

**Table 190: Muons in Lung (ICRP)**

$\langle Z/A \rangle$	$\rho$ [g/cm <sup>3</sup> ]	$I$ [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
0.54965	1.050	75.3	0.08588	3.5353	0.2261	2.8001	3.4708	0.00
$T$	$p$ [MeV/c]	Ionization	Brems	Pair prod [MeV cm <sup>2</sup> /g]	Photonucl	Total	CSDA range [g/cm <sup>2</sup> ]	
10.0 MeV	$4.704 \times 10^1$	7.883				7.883	$7.011 \times 10^{-1}$	
14.0 MeV	$5.616 \times 10^1$	6.149				6.149	$1.282 \times 10^0$	
20.0 MeV	$6.802 \times 10^1$	4.802				4.802	$2.399 \times 10^0$	
30.0 MeV	$8.509 \times 10^1$	3.726				3.726	$4.796 \times 10^0$	
40.0 MeV	$1.003 \times 10^2$	3.181				3.181	$7.720 \times 10^0$	
80.0 MeV	$1.527 \times 10^2$	2.389				2.389	$2.269 \times 10^1$	
100. MeV	$1.764 \times 10^2$	2.247				2.247	$3.135 \times 10^1$	
140. MeV	$2.218 \times 10^2$	2.093				2.093	$4.988 \times 10^1$	
200. MeV	$2.868 \times 10^2$	2.004				2.005	$7.929 \times 10^1$	
300. MeV	$3.917 \times 10^2$	1.971			0.000	1.971	$1.297 \times 10^2$	
318. MeV	$4.105 \times 10^2$	1.970			0.000	1.971	<i>Minimum ionization</i>	
400. MeV	$4.945 \times 10^2$	1.977			0.000	1.977	$1.804 \times 10^2$	
800. MeV	$8.995 \times 10^2$	2.052	0.000		0.000	2.053	$3.790 \times 10^2$	
1.00 GeV	$1.101 \times 10^3$	2.086	0.000		0.000	2.087	$4.757 \times 10^2$	
1.40 GeV	$1.502 \times 10^3$	2.142	0.000		0.001	2.143	$6.647 \times 10^2$	
2.00 GeV	$2.103 \times 10^3$	2.203	0.001	0.000	0.001	2.205	$9.405 \times 10^2$	
3.00 GeV	$3.104 \times 10^3$	2.272	0.001	0.001	0.001	2.276	$1.386 \times 10^3$	
4.00 GeV	$4.104 \times 10^3$	2.321	0.001	0.001	0.002	2.325	$1.821 \times 10^3$	
8.00 GeV	$8.105 \times 10^3$	2.431	0.004	0.003	0.004	2.442	$3.494 \times 10^3$	
10.0 GeV	$1.011 \times 10^4$	2.465	0.005	0.005	0.005	2.479	$4.307 \times 10^3$	
14.0 GeV	$1.411 \times 10^4$	2.514	0.007	0.008	0.007	2.536	$5.901 \times 10^3$	
20.0 GeV	$2.011 \times 10^4$	2.563	0.011	0.013	0.009	2.597	$8.238 \times 10^3$	
30.0 GeV	$3.011 \times 10^4$	2.616	0.019	0.023	0.013	2.671	$1.203 \times 10^4$	
40.0 GeV	$4.011 \times 10^4$	2.652	0.026	0.033	0.018	2.729	$1.573 \times 10^4$	
80.0 GeV	$8.011 \times 10^4$	2.735	0.060	0.080	0.034	2.910	$2.990 \times 10^4$	
100. GeV	$1.001 \times 10^5$	2.761	0.077	0.106	0.042	2.987	$3.669 \times 10^4$	
140. GeV	$1.401 \times 10^5$	2.800	0.114	0.159	0.059	3.132	$4.976 \times 10^4$	
200. GeV	$2.001 \times 10^5$	2.840	0.172	0.243	0.084	3.339	$6.831 \times 10^4$	
300. GeV	$3.001 \times 10^5$	2.886	0.271	0.387	0.125	3.669	$9.686 \times 10^4$	
400. GeV	$4.001 \times 10^5$	2.918	0.375	0.536	0.167	3.995	$1.230 \times 10^5$	
800. GeV	$8.001 \times 10^5$	2.997	0.804	1.157	0.337	5.295	$2.096 \times 10^5$	
1.00 TeV	$1.000 \times 10^6$	3.022	1.026	1.478	0.423	5.950	$2.453 \times 10^5$	
1.03 TeV	$1.031 \times 10^6$	3.026	1.061	1.528	0.437	6.052	<i>Muon critical energy</i>	
1.40 TeV	$1.400 \times 10^6$	3.061	1.473	2.117	0.601	7.252	$3.061 \times 10^5$	
2.00 TeV	$2.000 \times 10^6$	3.103	2.160	3.096	0.870	9.229	$3.792 \times 10^5$	
3.00 TeV	$3.000 \times 10^6$	3.151	3.312	4.726	1.332	12.521	$4.719 \times 10^5$	
4.00 TeV	$4.000 \times 10^6$	3.186	4.484	6.378	1.803	15.851	$5.428 \times 10^5$	
8.00 TeV	$8.000 \times 10^6$	3.271	9.228	13.033	3.764	29.296	$7.256 \times 10^5$	
10.0 TeV	$1.000 \times 10^7$	3.299	11.627	16.385	4.774	36.085	$7.870 \times 10^5$	
14.0 TeV	$1.400 \times 10^7$	3.342	16.416	23.063	6.855	49.676	$8.811 \times 10^5$	
20.0 TeV	$2.000 \times 10^7$	3.388	23.660	33.136	10.052	70.237	$9.822 \times 10^5$	
30.0 TeV	$3.000 \times 10^7$	3.441	35.722	49.897	15.602	104.662	$1.098 \times 10^6$	
40.0 TeV	$4.000 \times 10^7$	3.480	47.848	66.711	21.298	139.338	$1.181 \times 10^6$	
80.0 TeV	$8.000 \times 10^7$	3.574	96.489	134.024	45.204	279.292	$1.379 \times 10^6$	
100. TeV	$1.000 \times 10^8$	3.606	120.879	167.720	57.597	349.802	$1.443 \times 10^6$	