

**Table 024: Muons in Chromium**

| Z        | A [g/mol]           | $\rho$ [g/cm <sup>3</sup> ] | I [eV]  | a                                     | $k = m_s$ | $x_0$   | $x_1$                              | $\bar{C}$ | $\delta_0$ |
|----------|---------------------|-----------------------------|---------|---------------------------------------|-----------|---------|------------------------------------|-----------|------------|
| 24 (Cr)  | 51.9961 (6)         | 7.180                       | 257.0   | 0.15419                               | 2.9896    | 0.0340  | 3.0451                             | 4.1781    | 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 | $4.704 \times 10^1$ | 5.542                       |         |                                       |           | 5.542   | $1.014 \times 10^0$                |           |            |
| 14.0 MeV | $5.616 \times 10^1$ | 4.354                       |         |                                       |           | 4.354   | $1.836 \times 10^0$                |           |            |
| 20.0 MeV | $6.802 \times 10^1$ | 3.422                       |         |                                       |           | 3.422   | $3.408 \times 10^0$                |           |            |
| 30.0 MeV | $8.509 \times 10^1$ | 2.670                       |         |                                       |           | 2.670   | $6.761 \times 10^0$                |           |            |
| 40.0 MeV | $1.003 \times 10^2$ | 2.287                       |         |                                       |           | 2.287   | $1.083 \times 10^1$                |           |            |
| 80.0 MeV | $1.527 \times 10^2$ | 1.725                       |         |                                       |           | 1.725   | $3.160 \times 10^1$                |           |            |
| 100. MeV | $1.764 \times 10^2$ | 1.623                       |         |                                       |           | 1.623   | $4.358 \times 10^1$                |           |            |
| 140. MeV | $2.218 \times 10^2$ | 1.522                       |         |                                       |           | 1.522   | $6.914 \times 10^1$                |           |            |
| 200. MeV | $2.868 \times 10^2$ | 1.469                       |         |                                       |           | 1.469   | $1.094 \times 10^2$                |           |            |
| 273. MeV | $3.633 \times 10^2$ | 1.456                       |         |                                       | 0.000     | 1.456   | <i>Minimum ionization</i>          |           |            |
| 300. MeV | $3.917 \times 10^2$ | 1.457                       |         |                                       | 0.000     | 1.457   | $1.779 \times 10^2$                |           |            |
| 400. MeV | $4.945 \times 10^2$ | 1.471                       | 0.000   |                                       | 0.000     | 1.472   | $2.463 \times 10^2$                |           |            |
| 800. MeV | $8.995 \times 10^2$ | 1.550                       | 0.000   |                                       | 0.000     | 1.551   | $5.109 \times 10^2$                |           |            |
| 1.00 GeV | $1.101 \times 10^3$ | 1.583                       | 0.001   |                                       | 0.000     | 1.584   | $6.385 \times 10^2$                |           |            |
| 1.40 GeV | $1.502 \times 10^3$ | 1.636                       | 0.001   | 0.000                                 | 0.001     | 1.638   | $8.866 \times 10^2$                |           |            |
| 2.00 GeV | $2.103 \times 10^3$ | 1.693                       | 0.002   | 0.001                                 | 0.001     | 1.697   | $1.246 \times 10^3$                |           |            |
| 3.00 GeV | $3.104 \times 10^3$ | 1.758                       | 0.003   | 0.002                                 | 0.001     | 1.764   | $1.823 \times 10^3$                |           |            |
| 4.00 GeV | $4.104 \times 10^3$ | 1.803                       | 0.004   | 0.003                                 | 0.002     | 1.812   | $2.382 \times 10^3$                |           |            |
| 8.00 GeV | $8.105 \times 10^3$ | 1.905                       | 0.010   | 0.010                                 | 0.003     | 1.928   | $4.514 \times 10^3$                |           |            |
| 10.0 GeV | $1.011 \times 10^4$ | 1.936                       | 0.013   | 0.013                                 | 0.004     | 1.967   | $5.541 \times 10^3$                |           |            |
| 14.0 GeV | $1.411 \times 10^4$ | 1.980                       | 0.019   | 0.022                                 | 0.006     | 2.027   | $7.543 \times 10^3$                |           |            |
| 20.0 GeV | $2.011 \times 10^4$ | 2.024                       | 0.030   | 0.035                                 | 0.008     | 2.098   | $1.045 \times 10^4$                |           |            |
| 30.0 GeV | $3.011 \times 10^4$ | 2.071                       | 0.049   | 0.061                                 | 0.012     | 2.194   | $1.511 \times 10^4$                |           |            |
| 40.0 GeV | $4.011 \times 10^4$ | 2.102                       | 0.070   | 0.090                                 | 0.016     | 2.278   | $1.958 \times 10^4$                |           |            |
| 80.0 GeV | $8.011 \times 10^4$ | 2.173                       | 0.157   | 0.215                                 | 0.031     | 2.577   | $3.606 \times 10^4$                |           |            |
| 100. GeV | $1.001 \times 10^5$ | 2.195                       | 0.204   | 0.282                                 | 0.039     | 2.720   | $4.361 \times 10^4$                |           |            |
| 140. GeV | $1.401 \times 10^5$ | 2.227                       | 0.300   | 0.422                                 | 0.054     | 3.003   | $5.760 \times 10^4$                |           |            |
| 200. GeV | $2.001 \times 10^5$ | 2.261                       | 0.449   | 0.644                                 | 0.076     | 3.431   | $7.628 \times 10^4$                |           |            |
| 300. GeV | $3.001 \times 10^5$ | 2.299                       | 0.706   | 1.015                                 | 0.115     | 4.136   | $1.028 \times 10^5$                |           |            |
| 370. GeV | $3.706 \times 10^5$ | 2.319                       | 0.892   | 1.286                                 | 0.141     | 4.639   | <i>Muon critical energy</i>        |           |            |
| 400. GeV | $4.001 \times 10^5$ | 2.326                       | 0.971   | 1.401                                 | 0.153     | 4.852   | $1.251 \times 10^5$                |           |            |
| 800. GeV | $8.001 \times 10^5$ | 2.392                       | 2.069   | 2.985                                 | 0.309     | 7.756   | $1.897 \times 10^5$                |           |            |
| 1.00 TeV | $1.000 \times 10^6$ | 2.414                       | 2.634   | 3.797                                 | 0.388     | 9.234   | $2.133 \times 10^5$                |           |            |
| 1.40 TeV | $1.400 \times 10^6$ | 2.447                       | 3.768   | 5.417                                 | 0.550     | 12.183  | $2.510 \times 10^5$                |           |            |
| 2.00 TeV | $2.000 \times 10^6$ | 2.482                       | 5.505   | 7.893                                 | 0.795     | 16.677  | $2.929 \times 10^5$                |           |            |
| 3.00 TeV | $3.000 \times 10^6$ | 2.522                       | 8.409   | 12.009                                | 1.217     | 24.158  | $3.425 \times 10^5$                |           |            |
| 4.00 TeV | $4.000 \times 10^6$ | 2.551                       | 11.355  | 16.171                                | 1.646     | 31.723  | $3.785 \times 10^5$                |           |            |
| 8.00 TeV | $8.000 \times 10^6$ | 2.623                       | 23.245  | 32.913                                | 3.425     | 62.207  | $4.669 \times 10^5$                |           |            |
| 10.0 TeV | $1.000 \times 10^7$ | 2.646                       | 29.243  | 41.333                                | 4.340     | 77.563  | $4.956 \times 10^5$                |           |            |
| 14.0 TeV | $1.400 \times 10^7$ | 2.682                       | 41.207  | 58.130                                | 6.219     | 108.240 | $5.391 \times 10^5$                |           |            |
| 20.0 TeV | $2.000 \times 10^7$ | 2.721                       | 59.272  | 83.442                                | 9.102     | 154.538 | $5.852 \times 10^5$                |           |            |
| 30.0 TeV | $3.000 \times 10^7$ | 2.766                       | 89.347  | 125.555                               | 14.091    | 231.760 | $6.377 \times 10^5$                |           |            |
| 40.0 TeV | $4.000 \times 10^7$ | 2.798                       | 119.546 | 167.777                               | 19.203    | 309.324 | $6.749 \times 10^5$                |           |            |
| 80.0 TeV | $8.000 \times 10^7$ | 2.878                       | 240.561 | 336.801                               | 40.578    | 620.818 | $7.644 \times 10^5$                |           |            |
| 100. TeV | $1.000 \times 10^8$ | 2.904                       | 301.190 | 421.400                               | 51.630    | 777.125 | $7.931 \times 10^5$                |           |            |