

## Muons in gadolinium (Gd)

Z	A [g/mol]	$\rho$ [g/cm <sup>3</sup> ]	I [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
64 (Gd)	157.25(3)	7.901	591.0	0.25109	2.5977	0.1058	3.3932	5.8737	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	$4.704 \times 10^1$	4.225				4.225	$1.357 \times 10^0$		
14.0 MeV	$5.616 \times 10^1$	3.350				3.350	$2.430 \times 10^0$		
20.0 MeV	$6.802 \times 10^1$	2.655				2.655	$4.463 \times 10^0$		
30.0 MeV	$8.509 \times 10^1$	2.088				2.088	$8.765 \times 10^0$		
40.0 MeV	$1.003 \times 10^2$	1.798				1.798	$1.396 \times 10^1$		
80.0 MeV	$1.527 \times 10^2$	1.372				1.372	$4.020 \times 10^1$		
100. MeV	$1.764 \times 10^2$	1.297				1.297	$5.523 \times 10^1$		
140. MeV	$2.218 \times 10^2$	1.225				1.226	$8.709 \times 10^1$		
200. MeV	$2.868 \times 10^2$	1.192				1.192	$1.369 \times 10^2$		
243. MeV	$3.325 \times 10^2$	1.188	0.000			1.188	<i>Minimum ionization</i>		
300. MeV	$3.917 \times 10^2$	1.193	0.000		0.000	1.193	$2.210 \times 10^2$		
400. MeV	$4.945 \times 10^2$	1.212	0.000		0.000	1.212	$3.042 \times 10^2$		
800. MeV	$8.995 \times 10^2$	1.295	0.001		0.000	1.296	$6.228 \times 10^2$		
1.00 GeV	$1.101 \times 10^3$	1.328	0.001		0.000	1.330	$7.751 \times 10^2$		
1.40 GeV	$1.502 \times 10^3$	1.381	0.002	0.000	0.001	1.384	$1.070 \times 10^3$		
2.00 GeV	$2.103 \times 10^3$	1.439	0.003	0.001	0.001	1.444	$1.493 \times 10^3$		
3.00 GeV	$3.104 \times 10^3$	1.504	0.006	0.003	0.001	1.514	$2.169 \times 10^3$		
4.00 GeV	$4.104 \times 10^3$	1.549	0.008	0.006	0.002	1.565	$2.818 \times 10^3$		
8.00 GeV	$8.105 \times 10^3$	1.651	0.021	0.019	0.003	1.695	$5.264 \times 10^3$		
10.0 GeV	$1.011 \times 10^4$	1.682	0.027	0.027	0.004	1.741	$6.427 \times 10^3$		
14.0 GeV	$1.411 \times 10^4$	1.726	0.042	0.044	0.005	1.818	$8.674 \times 10^3$		
20.0 GeV	$2.011 \times 10^4$	1.770	0.065	0.072	0.007	1.916	$1.189 \times 10^4$		
30.0 GeV	$3.011 \times 10^4$	1.817	0.106	0.127	0.011	2.061	$1.691 \times 10^4$		
40.0 GeV	$4.011 \times 10^4$	1.847	0.150	0.186	0.015	2.199	$2.161 \times 10^4$		
80.0 GeV	$8.011 \times 10^4$	1.915	0.339	0.447	0.028	2.731	$3.790 \times 10^4$		
100. GeV	$1.001 \times 10^5$	1.936	0.439	0.588	0.035	2.999	$4.488 \times 10^4$		
140. GeV	$1.401 \times 10^5$	1.965	0.645	0.878	0.049	3.538	$5.715 \times 10^4$		
171. GeV	$1.712 \times 10^5$	1.982	0.810	1.113	0.060	3.966	<i>Muon critical energy</i>		
200. GeV	$2.001 \times 10^5$	1.995	0.966	1.337	0.070	4.370	$7.239 \times 10^4$		
300. GeV	$3.001 \times 10^5$	2.029	1.515	2.104	0.105	5.754	$9.229 \times 10^4$		
400. GeV	$4.001 \times 10^5$	2.053	2.082	2.899	0.140	7.175	$1.078 \times 10^5$		
800. GeV	$8.001 \times 10^5$	2.112	4.423	6.156	0.283	12.975	$1.487 \times 10^5$		
1.00 TeV	$1.000 \times 10^6$	2.130	5.626	7.822	0.355	15.935	$1.626 \times 10^5$		
1.40 TeV	$1.400 \times 10^6$	2.159	8.035	11.145	0.503	21.844	$1.840 \times 10^5$		
2.00 TeV	$2.000 \times 10^6$	2.190	11.720	16.216	0.727	30.855	$2.070 \times 10^5$		
3.00 TeV	$3.000 \times 10^6$	2.226	17.869	24.642	1.112	45.851	$2.334 \times 10^5$		
4.00 TeV	$4.000 \times 10^6$	2.252	24.100	33.156	1.502	61.012	$2.522 \times 10^5$		
8.00 TeV	$8.000 \times 10^6$	2.315	49.215	67.381	3.120	122.032	$2.977 \times 10^5$		
10.0 TeV	$1.000 \times 10^7$	2.335	61.868	84.583	3.950	152.738	$3.123 \times 10^5$		
14.0 TeV	$1.400 \times 10^7$	2.367	87.107	118.908	5.654	214.037	$3.343 \times 10^5$		
20.0 TeV	$2.000 \times 10^7$	2.401	125.182	170.612	8.266	306.463	$3.576 \times 10^5$		
30.0 TeV	$3.000 \times 10^7$	2.441	188.567	256.638	12.776	460.423	$3.841 \times 10^5$		
40.0 TeV	$4.000 \times 10^7$	2.469	252.173	342.864	17.391	614.900	$4.028 \times 10^5$		
80.0 TeV	$8.000 \times 10^7$	2.539	506.966	688.005	36.649	1234.160	$4.478 \times 10^5$		
100. TeV	$1.000 \times 10^8$	2.562	634.570	860.730	46.590	1544.454	$4.623 \times 10^5$		