# SELECTED NUCLEAR PARAMETERS

# FOR

# LABORATORY CRITICAL EXPERIMENTS

# AND

# COMMERCIAL REACTOR CRITICALS

**Date: November 1998**

9906100162 990608
PDR WASTE
WM-11 PDR
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## Pu & U Laboratory Critical Experiments

| Experiment | C (g Pu/l) | (g U/l) | E (wt% Pu-239) | Geom. | Refl. | Mixed Pu & U Reference |
|---|---|---|---|---|---|---|
| PNL1783 | 173.22 | 262.88 | 91.118 | Cylinder; D=35.39 cm; H=30.60 cm | Concrete | MIX-SOL-THERM-004 |
| PNL1868 | 118.71 | 173.98 | 91.118 | Cylinder; D=35.39 cm; H=27.03 cm | Concrete | MIX-SOL-THERM-004 |
| PNL2767 | 41.83 | 63.55 | 91.118 | Cylinder; D=35.39 cm; H=29.36 cm | Concrete | MIX-SOL-THERM-004 |
| PNL1577 | 172.56 | 262.79 | 91.118 | Cylinder; D=35.39 cm; H=57.97 cm | None | MIX-SOL-THERM-004 |
| PNL2070 | 118.9 | 174.53 | 91.118 | Cylinder; D=35.39 cm; H=41.08 cm | None | MIX-SOL-THERM-004 |
| PNL2565 | 41.69 | 63.38 | 91.118 | Cylinder; D=35.39 cm; H=44.46 cm | None | MIX-SOL-THERM-004 |
| PNL1158 | 11.83 | 11.05 | 91.102 | Cylinder; D=68.68 cm; H=76.80 cm | Water | MIX-SOL-THERM-002 |
| PNL1159 | 11.73 | 10.78 | 91.102 | Cylinder; D=68.68 cm; H=83.14 cm | Water | MIX-SOL-THERM-002 |
| PNL1161 | 12.19 | 41.04 | 91.102 | Cylinder; D=68.68 cm; H=81.72 cm | Water | MIX-SOL-THERM-002 |
| PNL1678 | 172.56 | 262.79 | 91.118 | Cylinder; D=35.39 cm; H=28.93 cm | Water | MIX-SOL-THERM-004 |
| PNL1969 | 119.04 | 174.67 | 91.118 | Cylinder; D=35.39 cm; H=25.26 cm | Water | MIX-SOL-THERM-004 |
| PNL2666 | 41.89 | 63.65 | 91.118 | Cylinder; D=35.39 cm; H=28.11 cm | Water | MIX-SOL-THERM-004 |
| PNL3187 | 102.19 | 365.2 | 91.118 | Annulus; H=48.55 cm | Water | MIX-SOL-THERM-001 |
| PNL3391 | 103.37 | 363.66 | 91.118 | Annulus; H=27.67 cm | Water | MIX-SOL-THERM-001 |
| PNL3492 | 103.37 | 363.66 | 91.117 | Annulus; H=37.19 cm | Water | MIX-SOL-THERM-001 |
| PNL3593 | 107.91 | 379.55 | 91.117 | Annulus; H=51.10 cm | Water | MIX-SOL-THERM-001 |
| PNL3694 | 102.19 | 365.2 | 91.117 | Annulus; H=32.86 cm | Water | MIX-SOL-THERM-001 |

| Experiment | C (g Pu/l) | C (g U/l) | E (wt% Pu-239) | Geom. | Refl. | Mixed Pu & U Reference |
|---|---|---|---|---|---|---|
| PNL3795 | 102.19 | 365.2 | 91.572 | Annulus; H=27.51 cm | Water | MIX-SOL-THERM-001 |
| PNL3808 | 102.19 | 365.2 | 91.117 | Annulus; H=45.09 cm | Water | MIX-SOL-THERM-001 |
| PNL3896 | 102.19 | 365.2 | 91.572 | Annulus; H=25.69 cm | Water | MIX-SOL-THERM-001 |
| PNL3897 | 102.19 | 365.2 | 91.572 | Annulus; H=28.94 cm | Water | MIX-SOL-THERM-001 |
| PNL3898 | 102.19 | 365.2 | 91.117 | Annulus; H=39.58 cm | Water | MIX-SOL-THERM-001 |
| PNL3999 | 102.19 | 365.2 | 91.117 | Annulus; H=79.18 cm | Water | MIX-SOL-THERM-001 |
| PNL5300 | 102.19 | 365.2 | 91.117 | Annulus; H=104.62 cm | Water | MIX-SOL-THERM-001 |
| AWRE1 | 101.3 | 228.5 | 93.95 | Cylinder; D=25.425 cm; H=56.31 cm | Water/Poly | MIX-SOL-THERM-003 |
| AWRE2 | 101.3 | 228.5 | 93.95 | Cylinder; D=30.62 cm; H=29.89 cm | Water/Poly | MIX-SOL-THERM-003 |
| AWRE3 | 101.3 | 228.5 | 93.95 | Cylinder; D=37.99 cm; H=21.17 cm | Water/Poly | MIX-SOL-THERM-003 |
| AWRE4 | 101.3 | 228.5 | 93.95 | Cylinder; D=50.72 cm; H=16.05 cm | Water/Poly | MIX-SOL-THERM-003 |
| AWRE5 | 31.58 | 71.3 | 93.95 | Cylinder; D=30.62 cm; H=46.18 cm | Water/Poly | MIX-SOL-THERM-003 |
| AWRE6 | 31.58 | 71.3 | 93.95 | Cylinder; D=37.99 cm; H=28.24 cm | Water/Poly | MIX-SOL-THERM-003 |
| AWRE7 | 31.58 | 71.3 | 93.95 | Cylinder; D=50.72 cm; H=20.39 cm | Water/Poly | MIX-SOL-THERM-003 |
| AWRE8 | 18.61 | 42.2 | 93.95 | Cylinder; D=37.99 cm; H=72.86 cm | Water/Poly | MIX-SOL-THERM-003 |
| AWRE9 | 18.61 | 42.2 | 93.95 | Cylinder; D=50.72 cm; H=33.59 cm | Water/Poly | MIX-SOL-THERM-003 |
| AWRE10 | 17.5 | 39.6 | 93.95 | Cylinder; D=50.72 cm; H=37.16 cm | Water/Poly | MIX-SOL-THERM-003 |

## Pu Laboratory Critical Experiments

| Experiment | C (g Pu/l) | E (wt% Pu-239) | Geom. | Refl. | Pu Reference |
|---|---|---|---|---|---|
| PUST1T1 | 73 | 95 | Sphere; D=29.21 cm | Water | PU-SOL-THERM-001 |
| PUST1T2 | 96 | 95 | Sphere; D=29.21 cm | Water | PU-SOL-THERM-001 |
| PUST1T3 | 119 | 95 | Sphere; D=29.21 cm | Water | PU-SOL-THERM-001 |
| PUST1T4 | 132 | 95 | Sphere; D=29.21 cm | Water | PU-SOL-THERM-001 |
| PUST1T5 | 140 | 95 | Sphere; D=29.21 cm | Water | PU-SOL-THERM-001 |
| PUST1T6 | 267.8 | 95 | Sphere; D=29.21 cm | Water | PU-SOL-THERM-001 |
| PU003-1 | 33.32 | 98.24 | Sphere; D=33.0 cm | Water | PU-SOL-THERM-003 |
| PU003-2 | 34.32 | 98.24 | Sphere; D=33.0 cm | Water | PU-SOL-THERM-003 |
| PU003-3 | 37.43 | 96.88 | Sphere; D=33.0 cm | Water | PU-SOL-THERM-003 |
| PU003-4 | 38.12 | 96.88 | Sphere; D=33.0 cm | Water | PU-SOL-THERM-003 |
| PU003-5 | 40.65 | 96.88 | Sphere; D=33.0 cm | Water | PU-SOL-THERM-003 |
| PU003-6 | 44.09 | 9688 | Sphere; D=33.0 cm | Water | PU-SOL-THERM-003 |
| PU003-7 | 35.98 | 96.88 | Sphere; D=33.0 cm | Water | PU-SOL-THERM-003 |
| PU003-8 | 36.81 | 96.88 | Sphere; D=33.0 cm | Water | PU-SOL-THERM-003 |
| PU004-1 | 26.27 | 99.46 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-004 |
| PU004-2 | 26.31 | 99.46 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-004 |
| PU004-3 | 27.2 | 99.46 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-004 |
| PU004-4 | 28.09 | 99.46 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-004 |
| PU004-5 | 27.58 | 98.24 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-004 |
| PU004-6 | 28.6 | 96.88 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-004 |
| PU004-7 | 29.57 | 96.88 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-004 |
| PU004-8 | 29.95 | 9688 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-004 |
| PU004-9 | 31.6 | 96.88 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-004 |

| Experiment | C (g Pu/l) | E (wt% Pu-239) | Geom. | Refl. | Pu Reference |
|---|---|---|---|---|---|
| PU04-10 | 35.36 | 96.88 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-004 |
| PU04-11 | 39.38 | 96.88 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-004 |
| PU04-12 | 29.44 | 96.88 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-004 |
| PU04-13 | 29.27 | 96.57 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-004 |
| PU005-1 | 29.65 | 95.95 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-005 |
| PU005-2 | 30.54 | 95.95 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-005 |
| PU005-3 | 31.43 | 95.95 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-005 |
| PU005-4 | 33.54 | 95.95 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-005 |
| PU005-5 | 36.04 | 95.95 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-005 |
| PU005-6 | 38.49 | 95.95 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-005 |
| PU005-7 | 40.91 | 95.95 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-005 |
| PU005-8 | 30.58 | 95.6 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-005 |
| PU005-9 | 31.85 | 95.6 | Sphere; D=35.56 cm | Water | PU-SOL-THERM-005 |
| PU007-2 | 232 | 95.01 | Sphere; D=29.21 cm; H=10.84 cm | Water | PU-SOL-THERM-007 (H=Height above center) |
| PU007-3 | 221 | 95.01 | Sphere; D=29.21 cm; H=10.84 cm | Water | PU-SOL-THERM-007 (H=Height above center) |
| PU007-5 | 100.2 | 95.01 | Sphere; D=29.21 cm; H=10.97 cm | Water | PU-SOL-THERM-007 (H=Height above center) |
| PU007-6 | 101.5 | 95.01 | Sphere; D=29.21 cm; H=10.67 cm | Water | PU-SOL-THERM-007 (H=Height above center) |
| PU007-7 | 100.1 | 95.01 | Sphere; D=29.21 cm; H=10.97 cm | Water | PU-SOL-THERM-007 (H=Height above center) |
| PU007-8 | 101.6 | 95.01 | Sphere; D=29.21 cm; H=10.91 cm | Water | PU-SOL-THERM-007 (H=Height above center) |
| PU007-9 | 101.6 | 95.01 | Sphere; D=29.21 cm; H=10.45 cm | Water | PU-SOL-THERM-007 (H=Height above center) |

| Experiment | C (g Pu/l) | E (wt% Pu-239) | Geom. | Refl. | Pu Reference |
|---|---|---|---|---|---|
| PU07-10 | 93.5 | 95.01 | Sphere; D=29.21 cm; H=10.84 cm | Water | PU-SOL-THERM-007 (H=Height above center) |
| PUST9-1 | 10.02 | 97.386 | Sphere; D=121.92 cm; H=15.96 cm | None | PU-SOL-THERM-009 (H=Height above center) |
| PUST9-2 | 9.539 | 97.386 | Sphere; D=121.92 cm; H=45.37 cm | None | PU-SOL-THERM-009 (H=Height above center) |
| PUST9-3 | 9.457 | 97.386 | Sphere; D=121.92 cm; H=Full | None | PU-SOL-THERM-009 (H=Height above center) |
| PU10091 | 99.09 | 97.15 | Cylinder; D=22.85 cm; H=30.71 cm | Water | PU-SOL-THERM-010 |
| PU10092 | 73.92 | 97.15 | Cylinder; D=22.85 cm; H=35.41 cm | Water | PU-SOL-THERM-010 |
| PU10093 | 54.53 | 97.15 | Cylinder; D=22.85 cm; H=44.58 cm | Water | PU-SOL-THERM-010 |
| PU10111 | 54.53 | 97.15 | Cylinder; D=27.94 cm; H=25.60 cm | Water | PU-SOL-THERM-010 |
| PU10112 | 47.27 | 97.15 | Cylinder; D=27.94 cm; H=28.17 cm | Water | PU-SOL-THERM-010 |
| PU10113 | 47.21 | 97.15 | Cylinder; D=27.94 cm; H=27.08 cm | Water | PU-SOL-THERM-010 |
| PU10114 | 41.73 | 97.15 | Cylinder; D=27.94 cm; H=32.64 cm | Water | PU-SOL-THERM-010 |
| PU10115 | 36.9 | 97.15 | Cylinder; D=27.94 cm; H=43.00 cm | Water | PU-SOL-THERM-010 |
| PU10116 | 63.99 | 97.1 | Cylinder; D=27.94 cm; H=22.81 cm | Water | PU-SOL-THERM-010 |
| PU10117 | 48.98 | 97.1 | Cylinder; D=27.94 cm; H=25.96 cm | Water | PU-SOL-THERM-010 |
| PU10121 | 48.75 | 97.1 | Cylinder; D=30.48 cm; H=22.35 cm | Water | PU-SOL-THERM-010 |
| PU10122 | 42.29 | 97.1 | Cylinder; D=30.48 cm; H=25.25 cm | Water | PU-SOL-THERM-010 |

| Experiment | C (g Pu/l) | E (wt% Pu-239) | Geom. | Refl. | Pu Reference |
|---|---|---|---|---|---|
| PU10123 | 36.52 | 97.1 | Cylinder; D=30.48 cm; H=28.47 cm | Water | PU-SOL-THERM-010 |
| PU10124 | 31.14 | 97.1 | Cylinder; D=30.48 cm; H=33.43 cm | Water | PU-SOL-THERM-010 |
| PU11161 | 34.96 | 95.83 | Sphere; D=40.24 cm | None | PU-SOL-THERM-011 |
| PU11162 | 36.22 | 95.83 | Sphere; D=40.24 cm | None | PU-SOL-THERM-011 |
| PU11163 | 38.13 | 95.83 | Sphere; D=40.24 cm | None | PU-SOL-THERM-011 |
| PU11164 | 38.16 | 95.83 | Sphere; D=40.24 cm | None | PU-SOL-THERM-011 |
| PU11165 | 43.43 | 95.83 | Sphere; D=40.24 cm | None | PU-SOL-THERM-011 |
| PU11181 | 22.35 | 95.8 | Sphere; D=45.39 cm | None | PU-SOL-THERM-011 |
| PU11182 | 23.27 | 95.8 | Sphere; D=45.39 cm | None | PU-SOL-THERM-011 |
| PU11183 | 23.1 | 95.8 | Sphere; D=45.39 cm | None | PU-SOL-THERM-011 |
| PU11184 | 23.82 | 95.8 | Sphere; D=45.39 cm | None | PU-SOL-THERM-011 |
| PU11185 | 25.2 | 95.8 | Sphere; D=45.39 cm | None | PU-SOL-THERM-011 |
| PU11186 | 27.49 | 95.8 | Sphere; D=45.39 cm | None | PU-SOL-THERM-011 |
| PU11187 | 23.94 | 95.8 | Sphere; D=45.39 cm | None | PU-SOL-THERM-011 |

## HEU Laboratory Critical Experiments

| Input ID | C (g U/l) | E (wt% U-235) | Geom. | Refl. | HEU Reference |
|---|---|---|---|---|---|
| HEST1-1 | 145.68 | 93.172 | Cylinder; D=27.92 cm; H=31.20 cm | Minimal 304 St.St. | HEU-SOL-THERM-001 |
| HEST1-2 | 346.73 | 93.172 | Cylinder; D=27.92 cm; H=28.93 cm | Minimal 304 St.St. | HEU-SOL-THERM-001 |
| HEST1-3 | 142.92 | 93.172 | Cylinder; D=28.01 cm; H=33.55 cm | Minimal Al-6061 | HEU-SOL-THERM-001 |
| HEST1-4 | 357.71 | 93.172 | Cylinder; D=28.01 cm; H=30.91 cm | Minimal Al-6061 | HEU-SOL-THERM-001 |
| HEST1-5 | 54.89 | 93.172 | Cylinder; D=33.01 cm; H=39.48 cm | Minimal Al-6061 | HEU-SOL-THERM-001 |
| HEST1-6 | 59.65 | 93.172 | Cylinder; D=33.01 cm; H=36.67 cm | Minimal Al-6061 | HEU-SOL-THERM-001 |
| HEST1-7 | 137.4 | 93.172 | Cylinder; D=33.01 cm; H=23.96 cm | Minimal Al-6061 | HEU-SOL-THERM-001 |
| HEST1-8 | 145.68 | 93.172 | Cylinder; D=33.01 cm; H=23.67 cm | Minimal Al-6061 | HEU-SOL-THERM-001 |
| HEST1-9 | 357.71 | 93.172 | Cylinder; D=33.01 cm; H=22.53 cm | Minimal Al-6061 | HEU-SOL-THERM-001 |
| HEST110 | 63.95 | 93.172 | Cylinder; D=50.69 cm; H=20.48 cm | Minimal Al-6061 | HEU-SOL-THERM-001 |
| HEST2-1 | 144.38 | 93.172 | Cylinder; D=27.92 cm; H=29.79 cm | Concrete | HEU-SOL-THERM-002 |
| HEST2-2 | 144.38 | 93.172 | Cylinder; D=27.92 cm; H=24.19 cm | Concrete | HEU-SOL-THERM-002 |
| HEST2-3 | 334.77 | 93.172 | Cylinder; D=27.92 cm; H=27.23 cm | Concrete | HEU-SOL-THERM-002 |
| HEST2-4 | 334.77 | 93.172 | Cylinder; D=27.92 cm; H=21.79 cm | Concrete | HEU-SOL-THERM-002 |
| HEST2-5 | 144.38 | 93.172 | Cylinder; D=28.01 cm; H=31.37 cm | Concrete | HEU-SOL-THERM-002 |

| Input ID | C (g U/l) | E (wt% U-235) | Geom. | Refl. | HEU Reference |
|---|---|---|---|---|---|
| HEST2-6 | 144.38 | 93.172 | Cylinder; D=28.01 cm; H=24.70 cm | Concrete | HEU-SOL-THERM-002 |
| HEST2-7 | 334.77 | 93.172 | Cylinder; D=28.01 cm; H=28.60 cm | Concrete | HEU-SOL-THERM-002 |
| HEST2-8 | 334.77 | 93.172 | Cylinder; D=28.01 cm; H=22.33 cm | Concrete | HEU-SOL-THERM-002 |
| HEST2-9 | 59.65 | 93.172 | Cylinder; D=33.01 cm; H=34.10 cm | Concrete | HEU-SOL-THERM-002 |
| HEST210 | 59.65 | 93.172 | Cylinder; D=33.01 cm; H=27.27 cm | Concrete | HEU-SOL-THERM-002 |
| HEST211 | 144.38 | 93.172 | Cylinder; D=33.01 cm; H=22.85 cm | Concrete | HEU-SOL-THERM-002 |
| HEST212 | 144.38 | 93.172 | Cylinder; D=33.01 cm; H=18.24 cm | Concrete | HEU-SOL-THERM-002 |
| HEST213 | 334.77 | 93.172 | Cylinder; D=33.01 cm; H=21.50 cm | Concrete | HEU-SOL-THERM-002 |
| HEST214 | 334.77 | 93.172 | Cylinder; D=33.01 cm; H=16.78 cm | Concrete | HEU-SOL-THERM-002 |
| HEUST31 | 60.32 | 93.172 | Cylinder; D=27.93 cm; H=50.52 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEUST32 | 60.32 | 93.172 | Cylinder; D=27.93 cm; H=67.48 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEUST33 | 147.66 | 93.172 | Cylinder; D=27.92 cm; H=29.71 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEUST34 | 147.66 | 93.172 | Cylinder; D=27.92 cm; H=25.03 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEUST35 | 345.33 | 93.172 | Cylinder; D=27.92 cm; H=27.60 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEUST36 | 345.33 | 93.172 | Cylinder; D=27.92 cm; H=22.75 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEUST37 | 60.32 | 93.172 | Cylinder; D=27.88 cm; H=51.67 cm | Plexiglass | HEU-SOL-THERM-003 |

| Input ID | C (g U/l) | E (wt% U-235) | Geom. | Refl. | HEU Reference |
|---|---|---|---|---|---|
| HEUST38 | 147.66 | 93.172 | Cylinder; D=28.01 cm; H=31.26 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEUST39 | 147.66 | 93.172 | Cylinder; D=28.01 cm; H=25.26 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEST310 | 345.33 | 93.172 | Cylinder; D=28.01 cm; H=28.84 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEST311 | 345.33 | 93.172 | Cylinder; D=28.01 cm; H=22.87 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEST312 | 60.32 | 93.172 | Cylinder; D=33.01 cm; H=34.33 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEST313 | 60.32 | 93.172 | Cylinder; D=33.01 cm; H=27.70 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEST314 | 60.32 | 93.172 | Cylinder; D=33.01 cm; H=31.75 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEST315 | 66.33 | 93.172 | Cylinder; D=33.01 cm; H=25.10 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEST316 | 147.66 | 93.172 | Cylinder; D=33.01 cm; H=22.78 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEST317 | 147.66 | 93.172 | Cylinder; D=33.01 cm; H=18.49 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEST318 | 345.33 | 93.172 | Cylinder; D=33.01 cm; H=21.76 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEST319 | 345.33 | 93.172 | Cylinder; D=33.01 cm; H=17.20 cm | Plexiglass | HEU-SOL-THERM-003 |
| HEUST71 | 67.28 | 93.172 | Cylinder (4x4); D=21.12 cm; H=28.63 cm | Concrete & 304 St.St. | HEU-SOL-THERM-007 |
| HEUST72 | 369.96 | 93.172 | Cylinder (4x4); D=21.12 cm; H=17.24 cm | Concrete & 304 St.St. | HEU-SOL-THERM-007 |
| HEUST73 | 67.28 | 93.172 | Cylinder (4x4); D=21.12 cm; H=27.15 cm | Concrete | HEU-SOL-THERM-007 |

| Input ID | C (g U/l) | E (wt% U-235) | Geom. | Refl. | HEU Reference |
|---|---|---|---|---|---|
| HEUST74 | 364.11 | 93.172 | Cylinder (4x4); D=21.12 cm; H=17.13 cm | Concrete | HEU-SOL-THERM-007 |
| HEUST75 | 76.09 | 93.172 | Cylinder (2x2); D=21.12 cm; H=60.70 cm | Concrete & 304 St.St. | HEU-SOL-THERM-007 |
| HEUST76 | 360.37 | 93.172 | Cylinder (2x2); D=21.12 cm; H=29.49 cm | Concrete & 304 St.St. | HEU-SOL-THERM-007 |
| HEUST77 | 76.09 | 93.172 | Cylinder (2x2); D=21.12 cm; H=62.34 cm | Concrete | HEU-SOL-THERM-007 |
| HEUST78 | 364.11 | 93.172 | Cylinder (2x2); D=21.12 cm; H=31.11 cm | Concrete | HEU-SOL-THERM-007 |
| HEUST79 | 80.72 | 93.172 | Cylinder (2x2); D=21.12 cm; H=57.88 cm | Concrete | HEU-SOL-THERM-007 |
| HEST710 | 83.49 | 93.172 | Cylinder (4x4); D=16.12 cm; H=57.34 cm | Concrete & 304 St.St. | HEU-SOL-THERM-007 |
| HEST711 | 360.37 | 93.172 | Cylinder (4x4); D=16.12 cm; H=32.32 cm | Concrete & 304 St.St. | HEU-SOL-THERM-007 |
| HEST712 | 83.49 | 93.172 | Cylinder (4x4); D=16.12 cm; H=51.21 cm | Concrete | HEU-SOL-THERM-007 |
| HEST713 | 359.55 | 93.172 | Cylinder (4x4); D=16.12 cm; H=31.82 cm | Concrete | HEU-SOL-THERM-007 |
| HEST714 | 359.55 | 93.172 | Cylinder (2x4); D=16.12 cm; H=51.45 cm | Concrete | HEU-SOL-THERM-007 |
| HEST715 | 359.55 | 93.172 | Cylinder (2x3); D=16.12 cm; H=65.49 cm | Concrete | HEU-SOL-THERM-007 |

| Input ID | C (g U/l) | E (wt% U-235) | Geom. | Refl. | HEU Reference |
|---|---|---|---|---|---|
| HEST716 | 359.55 | 93.172 | Cylinder (2x2); D=16.12 cm; H=101.45 cm | Concrete & 304 St.St. | HEU-SOL-THERM-007 |
| HEST717 | 359.55 | 93.172 | Cylinder (2x2); D=16.12 cm; H=104.04 cm | Concrete | HEU-SOL-THERM-007 |
| HEUST81 | 60.32 | 93.172 | Cylinder (4x4); D=21.12 cm; H=34.82 cm | Plexiglass & 304 St.St. | HEU-SOL-THERM-008 |
| HEUST83 | 60.32 | 93.172 | Cylinder (4x4); D=21.12 cm; H=31.76 cm | Plexiglass | HEU-SOL-THERM-008 |
| HEUST86 | 355.94 | 93.172 | Cylinder (2x2); D=21.12 cm; H=31.93 cm | Plexiglass & 304 St.St. | HEU-SOL-THERM-008 |
| HEUST89 | 60.35 | 93.172 | Cylinder (4x4); D=16.12 cm; H=105.85 cm | Plexiglass & 304 St.St. | HEU-SOL-THERM-008 |
| HEST813 | 355.94 | 93.172 | Cylinder (2x3); D=16.12 cm; H=95.20 cm | Plexiglass & 304 St.St. | HEU-SOL-THERM-008 |
| HEST131 | 20.12 w/ 0.0 g B/l | 93.2 | Sphere; D=69.2 | None | HEU-SOL-THERM-013 |
| HEST132 | 25.53 w/ 0.09 g B/l | 93.2 | Sphere; D=69.2 | None | HEU-SOL-THERM-013 |
| HEST133 | 26.77 w/ 0.19 g B/l | 93.2 | Sphere; D=69.2 | None | HEU-SOL-THERM-013 |
| HEST134 | 28.45 w/ 0.23 g B/l | 93.2 | Sphere; D=69.2 | None | HEU-SOL-THERM-013 |
| HEST141 | 70.0 w/ 0.0 g Gd/l | 89.04 | Cylinder; D=40 cm; H=19.3 cm | Water | HEU-SOL-THERM-014 |
| HEST142 | 68.8 w/ 0.1 g Gd/l | 89.04 | Cylinder; D=40 cm; H=27.4 cm | Water | HEU-SOL-THERM-014 |
| HEST143 | 67.7 w/ 0.19 g Gd/l | 89.04 | Cylinder; D=40 cm; H=44.6 cm | Water | HEU-SOL-THERM-014 |
| HEST151 | 100.5 w/ 0.0 g Gd/l | 89.04 | Cylinder; D=40 cm; H=18.7 cm | Water; H=15.1 cm | HEU-SOL-THERM-015 |

| Input ID | C (g U/l) | E (wt% U-235) | Geom. | Refl. | HEU Reference |
|---|---|---|---|---|---|
| HEST152 | 100.5 w/ 0.0 g Gd/l | 89.04 | Cylinder; D=40 cm; H=16.6 cm | Water; H=45.0 cm | HEU-SOL-THERM-015 |
| HEST153 | 98.8 w/ 0.20 g Gd/l | 89.04 | Cylinder; D=40 cm; H=29.9 cm | Water; H=17.0 cm | HEU-SOL-THERM-015 |
| HEST154 | 98.8 w/ 0.20 g Gd/l | 89.04 | Cylinder; D=40 cm; H=25.8 cm | Water; H=45.0 cm | HEU-SOL-THERM-015 |
| HEST155 | 95.2 w/ 0.40 g Gd/l | 89.04 | Cylinder; D=40 cm; H=51.2 cm | Water; H=47.0 cm | HEU-SOL-THERM-015 |
| HEST161 | 156.5 w/ 0.0 g Gd/l | 89.04 | Cylinder; D=40 cm; H=15.1 cm | Water | HEU-SOL-THERM-016 |
| HEST162 | 143.6 w/ 0.30 g Gd/l | 89.04 | Cylinder; D=40 cm; H=22.1 cm | Water | HEU-SOL-THERM-016 |
| HEST163 | 144.2 w/ 0.53 g Gd/l | 89.04 | Cylinder; D=40 cm; H=33.0 cm | Water | HEU-SOL-THERM-016 |
| HEST171 | 202.4 w/ 0.0 g Gd/l | 89.04 | Cylinder; D=12.4 cm; H=22.6 cm | Water; H=21.6 cm | HEU-SOL-THERM-017 |
| HEST172 | 202.4 w/ 0.0 g Gd/l | 89.04 | Cylinder; D=20 cm; H=15.6 cm | None | HEU-SOL-THERM-017 |
| HEST173 | 202.4 w/ 0.0 g Gd/l | 89.04 | Cylinder; D=20 cm; H=14.3 cm | Water; H=16.3 cm | HEU-SOL-THERM-017 |
| HEST174 | 196.2 w/ 0.30 g Gd/l | 89.04 | Cylinder; D=12.4 cm; H=34.8 cm | Water; H=45.4 cm | HEU-SOL-THERM-017 |
| HEST175 | 192 w/ 0.50 g Gd/l | 89.04 | Cylinder; D=12.4 cm; H=64.2 cm | Water; H=71.5 cm | HEU-SOL-THERM-017 |
| HEST176 | 192 w/ 0.50 g Gd/l | 89.04 | Cylinder; D=40 cm; H=25.7 cm | None | HEU-SOL-THERM-017 |
| HEST177 | 192 w/ 0.50 g Gd/l | 89.04 | Cylinder; D=20 cm; H=22.1 cm | Water; H=46.4 cm | HEU-SOL-THERM-017 |
| HEST178 | 186.2 w/ 0.79 g Gd/l | 89.04 | Cylinder; D=20 cm; H=37.7 cm | None | HEU-SOL-THERM-017 |
| HEST181 | 300.0 w/ 0.0 g Gd/l | 89.04 | Cylinder; D=12.4 cm; H=21.7 cm | Water; H=21.6 cm | HEU-SOL-THERM-018 |

| Input ID | C (g U/l) | E (wt% U-235) | Geom. | Refl. | HEU Reference |
|---|---|---|---|---|---|
| HEST182 | 300.0 w/ 0.0 g Gd/l | 89.04 | Cylinder; D=20 cm; H=15.5 cm | None | HEU-SOL-THERM-018 |
| HEST183 | 300.0 w/ 0.0 g Gd/l | 89.04 | Cylinder; D=20 cm; H=14.3 cm | Water; H=14.3 cm | HEU-SOL-THERM-018 |
| HEST184 | 291.3 w/ 0.5 g Gd/l | 89.04 | Cylinder; D=12.4 cm; H=34.8 cm | Water; H=45.4 cm | HEU-SOL-THERM-018 |
| HEST185 | 291.3 w/ 0.5 g Gd/l | 89.04 | Cylinder; D=20 cm; H=20.2 cm | None | HEU-SOL-THERM-018 |
| HEST186 | 291.3 w/ 0.5 g Gd/l | 89.04 | Cylinder; D=20 cm; H=17.9 cm | Water; H=21.4 cm | HEU-SOL-THERM-018 |
| HEST187 | 283.3 w/ 0.5 g Gd/l | 89.04 | Cylinder; D=12.4 cm; H=83.2 cm | Water; H=81.1 cm | HEU-SOL-THERM-018 |
| HEST188 | 283.3 w/ 0.98 g Gd/l | 89.04 | Cylinder; D=20 cm; H=28.1 cm | None | HEU-SOL-THERM-018 |
| HEST189 | 283.3 w/ 0.98 g Gd/l | 89.04 | Cylinder; D=20 cm; H=23.3 cm | Water; H=31.2 cm | HEU-SOL-THERM-018 |
| HST1810 | 285.3 w/ 1.4 g Gd/l | 89.04 | Cylinder; D=20 cm; H=41.4 cm | None | HEU-SOL-THERM-018 |
| HST1811 | 285.3 w/ 1.4 g Gd/l | 89.04 | Cylinder; D=20 cm; H=31.5 cm | Water; H=55.4 cm | HEU-SOL-THERM-018 |
| HST1812 | 279.6 w/ 1.9 g Gd/l | 89.04 | Cylinder; D=20 cm; H=48.8 cm | Water; H=59.4 cm | HEU-SOL-THERM-018 |
| HEST191 | 447.3 w/ 0.0 g Gd/l | 89.04 | Cylinder; D=12.4 cm; H=22.6 cm | Water; H=21.6 cm | HEU-SOL-THERM-019 |
| HEST192 | 393.6 w/ 0.65 g Gd/l | 89.04 | Cylinder; D=12.4 cm; H=31.5 cm | Water; H=42.4 cm | HEU-SOL-THERM-019 |
| HEST193 | 400.0 w/ 1.16 g Gd/l | 89.04 | Cylinder; D=12.4 cm; H=45.5 cm | Water; H=59.4 cm | HEU-SOL-THERM-019 |

## LEU Laboratory Critical Experiments

| Input ID | C (g U/l) | E (wt% U-235) | Geom. | Refl. | LEU Reference |
|---|---|---|---|---|---|
| LEUJA01 | 310.1 | 9.97 | Cylinder; D=59.0 cm; H=41.53 cm | Water | Ref. 2 |
| LEUJA14 | 313 | 9.97 | Cylinder; D=59.0 cm; H=46.83 cm | None | Ref. 2 |
| LEUJA29 | 290.4 | 9.97 | Cylinder; D=59.0 cm; H=46.70 cm | Water | Ref. 2 |
| LEUJA30 | 290.7 | 9.97 | Cylinder; D=59.0 cm; H=54.2 cm | None | Ref. 2 |
| LEUJA32 | 270 | 9.97 | Cylinder; D=59.0 cm; H=63.55 cm | None | Ref. 2 |
| LEUJA33 | 270 | 9.97 | Cylinder; D=59.0 cm; H=52.93 cm | Water | Ref. 2 |
| LEUJA34 | 253.6 | 9.97 | Cylinder; D=59.0 cm; H=64.85 cm | Water | Ref. 2 |
| LEUJA36 | 253.9 | 9.97 | Cylinder; D=59.0 cm; H=83.55 cm | None | Ref. 2 |
| LEUJA46 | 241.9 | 9.97 | Cylinder; D=59.0 cm; H=78.56 cm | Water | Ref. 2 |
| LEUJA49 | 241.9 | 9.97 | Cylinder; D=59.0 cm; H=112.27 cm | None | Ref. 2 |
| LEUJA51 | 233.2 | 9.97 | Cylinder; D=59.0 cm; H=95.50 cm | Water | Ref. 2 |
| LEUJA54 | 225.3 | 9.97 | Cylinder; D=59.0 cm; H=130.33 cm | Water | Ref. 2 |
| LEUST21 | 452.2 | 4.9 UO2F2 | Sphere; D=68.8 cm; V=170.5 L | Water | LEU-SOL-THERM-002 |
| LEUST22 | 491.7 | 4.9 UO2F2 | Sphere; D=68.8 cm; V=172 L | None | LEU-SOL-THERM-002 |
| LEUST23 | 491.7 | 4.9 UO2F2 | Sphere; D=68.8 cm; V=145.6 L | Water | LEU-SOL-THERM-002 |

## IEU Laboratory Critical Experiments

| Input ID | p (g U/cc) | E (wt% U-235) | Array | Refl. | IEU Reference |
|---|---|---|---|---|---|
| IECT101 | 3.1 | 29.83 | 15x14x14: 2392 U Cubes; 598 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT102 | 3.1 | 29.83 | 12x12x11: 1140 U Cubes; 570 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT103 | 3.1 | 29.83 | 10x10x9: 498 U Cubes; 498 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT104 | 3.1 | 29.83 | 10x10x8: 298 U Cubes; 596 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT105 | 3.1 | 29.83 | 16x14x14: 400 U Cubes; 2800 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT106 | 3.1 | 29.83 | 10x10x10: 527 U Cubes; 527 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT107 | 3.1 | 29.83 | 11x10x10: 558 U Cubes; 558 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT108 | 3.1 | 29.83 | 11x11x10: 646 U Cubes; 646 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT109 | 3.1 | 29.83 | 13x12x12: 1290 U Cubes; 645 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT110 | 3.1 | 29.83 | 11x11x14: 1155 U Cubes; 578 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT111 | 3.1 | 29.83 | 10x10x19: 1295 U Cubes; 648 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT112 | 3.1 | 29.83 | 9x9x39: 2150 U Cubes; 1075 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT113 | 3.1 | 29.83 | 9x9x11: 302 U Cubes; 604 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT114 | 3.1 | 29.83 | 8x8x16: 356 U Cubes; 712 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT115 | 3.1 | 29.83 | 8x7x26: 488 U Cubes; 976 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |

| Input ID | p (g U/cc) | E (wt% U-235) | Array | Refl. | IEU Reference |
|---|---|---|---|---|---|
| IECT116 | 3.1 | 29.83 | 11x11x10: 258 U Cubes; 1032 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT117 | 3.1 | 29.83 | 16x16x16: 2810 U Cubes; 1405 Polyethylene cubes | None | IEU-COMP-THERM-001 |
| IECT118 | 3.1 | 29.83 | 13x14x13: 1232 U Cubes; 1232 Polyethylene cubes | None | IEU-COMP-THERM-001 |
| IECT119 | 3.1 | 29.83 | 14x13x12: 464 U Cubes; 1856 Polyethylene cubes | None | IEU-COMP-THERM-001 |
| IECT120 | 3.1 | 29.83 | 12x13x11: 1170 U Cubes; 585 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT121 | 3.1 | 29.83 | 15x15x13: 2450 U Cubes; 612 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT122 | 3.1 | 29.83 | 15x15x14: 2235 U Cubes; 1117 Polyethylene cubes | Cd & Paraffin | IEU-COMP-THERM-001 |
| IECT123 | 3.1 | 29.83 | 12x13x12: 965 U Cubes; 965 Polyethylene cubes | Cd & Paraffin | IEU-COMP-THERM-001 |
| IECT124a | 3.1 | 29.83 | 13x13x13: 1118 U Cubes; 1118 Polyethylene cubes | B & Paraffin | IEU-COMP-THERM-001 |
| IECT125 | 3.1 | 29.83 | 13x13x11: 400 U Cubes; 1600 Polyethylene cubes | Cd & Paraffin | IEU-COMP-THERM-001 |
| IECT126 | 3.1 | 29.83 | 12x13x12: 341 U Cubes; 1364 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT127 | 3.1 | 29.83 | 14x13x12: 378 U Cubes; 1512 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT128 | 3.1 | 29.83 | 14x14x13: 1510 U Cubes; 755 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |
| IECT129 | 3.1 | 29.83 | 16x15x15: 1807 U Cubes; 903 Polyethylene cubes | Paraffin | IEU-COMP-THERM-001 |

*Polyethylene-moderated U(30)F4-Polytetraflouroethylene cubes (2.54 cm/side).

## U233 Laboratory Critical Experiments

| Input ID | p (g U/cc) | E (wt% U-233) | Geom. | Refl. | U233 Reference |
|---|---|---|---|---|---|
| u2331a | 16.424 | 98.11 | Sphere; D=11.97 cm | None | U233-MET-FAST-001 |
| u2332a | 18.621 | 98.2 | Sphere; D=10.09 cm | U (93.2 wt% U-235) | U233-MET-FAST-002 |
| u2332b | 18.644 | 98.2 | Sphere; D=9.2 cm | U (93.2 wt% U-235) | U233-MET-FAST-002 |
| u2333a | 18.621 | 98.2 | Sphere; D=10.09 cm | U (0.72 wt% U-235) | U233-MET-FAST-003 |
| u2333b | 18.644 | 98.2 | Sphere; D=9.2 cm | U (0.72 wt% U-235) | U233-MET-FAST-003 |
| u2334a1 | 18.621 | 98.2 | Sphere; D=10.09 cm | Tungsten | U233-MET-FAST-004 |
| u2334b1 | 18.644 | 98.2 | Sphere; D=9.2 cm | Tungsten | U233-MET-FAST-004 |
| u2335a | 18.621 | 98.2 | Sphere; D=10.09 cm | Beryllium | U233-MET-FAST-005 |
| u2335b | 18.644 | 98.2 | Sphere; D=9.2 cm | Beryllium | U233-MET-FAST-005 |
| u2336a | 18.42 | 98.13 | Sphere; D=8.4 cm | U (0.72 wt% U-235) | U233-MET-FAST-006 |

| Input ID | C (g U/l) | E (wt% U-233) | Geom. | Refl. | Reference |
|---|---|---|---|---|---|
| u233s1 | 1022.6 w/ 0.0 g/l B | 97.7 | Sphere; D=69.19 cm | None | U233-SOL-THERM-001 |
| u233s2 | 1025.3 w/ 0.02 g B/l | 97.7 | Sphere; D=69.19 cm | None | U233-SOL-THERM-001 |
| u233s3 | 1027.4 w/ 0.05 g B/l | 97.7 | Sphere; D=69.19 cm | None | U233-SOL-THERM-001 |
| u233s4 | 1027.5 w/ 0.07 g B/l | 97.7 | Sphere; D=69.19 cm | None | U233-SOL-THERM-001 |
| u233s5 | 1028.6 w/ 0.09 g B/l | 97.7 | Sphere; D=69.19 cm | None | U233-SOL-THERM-001 |
| u233s6 | 1015.3 | 97.76 | Sphere; D=122.0 cm | None | U233-SOL-THERM-008 |

1. NEA/NS/DOC(95)03/J, International handbook of Evaluated Criticality Safety Bnchmark Experiments, Nuclear energy Agency, Organization for Economic Cooperation and Development, Paris, 1995.
2. Miyoshi, Y., et al., "Critical Experiments on 10% Enriched uranyl Nitrate Solution Using a 60-cm Diameter Cylindrical Core," Nuclear Technology, Vol, 118, pg. 69-82, April 1997.
3. Wittekind, W.D. 1992. "K Basin Criticality Evaluation for Irradiated Fuel Canisters in Sludge." WHC-SD-NR-CSER-001 Rev. 0. Westinghouse Hanford company: Richland, washington. TIC: 240971

C - Concentration in grams per liter
p - density in grams per cubic centimeter
E - Enrichment
Geom - Geometry
Refl - Reflector material
Reference - Experiment designator used by the International Handbook of Evaluated Criticality Safety Benchmark Experiments.

## UO2 Lattice Laboratory Critical Experiments

| Input ID | E (wt% U-235) | Fuel D (cm) | Pitch (cm) | UO2 Notes |
|---|---|---|---|---|
| core2 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; No Metal Between Asemblies; 0 B4C Pins; 1037 ppm B; 0 cm between assemblies |
| core3 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; No Metal Between Asemblies; 0 B4C Pins; 769 ppm B; 1.636 cm between assemblies |
| core4 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; No Metal Between Asemblies; 84 B4C Pins; 0 ppm B; 1.636 cm between assemblies |
| core5 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; No Metal Between Asemblies; 64 B4C Pins; 0 ppm B; 3.272 cm between assemblies |
| core6 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; No Metal Between Asemblies; 64 B4C Pins; 0 ppm B; 3.272 cm between assemblies |
| core7 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; No Metal Between Asemblies; 34 B4C Pins; 0 ppm B; 4.908 cm between assemblies |
| core8 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; No Metal Between Asemblies; 34 B4C Pins; 0 ppm B; 4.908 cm between assemblies |
| core9 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; No Metal Between Asemblies; 0 B4C Pins; 0 ppm B; 6.544 cm between assemblies |
| core10 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; No Metal Between Asemblies; 0 B4C Pins; 143 ppm B; 4.908 cm between assemblies |
| core11 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; Stainless Steel Between Asemblies; 0 B4C Pins; 510 ppm B; 1.636 cm between assemblies |
| core12 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; Stainless Steel Between Asemblies; 0 B4C Pins; 217 ppm B; 3.272 cm between assemblies |
| core13 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; Borated Aluminum Between Asemblies; 0 B4C Pins; 15 ppm B; 1.636 cm between assemblies |
| core14 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; Borated Aluminum Between Asemblies; 0 B4C Pins; 92 ppm B; 1.636 cm between assemblies |
| core15 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; Borated Aluminum Between Asemblies; 0 B4C Pins; 395 ppm B; 1.636 cm between assemblies |
| core16 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; Borated Aluminum Between Asemblies; 0 B4C Pins; 121 ppm B; 3.272 cm between assemblies |

| Input ID | E (wt% U-235) | Fuel D (cm) | Pitch (cm) | UO2 Notes |
|---|---|---|---|---|
| core17 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; Borated Aluminum Between Asemblies; 0 B4C Pins; 487 ppm B; 1.636 cm between assemblies |
| core18 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; Borated Aluminum Between Asemblies; 0 B4C Pins; 197 ppm B; 3.272 cm between assemblies |
| core19 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; Borated Aluminum Between Asemblies; 0 B4C Pins; 634 ppm B; 1.636 cm between assemblies |
| core20 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; Borated Aluminum Between Asemblies; 0 B4C Pins; 320 ppm B; 3.272 cm between assemblies |
| core21 | 2.46 | 1.03 | 1.636 | 3x3 Array or 14x14 Assemblies; Borated Aluminum Between Asemblies; 0 B4C Pins; 72 ppm B; 4.908 cm between assemblies |
| exp1 | 2.35 | 1.118 | 2.032 | UO2 Rods; No Poison Plates |
| exp2 | 2.35 | 1.118 | 2.032 | UO2 Rods; Boral Poison Plates |
| exp3 | 2.35 | 1.118 | 2.032 | UO2 Rods; Type 6061 Al Poison Plates |
| exp4 | 2.35 | 1.118 | 2.032 | UO2 Rods; Type 304 Stainless Steel Poison Plates |
| exp5 | 4.31 | 1.265 | 1.892 | UO2 Rods; U(0.2) Reflector |
| exp6 | 4.31 | 1.265 | 1.892 | UO2 Rods; Lead Reflector |
| exp7 | 4.31 | 1.265 | 1.892 | UO2 Rods; Stainless Steel Reflector |
| exp8 | 4.31 | 1.265 | 1.89 | 357 UO2 Rods; Non-borated water |
| exp9 | 4.31 | 1.265 | 1.89 | 1237 UO2 Rods; Borated water (2.55 g B/l) |
| exp10 | 4.31 | 1.265 | 1.715 | 509 UO2 Rods; Non-borated water |
| exp11 | 4.31 | 1.265 | 1.715 | 1192 UO2 Rods; Non-borated water |
| exp12 | 4.31 | 1.265 | 1.891 | 952 UO2 Rods; Boral Flux Traps |
| exp13 | 4.31 | 1.265 | 1.891 | 862 UO2 Rods; Boral Flux Traps |
| exp14 | 2.35 | 1.118 | 1.526 | 708 UO2 Rods; Boral Flux Traps |
| exp15 | 2.35 | 1.118 | 2.21 | 342 UO2 Rods; Boral Flux Traps |
| exp17 | 5.74 | 0.907 | 1.422 | UO2 Rods; 19x19(361) |
| exp18 | 5.74 | 0.907 | 2.012 | UO2 Rods; 13x14(182) |
| ugd1 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 4808 2.46wt% UO2 Rods; 0 4.02wt% UO2 Rods; 0 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 153 Water holes; 1337.9 ppm B |
| ugd2 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 4808 2.46wt% UO2 Rods; 0 4.02wt% UO2 Rods; 0 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 16 Ag-In-Cd Rods; 0 Void Rods, 137 Water holes; 1250.0 ppm B |
| ugd3 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 4788 2.46wt% UO2 Rods; 0 4.02wt% UO2 Rods; 20 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 153 Water holes; 1239.3 ppm B |
| ugd4 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 4788 2.46wt% UO2 Rods; 0 4.02wt% UO2 Rods; 20 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 16 Ag-In-Cd Rods; 0 Void Rods, 137 Water holes; 1171.7 ppm B |

| Input ID | E (wt% U-235) | Fuel D (cm) | Pitch (cm) | UO2 Notes |
|---|---|---|---|---|
| ugd5 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 4780 2.46wt% UO2 Rods; 0 4.02wt% UO2 Rods; 28 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 153 Water holes; 1208.0 ppm B |
| ugd6 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 4780 2.46wt% UO2 Rods; 0 4.02wt% UO2 Rods; 28 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 16 Ag-In-Cd Rods; 0 Void Rods, 137 Water holes; 1155.8 ppm B |
| ugd7 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 4780 2.46wt% UO2 Rods; 0 4.02wt% UO2 Rods; 28 1.94wt% Annular UO2-Gd2O3; 0 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 153 Water holes; 1208.8 ppm B |
| ugd8 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 4772 2.46wt% UO2 Rods; 0 4.02wt% UO2 Rods; 36 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 153 Water holes; 1170.7 ppm B |
| ugd9 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 4772 2.46wt% UO2 Rods; 0 4.02wt% UO2 Rods; 36 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 16 Ag-In-Cd Rods; 0 Void Rods, 137 Water holes; 11130.5 ppm B |
| ugd10 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 4772 2.46wt% UO2 Rods; 0 4.02wt% UO2 Rods; 36 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 0 Ag-In-Cd Rods; 16 Void Rods, 137 Water holes; 1177.1 ppm B |
| ugd12 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 3920 2.46wt% UO2 Rods; 888 4.02wt% UO2 Rods; 0 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 153 Water holes; 1889.3 ppm B |
| ugd13 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 3920 2.46wt% UO2 Rods; 888 4.02wt% UO2 Rods; 0 1.94wt% UO2-Gd2O3 Rods; 16 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 137 Water holes; 1635.4 ppm B |
| ugd14 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 3920 2.46wt% UO2 Rods; 860 4.02wt% UO2 Rods; 28 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 153 Water holes; 1653.8 ppm B |
| ugd15 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 3920 2.46wt% UO2 Rods; 860 4.02wt% UO2 Rods; 28 1.94wt% UO2-Gd2O3 Rods; 16 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 137 Water holes; 1479.7 ppm B |
| ugd16 | 4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.128<br>1.03 | 1.636 | 3920 2.46wt% UO2 Rods; 852 4.02wt% UO2 Rods; 36 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 153 Water holes; 1579.4 ppm B |
| ugd17 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 3920 2.46wt% UO2 Rods; 852 4.02wt% UO2 Rods; 36 1.94wt% UO2-Gd2O3 Rods; 16 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 137 Water holes; 1432.1 ppm B |

| Input ID | E (wt% U-235) | Fuel D (cm) | Pitch (cm) | UO2 Notes |
|---|---|---|---|---|
| ugd18 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 3676 2.46wt% UO2 Rods; 944 4.02wt% UO2 Rods; 0 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 180 Water holes; 1776.8 ppm B |
| ugd19 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 3676 2.46wt% UO2 Rods; 928 4.02wt% UO2 Rods; 16 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 180 Water holes; 1628.3 ppm B |
| ugd20 | 2.46 (UO2)<br>4.02 (UO2)<br>1.94 (UO2-Gd2O3) | 1.03<br>1.128<br>1.03 | 1.636 | 3676 2.46wt% UO2 Rods; 912 4.02wt% UO2 Rods; 32 1.94wt% UO2-Gd2O3 Rods; 0 B4C; 0 Ag-In-Cd Rods; 0 Void Rods, 180 Water holes; 1499.0 ppm B |

## MOX Lattice Laboratory Critical Experiments

| Input ID | E (wt%) | Fuel D (cm) | Pitch (cm) | MOX Notes |
|---|---|---|---|---|
| exp22 | 91.84 wt% Pu-239; U(nat) | 1.283 | 1.778 | PuO2-UO2 Rods; 2 wt% PuO2; 98 wt% UO2; Unborated Water |
| exp23 | 91.84 wt% Pu-239; U(nat) | 1.283 | 1.778 | PuO2-UO2 Rods; 2 wt% PuO2; 98 wt% UO2; 680.9 ppm B |
| exp24 | 91.84 wt% Pu-239; U(nat) | 1.283 | 2.21 | PuO2-UO2 Rods; 2 wt% PuO2; 98 wt% UO2; Unborated Water |
| exp25 | 91.84 wt% Pu-239; U(nat) | 1.283 | 2.21 | PuO2-UO2 Rods; 2 wt% PuO2; 98 wt% UO2; 1090.4 ppm B |
| exp26 | 91.84 wt% Pu-239; U(nat) | 1.283 | 2.515 | PuO2-UO2 Rods; 2 wt% PuO2; 98 wt% UO2; Unborated Water |
| exp27 | 91.84 wt% Pu-239; U(nat) | 1.283 | 2.515 | PuO2-UO2 Rods; 2 wt% PuO2; 98 wt% UO2; 767.2 ppm B |
| exp28 | 81.75 wt% U-238; 5.27 wt% Pu-239 | 0.907 | 1.321 | PuO2-UO2 Rods; 22x23(506) |
| exp29 | 81.75 wt% U-238; 5.27 wt% Pu-239 | 0.907 | 1.422 | PuO2-UO2 Rods; 19x19(361) |
| exp30 | 81.75 wt% U-238; 5.27 wt% Pu-239 | 0.907 | 1.422 | PuO2-UO2 Rods; 21x21(441) |
| exp31 | 81.75 wt% U-238; 5.27 wt% Pu-239 | 0.907 | 1.867 | PuO2-UO2 Rods; 13x13(169) |
| exp32 | 81.75 wt% U-238; 5.27 wt% Pu-239 | 0.907 | 2.012 | PuO2-UO2 Rods; 12x12(144) |
| exp33 | 81.75 wt% U-238; 5.27 wt% Pu-239 | 0.907 | 2.642 | PuO2-UO2 Rods; 11x11(121) |
| exp34 | 91.81 wt% Pu-239; U(nat) | 1.283 | 1.598 | PuO2-UO2 Rods; Triangular Pitch w/ 6 UO2 rods around each PuO2-UO2; PuO2-UO2 Rods (2 wt% PuO2; 98 wt% UO2) |
| | 4.31 wt% U-235 | 1.265 | | UO2 Rods |

## Commercial Reactor Critical Experiments

| State Point | Initial E (wt% U-235) | Array | Fuel D (cm) | Pitch (cm) | Burnup (GWd/MTU) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Core Average |
| 1 | 2.445 | 15x15 | 0.94 | 1.44 | 0 | 0 | 0 |
| 2 | 2.445 | 15x15 | 0.94 | 1.44 | 3.81 | 10.81 | 8.09 |
| 3 | 2.445 | 15x15 | 0.94 | 1.44 | 6.57 | 16.08 | 12.34 |
| 4 | 2.67 | 15x15 | 0.94 | 1.44 | 0 | 17.03 | 8.67 |
| 5 | 2.693 | 15x15 | 0.94 | 1.44 | 0 | 19.65 | 7.51 |
| 6 | 2.693 | 15x15 | 0.94 | 1.44 | 2.8 | 25.29 | 12.54 |
| 7 | 2.693 | 15x15 | 0.94 | 1.44 | 4.31 | 27.91 | 14.98 |
| 8 | 2.648 | 15x15 | 0.94 | 1.44 | 0 | 17.5 | 6.92 |
| 9 | 2.648 | 15x15 | 0.94 | 1.44 | 6.11 | 25.3 | 13.99 |
| 10 | 2.648 | 15x15 | 0.94 | 1.44 | 6.79 | 26.16 | 14.76 |
| 11 | 2.915 | 15x15 | 0.94 | 1.44 | 0 | 17.26 | 7.07 |
| 12 | 2.915 | 15x15 | 0.94 | 1.44 | 9.18 | 28.19 | 19.12 |
| 13 | 3.21 | 15x15 | 0.94 | 1.44 | 0 | 21.89 | 12.01 |
| 14 | 3.21 | 15x15 | 0.94 | 1.44 | 3.24 | 24.88 | 14.99 |
| 15 | 3.21 | 15x15 | 0.94 | 1.44 | 13.16 | 34.67 | 24.41 |
| 16 | 3.554 | 15x15 | 0.94 | 1.44 | 0 | 25.11 | 10.02 |
| 17 | 3.554 | 15x15 | 0.94 | 1.44 | 6.25 | 32.91 | 18.09 |
| 18 | 3.554 | 15x15 | 0.94 | 1.44 | 6.97 | 33.87 | 19.04 |
| 19 | 3.554 | 15x15 | 0.94 | 1.44 | 7.63 | 34.73 | 19.91 |
| 20 | 3.554 | 15x15 | 0.94 | 1.44 | 11.11 | 39.16 | 24.35 |
| 21 | 3.554 | 15x15 | 0.94 | 1.44 | 11.53 | 39.67 | 24.87 |
| 22 | 3.755 | 15x15 | 0.94 | 1.44 | 0 | 27.41 | 12.26 |
| 23 | 3.755 | 15x15 | 0.94 | 1.44 | 2.69 | 32.4 | 15.28 |
| 24 | 3.755 | 15x15 | 0.94 | 1.44 | 3.83 | 32.88 | 16.59 |

| State Point | Initial E (wt% U-235) | Array | Fuel D (cm) | Pitch (cm) | Burnup (GWd/MTU) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Core Average |
| 25 | 3.755 | 15x15 | 0.94 | 1.44 | 10.84 | 35.97 | 24.78 |
| 26 | 3.755 | 15x15 | 0.94 | 1.44 | 10.99 | 36.04 | 24.96 |
| 27 | 3.755 | 15x15 | 0.94 | 1.44 | 13.86 | 39.15 | 28.24 |
| 28 | 3.892 | 15x15 | 0.94 | 1.44 | 0 | 34.78 | 14.18 |
| 29 | 3.892 | 15x15 | 0.94 | 1.44 | 5.08 | 36.52 | 19.11 |
| 30 | 3.892 | 15x15 | 0.94 | 1.44 | 6.95 | 37.2 | 20.97 |
| 31 | 3.892 | 15x15 | 0.94 | 1.44 | 11.41 | 40.25 | 25.44 |
| 32 | 4.015 | 15x15 | 0.94 | 1.44 | 0 | 35.25 | 15.27 |
| 33 | 4.015 | 15x15 | 0.94 | 1.44 | 17.64 | 49.22 | 33.06 |
| 36 | 2.535 | 17x17 | 1.26 | 0.82 | 0 | 0 | 0 |
| 37 | 3.43 | 17x17 | 1.26 | 0.82 | 0 | 26.91 | 11.1 |
| 38 | 3.43 | 17x17 | 1.26 | 0.82 | 7.36 | 34.42 | 19.2 |
| 46 | 2.602 | 17x17 | 1.26 | 0.82 | 0 | 0 | 0 |
| 47 | 3.472 | 17x17 | 1.26 | 0.78 | 0 | 28.12 | 11.74 |
| 48 | 3.472 | 17x17 | 1.26 | 0.78 | 2.11 | 30.56 | 14.34 |
| 49 | 3.618 | 17x17 | 1.26 | 0.78 | 0 | 27.22 | 10.79 |
| 50 | 3.618 | 17x17 | 1.26 | 0.78 | 4.13 | 31.66 | 16.17 |
| 51 | 3.618 | 17x17 | 1.26 | 0.78 | 8.95 | 38.11 | 22.56 |
| 59 | 2.633 | 15x15 | 0.94 | 1.44 | 0 | 0 | 0 |
| 60 | 2.82 | 15x15 | 0.94 | 1.44 | 0 | 24.86 | 10.33 |
| 61 | 2.82 | 15x15 | 0.94 | 1.44 | 2.26 | 27.84 | 13.87 |