

## Muons in tantalum (Ta)

Z	A [g/mol]	$\rho$ [g/cm <sup>3</sup> ]	I [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
73 (Ta)	180.94788 (2)	16.654	718.0	0.17798	2.7623	0.2117	3.4805	5.5262	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	$4.704 \times 10^1$	4.020				4.020	$1.438 \times 10^0$
14.0 MeV	$5.616 \times 10^1$	3.200				3.200	$2.564 \times 10^0$
20.0 MeV	$6.802 \times 10^1$	2.545				2.545	$4.688 \times 10^0$
30.0 MeV	$8.509 \times 10^1$	2.008				2.009	$9.168 \times 10^0$
40.0 MeV	$1.003 \times 10^2$	1.733				1.733	$1.456 \times 10^1$
80.0 MeV	$1.527 \times 10^2$	1.328				1.328	$4.171 \times 10^1$
100. MeV	$1.764 \times 10^2$	1.256				1.256	$5.724 \times 10^1$
140. MeV	$2.218 \times 10^2$	1.186				1.186	$9.015 \times 10^1$
200. MeV	$2.868 \times 10^2$	1.153				1.154	$1.416 \times 10^2$
243. MeV	$3.325 \times 10^2$	1.149	0.000			1.150	<i>Minimum ionization</i>
300. MeV	$3.917 \times 10^2$	1.154	0.000		0.000	1.155	$2.285 \times 10^2$
400. MeV	$4.945 \times 10^2$	1.172	0.000		0.000	1.173	$3.144 \times 10^2$
800. MeV	$8.995 \times 10^2$	1.253	0.001		0.000	1.254	$6.438 \times 10^2$
1.00 GeV	$1.101 \times 10^3$	1.285	0.001		0.000	1.287	$8.011 \times 10^2$
1.40 GeV	$1.502 \times 10^3$	1.336	0.002		0.001	1.339	$1.106 \times 10^3$
2.00 GeV	$2.103 \times 10^3$	1.391	0.004	0.001	0.001	1.397	$1.544 \times 10^3$
3.00 GeV	$3.104 \times 10^3$	1.454	0.006	0.003	0.001	1.465	$2.241 \times 10^3$
4.00 GeV	$4.104 \times 10^3$	1.498	0.009	0.006	0.002	1.515	$2.912 \times 10^3$
8.00 GeV	$8.105 \times 10^3$	1.596	0.023	0.021	0.003	1.644	$5.436 \times 10^3$
10.0 GeV	$1.011 \times 10^4$	1.626	0.031	0.030	0.004	1.691	$6.636 \times 10^3$
14.0 GeV	$1.411 \times 10^4$	1.669	0.047	0.048	0.005	1.770	$8.947 \times 10^3$
20.0 GeV	$2.011 \times 10^4$	1.711	0.072	0.079	0.007	1.871	$1.224 \times 10^4$
30.0 GeV	$3.011 \times 10^4$	1.756	0.119	0.139	0.011	2.026	$1.737 \times 10^4$
40.0 GeV	$4.011 \times 10^4$	1.786	0.168	0.204	0.014	2.173	$2.214 \times 10^4$
80.0 GeV	$8.011 \times 10^4$	1.853	0.379	0.492	0.028	2.753	$3.845 \times 10^4$
100. GeV	$1.001 \times 10^5$	1.873	0.491	0.647	0.035	3.048	$4.535 \times 10^4$
140. GeV	$1.401 \times 10^5$	1.902	0.721	0.967	0.049	3.640	$5.735 \times 10^4$
152. GeV	$1.520 \times 10^5$	1.909	0.791	1.065	0.053	3.820	<i>Muon critical energy</i>
200. GeV	$2.001 \times 10^5$	1.932	1.081	1.474	0.069	4.557	$7.206 \times 10^4$
300. GeV	$3.001 \times 10^5$	1.966	1.694	2.319	0.104	6.084	$9.100 \times 10^4$
400. GeV	$4.001 \times 10^5$	1.990	2.328	3.196	0.138	7.653	$1.056 \times 10^5$
800. GeV	$8.001 \times 10^5$	2.047	4.944	6.788	0.279	14.060	$1.436 \times 10^5$
1.00 TeV	$1.000 \times 10^6$	2.066	6.287	8.625	0.351	17.330	$1.564 \times 10^5$
1.40 TeV	$1.400 \times 10^6$	2.095	8.978	12.289	0.497	23.860	$1.760 \times 10^5$
2.00 TeV	$2.000 \times 10^6$	2.125	13.092	17.879	0.718	33.817	$1.971 \times 10^5$
3.00 TeV	$3.000 \times 10^6$	2.161	19.958	27.169	1.098	50.387	$2.211 \times 10^5$
4.00 TeV	$4.000 \times 10^6$	2.186	26.913	36.556	1.483	67.140	$2.383 \times 10^5$
8.00 TeV	$8.000 \times 10^6$	2.249	54.943	74.284	3.080	134.557	$2.795 \times 10^5$
10.0 TeV	$1.000 \times 10^7$	2.269	69.063	93.247	3.899	168.480	$2.928 \times 10^5$
14.0 TeV	$1.400 \times 10^7$	2.301	97.226	131.085	5.580	236.193	$3.127 \times 10^5$
20.0 TeV	$2.000 \times 10^7$	2.335	139.708	188.080	8.156	338.280	$3.339 \times 10^5$
30.0 TeV	$3.000 \times 10^7$	2.374	210.432	282.907	12.604	508.319	$3.578 \times 10^5$
40.0 TeV	$4.000 \times 10^7$	2.402	281.398	377.954	17.156	678.912	$3.748 \times 10^5$
80.0 TeV	$8.000 \times 10^7$	2.471	565.656	758.404	36.147	1362.680	$4.155 \times 10^5$
100. TeV	$1.000 \times 10^8$	2.494	708.010	948.800	45.950	1705.256	$4.286 \times 10^5$