

## Muons in praseodymium (Pr)

Z	A [g/mol]	$\rho$ [g/cm <sup>3</sup> ]	I [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
59 (Pr)	140.90766(2)	6.773	535.0	0.23265	2.7331	0.2313	3.2753	5.8003	0.14

  

T	p	Ionization	Brems	Pair prod	Photonucl	Total	CSDA range
	[MeV/c]	[MeV cm <sup>2</sup> /g]			[MeV cm <sup>2</sup> /g]		[g/cm <sup>2</sup> ]
10.0 MeV	$4.704 \times 10^1$	4.435				4.435	$1.288 \times 10^0$
14.0 MeV	$5.616 \times 10^1$	3.513				3.513	$2.311 \times 10^0$
20.0 MeV	$6.802 \times 10^1$	2.781				2.781	$4.251 \times 10^0$
30.0 MeV	$8.509 \times 10^1$	2.186				2.186	$8.360 \times 10^0$
40.0 MeV	$1.003 \times 10^2$	1.882				1.882	$1.332 \times 10^1$
80.0 MeV	$1.527 \times 10^2$	1.436				1.436	$3.839 \times 10^1$
100. MeV	$1.764 \times 10^2$	1.356				1.356	$5.275 \times 10^1$
140. MeV	$2.218 \times 10^2$	1.282				1.282	$8.322 \times 10^1$
200. MeV	$2.868 \times 10^2$	1.247				1.248	$1.308 \times 10^2$
239. MeV	$3.285 \times 10^2$	1.243	0.000			1.244	<i>Minimum ionization</i>
300. MeV	$3.917 \times 10^2$	1.249	0.000		0.000	1.249	$2.111 \times 10^2$
400. MeV	$4.945 \times 10^2$	1.268	0.000		0.000	1.269	$2.906 \times 10^2$
800. MeV	$8.995 \times 10^2$	1.355	0.001		0.000	1.356	$5.951 \times 10^2$
1.00 GeV	$1.101 \times 10^3$	1.389	0.001		0.000	1.391	$7.407 \times 10^2$
1.40 GeV	$1.502 \times 10^3$	1.443	0.002	0.000	0.001	1.446	$1.022 \times 10^3$
2.00 GeV	$2.103 \times 10^3$	1.502	0.003	0.001	0.001	1.508	$1.428 \times 10^3$
3.00 GeV	$3.104 \times 10^3$	1.568	0.005	0.003	0.001	1.579	$2.075 \times 10^3$
4.00 GeV	$4.104 \times 10^3$	1.614	0.008	0.006	0.002	1.630	$2.698 \times 10^3$
8.00 GeV	$8.105 \times 10^3$	1.717	0.020	0.019	0.003	1.759	$5.051 \times 10^3$
10.0 GeV	$1.011 \times 10^4$	1.748	0.026	0.026	0.004	1.805	$6.173 \times 10^3$
14.0 GeV	$1.411 \times 10^4$	1.792	0.040	0.043	0.005	1.881	$8.343 \times 10^3$
20.0 GeV	$2.011 \times 10^4$	1.836	0.062	0.070	0.007	1.976	$1.145 \times 10^4$
30.0 GeV	$3.011 \times 10^4$	1.882	0.102	0.122	0.011	2.118	$1.634 \times 10^4$
40.0 GeV	$4.011 \times 10^4$	1.913	0.143	0.179	0.015	2.251	$2.092 \times 10^4$
80.0 GeV	$8.011 \times 10^4$	1.980	0.324	0.430	0.029	2.764	$3.692 \times 10^4$
100. GeV	$1.001 \times 10^5$	2.000	0.420	0.566	0.036	3.023	$4.384 \times 10^4$
140. GeV	$1.401 \times 10^5$	2.030	0.616	0.845	0.050	3.542	$5.605 \times 10^4$
183. GeV	$1.827 \times 10^5$	2.053	0.833	1.156	0.065	4.108	<i>Muon critical energy</i>
200. GeV	$2.001 \times 10^5$	2.061	0.924	1.286	0.071	4.343	$7.133 \times 10^4$
300. GeV	$3.001 \times 10^5$	2.096	1.448	2.024	0.106	5.675	$9.143 \times 10^4$
400. GeV	$4.001 \times 10^5$	2.120	1.991	2.788	0.141	7.042	$1.072 \times 10^5$
800. GeV	$8.001 \times 10^5$	2.180	4.229	5.922	0.285	12.618	$1.491 \times 10^5$
1.00 TeV	$1.000 \times 10^6$	2.200	5.379	7.525	0.359	15.464	$1.634 \times 10^5$
1.40 TeV	$1.400 \times 10^6$	2.229	7.684	10.722	0.508	21.145	$1.854 \times 10^5$
2.00 TeV	$2.000 \times 10^6$	2.261	11.209	15.600	0.734	29.806	$2.092 \times 10^5$
3.00 TeV	$3.000 \times 10^6$	2.298	17.093	23.707	1.123	44.222	$2.366 \times 10^5$
4.00 TeV	$4.000 \times 10^6$	2.324	23.055	31.899	1.517	58.797	$2.562 \times 10^5$
8.00 TeV	$8.000 \times 10^6$	2.389	47.088	64.830	3.151	117.460	$3.033 \times 10^5$
10.0 TeV	$1.000 \times 10^7$	2.411	59.197	81.383	3.990	146.982	$3.185 \times 10^5$
14.0 TeV	$1.400 \times 10^7$	2.443	83.351	114.411	5.712	205.918	$3.414 \times 10^5$
20.0 TeV	$2.000 \times 10^7$	2.478	119.792	164.162	8.350	294.784	$3.656 \times 10^5$
30.0 TeV	$3.000 \times 10^7$	2.519	180.457	246.940	12.907	442.825	$3.931 \times 10^5$
40.0 TeV	$4.000 \times 10^7$	2.548	241.336	329.913	17.571	591.370	$4.126 \times 10^5$
80.0 TeV	$8.000 \times 10^7$	2.621	485.210	662.036	37.038	1186.907	$4.594 \times 10^5$
100. TeV	$1.000 \times 10^8$	2.644	607.350	828.250	47.090	1485.336	$4.744 \times 10^5$