## Muons in zinc (Zn)

| Z | $A$ [g/mol] | $\rho$ [g/cm$^3$] | $I$ [eV] | $a$ | $k = m_s$ | $x_0$ | $x_1$ | $\overline{C}$ | $\delta_0$ |
|---|---|---|---|---|---|---|---|---|---|
| 30 (Zn) | 65.38(2) | 7.133 | 330.0 | 0.14714 | 2.8652 | 0.0049 | 3.3668 | 4.6906 | 0.08 |

| $T$ | $p$ [MeV/$c$] | Ionization | Brems | Pair prod | Photonucl | Total | CSDA range [g/cm$^2$] |
|---|---|---|---|---|---|---|---|
| | | [MeV cm$^2$/g] | | | | | |
| 10.0 MeV | $4.704 \times 10^1$ | 5.291 | | | | 5.291 | $1.068 \times 10^0$ |
| 14.0 MeV | $5.616 \times 10^1$ | 4.168 | | | | 4.168 | $1.928 \times 10^0$ |
| 20.0 MeV | $6.802 \times 10^1$ | 3.284 | | | | 3.284 | $3.567 \times 10^0$ |
| 30.0 MeV | $8.509 \times 10^1$ | 2.569 | | | | 2.569 | $7.057 \times 10^0$ |
| 40.0 MeV | $1.003 \times 10^2$ | 2.204 | | | | 2.204 | $1.129 \times 10^1$ |
| 80.0 MeV | $1.527 \times 10^2$ | 1.665 | | | | 1.665 | $3.281 \times 10^1$ |
| 100. MeV | $1.764 \times 10^2$ | 1.568 | | | | 1.568 | $4.522 \times 10^1$ |
| 140. MeV | $2.218 \times 10^2$ | 1.472 | | | | 1.472 | $7.167 \times 10^1$ |
| 200. MeV | $2.868 \times 10^2$ | 1.422 | | | | 1.422 | $1.133 \times 10^2$ |
| 267. MeV | $3.577 \times 10^2$ | 1.411 | | | 0.000 | 1.411 | *Minimum ionization* |
| 300. MeV | $3.917 \times 10^2$ | 1.413 | 0.000 | | 0.000 | 1.413 | $1.840 \times 10^2$ |
| 400. MeV | $4.945 \times 10^2$ | 1.428 | 0.000 | | 0.000 | 1.429 | $2.544 \times 10^2$ |
| 800. MeV | $8.995 \times 10^2$ | 1.510 | 0.001 | | 0.000 | 1.511 | $5.265 \times 10^2$ |
| 1.00 GeV | $1.101 \times 10^3$ | 1.544 | 0.001 | | 0.000 | 1.546 | $6.573 \times 10^2$ |
| 1.40 GeV | $1.502 \times 10^3$ | 1.599 | 0.001 | 0.000 | 0.001 | 1.601 | $9.113 \times 10^2$ |
| 2.00 GeV | $2.103 \times 10^3$ | 1.658 | 0.002 | 0.001 | 0.001 | 1.662 | $1.279 \times 10^3$ |
| 3.00 GeV | $3.104 \times 10^3$ | 1.726 | 0.003 | 0.002 | 0.001 | 1.733 | $1.867 \times 10^3$ |
| 4.00 GeV | $4.104 \times 10^3$ | 1.773 | 0.005 | 0.004 | 0.002 | 1.784 | $2.435 \times 10^3$ |
| 8.00 GeV | $8.105 \times 10^3$ | 1.880 | 0.012 | 0.012 | 0.003 | 1.907 | $4.596 \times 10^3$ |
| 10.0 GeV | $1.011 \times 10^4$ | 1.912 | 0.016 | 0.016 | 0.004 | 1.949 | $5.633 \times 10^3$ |
| 14.0 GeV | $1.411 \times 10^4$ | 1.959 | 0.024 | 0.026 | 0.006 | 2.015 | $7.650 \times 10^3$ |
| 20.0 GeV | $2.011 \times 10^4$ | 2.005 | 0.037 | 0.043 | 0.008 | 2.093 | $1.057 \times 10^4$ |
| 30.0 GeV | $3.011 \times 10^4$ | 2.054 | 0.060 | 0.075 | 0.012 | 2.201 | $1.522 \times 10^4$ |
| 40.0 GeV | $4.011 \times 10^4$ | 2.087 | 0.085 | 0.109 | 0.016 | 2.297 | $1.967 \times 10^4$ |
| 80.0 GeV | $8.011 \times 10^4$ | 2.160 | 0.192 | 0.262 | 0.031 | 2.645 | $3.587 \times 10^4$ |
| 100. GeV | $1.001 \times 10^5$ | 2.182 | 0.248 | 0.344 | 0.038 | 2.813 | $4.320 \times 10^4$ |
| 140. GeV | $1.401 \times 10^5$ | 2.215 | 0.365 | 0.513 | 0.053 | 3.147 | $5.664 \times 10^4$ |
| 200. GeV | $2.001 \times 10^5$ | 2.249 | 0.547 | 0.782 | 0.075 | 3.654 | $7.432 \times 10^4$ |
| 300. GeV | $3.001 \times 10^5$ | 2.287 | 0.859 | 1.232 | 0.113 | 4.491 | $9.897 \times 10^4$ |
| 311. GeV | $3.106 \times 10^5$ | 2.290 | 0.892 | 1.281 | 0.117 | 4.581 | *Muon critical energy* |
| 400. GeV | $4.001 \times 10^5$ | 2.314 | 1.181 | 1.699 | 0.150 | 5.345 | $1.194 \times 10^5$ |
| 800. GeV | $8.001 \times 10^5$ | 2.379 | 2.515 | 3.617 | 0.304 | 8.815 | $1.771 \times 10^5$ |
| 1.00 TeV | $1.000 \times 10^6$ | 2.401 | 3.201 | 4.599 | 0.382 | 10.582 | $1.977 \times 10^5$ |
| 1.40 TeV | $1.400 \times 10^6$ | 2.433 | 4.577 | 6.559 | 0.541 | 14.110 | $2.304 \times 10^5$ |
| 2.00 TeV | $2.000 \times 10^6$ | 2.468 | 6.683 | 9.552 | 0.782 | 19.486 | $2.664 \times 10^5$ |
| 3.00 TeV | $3.000 \times 10^6$ | 2.508 | 10.204 | 14.526 | 1.196 | 28.435 | $3.087 \times 10^5$ |
| 4.00 TeV | $4.000 \times 10^6$ | 2.537 | 13.773 | 19.556 | 1.617 | 37.485 | $3.392 \times 10^5$ |
| 8.00 TeV | $8.000 \times 10^6$ | 2.608 | 28.179 | 39.784 | 3.364 | 73.936 | $4.138 \times 10^5$ |
| 10.0 TeV | $1.000 \times 10^7$ | 2.632 | 35.443 | 49.955 | 4.262 | 92.293 | $4.379 \times 10^5$ |
| 14.0 TeV | $1.400 \times 10^7$ | 2.668 | 49.934 | 70.247 | 6.106 | 128.955 | $4.744 \times 10^5$ |
| 20.0 TeV | $2.000 \times 10^7$ | 2.706 | 71.808 | 100.822 | 8.934 | 184.271 | $5.132 \times 10^5$ |
| 30.0 TeV | $3.000 \times 10^7$ | 2.751 | 108.223 | 151.694 | 13.826 | 276.494 | $5.572 \times 10^5$ |
| 40.0 TeV | $4.000 \times 10^7$ | 2.783 | 144.781 | 202.694 | 18.836 | 369.095 | $5.884 \times 10^5$ |
| 80.0 TeV | $8.000 \times 10^7$ | 2.862 | 291.272 | 406.851 | 39.777 | 740.762 | $6.633 \times 10^5$ |
| 100. TeV | $1.000 \times 10^8$ | 2.888 | 364.660 | 509.030 | 50.600 | 927.179 | $6.874 \times 10^5$ |