

**Table 161: Muons in Freon-12 (CF<sub>2</sub>Cl<sub>2</sub>)**

$\langle Z/A \rangle$	$\rho$ [g/cm <sup>3</sup> ]	$I$ [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
0.47969	1.120	143.0	0.07978	3.4626	0.3035	3.2659	4.8251	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	$4.704 \times 10^1$	6.308				6.308	$8.819 \times 10^{-1}$	
14.0 MeV	$5.616 \times 10^1$	4.938				4.938	$1.606 \times 10^0$	
20.0 MeV	$6.802 \times 10^1$	3.869				3.869	$2.994 \times 10^0$	
30.0 MeV	$8.509 \times 10^1$	3.011				3.011	$5.965 \times 10^0$	
40.0 MeV	$1.003 \times 10^2$	2.577				2.577	$9.578 \times 10^0$	
80.0 MeV	$1.527 \times 10^2$	1.945				1.945	$2.801 \times 10^1$	
100. MeV	$1.764 \times 10^2$	1.832				1.832	$3.863 \times 10^1$	
140. MeV	$2.218 \times 10^2$	1.722				1.722	$6.124 \times 10^1$	
200. MeV	$2.868 \times 10^2$	1.661				1.661	$9.685 \times 10^1$	
277. MeV	$3.683 \times 10^2$	1.645			0.000	1.645	<i>Minimum ionization</i>	
300. MeV	$3.917 \times 10^2$	1.646			0.000	1.646	$1.575 \times 10^2$	
400. MeV	$4.945 \times 10^2$	1.660			0.000	1.660	$2.180 \times 10^2$	
800. MeV	$8.995 \times 10^2$	1.742	0.000		0.000	1.743	$4.531 \times 10^2$	
1.00 GeV	$1.101 \times 10^3$	1.777	0.000		0.000	1.778	$5.666 \times 10^2$	
1.40 GeV	$1.502 \times 10^3$	1.833	0.001	0.000	0.001	1.834	$7.880 \times 10^2$	
2.00 GeV	$2.103 \times 10^3$	1.893	0.001	0.000	0.001	1.895	$1.109 \times 10^3$	
3.00 GeV	$3.104 \times 10^3$	1.961	0.002	0.001	0.001	1.965	$1.627 \times 10^3$	
4.00 GeV	$4.104 \times 10^3$	2.008	0.002	0.002	0.002	2.014	$2.129 \times 10^3$	
8.00 GeV	$8.105 \times 10^3$	2.114	0.006	0.006	0.004	2.129	$4.054 \times 10^3$	
10.0 GeV	$1.011 \times 10^4$	2.146	0.008	0.008	0.005	2.166	$4.985 \times 10^3$	
14.0 GeV	$1.411 \times 10^4$	2.191	0.012	0.013	0.006	2.223	$6.807 \times 10^3$	
20.0 GeV	$2.011 \times 10^4$	2.237	0.018	0.021	0.009	2.286	$9.467 \times 10^3$	
30.0 GeV	$3.011 \times 10^4$	2.286	0.030	0.037	0.013	2.366	$1.376 \times 10^4$	
40.0 GeV	$4.011 \times 10^4$	2.318	0.043	0.054	0.017	2.433	$1.793 \times 10^4$	
80.0 GeV	$8.011 \times 10^4$	2.392	0.097	0.131	0.033	2.653	$3.365 \times 10^4$	
100. GeV	$1.001 \times 10^5$	2.415	0.125	0.172	0.040	2.753	$4.105 \times 10^4$	
140. GeV	$1.401 \times 10^5$	2.448	0.184	0.258	0.056	2.948	$5.509 \times 10^4$	
200. GeV	$2.001 \times 10^5$	2.484	0.276	0.394	0.080	3.235	$7.451 \times 10^4$	
300. GeV	$3.001 \times 10^5$	2.524	0.435	0.624	0.120	3.702	$1.034 \times 10^5$	
400. GeV	$4.001 \times 10^5$	2.552	0.599	0.862	0.160	4.173	$1.288 \times 10^5$	
615. GeV	$6.149 \times 10^5$	2.594	0.961	1.387	0.247	5.189	<i>Muon critical energy</i>	
800. GeV	$8.001 \times 10^5$	2.620	1.279	1.846	0.323	6.069	$2.078 \times 10^5$	
1.00 TeV	$1.000 \times 10^6$	2.643	1.630	2.352	0.406	7.031	$2.384 \times 10^5$	
1.40 TeV	$1.400 \times 10^6$	2.677	2.334	3.361	0.575	8.948	$2.888 \times 10^5$	
2.00 TeV	$2.000 \times 10^6$	2.713	3.415	4.904	0.833	11.866	$3.468 \times 10^5$	
3.00 TeV	$3.000 \times 10^6$	2.755	5.223	7.470	1.275	16.724	$4.175 \times 10^5$	
4.00 TeV	$4.000 \times 10^6$	2.785	7.059	10.068	1.725	21.638	$4.699 \times 10^5$	
8.00 TeV	$8.000 \times 10^6$	2.860	14.477	20.523	3.595	41.456	$6.012 \times 10^5$	
10.0 TeV	$1.000 \times 10^7$	2.884	18.223	25.784	4.557	51.449	$6.444 \times 10^5$	
14.0 TeV	$1.400 \times 10^7$	2.922	25.700	36.271	6.537	71.430	$7.101 \times 10^5$	
20.0 TeV	$2.000 \times 10^7$	2.962	36.998	52.078	9.576	101.615	$7.802 \times 10^5$	
30.0 TeV	$3.000 \times 10^7$	3.008	55.790	78.391	14.844	152.034	$8.601 \times 10^5$	
40.0 TeV	$4.000 \times 10^7$	3.042	74.665	104.781	20.245	202.733	$9.169 \times 10^5$	
80.0 TeV	$8.000 \times 10^7$	3.125	150.337	210.418	42.867	406.747	$1.053 \times 10^6$	
100. TeV	$1.000 \times 10^8$	3.152	188.263	263.293	54.577	509.285	$1.097 \times 10^6$	