

Muons in thulium (Tm)

| Z | A [g/mol] | ρ [g/cm ³] | I [eV] | a | $k = m_s$ | x_0 | x_1 | \bar{C} | δ_0 |
|---------|--------------|-----------------------------|--------|---------|-----------|--------|--------|-----------|------------|
| 69 (Tm) | 168.93422(2) | 9.321 | 674.0 | 0.24889 | 2.5469 | 0.0812 | 3.5085 | 5.9677 | 0.14 |

| T | p [MeV/c] | Ionization | Brems | Pair prod [MeV cm ² /g] | Photonucl | Total | CSDA range [g/cm ²] |
|----------|---------------------|------------|---------|---------------------------------------|-----------|----------|------------------------------------|
| 10.0 MeV | 4.704×10^1 | 4.123 | | | | 4.123 | 1.398×10^0 |
| 14.0 MeV | 5.616×10^1 | 3.277 | | | | 3.277 | 2.497×10^0 |
| 20.0 MeV | 6.802×10^1 | 2.602 | | | | 2.603 | 4.572×10^0 |
| 30.0 MeV | 8.509×10^1 | 2.050 | | | | 2.050 | 8.957×10^0 |
| 40.0 MeV | 1.003×10^2 | 1.767 | | | | 1.767 | 1.424×10^1 |
| 80.0 MeV | 1.527×10^2 | 1.351 | | | | 1.351 | 4.092×10^1 |
| 100. MeV | 1.764×10^2 | 1.277 | | | | 1.277 | 5.619×10^1 |
| 140. MeV | 2.218×10^2 | 1.206 | | | | 1.207 | 8.855×10^1 |
| 200. MeV | 2.868×10^2 | 1.174 | | | | 1.174 | 1.391×10^2 |
| 237. MeV | 3.260×10^2 | 1.170 | 0.000 | | | 1.170 | <i>Minimum ionization</i> |
| 300. MeV | 3.917×10^2 | 1.175 | 0.000 | | 0.000 | 1.175 | 2.245×10^2 |
| 400. MeV | 4.945×10^2 | 1.194 | 0.000 | | 0.000 | 1.195 | 3.089×10^2 |
| 800. MeV | 8.995×10^2 | 1.278 | 0.001 | | 0.000 | 1.280 | 6.319×10^2 |
| 1.00 GeV | 1.101×10^3 | 1.312 | 0.001 | | 0.000 | 1.314 | 7.862×10^2 |
| 1.40 GeV | 1.502×10^3 | 1.365 | 0.002 | 0.000 | 0.001 | 1.368 | 1.084×10^3 |
| 2.00 GeV | 2.103×10^3 | 1.423 | 0.004 | 0.001 | 0.001 | 1.429 | 1.513×10^3 |
| 3.00 GeV | 3.104×10^3 | 1.489 | 0.006 | 0.003 | 0.001 | 1.500 | 2.195×10^3 |
| 4.00 GeV | 4.104×10^3 | 1.535 | 0.009 | 0.006 | 0.002 | 1.552 | 2.850×10^3 |
| 8.00 GeV | 8.105×10^3 | 1.639 | 0.022 | 0.020 | 0.003 | 1.685 | 5.313×10^3 |
| 10.0 GeV | 1.011×10^4 | 1.670 | 0.029 | 0.029 | 0.004 | 1.733 | 6.483×10^3 |
| 14.0 GeV | 1.411×10^4 | 1.715 | 0.045 | 0.047 | 0.005 | 1.813 | 8.738×10^3 |
| 20.0 GeV | 2.011×10^4 | 1.760 | 0.070 | 0.077 | 0.007 | 1.915 | 1.196×10^4 |
| 30.0 GeV | 3.011×10^4 | 1.808 | 0.114 | 0.135 | 0.011 | 2.069 | 1.698×10^4 |
| 40.0 GeV | 4.011×10^4 | 1.840 | 0.161 | 0.198 | 0.014 | 2.214 | 2.165×10^4 |
| 80.0 GeV | 8.011×10^4 | 1.909 | 0.365 | 0.477 | 0.028 | 2.780 | 3.773×10^4 |
| 100. GeV | 1.001×10^5 | 1.930 | 0.472 | 0.627 | 0.035 | 3.066 | 4.458×10^4 |
| 140. GeV | 1.401×10^5 | 1.961 | 0.693 | 0.936 | 0.049 | 3.640 | 5.654×10^4 |
| 161. GeV | 1.611×10^5 | 1.973 | 0.813 | 1.104 | 0.056 | 3.947 | <i>Muon critical energy</i> |
| 200. GeV | 2.001×10^5 | 1.992 | 1.039 | 1.426 | 0.069 | 4.528 | 7.130×10^4 |
| 300. GeV | 3.001×10^5 | 2.026 | 1.629 | 2.245 | 0.104 | 6.006 | 9.043×10^4 |
| 400. GeV | 4.001×10^5 | 2.050 | 2.239 | 3.092 | 0.139 | 7.522 | 1.053×10^5 |
| 800. GeV | 8.001×10^5 | 2.108 | 4.756 | 6.568 | 0.281 | 13.715 | 1.441×10^5 |
| 1.00 TeV | 1.000×10^6 | 2.127 | 6.048 | 8.346 | 0.353 | 16.876 | 1.572×10^5 |
| 1.40 TeV | 1.400×10^6 | 2.156 | 8.638 | 11.891 | 0.500 | 23.186 | 1.774×10^5 |
| 2.00 TeV | 2.000×10^6 | 2.187 | 12.597 | 17.300 | 0.723 | 32.809 | 1.990×10^5 |
| 3.00 TeV | 3.000×10^6 | 2.223 | 19.205 | 26.289 | 1.105 | 48.824 | 2.239×10^5 |
| 4.00 TeV | 4.000×10^6 | 2.249 | 25.900 | 35.373 | 1.493 | 65.015 | 2.416×10^5 |
| 8.00 TeV | 8.000×10^6 | 2.312 | 52.880 | 71.881 | 3.099 | 130.174 | 2.842×10^5 |
| 10.0 TeV | 1.000×10^7 | 2.333 | 66.472 | 90.230 | 3.924 | 162.961 | 2.979×10^5 |
| 14.0 TeV | 1.400×10^7 | 2.365 | 93.583 | 126.846 | 5.617 | 228.412 | 3.185×10^5 |
| 20.0 TeV | 2.000×10^7 | 2.399 | 134.480 | 182.002 | 8.210 | 327.093 | 3.404×10^5 |
| 30.0 TeV | 3.000×10^7 | 2.439 | 202.563 | 273.766 | 12.688 | 491.458 | 3.651×10^5 |
| 40.0 TeV | 4.000×10^7 | 2.467 | 270.881 | 365.744 | 17.270 | 656.365 | 3.827×10^5 |
| 80.0 TeV | 8.000×10^7 | 2.538 | 544.541 | 733.910 | 36.395 | 1317.385 | 4.248×10^5 |
| 100. TeV | 1.000×10^8 | 2.561 | 681.590 | 918.160 | 46.270 | 1648.583 | 4.384×10^5 |