## Table 064: Muons in Gadolinium

| Z | $A$ [g/mol] | $\rho$ [g/cm$^3$] | $I$ [eV] | $a$ | $k = m_s$ | $x_0$ | $x_1$ | $\overline{C}$ | $\delta_0$ |
|---|---|---|---|---|---|---|---|---|---|
| 64 (Gd) | 157.25 (3) | 7.900 | 591.0 | 0.25109 | 2.5977 | 0.1058 | 3.3932 | 5.8738 | 0.14 |

| $T$ | $p$ [MeV/$c$] | Ionization | Brems | Pair prod | Photonucl | Total | CSDA range [g/cm$^2$] |
|---|---|---|---|---|---|---|---|
| | | [MeV cm$^2$/g] | | | | | |
| 10.0 MeV | $4.704 \times 10^1$ | 4.225 | | | | 4.225 | $1.357 \times 10^0$ |
| 14.0 MeV | $5.616 \times 10^1$ | 3.350 | | | | 3.350 | $2.430 \times 10^0$ |
| 20.0 MeV | $6.802 \times 10^1$ | 2.655 | | | | 2.655 | $4.463 \times 10^0$ |
| 30.0 MeV | $8.509 \times 10^1$ | 2.088 | | | | 2.088 | $8.765 \times 10^0$ |
| 40.0 MeV | $1.003 \times 10^2$ | 1.798 | | | | 1.798 | $1.396 \times 10^1$ |
| 80.0 MeV | $1.527 \times 10^2$ | 1.372 | | | | 1.372 | $4.020 \times 10^1$ |
| 100. MeV | $1.764 \times 10^2$ | 1.297 | | | | 1.297 | $5.523 \times 10^1$ |
| 140. MeV | $2.218 \times 10^2$ | 1.225 | | | | 1.226 | $8.709 \times 10^1$ |
| 200. MeV | $2.868 \times 10^2$ | 1.192 | | | | 1.192 | $1.369 \times 10^2$ |
| 243. MeV | $3.325 \times 10^2$ | 1.188 | 0.000 | | | 1.188 | *Minimum ionization* |
| 300. MeV | $3.917 \times 10^2$ | 1.193 | 0.000 | | 0.000 | 1.193 | $2.210 \times 10^2$ |
| 400. MeV | $4.945 \times 10^2$ | 1.212 | 0.000 | | 0.000 | 1.212 | $3.042 \times 10^2$ |
| 800. MeV | $8.995 \times 10^2$ | 1.295 | 0.001 | | 0.000 | 1.296 | $6.228 \times 10^2$ |
| 1.00 GeV | $1.101 \times 10^3$ | 1.328 | 0.001 | | 0.000 | 1.330 | $7.751 \times 10^2$ |
| 1.40 GeV | $1.502 \times 10^3$ | 1.381 | 0.002 | 0.000 | 0.001 | 1.384 | $1.070 \times 10^3$ |
| 2.00 GeV | $2.103 \times 10^3$ | 1.439 | 0.003 | 0.001 | 0.001 | 1.444 | $1.493 \times 10^3$ |
| 3.00 GeV | $3.104 \times 10^3$ | 1.504 | 0.006 | 0.003 | 0.001 | 1.514 | $2.169 \times 10^3$ |
| 4.00 GeV | $4.104 \times 10^3$ | 1.549 | 0.008 | 0.006 | 0.002 | 1.565 | $2.818 \times 10^3$ |
| 8.00 GeV | $8.105 \times 10^3$ | 1.651 | 0.021 | 0.019 | 0.003 | 1.695 | $5.264 \times 10^3$ |
| 10.0 GeV | $1.011 \times 10^4$ | 1.682 | 0.027 | 0.027 | 0.004 | 1.741 | $6.427 \times 10^3$ |
| 14.0 GeV | $1.411 \times 10^4$ | 1.726 | 0.042 | 0.044 | 0.005 | 1.818 | $8.674 \times 10^3$ |
| 20.0 GeV | $2.011 \times 10^4$ | 1.770 | 0.065 | 0.072 | 0.007 | 1.916 | $1.189 \times 10^4$ |
| 30.0 GeV | $3.011 \times 10^4$ | 1.817 | 0.106 | 0.127 | 0.011 | 2.061 | $1.691 \times 10^4$ |
| 40.0 GeV | $4.011 \times 10^4$ | 1.847 | 0.150 | 0.186 | 0.015 | 2.199 | $2.161 \times 10^4$ |
| 80.0 GeV | $8.011 \times 10^4$ | 1.915 | 0.339 | 0.447 | 0.028 | 2.731 | $3.790 \times 10^4$ |
| 100. GeV | $1.001 \times 10^5$ | 1.936 | 0.439 | 0.588 | 0.035 | 2.999 | $4.488 \times 10^4$ |
| 140. GeV | $1.401 \times 10^5$ | 1.965 | 0.645 | 0.878 | 0.049 | 3.538 | $5.715 \times 10^4$ |
| 171. GeV | $1.712 \times 10^5$ | 1.982 | 0.810 | 1.113 | 0.060 | 3.966 | *Muon critical energy* |
| 200. GeV | $2.001 \times 10^5$ | 1.995 | 0.966 | 1.337 | 0.070 | 4.370 | $7.239 \times 10^4$ |
| 300. GeV | $3.001 \times 10^5$ | 2.029 | 1.515 | 2.104 | 0.105 | 5.754 | $9.229 \times 10^4$ |
| 400. GeV | $4.001 \times 10^5$ | 2.053 | 2.082 | 2.899 | 0.140 | 7.175 | $1.078 \times 10^5$ |
| 800. GeV | $8.001 \times 10^5$ | 2.112 | 4.423 | 6.156 | 0.283 | 12.975 | $1.487 \times 10^5$ |
| 1.00 TeV | $1.000 \times 10^6$ | 2.130 | 5.626 | 7.822 | 0.355 | 15.935 | $1.626 \times 10^5$ |
| 1.40 TeV | $1.400 \times 10^6$ | 2.159 | 8.035 | 11.145 | 0.503 | 21.844 | $1.840 \times 10^5$ |
| 2.00 TeV | $2.000 \times 10^6$ | 2.190 | 11.720 | 16.216 | 0.727 | 30.855 | $2.070 \times 10^5$ |
| 3.00 TeV | $3.000 \times 10^6$ | 2.226 | 17.869 | 24.642 | 1.112 | 45.851 | $2.334 \times 10^5$ |
| 4.00 TeV | $4.000 \times 10^6$ | 2.252 | 24.100 | 33.156 | 1.502 | 61.012 | $2.522 \times 10^5$ |
| 8.00 TeV | $8.000 \times 10^6$ | 2.315 | 49.215 | 67.381 | 3.120 | 122.032 | $2.977 \times 10^5$ |
| 10.0 TeV | $1.000 \times 10^7$ | 2.335 | 61.868 | 84.583 | 3.950 | 152.738 | $3.123 \times 10^5$ |
| 14.0 TeV | $1.400 \times 10^7$ | 2.367 | 87.107 | 118.908 | 5.654 | 214.037 | $3.343 \times 10^5$ |
| 20.0 TeV | $2.000 \times 10^7$ | 2.401 | 125.182 | 170.612 | 8.266 | 306.463 | $3.576 \times 10^5$ |
| 30.0 TeV | $3.000 \times 10^7$ | 2.441 | 188.567 | 256.638 | 12.776 | 460.423 | $3.841 \times 10^5$ |
| 40.0 TeV | $4.000 \times 10^7$ | 2.469 | 252.173 | 342.864 | 17.391 | 614.900 | $4.028 \times 10^5$ |
| 80.0 TeV | $8.000 \times 10^7$ | 2.539 | 506.966 | 688.005 | 36.649 | 1234.160 | $4.478 \times 10^5$ |
| 100. TeV | $1.000 \times 10^8$ | 2.562 | 634.570 | 860.730 | 46.590 | 1544.454 | $4.623 \times 10^5$ |