

# Muons in curium (Cm)

| Z        | A [g/mol]           | $\rho$ [g/cm <sup>3</sup> ] | I [eV]  | a                                     | $k = m_s$ | $x_0$    | $x_1$                              | $\overline{C}$ | $\delta_0$ |
|----------|---------------------|-----------------------------|---------|---------------------------------------|-----------|----------|------------------------------------|----------------|------------|
| 96 (Cm)  | [247.07035(3)]      | 13.510                      | 939.0   | 0.20257                               | 2.7579    | 0.2484   | 3.5160                             | 6.3097         | 0.14       |
| $T$      | $p$<br>[MeV/c]      | Ionization                  | Brems   | Pair prod<br>[MeV cm <sup>2</sup> /g] | Photonucl | Total    | CSDA range<br>[g/cm <sup>2</sup> ] |                |            |
| 10.0 MeV | $4.704 \times 10^1$ | 3.635                       |         |                                       |           | 3.635    | $1.614 \times 10^0$                |                |            |
| 14.0 MeV | $5.616 \times 10^1$ | 2.913                       |         |                                       |           | 2.913    | $2.854 \times 10^0$                |                |            |
| 20.0 MeV | $6.802 \times 10^1$ | 2.330                       |         |                                       |           | 2.330    | $5.180 \times 10^0$                |                |            |
| 30.0 MeV | $8.509 \times 10^1$ | 1.847                       |         |                                       |           | 1.847    | $1.006 \times 10^1$                |                |            |
| 40.0 MeV | $1.003 \times 10^2$ | 1.598                       |         |                                       |           | 1.598    | $1.591 \times 10^1$                |                |            |
| 80.0 MeV | $1.527 \times 10^2$ | 1.232                       |         |                                       |           | 1.232    | $4.525 \times 10^1$                |                |            |
| 100. MeV | $1.764 \times 10^2$ | 1.167                       |         |                                       |           | 1.167    | $6.197 \times 10^1$                |                |            |
| 140. MeV | $2.218 \times 10^2$ | 1.107                       |         |                                       |           | 1.108    | $9.731 \times 10^1$                |                |            |
| 200. MeV | $2.868 \times 10^2$ | 1.083                       |         |                                       |           | 1.083    | $1.523 \times 10^2$                |                |            |
| 222. MeV | $3.104 \times 10^2$ | 1.082                       | 0.000   |                                       |           | 1.082    | <i>Minimum ionization</i>          |                |            |
| 300. MeV | $3.917 \times 10^2$ | 1.090                       | 0.000   |                                       | 0.000     | 1.090    | $2.445 \times 10^2$                |                |            |
| 400. MeV | $4.945 \times 10^2$ | 1.111                       | 0.000   |                                       | 0.000     | 1.112    | $3.353 \times 10^2$                |                |            |
| 800. MeV | $8.995 \times 10^2$ | 1.196                       | 0.001   |                                       | 0.000     | 1.198    | $6.813 \times 10^2$                |                |            |
| 1.00 GeV | $1.101 \times 10^3$ | 1.229                       | 0.002   |                                       | 0.000     | 1.231    | $8.459 \times 10^2$                |                |            |
| 1.40 GeV | $1.502 \times 10^3$ | 1.281                       | 0.003   |                                       | 0.000     | 1.285    | $1.164 \times 10^3$                |                |            |
| 2.00 GeV | $2.103 \times 10^3$ | 1.338                       | 0.004   | 0.001                                 | 0.001     | 1.344    | $1.620 \times 10^3$                |                |            |
| 3.00 GeV | $3.104 \times 10^3$ | 1.401                       | 0.008   | 0.003                                 | 0.001     | 1.414    | $2.344 \times 10^3$                |                |            |
| 4.00 GeV | $4.104 \times 10^3$ | 1.445                       | 0.011   | 0.006                                 | 0.002     | 1.465    | $3.038 \times 10^3$                |                |            |
| 8.00 GeV | $8.105 \times 10^3$ | 1.544                       | 0.028   | 0.023                                 | 0.003     | 1.599    | $5.641 \times 10^3$                |                |            |
| 10.0 GeV | $1.011 \times 10^4$ | 1.574                       | 0.038   | 0.033                                 | 0.004     | 1.649    | $6.872 \times 10^3$                |                |            |
| 14.0 GeV | $1.411 \times 10^4$ | 1.617                       | 0.058   | 0.055                                 | 0.005     | 1.735    | $9.234 \times 10^3$                |                |            |
| 20.0 GeV | $2.011 \times 10^4$ | 1.659                       | 0.090   | 0.091                                 | 0.007     | 1.847    | $1.258 \times 10^4$                |                |            |
| 30.0 GeV | $3.011 \times 10^4$ | 1.704                       | 0.147   | 0.161                                 | 0.011     | 2.023    | $1.775 \times 10^4$                |                |            |
| 40.0 GeV | $4.011 \times 10^4$ | 1.733                       | 0.207   | 0.238                                 | 0.014     | 2.194    | $2.250 \times 10^4$                |                |            |
| 80.0 GeV | $8.011 \times 10^4$ | 1.798                       | 0.469   | 0.580                                 | 0.027     | 2.876    | $3.838 \times 10^4$                |                |            |
| 100. GeV | $1.001 \times 10^5$ | 1.818                       | 0.608   | 0.765                                 | 0.034     | 3.226    | $4.494 \times 10^4$                |                |            |
| 126. GeV | $1.258 \times 10^5$ | 1.837                       | 0.789   | 1.006                                 | 0.042     | 3.677    | <i>Muon critical energy</i>        |                |            |
| 140. GeV | $1.401 \times 10^5$ | 1.846                       | 0.892   | 1.145                                 | 0.047     | 3.933    | $5.616 \times 10^4$                |                |            |
| 200. GeV | $2.001 \times 10^5$ | 1.876                       | 1.337   | 1.748                                 | 0.067     | 5.030    | $6.962 \times 10^4$                |                |            |
| 300. GeV | $3.001 \times 10^5$ | 1.908                       | 2.095   | 2.755                                 | 0.101     | 6.860    | $8.659 \times 10^4$                |                |            |
| 400. GeV | $4.001 \times 10^5$ | 1.931                       | 2.879   | 3.798                                 | 0.134     | 8.744    | $9.948 \times 10^4$                |                |            |
| 800. GeV | $8.001 \times 10^5$ | 1.987                       | 6.110   | 8.075                                 | 0.271     | 16.444   | $1.323 \times 10^5$                |                |            |
| 1.00 TeV | $1.000 \times 10^6$ | 2.005                       | 7.768   | 10.262                                | 0.341     | 20.378   | $1.432 \times 10^5$                |                |            |
| 1.40 TeV | $1.400 \times 10^6$ | 2.032                       | 11.089  | 14.624                                | 0.483     | 28.229   | $1.598 \times 10^5$                |                |            |
| 2.00 TeV | $2.000 \times 10^6$ | 2.062                       | 16.164  | 21.280                                | 0.698     | 40.206   | $1.776 \times 10^5$                |                |            |
| 3.00 TeV | $3.000 \times 10^6$ | 2.096                       | 24.631  | 32.338                                | 1.067     | 60.133   | $1.978 \times 10^5$                |                |            |
| 4.00 TeV | $4.000 \times 10^6$ | 2.120                       | 33.205  | 43.512                                | 1.441     | 80.281   | $2.121 \times 10^5$                |                |            |
| 8.00 TeV | $8.000 \times 10^6$ | 2.181                       | 67.749  | 88.424                                | 2.991     | 161.346  | $2.466 \times 10^5$                |                |            |
| 10.0 TeV | $1.000 \times 10^7$ | 2.200                       | 85.145  | 110.996                               | 3.786     | 202.130  | $2.576 \times 10^5$                |                |            |
| 14.0 TeV | $1.400 \times 10^7$ | 2.231                       | 119.842 | 156.037                               | 5.417     | 283.528  | $2.742 \times 10^5$                |                |            |
| 20.0 TeV | $2.000 \times 10^7$ | 2.263                       | 172.170 | 223.882                               | 7.914     | 406.231  | $2.918 \times 10^5$                |                |            |
| 30.0 TeV | $3.000 \times 10^7$ | 2.301                       | 259.370 | 336.752                               | 12.227    | 610.652  | $3.118 \times 10^5$                |                |            |
| 40.0 TeV | $4.000 \times 10^7$ | 2.328                       | 346.882 | 449.882                               | 16.639    | 815.733  | $3.259 \times 10^5$                |                |            |
| 80.0 TeV | $8.000 \times 10^7$ | 2.395                       | 696.903 | 902.706                               | 35.048    | 1637.054 | $3.598 \times 10^5$                |                |            |
| 100. TeV | $1.000 \times 10^8$ | 2.417                       | 872.020 | 1129.320                              | 44.550    | 2048.309 | $3.707 \times 10^5$                |                |            |