

# KamLAND Material Samples 5/01

| Sample                         | <sup>232</sup> Th<br>[ppb] | <sup>238</sup> U<br>[ppb] | <sup>40</sup> K<br>[ppb] | <sup>60</sup> Co<br>(mBq/kg) | Time<br>[Days] |
|--------------------------------|----------------------------|---------------------------|--------------------------|------------------------------|----------------|
| Packard PPO(21-1011)           | <3                         | <1                        | <0.2                     | -                            | 6              |
| Packard PPO(21-0113)           | <4                         | <2                        | <0.3                     | -                            | 10             |
| PE/EVOH/Ny/PE                  | -                          | 20±3                      | -                        | -                            | 14.9           |
| XL/ON/ON/ON/ON/ON/XL (14)      | 4±4                        | 4±2                       | 0.2±0.3                  | -                            | 13.5           |
| XL/ON <sup>5</sup> /XL #2(15)  | 6±3                        | <2.1                      | 1.3±0.4                  | -                            | 5.81           |
| L' Garde KALADEX (15)          | 4.9±0.2                    | 1.8±0.7                   | 0.8±0.3                  | -                            | 1.9            |
| L' Garde MELINEX (15)          | 3.8±3                      | 4±1                       | 1.3±0.3                  | -                            | 5.0            |
| L' Garde Mylar D (15)          | <1.9                       | 0.7±0.6                   | 0.11±0.2                 | -                            | 5.9            |
| XL/ON <sup>5</sup> /XL #3 (16) | 0.7±2                      | <1                        | <0.3                     | -                            | 8              |
| XL/ON <sup>3</sup> /XL #1      | <6                         | <4                        | 1.3+-0.3                 | -                            | 14.5           |
| XL/ON <sup>3</sup> /XL #2      | <3                         | <3                        | 1.0+-0.2                 | -                            | 12.6           |
| L'Garde Balloon Glue           | 2.3±2.2                    | 1.4±1.1                   | <3                       | -                            | 6              |
| Balloon Pens                   | 6±2                        | <0.7                      | 3.6±2                    | <3                           | 7.2            |
| Black Chimney Plastic #1       | 48±4                       | 7±1                       | 5±0.6                    | -                            | 0.97           |
| Black Chimney Plastic #2       | <1                         | <3                        | 0.9±0.3                  | -                            | 6.3            |
| Yellow Kevlar braid            | <12                        | <4                        | 1.3±0.6                  | -                            | 15.2           |
| Kevlar braid washed            | <2                         | <0.7                      | 3.9±0.2                  | -                            | 9.0            |
| Technora                       | 118±12                     | 36±5                      | 7±1                      | -                            | 8.6            |
| Carbon Fiber (15)              | 5±6                        | 8±3                       | <0.9                     | -                            | 6.1            |
| Carbon Fiber                   | <7                         | <2.4                      | <0.6                     | -                            | 12             |
| Spectra Fiber(15)              | 9±4                        | 2.2±2                     | 22±0.9                   | -                            | 12.8           |
| Kevlar uncoated                | <25                        | <6                        | 2±1                      | -                            | 14.6           |
| Kevlar washed HP water         | <3.7                       | <0.8                      | 4.7±0.4                  | -                            | 2.9            |
| Kevlar washed, IPA, HP water   | 0.8±1                      | 0.4±0.6                   | 1.2±0.2                  | -                            | 3.0            |
| Kevlar washed, final           | 3.3±3                      | 1.8±1                     | 0.8±0.3                  | -                            | 3.8            |

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|-------------------------|----------------------------|---------------------------|--------------------------|------------------------------|----------------|
| Chinese glass (2)       | 440±50                     | 140±20                    | 100±10                   | -                            | 1.5            |
| Super K glass           | 470±50                     | 480±50                    | 80±10                    | -                            | 1.9            |
| Kamiokande glass        | 320±35                     | 250±30                    | 16±3                     | -                            | 3.9            |
| Kamiokande glass(20"PM) | 235±12                     | 153±4                     | 10±1                     | -                            | 4.2            |
| Hammamatsu glass        | 750±85                     | 630±70                    | 840±85                   | -                            | 1.4            |
| Schott glass 8246       | <43                        | 47±7                      | 3±0.9                    | -                            | 2.1            |
| Chinese glass (3)       | 140±20                     | 57±5                      | 108±6                    | -                            | 1.1            |
| Lemo cables             | 5-30                       | < 1                       | 3±6                      | -                            | 6.9            |
| Grey lining             | 7±2                        | 2±1                       | 1±3                      | -                            | 9.9            |
| Mitsui cable            | 120±25                     | 18±5                      | 3±7                      | -                            | 1.7            |
| Cable guide             | <9                         | <4                        | <0.15                    | -                            | 3              |
| Viton gasket            | 64±7                       | 14±2                      | 6±1                      | -                            | 4              |
| E-hut Wallboard         | 336±52                     | 335±40                    | 83±12                    | -                            | 0.3            |
| Refurb.PM elbow         | 50±5                       | 50±3                      | 1±0.5                    | -                            | 3              |
| Nylon Tube, LS pur.     | <2                         | <0.7                      | <0.15                    | -                            | 18.6           |
| Kamioka dust            | 1800±100                   | 620±40                    | 2100±30                  | -                            | 1.1            |
| KamLAND concrete        | 2630±50                    | 1280±30                   | 1470±20                  | -                            | 5.2            |
| Kamioka white rock      | 2480±80                    | 920±50                    | 1890±30                  | -                            | 0.9            |
| Super K white rock      | 230±30                     | 1400±40                   | 100±10                   | -                            | 2.6            |
| Mitsui SS               | < 2                        | 2±6                       | -                        | 20±2                         | 14.0           |
| Weld rods 308-R (1)     | 5300±90                    | 5500±70                   | 730±20                   |                              | 0.35           |
| Weld rods TIG308 (2)    | < 1                        | 0.2±0.08                  | 0.1±0.03                 | 2.5±0.4                      | 16.1           |
| Weld rods YF308-C (3)   | 3200±70                    | 4900±60                   | 80±5                     |                              | 0.33           |
| Weld rods SF-308L (4)   | 3200±50                    | 4500±40                   | 280±10                   |                              | 1.0            |
| Weld flux SF-308L       | 17700±300                  | 24200±300                 | 1000±30                  |                              | 0.41           |
| Weld core SF-308L       | 4.7±0.5                    | 1.9±0.4                   | 0.08±0.04                | 9±1                          | 8.96           |
| Weld rods GFW308L (5)   | 2950±30                    | 6310±30                   | 127±3                    |                              | 1.97           |
| Weld rods DW308L (6)    | 3800±100                   | 6100±100                  | 105±8                    |                              | 0.28           |
| Carbon coating          | 184±16                     | 29±5                      | 3±2                      |                              | 4.1            |
| Weld rods DW308LP (7)   | 1500±100                   | 3300±240                  | 185±4                    |                              | 11.0           |
| Large grinding wheel    | 21000±1000                 | 5600±100                  | 3100±100                 |                              | 0.9            |
| Small Grinding wheel    | 14000±1000                 | 4000±100                  | 1900±100                 |                              | 0.36           |
| Welding Slag            | 15000±1000                 | 27000±1000                | 700±100                  |                              | 1.02           |
| Welding Slag #2         | 19000±1000                 | 38000±1000                | 1000±100                 |                              | 0.24           |
| Welding Fume Dust       | 12000±1000                 | 23500±1000                | 2500±200                 |                              | 0.22           |

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|------------------------------|----------------------------|---------------------------|--------------------------|------------------------------|----------------|
| Welded SS (1) <sup>1,2</sup> | 3.2±0.5                    | 2.1±0.3                   | 2.4±0.2                  | 14±2                         | 2.9            |
| Welded SS (2) <sup>1,3</sup> | 3.7±0.5                    | 3.5±0.3                   | 0.25±0.04                | 14±2                         | 4.9            |
| Welded SS (3) <sup>1,4</sup> | 2.0±0.3                    | 1.8±0.2                   | 0.15±0.04                | 12±1                         | 5.3            |
| Unwelded SS (4)              | 0.9±0.2                    | 0.9±0.1                   | 0.06±0.02                | 14±1                         | 11.2           |
| Welded SS (5) <sup>1,5</sup> | 2.7±1.0                    | 0.9±0.2                   | 0.03±0.03                | 16±2                         | 5.0            |
| Welded SS (6) <sup>1,6</sup> | 8.4±1.0                    | 4.7±0.4                   | 0.24±0.08                | 44±3                         | 2.91           |
| Unwelded SS (1)              |                            |                           |                          |                              |                |
| Welded SS (2) <sup>7</sup>   | <0.7                       | 0.6±0.2                   | 0.15±0.03                | 65±2                         | 7.8            |
| Welded SS (3) <sup>8</sup>   | 0.7±0.4                    | 0.7±0.2                   | 0.22±0.05                | 62±3                         | 4.6            |
| Welded SS (4) <sup>9</sup>   |                            |                           |                          |                              |                |
| Welded SS (5) <sup>10</sup>  | <0.7                       | 0.3±0.1                   | 0.1±0.02                 | 62±3                         | 15.8           |
| Welded SS (6) <sup>11</sup>  | <0.7                       | 0.5±0.2                   | <0.03                    | 65±2                         | 8.0            |
| Welded SS (7) <sup>12</sup>  |                            |                           |                          |                              |                |
| Welded SS (8) <sup>13</sup>  |                            |                           |                          |                              |                |
| Balloon Neck Steel           | 2.8±0.5                    | 0.6±0.2                   | <0.1                     | 0.026±0.002                  | 7.2            |

<sup>1</sup> Activity evaluated under the assumption of homogenous distribution.

<sup>2</sup> Welded with a combination of TIG308 + S308R.

<sup>3</sup> Welded with a combination of TIG308 + FCW308.

<sup>4</sup> Welded with FCW308.

<sup>5</sup> Hand-welded with TIG308.

<sup>6</sup> Welded with SF-308L. Super K welding.

<sup>7</sup> DW308LP, no washing, no vacuum.

<sup>8</sup> DW308LP, no washing, vacuumed.

<sup>9</sup> DW308LP, no washing, vacuumed.

<sup>10</sup> DW308LP, high pressure water, vacuumed.

<sup>11</sup> DW308LP, high pressure water and grinding, vacuumed.

<sup>12</sup> DW308LP, acid, vacuumed.

<sup>13</sup> DW308LP, TGS308, acid, vacuumed.

<sup>14</sup> 1999 film, small 80. g sample.

<sup>15</sup> Radon correction included.

<sup>16</sup> 2000 film, 200 microns.