] Unit Cell    Water       (3)
 cylinder 10  0.45187    207.01  -207.01
 cylinder 20  0.47752    207.01  -207.01
 cylinder 30  0.53594    207.01  -207.01
 cuboid 40  0.71501  -0.71501  0.71501  -0.71501   207.01  -207.01
 media 1 1 10
 media 12 1 20 -10
 media 2 1 30 -20
 media 3 1 40 -30
 boundary 40
```

```
unit 30
com="Wet Instrument/Guide Tube with cladding"
' [10] Clad ID      Water       (3)
' [20] Clad OD      Zircaloy    (2)
' [30] Unit Cell    Water       (3)
 cylinder 10  0.65151    207.01  -207.01
 cylinder 20  0.68834    207.01  -207.01
 cuboid 30  0.71501  -0.71501  0.71501  -0.71501   207.01  -207.01
 media 3 1 10
 media 2 1 -10 20
 media 3 1 -20 30
 boundary 30

'-----------------------------------------------------------------
'Resting Pads for Assembly Unit 900- Assumed to be Water
'-------
unit 200
com="Pad Base Inner Full- Water (5)"
 cuboid 100   10.795  -10.795   0.3174  -0.3174   207.01  -207.01
 media 5 1 100
 boundary 100

unit 210
com="Pad Base Outer Full- Water (5)"
 cuboid 100   10.795  -10.795   0.3175  -0.3175   207.01  -207.01
 media 5 1 100
 boundary 100

'-----------------------------------------------------------------
'Stainless Steel Plates
'-------
unit 300
com="Base Inner Full- Steel (6)"
 cuboid 100  11.60249  -11.60249   0.1651  -0.1651   207.01  -207.01
 media 6 1 100
 boundary 100

unit 310
com="Base Outer Full- Steel (6)"
 cuboid 100  10.91999  -10.91999   0.1651  -0.1651   207.01  -207.01
 media 6 1 100
 boundary 100

unit 320
com="Lid Inner Lower- Steel (10)"
 cuboid 100   6.2738  -6.2738  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

unit 330
com="Lid Inner Upper- Steel (10)"
 cuboid 100   5.1308  -5.1308  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

unit 340
com="Lid Outer Upper- Steel (10)"
 cuboid 100   6.1595  -6.1595  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

unit 350
com="Lid Outer Lower- Steel (10)"
 cuboid 100   6.5151  -6.5151  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

'-----------------------------------------------------------------
'Boral 406 Array Base Inner Full
'-----------
unit 400
com="Edge: Base Inner Full; Axial Lower1- BORAL"
' [100] Boral Plate     Boral    (7)
' [200] Unit Cell       Water    (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200    9.525   -9.525  0.1511  -0.1511  15.0749  -14.4272
```

```
unit 30
com="Wet Instrument/Guide Tube with cladding"
' [10] Clad ID      Water       (3)
' [20] Clad OD      Zircaloy    (2)
' [30] Unit Cell    Water       (3)
 cylinder 10  0.65151    207.01  -207.01
 cylinder 20  0.68834    207.01  -207.01
 cuboid 30  0.71501  -0.71501  0.71501  -0.71501   207.01  -207.01
 media 3 1 10
 media 2 1 -10 20
 media 3 1 -20 30
 boundary 30

'-----------------------------------------------------------------
'Resting Pads for Assembly Unit 900- Assumed to be Water
'-------
unit 200
com="Pad Base Inner Full- Water (5)"
 cuboid 100   10.795  -10.795   0.3174  -0.3174   207.01  -207.01
 media 5 1 100
 boundary 100

unit 210
com="Pad Base Outer Full- Water (5)"
 cuboid 100   10.795  -10.795   0.3175  -0.3175   207.01  -207.01
 media 5 1 100
 boundary 100

'-----------------------------------------------------------------
'Stainless Steel Plates
'-------
unit 300
com="Base Inner Full- Steel (6)"
 cuboid 100  11.60249  -11.60249   0.1651  -0.1651   207.01  -207.01
 media 6 1 100
 boundary 100

unit 310
com="Base Outer Full- Steel (6)"
 cuboid 100  10.91999  -10.91999   0.1651  -0.1651   207.01  -207.01
 media 6 1 100
 boundary 100

unit 320
com="Lid Inner Lower- Steel (10)"
 cuboid 100   6.2738  -6.2738  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

unit 330
com="Lid Inner Upper- Steel (10)"
 cuboid 100   5.1308  -5.1308  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

unit 340
com="Lid Outer Upper- Steel (10)"
 cuboid 100   6.1595  -6.1595  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

unit 350
com="Lid Outer Lower- Steel (10)"
 cuboid 100   6.5151  -6.5151  0.10795  -0.10795   207.01  -207.01
 media 10 1 100
 boundary 100

'-----------------------------------------------------------------
'Boral 406 Array Base Inner Full
'-----------
unit 400
com="Edge: Base Inner Full; Axial Lower1- BORAL"
' [100] Boral Plate     Boral    (7)
' [200] Unit Cell       Water    (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200    9.525   -9.525  0.1511  -0.1511  15.0749  -14.4272
```

```
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 402
com="Edge: Base Inner Full; Axial Main9- BORAL"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511   19.177  -19.177
 cuboid 200    9.525   -9.525  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 404
com="Edge: Base Inner Full; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200    9.525   -9.525  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 406
com="Edge: Base Inner Full; Axial Array- Boral"
' [10] Boral Plate Array
' 400.402.402.402.402.402.402.402.402.402.404
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    9.525   -9.525  0.1511  -0.1511   207.01  -207.01
 array 406 10  place 1 1 1 0 0 -192.5828
 boundary 10

'-----------------------------------------------------------------
'Boral 416 Array Base Outer Full
'-----------
unit 410
com="Edge: Base Outer Full; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200    9.525   -9.525  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 412
com="Edge: Base Outer Full; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511   19.177  -19.177
 cuboid 200    9.525   -9.525  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 414
com="Edge: Base Outer Full; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200    9.525   -9.525  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 416
com="Edge: Base Outer Full; Axial Array- Boral"
' [10] Boral Plate Array
' 410.412.412.412.412.412.412.412.412.412.414
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    9.525   -9.525  0.1511  -0.1511   207.01  -207.01
 array 416 10  place 1 1 1 0 0 -192.5828
 boundary 10
```

```
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 402
com="Edge: Base Inner Full; Axial Main9- BORAL"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511   19.177  -19.177
 cuboid 200    9.525   -9.525  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 404
com="Edge: Base Inner Full; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200    9.525   -9.525  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 406
com="Edge: Base Inner Full; Axial Array- Boral"
' [10] Boral Plate Array
' 400.402.402.402.402.402.402.402.402.402.404
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    9.525   -9.525  0.1511  -0.1511   207.01  -207.01
 array 406 10  place 1 1 1 0 0 -192.5828
 boundary 10

'-----------------------------------------------------------------
'Boral 416 Array Base Outer Full
'-----------
unit 410
com="Edge: Base Outer Full; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200    9.525   -9.525  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 412
com="Edge: Base Outer Full; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511   19.177  -19.177
 cuboid 200    9.525   -9.525  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 414
com="Edge: Base Outer Full; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    9.525   -9.525  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200    9.525   -9.525  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 416
com="Edge: Base Outer Full; Axial Array- Boral"
' [10] Boral Plate Array
' 410.412.412.412.412.412.412.412.412.412.414
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    9.525   -9.525  0.1511  -0.1511   207.01  -207.01
 array 416 10  place 1 1 1 0 0 -192.5828
 boundary 10
```

```
'-----------------------------------------------------------------
'Boral 426 Array Lid Inner Lower
'----------
unit 420
com="Edge: Lid Inner Lower; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 422
com="Edge: Lid Inner Lower; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511   19.177  -19.177
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 424
com="Edge: Lid Inner Lower; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 426
com="Edge: Lid Inner Lower; Axial Array- Boral"
' 420.422.422.422.422.422.422.422.422.422.424
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10   6.0325  -6.0325  0.1511  -0.1511   207.01  -207.01
 array 426 10  place 1 1 1 0 0 -192.5828
 boundary 10


'-----------------------------------------------------------------
'Boral 436 Array Lid Inner Upper
'-----------
unit 430
com="Edge: Lid Inner Upper; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    4.953   -4.953  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200    4.953   -4.953  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 432
com="Edge: Lid Inner Upper; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    4.953   -4.953  0.1511  -0.1511   19.177  -19.177
 cuboid 200    4.953   -4.953  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 434
com="Edge: Lid Inner Upper; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    4.953   -4.953  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200    4.953   -4.953  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 436
com="Edge: Lid Inner Upper; Axial Array- Boral"
' 430.432.432.432.432.432.432.432.432.432.434
```


```
'-----------------------------------------------------------------
'Boral 426 Array Lid Inner Lower
'----------
unit 420
com="Edge: Lid Inner Lower; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 422
com="Edge: Lid Inner Lower; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511   19.177  -19.177
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 424
com="Edge: Lid Inner Lower; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 426
com="Edge: Lid Inner Lower; Axial Array- Boral"
' 420.422.422.422.422.422.422.422.422.422.424
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10   6.0325  -6.0325  0.1511  -0.1511   207.01  -207.01
 array 426 10  place 1 1 1 0 0 -192.5828
 boundary 10


'-----------------------------------------------------------------
'Boral 436 Array Lid Inner Upper
'-----------
unit 430
com="Edge: Lid Inner Upper; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    4.953   -4.953  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200    4.953   -4.953  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 432
com="Edge: Lid Inner Upper; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    4.953   -4.953  0.1511  -0.1511   19.177  -19.177
 cuboid 200    4.953   -4.953  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 434
com="Edge: Lid Inner Upper; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100    4.953   -4.953  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200    4.953   -4.953  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 436
com="Edge: Lid Inner Upper; Axial Array- Boral"
' 430.432.432.432.432.432.432.432.432.432.434
```

```
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    4.953   -4.953  0.1511  -0.1511   207.01  -207.01
 array 436 10  place 1 1 1 0 0 -192.5828
 boundary 10

'-----------------------------------------------------------------
'Boral 446 Array Lid Outer Upper
'-----------
unit 440
com="Edge: Lid Outer Upper; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 442
com="Edge: Lid Outer Upper; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511   19.177  -19.177
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 444
com="Edge: Lid Outer Upper; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 446
com="Edge: Lid Outer Upper; Axial Array- Boral"
' 440.442.442.442.442.442.442.442.442.442.444
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10   6.0325  -6.0325  0.1511  -0.1511   207.01  -207.01
 array 446 10  place 1 1 1 0 0 -192.5828
 boundary 10

'-----------------------------------------------------------------
'Boral 456 Array Lid Outer Lower
'-----------
unit 450
com="Edge: Lid Outer Lower; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   5.8801  -5.8801  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200   5.8801  -5.8801  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 452
com="Edge: Lid Outer Lower; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   5.8801  -5.8801  0.1511  -0.1511   19.177  -19.177
 cuboid 200   5.8801  -5.8801  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 454
com="Edge: Lid Outer Lower; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   5.8801  -5.8801  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200   5.8801  -5.8801  0.1511  -0.1511  13.5128  -14.1605
```


```
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10    4.953   -4.953  0.1511  -0.1511   207.01  -207.01
 array 436 10  place 1 1 1 0 0 -192.5828
 boundary 10

'-----------------------------------------------------------------
'Boral 446 Array Lid Outer Upper
'-----------
unit 440
com="Edge: Lid Outer Upper; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 442
com="Edge: Lid Outer Upper; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511   19.177  -19.177
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 444
com="Edge: Lid Outer Upper; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   6.0325  -6.0325  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200   6.0325  -6.0325  0.1511  -0.1511  13.5128  -14.1605
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 446
com="Edge: Lid Outer Upper; Axial Array- Boral"
' 440.442.442.442.442.442.442.442.442.442.444
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10   6.0325  -6.0325  0.1511  -0.1511   207.01  -207.01
 array 446 10  place 1 1 1 0 0 -192.5828
 boundary 10

'-----------------------------------------------------------------
'Boral 456 Array Lid Outer Lower
'-----------
unit 450
com="Edge: Lid Outer Lower; Axial Lower1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   5.8801  -5.8801  0.1511  -0.1511  14.4272  -14.4272
 cuboid 200   5.8801  -5.8801  0.1511  -0.1511  15.0749  -14.4272
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 452
com="Edge: Lid Outer Lower; Axial Main9- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   5.8801  -5.8801  0.1511  -0.1511   19.177  -19.177
 cuboid 200   5.8801  -5.8801  0.1511  -0.1511  19.8247  -19.8247
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 454
com="Edge: Lid Outer Lower; Axial Upper1- Boral"
' [100] Boral Plate     Boral   (7)
' [200] Unit Cell       Water   (4)
 cuboid 100   5.8801  -5.8801  0.1511  -0.1511  13.5128  -13.5128
 cuboid 200   5.8801  -5.8801  0.1511  -0.1511  13.5128  -14.1605
```

```
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 456
com="Edge: Lid Outer Lower; Axial Array- Boral"
' 450.452.452.452.452.452.452.452.452.454
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10   5.8801  -5.8801  0.1511  -0.1511   207.01  -207.01
 array 456 10  place 1 1 1 0 0 -192.5828
 boundary 10

'-----------------------------------------------------------------
'1166 Plastic/Nylon Blocks Array: Base Inner Full
'-----------
unit 1160
com="part 16 plastic block; Edge: Base Inner Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.29437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.19437         y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.17876        -14.17876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1162
com="part 16 plastic block; Edge: Base Inner Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.19437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.19437         y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.92856        -18.92856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1164
com="part 16 plastic block; Edge: Base Inner Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.19437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.19437         y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.26436        -13.26436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1166
com="Base Inner Full Plastic Array 1166"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.8116  -206.8116
 array 1166 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2166 Plastic/Nylon Blocks Array: Base Inner Full
'-----------
unit 2160
com="part 16 plastic block (right); Edge: Base Inner Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
```

```
 media 7 1 100
 media 4 1 -100 200
 boundary 200

unit 456
com="Edge: Lid Outer Lower; Axial Array- Boral"
' 450.452.452.452.452.452.452.452.452.454
' (4)(7)(4)...(4)(7)(4)x9...(4)(7)(4)
'  lower   ...    main   ...  upper
 cuboid 10   5.8801  -5.8801  0.1511  -0.1511   207.01  -207.01
 array 456 10  place 1 1 1 0 0 -192.5828
 boundary 10

'-----------------------------------------------------------------
'1166 Plastic/Nylon Blocks Array: Base Inner Full
'-----------
unit 1160
com="part 16 plastic block; Edge: Base Inner Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437         y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.22876        -14.22876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1162
com="part 16 plastic block; Edge: Base Inner Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437         y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.97856        -18.97856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1164
com="part 16 plastic block; Edge: Base Inner Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437         y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.31436        -13.31436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1166
com="Base Inner Full Plastic Array 1166"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.8116  -206.8116
 array 1166 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2166 Plastic/Nylon Blocks Array: Base Inner Full
'-----------
unit 2160
com="part 16 plastic block (right); Edge: Base Inner Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                    (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
```

```
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.19437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.19437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.17876        -14.17876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2162
com="part 16 plastic block (right); Edge: Base Inner Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.19437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.19437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.92856        -18.92856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2164
com="part 16 plastic block (right); Edge: Base Inner Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.19437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.19437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.26436        -13.26436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2166
com="Plastic block right 2166 array"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.7837  -206.7837
 array 2166 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'1176 Array 17L Plastic/Nylon Blocks Array: Base Outer Full
'-----------
unit 1170
com="part 171 plastic block; Edge: Base Outer Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.19437        y=0.31512 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.19437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.17876        -14.17876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1172
com="part 171 plastic block; Edge: Base Outer Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.19437        y=0.31512 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.19437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.92856        -18.92856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
```

```
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.22876        -14.22876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2162
com="part 16 plastic block (right); Edge: Base Inner Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.97856        -18.97856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2164
com="part 16 plastic block (right); Edge: Base Inner Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.31436        -13.31436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2166
com="Plastic block right 2166 array"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.7837  -206.7837
 array 2166 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'1176 Array 17L Plastic/Nylon Blocks Array: Base Outer Full
'-----------
unit 1170
com="part 171 plastic block; Edge: Base Outer Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=0.31512 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.22876        -14.22876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1172
com="part 171 plastic block; Edge: Base Outer Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=0.31512 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.97856        -18.97856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
```

```
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1174
com="part 17l plastic block; Edge: Base Outer Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.19437        y=0.31512 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.19437         y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.26436        -13.26436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1176
com="part 17L plastic block 1176 Array"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.8116  -206.8116
 array 1176 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2176 Array 17R Plastic/Nylon Blocks Array: Base Outer Full
'-----------
unit 2170
com="part 17r plastic block;Edge: Base Outer Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.19437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.19437         y=0.31512 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.17876        -14.17876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2172
com="part 17r plastic block; Edge: Base Outer Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.19437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.19437         y=0.31512 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.92856        -18.92856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2174
com="part 17r plastic block; Edge: Base Outer Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.19437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.19437         y=0.31512 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.26436        -13.26436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200
```

```
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1174
com="part 17l plastic block; Edge: Base Outer Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=0.31512 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437         y=1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.31436        -13.31436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 1176
com="part 17L plastic block 1176 Array"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.8116  -206.8116
 array 1176 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2176 Array 17R Plastic/Nylon Blocks Array: Base Outer Full
'-----------
unit 2170
com="part 17r plastic block;Edge: Base Outer Full; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437         y=0.31512 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  14.22876        -14.22876
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2172
com="part 17r plastic block; Edge: Base Outer Full; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437         y=0.31512 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  18.97856        -18.97856
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200

unit 2174
com="part 17r plastic block; Edge: Base Outer Full; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' bevel surface at -x [10], +x [20]                          (8) Nylon
' [100] thinned block without bevels, without axial gaps     (4) Water
' [200] thinned block without bevels, with axial gaps        (4) Water
 plane 10  xpl=1   origin  x=-9.24437        y=1.48828 z=0   rotate  a1=0 a2=0 a3=45
 plane 20  xpl=1   origin  x=9.24437         y=0.31512 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  9.24437  -9.24437  1.48828  -1.48828  13.31436        -13.31436
 cuboid 200  9.24437  -9.24437  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 -20 100
 media 4 1 -10 100
 media 4 1 20 100
 media 4 1 -100 200
 boundary 200
```

```
unit 2176
com="Array 2176 Part 17R plastic block; Base outer full"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.8116  -206.8116
 array 2176 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'1556 Array 55L Plastic/Nylon Blocks Array: Lid Inner Lower
'-----------
unit 1550
com="part 551 plastic block; Edge: Lid Inner Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps     (8)
' [200] thinned block without bevels, with axial gaps        (4)
 cuboid 100  4.46326         -4.46326         1.48828  -1.48828  14.17876         -14.17876
 cuboid 200  4.51326  -4.51326  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 1552
com="part 551 plastic block; Edge: Lid Inner Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps     (8)
' [200] thinned block without bevels, with axial gaps        (4)
 cuboid 100  4.46326         -4.46326         1.48828  -1.48828  18.92856         -18.92856
 cuboid 200  4.51326  -4.51326  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 1554
com="part 551 plastic block; Edge: Lid Inner Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps     (8)
' [200] thinned block without bevels, with axial gaps        (4)
 cuboid 100  4.46326         -4.46326         1.48828  -1.48828  13.26436         -13.26436
 cuboid 200  4.51326  -4.51326  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 1556
com="Array 1556 Part 55L plastic block; Lid Inner Lower"
 cuboid 10  4.51326  -4.51326  1.48828  -1.48828  206.8116  -206.8116
 array 1556 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2556 Array 55R Plastic/Nylon Blocks Array: Lid Inner Lower
'-----------
unit 2550
com="part 55r plastic block; Edge: Lid Inner Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps
' [200] thinned block without bevels, with axial gaps
 cuboid 100  6.11426         -6.3127          1.48828  -1.48828  14.17876         -14.17876
 cuboid 200  6.16426  -6.3627  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 2552
com="part 55r plastic block; Edge: Lid Inner Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps
' [200] thinned block without bevels, with axial gaps
 cuboid 100  6.11426         -6.3127          1.48828  -1.48828  18.92856         -18.92856
 cuboid 200  6.16426  -6.3627  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 2554
com="part 55r plastic block; Edge: Lid Inner Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps
```

```
unit 2176
com="Array 2176 Part 17R plastic block; Base outer full"
 cuboid 10  9.24437  -9.24437  1.48828  -1.48828  206.8116  -206.8116
 array 2176 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'1556 Array 55L Plastic/Nylon Blocks Array: Lid Inner Lower
'-----------
unit 1550
com="part 551 plastic block; Edge: Lid Inner Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps     (8)
' [200] thinned block without bevels, with axial gaps        (4)
 cuboid 100  4.51326         -4.51326         1.48828  -1.48828  14.22876         -14.22876
 cuboid 200  4.51326  -4.51326  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 1552
com="part 551 plastic block; Edge: Lid Inner Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps     (8)
' [200] thinned block without bevels, with axial gaps        (4)
 cuboid 100  4.51326         -4.51326         1.48828  -1.48828  18.97856         -18.97856
 cuboid 200  4.51326  -4.51326  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 1554
com="part 551 plastic block; Edge: Lid Inner Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps     (8)
' [200] thinned block without bevels, with axial gaps        (4)
 cuboid 100  4.51326         -4.51326         1.48828  -1.48828  13.31436         -13.31436
 cuboid 200  4.51326  -4.51326  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 1556
com="Array 1556 Part 55L plastic block; Lid Inner Lower"
 cuboid 10  4.51326  -4.51326  1.48828  -1.48828  206.8116  -206.8116
 array 1556 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2556 Array 55R Plastic/Nylon Blocks Array: Lid Inner Lower
'-----------
unit 2550
com="part 55r plastic block; Edge: Lid Inner Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps
' [200] thinned block without bevels, with axial gaps
 cuboid 100  6.16426         -6.3627          1.48828  -1.48828  14.22876         -14.22876
 cuboid 200  6.16426  -6.3627  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 2552
com="part 55r plastic block; Edge: Lid Inner Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps
' [200] thinned block without bevels, with axial gaps
 cuboid 100  6.16426         -6.3627          1.48828  -1.48828  18.97856         -18.97856
 cuboid 200  6.16426  -6.3627  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 2554
com="part 55r plastic block; Edge: Lid Inner Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [100] thinned block without bevels, without axial gaps
```

```
' [200] thinned block without bevels, with axial gaps
 cuboid 100  6.11426        -6.3127         1.48828  -1.48828  13.26436        -13.26436
 cuboid 200  6.16426  -6.3627  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 2556
com="Array 2556 Part 55R plastic block; Lid Inner Lower"
 cuboid 10  6.16426  -6.3627  1.48828  -1.48828  206.8116  -206.8116
 array 2556 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'1576 Array 57L Plastic/Nylon Blocks Array: Lid Inner Upper
'-----------
unit 1570
com="part 571 plastic block; Edge: Lid Inner Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.33063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  10.44496        0.28063  1.48828  -1.48828  14.17876        -14.17876
 cuboid 200  10.49496  0.28063  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1572
com="part 571 plastic block; Edge: Lid Inner Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.33063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  10.44496        0.28063  1.48828  -1.48828  18.92856        -18.92856
 cuboid 200  10.49496  0.28063  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1574
com="part 571 plastic block; Edge: Lid Inner Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.33063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  10.44496        0.28063  1.48828  -1.48828  13.26436        -13.26436
 cuboid 200  10.49496  0.28063  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1576
com="Array 1576 Part 57L plastic block; Lid Inner Upper"
 cuboid 10  10.49496  0.28063  1.48828  -1.48828  206.8116  -206.8116
 array 1576 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2576 Array 57R Plastic/Nylon Blocks Array: Lid Inner Upper
'-----------
unit 2570
com="part 57r plastic block; Edge: Lid Inner Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.33063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -10.44496        1.48828  -1.48828  14.17876        -14.17876
 cuboid 200  -0.28063  -10.49496  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 -10 100
```

```
' [200] thinned block without bevels, with axial gaps
 cuboid 100  6.16426        -6.3627         1.48828  -1.48828  13.31436        -13.31436
 cuboid 200  6.16426  -6.3627  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 100
 media 4 1 -100 200
 boundary 200

unit 2556
com="Array 2556 Part 55R plastic block; Lid Inner Lower"
 cuboid 10  6.16426  -6.3627  1.48828  -1.48828  206.8116  -206.8116
 array 2556 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'1576 Array 57L Plastic/Nylon Blocks Array: Lid Inner Upper
'-----------
unit 1570
com="part 571 plastic block; Edge: Lid Inner Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  10.49496        0.28063  1.48828  -1.48828  14.22876        -14.22876
 cuboid 200  10.49496  0.28063  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1572
com="part 571 plastic block; Edge: Lid Inner Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  10.49496        0.28063  1.48828  -1.48828  18.97856        -18.97856
 cuboid 200  10.49496  0.28063  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1574
com="part 571 plastic block; Edge: Lid Inner Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  10.49496        0.28063  1.48828  -1.48828  13.31436        -13.31436
 cuboid 200  10.49496  0.28063  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1576
com="Array 1576 Part 57L plastic block; Lid Inner Upper"
 cuboid 10  10.49496  0.28063  1.48828  -1.48828  206.8116  -206.8116
 array 1576 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'2576 Array 57R Plastic/Nylon Blocks Array: Lid Inner Upper
'-----------
unit 2570
com="part 57r plastic block; Edge: Lid Inner Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.28063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -10.49496        1.48828  -1.48828  14.22876        -14.22876
 cuboid 200  -0.28063  -10.49496  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 -10 100
```

```
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2572
com="part 57r plastic block; Edge: Lid Inner Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps      (4) Water
' [200] thinned block without bevels, with axial gaps         (4) Water
 plane 10  xpl=1   origin  x=-0.33063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -10.44496        1.48828  -1.48828  18.92856        -18.92856
 cuboid 200  -0.28063  -10.49496  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2574
com="part 57r plastic block; Edge: Lid Inner Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps      (4) Water
' [200] thinned block without bevels, with axial gaps         (4) Water
 plane 10  xpl=1   origin  x=-0.33063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -10.44496        1.48828  -1.48828  13.26436        -13.26436
 cuboid 200  -0.28063  -10.49496  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2576
com="Array 2576 Part 57R plastic block; Lid Inner Upper"
 cuboid 10  -0.28063  -10.49496  1.48828  -1.48828  206.8116  -206.8116
 array 2576 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'1598 Plastic/Nylon Lid Outer Upper
'-----------
unit 1598
com="part 591w plastic block"
' plastic thickness removed=0.0781 inch =0.19844 cm        Nylon (8)
 wedge 10  1.38799  1.38799  2.97656  28.45753   origin  x=0 y=0 z=0.19844
 wedge 20  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=30.34824
 wedge 30  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=69.99764
 wedge 40  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=109.647
 wedge 50  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=149.2964
 wedge 60  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=188.9458
 wedge 70  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=228.5952
 wedge 80  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=268.2446
 wedge 90  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=307.894
 wedge 100  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=347.5434
 wedge 110  1.38799  1.38799  2.97656  26.62873   origin  x=0 y=0 z=387.1928
 wedge 120  1.38799  1.38799  2.97656   414.02
 media 8 1 10
 media 8 1 20
 media 8 1 30
 media 8 1 40
 media 8 1 50
 media 8 1 60
 media 8 1 70
 media 8 1 80
 media 8 1 90
 media 8 1 100
 media 8 1 110
 media 4 1 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 120
 boundary 120


'-----------------------------------------------------------------
'2598 Plastic/Nylon Lid Outer Upper
'-----------
unit 2598
com="part 59rw plastic block"
' plastic thickness removed=0.0781 inch =0.19844 cm        Nylon(8)
 wedge 10  1.38799        0  2.97656  28.45753   origin  x=0 y=0 z=0.19844
```

```
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2572
com="part 57r plastic block; Edge: Lid Inner Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps      (4) Water
' [200] thinned block without bevels, with axial gaps         (4) Water
 plane 10  xpl=1   origin  x=-0.28063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -10.49496        1.48828  -1.48828  18.97856        -18.97856
 cuboid 200  -0.28063  -10.49496  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2574
com="part 57r plastic block; Edge: Lid Inner Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                    (8) Nylon
' [100] thinned block without bevels, without axial gaps      (4) Water
' [200] thinned block without bevels, with axial gaps         (4) Water
 plane 10  xpl=1   origin  x=-0.28063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -10.49496        1.48828  -1.48828  13.31436        -13.31436
 cuboid 200  -0.28063  -10.49496  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2576
com="Array 2576 Part 57R plastic block; Lid Inner Upper"
 cuboid 10  -0.28063  -10.49496  1.48828  -1.48828  206.8116  -206.8116
 array 2576 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'1598 Plastic/Nylon Lid Outer Upper
'-----------
unit 1598
com="part 591w plastic block"
' plastic thickness removed=0.0781 inch =0.19844 cm        Nylon (8)
 wedge 10  1.38799  1.38799  2.97656  28.45753   origin  x=0 y=0 z=0.19844
 wedge 20  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=30.34824
 wedge 30  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=69.99764
 wedge 40  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=109.647
 wedge 50  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=149.2964
 wedge 60  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=188.9458
 wedge 70  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=228.5952
 wedge 80  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=268.2446
 wedge 90  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=307.894
 wedge 100  1.38799  1.38799  2.97656  37.95713   origin  x=0 y=0 z=347.5434
 wedge 110  1.38799  1.38799  2.97656  26.62873   origin  x=0 y=0 z=387.1928
 wedge 120  1.38799  1.38799  2.97656   414.02
 media 8 1 10
 media 8 1 20
 media 8 1 30
 media 8 1 40
 media 8 1 50
 media 8 1 60
 media 8 1 70
 media 8 1 80
 media 8 1 90
 media 8 1 100
 media 8 1 110
 media 4 1 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 120
 boundary 120


'-----------------------------------------------------------------
'2598 Plastic/Nylon Lid Outer Upper
'-----------
unit 2598
com="part 59rw plastic block"
' plastic thickness removed=0.0781 inch =0.19844 cm        Nylon(8)
 wedge 10  1.38799        0  2.97656  28.45753   origin  x=0 y=0 z=0.19844
```

```
 wedge 20  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=30.34824
 wedge 30  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=69.99764
 wedge 40  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=109.647
 wedge 50  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=149.2964
 wedge 60  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=188.9458
 wedge 70  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=228.5952
 wedge 80  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=268.2446
 wedge 90  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=307.894
 wedge 100  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=347.5434
 wedge 110  1.38799        0  2.97656  26.62873   origin  x=0 y=0 z=387.1928
 wedge 120  1.38799        0  2.97656   414.02
 media 8 1 10
 media 8 1 20
 media 8 1 30
 media 8 1 40
 media 8 1 50
 media 8 1 60
 media 8 1 70
 media 8 1 80
 media 8 1 90
 media 8 1 100
 media 8 1 110
 media 4 1 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 120
 boundary 120


'-----------------------------------------------------------------
'1596 Array 59L Plastic/Nylon Blocks Array: Lid Outer Upper
'-----------
unit 1590
com="part 591 plastic block; Edge: Lid Outer Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.33063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -11.32245        1.48828  -1.48828  14.17876        -14.17876
 cuboid 200  -0.28063  -11.37245  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 1592
com="part 591 plastic block; Edge: Lid Outer Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.33063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -11.32245        1.48828  -1.48828  18.92856        -18.92856
 cuboid 200  -0.28063  -11.37245  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 1594
com="part 591 plastic block; Edge: Lid Outer Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.33063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -11.32245        1.48828  -1.48828  13.26436        -13.26436
 cuboid 200  -0.28063  -11.37245  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 1596
com="Array 1596 Part 59R plastic block; Lid Outer Upper"
 cuboid 10  -0.28063  -11.37245  1.48828  -1.48828  206.8116  -206.8116
 array 1596 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
```

```
 wedge 20  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=30.34824
 wedge 30  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=69.99764
 wedge 40  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=109.647
 wedge 50  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=149.2964
 wedge 60  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=188.9458
 wedge 70  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=228.5952
 wedge 80  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=268.2446
 wedge 90  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=307.894
 wedge 100  1.38799        0  2.97656  37.95713   origin  x=0 y=0 z=347.5434
 wedge 110  1.38799        0  2.97656  26.62873   origin  x=0 y=0 z=387.1928
 wedge 120  1.38799        0  2.97656   414.02
 media 8 1 10
 media 8 1 20
 media 8 1 30
 media 8 1 40
 media 8 1 50
 media 8 1 60
 media 8 1 70
 media 8 1 80
 media 8 1 90
 media 8 1 100
 media 8 1 110
 media 4 1 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 120
 boundary 120


'-----------------------------------------------------------------
'1596 Array 59L Plastic/Nylon Blocks Array: Lid Outer Upper
'-----------
unit 1590
com="part 591 plastic block; Edge: Lid Outer Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.28063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -11.37245        1.48828  -1.48828  14.22876        -14.22876
 cuboid 200  -0.28063  -11.37245  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 1592
com="part 591 plastic block; Edge: Lid Outer Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.28063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -11.37245        1.48828  -1.48828  18.97856        -18.97856
 cuboid 200  -0.28063  -11.37245  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 1594
com="part 591 plastic block; Edge: Lid Outer Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-0.28063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=45
 cuboid 100  -0.28063  -11.37245        1.48828  -1.48828  13.31436        -13.31436
 cuboid 200  -0.28063  -11.37245  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 1596
com="Array 1596 Part 59R plastic block; Lid Outer Upper"
 cuboid 10  -0.28063  -11.37245  1.48828  -1.48828  206.8116  -206.8116
 array 1596 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
```

```
'2596 Array 59R Plastic/Nylon Blocks Array: Lid Outer Upper
'-----------
unit 2590
com="part 59r plastic block; Edge: Lid Outer Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.33063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  11.32245        0.28063  1.48828  -1.48828  14.17876        -14.17876
 cuboid 200  11.37245  0.28063  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 2592
com="part 59r plastic block; Edge: Lid Outer Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.33063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  11.32245        0.28063  1.48828  -1.48828  18.92856        -18.92856
 cuboid 200  11.37245  0.28063  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 2594
com="part 59r plastic block; Edge: Lid Outer Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.33063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  11.32245        0.28063  1.48828  -1.48828  13.26436        -13.26436
 cuboid 200  11.37245  0.28063  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 2596
com="Array 2596 Part 59R plastic block; Lid Outer Upper"
 cuboid 10  11.37245  0.28063  1.48828  -1.48828  206.8116  -206.8116
 array 2596 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'1616 Array 61L Plastic/Nylon Blocks Array: Lid Outer Lower
'-----------
unit 1610
com="part 611 plastic block; Edge: Lid Outer Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-10.66083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-20
 cuboid 100  -0.24844        -10.71083  1.48828  -1.48828  14.17876        -14.17876
 cuboid 200  -0.19844  -10.71083  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1612
com="part 611 plastic block; Edge: Lid Outer Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-10.66083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-20
 cuboid 100  -0.24844        -10.71083  1.48828  -1.48828  18.92856        -18.92856
 cuboid 200  -0.19844  -10.71083  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 100
 media 4 1 -10 100
```

```
'2596 Array 59R Plastic/Nylon Blocks Array: Lid Outer Upper
'-----------
unit 2590
com="part 59r plastic block; Edge: Lid Outer Upper; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  11.37245        0.28063  1.48828  -1.48828  14.22876        -14.22876
 cuboid 200  11.37245  0.28063  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 2592
com="part 59r plastic block; Edge: Lid Outer Upper; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  11.37245        0.28063  1.48828  -1.48828  18.97856        -18.97856
 cuboid 200  11.37245  0.28063  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 2594
com="part 59r plastic block; Edge: Lid Outer Upper; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=0.28063        y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-45
 cuboid 100  11.37245        0.28063  1.48828  -1.48828  13.31436        -13.31436
 cuboid 200  11.37245  0.28063  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 2596
com="Array 2596 Part 59R plastic block; Lid Outer Upper"
 cuboid 10  11.37245  0.28063  1.48828  -1.48828  206.8116  -206.8116
 array 2596 10  place 1 1 1 0 0 -192.3844
 boundary 10


'-----------------------------------------------------------------
'1616 Array 61L Plastic/Nylon Blocks Array: Lid Outer Lower
'-----------
unit 1610
com="part 611 plastic block; Edge: Lid Outer Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-10.71083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-20
 cuboid 100  -0.19844        -10.71083  1.48828  -1.48828  14.22876        -14.22876
 cuboid 200  -0.19844  -10.71083  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1612
com="part 611 plastic block; Edge: Lid Outer Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-10.71083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-20
 cuboid 100  -0.19844        -10.71083  1.48828  -1.48828  18.97856        -18.97856
 cuboid 200  -0.19844  -10.71083  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 10 100
 media 4 1 -10 100
```

```
 media 4 1 -100 200
 boundary 200

unit 1614
com="part 61l plastic block; Edge: Lid Outer Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-10.66083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-20
 cuboid 100  -0.24844          -10.71083  1.48828  -1.48828  13.26436        -13.26436
 cuboid 200  -0.19844  -10.71083  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1616
com="Array 1616 Part 61L plastic block; Lid Outer Lower"
 cuboid 10  -0.19844  -10.71083  1.48828  -1.48828  206.8116  -206.8116
 array 1616 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'2616 Array 61R Plastic/Nylon Blocks Array: Lid Outer Lower
'-----------
unit 2610
com="part 61r plastic block; Edge: Lid Outer Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=10.66083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=20
 cuboid 100  10.71083  0.24844          1.48828  -1.48828  14.17876        -14.17876
 cuboid 200  10.71083  0.19844  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2612
com="part 61r plastic block; Edge: Lid Outer Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=10.66083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=20
 cuboid 100  10.71083  0.24844          1.48828  -1.48828  18.92856        -18.92856
 cuboid 200  10.71083  0.19844  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2614
com="part 61r plastic block; Edge: Lid Outer Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=10.66083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=20
 cuboid 100  10.71083  0.24844          1.48828  -1.48828  13.26436        -13.26436
 cuboid 200  10.71083  0.19844  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2616
com="Array 2616 Part 61R plastic block; Lid Outer Lower"
 cuboid 10  10.71083  0.19844  1.48828  -1.48828  206.8116  -206.8116
 array 2616 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'2 Array 61R Plastic/Nylon Blocks Array: Lid Outer Lower
'-----------
unit 810
com="aluminum door and rubber at upper edge of assy"
```

```
 media 4 1 -100 200
 boundary 200

unit 1614
com="part 61l plastic block; Edge: Lid Outer Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=-10.71083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=-20
 cuboid 100  -0.19844          -10.71083  1.48828  -1.48828  13.31436        -13.31436
 cuboid 200  -0.19844  -10.71083  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 10 100
 media 4 1 -10 100
 media 4 1 -100 200
 boundary 200

unit 1616
com="Array 1616 Part 61L plastic block; Lid Outer Lower"
 cuboid 10  -0.19844  -10.71083  1.48828  -1.48828  206.8116  -206.8116
 array 1616 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'2616 Array 61R Plastic/Nylon Blocks Array: Lid Outer Lower
'-----------
unit 2610
com="part 61r plastic block; Edge: Lid Outer Lower; Axial Lower1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=10.71083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=20
 cuboid 100  10.71083  0.19844          1.48828  -1.48828  14.22876        -14.22876
 cuboid 200  10.71083  0.19844  1.48828  -1.48828  15.0749  -14.4272
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2612
com="part 61r plastic block; Edge: Lid Outer Lower; Axial Main9"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=10.71083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=20
 cuboid 100  10.71083  0.19844          1.48828  -1.48828  18.97856        -18.97856
 cuboid 200  10.71083  0.19844  1.48828  -1.48828  19.8247  -19.8247
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2614
com="part 61r plastic block; Edge: Lid Outer Lower; Axial Upper1"
' plastic thickness removed=0.0781 inch =0.19844 cm
' [10] bevel surface at -x                                  (8) Nylon
' [100] thinned block without bevels, without axial gaps    (4) Water
' [200] thinned block without bevels, with axial gaps       (4) Water
 plane 10  xpl=1   origin  x=10.71083       y=-1.48828 z=0   rotate  a1=0 a2=0 a3=20
 cuboid 100  10.71083  0.19844          1.48828  -1.48828  13.31436        -13.31436
 cuboid 200  10.71083  0.19844  1.48828  -1.48828  13.5128  -14.1605
 media 8 1 -10 100
 media 4 1 10 100
 media 4 1 -100 200
 boundary 200

unit 2616
com="Array 2616 Part 61R plastic block; Lid Outer Lower"
 cuboid 10  10.71083  0.19844  1.48828  -1.48828  206.8116  -206.8116
 array 2616 10  place 1 1 1 0 0 -192.3844
 boundary 10

'-----------------------------------------------------------------
'2 Array 61R Plastic/Nylon Blocks Array: Lid Outer Lower
'-----------
unit 810
com="aluminum door and rubber at upper edge of assy"
```

```
' nominal aluminum dims: 0.25" thk by 7.9" wide by 35.0" long
' tolerances: 0.03" by 0.1" by 0.1"
' dimensions modeled: 0.22" by 7.8" by 34.9"
' there is a nominal 0.25" axial gap, modeled as 0.25 + 0.03(gap tol) + .1 (half of alum length tol times two)
' axial gap modeled as 0.38"
' [20]  this is a rubber layer, modeled as 0.325" of Delrin                    Delrin      (15)
' [40]  this is aluminum                                                        Aluminum    (13)
' [60]  gap                                                                     Water       (9)
 cuboid 20    9.906   -9.906   0.8255        0   44.323  -44.323
 cuboid 40    9.906   -9.906   1.3843        0   44.323  -44.323
 cuboid 60    9.906   -9.906   1.3843        0  44.8056  -44.8056
 media 15 1 20
 media 13 1 40 -20
 media 9 1 60 -40
 boundary 60

unit 820
com="aluminum door and rubber at upper edge of assy"
' there are 4 units 810, unit 820 is at -z end
' 4 * 44.8056 = 179.2224
' total length here is 207.01 - 179.2224 = 27.7876
' gap is final 0.19" (0.4826 cm) of the length
' [20]  this is a rubber layer, modeled as 0.325" of Delrin                    Delrin      (15)
' [40] this is aluminum                                                         aluminum    (13)
' [60] gap                                                                      Water       (9)
 cuboid 20    9.906   -9.906   0.8255        0   27.305        0
 cuboid 40    9.906   -9.906   1.3843        0   27.305        0
 cuboid 60    9.906   -9.906   1.3843        0  27.7876        0
 media 15 1 20
 media 13 1 40 -20
 media 9 1 60 -40
 boundary 60

unit 830
com="same as unit 820 except gap at -z end"
' [20]  this is a rubber layer, modeled as 0.325" of Delrin                    Delrin      (15)
' [40] this is aluminum                                                         aluminum    (13)
' [60] gap                                                                      Water       (9)
 cuboid 20    9.906   -9.906   0.8255        0  27.7876   0.4846
 cuboid 40    9.906   -9.906   1.3843        0  27.7876   0.4846
 cuboid 60    9.906   -9.906   1.3843        0  27.7876        0
 media 15 1 20
 media 13 1 40 -20
 media 9 1 60 -40
 boundary 60

unit 840
com="axial 2 array of doors"
 cuboid 10    9.906   -9.906   1.3843        0   207.01  -207.01
 array 2 10  place 1 1 1 0 0 -207.01
 boundary 10

'-----------------------------------------------------------------
'--------
unit 860
com="steel bar at center of package"
 cuboid 20    2.159   -2.159    1.778        0   207.01  -207.01
 media 14 1 20
 boundary 20

'-----------------------------------------------------------------
' Fuel Assembly Unit
'--------
unit 900
com="fuel assembly, not rotated"
 cuboid 10  21.4503        0  21.4503        0    207.01  -207.01
 array 1 10  place 1 1 1 0.71501 0.71501 0
 cuboid 15  21.4503       -0  21.4503       -0    207.01  -207.01
 cuboid 20  23.863     -0.635  23.863     -0.635 207.01  -207.01
 hole 840 origin x=11.5443 y=21.4503
 hole 840 origin x=21.4503 y=11.5443 rotate a3=-90
 hole 200   origin  x=10.795 y=-0.3175 z=0
 hole 200   origin  x=-0.3175 y=10.795 z=0   rotate  a1=0 a2=0 a3=90
 media 15 1 -10 15
 media  9 1 -15 20
 boundary 20
```

```
' nominal aluminum dims: 0.25" thk by 7.9" wide by 35.0" long
' tolerances: 0.03" by 0.1" by 0.1"
' dimensions modeled: 0.22" by 7.8" by 34.9"
' there is a nominal 0.25" axial gap, modeled as 0.25 + 0.03(gap tol) + .1 (half of alum length tol times two)
' axial gap modeled as 0.38"
' [20]  this is a rubber layer, modeled as 0.325" of Delrin                    Delrin      (15)
' [40]  this is aluminum                                                        Aluminum    (13)
' [60]  gap                                                                     Water       (9)
 cuboid 20    9.906   -9.906   0.8255        0   44.323  -44.323
 cuboid 40    9.906   -9.906   1.3843        0   44.323  -44.323
 cuboid 60    9.906   -9.906   1.3843        0  44.8056  -44.8056
 media 15 1 20
 media 13 1 40 -20
 media 9 1 60 -40
 boundary 60

unit 820
com="aluminum door and rubber at upper edge of assy"
' there are 4 units 810, unit 820 is at -z end
' 4 * 44.8056 = 179.2224
' total length here is 207.01 - 179.2224 = 27.7876
' gap is final 0.19" (0.4826 cm) of the length
' [20]  this is a rubber layer, modeled as 0.325" of Delrin                    Delrin      (15)
' [40] this is aluminum                                                         aluminum    (13)
' [60] gap                                                                      Water       (9)
 cuboid 20    9.906   -9.906   0.8255        0   27.305        0
 cuboid 40    9.906   -9.906   1.3843        0   27.305        0
 cuboid 60    9.906   -9.906   1.3843        0  27.7876        0
 media 15 1 20
 media 13 1 40 -20
 media 9 1 60 -40
 boundary 60

unit 830
com="same as unit 820 except gap at -z end"
' [20]  this is a rubber layer, modeled as 0.325" of Delrin                    Delrin      (15)
' [40] this is aluminum                                                         aluminum    (13)
' [60] gap                                                                      Water       (9)
 cuboid 20    9.906   -9.906   0.8255        0  27.7876   0.4846
 cuboid 40    9.906   -9.906   1.3843        0  27.7876   0.4846
 cuboid 60    9.906   -9.906   1.3843        0  27.7876        0
 media 15 1 20
 media 13 1 40 -20
 media 9 1 60 -40
 boundary 60

unit 840
com="axial 2 array of doors"
 cuboid 10    9.906   -9.906   1.3843        0   207.01  -207.01
 array 2 10  place 1 1 1 0 0 -207.01
 boundary 10

'-----------------------------------------------------------------
'--------
unit 860
com="steel bar at center of package"
 cuboid 20    2.159   -2.159    1.778        0   207.01  -207.01
 media 14 1 20
 boundary 20

'-----------------------------------------------------------------
' Fuel Assembly Unit
'--------
unit 900
com="fuel assembly, not rotated"
 cuboid 10  21.4503        0  21.4503        0    207.01  -207.01
 array 1 10  place 1 1 1 0.71501 0.71501 0
 cuboid 15  21.4503       -0  21.4503       -0    207.01  -207.01
 cuboid 20  23.863     -0.635  23.863     -0.635 207.01  -207.01
 hole 840 origin x=11.5443 y=21.4503
 hole 840 origin x=21.4503 y=11.5443 rotate a3=-90
 hole 200   origin  x=10.795 y=-0.3175 z=0
 hole 200   origin  x=-0.3175 y=10.795 z=0   rotate  a1=0 a2=0 a3=90
 media 15 1 -10 15
 media  9 1 -15 20
 boundary 20
```

```
'-----------------------------------------------------------------
' Package of two fuel assemblies
'--------
unit 1000
com="one package"
' bundle c-c spacing is 15.2"
' diamond is 10.03" x 9.86" (across outer steel surfaces)
' diamond diagonal is 14.0649"
' distance to spacers from diagonal: 8.10" (lower) and 8.62" (upper)
' vertical sum is 30.78"
' distance to outer surface of steel wall is 4.10" (lower) and 4.62" (upper)
' horizontal span across outer steel surfaces: 41.95"
' model steel as 0.115" thick
' base is 21.5" tall, including spacer height (54.61 cm)
' top of base is at y= 54.61 - 20.574 = 34.036 cm
' [2]   inner steel surface hanging central blocks with steel carriers
' [4]   outer steel surface hanging central blocks with steel carriers
' [580] inner surface of steel
' [590] outer surface of steel
' [600] package is 44.98" wide by 30.78" high by 207.98" long modeled as 42.98" by 28.78" by 163
' [860] top of bar is 0.25" below bottom of steel carrier 14.7707 - 0.25 * 2.54 - 0.7 * 2.54 = 12.3577
' [hole 300] Steel Base Inner Full
' [hole 310] Steel Base Outer Full
' [hole 320] Steel Lid Inner Full
' [hole 330] Steel Lid Inner Upper
' [hole 340] Steel Lid Outer Upper
' [hole 350] Steel Lid Outer Lower
' [hole 406] Boral Base Inner Full
' [hole 416] Boral Base Outer Full
' [hole 426] Boral Lid Inner Lower
' [hole 436] Boral Lid Inner Upper
' [hole 446] Boral Lid Outer Upper
' [hole 456] Boral Lid Outer Lower
' [hole 1166] Plastic Base Inner Full
' [hole 2166] Plastic Base Inner Full
' [hole 1166] Plastic Base Outer Full
' [hole 2166] Plastic Base Outer Full
' [hole 1556] Plastic Lid Inner Lower
' [hole 2556] Plastic Lid Inner Lower
' [hole 1576] Plastic Lid Inner Upper
' [hole 2576] Plastic Lid Inner Upper
' [hole 1596] Plastic Lid Outer Upper
' [hole 2596] Plastic Lid Outer Upper
' [hole 1598] Plastic Lid Outer Upper Wedge
' [hole 2598] Plastic Lid Outer Upper Wedge
' [hole 1616] Plastic Lid Outer Lower
' [hole 2616] Plastic Lid Outer Lower

cuboid 2   1.6256  -1.6256    22.45  14.9866   207.01  -207.01
cuboid 4   1.8415  -1.8415    22.45  14.7707   207.01  -207.01
wedge 6   1.3518          0   1.3518          413.92          origin  x=-1.3518         y=20.3255 z=-206.96
wedge 8   1.3518          1.3518          1.3518          413.92          origin  x=0 y=20.3255 z=-206.96
cuboid 10   1.3518          -1.3518          20.3255  14.9866   206.96          -206.96
plane 11  zpl=1   origin  x=0 y=0 z=-195.4197
plane 12  zpl=1   origin  x=0 y=0 z=-164.0411
plane 13  zpl=1   origin  x=0 y=0 z=-105.5545
plane 14  zpl=1   origin  x=0 y=0 z=-74.17587
plane 15  zpl=1   origin  x=0 y=0 z=-15.68933
plane 16  zpl=1   origin  x=0 y=0 z=15.68933
plane 17  zpl=1   origin  x=0 y=0 z=74.17587
plane 18  zpl=1   origin  x=0 y=0 z=105.5545
plane 19  zpl=1   origin  x=0 y=0 z=164.0411
plane 20  zpl=1   origin  x=0 y=0 z=195.4197
plane 31  ypl=1   origin  x=0 y=16 z=0
cuboid 32      -17     -30.5      34.5       26   207.01  -207.01   rotate  a1=0 a2=0 a3=20
cuboid 33     30.5        17      34.5       26   207.01  -207.01   rotate  a1=0 a2=0 a3=-20
cuboid 34      3.2        -5      24.5        0   207.01  -207.01   origin  x=-1.828 y=17.942 z=0   rotate  a1=0 a2=0 a
cuboid 35        5      -3.2      24.5        0   207.01  -207.01   origin  x=1.828 y=17.942 z=0   rotate  a1=0 a2=0 a3
cuboid 36       41       -41        22       16   207.01  -207.01
cuboid 580  52.9844  -52.9844  47.1675  -10.1981   207.01  -207.01
cuboid 590  53.2765  -53.2765  47.4596  -10.414   207.01  -207.01
cuboid 600  54.5846  -54.5846  47.4596  -18.034   207.01  -207.01
hole 860  origin x=0          y=12.3577   z=0
hole 900  origin x=19.304     y=1.36501   z=0   rotate  a1=0 a2=0 a3=45
hole 900  origin x=-19.304    y=1.36501   z=0   rotate  a1=0 a2=0 a3=45
hole 300  origin x=-10.73161  y=8.80588   z=0   rotate  a1=0 a2=0 a3=45
hole 300  origin x=10.73161   y=8.80588   z=0   rotate  a1=0 a2=0 a3=-45
hole 310  origin x=-27.39379  y=8.32328   z=0   rotate  a1=0 a2=0 a3=-45
hole 310  origin x=27.39379   y=8.32328   z=0   rotate  a1=0 a2=0 a3=45
```

```
'-----------------------------------------------------------------
' Package of two fuel assemblies
'--------
unit 1000
com="one package"
' bundle c-c spacing is 15.2"
' diamond is 10.03" x 9.86" (across outer steel surfaces)
' diamond diagonal is 14.0649"
' distance to spacers from diagonal: 8.10" (lower) and 8.62" (upper)
' vertical sum is 30.78"
' distance to outer surface of steel wall is 4.10" (lower) and 4.62" (upper)
' horizontal span across outer steel surfaces: 41.95"
' model steel as 0.115" thick
' base is 21.5" tall, including spacer height (54.61 cm)
' top of base is at y= 54.61 - 20.574 = 34.036 cm
' [2]   inner steel surface hanging central blocks with steel carriers
' [4]   outer steel surface hanging central blocks with steel carriers
' [580] inner surface of steel
' [590] outer surface of steel
' [600] package is 44.98" wide by 30.78" high by 207.98" long modeled as 42.98" by 28.78" by 163
' [860] top of bar is 0.25" below bottom of steel carrier 14.7707 - 0.25 * 2.54 - 0.7 * 2.54 = 12.3577
' [hole 300] Steel Base Inner Full
' [hole 310] Steel Base Outer Full
' [hole 320] Steel Lid Inner Full
' [hole 330] Steel Lid Inner Upper
' [hole 340] Steel Lid Outer Upper
' [hole 350] Steel Lid Outer Lower
' [hole 406] Boral Base Inner Full
' [hole 416] Boral Base Outer Full
' [hole 426] Boral Lid Inner Lower
' [hole 436] Boral Lid Inner Upper
' [hole 446] Boral Lid Outer Upper
' [hole 456] Boral Lid Outer Lower
' [hole 1166] Plastic Base Inner Full
' [hole 2166] Plastic Base Inner Full
' [hole 1166] Plastic Base Outer Full
' [hole 2166] Plastic Base Outer Full
' [hole 1556] Plastic Lid Inner Lower
' [hole 2556] Plastic Lid Inner Lower
' [hole 1576] Plastic Lid Inner Upper
' [hole 2576] Plastic Lid Inner Upper
' [hole 1596] Plastic Lid Outer Upper
' [hole 2596] Plastic Lid Outer Upper
' [hole 1598] Plastic Lid Outer Upper Wedge
' [hole 2598] Plastic Lid Outer Upper Wedge
' [hole 1616] Plastic Lid Outer Lower
' [hole 2616] Plastic Lid Outer Lower

cuboid 2   1.6256  -1.6256    22.45  14.9866   207.01  -207.01
cuboid 4   1.8415  -1.8415    22.45  14.7707   207.01  -207.01
wedge 6   1.4018          0   1.4018          414.02          origin  x=-1.4018         y=20.3255 z=-207.01
wedge 8   1.4018          1.4018          1.4018          414.02          origin  x=0 y=20.3255 z=-207.01
cuboid 10   1.4018          -1.4018          20.3255  14.9866   207.01          -207.01
plane 11  zpl=1   origin  x=0 y=0 z=-195.4197
plane 12  zpl=1   origin  x=0 y=0 z=-164.0411
plane 13  zpl=1   origin  x=0 y=0 z=-105.5545
plane 14  zpl=1   origin  x=0 y=0 z=-74.17587
plane 15  zpl=1   origin  x=0 y=0 z=-15.68933
plane 16  zpl=1   origin  x=0 y=0 z=15.68933
plane 17  zpl=1   origin  x=0 y=0 z=74.17587
plane 18  zpl=1   origin  x=0 y=0 z=105.5545
plane 19  zpl=1   origin  x=0 y=0 z=164.0411
plane 20  zpl=1   origin  x=0 y=0 z=195.4197
plane 31  ypl=1   origin  x=0 y=16 z=0
cuboid 32      -17     -30.5      34.5       26   207.01  -207.01   rotate  a1=0 a2=0 a3=20
cuboid 33     30.5        17      34.5       26   207.01  -207.01   rotate  a1=0 a2=0 a3=-20
cuboid 34      3.2        -5      24.5        0   207.01  -207.01   origin  x=-1.828 y=17.942 z=0   rotate  a1=0 a2=0 a
cuboid 35        5      -3.2      24.5        0   207.01  -207.01   origin  x=1.828 y=17.942 z=0   rotate  a1=0 a2=0 a3
cuboid 36       41       -41        22       16   207.01  -207.01
cuboid 580  52.9844  -52.9844  47.1675  -10.1981   207.01  -207.01
cuboid 590  53.2765  -53.2765  47.4596  -10.414   207.01  -207.01
cuboid 600  54.5846  -54.5846  47.4596  -18.034   207.01  -207.01
hole 860  origin x=0          y=12.3577   z=0
hole 900  origin x=19.304     y=1.36501   z=0   rotate  a1=0 a2=0 a3=45
hole 900  origin x=-19.304    y=1.36501   z=0   rotate  a1=0 a2=0 a3=45
hole 300  origin x=-10.73161  y=8.80588   z=0   rotate  a1=0 a2=0 a3=45
hole 300  origin x=10.73161   y=8.80588   z=0   rotate  a1=0 a2=0 a3=-45
hole 310  origin x=-27.39379  y=8.32328   z=0   rotate  a1=0 a2=0 a3=-45
hole 310  origin x=27.39379   y=8.32328   z=0   rotate  a1=0 a2=0 a3=45
```

```
hole 320  origin x=-4.86824   y=25.67904  z=0   rotate  a1=0 a2=0 a3=-45
hole 320  origin x=4.86824    y=25.67904  z=0   rotate  a1=0 a2=0 a3=45
hole 330  origin x=-15.05185  y=31.62397  z=0   rotate  a1=0 a2=0 a3=-45
hole 330  origin x=15.05185   y=31.62397  z=0   rotate  a1=0 a2=0 a3=45
hole 340  origin x=-23.67289  y=30.89657  z=0   rotate  a1=0 a2=0 a3=45
hole 340  origin x=23.67289   y=30.89657  z=0   rotate  a1=0 a2=0 a3=-45
hole 350  origin x=-34.23368  y=24.21537  z=0   rotate  a1=0 a2=0 a3=20
hole 350  origin x=34.23368   y=24.21537  z=0   rotate  a1=0 a2=0 a3=-20
hole 406  origin x=-11.31247  y=7.7778    z=0   rotate  a1=0 a2=0 a3=45
hole 406  origin x=11.31247   y=7.7778    z=0   rotate  a1=0 a2=0 a3=-45
hole 416  origin x=-27.29553  y=7.7778    z=0   rotate  a1=0 a2=0 a3=-45
hole 416  origin x=27.29553   y=7.7778    z=0   rotate  a1=0 a2=0 a3=45
hole 426  origin x=-4.85567   y=26.03286  z=0   rotate  a1=0 a2=0 a3=-45
hole 426  origin x=4.85567    y=26.03286  z=0   rotate  a1=180 a2=0 a3=45
hole 436  origin x=-15.2099   y=32.14842  z=0   rotate  a1=0 a2=0 a3=-45
hole 436  origin x=15.2099    y=32.14842  z=0   rotate  a1=180 a2=0 a3=45
hole 446  origin x=-23.87405  y=31.06181  z=0   rotate  a1=0 a2=0 a3=45
hole 446  origin x=23.87405   y=31.06181  z=0   rotate  a1=180 a2=0 a3=-45
hole 456  origin x=-33.78217  y=24.66807  z=0   rotate  a1=0 a2=0 a3=20
hole 456  origin x=33.78217   y=24.66807  z=0   rotate  a1=180 a2=0 a3=-20
hole 1166 origin x=-10.15323  y=6.61856   z=0   rotate  a1=0 a2=0 a3=45
hole 2166 origin x=10.15323   y=6.61856   z=0   rotate  a1=0 a2=0 a3=-45
hole 1166 origin x=-28.45477  y=6.61856   z=0   rotate  a1=0 a2=0 a3=-45
hole 2166 origin x=28.45477   y=6.61856   z=0   rotate  a1=0 a2=0 a3=45
hole 1556 origin x=-4.63037   y=28.12605  z=0   rotate  a1=0 a2=0 a3=-45
hole 2556 origin x=3.46294    y=26.95862  z=0   rotate  a1=0 a2=0 a3=45
hole 1576 origin x=-17.87625  y=37.13325  z=0   rotate  a1=0 a2=0 a3=-45
hole 2576 origin x=17.87625   y=37.13325  z=0   rotate  a1=0 a2=0 a3=45
hole 1596 origin x=-20.1918   y=37.20396  z=0   rotate  a1=0 a2=0 a3=45
hole 2596 origin x=20.1918    y=37.20396  z=0   rotate  a1=0 a2=0 a3=-45
hole 1598 origin x=-28.09172  y=27.05787  z=-207.01   rotate  a1=0 a2=0 a3=45
hole 2598 origin x=27.11026   y=28.03933  z=-207.01   rotate  a1=0 a2=0 a3=-45
hole 1616 origin x=-29.12357  y=28.13077  z=0   rotate  a1=0 a2=0 a3=20
hole 2616 origin x=29.12357   y=28.13077  z=0   rotate  a1=0 a2=0 a3=-20
media 9 1 32 31
media 9 1 33 31
media 4 1 32 -31
media 4 1 33 -31
media 9 1 34 -4
media 9 1 35 -34 -4
media 9 1 36 -35 -34 -33 -32 -4
media 9 1 4 -11 31
media 4 1 4 -11 -31
media 10 1 4 -2 11 -12
media 8 1 6 11 -12
media 8 1 8 11 -12
media 8 1 10 11 -12
media 9 1 2 -6 -8 -10 11 -12
media 9 1 4 12 -13 31
media 4 1 4 12 -13 -31
media 10 1 4 -2 13 -14
media 8 1 6 13 -14
media 8 1 8 13 -14
media 8 1 10 13 -14
media 9 1 2 -6 -8 -10 13 -14
media 9 1 4 14 -15 31
media 4 1 4 14 -15 -31
media 10 1 4 -2 15 -16
media 8 1 6 15 -16
media 8 1 8 15 -16
media 8 1 10 15 -16
media 9 1 2 -6 -8 -10 15 -16
media 9 1 4 16 -17 31
media 4 1 4 16 -17 -31
media 10 1 4 -2 17 -18
media 8 1 6 17 -18
media 8 1 8 17 -18
media 8 1 10 17 -18
media 9 1 2 -6 -8 -10 17 -18
media 9 1 4 18 -19 31
media 4 1 4 18 -19 -31
media 10 1 4 -2 19 -20
media 8 1 6 19 -20
media 8 1 8 19 -20
media 8 1 10 19 -20
media 9 1 2 -6 -8 -10 19 -20
media 9 1 4 20 31
media 4 1 4 20 -31
media 4 1 580 -32 -33 -34 -35 -36 -4
```

```
hole 320  origin x=-4.86824   y=25.67904  z=0   rotate  a1=0 a2=0 a3=-45
hole 320  origin x=4.86824    y=25.67904  z=0   rotate  a1=0 a2=0 a3=45
hole 330  origin x=-15.05185  y=31.62397  z=0   rotate  a1=0 a2=0 a3=-45
hole 330  origin x=15.05185   y=31.62397  z=0   rotate  a1=0 a2=0 a3=45
hole 340  origin x=-23.67289  y=30.89657  z=0   rotate  a1=0 a2=0 a3=45
hole 340  origin x=23.67289   y=30.89657  z=0   rotate  a1=0 a2=0 a3=-45
hole 350  origin x=-34.23368  y=24.21537  z=0   rotate  a1=0 a2=0 a3=20
hole 350  origin x=34.23368   y=24.21537  z=0   rotate  a1=0 a2=0 a3=-20
hole 406  origin x=-11.31247  y=7.7778    z=0   rotate  a1=0 a2=0 a3=45
hole 406  origin x=11.31247   y=7.7778    z=0   rotate  a1=0 a2=0 a3=-45
hole 416  origin x=-27.29553  y=7.7778    z=0   rotate  a1=0 a2=0 a3=-45
hole 416  origin x=27.29553   y=7.7778    z=0   rotate  a1=0 a2=0 a3=45
hole 426  origin x=-4.85567   y=26.03286  z=0   rotate  a1=0 a2=0 a3=-45
hole 426  origin x=4.85567    y=26.03286  z=0   rotate  a1=180 a2=0 a3=45
hole 436  origin x=-15.2099   y=32.14842  z=0   rotate  a1=0 a2=0 a3=-45
hole 436  origin x=15.2099    y=32.14842  z=0   rotate  a1=180 a2=0 a3=45
hole 446  origin x=-23.87405  y=31.06181  z=0   rotate  a1=0 a2=0 a3=45
hole 446  origin x=23.87405   y=31.06181  z=0   rotate  a1=180 a2=0 a3=-45
hole 456  origin x=-33.78217  y=24.66807  z=0   rotate  a1=0 a2=0 a3=20
hole 456  origin x=33.78217   y=24.66807  z=0   rotate  a1=180 a2=0 a3=-20
hole 1166 origin x=-10.15323  y=6.61856   z=0   rotate  a1=0 a2=0 a3=45
hole 2166 origin x=10.15323   y=6.61856   z=0   rotate  a1=0 a2=0 a3=-45
hole 1166 origin x=-28.45477  y=6.61856   z=0   rotate  a1=0 a2=0 a3=-45
hole 2166 origin x=28.45477   y=6.61856   z=0   rotate  a1=0 a2=0 a3=45
hole 1556 origin x=-4.63037   y=28.12605  z=0   rotate  a1=0 a2=0 a3=-45
hole 2556 origin x=3.46294    y=26.95862  z=0   rotate  a1=0 a2=0 a3=45
hole 1576 origin x=-17.87625  y=37.13325  z=0   rotate  a1=0 a2=0 a3=-45
hole 2576 origin x=17.87625   y=37.13325  z=0   rotate  a1=0 a2=0 a3=45
hole 1596 origin x=-20.1918   y=37.20396  z=0   rotate  a1=0 a2=0 a3=45
hole 2596 origin x=20.1918    y=37.20396  z=0   rotate  a1=0 a2=0 a3=-45
hole 1598 origin x=-28.09172  y=27.05787  z=-207.01   rotate  a1=0 a2=0 a3=45
hole 2598 origin x=27.11026   y=28.03933  z=-207.01   rotate  a1=0 a2=0 a3=-45
hole 1616 origin x=-29.12357  y=28.13077  z=0   rotate  a1=0 a2=0 a3=20
hole 2616 origin x=29.12357   y=28.13077  z=0   rotate  a1=0 a2=0 a3=-20
media 9 1 32 31
media 9 1 33 31
media 4 1 32 -31
media 4 1 33 -31
media 9 1 34 -4
media 9 1 35 -34 -4
media 9 1 36 -35 -34 -33 -32 -4
media 9 1 4 -11 31
media 4 1 4 -11 -31
media 10 1 4 -2 11 -12
media 8 1 6 11 -12
media 8 1 8 11 -12
media 8 1 10 11 -12
media 9 1 2 -6 -8 -10 11 -12
media 9 1 4 12 -13 31
media 4 1 4 12 -13 -31
media 10 1 4 -2 13 -14
media 8 1 6 13 -14
media 8 1 8 13 -14
media 8 1 10 13 -14
media 9 1 2 -6 -8 -10 13 -14
media 9 1 4 14 -15 31
media 4 1 4 14 -15 -31
media 10 1 4 -2 15 -16
media 8 1 6 15 -16
media 8 1 8 15 -16
media 8 1 10 15 -16
media 9 1 2 -6 -8 -10 15 -16
media 9 1 4 16 -17 31
media 4 1 4 16 -17 -31
media 10 1 4 -2 17 -18
media 8 1 6 17 -18
media 8 1 8 17 -18
media 8 1 10 17 -18
media 9 1 2 -6 -8 -10 17 -18
media 9 1 4 18 -19 31
media 4 1 4 18 -19 -31
media 10 1 4 -2 19 -20
media 8 1 6 19 -20
media 8 1 8 19 -20
media 8 1 10 19 -20
media 9 1 2 -6 -8 -10 19 -20
media 9 1 4 20 31
media 4 1 4 20 -31
media 4 1 580 -32 -33 -34 -35 -36 -4
```

```
 media 11 1 -580 590
 media 4 1 -590 600
 boundary 600


'-----------------------------------------------------------------
' Single Package of two fuel assemblies flipped
'--------
unit 1001
com="single container flipped"
 cuboid 600  54.5846  -54.5846  47.4596  -18.034   207.01  -207.01
 hole 1000   origin  x=0 y=29.4256 z=0   rotate  a1=0 a2=0 a3=180
 boundary 600


'-----------------------------------------------------------------
' 3x6x1 Packages of two fuel assemblies flipped
'--------
global unit 2000
com="global unit 2000 references array 2000"
  cuboid 10  545.846        0  523.9488        0   414.02        0
  array 2000 10  place 1 1 1 54.5846 18.034 207.01
  cuboid 20  575.846      -30  553.9488      -30   444.02      -30
  media 9 1 -10 20
  boundary 20
end geometry

read array
'-----------------------------------------------------------------
' Aluminum Door Array
'--------
ara=2 nux=1 nuy=1 nuz=6 typ=square
 fill
  820
  810
  810
  810
  810
  830  end fill


'-----------------------------------------------------------------
' Fuel Rod Array
'--------
ara=1 nux=15 nuy=15 nuz=1 typ=square
 fill
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 30 10 10 30 10 10 10 30 10 10 30 10 10
10 10 10 10 10 10 10 30 10 10 10 10 10 10 10
10 10 10 10 30 10 10 10 10 10 30 10 10 10 10
10 10 30 10 10 10 10 10 10 10 10 10 30 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 30 10 10 10 30 10 10 10 30 10 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 30 10 10 10 10 10 10 10 10 10 30 10 10
10 10 10 10 30 10 10 10 10 10 30 10 10 10 10
10 10 10 10 10 10 10 30 10 10 10 10 10 10 10
10 10 30 10 10 30 10 10 10 30 10 10 30 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
end fill

'-----------------------------------------------------------------
' Boral Base Inner Full
'--------
ara=406 nux=1 nuy=1 nuz=11 typ=square
 fill
  400
  402
  402
  402
  402
  402
  402
  402
  402
  402
  404  end fill
```


```
 media 11 1 -580 590
 media 4 1 -590 600
 boundary 600


'-----------------------------------------------------------------
' Single Package of two fuel assemblies flipped
'--------
unit 1001
com="single container flipped"
 cuboid 600  54.5846  -54.5846  47.4596  -18.034   207.01  -207.01
 hole 1000   origin  x=0 y=29.4256 z=0   rotate  a1=0 a2=0 a3=180
 boundary 600


'-----------------------------------------------------------------
' 3x6x1 Packages of two fuel assemblies flipped
'--------
global unit 2000
com="global unit 2000 references array 2000"
  cuboid 10  545.846        0  523.9488        0   414.02        0
  array 2000 10  place 1 1 1 54.5846 18.034 207.01
  cuboid 20  575.846      -30  553.9488      -30   444.02      -30
  media 9 1 -10 20
  boundary 20
end geometry

read array
'-----------------------------------------------------------------
' Aluminum Door Array
'--------
ara=2 nux=1 nuy=1 nuz=6 typ=square
 fill
  820
  810
  810
  810
  810
  830  end fill


'-----------------------------------------------------------------
' Fuel Rod Array
'--------
ara=1 nux=15 nuy=15 nuz=1 typ=square
 fill
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 30 10 10 30 10 10 10 30 10 10 30 10 10
10 10 10 10 10 10 10 30 10 10 10 10 10 10 10
10 10 10 10 30 10 10 10 10 10 30 10 10 10 10
10 10 30 10 10 10 10 10 10 10 10 10 30 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 30 10 10 10 30 10 10 10 30 10 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 30 10 10 10 10 10 10 10 10 10 30 10 10
10 10 10 10 30 10 10 10 10 10 30 10 10 10 10
10 10 10 10 10 10 10 30 10 10 10 10 10 10 10
10 10 30 10 10 30 10 10 10 30 10 10 30 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
end fill

'-----------------------------------------------------------------
' Boral Base Inner Full
'--------
ara=406 nux=1 nuy=1 nuz=11 typ=square
 fill
  400
  402
  402
  402
  402
  402
  402
  402
  402
  402
  404  end fill
```

```
'-----------------------------------------------------------------
' Boral Base Outer Full
'--------
ara=416 nux=1 nuy=1 nuz=11 typ=square
 fill
  410
  412
  412
  412
  412
  412
  412
  412
  412
  412
  414  end fill

'-----------------------------------------------------------------
' Boral Lid Inner Lower
'--------
ara=426 nux=1 nuy=1 nuz=11 typ=square
 fill
  420
  422
  422
  422
  422
  422
  422
  422
  422
  422
  424  end fill

'-----------------------------------------------------------------
' Boral Lid Inner Upper
'--------
ara=436 nux=1 nuy=1 nuz=11 typ=square
 fill
  430
  432
  432
  432
  432
  432
  432
  432
  432
  432
  434  end fill

'-----------------------------------------------------------------
' Boral Lid Outer Upper
'--------
ara=446 nux=1 nuy=1 nuz=11 typ=square
 fill
  440
  442
  442
  442
  442
  442
  442
  442
  442
  442
  444  end fill

'-----------------------------------------------------------------
' Boral Lid Outer Lower
'--------
ara=456 nux=1 nuy=1 nuz=11 typ=square
 fill
  450
```

```
'-----------------------------------------------------------------
' Boral Base Outer Full
'--------
ara=416 nux=1 nuy=1 nuz=11 typ=square
 fill
  410
  412
  412
  412
  412
  412
  412
  412
  412
  412
  414  end fill

'-----------------------------------------------------------------
' Boral Lid Inner Lower
'--------
ara=426 nux=1 nuy=1 nuz=11 typ=square
 fill
  420
  422
  422
  422
  422
  422
  422
  422
  422
  422
  424  end fill

'-----------------------------------------------------------------
' Boral Lid Inner Upper
'--------
ara=436 nux=1 nuy=1 nuz=11 typ=square
 fill
  430
  432
  432
  432
  432
  432
  432
  432
  432
  432
  434  end fill

'-----------------------------------------------------------------
' Boral Lid Outer Upper
'--------
ara=446 nux=1 nuy=1 nuz=11 typ=square
 fill
  440
  442
  442
  442
  442
  442
  442
  442
  442
  442
  444  end fill

'-----------------------------------------------------------------
' Boral Lid Outer Lower
'--------
ara=456 nux=1 nuy=1 nuz=11 typ=square
 fill
  450
```

```
 452
 452
 452
 452
 452
 452
 452
 452
 452
 454  end fill

'-----------------------------------------------------------------
' Plastic Base Inner Full
'--------
ara=1166 nux=1 nuy=1 nuz=11 typ=square
 fill
 1160
 1162
 1162
 1162
 1162
 1162
 1162
 1162
 1162
 1164  end fill

'-----------------------------------------------------------------
' Plastic Base Inner Full
'--------
ara=2166 nux=1 nuy=1 nuz=11 typ=square
 fill
 2160
 2162
 2162
 2162
 2162
 2162
 2162
 2162
 2162
 2164  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=1176 nux=1 nuy=1 nuz=11 typ=square
 fill
 1170
 1172
 1172
 1172
 1172
 1172
 1172
 1172
 1172
 1174  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=2176 nux=1 nuy=1 nuz=11 typ=square
 fill
 2170
 2172
 2172
 2172
 2172
 2172
 2172
 2172
 2172
```

```
 452
 452
 452
 452
 452
 452
 452
 452
 452
 454  end fill

'-----------------------------------------------------------------
' Plastic Base Inner Full
'--------
ara=1166 nux=1 nuy=1 nuz=11 typ=square
 fill
 1160
 1162
 1162
 1162
 1162
 1162
 1162
 1162
 1162
 1164  end fill

'-----------------------------------------------------------------
' Plastic Base Inner Full
'--------
ara=2166 nux=1 nuy=1 nuz=11 typ=square
 fill
 2160
 2162
 2162
 2162
 2162
 2162
 2162
 2162
 2162
 2164  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=1176 nux=1 nuy=1 nuz=11 typ=square
 fill
 1170
 1172
 1172
 1172
 1172
 1172
 1172
 1172
 1172
 1174  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=2176 nux=1 nuy=1 nuz=11 typ=square
 fill
 2170
 2172
 2172
 2172
 2172
 2172
 2172
 2172
 2172
```

```
 2174  end fill

'-----------------------------------------------------------------
' Plastic Lid Inner Lower
'--------
ara=1556 nux=1 nuy=1 nuz=11 typ=square
 fill
 1550
 1552
 1552
 1552
 1552
 1552
 1552
 1552
 1552
 1552
 1554  end fill

'-----------------------------------------------------------------
' Plastic Lid Inner Lower
'--------
ara=2556 nux=1 nuy=1 nuz=11 typ=square
 fill
 2550
 2552
 2552
 2552
 2552
 2552
 2552
 2552
 2552
 2554  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=1576 nux=1 nuy=1 nuz=11 typ=square
 fill
 1570
 1572
 1572
 1572
 1572
 1572
 1572
 1572
 1572
 1574  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=2576 nux=1 nuy=1 nuz=11 typ=square
 fill
 2570
 2572
 2572
 2572
 2572
 2572
 2572
 2572
 2572
 2574  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Upper
'--------
ara=1596 nux=1 nuy=1 nuz=11 typ=square
 fill
```

```
 2174  end fill

'-----------------------------------------------------------------
' Plastic Lid Inner Lower
'--------
ara=1556 nux=1 nuy=1 nuz=11 typ=square
 fill
 1550
 1552
 1552
 1552
 1552
 1552
 1552
 1552
 1552
 1552
 1554  end fill

'-----------------------------------------------------------------
' Plastic Lid Inner Lower
'--------
ara=2556 nux=1 nuy=1 nuz=11 typ=square
 fill
 2550
 2552
 2552
 2552
 2552
 2552
 2552
 2552
 2552
 2554  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=1576 nux=1 nuy=1 nuz=11 typ=square
 fill
 1570
 1572
 1572
 1572
 1572
 1572
 1572
 1572
 1572
 1574  end fill

'-----------------------------------------------------------------
' Plastic Base Outer Full
'--------
ara=2576 nux=1 nuy=1 nuz=11 typ=square
 fill
 2570
 2572
 2572
 2572
 2572
 2572
 2572
 2572
 2572
 2574  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Upper
'--------
ara=1596 nux=1 nuy=1 nuz=11 typ=square
 fill
```

```
 1590
 1592
 1592
 1592
 1592
 1592
 1592
 1592
 1592
 1592
 1594  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Upper
'--------
ara=2596 nux=1 nuy=1 nuz=11 typ=square
 fill
 2590
 2592
 2592
 2592
 2592
 2592
 2592
 2592
 2592
 2594  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Lower
'--------
ara=1616 nux=1 nuy=1 nuz=11 typ=square
 fill
 1610
 1612
 1612
 1612
 1612
 1612
 1612
 1612
 1612
 1614  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Lower
'--------
ara=2616 nux=1 nuy=1 nuz=11 typ=square
 fill
 2610
 2612
 2612
 2612
 2612
 2612
 2612
 2612
 2612
 2614  end fill

'-----------------------------------------------------------------
' Facility
'--------
ara=2000 nux=5 nuy=8 nuz=1
fill 5r1001
5r1000
5r1001
5r1000
5r1001
5r1000
5r1001
5r1000  end fill
```

```
 1590
 1592
 1592
 1592
 1592
 1592
 1592
 1592
 1592
 1592
 1594  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Upper
'--------
ara=2596 nux=1 nuy=1 nuz=11 typ=square
 fill
 2590
 2592
 2592
 2592
 2592
 2592
 2592
 2592
 2592
 2594  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Lower
'--------
ara=1616 nux=1 nuy=1 nuz=11 typ=square
 fill
 1610
 1612
 1612
 1612
 1612
 1612
 1612
 1612
 1612
 1614  end fill

'-----------------------------------------------------------------
' Plastic Lid Outer Lower
'--------
ara=2616 nux=1 nuy=1 nuz=11 typ=square
 fill
 2610
 2612
 2612
 2612
 2612
 2612
 2612
 2612
 2612
 2614  end fill

'-----------------------------------------------------------------
' Facility
'--------
ara=2000 nux=5 nuy=8 nuz=1
fill 5r1001
5r1000
5r1001
5r1000
5r1001
5r1000
5r1001
5r1000  end fill
```

```
end array
'read bnds
'     XFC=periodic
'     YFC=periodic
'     +ZB=h2o
'     -ZB=conc-4
'   end bnds

read start
 nst=1
end start


end data
end
!eof
nice -30 scale44a -o  this_case
```

MAP12_0.05_1_.in - MAP12_0_1_.in

```
end array
'read bnds
'     XFC=periodic
'     YFC=periodic
'     +ZB=h2o
'     -ZB=conc-4
'   end bnds

read start
 nst=1
end start


end data
end
!eof
nice -30 scale44a -o  this_case
```