**Section 326.APPENDIX A Quantities of Material for Major Possessor Determination**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Radionuclide | Abbrev. | UNSEALED  FORMS | | SEALED  SOURCES | | |
| MBq | mCi | GBq | Ci | | |
| Actinium-227 | Ac-227 | 0.037 | 0.001 | 370 | | 10 |
| Aluminum-26 | Al-26 | 370 | 10 | 37000 | | 1000 |
| Americium-241 | Am-241 | 0.037 | 0.001 | 370 | | 10 |
| Americium-242m | Am-242m | 0.037 | 0.001 | 370 | | 10 |
| Americium-243 | Am-243 | 0.037 | 0.001 | 370 | | 10 |
| Antimony-125 | Sb-125 | 3700 | 100 | 37000 | | 1000 |
| Barium-133 | Ba-133 | 3700 | 100 | 37000 | | 1000 |
| Berkelium-247 | Bk-247 | 0.037 | 0.001 | 370 | | 10 |
| Berkelium-249 | Bk-249 | 3.7 | 0.1 | 37000 | | 1000 |
| Beryllium-10 | Be-10 | 37 | 1 | 37000 | | 1000 |
| Bismuth-207 | Bi-207 | 370 | 10 | 37000 | | 1000 |
| Bismuth-210m | Bi-210m | 3.7 | 0.1 | 37000 | | 1000 |
| Cadmium-109 | Cd-109 | 37 | 1 | 37000 | | 1000 |
| Cadmium-113 | Cd-113 | 3700 | 100 | 37000 | | 1000 |
| Cadmium-113m | Cd-113m | 3.7 | 0.1 | 37000 | | 1000 |
| Calcium-41 | Ca-41 | 3700 | 100 | 37000 | | 1000 |
| Californium-248 | Cf-248 | 0.37 | 0.01 | 3700 | | 100 |
| Californium-249 | Cf-249 | 0.037 | 0.001 | 370 | | 10 |
| Californium-250 | Cf-250 | 0.037 | 0.001 | 370 | | 10 |
| Californium-251 | Cf-251 | 0.037 | 0.001 | 370 | | 10 |
| Californium-252 | Cf-252 | 0.037 | 0.001 | 370 | | 10 |
| Carbon-14 | C-14 | 37000 | 1000 | 37000 | | 1000 |
| Cerium-144 | Ce-144 | 37 | 1 | 37000 | | 1000 |
| Cesium-134 | Cs-134 | 370 | 10 | 37000 | | 1000 |
| Cesium-135 | Cs-135 | 3700 | 100 | 37000 | | 1000 |
| Cesium-137 | Cs-137 | 370 | 10 | 37000 | | 1000 |
| Chlorine-36 | Cl-36 | 370 | 10 | 37000 | | 1000 |
| Cobalt-60 | Co-60 | 37 | 1 | 37000 | | 1000 |
| Curium-243 | Cm-243 | 0.037 | 0.001 | 370 | | 10 |
| Curium-244 | Cm-244 | 0.037 | 0.001 | 370 | | 10 |
| Curium-245 | Cm-245 | 0.037 | 0.001 | 370 | | 10 |
| Curium-246 | Cm-246 | 0.037 | 0.001 | 370 | | 10 |
| Curium-247 | Cm-247 | 0.037 | 0.001 | 370 | | 10 |
| Curium-248 | Cm-248 | 0.037 | 0.001 | 370 | | 10 |
| Einsteinium-254 | Es-254 | 0.37 | 0.01 | 3700 | | 100 |
| Europium-150 (34.2y) | Eu-150 | 37 | 1 | 37000 | | 1000 |
| Europium-152 | Eu-152 | 37 | 1 | 37000 | | 1000 |
| Europium-154 | Eu-154 | 37 | 1 | 37000 | | 1000 |
| Europium-155 | Eu-155 | 370 | 10 | 37000 | | 1000 |
| Gadolinium-148 | Gd-148 | 0.037 | 0.001 | 370 | | 10 |
| Gadolinium-152 | Gd-152 | 3700 | 100 | 37000 | | 1000 |
| Germanium-68 | Ge-68 | 370 | 10 | 37000 | | 1000 |
| Hafnium-172 | Hf-172 | 37 | 1 | 37000 | | 1000 |
| Hafnium-182 | Hf-182 | 3.7 | 0.1 | 37000 | | 1000 |
| Holmium-166m | Ho-166m | 37 | 1 | 37000 | | 1000 |
| Hydrogen-3 | H-3 | 37000 | 1000 | 37000 | | 1000 |
| Indium-115 | In-115 | 3700 | 100 | 37000 | | 1000 |
| Iodine-129 | I-129 | 37 | 1 | 37000 | | 1000 |
| Iron-55 | Fe-55 | 3700 | 100 | 37000 | | 1000 |
| Iron-60 | Fe-60 | 37 | 1 | 37000 | | 1000 |
| Lanthanum-137 | La-137 | 370 | 10 | 37000 | | 1000 |
| Lanthanum-138 | La-138 | 3700 | 100 | 37000 | | 1000 |
| Lead-202 | Pb-202 | 370 | 10 | 37000 | | 1000 |
| Lead-205 | Pb-205 | 3700 | 100 | 37000 | | 1000 |
| Lead-210 | Pb-210 | 0.37 | 0.01 | 3700 | | 100 |
| Lutetium-173 | Lu-173 | 370 | 10 | 37000 | | 1000 |
| Lutetium-174 | Lu-174 | 370 | 10 | 37000 | | 1000 |
| Lutetium-176 | Lu-176 | 3700 | 100 | 37000 | | 1000 |
| Manganese-53 | Mn-53 | 37000 | 1000 | 37000 | | 1000 |
| Manganese-54 | Mn-54 | 3700 | 100 | 37000 | | 1000 |
| Mercury-194 | Hg-194 | 37 | 1 | 37000 | | 1000 |
| Molybdenum-93 | Mo-93 | 370 | 10 | 37000 | | 1000 |
| Neptunium-235 | Np-235 | 3700 | 100 | 37000 | | 1000 |
| Neptunium-236 (1.15x105y) | Np-236 | 0.037 | 0.001 | 370 | | 10 |
| Neptunium-237 | Np-237 | 0.037 | 0.001 | 370 | | 10 |
| Nickel-59 | Ni-59 | 3700 | 100 | 37000 | | 1000 |
| Nickel-63 | Ni-63 | 3700 | 100 | 37000 | | 1000 |
| Niobium-93m | Nb-93m | 370 | 10 | 37000 | | 1000 |
| Niobium-94 | Nb-94 | 37 | 1 | 37000 | | 1000 |
| Osmium-194 | Os-194 | 37 | 1 | 37000 | | 1000 |
| Palladium-107 | Pd-107 | 370 | 10 | 37000 | | 1000 |
| Platinum-193 | Pt-193 | 37000 | 1000 | 37000 | | 1000 |
| Plutonium-236 | Pu-236 | 0.037 | 0.001 | 370 | | 10 |
| Plutonium-238 | Pu-238 | 0.037 | 0.001 | 370 | | 10 |
| Plutonium-239 | Pu-239 | 0.037 | 0.001 | 370 | | 10 |
| Plutonium-240 | Pu-240 | 0.037 | 0.001 | 370 | | 10 |
| Plutonium-241 | Pu-241 | 0.37 | 0.01 | 3700 | | 100 |
| Plutonium-242 | Pu-242 | 0.037 | 0.001 | 370 | | 10 |
| Plutonium-244 | Pu-244 | 0.037 | 0.001 | 370 | | 10 |
| Potassium-40 | K-40 | 3700 | 100 | 37000 | | 1000 |
| Promethium-144 | Pm-144 | 370 | 10 | 37000 | | 1000 |
| Promethium-145 | Pm-145 | 370 | 10 | 37000 | | 1000 |
| Promethium-146 | Pm-146 | 37 | 1 | 37000 | | 1000 |
| Promethium-147 | Pm-147 | 370 | 10 | 37000 | | 1000 |
| Protactinium-231 | Pa-231 | 0.037 | 0.001 | 370 | | 10 |
| Radium-226 | Ra-226 | 3.7 | 0.1 | 37000 | | 1000 |
| Radium-228 | Ra-228 | 3.7 | 0.1 | 37000 | | 1000 |
| Rhenium-186m | Re-186m | 370 | 10 | 37000 | | 1000 |
| Rhenium-187 | Re-187 | 37000 | 1000 | 37000 | | 1000 |
| Rhodium-101 | Rh-101 | 370 | 10 | 37000 | | 1000 |
| Rhodium-102 | Rh-102 | 370 | 10 | 37000 | | 1000 |
| Rubidium-87 | Rb-87 | 3700 | 100 | 37000 | | 1000 |
| Ruthenium-106 | Ru-106 | 37 | 1 | 37000 | | 1000 |
| Samarium-145 | Sm-145 | 37000 | 100 | 37000 | | 1000 |
| Samarium-146 | Sm-146 | 37 | 1 | 37000 | | 1000 |
| Samarium-147 | Sm-147 | 3700 | 100 | 37000 | | 1000 |
| Samarium-151 | Sm-151 | 370 | 10 | 37000 | | 1000 |
| Selenium-79 | Se-79 | 3700 | 100 | 37000 | | 1000 |
| Silicon-32 | Si-32 | 37 | 1 | 37000 | | 1000 |
| Sodium-22 | Na-22 | 370 | 10 | 37000 | | 1000 |
| Strontium-90 | Sr-90 | 3.7 | 0.1 | 37000 | | 1000 |
| Tantalum-179 | Ta-179 | 3700 | 100 | 37000 | | 1000 |
| Tantalum-180m | Ta-180m | 37000 | 1000 | 37000 | | 1000 |
| Technetium-97 | Tc-97 | 37000 | 1000 | 37000 | | 1000 |
| Technetium-98 | Tc-98 | 370 | 10 | 37000 | | 1000 |
| Technetium-99 | Tc-99 | 3700 | 100 | 37000 | | 1000 |
| Tellurium-123 | Te-123 | 3700 | 100 | 37000 | | 1000 |
| Terbium-157 | Tb-157 | 370 | 10 | 37000 | | 1000 |
| Terbium-158 | Tb-158 | 37 | 1 | 37000 | | 1000 |
| Thallium-204 | Tl-204 | 3700 | 100 | 37000 | | 1000 |
| Thorium-228 | Th-228 | 0.037 | 0.001 | 370 | | 10 |
| Thorium-229 | Th-229 | 0.037 | 0.001 | 370 | | 10 |
| Thorium-230 | Th-230 | 0.037 | 0.001 | 370 | | 10 |
| Thorium-232 | Th-232 | 3700 | 100 | 37000 | | 1000 |
| Thulium-171 | Tm-171 | 370 | 10 | 37000 | | 1000 |
| Tin-119m | Sn-119m | 3700 | 100 | 37000 | | 1000 |
| Tin-121m | Sn-121 | 37000 | 1000 | 37000 | | 1000 |
| Tin-126 | Sn-126 | 370 | 10 | 37000 | | 1000 |
| Titanium-44 | Ti-44 | 37 | 1 | 37000 | | 1000 |
| Uranium-232 | U-232 | 0.037 | 0.001 | 370 | | 10 |
| Uranium-233 | U-233 | 0.037 | 0.001 | 370 | | 10 |
| Uranium-234 | U-234 | 0.037 | 0.001 | 370 | | 10 |
| Uranium-235 | U-235 | 0.037 | 0.001 | 370 | | 10 |
| Uranium-236 | U-236 | 0.037 | 0.001 | 370 | | 10 |
| Uranium-238 | U-238 | 3700 | 100 | 37000 | | 1000 |
| Vanadium-49 | V-49 | 37000 | 1000 | 37000 | | 1000 |
| Zirconium-93 | Zr-93 | 37 | 1 | 37000 | | 1000 |
| Thorium-natural |  | 3700 | 100 | 37000 | | 1000 |
| Uranium-natural |  | 3700 | 100 | 37000 | | 1000 |

When a combination of nuclides is involved, the limit for the combination shall be derived as follows: For each nuclide, the licensee shall determine the ratio between the quantity authorized on the license and the quantity established in this Appendix A for the form of the material (sealed source or unsealed material). If the sum of the ratios for all nuclides is greater than one, then the licensee shall post financial assurance arrangements.

AGENCY NOTE: Possession of special nuclear material (Plutonium, Uranium-233 and Uranium-235) is limited to quantities not sufficient to form a critical mass as defined in 32 Ill. Adm. Code 310.20.

(Source: Amended at 29 Ill. Reg. 20781, effective December 16, 2005)