

## Muons in b-100 Bone-equivalent plastic

|          | $\langle Z/A \rangle$ | $\rho$ [g/cm <sup>3</sup> ] | $I$ [eV] | $a$                      | $k = m_s$ | $x_0$   | $x_1$                              | $\bar{C}$              | $\delta_0$                  |
|----------|-----------------------|-----------------------------|----------|--------------------------|-----------|---------|------------------------------------|------------------------|-----------------------------|
|          | 0.52740               | 1.450                       | 85.9     | 0.05268                  | 3.7365    | 0.1252  | 3.0420                             | 3.4528                 | 0.00                        |
| $T$      | $p$<br>[MeV/c]        | Ionization                  | Brems    | Pair prod                | Photonucl | Total   | CSDA range<br>[g/cm <sup>2</sup> ] |                        |                             |
|          |                       |                             |          | [MeV cm <sup>2</sup> /g] |           |         |                                    |                        |                             |
| 10.0 MeV | $4.704 \times 10^1$   | 7.435                       |          |                          |           | 7.435   |                                    | $7.443 \times 10^{-1}$ |                             |
| 14.0 MeV | $5.616 \times 10^1$   | 5.803                       |          |                          |           | 5.803   |                                    | $1.360 \times 10^0$    |                             |
| 20.0 MeV | $6.802 \times 10^1$   | 4.535                       |          |                          |           | 4.535   |                                    | $2.543 \times 10^0$    |                             |
| 30.0 MeV | $8.509 \times 10^1$   | 3.521                       |          |                          |           | 3.521   |                                    | $5.080 \times 10^0$    |                             |
| 40.0 MeV | $1.003 \times 10^2$   | 3.008                       |          |                          |           | 3.008   |                                    | $8.173 \times 10^0$    |                             |
| 80.0 MeV | $1.527 \times 10^2$   | 2.256                       |          |                          |           | 2.256   |                                    | $2.401 \times 10^1$    |                             |
| 100. MeV | $1.764 \times 10^2$   | 2.115                       |          |                          |           | 2.115   |                                    | $3.319 \times 10^1$    |                             |
| 140. MeV | $2.218 \times 10^2$   | 1.971                       |          |                          |           | 1.971   |                                    | $5.287 \times 10^1$    |                             |
| 200. MeV | $2.868 \times 10^2$   | 1.889                       |          |                          |           | 1.889   |                                    | $8.408 \times 10^1$    |                             |
| 300. MeV | $3.917 \times 10^2$   | 1.859                       |          |                          | 0.000     | 1.859   |                                    | $1.376 \times 10^2$    |                             |
| 314. MeV | $4.065 \times 10^2$   | 1.859                       |          |                          | 0.000     | 1.859   |                                    |                        | <i>Minimum ionization</i>   |
| 400. MeV | $4.945 \times 10^2$   | 1.866                       |          |                          | 0.000     | 1.866   |                                    | $1.913 \times 10^2$    |                             |
| 800. MeV | $8.995 \times 10^2$   | 1.940                       | 0.000    |                          | 0.000     | 1.940   |                                    | $4.016 \times 10^2$    |                             |
| 1.00 GeV | $1.101 \times 10^3$   | 1.973                       | 0.000    |                          | 0.000     | 1.974   |                                    | $5.037 \times 10^2$    |                             |
| 1.40 GeV | $1.502 \times 10^3$   | 2.027                       | 0.000    | 0.000                    | 0.001     | 2.028   |                                    | $7.036 \times 10^2$    |                             |
| 2.00 GeV | $2.103 \times 10^3$   | 2.086                       | 0.001    | 0.000                    | 0.001     | 2.088   |                                    | $9.949 \times 10^2$    |                             |
| 3.00 GeV | $3.104 \times 10^3$   | 2.153                       | 0.001    | 0.001                    | 0.001     | 2.157   |                                    | $1.466 \times 10^3$    |                             |
| 4.00 GeV | $4.104 \times 10^3$   | 2.200                       | 0.002    | 0.001                    | 0.002     | 2.205   |                                    | $1.924 \times 10^3$    |                             |
| 8.00 GeV | $8.105 \times 10^3$   | 2.308                       | 0.004    | 0.004                    | 0.004     | 2.320   |                                    | $3.687 \times 10^3$    |                             |
| 10.0 GeV | $1.011 \times 10^4$   | 2.341                       | 0.006    | 0.006                    | 0.005     | 2.357   |                                    | $4.542 \times 10^3$    |                             |
| 14.0 GeV | $1.411 \times 10^4$   | 2.388                       | 0.008    | 0.009                    | 0.007     | 2.412   |                                    | $6.218 \times 10^3$    |                             |
| 20.0 GeV | $2.011 \times 10^4$   | 2.436                       | 0.013    | 0.015                    | 0.009     | 2.473   |                                    | $8.673 \times 10^3$    |                             |
| 30.0 GeV | $3.011 \times 10^4$   | 2.487                       | 0.021    | 0.026                    | 0.013     | 2.548   |                                    | $1.265 \times 10^4$    |                             |
| 40.0 GeV | $4.011 \times 10^4$   | 2.522                       | 0.030    | 0.039                    | 0.017     | 2.609   |                                    | $1.653 \times 10^4$    |                             |
| 80.0 GeV | $8.011 \times 10^4$   | 2.602                       | 0.069    | 0.093                    | 0.034     | 2.798   |                                    | $3.131 \times 10^4$    |                             |
| 100. GeV | $1.001 \times 10^5$   | 2.627                       | 0.090    | 0.123                    | 0.042     | 2.881   |                                    | $3.835 \times 10^4$    |                             |
| 140. GeV | $1.401 \times 10^5$   | 2.663                       | 0.132    | 0.184                    | 0.058     | 3.038   |                                    | $5.187 \times 10^4$    |                             |
| 200. GeV | $2.001 \times 10^5$   | 2.702                       | 0.199    | 0.282                    | 0.083     | 3.266   |                                    | $7.091 \times 10^4$    |                             |
| 300. GeV | $3.001 \times 10^5$   | 2.746                       | 0.313    | 0.447                    | 0.124     | 3.630   |                                    | $9.993 \times 10^4$    |                             |
| 400. GeV | $4.001 \times 10^5$   | 2.777                       | 0.432    | 0.619                    | 0.165     | 3.993   |                                    | $1.262 \times 10^5$    |                             |
| 800. GeV | $8.001 \times 10^5$   | 2.852                       | 0.925    | 1.332                    | 0.334     | 5.444   |                                    | $2.116 \times 10^5$    |                             |
| 877. GeV | $8.772 \times 10^5$   | 2.863                       | 1.023    | 1.473                    | 0.367     | 5.725   |                                    |                        | <i>Muon critical energy</i> |
| 1.00 TeV | $1.000 \times 10^6$   | 2.877                       | 1.180    | 1.700                    | 0.420     | 6.176   |                                    | $2.461 \times 10^5$    |                             |
| 1.40 TeV | $1.400 \times 10^6$   | 2.914                       | 1.692    | 2.432                    | 0.595     | 7.634   |                                    | $3.043 \times 10^5$    |                             |
| 2.00 TeV | $2.000 \times 10^6$   | 2.954                       | 2.479    | 3.554                    | 0.862     | 9.849   |                                    | $3.733 \times 10^5$    |                             |
| 3.00 TeV | $3.000 \times 10^6$   | 3.001                       | 3.796    | 5.420                    | 1.321     | 13.539  |                                    | $4.596 \times 10^5$    |                             |
| 4.00 TeV | $4.000 \times 10^6$   | 3.034                       | 5.136    | 7.311                    | 1.788     | 17.269  |                                    | $5.248 \times 10^5$    |                             |
| 8.00 TeV | $8.000 \times 10^6$   | 3.116                       | 10.556   | 14.927                   | 3.730     | 32.330  |                                    | $6.914 \times 10^5$    |                             |
| 10.0 TeV | $1.000 \times 10^7$   | 3.143                       | 13.296   | 18.761                   | 4.731     | 39.931  |                                    | $7.470 \times 10^5$    |                             |
| 14.0 TeV | $1.400 \times 10^7$   | 3.184                       | 18.764   | 26.404                   | 6.792     | 55.143  |                                    | $8.319 \times 10^5$    |                             |
| 20.0 TeV | $2.000 \times 10^7$   | 3.228                       | 27.031   | 37.928                   | 9.958     | 78.146  |                                    | $9.228 \times 10^5$    |                             |
| 30.0 TeV | $3.000 \times 10^7$   | 3.279                       | 40.792   | 57.102                   | 15.452    | 116.625 |                                    | $1.027 \times 10^6$    |                             |
| 40.0 TeV | $4.000 \times 10^7$   | 3.316                       | 54.620   | 76.334                   | 21.091    | 155.362 |                                    | $1.101 \times 10^6$    |                             |
| 80.0 TeV | $8.000 \times 10^7$   | 3.407                       | 110.058  | 153.330                  | 44.748    | 311.543 |                                    | $1.279 \times 10^6$    |                             |
| 100. TeV | $1.000 \times 10^8$   | 3.437                       | 137.844  | 191.873                  | 57.009    | 390.162 |                                    | $1.337 \times 10^6$    |                             |