

**Table 083: Muons in Bismuth**

Z	A [g/mol]	$\rho$ [g/cm <sup>3</sup> ]	I [eV]	a	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
83 (Bi)	208.98040 (1)	9.747	823.0	0.09410	3.1671	0.4152	3.8248	6.3505	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	$4.704 \times 10^1$	3.838				3.838	$1.517 \times 10^0$		
14.0 MeV	$5.616 \times 10^1$	3.066				3.066	$2.694 \times 10^0$		
20.0 MeV	$6.802 \times 10^1$	2.445				2.445	$4.907 \times 10^0$		
30.0 MeV	$8.509 \times 10^1$	1.935				1.935	$9.562 \times 10^0$		
40.0 MeV	$1.003 \times 10^2$	1.673				1.673	$1.515 \times 10^1$		
80.0 MeV	$1.527 \times 10^2$	1.288				1.288	$4.321 \times 10^1$		
100. MeV	$1.764 \times 10^2$	1.221				1.221	$5.919 \times 10^1$		
140. MeV	$2.218 \times 10^2$	1.157				1.157	$9.299 \times 10^1$		
200. MeV	$2.868 \times 10^2$	1.129				1.130	$1.457 \times 10^2$		
223. MeV	$3.114 \times 10^2$	1.128	0.000			1.128	<i>Minimum ionization</i>		
300. MeV	$3.917 \times 10^2$	1.136	0.000		0.000	1.137	$2.341 \times 10^2$		
400. MeV	$4.945 \times 10^2$	1.158	0.000		0.000	1.159	$3.213 \times 10^2$		
800. MeV	$8.995 \times 10^2$	1.245	0.001		0.000	1.247	$6.534 \times 10^2$		
1.00 GeV	$1.101 \times 10^3$	1.279	0.001		0.000	1.281	$8.116 \times 10^2$		
1.40 GeV	$1.502 \times 10^3$	1.332	0.002		0.001	1.335	$1.117 \times 10^3$		
2.00 GeV	$2.103 \times 10^3$	1.389	0.004	0.001	0.001	1.395	$1.556 \times 10^3$		
3.00 GeV	$3.104 \times 10^3$	1.453	0.007	0.003	0.001	1.465	$2.254 \times 10^3$		
4.00 GeV	$4.104 \times 10^3$	1.498	0.010	0.006	0.002	1.516	$2.925 \times 10^3$		
8.00 GeV	$8.105 \times 10^3$	1.598	0.025	0.022	0.003	1.649	$5.444 \times 10^3$		
10.0 GeV	$1.011 \times 10^4$	1.628	0.034	0.031	0.004	1.698	$6.639 \times 10^3$		
14.0 GeV	$1.411 \times 10^4$	1.671	0.052	0.051	0.005	1.780	$8.938 \times 10^3$		
20.0 GeV	$2.011 \times 10^4$	1.714	0.080	0.085	0.007	1.887	$1.221 \times 10^4$		
30.0 GeV	$3.011 \times 10^4$	1.759	0.131	0.150	0.011	2.052	$1.729 \times 10^4$		
40.0 GeV	$4.011 \times 10^4$	1.789	0.186	0.221	0.014	2.210	$2.198 \times 10^4$		
80.0 GeV	$8.011 \times 10^4$	1.856	0.420	0.534	0.028	2.838	$3.791 \times 10^4$		
100. GeV	$1.001 \times 10^5$	1.876	0.544	0.703	0.034	3.159	$4.459 \times 10^4$		
140. GeV	$1.401 \times 10^5$	1.905	0.798	1.051	0.048	3.804	$5.612 \times 10^4$		
140. GeV	$1.406 \times 10^5$	1.905	0.802	1.056	0.048	3.812	<i>Muon critical energy</i>		
200. GeV	$2.001 \times 10^5$	1.935	1.196	1.603	0.068	4.804	$7.013 \times 10^4$		
300. GeV	$3.001 \times 10^5$	1.969	1.875	2.524	0.102	6.472	$8.801 \times 10^4$		
400. GeV	$4.001 \times 10^5$	1.992	2.577	3.479	0.136	8.186	$1.017 \times 10^5$		
800. GeV	$8.001 \times 10^5$	2.049	5.471	7.392	0.276	15.189	$1.371 \times 10^5$		
1.00 TeV	$1.000 \times 10^6$	2.068	6.956	9.393	0.346	18.765	$1.489 \times 10^5$		
1.40 TeV	$1.400 \times 10^6$	2.096	9.932	13.384	0.490	25.903	$1.670 \times 10^5$		
2.00 TeV	$2.000 \times 10^6$	2.126	14.481	19.473	0.709	36.790	$1.863 \times 10^5$		
3.00 TeV	$3.000 \times 10^6$	2.161	22.071	29.590	1.083	54.907	$2.084 \times 10^5$		
4.00 TeV	$4.000 \times 10^6$	2.186	29.758	39.814	1.464	73.223	$2.241 \times 10^5$		
8.00 TeV	$8.000 \times 10^6$	2.248	60.733	80.904	3.039	146.925	$2.619 \times 10^5$		
10.0 TeV	$1.000 \times 10^7$	2.268	76.335	101.556	3.847	184.008	$2.741 \times 10^5$		
14.0 TeV	$1.400 \times 10^7$	2.299	107.453	142.764	5.505	258.023	$2.924 \times 10^5$		
20.0 TeV	$2.000 \times 10^7$	2.332	154.390	204.836	8.044	369.604	$3.117 \times 10^5$		
30.0 TeV	$3.000 \times 10^7$	2.370	232.528	308.108	12.430	555.437	$3.336 \times 10^5$		
40.0 TeV	$4.000 \times 10^7$	2.398	310.928	411.618	16.917	741.863	$3.491 \times 10^5$		
80.0 TeV	$8.000 \times 10^7$	2.467	624.949	825.936	35.637	1488.991	$3.864 \times 10^5$		
100. TeV	$1.000 \times 10^8$	2.489	782.200	1033.280	45.300	1863.271	$3.984 \times 10^5$		