

**Table 117: Muons in Bismuth germanate (BGO)  $[(\text{Bi}_2\text{O}_3)_2(\text{GeO}_2)_3]$**

$\langle Z/A \rangle$	$\rho$ [g/cm <sup>3</sup> ]	$I$ [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
0.42065	7.130	534.1	0.09569	3.0781	0.0456	3.7816	5.7409	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	$4.704 \times 10^1$	4.503				4.503	$1.259 \times 10^0$	
14.0 MeV	$5.616 \times 10^1$	3.557				3.557	$2.268 \times 10^0$	
20.0 MeV	$6.802 \times 10^1$	2.811				2.812	$4.186 \times 10^0$	
30.0 MeV	$8.509 \times 10^1$	2.208				2.208	$8.253 \times 10^0$	
40.0 MeV	$1.003 \times 10^2$	1.901				1.901	$1.316 \times 10^1$	
80.0 MeV	$1.527 \times 10^2$	1.452				1.452	$3.797 \times 10^1$	
100. MeV	$1.764 \times 10^2$	1.371				1.371	$5.218 \times 10^1$	
140. MeV	$2.218 \times 10^2$	1.294				1.294	$8.234 \times 10^1$	
200. MeV	$2.868 \times 10^2$	1.256				1.256	$1.296 \times 10^2$	
247. MeV	$3.366 \times 10^2$	1.251	0.000			1.251	<i>Minimum ionization</i>	
300. MeV	$3.917 \times 10^2$	1.255	0.000		0.000	1.255	$2.094 \times 10^2$	
400. MeV	$4.945 \times 10^2$	1.273	0.000		0.000	1.274	$2.885 \times 10^2$	
800. MeV	$8.995 \times 10^2$	1.356	0.001		0.000	1.358	$5.924 \times 10^2$	
1.00 GeV	$1.101 \times 10^3$	1.390	0.001		0.000	1.391	$7.378 \times 10^2$	
1.40 GeV	$1.502 \times 10^3$	1.443	0.002		0.001	1.445	$1.020 \times 10^3$	
2.00 GeV	$2.103 \times 10^3$	1.501	0.003	0.001	0.001	1.506	$1.426 \times 10^3$	
3.00 GeV	$3.104 \times 10^3$	1.566	0.005	0.003	0.001	1.576	$2.074 \times 10^3$	
4.00 GeV	$4.104 \times 10^3$	1.611	0.008	0.005	0.002	1.626	$2.698 \times 10^3$	
8.00 GeV	$8.105 \times 10^3$	1.714	0.020	0.018	0.003	1.755	$5.057 \times 10^3$	
10.0 GeV	$1.011 \times 10^4$	1.745	0.026	0.025	0.004	1.801	$6.181 \times 10^3$	
14.0 GeV	$1.411 \times 10^4$	1.790	0.040	0.041	0.006	1.876	$8.356 \times 10^3$	
20.0 GeV	$2.011 \times 10^4$	1.834	0.062	0.067	0.008	1.971	$1.147 \times 10^4$	
30.0 GeV	$3.011 \times 10^4$	1.881	0.102	0.117	0.011	2.113	$1.637 \times 10^4$	
40.0 GeV	$4.011 \times 10^4$	1.912	0.144	0.173	0.015	2.245	$2.096 \times 10^4$	
80.0 GeV	$8.011 \times 10^4$	1.982	0.326	0.418	0.029	2.756	$3.700 \times 10^4$	
100. GeV	$1.001 \times 10^5$	2.003	0.422	0.551	0.036	3.013	$4.394 \times 10^4$	
140. GeV	$1.401 \times 10^5$	2.034	0.620	0.823	0.050	3.529	$5.620 \times 10^4$	
185. GeV	$1.849 \times 10^5$	2.059	0.849	1.144	0.066	4.120	<i>Muon critical energy</i>	
200. GeV	$2.001 \times 10^5$	2.066	0.929	1.255	0.071	4.323	$7.154 \times 10^4$	
300. GeV	$3.001 \times 10^5$	2.102	1.456	1.977	0.107	5.644	$9.174 \times 10^4$	
400. GeV	$4.001 \times 10^5$	2.127	2.001	2.726	0.143	6.998	$1.076 \times 10^5$	
800. GeV	$8.001 \times 10^5$	2.187	4.251	5.795	0.289	12.523	$1.498 \times 10^5$	
1.00 TeV	$1.000 \times 10^6$	2.206	5.407	7.366	0.363	15.343	$1.642 \times 10^5$	
1.40 TeV	$1.400 \times 10^6$	2.236	7.722	10.497	0.514	20.970	$1.864 \times 10^5$	
2.00 TeV	$2.000 \times 10^6$	2.268	11.262	15.277	0.743	29.552	$2.104 \times 10^5$	
3.00 TeV	$3.000 \times 10^6$	2.305	17.170	23.219	1.137	43.832	$2.380 \times 10^5$	
4.00 TeV	$4.000 \times 10^6$	2.332	23.155	31.246	1.537	58.271	$2.578 \times 10^5$	
8.00 TeV	$8.000 \times 10^6$	2.397	47.280	63.511	3.194	116.384	$3.054 \times 10^5$	
10.0 TeV	$1.000 \times 10^7$	2.418	59.434	79.730	4.046	145.629	$3.207 \times 10^5$	
14.0 TeV	$1.400 \times 10^7$	2.451	83.676	112.089	5.793	204.011	$3.438 \times 10^5$	
20.0 TeV	$2.000 \times 10^7$	2.486	120.247	160.836	8.472	292.043	$3.683 \times 10^5$	
30.0 TeV	$3.000 \times 10^7$	2.527	181.129	241.939	13.104	438.700	$3.960 \times 10^5$	
40.0 TeV	$4.000 \times 10^7$	2.557	242.222	323.233	17.846	585.859	$4.157 \times 10^5$	
80.0 TeV	$8.000 \times 10^7$	2.629	486.939	648.634	37.654	1175.858	$4.629 \times 10^5$	
100. TeV	$1.000 \times 10^8$	2.653	609.495	811.482	47.887	1471.519	$4.781 \times 10^5$	