## Muons in caesium (Cs)

| Z | $A$ [g/mol] | $\rho$ [g/cm$^3$] | $I$ [eV] | $a$ | $k = m_s$ | $x_0$ | $x_1$ | $\overline{C}$ | $\delta_0$ |
|---|---|---|---|---|---|---|---|---|---|
| 55 (Cs) | 132.90545196(6) | 1.873 | 488.0 | 0.18233 | 2.8866 | 0.5473 | 3.5914 | 6.9135 | 0.14 |

| $T$ | $p$ [MeV/$c$] | Ionization | Brems | Pair prod | Photonucl | Total | CSDA range [g/cm$^2$] |
|---|---|---|---|---|---|---|---|
| | | [MeV cm$^2$/g] | | | | | |
| 10.0 MeV | $4.704 \times 10^1$ | 4.464 | | | | 4.464 | $1.277 \times 10^0$ |
| 14.0 MeV | $5.616 \times 10^1$ | 3.532 | | | | 3.532 | $2.294 \times 10^0$ |
| 20.0 MeV | $6.802 \times 10^1$ | 2.794 | | | | 2.794 | $4.224 \times 10^0$ |
| 30.0 MeV | $8.509 \times 10^1$ | 2.195 | | | | 2.195 | $8.315 \times 10^0$ |
| 40.0 MeV | $1.003 \times 10^2$ | 1.890 | | | | 1.890 | $1.325 \times 10^1$ |
| 80.0 MeV | $1.527 \times 10^2$ | 1.444 | | | | 1.444 | $3.820 \times 10^1$ |
| 100. MeV | $1.764 \times 10^2$ | 1.366 | | | | 1.366 | $5.248 \times 10^1$ |
| 140. MeV | $2.218 \times 10^2$ | 1.291 | | | | 1.291 | $8.274 \times 10^1$ |
| 200. MeV | $2.868 \times 10^2$ | 1.257 | | | | 1.257 | $1.300 \times 10^2$ |
| 236. MeV | $3.250 \times 10^2$ | 1.254 | | | | 1.254 | *Minimum ionization* |
| 300. MeV | $3.917 \times 10^2$ | 1.261 | 0.000 | | 0.000 | 1.261 | $2.096 \times 10^2$ |
| 400. MeV | $4.945 \times 10^2$ | 1.284 | 0.000 | | 0.000 | 1.285 | $2.882 \times 10^2$ |
| 800. MeV | $8.995 \times 10^2$ | 1.378 | 0.001 | | 0.000 | 1.380 | $5.881 \times 10^2$ |
| 1.00 GeV | $1.101 \times 10^3$ | 1.415 | 0.001 | | 0.000 | 1.417 | $7.311 \times 10^2$ |
| 1.40 GeV | $1.502 \times 10^3$ | 1.473 | 0.002 | 0.000 | 0.001 | 1.476 | $1.007 \times 10^3$ |
| 2.00 GeV | $2.103 \times 10^3$ | 1.535 | 0.003 | 0.001 | 0.001 | 1.540 | $1.405 \times 10^3$ |
| 3.00 GeV | $3.104 \times 10^3$ | 1.605 | 0.005 | 0.003 | 0.001 | 1.615 | $2.038 \times 10^3$ |
| 4.00 GeV | $4.104 \times 10^3$ | 1.653 | 0.007 | 0.006 | 0.002 | 1.668 | $2.647 \times 10^3$ |
| 8.00 GeV | $8.105 \times 10^3$ | 1.762 | 0.018 | 0.018 | 0.003 | 1.801 | $4.945 \times 10^3$ |
| 10.0 GeV | $1.011 \times 10^4$ | 1.794 | 0.024 | 0.025 | 0.004 | 1.847 | $6.041 \times 10^3$ |
| 14.0 GeV | $1.411 \times 10^4$ | 1.840 | 0.037 | 0.040 | 0.005 | 1.923 | $8.161 \times 10^3$ |
| 20.0 GeV | $2.011 \times 10^4$ | 1.886 | 0.057 | 0.065 | 0.008 | 2.017 | $1.121 \times 10^4$ |
| 30.0 GeV | $3.011 \times 10^4$ | 1.934 | 0.094 | 0.114 | 0.011 | 2.154 | $1.600 \times 10^4$ |
| 40.0 GeV | $4.011 \times 10^4$ | 1.966 | 0.133 | 0.167 | 0.015 | 2.282 | $2.051 \times 10^4$ |
| 80.0 GeV | $8.011 \times 10^4$ | 2.036 | 0.300 | 0.401 | 0.029 | 2.767 | $3.639 \times 10^4$ |
| 100. GeV | $1.001 \times 10^5$ | 2.057 | 0.389 | 0.527 | 0.036 | 3.010 | $4.332 \times 10^4$ |
| 140. GeV | $1.401 \times 10^5$ | 2.088 | 0.571 | 0.787 | 0.050 | 3.497 | $5.564 \times 10^4$ |
| 200. GeV | $1.996 \times 10^5$ | 2.119 | 0.853 | 1.195 | 0.071 | 4.239 | *Muon critical energy* |
| 200. GeV | $2.001 \times 10^5$ | 2.119 | 0.855 | 1.199 | 0.071 | 4.245 | $7.120 \times 10^4$ |
| 300. GeV | $3.001 \times 10^5$ | 2.154 | 1.341 | 1.886 | 0.106 | 5.489 | $9.187 \times 10^4$ |
| 400. GeV | $4.001 \times 10^5$ | 2.178 | 1.844 | 2.598 | 0.142 | 6.763 | $1.083 \times 10^5$ |
| 800. GeV | $8.001 \times 10^5$ | 2.237 | 3.918 | 5.519 | 0.287 | 11.963 | $1.522 \times 10^5$ |
| 1.00 TeV | $1.000 \times 10^6$ | 2.257 | 4.984 | 7.013 | 0.360 | 14.615 | $1.673 \times 10^5$ |
| 1.40 TeV | $1.400 \times 10^6$ | 2.286 | 7.120 | 9.993 | 0.510 | 19.911 | $1.906 \times 10^5$ |
| 2.00 TeV | $2.000 \times 10^6$ | 2.317 | 10.388 | 14.540 | 0.738 | 27.985 | $2.159 \times 10^5$ |
| 3.00 TeV | $3.000 \times 10^6$ | 2.354 | 15.843 | 22.098 | 1.128 | 41.424 | $2.451 \times 10^5$ |
| 4.00 TeV | $4.000 \times 10^6$ | 2.380 | 21.371 | 29.735 | 1.525 | 55.011 | $2.660 \times 10^5$ |
| 8.00 TeV | $8.000 \times 10^6$ | 2.444 | 43.656 | 60.435 | 3.168 | 109.704 | $3.165 \times 10^5$ |
| 10.0 TeV | $1.000 \times 10^7$ | 2.465 | 54.886 | 75.866 | 4.011 | 137.230 | $3.328 \times 10^5$ |
| 14.0 TeV | $1.400 \times 10^7$ | 2.497 | 77.286 | 106.658 | 5.742 | 192.184 | $3.573 \times 10^5$ |
| 20.0 TeV | $2.000 \times 10^7$ | 2.532 | 111.082 | 153.042 | 8.396 | 275.053 | $3.833 \times 10^5$ |
| 30.0 TeV | $3.000 \times 10^7$ | 2.572 | 167.344 | 230.212 | 12.979 | 413.109 | $4.127 \times 10^5$ |
| 40.0 TeV | $4.000 \times 10^7$ | 2.601 | 223.807 | 307.564 | 17.670 | 551.643 | $4.336 \times 10^5$ |
| 80.0 TeV | $8.000 \times 10^7$ | 2.672 | 449.996 | 617.197 | 37.249 | 1107.116 | $4.838 \times 10^5$ |
| 100. TeV | $1.000 \times 10^8$ | 2.696 | 563.280 | 772.160 | 47.360 | 1385.497 | $4.999 \times 10^5$ |