

**Muons in lead (Pb)**

Z	A [g/mol]	$\rho$ [g/cm <sup>3</sup> ]	I [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
82 (Pb)	207.2(1)	11.350	823.0	0.09359	3.1608	0.3776	3.8073	6.2018	0.14
$T$	$p$ [MeV/c]	Ionization	Brems	Pair prod [MeV cm <sup>2</sup> /g]	Photonucl	Total	CSDA range [g/cm <sup>2</sup> ]		
10.0 MeV	$4.704 \times 10^1$	3.823				3.823	$1.524 \times 10^0$		
14.0 MeV	$5.616 \times 10^1$	3.054				3.054	$2.705 \times 10^0$		
20.0 MeV	$6.802 \times 10^1$	2.436				2.436	$4.927 \times 10^0$		
30.0 MeV	$8.509 \times 10^1$	1.928				1.928	$9.600 \times 10^0$		
40.0 MeV	$1.003 \times 10^2$	1.666				1.666	$1.521 \times 10^1$		
80.0 MeV	$1.527 \times 10^2$	1.283				1.283	$4.338 \times 10^1$		
100. MeV	$1.764 \times 10^2$	1.215				1.215	$5.943 \times 10^1$		
140. MeV	$2.218 \times 10^2$	1.151				1.152	$9.339 \times 10^1$		
200. MeV	$2.868 \times 10^2$	1.124				1.124	$1.463 \times 10^2$		
226. MeV	$3.145 \times 10^2$	1.122	0.000			1.123	<i>Minimum ionization</i>		
300. MeV	$3.917 \times 10^2$	1.130	0.000		0.000	1.131	$2.352 \times 10^2$		
400. MeV	$4.945 \times 10^2$	1.151	0.000		0.000	1.152	$3.228 \times 10^2$		
800. MeV	$8.995 \times 10^2$	1.237	0.001		0.000	1.238	$6.572 \times 10^2$		
1.00 GeV	$1.101 \times 10^3$	1.270	0.001		0.000	1.272	$8.165 \times 10^2$		
1.40 GeV	$1.502 \times 10^3$	1.322	0.002		0.001	1.325	$1.124 \times 10^3$		
2.00 GeV	$2.103 \times 10^3$	1.379	0.004	0.001	0.001	1.385	$1.567 \times 10^3$		
3.00 GeV	$3.104 \times 10^3$	1.442	0.007	0.003	0.001	1.454	$2.270 \times 10^3$		
4.00 GeV	$4.104 \times 10^3$	1.486	0.010	0.006	0.002	1.504	$2.946 \times 10^3$		
8.00 GeV	$8.105 \times 10^3$	1.585	0.025	0.022	0.003	1.635	$5.486 \times 10^3$		
10.0 GeV	$1.011 \times 10^4$	1.615	0.033	0.031	0.004	1.683	$6.691 \times 10^3$		
14.0 GeV	$1.411 \times 10^4$	1.657	0.051	0.051	0.005	1.765	$9.009 \times 10^3$		
20.0 GeV	$2.011 \times 10^4$	1.700	0.079	0.084	0.007	1.871	$1.231 \times 10^4$		
30.0 GeV	$3.011 \times 10^4$	1.744	0.129	0.148	0.011	2.033	$1.743 \times 10^4$		
40.0 GeV	$4.011 \times 10^4$	1.774	0.183	0.218	0.014	2.190	$2.217 \times 10^4$		
80.0 GeV	$8.011 \times 10^4$	1.840	0.414	0.527	0.028	2.810	$3.825 \times 10^4$		
100. GeV	$1.001 \times 10^5$	1.860	0.536	0.694	0.034	3.126	$4.500 \times 10^4$		
140. GeV	$1.401 \times 10^5$	1.889	0.787	1.038	0.048	3.763	$5.665 \times 10^4$		
141. GeV	$1.412 \times 10^5$	1.890	0.794	1.048	0.048	3.782	<i>Muon critical energy</i>		
200. GeV	$2.001 \times 10^5$	1.919	1.179	1.583	0.068	4.750	$7.082 \times 10^4$		
300. GeV	$3.001 \times 10^5$	1.953	1.848	2.492	0.102	6.396	$8.891 \times 10^4$		
400. GeV	$4.001 \times 10^5$	1.976	2.539	3.434	0.136	8.087	$1.028 \times 10^5$		
800. GeV	$8.001 \times 10^5$	2.033	5.390	7.297	0.276	14.997	$1.386 \times 10^5$		
1.00 TeV	$1.000 \times 10^6$	2.051	6.854	9.272	0.346	18.526	$1.505 \times 10^5$		
1.40 TeV	$1.400 \times 10^6$	2.079	9.786	13.211	0.491	25.569	$1.689 \times 10^5$		
2.00 TeV	$2.000 \times 10^6$	2.109	14.269	19.221	0.709	36.310	$1.885 \times 10^5$		
3.00 TeV	$3.000 \times 10^6$	2.144	21.748	29.208	1.084	54.186	$2.109 \times 10^5$		
4.00 TeV	$4.000 \times 10^6$	2.169	29.323	39.300	1.465	72.258	$2.268 \times 10^5$		
8.00 TeV	$8.000 \times 10^6$	2.230	59.847	79.858	3.041	144.979	$2.651 \times 10^5$		
10.0 TeV	$1.000 \times 10^7$	2.251	75.222	100.242	3.850	181.567	$2.774 \times 10^5$		
14.0 TeV	$1.400 \times 10^7$	2.281	105.888	140.921	5.510	254.601	$2.959 \times 10^5$		
20.0 TeV	$2.000 \times 10^7$	2.315	152.142	202.196	8.052	364.707	$3.155 \times 10^5$		
30.0 TeV	$3.000 \times 10^7$	2.353	229.144	304.134	12.440	548.073	$3.377 \times 10^5$		
40.0 TeV	$4.000 \times 10^7$	2.381	306.405	406.307	16.930	732.025	$3.535 \times 10^5$		
80.0 TeV	$8.000 \times 10^7$	2.449	615.863	815.286	35.667	1469.266	$3.913 \times 10^5$		
100. TeV	$1.000 \times 10^8$	2.471	770.830	1019.960	45.340	1838.603	$4.034 \times 10^5$		