

## Muons in silicon dioxide (fused quartz) (SiO<sub>2</sub>)

	$\langle Z/A \rangle$	$\rho$ [g/cm <sup>3</sup> ]	$I$ [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
	0.49930	2.200	139.2	0.08408	3.5064	0.1500	3.0140	4.0560	0.00
$T$	$p$ [MeV/c]	Ionization	Brems	Pair prod	Photonucl	Total	CSDA range [g/cm <sup>2</sup> ]		
				[MeV cm <sup>2</sup> /g]					
10.0 MeV	$4.704 \times 10^1$	6.591				6.591			$8.438 \times 10^{-1}$
14.0 MeV	$5.616 \times 10^1$	5.158				5.158			$1.537 \times 10^0$
20.0 MeV	$6.802 \times 10^1$	4.041				4.041			$2.866 \times 10^0$
30.0 MeV	$8.509 \times 10^1$	3.145				3.145			$5.710 \times 10^0$
40.0 MeV	$1.003 \times 10^2$	2.691				2.691			$9.170 \times 10^0$
80.0 MeV	$1.527 \times 10^2$	2.030				2.030			$2.682 \times 10^1$
100. MeV	$1.764 \times 10^2$	1.908				1.908			$3.701 \times 10^1$
140. MeV	$2.218 \times 10^2$	1.786				1.786			$5.878 \times 10^1$
200. MeV	$2.868 \times 10^2$	1.719				1.719			$9.315 \times 10^1$
288. MeV	$3.788 \times 10^2$	1.699			0.000	1.699			<i>Minimum ionization</i>
300. MeV	$3.917 \times 10^2$	1.699			0.000	1.699			$1.518 \times 10^2$
400. MeV	$4.945 \times 10^2$	1.711			0.000	1.711			$2.105 \times 10^2$
800. MeV	$8.995 \times 10^2$	1.789	0.000		0.000	1.790			$4.391 \times 10^2$
1.00 GeV	$1.101 \times 10^3$	1.823	0.000		0.000	1.824			$5.497 \times 10^2$
1.40 GeV	$1.502 \times 10^3$	1.877	0.001	0.000	0.001	1.879			$7.657 \times 10^2$
2.00 GeV	$2.103 \times 10^3$	1.936	0.001	0.000	0.001	1.939			$1.080 \times 10^3$
3.00 GeV	$3.104 \times 10^3$	2.003	0.001	0.001	0.001	2.007			$1.586 \times 10^3$
4.00 GeV	$4.104 \times 10^3$	2.049	0.002	0.002	0.002	2.055			$2.078 \times 10^3$
8.00 GeV	$8.105 \times 10^3$	2.154	0.005	0.005	0.004	2.168			$3.967 \times 10^3$
10.0 GeV	$1.011 \times 10^4$	2.186	0.007	0.007	0.005	2.204			$4.881 \times 10^3$
14.0 GeV	$1.411 \times 10^4$	2.232	0.010	0.011	0.006	2.259			$6.673 \times 10^3$
20.0 GeV	$2.011 \times 10^4$	2.277	0.016	0.018	0.009	2.321			$9.291 \times 10^3$
30.0 GeV	$3.011 \times 10^4$	2.326	0.026	0.032	0.013	2.398			$1.353 \times 10^4$
40.0 GeV	$4.011 \times 10^4$	2.360	0.037	0.047	0.017	2.461			$1.764 \times 10^4$
80.0 GeV	$8.011 \times 10^4$	2.435	0.083	0.113	0.033	2.665			$3.324 \times 10^4$
100. GeV	$1.001 \times 10^5$	2.459	0.108	0.148	0.041	2.757			$4.062 \times 10^4$
140. GeV	$1.401 \times 10^5$	2.494	0.159	0.222	0.057	2.932			$5.468 \times 10^4$
200. GeV	$2.001 \times 10^5$	2.530	0.239	0.339	0.081	3.190			$7.429 \times 10^4$
300. GeV	$3.001 \times 10^5$	2.572	0.376	0.537	0.122	3.607			$1.038 \times 10^5$
400. GeV	$4.001 \times 10^5$	2.601	0.519	0.744	0.162	4.026			$1.300 \times 10^5$
708. GeV	$7.083 \times 10^5$	2.660	0.971	1.400	0.289	5.321			<i>Muon critical energy</i>
800. GeV	$8.001 \times 10^5$	2.673	1.109	1.599	0.328	5.708			$2.130 \times 10^5$
1.00 TeV	$1.000 \times 10^6$	2.696	1.413	2.038	0.412	6.560			$2.457 \times 10^5$
1.40 TeV	$1.400 \times 10^6$	2.731	2.026	2.914	0.584	8.255			$2.999 \times 10^5$
2.00 TeV	$2.000 \times 10^6$	2.769	2.965	4.255	0.845	10.835			$3.632 \times 10^5$
3.00 TeV	$3.000 \times 10^6$	2.813	4.537	6.485	1.294	15.130			$4.409 \times 10^5$
4.00 TeV	$4.000 \times 10^6$	2.845	6.135	8.744	1.750	19.474			$4.991 \times 10^5$
8.00 TeV	$8.000 \times 10^6$	2.922	12.593	17.837	3.650	37.002			$6.456 \times 10^5$
10.0 TeV	$1.000 \times 10^7$	2.947	15.855	22.413	4.628	45.844			$6.941 \times 10^5$
14.0 TeV	$1.400 \times 10^7$	2.986	22.366	31.535	6.641	63.528			$7.679 \times 10^5$
20.0 TeV	$2.000 \times 10^7$	3.028	32.207	45.288	9.731	90.254			$8.467 \times 10^5$
30.0 TeV	$3.000 \times 10^7$	3.077	48.579	68.177	15.089	134.921			$9.368 \times 10^5$
40.0 TeV	$4.000 \times 10^7$	3.112	65.025	91.135	20.584	179.856			$1.001 \times 10^6$
80.0 TeV	$8.000 \times 10^7$	3.198	130.975	183.039	43.614	360.826			$1.155 \times 10^6$
100. TeV	$1.000 \times 10^8$	3.226	164.033	229.042	55.540	451.842			$1.204 \times 10^6$