

**Table 163: Muons in Freon-13 (CF<sub>3</sub>Cl)**

$\langle Z/A \rangle$	$\rho$ [g/cm <sup>3</sup> ]	$I$ [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
0.47966	0.950	126.6	0.07238	3.5551	0.3659	3.2337	4.7483	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	$4.704 \times 10^1$	6.416				6.416	$8.659 \times 10^{-1}$	
14.0 MeV	$5.616 \times 10^1$	5.019				5.019	$1.578 \times 10^0$	
20.0 MeV	$6.802 \times 10^1$	3.930				3.930	$2.945 \times 10^0$	
30.0 MeV	$8.509 \times 10^1$	3.057				3.057	$5.870 \times 10^0$	
40.0 MeV	$1.003 \times 10^2$	2.615				2.615	$9.430 \times 10^0$	
80.0 MeV	$1.527 \times 10^2$	1.971				1.971	$2.760 \times 10^1$	
100. MeV	$1.764 \times 10^2$	1.857				1.857	$3.809 \times 10^1$	
140. MeV	$2.218 \times 10^2$	1.745				1.745	$6.041 \times 10^1$	
200. MeV	$2.868 \times 10^2$	1.685				1.685	$9.551 \times 10^1$	
283. MeV	$3.738 \times 10^2$	1.668			0.000	1.668	<i>Minimum ionization</i>	
300. MeV	$3.917 \times 10^2$	1.668			0.000	1.668	$1.553 \times 10^2$	
400. MeV	$4.945 \times 10^2$	1.681			0.000	1.681	$2.151 \times 10^2$	
800. MeV	$8.995 \times 10^2$	1.762	0.000		0.000	1.763	$4.473 \times 10^2$	
1.00 GeV	$1.101 \times 10^3$	1.796	0.000		0.000	1.797	$5.596 \times 10^2$	
1.40 GeV	$1.502 \times 10^3$	1.851	0.001	0.000	0.001	1.853	$7.787 \times 10^2$	
2.00 GeV	$2.103 \times 10^3$	1.911	0.001	0.000	0.001	1.913	$1.097 \times 10^3$	
3.00 GeV	$3.104 \times 10^3$	1.978	0.001	0.001	0.001	1.982	$1.610 \times 10^3$	
4.00 GeV	$4.104 \times 10^3$	2.024	0.002	0.002	0.002	2.030	$2.108 \times 10^3$	
8.00 GeV	$8.105 \times 10^3$	2.129	0.005	0.005	0.004	2.142	$4.020 \times 10^3$	
10.0 GeV	$1.011 \times 10^4$	2.160	0.007	0.007	0.005	2.178	$4.946 \times 10^3$	
14.0 GeV	$1.411 \times 10^4$	2.205	0.010	0.011	0.006	2.233	$6.758 \times 10^3$	
20.0 GeV	$2.011 \times 10^4$	2.250	0.016	0.018	0.009	2.294	$9.408 \times 10^3$	
30.0 GeV	$3.011 \times 10^4$	2.299	0.026	0.032	0.013	2.370	$1.369 \times 10^4$	
40.0 GeV	$4.011 \times 10^4$	2.331	0.037	0.047	0.017	2.432	$1.786 \times 10^4$	
80.0 GeV	$8.011 \times 10^4$	2.404	0.083	0.113	0.033	2.634	$3.364 \times 10^4$	
100. GeV	$1.001 \times 10^5$	2.427	0.108	0.149	0.041	2.725	$4.110 \times 10^4$	
140. GeV	$1.401 \times 10^5$	2.461	0.159	0.223	0.057	2.899	$5.533 \times 10^4$	
200. GeV	$2.001 \times 10^5$	2.496	0.239	0.340	0.081	3.156	$7.515 \times 10^4$	
300. GeV	$3.001 \times 10^5$	2.536	0.376	0.539	0.121	3.571	$1.049 \times 10^5$	
400. GeV	$4.001 \times 10^5$	2.564	0.518	0.745	0.161	3.988	$1.314 \times 10^5$	
699. GeV	$6.990 \times 10^5$	2.619	0.956	1.379	0.284	5.239	<i>Muon critical energy</i>	
800. GeV	$8.001 \times 10^5$	2.633	1.107	1.598	0.326	5.664	$2.151 \times 10^5$	
1.00 TeV	$1.000 \times 10^6$	2.655	1.411	2.038	0.410	6.514	$2.481 \times 10^5$	
1.40 TeV	$1.400 \times 10^6$	2.689	2.022	2.913	0.581	8.205	$3.027 \times 10^5$	
2.00 TeV	$2.000 \times 10^6$	2.725	2.959	4.252	0.841	10.778	$3.663 \times 10^5$	
3.00 TeV	$3.000 \times 10^6$	2.767	4.528	6.479	1.288	15.063	$4.444 \times 10^5$	
4.00 TeV	$4.000 \times 10^6$	2.798	6.122	8.735	1.743	19.397	$5.028 \times 10^5$	
8.00 TeV	$8.000 \times 10^6$	2.872	12.564	17.815	3.633	36.885	$6.498 \times 10^5$	
10.0 TeV	$1.000 \times 10^7$	2.896	15.817	22.385	4.606	45.705	$6.985 \times 10^5$	
14.0 TeV	$1.400 \times 10^7$	2.934	22.310	31.494	6.609	63.347	$7.725 \times 10^5$	
20.0 TeV	$2.000 \times 10^7$	2.974	32.124	45.226	9.683	90.007	$8.516 \times 10^5$	
30.0 TeV	$3.000 \times 10^7$	3.021	48.452	68.081	15.014	134.568	$9.418 \times 10^5$	
40.0 TeV	$4.000 \times 10^7$	3.054	64.854	91.005	20.482	179.395	$1.006 \times 10^6$	
80.0 TeV	$8.000 \times 10^7$	3.137	130.615	182.773	43.392	359.916	$1.160 \times 10^6$	
100. TeV	$1.000 \times 10^8$	3.164	163.575	228.707	55.254	450.700	$1.210 \times 10^6$	