

## Muons in yttrium (Y)

Z	A [g/mol]	$\rho$ [g/cm <sup>3</sup> ]	I [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
39 (Y)	88.90584(2)	4.469	379.0	0.07138	3.4585	0.3608	3.5542	5.4801	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	$4.704 \times 10^1$	4.947				4.947	$1.145 \times 10^0$		
14.0 MeV	$5.616 \times 10^1$	3.903				3.903	$2.064 \times 10^0$		
20.0 MeV	$6.802 \times 10^1$	3.080				3.080	$3.814 \times 10^0$		
30.0 MeV	$8.509 \times 10^1$	2.413				2.414	$7.531 \times 10^0$		
40.0 MeV	$1.003 \times 10^2$	2.074				2.074	$1.203 \times 10^1$		
80.0 MeV	$1.527 \times 10^2$	1.578				1.578	$3.481 \times 10^1$		
100. MeV	$1.764 \times 10^2$	1.490				1.490	$4.789 \times 10^1$		
140. MeV	$2.218 \times 10^2$	1.405				1.405	$7.566 \times 10^1$		
200. MeV	$2.868 \times 10^2$	1.365				1.365	$1.191 \times 10^2$		
246. MeV	$3.356 \times 10^2$	1.359				1.360	<i>Minimum ionization</i>		
300. MeV	$3.917 \times 10^2$	1.364	0.000		0.000	1.364	$1.926 \times 10^2$		
400. MeV	$4.945 \times 10^2$	1.383	0.000		0.000	1.384	$2.654 \times 10^2$		
800. MeV	$8.995 \times 10^2$	1.471	0.001		0.000	1.472	$5.454 \times 10^2$		
1.00 GeV	$1.101 \times 10^3$	1.505	0.001		0.000	1.507	$6.796 \times 10^2$		
1.40 GeV	$1.502 \times 10^3$	1.560	0.001	0.000	0.001	1.563	$9.400 \times 10^2$		
2.00 GeV	$2.103 \times 10^3$	1.620	0.002	0.001	0.001	1.624	$1.316 \times 10^3$		
3.00 GeV	$3.104 \times 10^3$	1.686	0.004	0.003	0.001	1.694	$1.918 \times 10^3$		
4.00 GeV	$4.104 \times 10^3$	1.731	0.006	0.005	0.002	1.744	$2.500 \times 10^3$		
8.00 GeV	$8.105 \times 10^3$	1.834	0.014	0.014	0.003	1.866	$4.709 \times 10^3$		
10.0 GeV	$1.011 \times 10^4$	1.865	0.019	0.020	0.004	1.908	$5.769 \times 10^3$		
14.0 GeV	$1.411 \times 10^4$	1.909	0.029	0.032	0.006	1.975	$7.828 \times 10^3$		
20.0 GeV	$2.011 \times 10^4$	1.953	0.045	0.052	0.008	2.057	$1.080 \times 10^4$		
30.0 GeV	$3.011 \times 10^4$	1.999	0.073	0.090	0.012	2.174	$1.553 \times 10^4$		
40.0 GeV	$4.011 \times 10^4$	2.030	0.103	0.132	0.015	2.281	$2.002 \times 10^4$		
80.0 GeV	$8.011 \times 10^4$	2.099	0.233	0.316	0.030	2.679	$3.617 \times 10^4$		
100. GeV	$1.001 \times 10^5$	2.121	0.301	0.415	0.037	2.875	$4.337 \times 10^4$		
140. GeV	$1.401 \times 10^5$	2.152	0.442	0.620	0.052	3.267	$5.642 \times 10^4$		
200. GeV	$2.001 \times 10^5$	2.184	0.663	0.944	0.073	3.866	$7.329 \times 10^4$		
255. GeV	$2.556 \times 10^5$	2.206	0.871	1.242	0.094	4.413	<i>Muon critical energy</i>		
300. GeV	$3.001 \times 10^5$	2.221	1.041	1.486	0.110	4.858	$9.632 \times 10^4$		
400. GeV	$4.001 \times 10^5$	2.246	1.431	2.048	0.147	5.873	$1.150 \times 10^5$		
800. GeV	$8.001 \times 10^5$	2.309	3.044	4.354	0.296	10.005	$1.666 \times 10^5$		
1.00 TeV	$1.000 \times 10^6$	2.330	3.873	5.535	0.372	12.110	$1.848 \times 10^5$		
1.40 TeV	$1.400 \times 10^6$	2.361	5.535	7.890	0.528	16.315	$2.131 \times 10^5$		
2.00 TeV	$2.000 \times 10^6$	2.394	8.080	11.485	0.763	22.723	$2.442 \times 10^5$		
3.00 TeV	$3.000 \times 10^6$	2.432	12.330	17.460	1.168	33.391	$2.803 \times 10^5$		
4.00 TeV	$4.000 \times 10^6$	2.460	16.638	23.500	1.578	44.177	$3.062 \times 10^5$		
8.00 TeV	$8.000 \times 10^6$	2.528	34.017	47.784	3.280	87.610	$3.693 \times 10^5$		
10.0 TeV	$1.000 \times 10^7$	2.551	42.777	59.993	4.155	109.477	$3.897 \times 10^5$		
14.0 TeV	$1.400 \times 10^7$	2.585	60.251	84.352	5.951	153.140	$4.204 \times 10^5$		
20.0 TeV	$2.000 \times 10^7$	2.621	86.624	121.050	8.704	219.001	$4.530 \times 10^5$		
30.0 TeV	$3.000 \times 10^7$	2.664	130.529	182.110	13.462	328.767	$4.900 \times 10^5$		
40.0 TeV	$4.000 \times 10^7$	2.695	174.601	243.319	18.334	438.950	$5.163 \times 10^5$		
80.0 TeV	$8.000 \times 10^7$	2.770	351.173	488.341	38.685	880.971	$5.793 \times 10^5$		
100. TeV	$1.000 \times 10^8$	2.795	439.620	610.970	49.200	1102.586	$5.996 \times 10^5$		