

Tabelle

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PROTON STOPPING POWER AND RANGE

HYDROGEN

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	7.465E+02	2.264E+02	9.730E+02	1.091E-06	9.045E-07	.8293
1.500E-03	9.143E+02	1.726E+02	1.087E+03	1.574E-06	1.342E-06	.8528
2.000E-03	1.056E+03	1.411E+02	1.197E+03	2.012E-06	1.749E-06	.8690
2.500E-03	1.180E+03	1.201E+02	1.300E+03	2.413E-06	2.125E-06	.8810
3.000E-03	1.293E+03	1.050E+02	1.398E+03	2.783E-06	2.478E-06	.8903
4.000E-03	1.493E+03	8.454E+01	1.578E+03	3.455E-06	3.123E-06	.9039
5.000E-03	1.669E+03	7.122E+01	1.741E+03	4.058E-06	3.708E-06	.9136
6.000E-03	1.829E+03	6.179E+01	1.890E+03	4.609E-06	4.245E-06	.9210
7.000E-03	1.975E+03	5.472E+01	2.030E+03	5.119E-06	4.744E-06	.9267
8.000E-03	2.112E+03	4.921E+01	2.161E+03	5.597E-06	5.213E-06	.9315
9.000E-03	2.240E+03	4.479E+01	2.284E+03	6.047E-06	5.656E-06	.9354
1.000E-02	2.361E+03	4.115E+01	2.402E+03	6.473E-06	6.077E-06	.9388
1.250E-02	2.586E+03	3.434E+01	2.621E+03	7.467E-06	7.059E-06	.9454
1.500E-02	2.777E+03	2.958E+01	2.807E+03	8.388E-06	7.972E-06	.9504
1.750E-02	2.942E+03	2.605E+01	2.968E+03	9.254E-06	8.831E-06	.9543
2.000E-02	3.084E+03	2.332E+01	3.107E+03	1.008E-05	9.649E-06	.9575
2.250E-02	3.208E+03	2.114E+01	3.229E+03	1.087E-05	1.043E-05	.9602
2.500E-02	3.316E+03	1.936E+01	3.335E+03	1.163E-05	1.119E-05	.9625
2.750E-02	3.409E+03	1.787E+01	3.427E+03	1.237E-05	1.193E-05	.9645
3.000E-02	3.490E+03	1.661E+01	3.506E+03	1.309E-05	1.265E-05	.9663
3.500E-02	3.618E+03	1.458E+01	3.633E+03	1.449E-05	1.404E-05	.9692
4.000E-02	3.710E+03	1.302E+01	3.723E+03	1.584E-05	1.540E-05	.9716
4.500E-02	3.771E+03	1.178E+01	3.783E+03	1.718E-05	1.672E-05	.9736
5.000E-02	3.808E+03	1.077E+01	3.818E+03	1.849E-05	1.804E-05	.9753
5.500E-02	3.823E+03	9.923E+00	3.833E+03	1.980E-05	1.934E-05	.9768
6.000E-02	3.822E+03	9.209E+00	3.831E+03	2.110E-05	2.064E-05	.9782
6.500E-02	3.807E+03	8.596E+00	3.816E+03	2.241E-05	2.195E-05	.9794
7.000E-02	3.781E+03	8.065E+00	3.789E+03	2.372E-05	2.326E-05	.9804
7.500E-02	3.745E+03	7.599E+00	3.753E+03	2.505E-05	2.458E-05	.9814
8.000E-02	3.702E+03	7.186E+00	3.710E+03	2.639E-05	2.592E-05	.9823
8.500E-02	3.654E+03	6.819E+00	3.661E+03	2.775E-05	2.728E-05	.9831
9.000E-02	3.601E+03	6.490E+00	3.608E+03	2.912E-05	2.865E-05	.9838
9.500E-02	3.545E+03	6.192E+00	3.552E+03	3.052E-05	3.005E-05	.9845
1.000E-01	3.487E+03	5.922E+00	3.493E+03	3.194E-05	3.146E-05	.9852
1.250E-01	3.183E+03	4.876E+00	3.188E+03	3.943E-05	3.895E-05	.9878
1.500E-01	2.890E+03	4.157E+00	2.895E+03	4.766E-05	4.717E-05	.9898
1.750E-01	2.629E+03	3.631E+00	2.633E+03	5.672E-05	5.623E-05	.9913
2.000E-01	2.402E+03	3.228E+00	2.406E+03	6.666E-05	6.617E-05	.9925
2.250E-01	2.204E+03	2.909E+00	2.207E+03	7.752E-05	7.702E-05	.9935
2.500E-01	2.031E+03	2.650E+00	2.034E+03	8.933E-05	8.882E-05	.9943
2.750E-01	1.882E+03	2.431E+00	1.884E+03	1.021E-04	1.016E-04	.9950
3.000E-01	1.753E+03	2.242E+00	1.755E+03	1.159E-04	1.153E-04	.9955

3.500E-01	1.544E+03	1.942E+00	1.546E+03	1.463E-04	1.458E-04	.9963
4.000E-01	1.384E+03	1.715E+00	1.385E+03	1.805E-04	1.800E-04	.9970
4.500E-01	1.258E+03	1.536E+00	1.260E+03	2.184E-04	2.179E-04	.9974
5.000E-01	1.159E+03	1.392E+00	1.160E+03	2.598E-04	2.593E-04	.9978
5.500E-01	1.077E+03	1.273E+00	1.078E+03	3.046E-04	3.040E-04	.9980
6.000E-01	1.007E+03	1.173E+00	1.009E+03	3.526E-04	3.519E-04	.9983
6.500E-01	9.470E+02	1.088E+00	9.481E+02	4.037E-04	4.031E-04	.9984
7.000E-01	8.942E+02	1.015E+00	8.952E+02	4.580E-04	4.574E-04	.9986
7.500E-01	8.475E+02	9.515E-01	8.485E+02	5.154E-04	5.147E-04	.9987
8.000E-01	8.059E+02	8.955E-01	8.068E+02	5.759E-04	5.752E-04	.9988
8.500E-01	7.686E+02	8.459E-01	7.695E+02	6.393E-04	6.386E-04	.9989
9.000E-01	7.349E+02	8.015E-01	7.357E+02	7.058E-04	7.051E-04	.9990
9.500E-01	7.043E+02	7.618E-01	7.051E+02	7.753E-04	7.745E-04	.9990
1.000E+00	6.764E+02	7.258E-01	6.771E+02	8.476E-04	8.469E-04	.9991
1.250E+00	5.667E+02	5.881E-01	5.673E+02	1.253E-03	1.252E-03	.9993
1.500E+00	4.897E+02	4.951E-01	4.902E+02	1.728E-03	1.727E-03	.9994
1.750E+00	4.325E+02	4.279E-01	4.329E+02	2.272E-03	2.271E-03	.9995
2.000E+00	3.881E+02	3.772E-01	3.885E+02	2.883E-03	2.881E-03	.9995
2.250E+00	3.526E+02	3.374E-01	3.530E+02	3.559E-03	3.557E-03	.9996
2.500E+00	3.235E+02	3.053E-01	3.238E+02	4.299E-03	4.297E-03	.9996
2.750E+00	2.992E+02	2.790E-01	2.995E+02	5.102E-03	5.100E-03	.9996
3.000E+00	2.785E+02	2.569E-01	2.788E+02	5.968E-03	5.966E-03	.9996
3.500E+00	2.452E+02	2.219E-01	2.455E+02	7.884E-03	7.881E-03	.9997
4.000E+00	2.195E+02	1.955E-01	2.197E+02	1.004E-02	1.004E-02	.9997
4.500E+00	1.991E+02	1.748E-01	1.992E+02	1.243E-02	1.243E-02	.9997
5.000E+00	1.823E+02	1.582E-01	1.825E+02	1.506E-02	1.505E-02	.9997
5.500E+00	1.684E+02	1.445E-01	1.685E+02	1.791E-02	1.791E-02	.9997
6.000E+00	1.565E+02	1.330E-01	1.567E+02	2.099E-02	2.099E-02	.9997
6.500E+00	1.464E+02	1.233E-01	1.465E+02	2.429E-02	2.429E-02	.9997
7.000E+00	1.375E+02	1.149E-01	1.377E+02	2.782E-02	2.781E-02	.9997
7.500E+00	1.298E+02	1.076E-01	1.299E+02	3.156E-02	3.155E-02	.9997
8.000E+00	1.229E+02	1.012E-01	1.230E+02	3.551E-02	3.551E-02	.9997
8.500E+00	1.168E+02	9.552E-02	1.169E+02	3.969E-02	3.968E-02	.9997
9.000E+00	1.113E+02	9.047E-02	1.114E+02	4.407E-02	4.406E-02	.9997
9.500E+00	1.064E+02	8.593E-02	1.065E+02	4.866E-02	4.865E-02	.9997
1.000E+01	1.019E+02	8.184E-02	1.019E+02	5.346E-02	5.345E-02	.9998
1.250E+01	8.437E+01	6.617E-02	8.444E+01	8.054E-02	8.052E-02	.9998
1.500E+01	7.233E+01	5.562E-02	7.239E+01	1.126E-01	1.126E-01	.9998
1.750E+01	6.351E+01	4.802E-02	6.356E+01	1.496E-01	1.495E-01	.9998
2.000E+01	5.675E+01	4.228E-02	5.679E+01	1.913E-01	1.912E-01	.9998
2.500E+01	4.704E+01	3.418E-02	4.707E+01	2.884E-01	2.884E-01	.9998
2.750E+01	4.343E+01	3.121E-02	4.346E+01	3.438E-01	3.437E-01	.9998
3.000E+01	4.038E+01	2.872E-02	4.041E+01	4.035E-01	4.034E-01	.9998
3.500E+01	3.551E+01	2.479E-02	3.554E+01	5.357E-01	5.356E-01	.9998
4.000E+01	3.179E+01	2.183E-02	3.182E+01	6.847E-01	6.846E-01	.9998
4.500E+01	2.885E+01	1.951E-02	2.887E+01	8.499E-01	8.497E-01	.9998
5.000E+01	2.647E+01	1.764E-02	2.649E+01	1.031E+00	1.031E+00	.9998
5.500E+01	2.450E+01	1.611E-02	2.451E+01	1.227E+00	1.227E+00	.9998
6.000E+01	2.284E+01	1.482E-02	2.285E+01	1.439E+00	1.438E+00	.9998
6.500E+01	2.141E+01	1.373E-02	2.143E+01	1.665E+00	1.665E+00	.9998
7.000E+01	2.019E+01	1.279E-02	2.020E+01	1.905E+00	1.905E+00	.9998
7.500E+01	1.911E+01	1.198E-02	1.913E+01	2.160E+00	2.159E+00	.9998
8.000E+01	1.817E+01	1.126E-02	1.818E+01	2.428E+00	2.428E+00	.9998
8.500E+01	1.733E+01	1.063E-02	1.734E+01	2.710E+00	2.709E+00	.9998
9.000E+01	1.658E+01	1.006E-02	1.659E+01	3.005E+00	3.004E+00	.9998
9.500E+01	1.590E+01	9.557E-03	1.591E+01	3.312E+00	3.312E+00	.9998
1.000E+02	1.529E+01	9.100E-03	1.530E+01	3.633E+00	3.632E+00	.9998

1.250E+02	1.294E+01	7.353E-03	1.295E+01	5.417E+00	5.416E+00	.9998
1.500E+02	1.135E+01	6.178E-03	1.135E+01	7.485E+00	7.484E+00	.9998
1.750E+02	1.020E+01	5.333E-03	1.020E+01	9.813E+00	9.812E+00	.9998
2.000E+02	9.323E+00	4.695E-03	9.328E+00	1.238E+01	1.238E+01	.9998
2.250E+02	8.640E+00	4.195E-03	8.645E+00	1.517E+01	1.517E+01	.9998
2.500E+02	8.092E+00	3.794E-03	8.096E+00	1.816E+01	1.816E+01	.9998
2.750E+02	7.642E+00	3.464E-03	7.645E+00	2.134E+01	2.134E+01	.9998
3.000E+02	7.266E+00	3.188E-03	7.269E+00	2.469E+01	2.469E+01	.9998
3.500E+02	6.676E+00	2.753E-03	6.679E+00	3.188E+01	3.188E+01	.9999
4.000E+02	6.236E+00	2.424E-03	6.238E+00	3.964E+01	3.964E+01	.9999
4.500E+02	5.895E+00	2.166E-03	5.897E+00	4.789E+01	4.789E+01	.9999
5.000E+02	5.625E+00	1.960E-03	5.627E+00	5.658E+01	5.657E+01	.9999
5.500E+02	5.407E+00	1.790E-03	5.409E+00	6.565E+01	6.564E+01	.9999
6.000E+02	5.228E+00	1.647E-03	5.230E+00	7.505E+01	7.504E+01	.9999
6.500E+02	5.079E+00	1.527E-03	5.081E+00	8.476E+01	8.474E+01	.9999
7.000E+02	4.954E+00	1.423E-03	4.955E+00	9.472E+01	9.471E+01	.9999
7.500E+02	4.847E+00	1.333E-03	4.848E+00	1.049E+02	1.049E+02	.9999
8.000E+02	4.755E+00	1.253E-03	4.757E+00	1.153E+02	1.153E+02	.9999
8.500E+02	4.676E+00	1.183E-03	4.678E+00	1.259E+02	1.259E+02	.9999
9.000E+02	4.608E+00	1.121E-03	4.609E+00	1.367E+02	1.367E+02	.9999
9.500E+02	4.548E+00	1.065E-03	4.549E+00	1.476E+02	1.476E+02	.9999
1.000E+03	4.496E+00	1.014E-03	4.497E+00	1.587E+02	1.587E+02	.9999
1.500E+03	4.212E+00	6.908E-04	4.213E+00	2.743E+02	2.742E+02	.9999
2.000E+03	4.125E+00	5.264E-04	4.125E+00	3.945E+02	3.944E+02	.9999
2.500E+03	4.106E+00	4.265E-04	4.107E+00	5.160E+02	5.160E+02	.9999
3.000E+03	4.117E+00	3.592E-04	4.118E+00	6.377E+02	6.376E+02	.9999
4.000E+03	4.172E+00	2.740E-04	4.172E+00	8.791E+02	8.790E+02	.9999
5.000E+03	4.240E+00	2.221E-04	4.240E+00	1.117E+03	1.117E+03	.9999
6.000E+03	4.307E+00	1.872E-04	4.307E+00	1.351E+03	1.351E+03	1.0000
7.000E+03	4.371E+00	1.620E-04	4.372E+00	1.581E+03	1.581E+03	1.0000
8.000E+03	4.431E+00	1.429E-04	4.431E+00	1.808E+03	1.808E+03	1.0000
9.000E+03	4.487E+00	1.279E-04	4.487E+00	2.033E+03	2.033E+03	1.0000
1.000E+04	4.539E+00	1.159E-04	4.539E+00	2.254E+03	2.254E+03	1.0000

PROTON STOPPING POWER AND RANGE

HELIUM

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	1.842E+02	4.837E+01	2.326E+02	4.882E-06	2.831E-06	.5800
1.500E-03	2.256E+02	3.761E+01	2.633E+02	6.887E-06	4.321E-06	.6273
2.000E-03	2.606E+02	3.112E+01	2.917E+02	8.691E-06	5.751E-06	.6617
2.500E-03	2.913E+02	2.672E+01	3.180E+02	1.033E-05	7.107E-06	.6880
3.000E-03	3.191E+02	2.351E+01	3.426E+02	1.184E-05	8.397E-06	.7090
4.000E-03	3.685E+02	1.911E+01	3.876E+02	1.458E-05	1.080E-05	.7408
5.000E-03	4.120E+02	1.620E+01	4.282E+02	1.704E-05	1.302E-05	.7641
6.000E-03	4.513E+02	1.412E+01	4.654E+02	1.927E-05	1.508E-05	.7822
7.000E-03	4.874E+02	1.256E+01	5.000E+02	2.135E-05	1.701E-05	.7967
8.000E-03	5.211E+02	1.133E+01	5.324E+02	2.328E-05	1.883E-05	.8087
9.000E-03	5.527E+02	1.033E+01	5.630E+02	2.511E-05	2.056E-05	.8188
1.000E-02	5.826E+02	9.515E+00	5.921E+02	2.684E-05	2.221E-05	.8275
1.250E-02	6.413E+02	7.974E+00	6.492E+02	3.086E-05	2.608E-05	.8450
1.500E-02	6.919E+02	6.891E+00	6.988E+02	3.457E-05	2.967E-05	.8583
1.750E-02	7.367E+02	6.084E+00	7.427E+02	3.804E-05	3.305E-05	.8688
2.000E-02	7.766E+02	5.458E+00	7.821E+02	4.132E-05	3.626E-05	.8775
2.250E-02	8.125E+02	4.957E+00	8.175E+02	4.444E-05	3.932E-05	.8848
2.500E-02	8.449E+02	4.546E+00	8.495E+02	4.744E-05	4.227E-05	.8910
2.750E-02	8.742E+02	4.202E+00	8.784E+02	5.033E-05	4.512E-05	.8964
3.000E-02	9.008E+02	3.910E+00	9.047E+02	5.314E-05	4.789E-05	.9012
3.500E-02	9.466E+02	3.439E+00	9.500E+02	5.853E-05	5.321E-05	.9092
4.000E-02	9.841E+02	3.076E+00	9.872E+02	6.369E-05	5.832E-05	.9157
4.500E-02	1.014E+03	2.786E+00	1.017E+03	6.867E-05	6.326E-05	.9212
5.000E-02	1.039E+03	2.550E+00	1.041E+03	7.353E-05	6.808E-05	.9259
5.500E-02	1.058E+03	2.352E+00	1.060E+03	7.828E-05	7.281E-05	.9300
6.000E-02	1.072E+03	2.185E+00	1.074E+03	8.297E-05	7.746E-05	.9336
6.500E-02	1.083E+03	2.042E+00	1.085E+03	8.760E-05	8.207E-05	.9369
7.000E-02	1.089E+03	1.917E+00	1.091E+03	9.219E-05	8.664E-05	.9398
7.500E-02	1.093E+03	1.807E+00	1.095E+03	9.677E-05	9.119E-05	.9424
8.000E-02	1.094E+03	1.710E+00	1.096E+03	1.013E-04	9.573E-05	.9448
8.500E-02	1.093E+03	1.624E+00	1.095E+03	1.059E-04	1.003E-04	.9470
9.000E-02	1.090E+03	1.546E+00	1.092E+03	1.105E-04	1.048E-04	.9490
9.500E-02	1.085E+03	1.476E+00	1.087E+03	1.151E-04	1.094E-04	.9509
1.000E-01	1.079E+03	1.412E+00	1.080E+03	1.197E-04	1.140E-04	.9527
1.250E-01	1.032E+03	1.165E+00	1.033E+03	1.433E-04	1.376E-04	.9600
1.500E-01	9.730E+02	9.949E-01	9.739E+02	1.682E-04	1.624E-04	.9656
1.750E-01	9.112E+02	8.701E-01	9.121E+02	1.947E-04	1.889E-04	.9700
2.000E-01	8.521E+02	7.740E-01	8.528E+02	2.231E-04	2.172E-04	.9736
2.250E-01	7.975E+02	6.963E-01	7.982E+02	2.534E-04	2.474E-04	.9765
2.500E-01	7.483E+02	6.332E-01	7.489E+02	2.857E-04	2.797E-04	.9790
2.750E-01	7.045E+02	5.810E-01	7.051E+02	3.201E-04	3.141E-04	.9811
3.000E-01	6.658E+02	5.370E-01	6.663E+02	3.566E-04	3.505E-04	.9829

3.500E-01	6.004E+02	4.668E-01	6.009E+02	4.358E-04	4.296E-04	.9858
4.000E-01	5.477E+02	4.133E-01	5.481E+02	5.230E-04	5.167E-04	.9880
4.500E-01	5.045E+02	3.711E-01	5.048E+02	6.181E-04	6.117E-04	.9897
5.000E-01	4.683E+02	3.369E-01	4.687E+02	7.210E-04	7.145E-04	.9910
5.500E-01	4.377E+02	3.087E-01	4.380E+02	8.315E-04	8.249E-04	.9921
6.000E-01	4.113E+02	2.849E-01	4.116E+02	9.493E-04	9.426E-04	.9929
6.500E-01	3.882E+02	2.646E-01	3.885E+02	1.074E-03	1.068E-03	.9937
7.000E-01	3.680E+02	2.471E-01	3.682E+02	1.207E-03	1.200E-03	.9943
7.500E-01	3.499E+02	2.318E-01	3.502E+02	1.346E-03	1.339E-03	.9948
8.000E-01	3.338E+02	2.184E-01	3.341E+02	1.492E-03	1.485E-03	.9952
8.500E-01	3.193E+02	2.064E-01	3.195E+02	1.645E-03	1.638E-03	.9956
9.000E-01	3.062E+02	1.958E-01	3.064E+02	1.805E-03	1.798E-03	.9959
9.500E-01	2.942E+02	1.862E-01	2.944E+02	1.972E-03	1.964E-03	.9962
1.000E+00	2.832E+02	1.775E-01	2.834E+02	2.145E-03	2.137E-03	.9964
1.250E+00	2.396E+02	1.442E-01	2.397E+02	3.108E-03	3.099E-03	.9973
1.500E+00	2.086E+02	1.216E-01	2.087E+02	4.229E-03	4.219E-03	.9978
1.750E+00	1.852E+02	1.052E-01	1.853E+02	5.502E-03	5.492E-03	.9982
2.000E+00	1.670E+02	9.283E-02	1.671E+02	6.925E-03	6.914E-03	.9984
2.250E+00	1.523E+02	8.310E-02	1.524E+02	8.494E-03	8.482E-03	.9986
2.500E+00	1.402E+02	7.526E-02	1.403E+02	1.021E-02	1.019E-02	.9987
2.750E+00	1.300E+02	6.880E-02	1.301E+02	1.206E-02	1.204E-02	.9988
3.000E+00	1.213E+02	6.338E-02	1.214E+02	1.405E-02	1.403E-02	.9989
3.500E+00	1.073E+02	5.480E-02	1.073E+02	1.844E-02	1.842E-02	.9990
4.000E+00	9.637E+01	4.831E-02	9.642E+01	2.336E-02	2.334E-02	.9991
4.500E+00	8.763E+01	4.322E-02	8.767E+01	2.881E-02	2.878E-02	.9992
5.000E+00	8.046E+01	3.912E-02	8.050E+01	3.476E-02	3.474E-02	.9992
5.500E+00	7.446E+01	3.575E-02	7.450E+01	4.123E-02	4.119E-02	.9993
6.000E+00	6.936E+01	3.292E-02	6.939E+01	4.818E-02	4.815E-02	.9993
6.500E+00	6.497E+01	3.051E-02	6.500E+01	5.563E-02	5.560E-02	.9993
7.000E+00	6.114E+01	2.844E-02	6.117E+01	6.357E-02	6.353E-02	.9993
7.500E+00	5.778E+01	2.664E-02	5.780E+01	7.198E-02	7.193E-02	.9993
8.000E+00	5.479E+01	2.506E-02	5.482E+01	8.087E-02	8.081E-02	.9994
8.500E+00	5.213E+01	2.366E-02	5.215E+01	9.022E-02	9.016E-02	.9994
9.000E+00	4.973E+01	2.241E-02	4.975E+01	1.000E-01	9.998E-02	.9994
9.500E+00	4.756E+01	2.129E-02	4.758E+01	1.103E-01	1.103E-01	.9994
1.000E+01	4.559E+01	2.028E-02	4.561E+01	1.211E-01	1.210E-01	.9994
1.250E+01	3.791E+01	1.640E-02	3.793E+01	1.815E-01	1.813E-01	.9994
1.500E+01	3.260E+01	1.379E-02	3.261E+01	2.528E-01	2.526E-01	.9995
1.750E+01	2.869E+01	1.191E-02	2.870E+01	3.347E-01	3.345E-01	.9995
2.000E+01	2.568E+01	1.049E-02	2.569E+01	4.269E-01	4.267E-01	.9995
2.500E+01	2.136E+01	8.483E-03	2.136E+01	6.413E-01	6.410E-01	.9995
2.750E+01	1.974E+01	7.747E-03	1.975E+01	7.632E-01	7.628E-01	.9995
3.000E+01	1.838E+01	7.131E-03	1.838E+01	8.945E-01	8.940E-01	.9995
3.500E+01	1.619E+01	6.157E-03	1.620E+01	1.185E+00	1.184E+00	.9995
4.000E+01	1.452E+01	5.421E-03	1.453E+01	1.511E+00	1.511E+00	.9995
4.500E+01	1.320E+01	4.845E-03	1.320E+01	1.873E+00	1.872E+00	.9996
5.000E+01	1.212E+01	4.382E-03	1.212E+01	2.269E+00	2.268E+00	.9996
5.500E+01	1.123E+01	4.002E-03	1.123E+01	2.697E+00	2.696E+00	.9996
6.000E+01	1.048E+01	3.683E-03	1.048E+01	3.159E+00	3.157E+00	.9996
6.500E+01	9.833E+00	3.412E-03	9.836E+00	3.651E+00	3.650E+00	.9996
7.000E+01	9.276E+00	3.179E-03	9.279E+00	4.175E+00	4.173E+00	.9996
7.500E+01	8.789E+00	2.977E-03	8.792E+00	4.729E+00	4.727E+00	.9996
8.000E+01	8.360E+00	2.799E-03	8.362E+00	5.312E+00	5.310E+00	.9996
8.500E+01	7.978E+00	2.642E-03	7.981E+00	5.925E+00	5.922E+00	.9996
9.000E+01	7.637E+00	2.502E-03	7.639E+00	6.565E+00	6.562E+00	.9996
9.500E+01	7.329E+00	2.376E-03	7.332E+00	7.233E+00	7.231E+00	.9996
1.000E+02	7.051E+00	2.262E-03	7.053E+00	7.929E+00	7.926E+00	.9996

1.250E+02	5.979E+00	1.829E-03	5.981E+00	1.180E+01	1.179E+01	.9996
1.500E+02	5.250E+00	1.537E-03	5.252E+00	1.627E+01	1.626E+01	.9996
1.750E+02	4.723E+00	1.327E-03	4.724E+00	2.130E+01	2.129E+01	.9996
2.000E+02	4.323E+00	1.168E-03	4.324E+00	2.684E+01	2.683E+01	.9996
2.250E+02	4.010E+00	1.044E-03	4.011E+00	3.285E+01	3.284E+01	.9997
2.500E+02	3.758E+00	9.441E-04	3.759E+00	3.929E+01	3.928E+01	.9997
2.750E+02	3.552E+00	8.621E-04	3.552E+00	4.614E+01	4.613E+01	.9997
3.000E+02	3.379E+00	7.935E-04	3.380E+00	5.336E+01	5.334E+01	.9997
3.500E+02	3.108E+00	6.851E-04	3.109E+00	6.881E+01	6.879E+01	.9997
4.000E+02	2.906E+00	6.033E-04	2.906E+00	8.547E+01	8.544E+01	.9997
4.500E+02	2.749E+00	5.394E-04	2.750E+00	1.032E+02	1.031E+02	.9997
5.000E+02	2.625E+00	4.879E-04	2.626E+00	1.218E+02	1.218E+02	.9997
5.500E+02	2.525E+00	4.457E-04	2.526E+00	1.412E+02	1.412E+02	.9997
6.000E+02	2.443E+00	4.103E-04	2.444E+00	1.614E+02	1.613E+02	.9997
6.500E+02	2.375E+00	3.802E-04	2.375E+00	1.821E+02	1.821E+02	.9997
7.000E+02	2.317E+00	3.544E-04	2.318E+00	2.034E+02	2.034E+02	.9997
7.500E+02	2.268E+00	3.319E-04	2.269E+00	2.253E+02	2.252E+02	.9997
8.000E+02	2.227E+00	3.122E-04	2.227E+00	2.475E+02	2.474E+02	.9997
8.500E+02	2.191E+00	2.948E-04	2.191E+00	2.701E+02	2.701E+02	.9998
9.000E+02	2.159E+00	2.792E-04	2.160E+00	2.931E+02	2.931E+02	.9998
9.500E+02	2.132E+00	2.653E-04	2.132E+00	3.164E+02	3.164E+02	.9998
1.000E+03	2.108E+00	2.527E-04	2.109E+00	3.400E+02	3.399E+02	.9998
1.500E+03	1.981E+00	1.722E-04	1.981E+00	5.861E+02	5.860E+02	.9998
2.000E+03	1.944E+00	1.312E-04	1.944E+00	8.414E+02	8.412E+02	.9998
2.500E+03	1.939E+00	1.063E-04	1.939E+00	1.099E+03	1.099E+03	.9998
3.000E+03	1.947E+00	8.958E-05	1.947E+00	1.356E+03	1.356E+03	.9999
4.000E+03	1.977E+00	6.835E-05	1.977E+00	1.866E+03	1.866E+03	.9999
5.000E+03	2.013E+00	5.543E-05	2.013E+00	2.368E+03	2.367E+03	.9999
6.000E+03	2.048E+00	4.672E-05	2.048E+00	2.860E+03	2.860E+03	.9999
7.000E+03	2.081E+00	4.043E-05	2.081E+00	3.345E+03	3.344E+03	.9999
8.000E+03	2.111E+00	3.567E-05	2.111E+00	3.822E+03	3.821E+03	.9999
9.000E+03	2.139E+00	3.194E-05	2.139E+00	4.292E+03	4.292E+03	.9999
1.000E+04	2.166E+00	2.894E-05	2.166E+00	4.757E+03	4.756E+03	.9999

PROTON STOPPING POWER AND RANGE

CARBON (amorphous, density 2.0 g/cm³)

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP(e)	STOP(n)	STOP(t)	RANGE(c)	RANGE(p)	DETOUR
1.000E-03	1.384E+02	2.514E+01	1.635E+02	8.354E-06	3.084E-06	.3691
1.500E-03	1.695E+02	2.106E+01	1.905E+02	1.116E-05	4.658E-06	.4174
2.000E-03	1.957E+02	1.829E+01	2.140E+02	1.363E-05	6.204E-06	.4551
2.500E-03	2.188E+02	1.625E+01	2.351E+02	1.586E-05	7.703E-06	.4856
3.000E-03	2.397E+02	1.469E+01	2.544E+02	1.790E-05	9.151E-06	.5112
4.000E-03	2.702E+02	1.241E+01	2.826E+02	2.162E-05	1.194E-05	.5524
5.000E-03	2.978E+02	1.081E+01	3.086E+02	2.501E-05	1.462E-05	.5846
6.000E-03	3.227E+02	9.618E+00	3.323E+02	2.813E-05	1.718E-05	.6107
7.000E-03	3.454E+02	8.690E+00	3.541E+02	3.104E-05	1.963E-05	.6324
8.000E-03	3.651E+02	7.943E+00	3.730E+02	3.379E-05	2.199E-05	.6509
9.000E-03	3.826E+02	7.328E+00	3.899E+02	3.641E-05	2.428E-05	.6669
1.000E-02	3.987E+02	6.810E+00	4.055E+02	3.893E-05	2.651E-05	.6810
1.250E-02	4.335E+02	5.814E+00	4.393E+02	4.484E-05	3.183E-05	.7100
1.500E-02	4.624E+02	5.094E+00	4.675E+02	5.035E-05	3.689E-05	.7326
1.750E-02	4.874E+02	4.547E+00	4.920E+02	5.556E-05	4.173E-05	.7511
2.000E-02	5.099E+02	4.115E+00	5.140E+02	6.053E-05	4.639E-05	.7664
2.250E-02	5.300E+02	3.765E+00	5.337E+02	6.530E-05	5.090E-05	.7795
2.500E-02	5.477E+02	3.475E+00	5.512E+02	6.991E-05	5.528E-05	.7908
2.750E-02	5.634E+02	3.229E+00	5.667E+02	7.438E-05	5.956E-05	.8007
3.000E-02	5.776E+02	3.019E+00	5.806E+02	7.874E-05	6.374E-05	.8095
3.500E-02	6.039E+02	2.678E+00	6.065E+02	8.716E-05	7.186E-05	.8244
4.000E-02	6.283E+02	2.411E+00	6.307E+02	9.524E-05	7.969E-05	.8367
4.500E-02	6.501E+02	2.196E+00	6.523E+02	1.030E-04	8.726E-05	.8470
5.000E-02	6.686E+02	2.019E+00	6.706E+02	1.106E-04	9.464E-05	.8558
5.500E-02	6.835E+02	1.870E+00	6.854E+02	1.180E-04	1.018E-04	.8634
6.000E-02	6.953E+02	1.744E+00	6.971E+02	1.252E-04	1.089E-04	.8701
6.500E-02	7.045E+02	1.634E+00	7.062E+02	1.323E-04	1.159E-04	.8761
7.000E-02	7.114E+02	1.539E+00	7.130E+02	1.394E-04	1.229E-04	.8815
7.500E-02	7.163E+02	1.455E+00	7.178E+02	1.463E-04	1.297E-04	.8864
8.000E-02	7.194E+02	1.380E+00	7.208E+02	1.533E-04	1.366E-04	.8909
8.500E-02	7.208E+02	1.313E+00	7.222E+02	1.602E-04	1.434E-04	.8950
9.000E-02	7.209E+02	1.253E+00	7.221E+02	1.671E-04	1.502E-04	.8989
9.500E-02	7.197E+02	1.199E+00	7.209E+02	1.741E-04	1.571E-04	.9024
1.000E-01	7.174E+02	1.149E+00	7.186E+02	1.810E-04	1.640E-04	.9057
1.250E-01	6.945E+02	9.548E-01	6.954E+02	2.163E-04	1.989E-04	.9194
1.500E-01	6.611E+02	8.200E-01	6.619E+02	2.531E-04	2.354E-04	.9299
1.750E-01	6.247E+02	7.204E-01	6.254E+02	2.920E-04	2.740E-04	.9383
2.000E-01	5.891E+02	6.436E-01	5.898E+02	3.332E-04	3.149E-04	.9451
2.250E-01	5.560E+02	5.825E-01	5.566E+02	3.768E-04	3.583E-04	.9508
2.500E-01	5.260E+02	5.326E-01	5.265E+02	4.230E-04	4.042E-04	.9556
2.750E-01	4.991E+02	4.911E-01	4.996E+02	4.718E-04	4.527E-04	.9596
3.000E-01	4.750E+02	4.559E-01	4.754E+02	5.231E-04	5.038E-04	.9631

3.500E-01	4.358E+02	3.995E-01	4.362E+02	6.330E-04	6.133E-04	.9688
4.000E-01	4.044E+02	3.561E-01	4.048E+02	7.522E-04	7.319E-04	.9731
4.500E-01	3.779E+02	3.217E-01	3.782E+02	8.800E-04	8.593E-04	.9764
5.000E-01	3.546E+02	2.937E-01	3.549E+02	1.017E-03	9.953E-04	.9791
5.500E-01	3.340E+02	2.704E-01	3.343E+02	1.162E-03	1.140E-03	.9813
6.000E-01	3.159E+02	2.505E-01	3.161E+02	1.316E-03	1.293E-03	.9831
6.500E-01	3.002E+02	2.335E-01	3.004E+02	1.478E-03	1.455E-03	.9846
7.000E-01	2.862E+02	2.187E-01	2.864E+02	1.649E-03	1.625E-03	.9859
7.500E-01	2.737E+02	2.058E-01	2.739E+02	1.827E-03	1.803E-03	.9870
8.000E-01	2.624E+02	1.943E-01	2.626E+02	2.014E-03	1.989E-03	.9879
8.500E-01	2.522E+02	1.842E-01	2.523E+02	2.208E-03	2.183E-03	.9887
9.000E-01	2.427E+02	1.750E-01	2.429E+02	2.410E-03	2.384E-03	.9894
9.500E-01	2.341E+02	1.668E-01	2.342E+02	2.620E-03	2.593E-03	.9900
1.000E+00	2.261E+02	1.594E-01	2.263E+02	2.837E-03	2.810E-03	.9906
1.250E+00	1.942E+02	1.305E-01	1.943E+02	4.033E-03	4.003E-03	.9926
1.500E+00	1.711E+02	1.108E-01	1.712E+02	5.407E-03	5.374E-03	.9939
1.750E+00	1.534E+02	9.640E-02	1.535E+02	6.952E-03	6.915E-03	.9947
2.000E+00	1.394E+02	8.541E-02	1.395E+02	8.662E-03	8.621E-03	.9953
2.250E+00	1.280E+02	7.674E-02	1.281E+02	1.053E-02	1.049E-02	.9958
2.500E+00	1.185E+02	6.971E-02	1.186E+02	1.256E-02	1.252E-02	.9961
2.750E+00	1.104E+02	6.390E-02	1.105E+02	1.475E-02	1.470E-02	.9964
3.000E+00	1.035E+02	5.901E-02	1.036E+02	1.709E-02	1.703E-02	.9966
3.500E+00	9.218E+01	5.122E-02	9.223E+01	2.221E-02	2.215E-02	.9969
4.000E+00	8.326E+01	4.529E-02	8.330E+01	2.793E-02	2.785E-02	.9972
4.500E+00	7.606E+01	4.063E-02	7.610E+01	3.422E-02	3.412E-02	.9973
5.000E+00	7.010E+01	3.685E-02	7.014E+01	4.107E-02	4.096E-02	.9975
5.500E+00	6.509E+01	3.373E-02	6.512E+01	4.847E-02	4.835E-02	.9976
6.000E+00	6.081E+01	3.112E-02	6.084E+01	5.642E-02	5.629E-02	.9977
6.500E+00	5.710E+01	2.888E-02	5.713E+01	6.490E-02	6.476E-02	.9978
7.000E+00	5.386E+01	2.696E-02	5.388E+01	7.392E-02	7.376E-02	.9978
7.500E+00	5.099E+01	2.528E-02	5.102E+01	8.346E-02	8.328E-02	.9979
8.000E+00	4.845E+01	2.380E-02	4.847E+01	9.352E-02	9.332E-02	.9979
8.500E+00	4.617E+01	2.249E-02	4.620E+01	1.041E-01	1.039E-01	.9980
9.000E+00	4.411E+01	2.132E-02	4.414E+01	1.152E-01	1.149E-01	.9980
9.500E+00	4.225E+01	2.027E-02	4.227E+01	1.267E-01	1.265E-01	.9980
1.000E+01	4.055E+01	1.932E-02	4.057E+01	1.388E-01	1.386E-01	.9981
1.250E+01	3.389E+01	1.567E-02	3.391E+01	2.065E-01	2.062E-01	.9982
1.500E+01	2.925E+01	1.320E-02	2.926E+01	2.862E-01	2.857E-01	.9983
1.750E+01	2.582E+01	1.141E-02	2.583E+01	3.773E-01	3.767E-01	.9983
2.000E+01	2.317E+01	1.006E-02	2.318E+01	4.796E-01	4.789E-01	.9984
2.500E+01	1.933E+01	8.149E-03	1.934E+01	7.169E-01	7.158E-01	.9984
2.750E+01	1.790E+01	7.446E-03	1.791E+01	8.513E-01	8.500E-01	.9985
3.000E+01	1.668E+01	6.858E-03	1.669E+01	9.961E-01	9.946E-01	.9985
3.500E+01	1.473E+01	5.926E-03	1.474E+01	1.316E+00	1.314E+00	.9985
4.000E+01	1.323E+01	5.221E-03	1.324E+01	1.674E+00	1.672E+00	.9986
4.500E+01	1.204E+01	4.669E-03	1.205E+01	2.071E+00	2.068E+00	.9986
5.000E+01	1.107E+01	4.225E-03	1.108E+01	2.504E+00	2.500E+00	.9986
5.500E+01	1.027E+01	3.859E-03	1.027E+01	2.973E+00	2.969E+00	.9986
6.000E+01	9.591E+00	3.553E-03	9.595E+00	3.477E+00	3.472E+00	.9986
6.500E+01	9.010E+00	3.293E-03	9.013E+00	4.015E+00	4.010E+00	.9987
7.000E+01	8.506E+00	3.069E-03	8.509E+00	4.586E+00	4.580E+00	.9987
7.500E+01	8.065E+00	2.874E-03	8.068E+00	5.190E+00	5.183E+00	.9987
8.000E+01	7.675E+00	2.703E-03	7.678E+00	5.825E+00	5.818E+00	.9987
8.500E+01	7.329E+00	2.551E-03	7.331E+00	6.492E+00	6.484E+00	.9987
9.000E+01	7.019E+00	2.416E-03	7.021E+00	7.189E+00	7.180E+00	.9987
9.500E+01	6.739E+00	2.295E-03	6.742E+00	7.916E+00	7.906E+00	.9987
1.000E+02	6.486E+00	2.186E-03	6.488E+00	8.672E+00	8.662E+00	.9988

1.250E+02	5.509E+00	1.768E-03	5.511E+00	1.287E+01	1.286E+01	.9988
1.500E+02	4.844E+00	1.486E-03	4.845E+00	1.773E+01	1.770E+01	.9988
1.750E+02	4.360E+00	1.283E-03	4.362E+00	2.318E+01	2.315E+01	.9989
2.000E+02	3.994E+00	1.130E-03	3.995E+00	2.917E+01	2.914E+01	.9989
2.250E+02	3.706E+00	1.010E-03	3.707E+00	3.568E+01	3.564E+01	.9989
2.500E+02	3.475E+00	9.141E-04	3.475E+00	4.265E+01	4.260E+01	.9989
2.750E+02	3.284E+00	8.349E-04	3.285E+00	5.005E+01	5.000E+01	.9990
3.000E+02	3.125E+00	7.686E-04	3.126E+00	5.786E+01	5.780E+01	.9990
3.500E+02	2.875E+00	6.638E-04	2.875E+00	7.457E+01	7.449E+01	.9990
4.000E+02	2.687E+00	5.847E-04	2.688E+00	9.258E+01	9.249E+01	.9990
4.500E+02	2.542E+00	5.228E-04	2.542E+00	1.117E+02	1.116E+02	.9991
5.000E+02	2.426E+00	4.730E-04	2.427E+00	1.319E+02	1.318E+02	.9991
5.500E+02	2.333E+00	4.321E-04	2.333E+00	1.529E+02	1.528E+02	.9991
6.000E+02	2.256E+00	3.979E-04	2.256E+00	1.747E+02	1.746E+02	.9991
6.500E+02	2.191E+00	3.688E-04	2.192E+00	1.972E+02	1.970E+02	.9992
7.000E+02	2.137E+00	3.438E-04	2.137E+00	2.203E+02	2.201E+02	.9992
7.500E+02	2.091E+00	3.220E-04	2.091E+00	2.440E+02	2.438E+02	.9992
8.000E+02	2.051E+00	3.029E-04	2.051E+00	2.681E+02	2.679E+02	.9992
8.500E+02	2.016E+00	2.860E-04	2.016E+00	2.927E+02	2.925E+02	.9992
9.000E+02	1.986E+00	2.710E-04	1.986E+00	3.177E+02	3.175E+02	.9992
9.500E+02	1.960E+00	2.575E-04	1.960E+00	3.430E+02	3.428E+02	.9993
1.000E+03	1.937E+00	2.453E-04	1.937E+00	3.687E+02	3.684E+02	.9993
1.500E+03	1.807E+00	1.672E-04	1.808E+00	6.375E+02	6.372E+02	.9994
2.000E+03	1.763E+00	1.275E-04	1.763E+00	9.183E+02	9.178E+02	.9995
2.500E+03	1.748E+00	1.034E-04	1.748E+00	1.203E+03	1.203E+03	.9995
3.000E+03	1.746E+00	8.710E-05	1.746E+00	1.490E+03	1.489E+03	.9995
4.000E+03	1.759E+00	6.650E-05	1.759E+00	2.061E+03	2.060E+03	.9996
5.000E+03	1.778E+00	5.395E-05	1.778E+00	2.626E+03	2.625E+03	.9997
6.000E+03	1.799E+00	4.548E-05	1.799E+00	3.185E+03	3.184E+03	.9997
7.000E+03	1.819E+00	3.937E-05	1.819E+00	3.738E+03	3.737E+03	.9997
8.000E+03	1.837E+00	3.474E-05	1.837E+00	4.285E+03	4.284E+03	.9997
9.000E+03	1.855E+00	3.112E-05	1.855E+00	4.827E+03	4.826E+03	.9998
1.000E+04	1.871E+00	2.820E-05	1.871E+00	5.363E+03	5.362E+03	.9998

PROTON STOPPING POWER AND RANGE

ALUMINUM

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	9.238E+01	1.197E+01	1.043E+02	1.471E-05	3.758E-06	.2555
1.500E-03	1.131E+02	1.072E+01	1.239E+02	1.906E-05	5.590E-06	.2933
2.000E-03	1.306E+02	9.749E+00	1.404E+02	2.285E-05	7.413E-06	.3245
2.500E-03	1.461E+02	8.967E+00	1.550E+02	2.623E-05	9.205E-06	.3509
3.000E-03	1.600E+02	8.324E+00	1.683E+02	2.933E-05	1.096E-05	.3738
4.000E-03	1.848E+02	7.322E+00	1.921E+02	3.487E-05	1.438E-05	.4122
5.000E-03	2.066E+02	6.571E+00	2.131E+02	3.981E-05	1.765E-05	.4434
6.000E-03	2.263E+02	5.982E+00	2.323E+02	4.430E-05	2.080E-05	.4696
7.000E-03	2.444E+02	5.505E+00	2.499E+02	4.845E-05	2.384E-05	.4921
8.000E-03	2.613E+02	5.110E+00	2.664E+02	5.232E-05	2.677E-05	.5117
9.000E-03	2.771E+02	4.775E+00	2.819E+02	5.597E-05	2.961E-05	.5291
1.000E-02	2.921E+02	4.488E+00	2.966E+02	5.943E-05	3.236E-05	.5445
1.250E-02	3.206E+02	3.917E+00	3.245E+02	6.746E-05	3.895E-05	.5773
1.500E-02	3.448E+02	3.491E+00	3.483E+02	7.489E-05	4.523E-05	.6040
1.750E-02	3.657E+02	3.157E+00	3.689E+02	8.186E-05	5.127E-05	.6263
2.000E-02	3.838E+02	2.889E+00	3.867E+02	8.848E-05	5.711E-05	.6454
2.250E-02	3.996E+02	2.667E+00	4.022E+02	9.481E-05	6.277E-05	.6620
2.500E-02	4.132E+02	2.480E+00	4.157E+02	1.009E-04	6.829E-05	.6767
2.750E-02	4.250E+02	2.321E+00	4.273E+02	1.069E-04	7.370E-05	.6898
3.000E-02	4.351E+02	2.183E+00	4.373E+02	1.126E-04	7.902E-05	.7015
3.500E-02	4.510E+02	1.955E+00	4.529E+02	1.239E-04	8.943E-05	.7220
4.000E-02	4.620E+02	1.774E+00	4.638E+02	1.348E-04	9.964E-05	.7394
4.500E-02	4.692E+02	1.627E+00	4.709E+02	1.455E-04	1.097E-04	.7544
5.000E-02	4.734E+02	1.504E+00	4.749E+02	1.560E-04	1.198E-04	.7676
5.500E-02	4.752E+02	1.401E+00	4.766E+02	1.665E-04	1.298E-04	.7793
6.000E-02	4.751E+02	1.311E+00	4.764E+02	1.770E-04	1.398E-04	.7898
6.500E-02	4.737E+02	1.234E+00	4.749E+02	1.875E-04	1.499E-04	.7994
7.000E-02	4.712E+02	1.166E+00	4.724E+02	1.981E-04	1.601E-04	.8081
7.500E-02	4.680E+02	1.106E+00	4.691E+02	2.087E-04	1.703E-04	.8161
8.000E-02	4.642E+02	1.052E+00	4.653E+02	2.194E-04	1.807E-04	.8234
8.500E-02	4.601E+02	1.003E+00	4.611E+02	2.302E-04	1.911E-04	.8302
9.000E-02	4.558E+02	9.597E-01	4.567E+02	2.411E-04	2.017E-04	.8366
9.500E-02	4.513E+02	9.200E-01	4.522E+02	2.521E-04	2.124E-04	.8425
1.000E-01	4.468E+02	8.837E-01	4.477E+02	2.632E-04	2.232E-04	.8480
1.250E-01	4.245E+02	7.406E-01	4.253E+02	3.205E-04	2.791E-04	.8708
1.500E-01	4.045E+02	6.400E-01	4.051E+02	3.808E-04	3.381E-04	.8880
1.750E-01	3.867E+02	5.651E-01	3.873E+02	4.439E-04	4.001E-04	.9013
2.000E-01	3.710E+02	5.070E-01	3.715E+02	5.098E-04	4.649E-04	.9119
2.250E-01	3.568E+02	4.604E-01	3.573E+02	5.785E-04	5.325E-04	.9205
2.500E-01	3.440E+02	4.222E-01	3.444E+02	6.498E-04	6.028E-04	.9277
2.750E-01	3.323E+02	3.903E-01	3.327E+02	7.236E-04	6.757E-04	.9337
3.000E-01	3.215E+02	3.632E-01	3.218E+02	8.001E-04	7.511E-04	.9389

3.500E-01	3.017E+02	3.195E-01	3.020E+02	9.605E-04	9.097E-04	.9471
4.000E-01	2.842E+02	2.858E-01	2.844E+02	1.131E-03	1.079E-03	.9535
4.500E-01	2.686E+02	2.589E-01	2.689E+02	1.312E-03	1.258E-03	.9585
5.000E-01	2.548E+02	2.369E-01	2.550E+02	1.503E-03	1.447E-03	.9626
5.500E-01	2.425E+02	2.185E-01	2.427E+02	1.704E-03	1.646E-03	.9659
6.000E-01	2.314E+02	2.030E-01	2.316E+02	1.915E-03	1.855E-03	.9687
6.500E-01	2.215E+02	1.897E-01	2.216E+02	2.136E-03	2.074E-03	.9711
7.000E-01	2.124E+02	1.781E-01	2.126E+02	2.366E-03	2.303E-03	.9731
7.500E-01	2.042E+02	1.679E-01	2.043E+02	2.606E-03	2.541E-03	.9749
8.000E-01	1.966E+02	1.589E-01	1.968E+02	2.856E-03	2.788E-03	.9764
8.500E-01	1.897E+02	1.509E-01	1.899E+02	3.114E-03	3.045E-03	.9778
9.000E-01	1.833E+02	1.436E-01	1.835E+02	3.382E-03	3.311E-03	.9790
9.500E-01	1.774E+02	1.371E-01	1.775E+02	3.659E-03	3.586E-03	.9800
1.000E+00	1.719E+02	1.312E-01	1.720E+02	3.945E-03	3.870E-03	.9810
1.250E+00	1.494E+02	1.082E-01	1.495E+02	5.509E-03	5.424E-03	.9845
1.500E+00	1.327E+02	9.232E-02	1.328E+02	7.287E-03	7.191E-03	.9868
1.750E+00	1.198E+02	8.066E-02	1.199E+02	9.272E-03	9.164E-03	.9884
2.000E+00	1.094E+02	7.173E-02	1.095E+02	1.146E-02	1.134E-02	.9895
2.250E+00	1.009E+02	6.466E-02	1.010E+02	1.384E-02	1.370E-02	.9904
2.500E+00	9.377E+01	5.891E-02	9.383E+01	1.641E-02	1.626E-02	.9911
2.750E+00	8.769E+01	5.414E-02	8.775E+01	1.916E-02	1.900E-02	.9916
3.000E+00	8.245E+01	5.011E-02	8.250E+01	2.210E-02	2.193E-02	.9921
3.500E+00	7.383E+01	4.369E-02	7.388E+01	2.852E-02	2.832E-02	.9928
4.000E+00	6.703E+01	3.877E-02	6.707E+01	3.563E-02	3.540E-02	.9933
4.500E+00	6.151E+01	3.489E-02	6.154E+01	4.343E-02	4.315E-02	.9937
5.000E+00	5.691E+01	3.174E-02	5.695E+01	5.188E-02	5.157E-02	.9940
5.500E+00	5.303E+01	2.913E-02	5.306E+01	6.098E-02	6.063E-02	.9942
6.000E+00	4.970E+01	2.693E-02	4.973E+01	7.072E-02	7.033E-02	.9944
6.500E+00	4.681E+01	2.505E-02	4.684E+01	8.109E-02	8.065E-02	.9946
7.000E+00	4.428E+01	2.342E-02	4.430E+01	9.207E-02	9.158E-02	.9948
7.500E+00	4.203E+01	2.200E-02	4.205E+01	1.037E-01	1.031E-01	.9949
8.000E+00	4.002E+01	2.075E-02	4.004E+01	1.158E-01	1.153E-01	.9950
8.500E+00	3.822E+01	1.963E-02	3.824E+01	1.286E-01	1.280E-01	.9951
9.000E+00	3.658E+01	1.864E-02	3.660E+01	1.420E-01	1.413E-01	.9952
9.500E+00	3.510E+01	1.774E-02	3.512E+01	1.559E-01	1.552E-01	.9953
1.000E+01	3.375E+01	1.693E-02	3.376E+01	1.705E-01	1.697E-01	.9953
1.250E+01	2.841E+01	1.380E-02	2.842E+01	2.515E-01	2.504E-01	.9956
1.500E+01	2.465E+01	1.166E-02	2.466E+01	3.462E-01	3.448E-01	.9958
1.750E+01	2.185E+01	1.012E-02	2.186E+01	4.541E-01	4.523E-01	.9960
2.000E+01	1.968E+01	8.940E-03	1.969E+01	5.748E-01	5.726E-01	.9961
2.500E+01	1.651E+01	7.266E-03	1.652E+01	8.533E-01	8.501E-01	.9963
2.750E+01	1.532E+01	6.649E-03	1.532E+01	1.011E+00	1.007E+00	.9963
3.000E+01	1.430E+01	6.130E-03	1.431E+01	1.180E+00	1.175E+00	.9964
3.500E+01	1.267E+01	5.308E-03	1.268E+01	1.552E+00	1.546E+00	.9965
4.000E+01	1.141E+01	4.684E-03	1.142E+01	1.968E+00	1.961E+00	.9966
4.500E+01	1.041E+01	4.194E-03	1.041E+01	2.427E+00	2.419E+00	.9966
5.000E+01	9.590E+00	3.798E-03	9.594E+00	2.928E+00	2.918E+00	.9967
5.500E+01	8.908E+00	3.473E-03	8.911E+00	3.469E+00	3.458E+00	.9968
6.000E+01	8.330E+00	3.200E-03	8.334E+00	4.050E+00	4.037E+00	.9968
6.500E+01	7.835E+00	2.967E-03	7.838E+00	4.669E+00	4.654E+00	.9968
7.000E+01	7.405E+00	2.767E-03	7.408E+00	5.325E+00	5.309E+00	.9969
7.500E+01	7.029E+00	2.593E-03	7.031E+00	6.018E+00	6.000E+00	.9969
8.000E+01	6.696E+00	2.439E-03	6.698E+00	6.747E+00	6.727E+00	.9970
8.500E+01	6.399E+00	2.304E-03	6.401E+00	7.511E+00	7.488E+00	.9970
9.000E+01	6.133E+00	2.182E-03	6.135E+00	8.309E+00	8.284E+00	.9970
9.500E+01	5.893E+00	2.074E-03	5.895E+00	9.141E+00	9.114E+00	.9970
1.000E+02	5.676E+00	1.976E-03	5.678E+00	1.001E+01	9.976E+00	.9971

1.250E+02	4.835E+00	1.600E-03	4.837E+00	1.480E+01	1.476E+01	.9972
1.500E+02	4.261E+00	1.346E-03	4.262E+00	2.032E+01	2.026E+01	.9973
1.750E+02	3.843E+00	1.163E-03	3.844E+00	2.651E+01	2.644E+01	.9973
2.000E+02	3.525E+00	1.025E-03	3.526E+00	3.331E+01	3.322E+01	.9974
2.250E+02	3.276E+00	9.164E-04	3.277E+00	4.067E+01	4.057E+01	.9975
2.500E+02	3.075E+00	8.293E-04	3.076E+00	4.855E+01	4.843E+01	.9975
2.750E+02	2.910E+00	7.576E-04	2.911E+00	5.691E+01	5.678E+01	.9976
3.000E+02	2.772E+00	6.976E-04	2.773E+00	6.572E+01	6.556E+01	.9976
3.500E+02	2.555E+00	6.027E-04	2.555E+00	8.454E+01	8.434E+01	.9977
4.000E+02	2.392E+00	5.311E-04	2.393E+00	1.048E+02	1.046E+02	.9978
4.500E+02	2.266E+00	4.750E-04	2.267E+00	1.263E+02	1.260E+02	.9979
5.000E+02	2.166E+00	4.299E-04	2.167E+00	1.489E+02	1.485E+02	.9979
5.500E+02	2.086E+00	3.928E-04	2.086E+00	1.724E+02	1.720E+02	.9980
6.000E+02	2.019E+00	3.617E-04	2.020E+00	1.968E+02	1.964E+02	.9980
6.500E+02	1.964E+00	3.353E-04	1.965E+00	2.219E+02	2.214E+02	.9981
7.000E+02	1.918E+00	3.126E-04	1.918E+00	2.476E+02	2.472E+02	.9981
7.500E+02	1.878E+00	2.929E-04	1.879E+00	2.740E+02	2.735E+02	.9982
8.000E+02	1.845E+00	2.755E-04	1.845E+00	3.008E+02	3.003E+02	.9982
8.500E+02	1.816E+00	2.602E-04	1.816E+00	3.282E+02	3.276E+02	.9982
9.000E+02	1.790E+00	2.465E-04	1.791E+00	3.559E+02	3.553E+02	.9983
9.500E+02	1.768E+00	2.342E-04	1.769E+00	3.840E+02	3.833E+02	.9983
1.000E+03	1.749E+00	2.232E-04	1.750E+00	4.124E+02	4.117E+02	.9983
1.500E+03	1.647E+00	1.523E-04	1.647E+00	7.087E+02	7.077E+02	.9986
2.000E+03	1.617E+00	1.162E-04	1.618E+00	1.016E+03	1.014E+03	.9987
2.500E+03	1.613E+00	9.419E-05	1.613E+00	1.325E+03	1.324E+03	.9989
3.000E+03	1.619E+00	7.938E-05	1.619E+00	1.635E+03	1.633E+03	.9990
4.000E+03	1.642E+00	6.062E-05	1.642E+00	2.248E+03	2.246E+03	.9991
5.000E+03	1.668E+00	4.920E-05	1.668E+00	2.853E+03	2.850E+03	.9992
6.000E+03	1.692E+00	4.148E-05	1.692E+00	3.448E+03	3.445E+03	.9993
7.000E+03	1.714E+00	3.592E-05	1.714E+00	4.035E+03	4.032E+03	.9993
8.000E+03	1.734E+00	3.170E-05	1.734E+00	4.615E+03	4.612E+03	.9994
9.000E+03	1.752E+00	2.840E-05	1.752E+00	5.189E+03	5.186E+03	.9994
1.000E+04	1.768E+00	2.574E-05	1.768E+00	5.757E+03	5.754E+03	.9995

PROTON STOPPING POWER AND RANGE

SILICON

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	1.050E+02	1.188E+01	1.169E+02	1.340E-05	3.558E-06	.2655
1.500E-03	1.286E+02	1.072E+01	1.393E+02	1.728E-05	5.242E-06	.3034
2.000E-03	1.485E+02	9.792E+00	1.583E+02	2.064E-05	6.906E-06	.3346
2.500E-03	1.660E+02	9.040E+00	1.750E+02	2.364E-05	8.532E-06	.3609
3.000E-03	1.818E+02	8.416E+00	1.903E+02	2.638E-05	1.012E-05	.3837
4.000E-03	2.100E+02	7.436E+00	2.174E+02	3.128E-05	1.319E-05	.4217
5.000E-03	2.348E+02	6.695E+00	2.414E+02	3.564E-05	1.613E-05	.4526
6.000E-03	2.572E+02	6.111E+00	2.633E+02	3.961E-05	1.895E-05	.4785
7.000E-03	2.778E+02	5.636E+00	2.834E+02	4.326E-05	2.166E-05	.5007
8.000E-03	2.969E+02	5.240E+00	3.022E+02	4.668E-05	2.427E-05	.5200
9.000E-03	3.150E+02	4.905E+00	3.199E+02	4.989E-05	2.680E-05	.5371
1.000E-02	3.320E+02	4.615E+00	3.366E+02	5.294E-05	2.924E-05	.5523
1.250E-02	3.646E+02	4.039E+00	3.686E+02	6.002E-05	3.508E-05	.5845
1.500E-02	3.925E+02	3.607E+00	3.961E+02	6.656E-05	4.065E-05	.6108
1.750E-02	4.167E+02	3.267E+00	4.199E+02	7.268E-05	4.598E-05	.6327
2.000E-02	4.378E+02	2.993E+00	4.408E+02	7.849E-05	5.113E-05	.6514
2.250E-02	4.563E+02	2.767E+00	4.591E+02	8.404E-05	5.611E-05	.6677
2.500E-02	4.725E+02	2.576E+00	4.751E+02	8.939E-05	6.097E-05	.6820
2.750E-02	4.866E+02	2.412E+00	4.890E+02	9.458E-05	6.572E-05	.6948
3.000E-02	4.989E+02	2.270E+00	5.011E+02	9.963E-05	7.037E-05	.7063
3.500E-02	5.184E+02	2.036E+00	5.204E+02	1.094E-04	7.947E-05	.7263
4.000E-02	5.323E+02	1.849E+00	5.342E+02	1.189E-04	8.836E-05	.7433
4.500E-02	5.416E+02	1.697E+00	5.433E+02	1.282E-04	9.714E-05	.7579
5.000E-02	5.470E+02	1.571E+00	5.485E+02	1.373E-04	1.058E-04	.7708
5.500E-02	5.492E+02	1.463E+00	5.507E+02	1.464E-04	1.145E-04	.7823
6.000E-02	5.490E+02	1.371E+00	5.504E+02	1.555E-04	1.232E-04	.7926
6.500E-02	5.468E+02	1.290E+00	5.480E+02	1.646E-04	1.320E-04	.8019
7.000E-02	5.430E+02	1.220E+00	5.442E+02	1.737E-04	1.408E-04	.8105
7.500E-02	5.380E+02	1.157E+00	5.392E+02	1.830E-04	1.497E-04	.8184
8.000E-02	5.322E+02	1.101E+00	5.333E+02	1.923E-04	1.588E-04	.8256
8.500E-02	5.257E+02	1.051E+00	5.267E+02	2.017E-04	1.679E-04	.8324
9.000E-02	5.188E+02	1.005E+00	5.198E+02	2.113E-04	1.772E-04	.8387
9.500E-02	5.117E+02	9.640E-01	5.126E+02	2.210E-04	1.866E-04	.8446
1.000E-01	5.044E+02	9.262E-01	5.053E+02	2.308E-04	1.962E-04	.8501
1.250E-01	4.687E+02	7.770E-01	4.695E+02	2.821E-04	2.463E-04	.8731
1.500E-01	4.373E+02	6.720E-01	4.379E+02	3.373E-04	3.004E-04	.8906
1.750E-01	4.107E+02	5.937E-01	4.113E+02	3.963E-04	3.583E-04	.9042
2.000E-01	3.884E+02	5.329E-01	3.889E+02	4.588E-04	4.198E-04	.9150
2.250E-01	3.694E+02	4.842E-01	3.699E+02	5.247E-04	4.848E-04	.9238
2.500E-01	3.530E+02	4.442E-01	3.535E+02	5.939E-04	5.529E-04	.9310
2.750E-01	3.387E+02	4.107E-01	3.391E+02	6.661E-04	6.242E-04	.9370
3.000E-01	3.259E+02	3.823E-01	3.263E+02	7.413E-04	6.984E-04	.9421

3.500E-01	3.041E+02	3.364E-01	3.045E+02	9.001E-04	8.553E-04	.9502
4.000E-01	2.859E+02	3.010E-01	2.862E+02	1.070E-03	1.023E-03	.9564
4.500E-01	2.703E+02	2.728E-01	2.706E+02	1.249E-03	1.201E-03	.9611
5.000E-01	2.567E+02	2.497E-01	2.569E+02	1.439E-03	1.389E-03	.9649
5.500E-01	2.452E+02	2.304E-01	2.454E+02	1.638E-03	1.586E-03	.9680
6.000E-01	2.351E+02	2.141E-01	2.353E+02	1.846E-03	1.792E-03	.9706
6.500E-01	2.259E+02	2.001E-01	2.261E+02	2.063E-03	2.007E-03	.9728
7.000E-01	2.172E+02	1.879E-01	2.174E+02	2.289E-03	2.231E-03	.9746
7.500E-01	2.090E+02	1.772E-01	2.091E+02	2.523E-03	2.463E-03	.9762
8.000E-01	2.011E+02	1.677E-01	2.012E+02	2.767E-03	2.705E-03	.9776
8.500E-01	1.936E+02	1.592E-01	1.938E+02	3.020E-03	2.956E-03	.9788
9.000E-01	1.870E+02	1.516E-01	1.872E+02	3.283E-03	3.217E-03	.9799
9.500E-01	1.809E+02	1.448E-01	1.811E+02	3.555E-03	3.487E-03	.9809
1.000E+00	1.753E+02	1.385E-01	1.754E+02	3.835E-03	3.765E-03	.9817
1.250E+00	1.523E+02	1.143E-01	1.524E+02	5.369E-03	5.288E-03	.9849
1.500E+00	1.354E+02	9.761E-02	1.355E+02	7.112E-03	7.020E-03	.9870
1.750E+00	1.222E+02	8.532E-02	1.223E+02	9.057E-03	8.953E-03	.9885
2.000E+00	1.117E+02	7.590E-02	1.118E+02	1.120E-02	1.108E-02	.9895
2.250E+00	1.030E+02	6.843E-02	1.031E+02	1.353E-02	1.340E-02	.9903
2.500E+00	9.580E+01	6.236E-02	9.586E+01	1.605E-02	1.590E-02	.9910
2.750E+00	8.962E+01	5.733E-02	8.968E+01	1.874E-02	1.858E-02	.9915
3.000E+00	8.428E+01	5.307E-02	8.433E+01	2.162E-02	2.144E-02	.9919
3.500E+00	7.550E+01	4.628E-02	7.554E+01	2.790E-02	2.769E-02	.9925
4.000E+00	6.856E+01	4.109E-02	6.860E+01	3.485E-02	3.461E-02	.9930
4.500E+00	6.292E+01	3.699E-02	6.296E+01	4.247E-02	4.219E-02	.9934
5.000E+00	5.824E+01	3.366E-02	5.828E+01	5.073E-02	5.041E-02	.9937
5.500E+00	5.428E+01	3.089E-02	5.431E+01	5.962E-02	5.926E-02	.9939
6.000E+00	5.088E+01	2.857E-02	5.091E+01	6.914E-02	6.873E-02	.9941
6.500E+00	4.792E+01	2.658E-02	4.795E+01	7.926E-02	7.881E-02	.9943
7.000E+00	4.533E+01	2.486E-02	4.536E+01	8.999E-02	8.949E-02	.9944
7.500E+00	4.304E+01	2.335E-02	4.306E+01	1.013E-01	1.008E-01	.9946
8.000E+00	4.099E+01	2.203E-02	4.101E+01	1.132E-01	1.126E-01	.9947
8.500E+00	3.914E+01	2.085E-02	3.916E+01	1.257E-01	1.250E-01	.9948
9.000E+00	3.748E+01	1.979E-02	3.750E+01	1.387E-01	1.380E-01	.9949
9.500E+00	3.596E+01	1.884E-02	3.598E+01	1.524E-01	1.516E-01	.9950
1.000E+01	3.458E+01	1.798E-02	3.459E+01	1.665E-01	1.657E-01	.9950
1.250E+01	2.912E+01	1.466E-02	2.913E+01	2.456E-01	2.445E-01	.9953
1.500E+01	2.528E+01	1.240E-02	2.529E+01	3.380E-01	3.365E-01	.9955
1.750E+01	2.242E+01	1.076E-02	2.243E+01	4.432E-01	4.413E-01	.9957
2.000E+01	2.019E+01	9.513E-03	2.020E+01	5.608E-01	5.585E-01	.9958
2.500E+01	1.695E+01	7.736E-03	1.695E+01	8.322E-01	8.289E-01	.9960
2.750E+01	1.572E+01	7.080E-03	1.573E+01	9.854E-01	9.815E-01	.9960
3.000E+01	1.469E+01	6.529E-03	1.469E+01	1.150E+00	1.145E+00	.9961
3.500E+01	1.301E+01	5.654E-03	1.302E+01	1.512E+00	1.507E+00	.9962
4.000E+01	1.172E+01	4.991E-03	1.173E+01	1.918E+00	1.911E+00	.9963
4.500E+01	1.069E+01	4.469E-03	1.070E+01	2.365E+00	2.356E+00	.9964
5.000E+01	9.852E+00	4.049E-03	9.856E+00	2.852E+00	2.842E+00	.9964
5.500E+01	9.153E+00	3.702E-03	9.157E+00	3.379E+00	3.367E+00	.9965
6.000E+01	8.561E+00	3.411E-03	8.564E+00	3.944E+00	3.930E+00	.9966
6.500E+01	8.052E+00	3.164E-03	8.056E+00	4.546E+00	4.531E+00	.9966
7.000E+01	7.611E+00	2.951E-03	7.614E+00	5.185E+00	5.167E+00	.9966
7.500E+01	7.225E+00	2.765E-03	7.227E+00	5.859E+00	5.840E+00	.9967
8.000E+01	6.883E+00	2.602E-03	6.885E+00	6.568E+00	6.547E+00	.9967
8.500E+01	6.578E+00	2.457E-03	6.581E+00	7.311E+00	7.288E+00	.9967
9.000E+01	6.305E+00	2.328E-03	6.308E+00	8.088E+00	8.062E+00	.9968
9.500E+01	6.059E+00	2.212E-03	6.061E+00	8.897E+00	8.868E+00	.9968
1.000E+02	5.836E+00	2.108E-03	5.838E+00	9.737E+00	9.706E+00	.9968

1.250E+02	4.972E+00	1.707E-03	4.974E+00	1.440E+01	1.435E+01	.9970
1.500E+02	4.382E+00	1.436E-03	4.383E+00	1.977E+01	1.971E+01	.9970
1.750E+02	3.953E+00	1.241E-03	3.954E+00	2.578E+01	2.571E+01	.9971
2.000E+02	3.627E+00	1.094E-03	3.628E+00	3.240E+01	3.231E+01	.9972
2.250E+02	3.370E+00	9.782E-04	3.371E+00	3.955E+01	3.945E+01	.9973
2.500E+02	3.164E+00	8.852E-04	3.165E+00	4.721E+01	4.709E+01	.9973
2.750E+02	2.994E+00	8.088E-04	2.995E+00	5.534E+01	5.520E+01	.9974
3.000E+02	2.852E+00	7.447E-04	2.853E+00	6.390E+01	6.373E+01	.9974
3.500E+02	2.629E+00	6.435E-04	2.630E+00	8.219E+01	8.198E+01	.9975
4.000E+02	2.462E+00	5.670E-04	2.462E+00	1.019E+02	1.016E+02	.9976
4.500E+02	2.332E+00	5.072E-04	2.333E+00	1.227E+02	1.225E+02	.9977
5.000E+02	2.230E+00	4.590E-04	2.230E+00	1.447E+02	1.444E+02	.9977
5.500E+02	2.147E+00	4.194E-04	2.147E+00	1.675E+02	1.672E+02	.9978
6.000E+02	2.079E+00	3.862E-04	2.079E+00	1.912E+02	1.908E+02	.9979
6.500E+02	2.022E+00	3.581E-04	2.022E+00	2.156E+02	2.152E+02	.9979
7.000E+02	1.974E+00	3.338E-04	1.975E+00	2.406E+02	2.401E+02	.9980
7.500E+02	1.934E+00	3.127E-04	1.934E+00	2.662E+02	2.657E+02	.9980
8.000E+02	1.899E+00	2.942E-04	1.899E+00	2.923E+02	2.917E+02	.9980
8.500E+02	1.869E+00	2.778E-04	1.870E+00	3.189E+02	3.182E+02	.9981
9.000E+02	1.843E+00	2.632E-04	1.844E+00	3.458E+02	3.451E+02	.9981
9.500E+02	1.821E+00	2.501E-04	1.821E+00	3.731E+02	3.724E+02	.9982
1.000E+03	1.801E+00	2.383E-04	1.801E+00	4.007E+02	4.000E+02	.9982
1.500E+03	1.696E+00	1.626E-04	1.696E+00	6.884E+02	6.873E+02	.9985
2.000E+03	1.665E+00	1.241E-04	1.666E+00	9.865E+02	9.851E+02	.9986
2.500E+03	1.661E+00	1.006E-04	1.661E+00	1.287E+03	1.286E+03	.9988
3.000E+03	1.668E+00	8.479E-05	1.668E+00	1.588E+03	1.586E+03	.9989
4.000E+03	1.692E+00	6.476E-05	1.692E+00	2.183E+03	2.181E+03	.9990
5.000E+03	1.720E+00	5.255E-05	1.720E+00	2.770E+03	2.767E+03	.9991
6.000E+03	1.746E+00	4.432E-05	1.746E+00	3.347E+03	3.344E+03	.9992
7.000E+03	1.770E+00	3.837E-05	1.770E+00	3.915E+03	3.913E+03	.9993
8.000E+03	1.792E+00	3.387E-05	1.792E+00	4.477E+03	4.474E+03	.9993
9.000E+03	1.812E+00	3.034E-05	1.812E+00	5.032E+03	5.029E+03	.9994
1.000E+04	1.830E+00	2.749E-05	1.830E+00	5.581E+03	5.578E+03	.9994

PROTON STOPPING POWER AND RANGE

IRON

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	3.781E+01	5.233E+00	4.304E+01	3.706E-05	5.311E-06	.1433
1.500E-03	4.631E+01	4.980E+00	5.129E+01	4.758E-05	7.882E-06	.1656
2.000E-03	5.347E+01	4.734E+00	5.820E+01	5.672E-05	1.049E-05	.1850
2.500E-03	5.978E+01	4.508E+00	6.429E+01	6.489E-05	1.312E-05	.2021
3.000E-03	6.549E+01	4.304E+00	6.979E+01	7.234E-05	1.575E-05	.2177
4.000E-03	7.562E+01	3.954E+00	7.957E+01	8.573E-05	2.102E-05	.2451
5.000E-03	8.454E+01	3.666E+00	8.821E+01	9.765E-05	2.627E-05	.2690
6.000E-03	9.261E+01	3.425E+00	9.604E+01	1.085E-04	3.147E-05	.2901
7.000E-03	1.000E+02	3.220E+00	1.033E+02	1.185E-04	3.663E-05	.3090
8.000E-03	1.069E+02	3.043E+00	1.100E+02	1.279E-04	4.172E-05	.3262
9.000E-03	1.134E+02	2.888E+00	1.163E+02	1.368E-04	4.675E-05	.3418
1.000E-02	1.196E+02	2.750E+00	1.223E+02	1.451E-04	5.171E-05	.3563
1.250E-02	1.320E+02	2.467E+00	1.345E+02	1.646E-04	6.389E-05	.3882
1.500E-02	1.430E+02	2.246E+00	1.453E+02	1.825E-04	7.579E-05	.4154
1.750E-02	1.530E+02	2.066E+00	1.550E+02	1.991E-04	8.741E-05	.4390
2.000E-02	1.620E+02	1.917E+00	1.640E+02	2.148E-04	9.876E-05	.4598
2.250E-02	1.704E+02	1.791E+00	1.722E+02	2.297E-04	1.099E-04	.4784
2.500E-02	1.782E+02	1.683E+00	1.799E+02	2.439E-04	1.207E-04	.4950
2.750E-02	1.854E+02	1.589E+00	1.870E+02	2.575E-04	1.314E-04	.5102
3.000E-02	1.922E+02	1.507E+00	1.937E+02	2.706E-04	1.418E-04	.5240
3.500E-02	2.046E+02	1.368E+00	2.060E+02	2.956E-04	1.621E-04	.5484
4.000E-02	2.156E+02	1.255E+00	2.169E+02	3.193E-04	1.818E-04	.5694
4.500E-02	2.254E+02	1.162E+00	2.266E+02	3.418E-04	2.009E-04	.5878
5.000E-02	2.342E+02	1.083E+00	2.353E+02	3.635E-04	2.196E-04	.6041
5.500E-02	2.421E+02	1.015E+00	2.431E+02	3.844E-04	2.378E-04	.6188
6.000E-02	2.492E+02	9.561E-01	2.502E+02	4.046E-04	2.557E-04	.6319
6.500E-02	2.555E+02	9.044E-01	2.565E+02	4.244E-04	2.733E-04	.6440
7.000E-02	2.612E+02	8.586E-01	2.621E+02	4.436E-04	2.906E-04	.6550
7.500E-02	2.662E+02	8.177E-01	2.671E+02	4.625E-04	3.077E-04	.6651
8.000E-02	2.707E+02	7.810E-01	2.715E+02	4.811E-04	3.245E-04	.6746
8.500E-02	2.746E+02	7.478E-01	2.754E+02	4.994E-04	3.412E-04	.6833
9.000E-02	2.781E+02	7.175E-01	2.788E+02	5.174E-04	3.578E-04	.6915
9.500E-02	2.810E+02	6.899E-01	2.817E+02	5.353E-04	3.743E-04	.6992
1.000E-01	2.836E+02	6.645E-01	2.842E+02	5.529E-04	3.906E-04	.7065
1.250E-01	2.909E+02	5.634E-01	2.915E+02	6.396E-04	4.716E-04	.7374
1.500E-01	2.915E+02	4.911E-01	2.920E+02	7.251E-04	5.525E-04	.7620
1.750E-01	2.876E+02	4.365E-01	2.880E+02	8.113E-04	6.346E-04	.7822
2.000E-01	2.810E+02	3.938E-01	2.813E+02	8.990E-04	7.187E-04	.7994
2.250E-01	2.728E+02	3.593E-01	2.732E+02	9.892E-04	8.055E-04	.8143
2.500E-01	2.639E+02	3.308E-01	2.643E+02	1.082E-03	8.953E-04	.8273
2.750E-01	2.549E+02	3.068E-01	2.552E+02	1.178E-03	9.885E-04	.8388
3.000E-01	2.460E+02	2.864E-01	2.463E+02	1.278E-03	1.085E-03	.8491

3.500E-01	2.295E+02	2.532E-01	2.297E+02	1.488E-03	1.290E-03	.8665
4.000E-01	2.148E+02	2.274E-01	2.150E+02	1.714E-03	1.509E-03	.8808
4.500E-01	2.021E+02	2.067E-01	2.023E+02	1.953E-03	1.744E-03	.8926
5.000E-01	1.911E+02	1.897E-01	1.913E+02	2.208E-03	1.992E-03	.9025
5.500E-01	1.816E+02	1.755E-01	1.818E+02	2.476E-03	2.255E-03	.9108
6.000E-01	1.734E+02	1.634E-01	1.736E+02	2.758E-03	2.531E-03	.9179
6.500E-01	1.662E+02	1.530E-01	1.663E+02	3.052E-03	2.820E-03	.9240
7.000E-01	1.597E+02	1.439E-01	1.598E+02	3.359E-03	3.121E-03	.9293
7.500E-01	1.538E+02	1.359E-01	1.540E+02	3.678E-03	3.435E-03	.9339
8.000E-01	1.485E+02	1.288E-01	1.486E+02	4.008E-03	3.760E-03	.9380
8.500E-01	1.436E+02	1.225E-01	1.438E+02	4.350E-03	4.096E-03	.9415
9.000E-01	1.391E+02	1.168E-01	1.393E+02	4.704E-03	4.444E-03	.9447
9.500E-01	1.350E+02	1.116E-01	1.351E+02	5.068E-03	4.803E-03	.9476
1.000E+00	1.311E+02	1.069E-01	1.313E+02	5.444E-03	5.172E-03	.9501
1.250E+00	1.153E+02	8.862E-02	1.154E+02	7.481E-03	7.179E-03	.9597
1.500E+00	1.035E+02	7.595E-02	1.036E+02	9.771E-03	9.438E-03	.9659
1.750E+00	9.402E+01	6.661E-02	9.408E+01	1.231E-02	1.194E-02	.9703
2.000E+00	8.652E+01	5.944E-02	8.658E+01	1.508E-02	1.468E-02	.9735
2.250E+00	8.026E+01	5.373E-02	8.031E+01	1.808E-02	1.765E-02	.9759
2.500E+00	7.496E+01	4.908E-02	7.501E+01	2.130E-02	2.083E-02	.9778
2.750E+00	7.044E+01	4.520E-02	7.049E+01	2.474E-02	2.423E-02	.9793
3.000E+00	6.649E+01	4.192E-02	6.653E+01	2.840E-02	2.785E-02	.9806
3.500E+00	5.999E+01	3.666E-02	6.002E+01	3.632E-02	3.569E-02	.9825
4.000E+00	5.479E+01	3.263E-02	5.482E+01	4.505E-02	4.433E-02	.9839
4.500E+00	5.053E+01	2.944E-02	5.056E+01	5.456E-02	5.374E-02	.9850
5.000E+00	4.696E+01	2.684E-02	4.699E+01	6.482E-02	6.391E-02	.9858
5.500E+00	4.393E+01	2.468E-02	4.395E+01	7.583E-02	7.481E-02	.9865
6.000E+00	4.131E+01	2.286E-02	4.133E+01	8.757E-02	8.644E-02	.9871
6.500E+00	3.902E+01	2.130E-02	3.904E+01	1.000E-01	9.878E-02	.9876
7.000E+00	3.700E+01	1.995E-02	3.702E+01	1.132E-01	1.118E-01	.9880
7.500E+00	3.521E+01	1.877E-02	3.523E+01	1.270E-01	1.255E-01	.9883
8.000E+00	3.360E+01	1.773E-02	3.362E+01	1.416E-01	1.400E-01	.9886
8.500E+00	3.215E+01	1.680E-02	3.217E+01	1.568E-01	1.550E-01	.9889
9.000E+00	3.084E+01	1.597E-02	3.085E+01	1.726E-01	1.708E-01	.9892
9.500E+00	2.964E+01	1.522E-02	2.965E+01	1.892E-01	1.872E-01	.9894
1.000E+01	2.854E+01	1.454E-02	2.856E+01	2.064E-01	2.042E-01	.9896
1.250E+01	2.419E+01	1.191E-02	2.420E+01	3.019E-01	2.989E-01	.9903
1.500E+01	2.109E+01	1.011E-02	2.110E+01	4.128E-01	4.090E-01	.9908
1.750E+01	1.878E+01	8.800E-03	1.878E+01	5.386E-01	5.339E-01	.9912
2.000E+01	1.697E+01	7.800E-03	1.697E+01	6.788E-01	6.731E-01	.9915
2.500E+01	1.431E+01	6.370E-03	1.432E+01	1.001E+00	9.929E-01	.9919
2.750E+01	1.330E+01	5.841E-03	1.331E+01	1.182E+00	1.173E+00	.9921
3.000E+01	1.245E+01	5.396E-03	1.245E+01	1.377E+00	1.366E+00	.9922
3.500E+01	1.106E+01	4.686E-03	1.107E+01	1.803E+00	1.790E+00	.9925
4.000E+01	9.990E+00	4.146E-03	9.994E+00	2.279E+00	2.263E+00	.9927
4.500E+01	9.133E+00	3.721E-03	9.136E+00	2.803E+00	2.783E+00	.9928
5.000E+01	8.430E+00	3.376E-03	8.433E+00	3.374E+00	3.350E+00	.9930
5.500E+01	7.843E+00	3.092E-03	7.847E+00	3.989E+00	3.961E+00	.9931
6.000E+01	7.346E+00	2.853E-03	7.348E+00	4.648E+00	4.616E+00	.9932
6.500E+01	6.918E+00	2.649E-03	6.920E+00	5.349E+00	5.313E+00	.9933
7.000E+01	6.545E+00	2.473E-03	6.548E+00	6.092E+00	6.052E+00	.9934
7.500E+01	6.219E+00	2.320E-03	6.221E+00	6.876E+00	6.831E+00	.9935
8.000E+01	5.929E+00	2.185E-03	5.932E+00	7.699E+00	7.650E+00	.9935
8.500E+01	5.671E+00	2.065E-03	5.673E+00	8.562E+00	8.507E+00	.9936
9.000E+01	5.440E+00	1.958E-03	5.442E+00	9.462E+00	9.402E+00	.9937
9.500E+01	5.231E+00	1.862E-03	5.232E+00	1.040E+01	1.033E+01	.9937
1.000E+02	5.041E+00	1.775E-03	5.043E+00	1.137E+01	1.130E+01	.9938

1.250E+02	4.305E+00	1.441E-03	4.306E+00	1.676E+01	1.666E+01	.9940
1.500E+02	3.800E+00	1.215E-03	3.801E+00	2.296E+01	2.283E+01	.9942
1.750E+02	3.432E+00	1.051E-03	3.433E+00	2.989E+01	2.972E+01	.9944
2.000E+02	3.152E+00	9.271E-04	3.153E+00	3.750E+01	3.730E+01	.9946
2.250E+02	2.931E+00	8.299E-04	2.932E+00	4.573E+01	4.549E+01	.9947
2.500E+02	2.753E+00	7.516E-04	2.754E+00	5.454E+01	5.426E+01	.9948
2.750E+02	2.607E+00	6.871E-04	2.607E+00	6.388E+01	6.355E+01	.9949
3.000E+02	2.484E+00	6.330E-04	2.485E+00	7.371E+01	7.334E+01	.9950
3.500E+02	2.291E+00	5.474E-04	2.291E+00	9.470E+01	9.424E+01	.9952
4.000E+02	2.146E+00	4.827E-04	2.147E+00	1.173E+02	1.167E+02	.9953
4.500E+02	2.034E+00	4.319E-04	2.034E+00	1.412E+02	1.406E+02	.9955
5.000E+02	1.945E+00	3.911E-04	1.945E+00	1.664E+02	1.656E+02	.9956
5.500E+02	1.873E+00	3.574E-04	1.874E+00	1.926E+02	1.918E+02	.9957
6.000E+02	1.814E+00	3.293E-04	1.814E+00	2.197E+02	2.188E+02	.9958
6.500E+02	1.765E+00	3.053E-04	1.765E+00	2.477E+02	2.467E+02	.9959
7.000E+02	1.724E+00	2.847E-04	1.724E+00	2.763E+02	2.752E+02	.9960
7.500E+02	1.688E+00	2.668E-04	1.689E+00	3.056E+02	3.045E+02	.9961
8.000E+02	1.658E+00	2.511E-04	1.659E+00	3.355E+02	3.342E+02	.9962
8.500E+02	1.632E+00	2.371E-04	1.633E+00	3.659E+02	3.645E+02	.9963
9.000E+02	1.610E+00	2.247E-04	1.610E+00	3.968E+02	3.953E+02	.9963
9.500E+02	1.590E+00	2.135E-04	1.591E+00	4.280E+02	4.265E+02	.9964
1.000E+03	1.573E+00	2.035E-04	1.574E+00	4.596E+02	4.580E+02	.9965
1.500E+03	1.482E+00	1.390E-04	1.482E+00	7.889E+02	7.865E+02	.9970
2.000E+03	1.456E+00	1.061E-04	1.456E+00	1.130E+03	1.127E+03	.9974
2.500E+03	1.452E+00	8.605E-05	1.452E+00	1.474E+03	1.471E+03	.9976
3.000E+03	1.457E+00	7.254E-05	1.457E+00	1.818E+03	1.814E+03	.9978
4.000E+03	1.478E+00	5.543E-05	1.478E+00	2.500E+03	2.495E+03	.9981
5.000E+03	1.501E+00	4.500E-05	1.501E+00	3.171E+03	3.166E+03	.9983
6.000E+03	1.524E+00	3.795E-05	1.524E+00	3.832E+03	3.826E+03	.9985
7.000E+03	1.546E+00	3.287E-05	1.546E+00	4.483E+03	4.477E+03	.9986
8.000E+03	1.566E+00	2.901E-05	1.566E+00	5.126E+03	5.120E+03	.9987
9.000E+03	1.584E+00	2.600E-05	1.584E+00	5.761E+03	5.754E+03	.9988
1.000E+04	1.601E+00	2.356E-05	1.601E+00	6.389E+03	6.382E+03	.9989

PROTON STOPPING POWER AND RANGE

COPPER

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	3.490E+01	4.408E+00	3.931E+01	4.116E-05	5.620E-06	.1365
1.500E-03	4.274E+01	4.231E+00	4.697E+01	5.267E-05	8.301E-06	.1576
2.000E-03	4.935E+01	4.049E+00	5.340E+01	6.263E-05	1.101E-05	.1759
2.500E-03	5.518E+01	3.876E+00	5.906E+01	7.152E-05	1.374E-05	.1921
3.000E-03	6.045E+01	3.718E+00	6.416E+01	7.964E-05	1.647E-05	.2068
4.000E-03	6.980E+01	3.440E+00	7.324E+01	9.419E-05	2.194E-05	.2329
5.000E-03	7.804E+01	3.207E+00	8.124E+01	1.071E-04	2.739E-05	.2556
6.000E-03	8.548E+01	3.010E+00	8.849E+01	1.189E-04	3.280E-05	.2758
7.000E-03	9.233E+01	2.840E+00	9.517E+01	1.298E-04	3.817E-05	.2940
8.000E-03	9.871E+01	2.692E+00	1.014E+02	1.400E-04	4.347E-05	.3106
9.000E-03	1.047E+02	2.561E+00	1.073E+02	1.496E-04	4.872E-05	.3258
1.000E-02	1.104E+02	2.445E+00	1.128E+02	1.587E-04	5.391E-05	.3398
1.250E-02	1.214E+02	2.204E+00	1.236E+02	1.798E-04	6.668E-05	.3709
1.500E-02	1.309E+02	2.014E+00	1.329E+02	1.993E-04	7.925E-05	.3977
1.750E-02	1.392E+02	1.859E+00	1.411E+02	2.175E-04	9.160E-05	.4211
2.000E-02	1.466E+02	1.729E+00	1.484E+02	2.348E-04	1.037E-04	.4419
2.250E-02	1.532E+02	1.620E+00	1.548E+02	2.513E-04	1.157E-04	.4605
2.500E-02	1.590E+02	1.525E+00	1.606E+02	2.671E-04	1.275E-04	.4774
2.750E-02	1.643E+02	1.442E+00	1.657E+02	2.824E-04	1.392E-04	.4928
3.000E-02	1.689E+02	1.369E+00	1.703E+02	2.973E-04	1.507E-04	.5069
3.500E-02	1.769E+02	1.246E+00	1.781E+02	3.260E-04	1.735E-04	.5321
4.000E-02	1.832E+02	1.146E+00	1.844E+02	3.536E-04	1.959E-04	.5541
4.500E-02	1.884E+02	1.062E+00	1.894E+02	3.803E-04	2.181E-04	.5734
5.000E-02	1.925E+02	9.917E-01	1.935E+02	4.064E-04	2.401E-04	.5908
5.500E-02	1.959E+02	9.309E-01	1.968E+02	4.320E-04	2.620E-04	.6064
6.000E-02	1.987E+02	8.779E-01	1.996E+02	4.573E-04	2.838E-04	.6206
6.500E-02	2.010E+02	8.314E-01	2.018E+02	4.822E-04	3.055E-04	.6336
7.000E-02	2.028E+02	7.900E-01	2.036E+02	5.068E-04	3.272E-04	.6456
7.500E-02	2.044E+02	7.531E-01	2.051E+02	5.313E-04	3.489E-04	.6567
8.000E-02	2.056E+02	7.198E-01	2.063E+02	5.556E-04	3.705E-04	.6669
8.500E-02	2.067E+02	6.896E-01	2.073E+02	5.798E-04	3.922E-04	.6765
9.000E-02	2.075E+02	6.622E-01	2.082E+02	6.038E-04	4.139E-04	.6855
9.500E-02	2.082E+02	6.371E-01	2.088E+02	6.278E-04	4.356E-04	.6939
1.000E-01	2.087E+02	6.140E-01	2.093E+02	6.517E-04	4.574E-04	.7018
1.250E-01	2.099E+02	5.217E-01	2.104E+02	7.707E-04	5.667E-04	.7353
1.500E-01	2.092E+02	4.556E-01	2.097E+02	8.897E-04	6.774E-04	.7613
1.750E-01	2.075E+02	4.055E-01	2.079E+02	1.009E-03	7.897E-04	.7824
2.000E-01	2.051E+02	3.662E-01	2.055E+02	1.130E-03	9.040E-04	.7998
2.250E-01	2.023E+02	3.344E-01	2.026E+02	1.253E-03	1.020E-03	.8144
2.500E-01	1.991E+02	3.081E-01	1.994E+02	1.377E-03	1.139E-03	.8270
2.750E-01	1.958E+02	2.860E-01	1.961E+02	1.504E-03	1.260E-03	.8380
3.000E-01	1.923E+02	2.671E-01	1.926E+02	1.632E-03	1.383E-03	.8476

3.500E-01	1.854E+02	2.364E-01	1.856E+02	1.897E-03	1.638E-03	.8637
4.000E-01	1.786E+02	2.125E-01	1.788E+02	2.171E-03	1.903E-03	.8767
4.500E-01	1.720E+02	1.933E-01	1.722E+02	2.456E-03	2.180E-03	.8874
5.000E-01	1.658E+02	1.775E-01	1.660E+02	2.752E-03	2.467E-03	.8964
5.500E-01	1.596E+02	1.643E-01	1.598E+02	3.059E-03	2.766E-03	.9041
6.000E-01	1.536E+02	1.530E-01	1.538E+02	3.378E-03	3.076E-03	.9108
6.500E-01	1.480E+02	1.433E-01	1.481E+02	3.709E-03	3.400E-03	.9166
7.000E-01	1.427E+02	1.348E-01	1.428E+02	4.053E-03	3.736E-03	.9217
7.500E-01	1.378E+02	1.274E-01	1.379E+02	4.409E-03	4.084E-03	.9262
8.000E-01	1.333E+02	1.208E-01	1.334E+02	4.778E-03	4.445E-03	.9303
8.500E-01	1.291E+02	1.149E-01	1.292E+02	5.159E-03	4.818E-03	.9339
9.000E-01	1.252E+02	1.095E-01	1.253E+02	5.552E-03	5.203E-03	.9371
9.500E-01	1.217E+02	1.047E-01	1.218E+02	5.957E-03	5.599E-03	.9400
1.000E+00	1.183E+02	1.003E-01	1.184E+02	6.373E-03	6.008E-03	.9427
1.250E+00	1.047E+02	8.324E-02	1.048E+02	8.622E-03	8.216E-03	.9529
1.500E+00	9.443E+01	7.139E-02	9.450E+01	1.114E-02	1.069E-02	.9598
1.750E+00	8.645E+01	6.265E-02	8.652E+01	1.391E-02	1.342E-02	.9647
2.000E+00	7.987E+01	5.593E-02	7.992E+01	1.692E-02	1.638E-02	.9683
2.250E+00	7.425E+01	5.058E-02	7.430E+01	2.016E-02	1.958E-02	.9711
2.500E+00	6.955E+01	4.622E-02	6.960E+01	2.364E-02	2.301E-02	.9734
2.750E+00	6.552E+01	4.259E-02	6.556E+01	2.735E-02	2.667E-02	.9752
3.000E+00	6.196E+01	3.950E-02	6.199E+01	3.127E-02	3.054E-02	.9767
3.500E+00	5.607E+01	3.457E-02	5.610E+01	3.976E-02	3.893E-02	.9790
4.000E+00	5.133E+01	3.078E-02	5.136E+01	4.909E-02	4.814E-02	.9807
4.500E+00	4.743E+01	2.778E-02	4.746E+01	5.922E-02	5.816E-02	.9821
5.000E+00	4.416E+01	2.534E-02	4.418E+01	7.015E-02	6.897E-02	.9831
5.500E+00	4.136E+01	2.331E-02	4.139E+01	8.185E-02	8.054E-02	.9840
6.000E+00	3.894E+01	2.159E-02	3.897E+01	9.431E-02	9.286E-02	.9847
6.500E+00	3.683E+01	2.013E-02	3.685E+01	1.075E-01	1.059E-01	.9853
7.000E+00	3.496E+01	1.886E-02	3.498E+01	1.214E-01	1.197E-01	.9858
7.500E+00	3.329E+01	1.774E-02	3.331E+01	1.361E-01	1.342E-01	.9862
8.000E+00	3.180E+01	1.676E-02	3.181E+01	1.515E-01	1.494E-01	.9866
8.500E+00	3.045E+01	1.588E-02	3.046E+01	1.675E-01	1.653E-01	.9870
9.000E+00	2.922E+01	1.510E-02	2.924E+01	1.843E-01	1.819E-01	.9873
9.500E+00	2.810E+01	1.439E-02	2.812E+01	2.017E-01	1.992E-01	.9875
1.000E+01	2.708E+01	1.375E-02	2.709E+01	2.199E-01	2.172E-01	.9878
1.250E+01	2.299E+01	1.127E-02	2.301E+01	3.204E-01	3.168E-01	.9887
1.500E+01	2.009E+01	9.579E-03	2.010E+01	4.370E-01	4.323E-01	.9894
1.750E+01	1.790E+01	8.341E-03	1.791E+01	5.690E-01	5.632E-01	.9898
2.000E+01	1.619E+01	7.396E-03	1.620E+01	7.160E-01	7.090E-01	.9902
2.500E+01	1.368E+01	6.045E-03	1.368E+01	1.053E+00	1.044E+00	.9907
2.750E+01	1.272E+01	5.545E-03	1.273E+01	1.243E+00	1.232E+00	.9909
3.000E+01	1.191E+01	5.123E-03	1.191E+01	1.446E+00	1.433E+00	.9911
3.500E+01	1.059E+01	4.452E-03	1.060E+01	1.892E+00	1.876E+00	.9914
4.000E+01	9.573E+00	3.941E-03	9.577E+00	2.389E+00	2.369E+00	.9917
4.500E+01	8.756E+00	3.538E-03	8.760E+00	2.936E+00	2.912E+00	.9918
5.000E+01	8.086E+00	3.212E-03	8.090E+00	3.530E+00	3.502E+00	.9920
5.500E+01	7.527E+00	2.942E-03	7.530E+00	4.171E+00	4.139E+00	.9922
6.000E+01	7.052E+00	2.716E-03	7.055E+00	4.858E+00	4.820E+00	.9923
6.500E+01	6.644E+00	2.522E-03	6.646E+00	5.588E+00	5.546E+00	.9924
7.000E+01	6.288E+00	2.355E-03	6.291E+00	6.362E+00	6.314E+00	.9925
7.500E+01	5.976E+00	2.210E-03	5.979E+00	7.178E+00	7.124E+00	.9926
8.000E+01	5.700E+00	2.081E-03	5.702E+00	8.034E+00	7.975E+00	.9927
8.500E+01	5.453E+00	1.968E-03	5.455E+00	8.931E+00	8.866E+00	.9928
9.000E+01	5.232E+00	1.866E-03	5.234E+00	9.867E+00	9.796E+00	.9928
9.500E+01	5.032E+00	1.774E-03	5.034E+00	1.084E+01	1.076E+01	.9929
1.000E+02	4.850E+00	1.692E-03	4.852E+00	1.185E+01	1.177E+01	.9930

1.250E+02	4.146E+00	1.374E-03	4.147E+00	1.745E+01	1.733E+01	.9933
1.500E+02	3.663E+00	1.159E-03	3.664E+00	2.388E+01	2.373E+01	.9935
1.750E+02	3.310E+00	1.003E-03	3.311E+00	3.108E+01	3.088E+01	.9937
2.000E+02	3.041E+00	8.852E-04	3.042E+00	3.896E+01	3.872E+01	.9938
2.250E+02	2.829E+00	7.926E-04	2.830E+00	4.749E+01	4.721E+01	.9940
2.500E+02	2.658E+00	7.179E-04	2.659E+00	5.662E+01	5.628E+01	.9941
2.750E+02	2.518E+00	6.564E-04	2.518E+00	6.628E+01	6.590E+01	.9942
3.000E+02	2.400E+00	6.048E-04	2.400E+00	7.646E+01	7.603E+01	.9944
3.500E+02	2.214E+00	5.231E-04	2.214E+00	9.819E+01	9.765E+01	.9946
4.000E+02	2.074E+00	4.613E-04	2.074E+00	1.215E+02	1.209E+02	.9947
4.500E+02	1.966E+00	4.129E-04	1.966E+00	1.463E+02	1.456E+02	.9949
5.000E+02	1.880E+00	3.739E-04	1.880E+00	1.724E+02	1.715E+02	.9950
5.500E+02	1.810E+00	3.418E-04	1.811E+00	1.995E+02	1.985E+02	.9952
6.000E+02	1.753E+00	3.149E-04	1.754E+00	2.275E+02	2.265E+02	.9953
6.500E+02	1.706E+00	2.920E-04	1.706E+00	2.565E+02	2.553E+02	.9954
7.000E+02	1.666E+00	2.723E-04	1.666E+00	2.861E+02	2.848E+02	.9955
7.500E+02	1.632E+00	2.552E-04	1.632E+00	3.164E+02	3.151E+02	.9956
8.000E+02	1.603E+00	2.401E-04	1.603E+00	3.474E+02	3.459E+02	.9957
8.500E+02	1.578E+00	2.268E-04	1.578E+00	3.788E+02	3.772E+02	.9958
9.000E+02	1.556E+00	2.149E-04	1.556E+00	4.107E+02	4.090E+02	.9959
9.500E+02	1.537E+00	2.043E-04	1.538E+00	4.430E+02	4.412E+02	.9960
1.000E+03	1.521E+00	1.947E-04	1.521E+00	4.757E+02	4.739E+02	.9960
1.500E+03	1.433E+00	1.330E-04	1.433E+00	8.164E+02	8.136E+02	.9966
2.000E+03	1.407E+00	1.015E-04	1.407E+00	1.169E+03	1.166E+03	.9970
2.500E+03	1.404E+00	8.235E-05	1.404E+00	1.525E+03	1.521E+03	.9973
3.000E+03	1.409E+00	6.943E-05	1.409E+00	1.881E+03	1.876E+03	.9975
4.000E+03	1.430E+00	5.306E-05	1.430E+00	2.585E+03	2.580E+03	.9979
5.000E+03	1.454E+00	4.307E-05	1.454E+00	3.279E+03	3.273E+03	.9981
6.000E+03	1.476E+00	3.633E-05	1.476E+00	3.961E+03	3.955E+03	.9983
7.000E+03	1.498E+00	3.146E-05	1.498E+00	4.634E+03	4.627E+03	.9984
8.000E+03	1.517E+00	2.778E-05	1.517E+00	5.297E+03	5.290E+03	.9986
9.000E+03	1.535E+00	2.489E-05	1.535E+00	5.952E+03	5.945E+03	.9987
1.000E+04	1.552E+00	2.256E-05	1.552E+00	6.600E+03	6.592E+03	.9987

PROTON STOPPING POWER AND RANGE

GERMANIUM

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	4.591E+01	3.642E+00	4.955E+01	3.390E-05	5.626E-06	.1660
1.500E-03	5.623E+01	3.522E+00	5.975E+01	4.298E-05	8.165E-06	.1900
2.000E-03	6.493E+01	3.390E+00	6.831E+01	5.080E-05	1.069E-05	.2104
2.500E-03	7.259E+01	3.261E+00	7.585E+01	5.773E-05	1.317E-05	.2282
3.000E-03	7.952E+01	3.140E+00	8.266E+01	6.404E-05	1.564E-05	.2442
4.000E-03	9.182E+01	2.924E+00	9.474E+01	7.531E-05	2.050E-05	.2722
5.000E-03	1.027E+02	2.740E+00	1.054E+02	8.531E-05	2.526E-05	.2962
6.000E-03	1.125E+02	2.582E+00	1.150E+02	9.438E-05	2.994E-05	.3172
7.000E-03	1.215E+02	2.444E+00	1.239E+02	1.028E-04	3.452E-05	.3360
8.000E-03	1.299E+02	2.323E+00	1.322E+02	1.106E-04	3.902E-05	.3530
9.000E-03	1.377E+02	2.216E+00	1.399E+02	1.179E-04	4.344E-05	.3684
1.000E-02	1.452E+02	2.121E+00	1.473E+02	1.249E-04	4.777E-05	.3826
1.250E-02	1.597E+02	1.920E+00	1.617E+02	1.410E-04	5.835E-05	.4137
1.500E-02	1.723E+02	1.760E+00	1.741E+02	1.559E-04	6.865E-05	.4403
1.750E-02	1.833E+02	1.630E+00	1.850E+02	1.698E-04	7.870E-05	.4633
2.000E-02	1.931E+02	1.520E+00	1.946E+02	1.830E-04	8.852E-05	.4837
2.250E-02	2.017E+02	1.426E+00	2.032E+02	1.956E-04	9.814E-05	.5018
2.500E-02	2.094E+02	1.345E+00	2.108E+02	2.077E-04	1.076E-04	.5181
2.750E-02	2.163E+02	1.274E+00	2.175E+02	2.193E-04	1.169E-04	.5330
3.000E-02	2.223E+02	1.212E+00	2.235E+02	2.307E-04	1.261E-04	.5466
3.500E-02	2.323E+02	1.105E+00	2.334E+02	2.525E-04	1.441E-04	.5707
4.000E-02	2.400E+02	1.018E+00	2.410E+02	2.736E-04	1.619E-04	.5917
4.500E-02	2.456E+02	9.459E-01	2.466E+02	2.941E-04	1.795E-04	.6102
5.000E-02	2.496E+02	8.842E-01	2.505E+02	3.142E-04	1.969E-04	.6268
5.500E-02	2.523E+02	8.310E-01	2.531E+02	3.341E-04	2.144E-04	.6417
6.000E-02	2.539E+02	7.847E-01	2.546E+02	3.537E-04	2.318E-04	.6554
6.500E-02	2.545E+02	7.438E-01	2.553E+02	3.733E-04	2.493E-04	.6679
7.000E-02	2.545E+02	7.074E-01	2.552E+02	3.929E-04	2.670E-04	.6794
7.500E-02	2.539E+02	6.749E-01	2.546E+02	4.125E-04	2.847E-04	.6901
8.000E-02	2.529E+02	6.455E-01	2.535E+02	4.322E-04	3.026E-04	.7001
8.500E-02	2.515E+02	6.189E-01	2.521E+02	4.520E-04	3.207E-04	.7095
9.000E-02	2.500E+02	5.946E-01	2.505E+02	4.719E-04	3.389E-04	.7182
9.500E-02	2.482E+02	5.724E-01	2.488E+02	4.919E-04	3.574E-04	.7265
1.000E-01	2.464E+02	5.520E-01	2.469E+02	5.121E-04	3.760E-04	.7342
1.250E-01	2.365E+02	4.701E-01	2.370E+02	6.154E-04	4.722E-04	.7672
1.500E-01	2.272E+02	4.111E-01	2.276E+02	7.231E-04	5.733E-04	.7929
1.750E-01	2.189E+02	3.664E-01	2.193E+02	8.350E-04	6.792E-04	.8134
2.000E-01	2.116E+02	3.312E-01	2.120E+02	9.510E-04	7.895E-04	.8302
2.250E-01	2.051E+02	3.027E-01	2.054E+02	1.071E-03	9.039E-04	.8441
2.500E-01	1.993E+02	2.792E-01	1.996E+02	1.194E-03	1.022E-03	.8558
2.750E-01	1.939E+02	2.593E-01	1.942E+02	1.321E-03	1.144E-03	.8658
3.000E-01	1.890E+02	2.423E-01	1.893E+02	1.452E-03	1.269E-03	.8745

3.500E-01	1.801E+02	2.146E-01	1.804E+02	1.723E-03	1.531E-03	.8886
4.000E-01	1.723E+02	1.930E-01	1.725E+02	2.006E-03	1.805E-03	.8998
4.500E-01	1.652E+02	1.757E-01	1.654E+02	2.302E-03	2.092E-03	.9087
5.000E-01	1.588E+02	1.615E-01	1.590E+02	2.611E-03	2.392E-03	.9161
5.500E-01	1.526E+02	1.495E-01	1.527E+02	2.932E-03	2.704E-03	.9223
6.000E-01	1.466E+02	1.393E-01	1.467E+02	3.266E-03	3.029E-03	.9276
6.500E-01	1.409E+02	1.305E-01	1.411E+02	3.613E-03	3.368E-03	.9322
7.000E-01	1.357E+02	1.229E-01	1.358E+02	3.975E-03	3.721E-03	.9362
7.500E-01	1.308E+02	1.161E-01	1.309E+02	4.350E-03	4.087E-03	.9397
8.000E-01	1.263E+02	1.101E-01	1.264E+02	4.738E-03	4.467E-03	.9428
8.500E-01	1.221E+02	1.047E-01	1.222E+02	5.141E-03	4.861E-03	.9455
9.000E-01	1.183E+02	9.991E-02	1.184E+02	5.556E-03	5.267E-03	.9480
9.500E-01	1.147E+02	9.554E-02	1.148E+02	5.985E-03	5.688E-03	.9502
1.000E+00	1.113E+02	9.156E-02	1.114E+02	6.428E-03	6.121E-03	.9523
1.250E+00	9.772E+01	7.603E-02	9.779E+01	8.830E-03	8.476E-03	.9600
1.500E+00	8.777E+01	6.524E-02	8.783E+01	1.153E-02	1.113E-02	.9651
1.750E+00	8.018E+01	5.728E-02	8.024E+01	1.452E-02	1.406E-02	.9688
2.000E+00	7.418E+01	5.116E-02	7.423E+01	1.776E-02	1.725E-02	.9715
2.250E+00	6.920E+01	4.628E-02	6.925E+01	2.125E-02	2.069E-02	.9736
2.500E+00	6.489E+01	4.230E-02	6.493E+01	2.498E-02	2.436E-02	.9753
2.750E+00	6.112E+01	3.899E-02	6.116E+01	2.895E-02	2.827E-02	.9767
3.000E+00	5.783E+01	3.619E-02	5.787E+01	3.315E-02	3.242E-02	.9778
3.500E+00	5.243E+01	3.168E-02	5.246E+01	4.224E-02	4.138E-02	.9796
4.000E+00	4.804E+01	2.822E-02	4.807E+01	5.221E-02	5.122E-02	.9810
4.500E+00	4.445E+01	2.548E-02	4.448E+01	6.303E-02	6.190E-02	.9820
5.000E+00	4.141E+01	2.324E-02	4.144E+01	7.469E-02	7.341E-02	.9829
5.500E+00	3.883E+01	2.139E-02	3.885E+01	8.716E-02	8.573E-02	.9836
6.000E+00	3.658E+01	1.982E-02	3.660E+01	1.004E-01	9.884E-02	.9842
6.500E+00	3.462E+01	1.848E-02	3.464E+01	1.145E-01	1.127E-01	.9847
7.000E+00	3.288E+01	1.731E-02	3.290E+01	1.293E-01	1.274E-01	.9851
7.500E+00	3.133E+01	1.630E-02	3.135E+01	1.449E-01	1.428E-01	.9855
8.000E+00	2.994E+01	1.540E-02	2.995E+01	1.612E-01	1.589E-01	.9859
8.500E+00	2.868E+01	1.459E-02	2.869E+01	1.783E-01	1.758E-01	.9862
9.000E+00	2.754E+01	1.388E-02	2.755E+01	1.960E-01	1.934E-01	.9864
9.500E+00	2.649E+01	1.323E-02	2.650E+01	2.145E-01	2.117E-01	.9867
1.000E+01	2.553E+01	1.264E-02	2.555E+01	2.338E-01	2.307E-01	.9869
1.250E+01	2.172E+01	1.037E-02	2.173E+01	3.403E-01	3.361E-01	.9878
1.500E+01	1.899E+01	8.815E-03	1.900E+01	4.636E-01	4.583E-01	.9884
1.750E+01	1.694E+01	7.679E-03	1.695E+01	6.032E-01	5.965E-01	.9889
2.000E+01	1.533E+01	6.812E-03	1.534E+01	7.585E-01	7.503E-01	.9892
2.500E+01	1.297E+01	5.572E-03	1.297E+01	1.114E+00	1.103E+00	.9898
2.750E+01	1.207E+01	5.112E-03	1.207E+01	1.314E+00	1.301E+00	.9900
3.000E+01	1.130E+01	4.724E-03	1.130E+01	1.528E+00	1.513E+00	.9902
3.500E+01	1.006E+01	4.108E-03	1.006E+01	1.998E+00	1.979E+00	.9905
4.000E+01	9.093E+00	3.637E-03	9.097E+00	2.522E+00	2.498E+00	.9908
4.500E+01	8.321E+00	3.266E-03	8.324E+00	3.097E+00	3.069E+00	.9910
5.000E+01	7.687E+00	2.966E-03	7.690E+00	3.723E+00	3.690E+00	.9911
5.500E+01	7.158E+00	2.718E-03	7.160E+00	4.397E+00	4.359E+00	.9913
6.000E+01	6.708E+00	2.509E-03	6.711E+00	5.119E+00	5.075E+00	.9914
6.500E+01	6.321E+00	2.331E-03	6.324E+00	5.887E+00	5.837E+00	.9916
7.000E+01	5.984E+00	2.177E-03	5.987E+00	6.700E+00	6.644E+00	.9917
7.500E+01	5.689E+00	2.043E-03	5.691E+00	7.557E+00	7.495E+00	.9918
8.000E+01	5.427E+00	1.925E-03	5.429E+00	8.457E+00	8.388E+00	.9919
8.500E+01	5.193E+00	1.820E-03	5.195E+00	9.398E+00	9.323E+00	.9920
9.000E+01	4.983E+00	1.726E-03	4.985E+00	1.038E+01	1.030E+01	.9920
9.500E+01	4.793E+00	1.642E-03	4.795E+00	1.140E+01	1.131E+01	.9921
1.000E+02	4.621E+00	1.566E-03	4.623E+00	1.247E+01	1.237E+01	.9922

1.250E+02	3.953E+00	1.272E-03	3.954E+00	1.834E+01	1.820E+01	.9925
1.500E+02	3.494E+00	1.074E-03	3.495E+00	2.508E+01	2.490E+01	.9928
1.750E+02	3.159E+00	9.297E-04	3.160E+00	3.262E+01	3.239E+01	.9930
2.000E+02	2.904E+00	8.205E-04	2.905E+00	4.089E+01	4.061E+01	.9932
2.250E+02	2.703E+00	7.348E-04	2.704E+00	4.982E+01	4.948E+01	.9933
2.500E+02	2.541E+00	6.657E-04	2.542E+00	5.936E+01	5.897E+01	.9935
2.750E+02	2.408E+00	6.087E-04	2.409E+00	6.947E+01	6.903E+01	.9936
3.000E+02	2.297E+00	5.610E-04	2.297E+00	8.010E+01	7.960E+01	.9937
3.500E+02	2.121E+00	4.853E-04	2.122E+00	1.028E+02	1.022E+02	.9940
4.000E+02	1.990E+00	4.281E-04	1.990E+00	1.272E+02	1.264E+02	.9942
4.500E+02	1.888E+00	3.832E-04	1.888E+00	1.530E+02	1.521E+02	.9943
5.000E+02	1.808E+00	3.470E-04	1.808E+00	1.801E+02	1.791E+02	.9945
5.500E+02	1.743E+00	3.172E-04	1.743E+00	2.082E+02	2.071E+02	.9947
6.000E+02	1.689E+00	2.923E-04	1.689E+00	2.374E+02	2.362E+02	.9948
6.500E+02	1.645E+00	2.711E-04	1.645E+00	2.674E+02	2.660E+02	.9949
7.000E+02	1.608E+00	2.528E-04	1.608E+00	2.981E+02	2.967E+02	.9950
7.500E+02	1.576E+00	2.369E-04	1.576E+00	3.296E+02	3.280E+02	.9951
8.000E+02	1.549E+00	2.230E-04	1.549E+00	3.616E+02	3.598E+02	.9953
8.500E+02	1.526E+00	2.106E-04	1.526E+00	3.941E+02	3.922E+02	.9953
9.000E+02	1.506E+00	1.996E-04	1.506E+00	4.271E+02	4.251E+02	.9954
9.500E+02	1.489E+00	1.897E-04	1.489E+00	4.604E+02	4.584E+02	.9955
1.000E+03	1.474E+00	1.808E-04	1.474E+00	4.942E+02	4.920E+02	.9956
1.500E+03	1.395E+00	1.235E-04	1.395E+00	8.449E+02	8.417E+02	.9963
2.000E+03	1.374E+00	9.429E-05	1.374E+00	1.207E+03	1.203E+03	.9967
2.500E+03	1.373E+00	7.651E-05	1.373E+00	1.571E+03	1.566E+03	.9970
3.000E+03	1.380E+00	6.451E-05	1.380E+00	1.934E+03	1.929E+03	.9973
4.000E+03	1.402E+00	4.930E-05	1.402E+00	2.653E+03	2.647E+03	.9977
5.000E+03	1.427E+00	4.002E-05	1.427E+00	3.360E+03	3.353E+03	.9979
6.000E+03	1.450E+00	3.376E-05	1.450E+00	4.055E+03	4.048E+03	.9981
7.000E+03	1.471E+00	2.924E-05	1.471E+00	4.740E+03	4.732E+03	.9983
8.000E+03	1.491E+00	2.582E-05	1.491E+00	5.415E+03	5.406E+03	.9984
9.000E+03	1.509E+00	2.313E-05	1.509E+00	6.081E+03	6.073E+03	.9985
1.000E+04	1.525E+00	2.097E-05	1.525E+00	6.741E+03	6.731E+03	.9986

PROTON STOPPING POWER AND RANGE

TUNGSTEN

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	1.497E+01	9.926E-01	1.596E+01	1.088E-04	9.540E-06	.0877
1.500E-03	1.834E+01	1.011E+00	1.935E+01	1.370E-04	1.363E-05	.0995
2.000E-03	2.117E+01	1.014E+00	2.219E+01	1.610E-04	1.768E-05	.1098
2.500E-03	2.367E+01	1.010E+00	2.468E+01	1.824E-04	2.169E-05	.1189
3.000E-03	2.593E+01	1.002E+00	2.693E+01	2.018E-04	2.568E-05	.1273
4.000E-03	2.994E+01	9.814E-01	3.092E+01	2.363E-04	3.361E-05	.1422
5.000E-03	3.347E+01	9.579E-01	3.443E+01	2.669E-04	4.152E-05	.1555
6.000E-03	3.667E+01	9.338E-01	3.760E+01	2.947E-04	4.940E-05	.1676
7.000E-03	3.961E+01	9.102E-01	4.052E+01	3.203E-04	5.726E-05	.1788
8.000E-03	4.234E+01	8.874E-01	4.323E+01	3.442E-04	6.511E-05	.1892
9.000E-03	4.491E+01	8.657E-01	4.578E+01	3.666E-04	7.294E-05	.1989
1.000E-02	4.734E+01	8.450E-01	4.819E+01	3.879E-04	8.074E-05	.2081
1.250E-02	5.230E+01	7.977E-01	5.310E+01	4.372E-04	1.002E-04	.2292
1.500E-02	5.670E+01	7.562E-01	5.746E+01	4.825E-04	1.197E-04	.2482
1.750E-02	6.068E+01	7.195E-01	6.140E+01	5.245E-04	1.392E-04	.2653
2.000E-02	6.433E+01	6.869E-01	6.502E+01	5.641E-04	1.585E-04	.2810
2.250E-02	6.770E+01	6.578E-01	6.836E+01	6.016E-04	1.778E-04	.2955
2.500E-02	7.084E+01	6.315E-01	7.148E+01	6.373E-04	1.969E-04	.3089
2.750E-02	7.378E+01	6.077E-01	7.439E+01	6.716E-04	2.159E-04	.3215
3.000E-02	7.655E+01	5.859E-01	7.713E+01	7.046E-04	2.348E-04	.3332
3.500E-02	8.161E+01	5.477E-01	8.216E+01	7.673E-04	2.722E-04	.3547
4.000E-02	8.615E+01	5.151E-01	8.667E+01	8.266E-04	3.091E-04	.3739
4.500E-02	9.024E+01	4.868E-01	9.073E+01	8.829E-04	3.455E-04	.3914
5.000E-02	9.395E+01	4.620E-01	9.441E+01	9.369E-04	3.816E-04	.4073
5.500E-02	9.730E+01	4.400E-01	9.774E+01	9.890E-04	4.173E-04	.4220
6.000E-02	1.003E+02	4.204E-01	1.008E+02	1.039E-03	4.527E-04	.4356
6.500E-02	1.031E+02	4.028E-01	1.035E+02	1.088E-03	4.878E-04	.4482
7.000E-02	1.056E+02	3.868E-01	1.060E+02	1.136E-03	5.226E-04	.4601
7.500E-02	1.078E+02	3.722E-01	1.082E+02	1.183E-03	5.572E-04	.4712
8.000E-02	1.099E+02	3.589E-01	1.102E+02	1.228E-03	5.917E-04	.4816
8.500E-02	1.117E+02	3.467E-01	1.120E+02	1.273E-03	6.260E-04	.4915
9.000E-02	1.133E+02	3.353E-01	1.136E+02	1.318E-03	6.601E-04	.5009
9.500E-02	1.147E+02	3.248E-01	1.150E+02	1.362E-03	6.942E-04	.5099
1.000E-01	1.160E+02	3.151E-01	1.163E+02	1.405E-03	7.282E-04	.5184
1.250E-01	1.200E+02	2.749E-01	1.203E+02	1.616E-03	8.981E-04	.5559
1.500E-01	1.212E+02	2.449E-01	1.214E+02	1.822E-03	1.070E-03	.5870
1.750E-01	1.205E+02	2.215E-01	1.207E+02	2.028E-03	1.245E-03	.6136
2.000E-01	1.185E+02	2.026E-01	1.187E+02	2.237E-03	1.425E-03	.6368
2.250E-01	1.159E+02	1.870E-01	1.161E+02	2.450E-03	1.610E-03	.6573
2.500E-01	1.129E+02	1.739E-01	1.131E+02	2.668E-03	1.803E-03	.6757
2.750E-01	1.098E+02	1.627E-01	1.100E+02	2.892E-03	2.002E-03	.6922
3.000E-01	1.067E+02	1.530E-01	1.069E+02	3.123E-03	2.208E-03	.7071

3.500E-01	1.002E+02	1.370E-01	1.003E+02	3.606E-03	2.643E-03	.7331
4.000E-01	9.414E+01	1.243E-01	9.426E+01	4.120E-03	3.111E-03	.7551
4.500E-01	8.908E+01	1.140E-01	8.919E+01	4.666E-03	3.610E-03	.7737
5.000E-01	8.500E+01	1.054E-01	8.510E+01	5.240E-03	4.137E-03	.7895
5.500E-01	8.168E+01	9.811E-02	8.178E+01	5.840E-03	4.690E-03	.8031
6.000E-01	7.878E+01	9.186E-02	7.887E+01	6.463E-03	5.266E-03	.8149
6.500E-01	7.620E+01	8.642E-02	7.629E+01	7.107E-03	5.864E-03	.8251
7.000E-01	7.388E+01	8.165E-02	7.396E+01	7.773E-03	6.483E-03	.8341
7.500E-01	7.178E+01	7.743E-02	7.186E+01	8.459E-03	7.123E-03	.8420
8.000E-01	6.986E+01	7.365E-02	6.993E+01	9.165E-03	7.781E-03	.8491
8.500E-01	6.809E+01	7.026E-02	6.816E+01	9.889E-03	8.459E-03	.8554
9.000E-01	6.645E+01	6.720E-02	6.652E+01	1.063E-02	9.155E-03	.8611
9.500E-01	6.493E+01	6.441E-02	6.499E+01	1.139E-02	9.868E-03	.8662
1.000E+00	6.350E+01	6.187E-02	6.356E+01	1.217E-02	1.060E-02	.8709
1.250E+00	5.752E+01	5.184E-02	5.758E+01	1.631E-02	1.450E-02	.8891
1.500E+00	5.290E+01	4.480E-02	5.294E+01	2.084E-02	1.880E-02	.9017
1.750E+00	4.915E+01	3.955E-02	4.919E+01	2.575E-02	2.346E-02	.9110
2.000E+00	4.604E+01	3.548E-02	4.607E+01	3.100E-02	2.846E-02	.9181
2.250E+00	4.338E+01	3.222E-02	4.342E+01	3.660E-02	3.380E-02	.9237
2.500E+00	4.109E+01	2.955E-02	4.112E+01	4.252E-02	3.947E-02	.9283
2.750E+00	3.908E+01	2.731E-02	3.911E+01	4.875E-02	4.544E-02	.9321
3.000E+00	3.731E+01	2.541E-02	3.733E+01	5.530E-02	5.172E-02	.9353
3.500E+00	3.429E+01	2.235E-02	3.431E+01	6.928E-02	6.516E-02	.9405
4.000E+00	3.181E+01	1.999E-02	3.183E+01	8.443E-02	7.974E-02	.9445
4.500E+00	2.973E+01	1.811E-02	2.975E+01	1.007E-01	9.542E-02	.9477
5.000E+00	2.795E+01	1.657E-02	2.797E+01	1.180E-01	1.122E-01	.9503
5.500E+00	2.641E+01	1.529E-02	2.643E+01	1.364E-01	1.300E-01	.9525
6.000E+00	2.506E+01	1.420E-02	2.508E+01	1.559E-01	1.487E-01	.9544
6.500E+00	2.387E+01	1.327E-02	2.388E+01	1.763E-01	1.685E-01	.9560
7.000E+00	2.280E+01	1.246E-02	2.281E+01	1.977E-01	1.893E-01	.9574
7.500E+00	2.184E+01	1.174E-02	2.185E+01	2.201E-01	2.110E-01	.9586
8.000E+00	2.097E+01	1.111E-02	2.098E+01	2.435E-01	2.337E-01	.9597
8.500E+00	2.018E+01	1.055E-02	2.019E+01	2.678E-01	2.573E-01	.9607
9.000E+00	1.946E+01	1.004E-02	1.947E+01	2.930E-01	2.818E-01	.9616
9.500E+00	1.879E+01	9.584E-03	1.880E+01	3.192E-01	3.072E-01	.9624
1.000E+01	1.818E+01	9.170E-03	1.818E+01	3.462E-01	3.334E-01	.9632
1.250E+01	1.569E+01	7.560E-03	1.570E+01	4.947E-01	4.779E-01	.9661
1.500E+01	1.388E+01	6.453E-03	1.389E+01	6.643E-01	6.432E-01	.9682
1.750E+01	1.250E+01	5.641E-03	1.250E+01	8.544E-01	8.285E-01	.9697
2.000E+01	1.140E+01	5.019E-03	1.140E+01	1.064E+00	1.033E+00	.9710
2.500E+01	9.751E+00	4.125E-03	9.755E+00	1.540E+00	1.498E+00	.9728
2.750E+01	9.121E+00	3.793E-03	9.125E+00	1.805E+00	1.757E+00	.9735
3.000E+01	8.581E+00	3.513E-03	8.585E+00	2.088E+00	2.034E+00	.9741
3.500E+01	7.701E+00	3.065E-03	7.704E+00	2.704E+00	2.637E+00	.9751
4.000E+01	7.012E+00	2.722E-03	7.015E+00	3.385E+00	3.303E+00	.9760
4.500E+01	6.455E+00	2.451E-03	6.458E+00	4.129E+00	4.032E+00	.9766
5.000E+01	5.995E+00	2.231E-03	5.997E+00	4.933E+00	4.820E+00	.9772
5.500E+01	5.607E+00	2.049E-03	5.609E+00	5.796E+00	5.666E+00	.9777
6.000E+01	5.275E+00	1.895E-03	5.276E+00	6.715E+00	6.568E+00	.9781
6.500E+01	4.987E+00	1.764E-03	4.989E+00	7.690E+00	7.525E+00	.9785
7.000E+01	4.735E+00	1.650E-03	4.737E+00	8.719E+00	8.535E+00	.9789
7.500E+01	4.512E+00	1.551E-03	4.514E+00	9.801E+00	9.597E+00	.9792
8.000E+01	4.314E+00	1.464E-03	4.316E+00	1.093E+01	1.071E+01	.9795
8.500E+01	4.136E+00	1.386E-03	4.138E+00	1.212E+01	1.187E+01	.9798
9.000E+01	3.976E+00	1.316E-03	3.977E+00	1.335E+01	1.308E+01	.9800
9.500E+01	3.830E+00	1.253E-03	3.831E+00	1.463E+01	1.434E+01	.9802
1.000E+02	3.697E+00	1.196E-03	3.698E+00	1.596E+01	1.565E+01	.9804

1.250E+02	3.178E+00	9.772E-04	3.179E+00	2.328E+01	2.285E+01	.9814
1.500E+02	2.820E+00	8.277E-04	2.821E+00	3.165E+01	3.108E+01	.9821
1.750E+02	2.557E+00	7.190E-04	2.558E+00	4.098E+01	4.027E+01	.9826
2.000E+02	2.356E+00	6.363E-04	2.357E+00	5.117E+01	5.031E+01	.9831
2.250E+02	2.198E+00	5.711E-04	2.198E+00	6.217E+01	6.115E+01	.9836
2.500E+02	2.070E+00	5.184E-04	2.070E+00	7.390E+01	7.271E+01	.9840
2.750E+02	1.964E+00	4.748E-04	1.965E+00	8.630E+01	8.495E+01	.9843
3.000E+02	1.876E+00	4.382E-04	1.876E+00	9.933E+01	9.781E+01	.9846
3.500E+02	1.736E+00	3.801E-04	1.736E+00	1.271E+02	1.252E+02	.9852
4.000E+02	1.631E+00	3.359E-04	1.631E+00	1.568E+02	1.546E+02	.9857
4.500E+02	1.550E+00	3.012E-04	1.550E+00	1.883E+02	1.857E+02	.9862
5.000E+02	1.486E+00	2.731E-04	1.486E+00	2.213E+02	2.183E+02	.9866
5.500E+02	1.434E+00	2.500E-04	1.434E+00	2.555E+02	2.522E+02	.9869
6.000E+02	1.391E+00	2.306E-04	1.391E+00	2.909E+02	2.872E+02	.9873
6.500E+02	1.356E+00	2.140E-04	1.356E+00	3.274E+02	3.233E+02	.9876
7.000E+02	1.326E+00	1.998E-04	1.326E+00	3.647E+02	3.602E+02	.9879
7.500E+02	1.301E+00	1.874E-04	1.301E+00	4.027E+02	3.980E+02	.9882
8.000E+02	1.279E+00	1.764E-04	1.279E+00	4.415E+02	4.364E+02	.9884
8.500E+02	1.261E+00	1.667E-04	1.261E+00	4.809E+02	4.754E+02	.9887
9.000E+02	1.245E+00	1.581E-04	1.245E+00	5.208E+02	5.150E+02	.9889
9.500E+02	1.231E+00	1.503E-04	1.231E+00	5.612E+02	5.550E+02	.9891
1.000E+03	1.219E+00	1.433E-04	1.219E+00	6.020E+02	5.955E+02	.9893
1.500E+03	1.157E+00	9.821E-05	1.157E+00	1.025E+03	1.016E+03	.9909
2.000E+03	1.143E+00	7.511E-05	1.143E+00	1.461E+03	1.449E+03	.9920
2.500E+03	1.145E+00	6.101E-05	1.145E+00	1.898E+03	1.884E+03	.9928
3.000E+03	1.153E+00	5.148E-05	1.153E+00	2.334E+03	2.318E+03	.9934
4.000E+03	1.175E+00	3.939E-05	1.175E+00	3.193E+03	3.175E+03	.9943
5.000E+03	1.199E+00	3.200E-05	1.199E+00	4.035E+03	4.015E+03	.9950
6.000E+03	1.222E+00	2.701E-05	1.222E+00	4.861E+03	4.839E+03	.9954
7.000E+03	1.243E+00	2.341E-05	1.243E+00	5.672E+03	5.648E+03	.9958
8.000E+03	1.262E+00	2.067E-05	1.262E+00	6.470E+03	6.445E+03	.9961
9.000E+03	1.280E+00	1.853E-05	1.280E+00	7.257E+03	7.231E+03	.9964
1.000E+04	1.296E+00	1.680E-05	1.296E+00	8.034E+03	8.007E+03	.9966

PROTON STOPPING POWER AND RANGE

LEAD

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	1.540E+01	8.290E-01	1.623E+01	1.079E-04	1.006E-05	.0932
1.500E-03	1.886E+01	8.494E-01	1.971E+01	1.355E-04	1.428E-05	.1054
2.000E-03	2.178E+01	8.554E-01	2.264E+01	1.592E-04	1.843E-05	.1158
2.500E-03	2.435E+01	8.548E-01	2.521E+01	1.801E-04	2.253E-05	.1251
3.000E-03	2.668E+01	8.508E-01	2.753E+01	1.990E-04	2.658E-05	.1335
4.000E-03	3.081E+01	8.374E-01	3.164E+01	2.328E-04	3.460E-05	.1486
5.000E-03	3.444E+01	8.208E-01	3.526E+01	2.627E-04	4.255E-05	.1620
6.000E-03	3.773E+01	8.033E-01	3.853E+01	2.898E-04	5.045E-05	.1741
7.000E-03	4.075E+01	7.856E-01	4.154E+01	3.148E-04	5.830E-05	.1852
8.000E-03	4.357E+01	7.682E-01	4.433E+01	3.381E-04	6.611E-05	.1955
9.000E-03	4.621E+01	7.514E-01	4.696E+01	3.600E-04	7.387E-05	.2052
1.000E-02	4.871E+01	7.352E-01	4.944E+01	3.807E-04	8.160E-05	.2143
1.250E-02	5.382E+01	6.977E-01	5.451E+01	4.288E-04	1.009E-04	.2352
1.500E-02	5.834E+01	6.643E-01	5.901E+01	4.728E-04	1.200E-04	.2539
1.750E-02	6.245E+01	6.344E-01	6.308E+01	5.138E-04	1.391E-04	.2708
2.000E-02	6.621E+01	6.075E-01	6.682E+01	5.523E-04	1.581E-04	.2863
2.250E-02	6.970E+01	5.833E-01	7.028E+01	5.887E-04	1.769E-04	.3005
2.500E-02	7.294E+01	5.614E-01	7.350E+01	6.235E-04	1.956E-04	.3137
2.750E-02	7.598E+01	5.413E-01	7.653E+01	6.568E-04	2.141E-04	.3260
3.000E-02	7.885E+01	5.230E-01	7.937E+01	6.889E-04	2.325E-04	.3376
3.500E-02	8.411E+01	4.905E-01	8.460E+01	7.499E-04	2.689E-04	.3587
4.000E-02	8.884E+01	4.626E-01	8.930E+01	8.074E-04	3.048E-04	.3776
4.500E-02	9.313E+01	4.383E-01	9.356E+01	8.620E-04	3.402E-04	.3947
5.000E-02	9.702E+01	4.169E-01	9.744E+01	9.144E-04	3.752E-04	.4104
5.500E-02	1.006E+02	3.978E-01	1.010E+02	9.648E-04	4.098E-04	.4248
6.000E-02	1.038E+02	3.807E-01	1.042E+02	1.014E-03	4.440E-04	.4381
6.500E-02	1.068E+02	3.653E-01	1.071E+02	1.061E-03	4.779E-04	.4505
7.000E-02	1.095E+02	3.513E-01	1.098E+02	1.107E-03	5.115E-04	.4621
7.500E-02	1.119E+02	3.385E-01	1.122E+02	1.152E-03	5.449E-04	.4730
8.000E-02	1.141E+02	3.268E-01	1.145E+02	1.196E-03	5.781E-04	.4833
8.500E-02	1.162E+02	3.160E-01	1.165E+02	1.239E-03	6.110E-04	.4930
9.000E-02	1.180E+02	3.060E-01	1.183E+02	1.282E-03	6.438E-04	.5022
9.500E-02	1.196E+02	2.967E-01	1.199E+02	1.324E-03	6.765E-04	.5110
1.000E-01	1.211E+02	2.880E-01	1.214E+02	1.365E-03	7.091E-04	.5193
1.250E-01	1.261E+02	2.522E-01	1.264E+02	1.567E-03	8.712E-04	.5561
1.500E-01	1.281E+02	2.253E-01	1.283E+02	1.763E-03	1.034E-03	.5865
1.750E-01	1.279E+02	2.042E-01	1.281E+02	1.957E-03	1.199E-03	.6126
2.000E-01	1.263E+02	1.872E-01	1.265E+02	2.154E-03	1.368E-03	.6353
2.250E-01	1.236E+02	1.730E-01	1.238E+02	2.353E-03	1.543E-03	.6555
2.500E-01	1.204E+02	1.611E-01	1.206E+02	2.558E-03	1.723E-03	.6736
2.750E-01	1.169E+02	1.509E-01	1.171E+02	2.768E-03	1.910E-03	.6900
3.000E-01	1.133E+02	1.421E-01	1.135E+02	2.985E-03	2.104E-03	.7048

3.500E-01	1.064E+02	1.274E-01	1.065E+02	3.440E-03	2.514E-03	.7309
4.000E-01	9.998E+01	1.158E-01	1.001E+02	3.925E-03	2.955E-03	.7529
4.500E-01	9.437E+01	1.063E-01	9.448E+01	4.439E-03	3.425E-03	.7716
5.000E-01	8.950E+01	9.838E-02	8.960E+01	4.983E-03	3.925E-03	.7876
5.500E-01	8.518E+01	9.166E-02	8.528E+01	5.555E-03	4.452E-03	.8015
6.000E-01	8.137E+01	8.589E-02	8.146E+01	6.155E-03	5.007E-03	.8135
6.500E-01	7.801E+01	8.086E-02	7.810E+01	6.782E-03	5.589E-03	.8241
7.000E-01	7.505E+01	7.644E-02	7.512E+01	7.435E-03	6.196E-03	.8333
7.500E-01	7.242E+01	7.253E-02	7.249E+01	8.113E-03	6.827E-03	.8415
8.000E-01	7.008E+01	6.903E-02	7.015E+01	8.814E-03	7.481E-03	.8488
8.500E-01	6.799E+01	6.588E-02	6.806E+01	9.538E-03	8.157E-03	.8552
9.000E-01	6.612E+01	6.303E-02	6.619E+01	1.028E-02	8.854E-03	.8611
9.500E-01	6.444E+01	6.044E-02	6.450E+01	1.105E-02	9.571E-03	.8663
1.000E+00	6.292E+01	5.807E-02	6.298E+01	1.183E-02	1.031E-02	.8710
1.250E+00	5.688E+01	4.873E-02	5.693E+01	1.602E-02	1.424E-02	.8893
1.500E+00	5.222E+01	4.216E-02	5.226E+01	2.061E-02	1.858E-02	.9016
1.750E+00	4.846E+01	3.725E-02	4.850E+01	2.558E-02	2.329E-02	.9105
2.000E+00	4.534E+01	3.344E-02	4.537E+01	3.091E-02	2.836E-02	.9174
2.250E+00	4.269E+01	3.038E-02	4.272E+01	3.659E-02	3.377E-02	.9228
2.500E+00	4.040E+01	2.788E-02	4.043E+01	4.261E-02	3.951E-02	.9272
2.750E+00	3.840E+01	2.578E-02	3.843E+01	4.896E-02	4.557E-02	.9308
3.000E+00	3.663E+01	2.400E-02	3.666E+01	5.562E-02	5.195E-02	.9339
3.500E+00	3.364E+01	2.112E-02	3.366E+01	6.988E-02	6.561E-02	.9389
4.000E+00	3.118E+01	1.890E-02	3.120E+01	8.532E-02	8.043E-02	.9427
4.500E+00	2.913E+01	1.713E-02	2.914E+01	1.019E-01	9.639E-02	.9458
5.000E+00	2.737E+01	1.568E-02	2.739E+01	1.196E-01	1.134E-01	.9483
5.500E+00	2.586E+01	1.447E-02	2.587E+01	1.384E-01	1.316E-01	.9504
6.000E+00	2.453E+01	1.344E-02	2.454E+01	1.583E-01	1.507E-01	.9522
6.500E+00	2.336E+01	1.256E-02	2.337E+01	1.792E-01	1.709E-01	.9538
7.000E+00	2.231E+01	1.180E-02	2.232E+01	2.011E-01	1.920E-01	.9552
7.500E+00	2.137E+01	1.113E-02	2.138E+01	2.239E-01	2.142E-01	.9564
8.000E+00	2.051E+01	1.053E-02	2.052E+01	2.478E-01	2.373E-01	.9575
8.500E+00	1.974E+01	9.999E-03	1.975E+01	2.727E-01	2.613E-01	.9584
9.000E+00	1.903E+01	9.521E-03	1.904E+01	2.985E-01	2.863E-01	.9593
9.500E+00	1.838E+01	9.090E-03	1.839E+01	3.252E-01	3.122E-01	.9601
1.000E+01	1.778E+01	8.698E-03	1.779E+01	3.528E-01	3.390E-01	.9608
1.250E+01	1.535E+01	7.176E-03	1.536E+01	5.046E-01	4.863E-01	.9638
1.500E+01	1.359E+01	6.127E-03	1.359E+01	6.780E-01	6.548E-01	.9658
1.750E+01	1.223E+01	5.359E-03	1.224E+01	8.722E-01	8.438E-01	.9674
2.000E+01	1.116E+01	4.770E-03	1.116E+01	1.086E+00	1.052E+00	.9687
2.500E+01	9.550E+00	3.923E-03	9.554E+00	1.572E+00	1.526E+00	.9706
2.750E+01	8.929E+00	3.608E-03	8.932E+00	1.843E+00	1.790E+00	.9713
3.000E+01	8.393E+00	3.342E-03	8.396E+00	2.132E+00	2.072E+00	.9720
3.500E+01	7.514E+00	2.916E-03	7.516E+00	2.763E+00	2.688E+00	.9730
4.000E+01	6.822E+00	2.591E-03	6.825E+00	3.462E+00	3.371E+00	.9739
4.500E+01	6.264E+00	2.334E-03	6.267E+00	4.227E+00	4.120E+00	.9746
5.000E+01	5.804E+00	2.125E-03	5.806E+00	5.057E+00	4.931E+00	.9752
5.500E+01	5.418E+00	1.952E-03	5.420E+00	5.949E+00	5.804E+00	.9757
6.000E+01	5.088E+00	1.806E-03	5.090E+00	6.901E+00	6.737E+00	.9761
6.500E+01	4.804E+00	1.681E-03	4.806E+00	7.913E+00	7.727E+00	.9765
7.000E+01	4.557E+00	1.573E-03	4.558E+00	8.982E+00	8.774E+00	.9769
7.500E+01	4.339E+00	1.479E-03	4.340E+00	1.011E+01	9.876E+00	.9772
8.000E+01	4.146E+00	1.396E-03	4.147E+00	1.129E+01	1.103E+01	.9775
8.500E+01	3.973E+00	1.322E-03	3.974E+00	1.252E+01	1.224E+01	.9778
9.000E+01	3.818E+00	1.255E-03	3.819E+00	1.380E+01	1.350E+01	.9781
9.500E+01	3.678E+00	1.196E-03	3.679E+00	1.514E+01	1.481E+01	.9783
1.000E+02	3.551E+00	1.142E-03	3.552E+00	1.652E+01	1.616E+01	.9785

1.250E+02	3.056E+00	9.329E-04	3.057E+00	2.414E+01	2.364E+01	.9794
1.500E+02	2.713E+00	7.905E-04	2.714E+00	3.284E+01	3.219E+01	.9802
1.750E+02	2.462E+00	6.870E-04	2.463E+00	4.253E+01	4.171E+01	.9808
2.000E+02	2.270E+00	6.081E-04	2.271E+00	5.312E+01	5.212E+01	.9813
2.250E+02	2.118E+00	5.459E-04	2.119E+00	6.453E+01	6.335E+01	.9818
2.500E+02	1.996E+00	4.957E-04	1.996E+00	7.669E+01	7.533E+01	.9822
2.750E+02	1.895E+00	4.541E-04	1.895E+00	8.955E+01	8.799E+01	.9826
3.000E+02	1.810E+00	4.192E-04	1.810E+00	1.031E+02	1.013E+02	.9829
3.500E+02	1.676E+00	3.637E-04	1.677E+00	1.318E+02	1.296E+02	.9836
4.000E+02	1.576E+00	3.215E-04	1.577E+00	1.626E+02	1.600E+02	.9841
4.500E+02	1.499E+00	2.883E-04	1.499E+00	1.952E+02	1.921E+02	.9846
5.000E+02	1.437E+00	2.615E-04	1.438E+00	2.292E+02	2.258E+02	.9850
5.500E+02	1.388E+00	2.394E-04	1.388E+00	2.646E+02	2.608E+02	.9854
6.000E+02	1.347E+00	2.209E-04	1.348E+00	3.012E+02	2.969E+02	.9858
6.500E+02	1.314E+00	2.051E-04	1.314E+00	3.388E+02	3.341E+02	.9862
7.000E+02	1.286E+00	1.914E-04	1.286E+00	3.773E+02	3.722E+02	.9865
7.500E+02	1.262E+00	1.795E-04	1.262E+00	4.165E+02	4.110E+02	.9868
8.000E+02	1.242E+00	1.691E-04	1.242E+00	4.565E+02	4.506E+02	.9871
8.500E+02	1.224E+00	1.598E-04	1.224E+00	4.971E+02	4.908E+02	.9873
9.000E+02	1.209E+00	1.515E-04	1.210E+00	5.382E+02	5.315E+02	.9876
9.500E+02	1.197E+00	1.441E-04	1.197E+00	5.797E+02	5.727E+02	.9878
1.000E+03	1.185E+00	1.374E-04	1.186E+00	6.217E+02	6.143E+02	.9881
1.500E+03	1.130E+00	9.419E-05	1.130E+00	1.056E+03	1.045E+03	.9898
2.000E+03	1.120E+00	7.205E-05	1.120E+00	1.501E+03	1.488E+03	.9910
2.500E+03	1.124E+00	5.854E-05	1.124E+00	1.947E+03	1.932E+03	.9919
3.000E+03	1.135E+00	4.940E-05	1.135E+00	2.390E+03	2.372E+03	.9926
4.000E+03	1.161E+00	3.780E-05	1.161E+00	3.261E+03	3.241E+03	.9936
5.000E+03	1.187E+00	3.072E-05	1.187E+00	4.113E+03	4.090E+03	.9944
6.000E+03	1.211E+00	2.593E-05	1.211E+00	4.947E+03	4.922E+03	.9949
7.000E+03	1.233E+00	2.247E-05	1.233E+00	5.765E+03	5.738E+03	.9954
8.000E+03	1.253E+00	1.985E-05	1.253E+00	6.569E+03	6.541E+03	.9957
9.000E+03	1.271E+00	1.779E-05	1.271E+00	7.361E+03	7.332E+03	.9960
1.000E+04	1.288E+00	1.613E-05	1.288E+00	8.143E+03	8.112E+03	.9962

PROTON STOPPING POWER AND RANGE

URANIUM

T = Proton kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	1.838E+01	6.695E-01	1.905E+01	9.290E-05	1.052E-05	.1132
1.500E-03	2.251E+01	6.904E-01	2.320E+01	1.164E-04	1.476E-05	.1268
2.000E-03	2.599E+01	6.984E-01	2.669E+01	1.365E-04	1.890E-05	.1385
2.500E-03	2.906E+01	7.005E-01	2.976E+01	1.542E-04	2.294E-05	.1488
3.000E-03	3.183E+01	6.995E-01	3.253E+01	1.702E-04	2.691E-05	.1581
4.000E-03	3.675E+01	6.922E-01	3.745E+01	1.988E-04	3.470E-05	.1745
5.000E-03	4.109E+01	6.817E-01	4.177E+01	2.241E-04	4.234E-05	.1889
6.000E-03	4.501E+01	6.699E-01	4.568E+01	2.469E-04	4.985E-05	.2019
7.000E-03	4.862E+01	6.575E-01	4.928E+01	2.680E-04	5.726E-05	.2137
8.000E-03	5.198E+01	6.451E-01	5.262E+01	2.876E-04	6.458E-05	.2245
9.000E-03	5.513E+01	6.328E-01	5.576E+01	3.061E-04	7.182E-05	.2347
1.000E-02	5.811E+01	6.208E-01	5.873E+01	3.235E-04	7.899E-05	.2442
1.250E-02	6.419E+01	5.926E-01	6.479E+01	3.640E-04	9.672E-05	.2657
1.500E-02	6.957E+01	5.669E-01	7.014E+01	4.010E-04	1.142E-04	.2849
1.750E-02	7.444E+01	5.436E-01	7.499E+01	4.355E-04	1.316E-04	.3021
2.000E-02	7.890E+01	5.224E-01	7.942E+01	4.679E-04	1.487E-04	.3178
2.250E-02	8.302E+01	5.032E-01	8.352E+01	4.985E-04	1.656E-04	.3321
2.500E-02	8.684E+01	4.856E-01	8.733E+01	5.278E-04	1.823E-04	.3454
2.750E-02	9.042E+01	4.694E-01	9.089E+01	5.559E-04	1.988E-04	.3577
3.000E-02	9.378E+01	4.545E-01	9.423E+01	5.829E-04	2.152E-04	.3692
3.500E-02	9.992E+01	4.279E-01	1.003E+02	6.342E-04	2.475E-04	.3902
4.000E-02	1.054E+02	4.049E-01	1.058E+02	6.827E-04	2.792E-04	.4089
4.500E-02	1.103E+02	3.847E-01	1.107E+02	7.289E-04	3.104E-04	.4258
5.000E-02	1.148E+02	3.668E-01	1.151E+02	7.732E-04	3.411E-04	.4412
5.500E-02	1.188E+02	3.508E-01	1.191E+02	8.158E-04	3.715E-04	.4554
6.000E-02	1.224E+02	3.364E-01	1.227E+02	8.572E-04	4.016E-04	.4685
6.500E-02	1.257E+02	3.234E-01	1.260E+02	8.974E-04	4.313E-04	.4806
7.000E-02	1.286E+02	3.115E-01	1.289E+02	9.366E-04	4.608E-04	.4920
7.500E-02	1.312E+02	3.006E-01	1.315E+02	9.750E-04	4.901E-04	.5026
8.000E-02	1.335E+02	2.906E-01	1.338E+02	1.013E-03	5.192E-04	.5127
8.500E-02	1.356E+02	2.813E-01	1.359E+02	1.050E-03	5.481E-04	.5221
9.000E-02	1.374E+02	2.727E-01	1.377E+02	1.086E-03	5.770E-04	.5311
9.500E-02	1.390E+02	2.647E-01	1.393E+02	1.122E-03	6.057E-04	.5397
1.000E-01	1.404E+02	2.573E-01	1.406E+02	1.158E-03	6.345E-04	.5478
1.250E-01	1.444E+02	2.263E-01	1.446E+02	1.333E-03	7.780E-04	.5836
1.500E-01	1.448E+02	2.028E-01	1.450E+02	1.505E-03	9.233E-04	.6134
1.750E-01	1.427E+02	1.843E-01	1.429E+02	1.679E-03	1.072E-03	.6388
2.000E-01	1.391E+02	1.693E-01	1.393E+02	1.856E-03	1.227E-03	.6611
2.250E-01	1.345E+02	1.568E-01	1.347E+02	2.038E-03	1.388E-03	.6808
2.500E-01	1.296E+02	1.462E-01	1.297E+02	2.227E-03	1.556E-03	.6985
2.750E-01	1.242E+02	1.372E-01	1.243E+02	2.424E-03	1.732E-03	.7145
3.000E-01	1.188E+02	1.293E-01	1.189E+02	2.630E-03	1.917E-03	.7290

3.500E-01	1.087E+02	1.162E-01	1.088E+02	3.070E-03	2.316E-03	.7543
4.000E-01	1.000E+02	1.058E-01	1.001E+02	3.549E-03	2.753E-03	.7756
4.500E-01	9.278E+01	9.722E-02	9.288E+01	4.068E-03	3.228E-03	.7935
5.000E-01	8.672E+01	9.009E-02	8.681E+01	4.625E-03	3.740E-03	.8086
5.500E-01	8.164E+01	8.402E-02	8.172E+01	5.219E-03	4.287E-03	.8214
6.000E-01	7.735E+01	7.880E-02	7.743E+01	5.848E-03	4.868E-03	.8324
6.500E-01	7.371E+01	7.425E-02	7.379E+01	6.510E-03	5.481E-03	.8418
7.000E-01	7.060E+01	7.024E-02	7.067E+01	7.203E-03	6.122E-03	.8500
7.500E-01	6.792E+01	6.669E-02	6.799E+01	7.925E-03	6.792E-03	.8571
8.000E-01	6.559E+01	6.351E-02	6.565E+01	8.673E-03	7.488E-03	.8633
8.500E-01	6.356E+01	6.064E-02	6.362E+01	9.447E-03	8.208E-03	.8688
9.000E-01	6.177E+01	5.805E-02	6.183E+01	1.024E-02	8.950E-03	.8737
9.500E-01	6.019E+01	5.569E-02	6.024E+01	1.106E-02	9.714E-03	.8780
1.000E+00	5.878E+01	5.353E-02	5.884E+01	1.190E-02	1.050E-02	.8819
1.250E+00	5.333E+01	4.500E-02	5.338E+01	1.638E-02	1.468E-02	.8966
1.500E+00	4.908E+01	3.897E-02	4.912E+01	2.126E-02	1.927E-02	.9064
1.750E+00	4.562E+01	3.447E-02	4.566E+01	2.655E-02	2.425E-02	.9135
2.000E+00	4.273E+01	3.097E-02	4.276E+01	3.221E-02	2.960E-02	.9190
2.250E+00	4.028E+01	2.816E-02	4.031E+01	3.824E-02	3.531E-02	.9234
2.500E+00	3.815E+01	2.585E-02	3.818E+01	4.461E-02	4.135E-02	.9270
2.750E+00	3.629E+01	2.392E-02	3.631E+01	5.133E-02	4.774E-02	.9300
3.000E+00	3.463E+01	2.228E-02	3.465E+01	5.838E-02	5.445E-02	.9326
3.500E+00	3.182E+01	1.962E-02	3.184E+01	7.345E-02	6.881E-02	.9369
4.000E+00	2.952E+01	1.757E-02	2.954E+01	8.977E-02	8.440E-02	.9402
4.500E+00	2.759E+01	1.593E-02	2.760E+01	1.073E-01	1.012E-01	.9430
5.000E+00	2.594E+01	1.459E-02	2.595E+01	1.260E-01	1.191E-01	.9452
5.500E+00	2.451E+01	1.347E-02	2.452E+01	1.458E-01	1.381E-01	.9472
6.000E+00	2.326E+01	1.252E-02	2.327E+01	1.668E-01	1.582E-01	.9488
6.500E+00	2.215E+01	1.170E-02	2.216E+01	1.888E-01	1.794E-01	.9503
7.000E+00	2.116E+01	1.099E-02	2.117E+01	2.119E-01	2.016E-01	.9516
7.500E+00	2.027E+01	1.037E-02	2.028E+01	2.360E-01	2.249E-01	.9528
8.000E+00	1.947E+01	9.819E-03	1.948E+01	2.612E-01	2.491E-01	.9538
8.500E+00	1.874E+01	9.326E-03	1.875E+01	2.873E-01	2.743E-01	.9547
9.000E+00	1.807E+01	8.882E-03	1.808E+01	3.145E-01	3.005E-01	.9556
9.500E+00	1.746E+01	8.481E-03	1.747E+01	3.426E-01	3.277E-01	.9564
1.000E+01	1.689E+01	8.117E-03	1.690E+01	3.718E-01	3.558E-01	.9571
1.250E+01	1.460E+01	6.702E-03	1.461E+01	5.314E-01	5.102E-01	.9600
1.500E+01	1.294E+01	5.726E-03	1.294E+01	7.136E-01	6.866E-01	.9622
1.750E+01	1.166E+01	5.010E-03	1.166E+01	9.175E-01	8.843E-01	.9638
2.000E+01	1.064E+01	4.461E-03	1.065E+01	1.142E+00	1.102E+00	.9651
2.500E+01	9.121E+00	3.671E-03	9.124E+00	1.651E+00	1.597E+00	.9671
2.750E+01	8.532E+00	3.377E-03	8.535E+00	1.935E+00	1.873E+00	.9679
3.000E+01	8.023E+00	3.129E-03	8.026E+00	2.237E+00	2.167E+00	.9686
3.500E+01	7.189E+00	2.732E-03	7.191E+00	2.896E+00	2.809E+00	.9698
4.000E+01	6.532E+00	2.428E-03	6.534E+00	3.627E+00	3.521E+00	.9707
4.500E+01	6.001E+00	2.188E-03	6.003E+00	4.426E+00	4.300E+00	.9715
5.000E+01	5.562E+00	1.993E-03	5.564E+00	5.292E+00	5.145E+00	.9722
5.500E+01	5.193E+00	1.831E-03	5.195E+00	6.223E+00	6.053E+00	.9727
6.000E+01	4.879E+00	1.694E-03	4.881E+00	7.216E+00	7.023E+00	.9732
6.500E+01	4.608E+00	1.578E-03	4.610E+00	8.271E+00	8.053E+00	.9737
7.000E+01	4.372E+00	1.477E-03	4.373E+00	9.385E+00	9.142E+00	.9741
7.500E+01	4.164E+00	1.388E-03	4.165E+00	1.056E+01	1.029E+01	.9744
8.000E+01	3.979E+00	1.310E-03	3.980E+00	1.179E+01	1.149E+01	.9748
8.500E+01	3.814E+00	1.241E-03	3.815E+00	1.307E+01	1.274E+01	.9751
9.000E+01	3.666E+00	1.179E-03	3.667E+00	1.441E+01	1.405E+01	.9754
9.500E+01	3.532E+00	1.123E-03	3.533E+00	1.580E+01	1.541E+01	.9756
1.000E+02	3.410E+00	1.072E-03	3.411E+00	1.724E+01	1.682E+01	.9759

1.250E+02	2.936E+00	8.769E-04	2.937E+00	2.517E+01	2.459E+01	.9769
1.500E+02	2.607E+00	7.434E-04	2.608E+00	3.423E+01	3.346E+01	.9777
1.750E+02	2.366E+00	6.463E-04	2.367E+00	4.431E+01	4.335E+01	.9784
2.000E+02	2.182E+00	5.723E-04	2.183E+00	5.532E+01	5.416E+01	.9790
2.250E+02	2.036E+00	5.139E-04	2.037E+00	6.719E+01	6.582E+01	.9795
2.500E+02	1.919E+00	4.667E-04	1.919E+00	7.985E+01	7.825E+01	.9800
2.750E+02	1.821E+00	4.277E-04	1.822E+00	9.323E+01	9.140E+01	.9804
3.000E+02	1.740E+00	3.949E-04	1.740E+00	1.073E+02	1.052E+02	.9808
3.500E+02	1.612E+00	3.427E-04	1.612E+00	1.372E+02	1.346E+02	.9815
4.000E+02	1.515E+00	3.031E-04	1.516E+00	1.692E+02	1.662E+02	.9821
4.500E+02	1.441E+00	2.719E-04	1.441E+00	2.031E+02	1.996E+02	.9827
5.000E+02	1.382E+00	2.467E-04	1.382E+00	2.385E+02	2.345E+02	.9832
5.500E+02	1.334E+00	2.259E-04	1.334E+00	2.754E+02	2.709E+02	.9836
6.000E+02	1.295E+00	2.084E-04	1.295E+00	3.134E+02	3.084E+02	.9841
6.500E+02	1.263E+00	1.935E-04	1.263E+00	3.525E+02	3.470E+02	.9845
7.000E+02	1.236E+00	1.806E-04	1.236E+00	3.925E+02	3.866E+02	.9848
7.500E+02	1.213E+00	1.694E-04	1.213E+00	4.334E+02	4.269E+02	.9852
8.000E+02	1.193E+00	1.596E-04	1.194E+00	4.749E+02	4.680E+02	.9855
8.500E+02	1.177E+00	1.509E-04	1.177E+00	5.171E+02	5.098E+02	.9858
9.000E+02	1.163E+00	1.431E-04	1.163E+00	5.599E+02	5.521E+02	.9861
9.500E+02	1.150E+00	1.361E-04	1.150E+00	6.031E+02	5.949E+02	.9863
1.000E+03	1.140E+00	1.297E-04	1.140E+00	6.468E+02	6.381E+02	.9866
1.500E+03	1.087E+00	8.898E-05	1.087E+00	1.099E+03	1.086E+03	.9886
2.000E+03	1.077E+00	6.809E-05	1.077E+00	1.562E+03	1.546E+03	.9899
2.500E+03	1.082E+00	5.533E-05	1.082E+00	2.025E+03	2.007E+03	.9909
3.000E+03	1.092E+00	4.670E-05	1.092E+00	2.485E+03	2.465E+03	.9917
4.000E+03	1.117E+00	3.575E-05	1.117E+00	3.391E+03	3.366E+03	.9928
5.000E+03	1.143E+00	2.906E-05	1.143E+00	4.275E+03	4.248E+03	.9937
6.000E+03	1.167E+00	2.453E-05	1.167E+00	5.141E+03	5.111E+03	.9943
7.000E+03	1.189E+00	2.126E-05	1.189E+00	5.990E+03	5.958E+03	.9948
8.000E+03	1.208E+00	1.878E-05	1.208E+00	6.824E+03	6.791E+03	.9952
9.000E+03	1.226E+00	1.683E-05	1.226E+00	7.646E+03	7.611E+03	.9955
1.000E+04	1.242E+00	1.527E-05	1.242E+00	8.456E+03	8.420E+03	.9958

PROTON STOPPING POWER AND RANGE

AIR (dry, near sea level)

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP(e)	STOP(n)	STOP(t)	RANGE(c)	RANGE(p)	DETOUR
1.000E-03	1.197E+02	2.163E+01	1.414E+02	9.857E-06	3.257E-06	.3304
1.500E-03	1.467E+02	1.840E+01	1.651E+02	1.310E-05	4.925E-06	.3760
2.000E-03	1.693E+02	1.614E+01	1.855E+02	1.595E-05	6.577E-06	.4123
2.500E-03	1.893E+02	1.446E+01	2.038E+02	1.852E-05	8.189E-06	.4421
3.000E-03	2.074E+02	1.314E+01	2.206E+02	2.088E-05	9.759E-06	.4674
4.000E-03	2.395E+02	1.120E+01	2.507E+02	2.512E-05	1.277E-05	.5084
5.000E-03	2.678E+02	9.825E+00	2.776E+02	2.891E-05	1.563E-05	.5406
6.000E-03	2.933E+02	8.786E+00	3.021E+02	3.236E-05	1.834E-05	.5669
7.000E-03	3.168E+02	7.970E+00	3.248E+02	3.555E-05	2.094E-05	.5889
8.000E-03	3.387E+02	7.310E+00	3.460E+02	3.853E-05	2.342E-05	.6078
9.000E-03	3.592E+02	6.762E+00	3.660E+02	4.134E-05	2.580E-05	.6242
1.000E-02	3.787E+02	6.300E+00	3.850E+02	4.400E-05	2.810E-05	.6387
1.250E-02	4.170E+02	5.404E+00	4.224E+02	5.019E-05	3.356E-05	.6686
1.500E-02	4.504E+02	4.751E+00	4.552E+02	5.588E-05	3.869E-05	.6923
1.750E-02	4.801E+02	4.253E+00	4.843E+02	6.120E-05	4.356E-05	.7118
2.000E-02	5.067E+02	3.858E+00	5.106E+02	6.623E-05	4.822E-05	.7281
2.250E-02	5.307E+02	3.536E+00	5.343E+02	7.101E-05	5.269E-05	.7420
2.500E-02	5.526E+02	3.269E+00	5.558E+02	7.560E-05	5.701E-05	.7542
2.750E-02	5.724E+02	3.042E+00	5.755E+02	8.002E-05	6.120E-05	.7648
3.000E-02	5.905E+02	2.848E+00	5.934E+02	8.430E-05	6.527E-05	.7743
3.500E-02	6.221E+02	2.531E+00	6.246E+02	9.250E-05	7.313E-05	.7906
4.000E-02	6.483E+02	2.282E+00	6.506E+02	1.003E-04	8.069E-05	.8041
4.500E-02	6.700E+02	2.082E+00	6.721E+02	1.079E-04	8.800E-05	.8156
5.000E-02	6.877E+02	1.917E+00	6.897E+02	1.152E-04	9.513E-05	.8256
5.500E-02	7.020E+02	1.777E+00	7.038E+02	1.224E-04	1.021E-04	.8343
6.000E-02	7.132E+02	1.659E+00	7.149E+02	1.295E-04	1.090E-04	.8420
6.500E-02	7.217E+02	1.556E+00	7.233E+02	1.364E-04	1.158E-04	.8490
7.000E-02	7.278E+02	1.466E+00	7.293E+02	1.433E-04	1.226E-04	.8553
7.500E-02	7.319E+02	1.387E+00	7.333E+02	1.501E-04	1.293E-04	.8611
8.000E-02	7.341E+02	1.316E+00	7.355E+02	1.569E-04	1.360E-04	.8664
8.500E-02	7.348E+02	1.253E+00	7.360E+02	1.637E-04	1.426E-04	.8712
9.000E-02	7.340E+02	1.196E+00	7.352E+02	1.705E-04	1.493E-04	.8758
9.500E-02	7.320E+02	1.145E+00	7.332E+02	1.773E-04	1.561E-04	.8800
1.000E-01	7.290E+02	1.098E+00	7.301E+02	1.842E-04	1.628E-04	.8839
1.250E-01	7.029E+02	9.142E-01	7.038E+02	2.190E-04	1.972E-04	.9005
1.500E-01	6.672E+02	7.861E-01	6.680E+02	2.554E-04	2.333E-04	.9133
1.750E-01	6.291E+02	6.914E-01	6.298E+02	2.940E-04	2.715E-04	.9236
2.000E-01	5.922E+02	6.183E-01	5.928E+02	3.349E-04	3.121E-04	.9320
2.250E-01	5.583E+02	5.600E-01	5.589E+02	3.783E-04	3.553E-04	.9390
2.500E-01	5.278E+02	5.124E-01	5.284E+02	4.244E-04	4.010E-04	.9450
2.750E-01	5.006E+02	4.727E-01	5.011E+02	4.730E-04	4.493E-04	.9500
3.000E-01	4.763E+02	4.390E-01	4.767E+02	5.241E-04	5.002E-04	.9544

3.500E-01	4.349E+02	3.850E-01	4.353E+02	6.340E-04	6.095E-04	.9614
4.000E-01	4.012E+02	3.435E-01	4.015E+02	7.538E-04	7.287E-04	.9668
4.500E-01	3.733E+02	3.105E-01	3.736E+02	8.830E-04	8.573E-04	.9710
5.000E-01	3.498E+02	2.836E-01	3.501E+02	1.021E-03	9.951E-04	.9743
5.500E-01	3.297E+02	2.612E-01	3.300E+02	1.169E-03	1.142E-03	.9770
6.000E-01	3.121E+02	2.423E-01	3.123E+02	1.324E-03	1.297E-03	.9793
6.500E-01	2.964E+02	2.261E-01	2.967E+02	1.489E-03	1.461E-03	.9812
7.000E-01	2.824E+02	2.119E-01	2.826E+02	1.661E-03	1.633E-03	.9827
7.500E-01	2.699E+02	1.995E-01	2.701E+02	1.842E-03	1.813E-03	.9841
8.000E-01	2.587E+02	1.885E-01	2.589E+02	2.032E-03	2.002E-03	.9852
8.500E-01	2.485E+02	1.787E-01	2.486E+02	2.229E-03	2.198E-03	.9862
9.000E-01	2.391E+02	1.699E-01	2.393E+02	2.434E-03	2.402E-03	.9871
9.500E-01	2.306E+02	1.620E-01	2.308E+02	2.646E-03	2.614E-03	.9879
1.000E+00	2.227E+02	1.548E-01	2.229E+02	2.867E-03	2.834E-03	.9886
1.250E+00	1.911E+02	1.270E-01	1.912E+02	4.082E-03	4.046E-03	.9910
1.500E+00	1.682E+02	1.080E-01	1.683E+02	5.479E-03	5.438E-03	.9926
1.750E+00	1.508E+02	9.404E-02	1.509E+02	7.051E-03	7.006E-03	.9936
2.000E+00	1.370E+02	8.340E-02	1.371E+02	8.792E-03	8.742E-03	.9943
2.250E+00	1.258E+02	7.500E-02	1.258E+02	1.070E-02	1.064E-02	.9949
2.500E+00	1.164E+02	6.818E-02	1.165E+02	1.276E-02	1.270E-02	.9953
2.750E+00	1.085E+02	6.254E-02	1.086E+02	1.499E-02	1.492E-02	.9956
3.000E+00	1.017E+02	5.778E-02	1.018E+02	1.737E-02	1.730E-02	.9959
3.500E+00	9.063E+01	5.021E-02	9.068E+01	2.258E-02	2.250E-02	.9963
4.000E+00	8.192E+01	4.444E-02	8.197E+01	2.839E-02	2.829E-02	.9966
4.500E+00	7.488E+01	3.989E-02	7.492E+01	3.478E-02	3.466E-02	.9968
5.000E+00	6.905E+01	3.621E-02	6.909E+01	4.173E-02	4.161E-02	.9969
5.500E+00	6.414E+01	3.317E-02	6.417E+01	4.925E-02	4.910E-02	.9971
6.000E+00	5.994E+01	3.061E-02	5.997E+01	5.731E-02	5.715E-02	.9972
6.500E+00	5.630E+01	2.843E-02	5.633E+01	6.592E-02	6.574E-02	.9973
7.000E+00	5.312E+01	2.654E-02	5.315E+01	7.506E-02	7.486E-02	.9973
7.500E+00	5.031E+01	2.490E-02	5.033E+01	8.474E-02	8.452E-02	.9974
8.000E+00	4.781E+01	2.345E-02	4.783E+01	9.493E-02	9.469E-02	.9975
8.500E+00	4.557E+01	2.217E-02	4.559E+01	1.056E-01	1.054E-01	.9975
9.000E+00	4.355E+01	2.102E-02	4.357E+01	1.169E-01	1.166E-01	.9976
9.500E+00	4.171E+01	1.999E-02	4.173E+01	1.286E-01	1.283E-01	.9976
1.000E+01	4.004E+01	1.905E-02	4.006E+01	1.408E-01	1.405E-01	.9976
1.250E+01	3.349E+01	1.547E-02	3.351E+01	2.094E-01	2.089E-01	.9978
1.500E+01	2.892E+01	1.304E-02	2.894E+01	2.899E-01	2.893E-01	.9979
1.750E+01	2.554E+01	1.128E-02	2.555E+01	3.820E-01	3.813E-01	.9979
2.000E+01	2.293E+01	9.953E-03	2.294E+01	4.855E-01	4.845E-01	.9980
2.500E+01	1.914E+01	8.066E-03	1.915E+01	7.252E-01	7.238E-01	.9981
2.750E+01	1.773E+01	7.372E-03	1.773E+01	8.609E-01	8.593E-01	.9981
3.000E+01	1.652E+01	6.790E-03	1.653E+01	1.007E+00	1.005E+00	.9981
3.500E+01	1.460E+01	5.870E-03	1.460E+01	1.330E+00	1.327E+00	.9982
4.000E+01	1.312E+01	5.173E-03	1.312E+01	1.691E+00	1.688E+00	.9982
4.500E+01	1.194E+01	4.627E-03	1.194E+01	2.091E+00	2.088E+00	.9983
5.000E+01	1.098E+01	4.187E-03	1.099E+01	2.528E+00	2.524E+00	.9983
5.500E+01	1.019E+01	3.826E-03	1.019E+01	3.001E+00	2.996E+00	.9983
6.000E+01	9.514E+00	3.523E-03	9.517E+00	3.509E+00	3.504E+00	.9983
6.500E+01	8.938E+00	3.265E-03	8.942E+00	4.052E+00	4.045E+00	.9984
7.000E+01	8.440E+00	3.043E-03	8.443E+00	4.628E+00	4.620E+00	.9984
7.500E+01	8.003E+00	2.850E-03	8.006E+00	5.236E+00	5.228E+00	.9984
8.000E+01	7.618E+00	2.681E-03	7.620E+00	5.876E+00	5.867E+00	.9984
8.500E+01	7.275E+00	2.531E-03	7.277E+00	6.548E+00	6.538E+00	.9984
9.000E+01	6.968E+00	2.397E-03	6.970E+00	7.250E+00	7.239E+00	.9984
9.500E+01	6.691E+00	2.277E-03	6.693E+00	7.983E+00	7.970E+00	.9985
1.000E+02	6.441E+00	2.169E-03	6.443E+00	8.744E+00	8.731E+00	.9985

1.250E+02	5.474E+00	1.754E-03	5.475E+00	1.297E+01	1.295E+01	.9985
1.500E+02	4.815E+00	1.475E-03	4.816E+00	1.786E+01	1.783E+01	.9986
1.750E+02	4.337E+00	1.274E-03	4.338E+00	2.334E+01	2.330E+01	.9986
2.000E+02	3.975E+00	1.122E-03	3.976E+00	2.937E+01	2.933E+01	.9986
2.250E+02	3.690E+00	1.003E-03	3.691E+00	3.590E+01	3.585E+01	.9987
2.500E+02	3.462E+00	9.075E-04	3.462E+00	4.290E+01	4.284E+01	.9987
2.750E+02	3.274E+00	8.289E-04	3.275E+00	5.033E+01	5.026E+01	.9987
3.000E+02	3.117E+00	7.631E-04	3.118E+00	5.816E+01	5.809E+01	.9987
3.500E+02	2.870E+00	6.591E-04	2.871E+00	7.490E+01	7.481E+01	.9988
4.000E+02	2.686E+00	5.806E-04	2.687E+00	9.293E+01	9.282E+01	.9988
4.500E+02	2.544E+00	5.191E-04	2.544E+00	1.121E+02	1.119E+02	.9989
5.000E+02	2.431E+00	4.697E-04	2.431E+00	1.322E+02	1.320E+02	.9989
5.500E+02	2.340E+00	4.291E-04	2.340E+00	1.532E+02	1.530E+02	.9989
6.000E+02	2.265E+00	3.951E-04	2.266E+00	1.749E+02	1.747E+02	.9990
6.500E+02	2.203E+00	3.663E-04	2.203E+00	1.973E+02	1.971E+02	.9990
7.000E+02	2.151E+00	3.414E-04	2.151E+00	2.203E+02	2.200E+02	.9990
7.500E+02	2.107E+00	3.198E-04	2.107E+00	2.437E+02	2.435E+02	.9990
8.000E+02	2.069E+00	3.009E-04	2.069E+00	2.677E+02	2.674E+02	.9990
8.500E+02	2.036E+00	2.841E-04	2.037E+00	2.921E+02	2.918E+02	.9991
9.000E+02	2.008E+00	2.691E-04	2.008E+00	3.168E+02	3.165E+02	.9991
9.500E+02	1.984E+00	2.557E-04	1.984E+00	3.418E+02	3.415E+02	.9991
1.000E+03	1.962E+00	2.436E-04	1.963E+00	3.672E+02	3.668E+02	.9991
1.500E+03	1.850E+00	1.661E-04	1.850E+00	6.311E+02	6.306E+02	.9992
2.000E+03	1.820E+00	1.267E-04	1.820E+00	9.041E+02	9.035E+02	.9993
2.500E+03	1.818E+00	1.027E-04	1.818E+00	1.179E+03	1.178E+03	.9994
3.000E+03	1.828E+00	8.655E-05	1.828E+00	1.454E+03	1.453E+03	.9994
4.000E+03	1.861E+00	6.608E-05	1.861E+00	1.996E+03	1.995E+03	.9995
5.000E+03	1.898E+00	5.362E-05	1.898E+00	2.528E+03	2.527E+03	.9996
6.000E+03	1.933E+00	4.520E-05	1.934E+00	3.050E+03	3.049E+03	.9996
7.000E+03	1.967E+00	3.913E-05	1.967E+00	3.563E+03	3.561E+03	.9997
8.000E+03	1.998E+00	3.453E-05	1.998E+00	4.067E+03	4.066E+03	.9997
9.000E+03	2.026E+00	3.093E-05	2.026E+00	4.564E+03	4.563E+03	.9997
1.000E+04	2.052E+00	2.803E-05	2.052E+00	5.054E+03	5.053E+03	.9997

PROTON STOPPING POWER AND RANGE

WATER, LIQUID

T = Proton kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	1.337E+02	4.315E+01	1.769E+02	6.319E-06	2.878E-06	.4555
1.500E-03	1.638E+02	3.460E+01	1.984E+02	8.969E-06	4.400E-06	.4906
2.000E-03	1.891E+02	2.927E+01	2.184E+02	1.137E-05	5.909E-06	.5197
2.500E-03	2.114E+02	2.557E+01	2.370E+02	1.357E-05	7.380E-06	.5440
3.000E-03	2.316E+02	2.281E+01	2.544E+02	1.560E-05	8.811E-06	.5647
4.000E-03	2.675E+02	1.894E+01	2.864E+02	1.930E-05	1.155E-05	.5986
5.000E-03	2.990E+02	1.631E+01	3.153E+02	2.262E-05	1.415E-05	.6254
6.000E-03	3.276E+02	1.439E+01	3.420E+02	2.567E-05	1.661E-05	.6473
7.000E-03	3.538E+02	1.292E+01	3.667E+02	2.849E-05	1.896E-05	.6656
8.000E-03	3.782E+02	1.175E+01	3.900E+02	3.113E-05	2.121E-05	.6813
9.000E-03	4.012E+02	1.080E+01	4.120E+02	3.363E-05	2.337E-05	.6950
1.000E-02	4.229E+02	1.000E+01	4.329E+02	3.599E-05	2.545E-05	.7070
1.250E-02	4.660E+02	8.485E+00	4.745E+02	4.150E-05	3.037E-05	.7318
1.500E-02	5.036E+02	7.400E+00	5.110E+02	4.657E-05	3.499E-05	.7514
1.750E-02	5.372E+02	6.581E+00	5.437E+02	5.131E-05	3.938E-05	.7674
2.000E-02	5.673E+02	5.939E+00	5.733E+02	5.578E-05	4.356E-05	.7808
2.250E-02	5.946E+02	5.421E+00	6.001E+02	6.005E-05	4.757E-05	.7923
2.500E-02	6.195E+02	4.993E+00	6.245E+02	6.413E-05	5.144E-05	.8022
2.750E-02	6.421E+02	4.633E+00	6.467E+02	6.806E-05	5.519E-05	.8109
3.000E-02	6.628E+02	4.325E+00	6.671E+02	7.187E-05	5.883E-05	.8187
3.500E-02	6.989E+02	3.826E+00	7.028E+02	7.916E-05	6.585E-05	.8319
4.000E-02	7.290E+02	3.437E+00	7.324E+02	8.613E-05	7.259E-05	.8429
4.500E-02	7.538E+02	3.126E+00	7.569E+02	9.284E-05	7.911E-05	.8522
5.000E-02	7.740E+02	2.870E+00	7.768E+02	9.935E-05	8.547E-05	.8602
5.500E-02	7.901E+02	2.655E+00	7.927E+02	1.057E-04	9.169E-05	.8673
6.000E-02	8.026E+02	2.473E+00	8.050E+02	1.120E-04	9.782E-05	.8735
6.500E-02	8.119E+02	2.316E+00	8.142E+02	1.182E-04	1.039E-04	.8791
7.000E-02	8.183E+02	2.178E+00	8.205E+02	1.243E-04	1.099E-04	.8842
7.500E-02	8.223E+02	2.058E+00	8.243E+02	1.303E-04	1.159E-04	.8889
8.000E-02	8.241E+02	1.951E+00	8.260E+02	1.364E-04	1.218E-04	.8931
8.500E-02	8.239E+02	1.855E+00	8.258E+02	1.425E-04	1.278E-04	.8971
9.000E-02	8.222E+02	1.769E+00	8.239E+02	1.485E-04	1.338E-04	.9007
9.500E-02	8.190E+02	1.691E+00	8.206E+02	1.546E-04	1.398E-04	.9041
1.000E-01	8.145E+02	1.620E+00	8.161E+02	1.607E-04	1.458E-04	.9073
1.250E-01	7.801E+02	1.343E+00	7.814E+02	1.920E-04	1.767E-04	.9207
1.500E-01	7.360E+02	1.152E+00	7.371E+02	2.249E-04	2.094E-04	.9310
1.750E-01	6.959E+02	1.010E+00	6.969E+02	2.598E-04	2.440E-04	.9393
2.000E-01	6.604E+02	9.016E-01	6.613E+02	2.966E-04	2.806E-04	.9460
2.250E-01	6.286E+02	8.152E-01	6.294E+02	3.354E-04	3.191E-04	.9515
2.500E-01	5.999E+02	7.447E-01	6.006E+02	3.761E-04	3.596E-04	.9562
2.750E-01	5.737E+02	6.855E-01	5.744E+02	4.186E-04	4.019E-04	.9601
3.000E-01	5.497E+02	6.351E-01	5.504E+02	4.631E-04	4.462E-04	.9635

3.500E-01	5.075E+02	5.545E-01	5.080E+02	5.577E-04	5.404E-04	.9689
4.000E-01	4.714E+02	4.928E-01	4.719E+02	6.599E-04	6.422E-04	.9731
4.500E-01	4.401E+02	4.439E-01	4.406E+02	7.697E-04	7.515E-04	.9764
5.000E-01	4.128E+02	4.043E-01	4.132E+02	8.869E-04	8.683E-04	.9790
5.500E-01	3.888E+02	3.715E-01	3.891E+02	1.012E-03	9.926E-04	.9811
6.000E-01	3.676E+02	3.438E-01	3.680E+02	1.144E-03	1.124E-03	.9829
6.500E-01	3.489E+02	3.201E-01	3.492E+02	1.283E-03	1.263E-03	.9844
7.000E-01	3.322E+02	2.996E-01	3.325E+02	1.430E-03	1.410E-03	.9857
7.500E-01	3.172E+02	2.817E-01	3.175E+02	1.584E-03	1.563E-03	.9868
8.000E-01	3.037E+02	2.658E-01	3.039E+02	1.745E-03	1.724E-03	.9877
8.500E-01	2.914E+02	2.516E-01	2.917E+02	1.913E-03	1.891E-03	.9886
9.000E-01	2.803E+02	2.390E-01	2.805E+02	2.088E-03	2.066E-03	.9893
9.500E-01	2.700E+02	2.276E-01	2.702E+02	2.270E-03	2.247E-03	.9899
1.000E+00	2.606E+02	2.173E-01	2.608E+02	2.458E-03	2.435E-03	.9905
1.250E+00	2.228E+02	1.775E-01	2.229E+02	3.499E-03	3.472E-03	.9925
1.500E+00	1.955E+02	1.504E-01	1.957E+02	4.698E-03	4.669E-03	.9938
1.750E+00	1.748E+02	1.307E-01	1.749E+02	6.052E-03	6.020E-03	.9946
2.000E+00	1.585E+02	1.157E-01	1.586E+02	7.555E-03	7.519E-03	.9952
2.250E+00	1.453E+02	1.038E-01	1.454E+02	9.203E-03	9.164E-03	.9957
2.500E+00	1.343E+02	9.428E-02	1.344E+02	1.099E-02	1.095E-02	.9960
2.750E+00	1.250E+02	8.637E-02	1.251E+02	1.292E-02	1.288E-02	.9963
3.000E+00	1.171E+02	7.972E-02	1.172E+02	1.499E-02	1.494E-02	.9965
3.500E+00	1.041E+02	6.916E-02	1.042E+02	1.952E-02	1.946E-02	.9968
4.000E+00	9.398E+01	6.113E-02	9.404E+01	2.458E-02	2.451E-02	.9971
4.500E+00	8.580E+01	5.481E-02	8.586E+01	3.015E-02	3.007E-02	.9973
5.000E+00	7.906E+01	4.970E-02	7.911E+01	3.623E-02	3.613E-02	.9974
5.500E+00	7.339E+01	4.549E-02	7.343E+01	4.279E-02	4.268E-02	.9975
6.000E+00	6.854E+01	4.195E-02	6.858E+01	4.984E-02	4.972E-02	.9976
6.500E+00	6.434E+01	3.894E-02	6.438E+01	5.737E-02	5.724E-02	.9977
7.000E+00	6.068E+01	3.634E-02	6.071E+01	6.537E-02	6.522E-02	.9977
7.500E+00	5.744E+01	3.407E-02	5.747E+01	7.384E-02	7.368E-02	.9978
8.000E+00	5.456E+01	3.208E-02	5.460E+01	8.277E-02	8.259E-02	.9978
8.500E+00	5.199E+01	3.031E-02	5.202E+01	9.215E-02	9.196E-02	.9979
9.000E+00	4.966E+01	2.873E-02	4.969E+01	1.020E-01	1.018E-01	.9979
9.500E+00	4.756E+01	2.731E-02	4.759E+01	1.123E-01	1.120E-01	.9979
1.000E+01	4.564E+01	2.603E-02	4.567E+01	1.230E-01	1.228E-01	.9980
1.250E+01	3.813E+01	2.111E-02	3.815E+01	1.832E-01	1.828E-01	.9981
1.500E+01	3.290E+01	1.778E-02	3.292E+01	2.539E-01	2.535E-01	.9982
1.750E+01	2.904E+01	1.538E-02	2.905E+01	3.350E-01	3.344E-01	.9982
2.000E+01	2.605E+01	1.356E-02	2.607E+01	4.260E-01	4.252E-01	.9983
2.500E+01	2.174E+01	1.098E-02	2.175E+01	6.370E-01	6.359E-01	.9983
2.750E+01	2.012E+01	1.003E-02	2.013E+01	7.566E-01	7.553E-01	.9984
3.000E+01	1.875E+01	9.239E-03	1.876E+01	8.853E-01	8.839E-01	.9984
3.500E+01	1.656E+01	7.983E-03	1.656E+01	1.170E+00	1.168E+00	.9984
4.000E+01	1.487E+01	7.034E-03	1.488E+01	1.489E+00	1.486E+00	.9985
4.500E+01	1.353E+01	6.290E-03	1.354E+01	1.841E+00	1.839E+00	.9985
5.000E+01	1.244E+01	5.691E-03	1.245E+01	2.227E+00	2.224E+00	.9985
5.500E+01	1.154E+01	5.199E-03	1.154E+01	2.644E+00	2.641E+00	.9985
6.000E+01	1.078E+01	4.786E-03	1.078E+01	3.093E+00	3.089E+00	.9986
6.500E+01	1.012E+01	4.435E-03	1.013E+01	3.572E+00	3.567E+00	.9986
7.000E+01	9.555E+00	4.134E-03	9.559E+00	4.080E+00	4.075E+00	.9986
7.500E+01	9.059E+00	3.871E-03	9.063E+00	4.618E+00	4.611E+00	.9986
8.000E+01	8.622E+00	3.641E-03	8.625E+00	5.184E+00	5.176E+00	.9986
8.500E+01	8.233E+00	3.437E-03	8.236E+00	5.777E+00	5.769E+00	.9986
9.000E+01	7.884E+00	3.255E-03	7.888E+00	6.398E+00	6.389E+00	.9986
9.500E+01	7.570E+00	3.092E-03	7.573E+00	7.045E+00	7.035E+00	.9986
1.000E+02	7.286E+00	2.944E-03	7.289E+00	7.718E+00	7.707E+00	.9987

1.250E+02	6.190E+00	2.381E-03	6.192E+00	1.146E+01	1.144E+01	.9987
1.500E+02	5.443E+00	2.001E-03	5.445E+00	1.577E+01	1.576E+01	.9987
1.750E+02	4.901E+00	1.728E-03	4.903E+00	2.062E+01	2.060E+01	.9988
2.000E+02	4.491E+00	1.522E-03	4.492E+00	2.596E+01	2.593E+01	.9988
2.250E+02	4.169E+00	1.361E-03	4.170E+00	3.174E+01	3.171E+01	.9988
2.500E+02	3.910E+00	1.231E-03	3.911E+00	3.794E+01	3.790E+01	.9989
2.750E+02	3.697E+00	1.124E-03	3.698E+00	4.452E+01	4.447E+01	.9989
3.000E+02	3.519E+00	1.035E-03	3.520E+00	5.145E+01	5.139E+01	.9989
3.500E+02	3.240E+00	8.936E-04	3.241E+00	6.628E+01	6.621E+01	.9989
4.000E+02	3.031E+00	7.870E-04	3.032E+00	8.225E+01	8.217E+01	.9990
4.500E+02	2.870E+00	7.037E-04	2.871E+00	9.921E+01	9.912E+01	.9990
5.000E+02	2.743E+00	6.367E-04	2.743E+00	1.170E+02	1.169E+02	.9990
5.500E+02	2.640E+00	5.816E-04	2.640E+00	1.356E+02	1.355E+02	.9991
6.000E+02	2.555E+00	5.355E-04	2.556E+00	1.549E+02	1.547E+02	.9991
6.500E+02	2.485E+00	4.963E-04	2.485E+00	1.747E+02	1.746E+02	.9991
7.000E+02	2.426E+00	4.626E-04	2.426E+00	1.951E+02	1.949E+02	.9991
7.500E+02	2.375E+00	4.333E-04	2.376E+00	2.159E+02	2.158E+02	.9991
8.000E+02	2.333E+00	4.076E-04	2.333E+00	2.372E+02	2.370E+02	.9992
8.500E+02	2.296E+00	3.849E-04	2.296E+00	2.588E+02	2.586E+02	.9992
9.000E+02	2.264E+00	3.646E-04	2.264E+00	2.807E+02	2.805E+02	.9992
9.500E+02	2.236E+00	3.464E-04	2.236E+00	3.029E+02	3.027E+02	.9992
1.000E+03	2.211E+00	3.300E-04	2.211E+00	3.254E+02	3.252E+02	.9992
1.500E+03	2.070E+00	2.249E-04	2.070E+00	5.605E+02	5.601E+02	.9993
2.000E+03	2.021E+00	1.715E-04	2.021E+00	8.054E+02	8.049E+02	.9994
2.500E+03	2.004E+00	1.390E-04	2.004E+00	1.054E+03	1.053E+03	.9995
3.000E+03	2.001E+00	1.171E-04	2.001E+00	1.304E+03	1.303E+03	.9995
4.000E+03	2.012E+00	8.939E-05	2.012E+00	1.802E+03	1.802E+03	.9996
5.000E+03	2.031E+00	7.251E-05	2.031E+00	2.297E+03	2.296E+03	.9996
6.000E+03	2.052E+00	6.112E-05	2.052E+00	2.787E+03	2.786E+03	.9997
7.000E+03	2.072E+00	5.291E-05	2.072E+00	3.272E+03	3.271E+03	.9997
8.000E+03	2.091E+00	4.669E-05	2.091E+00	3.752E+03	3.751E+03	.9997
9.000E+03	2.109E+00	4.181E-05	2.109E+00	4.228E+03	4.227E+03	.9997
1.000E+04	2.126E+00	3.788E-05	2.126E+00	4.700E+03	4.699E+03	.9998

PROTON STOPPING POWER AND RANGE

PLASTIC SCINTILLATOR (vinyltoluene-based)

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP(e)	STOP(n)	STOP(t)	RANGE(c)	RANGE(p)	DETOUR
1.000E-03	1.901E+02	4.225E+01	2.323E+02	5.235E-06	2.567E-06	.4904
1.500E-03	2.328E+02	3.394E+01	2.667E+02	7.227E-06	3.850E-06	.5327
2.000E-03	2.688E+02	2.872E+01	2.975E+02	9.000E-06	5.091E-06	.5656
2.500E-03	3.005E+02	2.508E+01	3.256E+02	1.061E-05	6.279E-06	.5921
3.000E-03	3.292E+02	2.236E+01	3.516E+02	1.208E-05	7.418E-06	.6140
4.000E-03	3.741E+02	1.854E+01	3.927E+02	1.477E-05	9.582E-06	.6489
5.000E-03	4.144E+02	1.594E+01	4.303E+02	1.720E-05	1.162E-05	.6758
6.000E-03	4.507E+02	1.405E+01	4.648E+02	1.943E-05	1.355E-05	.6973
7.000E-03	4.839E+02	1.260E+01	4.965E+02	2.151E-05	1.538E-05	.7150
8.000E-03	5.135E+02	1.145E+01	5.250E+02	2.347E-05	1.713E-05	.7300
9.000E-03	5.404E+02	1.051E+01	5.510E+02	2.533E-05	1.881E-05	.7428
1.000E-02	5.654E+02	9.729E+00	5.752E+02	2.710E-05	2.044E-05	.7541
1.250E-02	6.165E+02	8.239E+00	6.247E+02	3.127E-05	2.430E-05	.7771
1.500E-02	6.592E+02	7.175E+00	6.663E+02	3.514E-05	2.794E-05	.7950
1.750E-02	6.960E+02	6.375E+00	7.024E+02	3.879E-05	3.140E-05	.8095
2.000E-02	7.287E+02	5.748E+00	7.345E+02	4.227E-05	3.473E-05	.8215
2.250E-02	7.576E+02	5.242E+00	7.629E+02	4.561E-05	3.793E-05	.8317
2.500E-02	7.830E+02	4.825E+00	7.878E+02	4.883E-05	4.104E-05	.8406
2.750E-02	8.053E+02	4.474E+00	8.098E+02	5.196E-05	4.407E-05	.8483
3.000E-02	8.252E+02	4.175E+00	8.293E+02	5.501E-05	4.704E-05	.8551
3.500E-02	8.601E+02	3.690E+00	8.638E+02	6.091E-05	5.279E-05	.8667
4.000E-02	8.902E+02	3.313E+00	8.935E+02	6.660E-05	5.836E-05	.8762
4.500E-02	9.154E+02	3.010E+00	9.184E+02	7.212E-05	6.377E-05	.8842
5.000E-02	9.354E+02	2.762E+00	9.382E+02	7.750E-05	6.906E-05	.8911
5.500E-02	9.504E+02	2.555E+00	9.530E+02	8.279E-05	7.427E-05	.8971
6.000E-02	9.611E+02	2.378E+00	9.635E+02	8.800E-05	7.941E-05	.9023
6.500E-02	9.682E+02	2.226E+00	9.704E+02	9.317E-05	8.451E-05	.9070
7.000E-02	9.723E+02	2.094E+00	9.744E+02	9.831E-05	8.959E-05	.9113
7.500E-02	9.738E+02	1.977E+00	9.758E+02	1.034E-04	9.466E-05	.9151
8.000E-02	9.730E+02	1.874E+00	9.748E+02	1.086E-04	9.974E-05	.9187
8.500E-02	9.702E+02	1.781E+00	9.719E+02	1.137E-04	1.048E-04	.9219
9.000E-02	9.657E+02	1.698E+00	9.674E+02	1.189E-04	1.099E-04	.9249
9.500E-02	9.599E+02	1.623E+00	9.615E+02	1.240E-04	1.151E-04	.9277
1.000E-01	9.528E+02	1.555E+00	9.544E+02	1.293E-04	1.202E-04	.9303
1.250E-01	9.060E+02	1.288E+00	9.073E+02	1.561E-04	1.469E-04	.9410
1.500E-01	8.506E+02	1.104E+00	8.517E+02	1.845E-04	1.751E-04	.9492
1.750E-01	7.951E+02	9.677E-01	7.961E+02	2.149E-04	2.053E-04	.9557
2.000E-01	7.433E+02	8.633E-01	7.441E+02	2.474E-04	2.377E-04	.9609
2.250E-01	6.964E+02	7.802E-01	6.972E+02	2.821E-04	2.723E-04	.9652
2.500E-01	6.547E+02	7.126E-01	6.554E+02	3.191E-04	3.091E-04	.9688
2.750E-01	6.179E+02	6.559E-01	6.185E+02	3.584E-04	3.483E-04	.9718
3.000E-01	5.853E+02	6.077E-01	5.859E+02	3.999E-04	3.897E-04	.9743

3.500E-01	5.307E+02	5.306E-01	5.313E+02	4.897E-04	4.791E-04	.9785
4.000E-01	4.871E+02	4.716E-01	4.876E+02	5.880E-04	5.772E-04	.9816
4.500E-01	4.513E+02	4.250E-01	4.517E+02	6.947E-04	6.835E-04	.9839
5.000E-01	4.214E+02	3.871E-01	4.218E+02	8.093E-04	7.978E-04	.9858
5.500E-01	3.959E+02	3.556E-01	3.963E+02	9.317E-04	9.199E-04	.9873
6.000E-01	3.737E+02	3.290E-01	3.740E+02	1.062E-03	1.050E-03	.9886
6.500E-01	3.544E+02	3.062E-01	3.547E+02	1.199E-03	1.186E-03	.9896
7.000E-01	3.372E+02	2.864E-01	3.375E+02	1.344E-03	1.331E-03	.9905
7.500E-01	3.219E+02	2.692E-01	3.222E+02	1.495E-03	1.482E-03	.9912
8.000E-01	3.081E+02	2.539E-01	3.084E+02	1.654E-03	1.640E-03	.9918
8.500E-01	2.957E+02	2.404E-01	2.959E+02	1.819E-03	1.806E-03	.9924
9.000E-01	2.842E+02	2.283E-01	2.845E+02	1.992E-03	1.978E-03	.9928
9.500E-01	2.738E+02	2.174E-01	2.740E+02	2.171E-03	2.156E-03	.9932
1.000E+00	2.641E+02	2.075E-01	2.643E+02	2.357E-03	2.342E-03	.9936
1.250E+00	2.257E+02	1.694E-01	2.259E+02	3.384E-03	3.366E-03	.9949
1.500E+00	1.981E+02	1.435E-01	1.983E+02	4.568E-03	4.548E-03	.9957
1.750E+00	1.771E+02	1.246E-01	1.772E+02	5.904E-03	5.882E-03	.9963
2.000E+00	1.605E+02	1.102E-01	1.606E+02	7.388E-03	7.363E-03	.9967
2.250E+00	1.471E+02	9.889E-02	1.472E+02	9.015E-03	8.988E-03	.9969
2.500E+00	1.359E+02	8.974E-02	1.360E+02	1.078E-02	1.075E-02	.9972
2.750E+00	1.265E+02	8.218E-02	1.266E+02	1.269E-02	1.266E-02	.9973
3.000E+00	1.184E+02	7.583E-02	1.185E+02	1.473E-02	1.470E-02	.9975
3.500E+00	1.052E+02	6.573E-02	1.053E+02	1.922E-02	1.918E-02	.9977
4.000E+00	9.485E+01	5.806E-02	9.490E+01	2.423E-02	2.418E-02	.9978
4.500E+00	8.652E+01	5.203E-02	8.657E+01	2.975E-02	2.969E-02	.9980
5.000E+00	7.965E+01	4.717E-02	7.969E+01	3.578E-02	3.571E-02	.9980
5.500E+00	7.387E+01	4.315E-02	7.392E+01	4.230E-02	4.222E-02	.9981
6.000E+00	6.895E+01	3.978E-02	6.899E+01	4.931E-02	4.922E-02	.9982
6.500E+00	6.469E+01	3.691E-02	6.473E+01	5.679E-02	5.669E-02	.9982
7.000E+00	6.098E+01	3.443E-02	6.101E+01	6.475E-02	6.464E-02	.9983
7.500E+00	5.770E+01	3.227E-02	5.773E+01	7.318E-02	7.306E-02	.9983
8.000E+00	5.478E+01	3.038E-02	5.482E+01	8.207E-02	8.194E-02	.9983
8.500E+00	5.218E+01	2.870E-02	5.221E+01	9.142E-02	9.127E-02	.9984
9.000E+00	4.983E+01	2.720E-02	4.986E+01	1.012E-01	1.011E-01	.9984
9.500E+00	4.770E+01	2.585E-02	4.773E+01	1.115E-01	1.113E-01	.9984
1.000E+01	4.577E+01	2.463E-02	4.579E+01	1.222E-01	1.220E-01	.9984
1.250E+01	3.819E+01	1.996E-02	3.821E+01	1.822E-01	1.820E-01	.9985
1.500E+01	3.292E+01	1.680E-02	3.294E+01	2.529E-01	2.526E-01	.9986
1.750E+01	2.903E+01	1.453E-02	2.904E+01	3.339E-01	3.335E-01	.9986
2.000E+01	2.603E+01	1.280E-02	2.604E+01	4.250E-01	4.244E-01	.9987
2.500E+01	2.170E+01	1.036E-02	2.171E+01	6.363E-01	6.355E-01	.9987
2.750E+01	2.007E+01	9.466E-03	2.008E+01	7.562E-01	7.552E-01	.9987
3.000E+01	1.870E+01	8.716E-03	1.871E+01	8.852E-01	8.841E-01	.9987
3.500E+01	1.650E+01	7.530E-03	1.651E+01	1.170E+00	1.169E+00	.9988
4.000E+01	1.482E+01	6.633E-03	1.482E+01	1.491E+00	1.489E+00	.9988
4.500E+01	1.348E+01	5.930E-03	1.348E+01	1.845E+00	1.842E+00	.9988
5.000E+01	1.239E+01	5.365E-03	1.239E+01	2.232E+00	2.229E+00	.9988
5.500E+01	1.149E+01	4.900E-03	1.149E+01	2.651E+00	2.648E+00	.9989
6.000E+01	1.072E+01	4.511E-03	1.073E+01	3.102E+00	3.098E+00	.9989
6.500E+01	1.007E+01	4.180E-03	1.007E+01	3.583E+00	3.579E+00	.9989
7.000E+01	9.505E+00	3.895E-03	9.509E+00	4.094E+00	4.090E+00	.9989
7.500E+01	9.010E+00	3.648E-03	9.014E+00	4.635E+00	4.629E+00	.9989
8.000E+01	8.574E+00	3.430E-03	8.577E+00	5.203E+00	5.198E+00	.9989
8.500E+01	8.186E+00	3.238E-03	8.189E+00	5.800E+00	5.794E+00	.9989
9.000E+01	7.838E+00	3.066E-03	7.841E+00	6.424E+00	6.418E+00	.9989
9.500E+01	7.525E+00	2.913E-03	7.528E+00	7.075E+00	7.068E+00	.9989
1.000E+02	7.242E+00	2.774E-03	7.245E+00	7.753E+00	7.744E+00	.9990

1.250E+02	6.149E+00	2.243E-03	6.151E+00	1.152E+01	1.150E+01	.9990
1.500E+02	5.405E+00	1.885E-03	5.407E+00	1.586E+01	1.585E+01	.9990
1.750E+02	4.866E+00	1.628E-03	4.867E+00	2.075E+01	2.073E+01	.9990
2.000E+02	4.457E+00	1.433E-03	4.458E+00	2.612E+01	2.610E+01	.9991
2.250E+02	4.137E+00	1.281E-03	4.138E+00	3.195E+01	3.192E+01	.9991
2.500E+02	3.879E+00	1.159E-03	3.880E+00	3.819E+01	3.816E+01	.9991
2.750E+02	3.667E+00	1.058E-03	3.668E+00	4.483E+01	4.479E+01	.9991
3.000E+02	3.490E+00	9.743E-04	3.491E+00	5.182E+01	5.177E+01	.9991
3.500E+02	3.213E+00	8.413E-04	3.214E+00	6.677E+01	6.672E+01	.9992
4.000E+02	3.005E+00	7.410E-04	3.006E+00	8.288E+01	8.281E+01	.9992
4.500E+02	2.845E+00	6.625E-04	2.846E+00	9.999E+01	9.991E+01	.9992
5.000E+02	2.718E+00	5.994E-04	2.719E+00	1.180E+02	1.179E+02	.9992
5.500E+02	2.615E+00	5.475E-04	2.616E+00	1.367E+02	1.366E+02	.9993
6.000E+02	2.531E+00	5.041E-04	2.532E+00	1.562E+02	1.561E+02	.9993
6.500E+02	2.461E+00	4.672E-04	2.462E+00	1.762E+02	1.761E+02	.9993
7.000E+02	2.402E+00	4.355E-04	2.402E+00	1.968E+02	1.966E+02	.9993
7.500E+02	2.350E+00	4.079E-04	2.350E+00	2.178E+02	2.177E+02	.9993
8.000E+02	2.306E+00	3.837E-04	2.306E+00	2.393E+02	2.392E+02	.9993
8.500E+02	2.267E+00	3.623E-04	2.267E+00	2.612E+02	2.610E+02	.9993
9.000E+02	2.234E+00	3.432E-04	2.234E+00	2.834E+02	2.832E+02	.9994
9.500E+02	2.204E+00	3.261E-04	2.204E+00	3.059E+02	3.057E+02	.9994
1.000E+03	2.178E+00	3.106E-04	2.178E+00	3.288E+02	3.286E+02	.9994
1.500E+03	2.032E+00	2.117E-04	2.033E+00	5.678E+02	5.675E+02	.9995
2.000E+03	1.980E+00	1.614E-04	1.981E+00	8.175E+02	8.171E+02	.9995
2.500E+03	1.962E+00	1.308E-04	1.962E+00	1.071E+03	1.071E+03	.9996
3.000E+03	1.959E+00	1.102E-04	1.959E+00	1.327E+03	1.326E+03	.9996
4.000E+03	1.970E+00	8.413E-05	1.970E+00	1.836E+03	1.835E+03	.9997
5.000E+03	1.989E+00	6.824E-05	1.989E+00	2.341E+03	2.341E+03	.9997
6.000E+03	2.009E+00	5.752E-05	2.010E+00	2.841E+03	2.841E+03	.9997
7.000E+03	2.030E+00	4.979E-05	2.030E+00	3.337E+03	3.336E+03	.9998
8.000E+03	2.049E+00	4.394E-05	2.049E+00	3.827E+03	3.826E+03	.9998
9.000E+03	2.067E+00	3.935E-05	2.067E+00	4.313E+03	4.312E+03	.9998
1.000E+04	2.084E+00	3.565E-05	2.084E+00	4.794E+03	4.793E+03	.9998

PROTON STOPPING POWER AND RANGE

SODIUM IODIDE

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	4.110E+01	3.564E+00	4.466E+01	3.644E-05	6.397E-06	.1755
1.500E-03	5.034E+01	3.313E+00	5.365E+01	4.654E-05	9.249E-06	.1987
2.000E-03	5.812E+01	3.108E+00	6.123E+01	5.525E-05	1.206E-05	.2182
2.500E-03	6.498E+01	2.937E+00	6.792E+01	6.300E-05	1.481E-05	.2350
3.000E-03	7.119E+01	2.792E+00	7.398E+01	7.004E-05	1.751E-05	.2500
4.000E-03	8.220E+01	2.556E+00	8.475E+01	8.264E-05	2.281E-05	.2760
5.000E-03	9.190E+01	2.369E+00	9.427E+01	9.381E-05	2.797E-05	.2981
6.000E-03	1.007E+02	2.217E+00	1.029E+02	1.040E-04	3.300E-05	.3175
7.000E-03	1.087E+02	2.089E+00	1.108E+02	1.133E-04	3.793E-05	.3347
8.000E-03	1.162E+02	1.979E+00	1.182E+02	1.220E-04	4.275E-05	.3503
9.000E-03	1.233E+02	1.884E+00	1.252E+02	1.303E-04	4.748E-05	.3645
1.000E-02	1.300E+02	1.799E+00	1.318E+02	1.380E-04	5.212E-05	.3776
1.250E-02	1.434E+02	1.626E+00	1.450E+02	1.561E-04	6.343E-05	.4064
1.500E-02	1.552E+02	1.489E+00	1.567E+02	1.727E-04	7.442E-05	.4310
1.750E-02	1.658E+02	1.379E+00	1.671E+02	1.881E-04	8.510E-05	.4524
2.000E-02	1.754E+02	1.286E+00	1.767E+02	2.026E-04	9.552E-05	.4714
2.250E-02	1.842E+02	1.208E+00	1.854E+02	2.165E-04	1.057E-04	.4883
2.500E-02	1.923E+02	1.140E+00	1.934E+02	2.297E-04	1.156E-04	.5036
2.750E-02	1.997E+02	1.081E+00	2.008E+02	2.423E-04	1.254E-04	.5175
3.000E-02	2.066E+02	1.029E+00	2.077E+02	2.546E-04	1.350E-04	.5302
3.500E-02	2.190E+02	9.410E-01	2.199E+02	2.780E-04	1.537E-04	.5529
4.000E-02	2.296E+02	8.688E-01	2.305E+02	3.001E-04	1.719E-04	.5726
4.500E-02	2.389E+02	8.086E-01	2.397E+02	3.214E-04	1.896E-04	.5899
5.000E-02	2.468E+02	7.573E-01	2.475E+02	3.419E-04	2.070E-04	.6054
5.500E-02	2.535E+02	7.130E-01	2.542E+02	3.618E-04	2.241E-04	.6193
6.000E-02	2.592E+02	6.743E-01	2.599E+02	3.813E-04	2.410E-04	.6320
6.500E-02	2.640E+02	6.402E-01	2.647E+02	4.003E-04	2.577E-04	.6436
7.000E-02	2.680E+02	6.097E-01	2.686E+02	4.191E-04	2.742E-04	.6543
7.500E-02	2.711E+02	5.825E-01	2.717E+02	4.376E-04	2.907E-04	.6643
8.000E-02	2.736E+02	5.579E-01	2.741E+02	4.559E-04	3.071E-04	.6735
8.500E-02	2.754E+02	5.355E-01	2.759E+02	4.741E-04	3.234E-04	.6822
9.000E-02	2.767E+02	5.151E-01	2.772E+02	4.922E-04	3.398E-04	.6904
9.500E-02	2.774E+02	4.963E-01	2.779E+02	5.102E-04	3.562E-04	.6981
1.000E-01	2.777E+02	4.791E-01	2.781E+02	5.282E-04	3.726E-04	.7054
1.250E-01	2.737E+02	4.098E-01	2.741E+02	6.185E-04	4.558E-04	.7370
1.500E-01	2.642E+02	3.596E-01	2.646E+02	7.112E-04	5.423E-04	.7625
1.750E-01	2.523E+02	3.214E-01	2.526E+02	8.079E-04	6.332E-04	.7837
2.000E-01	2.397E+02	2.912E-01	2.400E+02	9.094E-04	7.292E-04	.8018
2.250E-01	2.276E+02	2.666E-01	2.278E+02	1.016E-03	8.307E-04	.8174
2.500E-01	2.162E+02	2.463E-01	2.165E+02	1.129E-03	9.381E-04	.8309
2.750E-01	2.059E+02	2.291E-01	2.061E+02	1.247E-03	1.051E-03	.8428
3.000E-01	1.966E+02	2.143E-01	1.968E+02	1.371E-03	1.170E-03	.8532

3.500E-01	1.807E+02	1.903E-01	1.809E+02	1.637E-03	1.425E-03	.8706
4.000E-01	1.678E+02	1.715E-01	1.680E+02	1.924E-03	1.701E-03	.8843
4.500E-01	1.573E+02	1.563E-01	1.575E+02	2.232E-03	1.998E-03	.8954
5.000E-01	1.485E+02	1.438E-01	1.487E+02	2.559E-03	2.314E-03	.9044
5.500E-01	1.411E+02	1.333E-01	1.412E+02	2.904E-03	2.648E-03	.9119
6.000E-01	1.347E+02	1.243E-01	1.348E+02	3.266E-03	2.999E-03	.9182
6.500E-01	1.291E+02	1.166E-01	1.292E+02	3.645E-03	3.367E-03	.9235
7.000E-01	1.241E+02	1.098E-01	1.242E+02	4.040E-03	3.750E-03	.9281
7.500E-01	1.197E+02	1.039E-01	1.198E+02	4.450E-03	4.148E-03	.9320
8.000E-01	1.157E+02	9.857E-02	1.158E+02	4.875E-03	4.560E-03	.9355
8.500E-01	1.119E+02	9.382E-02	1.120E+02	5.314E-03	4.987E-03	.9385
9.000E-01	1.084E+02	8.954E-02	1.085E+02	5.767E-03	5.428E-03	.9412
9.500E-01	1.051E+02	8.567E-02	1.051E+02	6.236E-03	5.884E-03	.9436
1.000E+00	1.019E+02	8.214E-02	1.020E+02	6.718E-03	6.354E-03	.9457
1.250E+00	8.879E+01	6.831E-02	8.886E+01	9.352E-03	8.921E-03	.9539
1.500E+00	7.899E+01	5.869E-02	7.905E+01	1.234E-02	1.184E-02	.9593
1.750E+00	7.148E+01	5.157E-02	7.153E+01	1.567E-02	1.509E-02	.9631
2.000E+00	6.554E+01	4.609E-02	6.559E+01	1.933E-02	1.867E-02	.9659
2.250E+00	6.075E+01	4.172E-02	6.079E+01	2.329E-02	2.254E-02	.9680
2.500E+00	5.680E+01	3.815E-02	5.684E+01	2.755E-02	2.671E-02	.9697
2.750E+00	5.349E+01	3.518E-02	5.352E+01	3.208E-02	3.115E-02	.9711
3.000E+00	5.066E+01	3.266E-02	5.070E+01	3.688E-02	3.586E-02	.9723
3.500E+00	4.606E+01	2.862E-02	4.609E+01	4.724E-02	4.602E-02	.9741
4.000E+00	4.233E+01	2.551E-02	4.236E+01	5.857E-02	5.713E-02	.9754
4.500E+00	3.926E+01	2.305E-02	3.928E+01	7.084E-02	6.918E-02	.9765
5.000E+00	3.666E+01	2.104E-02	3.668E+01	8.402E-02	8.213E-02	.9774
5.500E+00	3.444E+01	1.937E-02	3.446E+01	9.810E-02	9.595E-02	.9781
6.000E+00	3.250E+01	1.795E-02	3.252E+01	1.130E-01	1.106E-01	.9788
6.500E+00	3.082E+01	1.674E-02	3.084E+01	1.288E-01	1.262E-01	.9793
7.000E+00	2.932E+01	1.569E-02	2.934E+01	1.455E-01	1.425E-01	.9798
7.500E+00	2.798E+01	1.477E-02	2.800E+01	1.629E-01	1.597E-01	.9802
8.000E+00	2.677E+01	1.396E-02	2.678E+01	1.812E-01	1.777E-01	.9806
8.500E+00	2.567E+01	1.323E-02	2.569E+01	2.002E-01	1.964E-01	.9809
9.000E+00	2.467E+01	1.258E-02	2.468E+01	2.201E-01	2.160E-01	.9813
9.500E+00	2.376E+01	1.200E-02	2.377E+01	2.408E-01	2.363E-01	.9815
1.000E+01	2.293E+01	1.147E-02	2.294E+01	2.622E-01	2.574E-01	.9818
1.250E+01	1.958E+01	9.413E-03	1.959E+01	3.805E-01	3.740E-01	.9829
1.500E+01	1.719E+01	8.005E-03	1.719E+01	5.171E-01	5.086E-01	.9836
1.750E+01	1.537E+01	6.977E-03	1.538E+01	6.711E-01	6.605E-01	.9842
2.000E+01	1.394E+01	6.192E-03	1.395E+01	8.420E-01	8.291E-01	.9847
2.500E+01	1.183E+01	5.069E-03	1.184E+01	1.233E+00	1.215E+00	.9854
2.750E+01	1.103E+01	4.652E-03	1.103E+01	1.452E+00	1.431E+00	.9857
3.000E+01	1.034E+01	4.301E-03	1.035E+01	1.686E+00	1.662E+00	.9860
3.500E+01	9.223E+00	3.742E-03	9.227E+00	2.198E+00	2.169E+00	.9864
4.000E+01	8.352E+00	3.316E-03	8.355E+00	2.769E+00	2.732E+00	.9868
4.500E+01	7.653E+00	2.980E-03	7.656E+00	3.395E+00	3.351E+00	.9871
5.000E+01	7.078E+00	2.707E-03	7.081E+00	4.074E+00	4.023E+00	.9873
5.500E+01	6.597E+00	2.482E-03	6.600E+00	4.806E+00	4.747E+00	.9875
6.000E+01	6.188E+00	2.293E-03	6.191E+00	5.589E+00	5.521E+00	.9877
6.500E+01	5.836E+00	2.131E-03	5.838E+00	6.421E+00	6.344E+00	.9879
7.000E+01	5.529E+00	1.991E-03	5.531E+00	7.302E+00	7.215E+00	.9881
7.500E+01	5.259E+00	1.869E-03	5.261E+00	8.229E+00	8.132E+00	.9882
8.000E+01	5.020E+00	1.762E-03	5.021E+00	9.202E+00	9.095E+00	.9883
8.500E+01	4.806E+00	1.667E-03	4.808E+00	1.022E+01	1.010E+01	.9885
9.000E+01	4.614E+00	1.581E-03	4.615E+00	1.128E+01	1.115E+01	.9886
9.500E+01	4.440E+00	1.505E-03	4.442E+00	1.239E+01	1.225E+01	.9887
1.000E+02	4.283E+00	1.435E-03	4.284E+00	1.353E+01	1.338E+01	.9888

1.250E+02	3.670E+00	1.168E-03	3.671E+00	1.986E+01	1.965E+01	.9892
1.500E+02	3.248E+00	9.869E-04	3.249E+00	2.712E+01	2.684E+01	.9896
1.750E+02	2.940E+00	8.555E-04	2.941E+00	3.523E+01	3.487E+01	.9899
2.000E+02	2.705E+00	7.557E-04	2.706E+00	4.410E+01	4.367E+01	.9902
2.250E+02	2.521E+00	6.772E-04	2.521E+00	5.368E+01	5.317E+01	.9904
2.500E+02	2.371E+00	6.139E-04	2.372E+00	6.391E+01	6.331E+01	.9906
2.750E+02	2.249E+00	5.617E-04	2.249E+00	7.475E+01	7.406E+01	.9908
3.000E+02	2.146E+00	5.179E-04	2.146E+00	8.613E+01	8.536E+01	.9910
3.500E+02	1.984E+00	4.485E-04	1.984E+00	1.104E+02	1.094E+02	.9913
4.000E+02	1.863E+00	3.958E-04	1.863E+00	1.364E+02	1.353E+02	.9916
4.500E+02	1.769E+00	3.545E-04	1.769E+00	1.640E+02	1.627E+02	.9919
5.000E+02	1.695E+00	3.212E-04	1.695E+00	1.929E+02	1.914E+02	.9921
5.500E+02	1.635E+00	2.937E-04	1.636E+00	2.229E+02	2.212E+02	.9923
6.000E+02	1.586E+00	2.707E-04	1.587E+00	2.540E+02	2.521E+02	.9925
6.500E+02	1.546E+00	2.512E-04	1.546E+00	2.859E+02	2.838E+02	.9927
7.000E+02	1.511E+00	2.343E-04	1.512E+00	3.186E+02	3.164E+02	.9929
7.500E+02	1.483E+00	2.196E-04	1.483E+00	3.520E+02	3.496E+02	.9930
8.000E+02	1.458E+00	2.067E-04	1.458E+00	3.861E+02	3.834E+02	.9932
8.500E+02	1.437E+00	1.953E-04	1.437E+00	4.206E+02	4.178E+02	.9933
9.000E+02	1.419E+00	1.851E-04	1.419E+00	4.556E+02	4.526E+02	.9934
9.500E+02	1.403E+00	1.760E-04	1.403E+00	4.911E+02	4.879E+02	.9936
1.000E+03	1.389E+00	1.677E-04	1.389E+00	5.269E+02	5.236E+02	.9937
1.500E+03	1.319E+00	1.147E-04	1.319E+00	8.983E+02	8.934E+02	.9946
2.000E+03	1.303E+00	8.761E-05	1.303E+00	1.280E+03	1.274E+03	.9953
2.500E+03	1.305E+00	7.111E-05	1.305E+00	1.664E+03	1.657E+03	.9957
3.000E+03	1.315E+00	5.997E-05	1.315E+00	2.046E+03	2.038E+03	.9961
4.000E+03	1.340E+00	4.585E-05	1.340E+00	2.799E+03	2.790E+03	.9966
5.000E+03	1.366E+00	3.723E-05	1.366E+00	3.538E+03	3.528E+03	.9970
6.000E+03	1.391E+00	3.141E-05	1.391E+00	4.264E+03	4.252E+03	.9973
7.000E+03	1.414E+00	2.721E-05	1.414E+00	4.976E+03	4.964E+03	.9975
8.000E+03	1.435E+00	2.402E-05	1.435E+00	5.678E+03	5.665E+03	.9977
9.000E+03	1.454E+00	2.153E-05	1.454E+00	6.371E+03	6.357E+03	.9979
1.000E+04	1.471E+00	1.951E-05	1.471E+00	7.054E+03	7.040E+03	.9980

PROTON STOPPING POWER AND RANGE

MS20 TISSUE SUBSTITUTE

T = Proton kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP(e)	STOP(n)	STOP(t)	RANGE(c)	RANGE(p)	DETOUR
1.000E-03	1.744E+02	3.897E+01	2.134E+02	5.705E-06	2.681E-06	.4699
1.500E-03	2.136E+02	3.143E+01	2.450E+02	7.874E-06	4.019E-06	.5104
2.000E-03	2.467E+02	2.668E+01	2.733E+02	9.804E-06	5.318E-06	.5424
2.500E-03	2.758E+02	2.335E+01	2.991E+02	1.155E-05	6.566E-06	.5685
3.000E-03	3.021E+02	2.087E+01	3.230E+02	1.316E-05	7.766E-06	.5902
4.000E-03	3.450E+02	1.736E+01	3.623E+02	1.608E-05	1.005E-05	.6251
5.000E-03	3.832E+02	1.497E+01	3.982E+02	1.871E-05	1.220E-05	.6523
6.000E-03	4.177E+02	1.322E+01	4.310E+02	2.112E-05	1.424E-05	.6742
7.000E-03	4.494E+02	1.188E+01	4.612E+02	2.336E-05	1.617E-05	.6923
8.000E-03	4.779E+02	1.081E+01	4.888E+02	2.546E-05	1.802E-05	.7077
9.000E-03	5.043E+02	9.934E+00	5.142E+02	2.746E-05	1.980E-05	.7211
1.000E-02	5.288E+02	9.205E+00	5.380E+02	2.936E-05	2.151E-05	.7327
1.250E-02	5.781E+02	7.812E+00	5.859E+02	3.380E-05	2.558E-05	.7567
1.500E-02	6.198E+02	6.816E+00	6.266E+02	3.792E-05	2.941E-05	.7755
1.750E-02	6.560E+02	6.064E+00	6.621E+02	4.180E-05	3.306E-05	.7908
2.000E-02	6.882E+02	5.474E+00	6.937E+02	4.549E-05	3.655E-05	.8035
2.250E-02	7.167E+02	4.997E+00	7.217E+02	4.902E-05	3.992E-05	.8143
2.500E-02	7.420E+02	4.603E+00	7.466E+02	5.243E-05	4.318E-05	.8237
2.750E-02	7.644E+02	4.272E+00	7.687E+02	5.572E-05	4.636E-05	.8320
3.000E-02	7.844E+02	3.989E+00	7.884E+02	5.893E-05	4.946E-05	.8393
3.500E-02	8.193E+02	3.529E+00	8.228E+02	6.514E-05	5.548E-05	.8517
4.000E-02	8.487E+02	3.171E+00	8.518E+02	7.111E-05	6.129E-05	.8620
4.500E-02	8.728E+02	2.884E+00	8.757E+02	7.689E-05	6.695E-05	.8707
5.000E-02	8.920E+02	2.648E+00	8.946E+02	8.254E-05	7.248E-05	.8781
5.500E-02	9.064E+02	2.451E+00	9.088E+02	8.808E-05	7.792E-05	.8846
6.000E-02	9.168E+02	2.283E+00	9.190E+02	9.355E-05	8.330E-05	.8904
6.500E-02	9.237E+02	2.138E+00	9.259E+02	9.897E-05	8.864E-05	.8956
7.000E-02	9.278E+02	2.011E+00	9.298E+02	1.044E-04	9.395E-05	.9003
7.500E-02	9.294E+02	1.900E+00	9.313E+02	1.097E-04	9.925E-05	.9045
8.000E-02	9.288E+02	1.801E+00	9.306E+02	1.151E-04	1.046E-04	.9084
8.500E-02	9.264E+02	1.713E+00	9.281E+02	1.205E-04	1.099E-04	.9120
9.000E-02	9.223E+02	1.633E+00	9.239E+02	1.259E-04	1.152E-04	.9153
9.500E-02	9.169E+02	1.562E+00	9.185E+02	1.313E-04	1.206E-04	.9183
1.000E-01	9.104E+02	1.496E+00	9.119E+02	1.368E-04	1.260E-04	.9212
1.250E-01	8.666E+02	1.241E+00	8.679E+02	1.648E-04	1.538E-04	.9332
1.500E-01	8.145E+02	1.064E+00	8.155E+02	1.945E-04	1.833E-04	.9423
1.750E-01	7.620E+02	9.336E-01	7.629E+02	2.262E-04	2.148E-04	.9495
2.000E-01	7.128E+02	8.332E-01	7.137E+02	2.601E-04	2.485E-04	.9554
2.250E-01	6.683E+02	7.534E-01	6.690E+02	2.963E-04	2.845E-04	.9602
2.500E-01	6.286E+02	6.884E-01	6.292E+02	3.349E-04	3.229E-04	.9642
2.750E-01	5.933E+02	6.338E-01	5.940E+02	3.758E-04	3.636E-04	.9676
3.000E-01	5.621E+02	5.874E-01	5.627E+02	4.190E-04	4.067E-04	.9706

3.500E-01	5.077E+02	5.132E-01	5.082E+02	5.126E-04	4.999E-04	.9752
4.000E-01	4.633E+02	4.563E-01	4.637E+02	6.158E-04	6.027E-04	.9788
4.500E-01	4.276E+02	4.113E-01	4.280E+02	7.281E-04	7.147E-04	.9815
5.000E-01	3.989E+02	3.748E-01	3.993E+02	8.492E-04	8.353E-04	.9837
5.500E-01	3.753E+02	3.444E-01	3.757E+02	9.784E-04	9.641E-04	.9854
6.000E-01	3.547E+02	3.188E-01	3.550E+02	1.115E-03	1.101E-03	.9868
6.500E-01	3.367E+02	2.968E-01	3.370E+02	1.260E-03	1.245E-03	.9880
7.000E-01	3.206E+02	2.778E-01	3.209E+02	1.412E-03	1.397E-03	.9890
7.500E-01	3.062E+02	2.611E-01	3.065E+02	1.572E-03	1.556E-03	.9898
8.000E-01	2.933E+02	2.464E-01	2.936E+02	1.738E-03	1.722E-03	.9905
8.500E-01	2.816E+02	2.333E-01	2.818E+02	1.912E-03	1.895E-03	.9911
9.000E-01	2.709E+02	2.216E-01	2.711E+02	2.093E-03	2.076E-03	.9916
9.500E-01	2.610E+02	2.111E-01	2.612E+02	2.281E-03	2.263E-03	.9921
1.000E+00	2.520E+02	2.016E-01	2.522E+02	2.476E-03	2.457E-03	.9925
1.250E+00	2.157E+02	1.647E-01	2.159E+02	3.551E-03	3.530E-03	.9940
1.500E+00	1.895E+02	1.396E-01	1.897E+02	4.790E-03	4.766E-03	.9950
1.750E+00	1.696E+02	1.213E-01	1.697E+02	6.186E-03	6.158E-03	.9956
2.000E+00	1.539E+02	1.074E-01	1.540E+02	7.734E-03	7.703E-03	.9960
2.250E+00	1.411E+02	9.639E-02	1.412E+02	9.432E-03	9.397E-03	.9963
2.500E+00	1.304E+02	8.751E-02	1.305E+02	1.128E-02	1.124E-02	.9966
2.750E+00	1.215E+02	8.017E-02	1.215E+02	1.326E-02	1.322E-02	.9968
3.000E+00	1.138E+02	7.399E-02	1.138E+02	1.539E-02	1.534E-02	.9970
3.500E+00	1.012E+02	6.418E-02	1.012E+02	2.006E-02	2.000E-02	.9972
4.000E+00	9.131E+01	5.673E-02	9.137E+01	2.526E-02	2.520E-02	.9974
4.500E+00	8.336E+01	5.086E-02	8.341E+01	3.100E-02	3.092E-02	.9975
5.000E+00	7.679E+01	4.612E-02	7.684E+01	3.725E-02	3.716E-02	.9976
5.500E+00	7.127E+01	4.221E-02	7.132E+01	4.401E-02	4.391E-02	.9977
6.000E+00	6.656E+01	3.892E-02	6.660E+01	5.127E-02	5.115E-02	.9978
6.500E+00	6.249E+01	3.613E-02	6.252E+01	5.902E-02	5.889E-02	.9978
7.000E+00	5.892E+01	3.371E-02	5.896E+01	6.726E-02	6.712E-02	.9979
7.500E+00	5.578E+01	3.161E-02	5.581E+01	7.598E-02	7.582E-02	.9979
8.000E+00	5.298E+01	2.976E-02	5.301E+01	8.518E-02	8.500E-02	.9980
8.500E+00	5.048E+01	2.812E-02	5.051E+01	9.484E-02	9.465E-02	.9980
9.000E+00	4.823E+01	2.665E-02	4.825E+01	1.050E-01	1.048E-01	.9980
9.500E+00	4.618E+01	2.533E-02	4.621E+01	1.156E-01	1.153E-01	.9981
1.000E+01	4.432E+01	2.414E-02	4.434E+01	1.266E-01	1.264E-01	.9981
1.250E+01	3.702E+01	1.958E-02	3.704E+01	1.886E-01	1.882E-01	.9982
1.500E+01	3.194E+01	1.649E-02	3.196E+01	2.615E-01	2.610E-01	.9983
1.750E+01	2.819E+01	1.426E-02	2.820E+01	3.449E-01	3.443E-01	.9983
2.000E+01	2.529E+01	1.257E-02	2.530E+01	4.387E-01	4.379E-01	.9983
2.500E+01	2.110E+01	1.018E-02	2.111E+01	6.560E-01	6.550E-01	.9984
2.750E+01	1.953E+01	9.303E-03	1.954E+01	7.792E-01	7.780E-01	.9984
3.000E+01	1.820E+01	8.567E-03	1.821E+01	9.119E-01	9.105E-01	.9985
3.500E+01	1.607E+01	7.403E-03	1.608E+01	1.205E+00	1.203E+00	.9985
4.000E+01	1.443E+01	6.522E-03	1.444E+01	1.534E+00	1.531E+00	.9985
4.500E+01	1.313E+01	5.833E-03	1.314E+01	1.897E+00	1.894E+00	.9985
5.000E+01	1.208E+01	5.277E-03	1.208E+01	2.294E+00	2.291E+00	.9986
5.500E+01	1.120E+01	4.820E-03	1.120E+01	2.724E+00	2.720E+00	.9986
6.000E+01	1.046E+01	4.438E-03	1.046E+01	3.186E+00	3.182E+00	.9986
6.500E+01	9.824E+00	4.113E-03	9.828E+00	3.680E+00	3.675E+00	.9986
7.000E+01	9.274E+00	3.833E-03	9.278E+00	4.204E+00	4.198E+00	.9986
7.500E+01	8.793E+00	3.590E-03	8.797E+00	4.757E+00	4.751E+00	.9987
8.000E+01	8.368E+00	3.376E-03	8.372E+00	5.340E+00	5.333E+00	.9987
8.500E+01	7.991E+00	3.187E-03	7.994E+00	5.952E+00	5.944E+00	.9987
9.000E+01	7.653E+00	3.018E-03	7.656E+00	6.591E+00	6.582E+00	.9987
9.500E+01	7.348E+00	2.867E-03	7.351E+00	7.258E+00	7.248E+00	.9987
1.000E+02	7.072E+00	2.730E-03	7.075E+00	7.951E+00	7.941E+00	.9987

1.250E+02	6.008E+00	2.208E-03	6.010E+00	1.180E+01	1.179E+01	.9988
1.500E+02	5.283E+00	1.856E-03	5.285E+00	1.625E+01	1.623E+01	.9988
1.750E+02	4.757E+00	1.603E-03	4.759E+00	2.125E+01	2.122E+01	.9988
2.000E+02	4.359E+00	1.411E-03	4.360E+00	2.675E+01	2.671E+01	.9988
2.250E+02	4.046E+00	1.262E-03	4.047E+00	3.270E+01	3.267E+01	.9989
2.500E+02	3.795E+00	1.141E-03	3.796E+00	3.909E+01	3.904E+01	.9989
2.750E+02	3.588E+00	1.042E-03	3.589E+00	4.587E+01	4.582E+01	.9989
3.000E+02	3.416E+00	9.595E-04	3.417E+00	5.301E+01	5.295E+01	.9989
3.500E+02	3.145E+00	8.287E-04	3.146E+00	6.829E+01	6.822E+01	.9990
4.000E+02	2.942E+00	7.299E-04	2.943E+00	8.474E+01	8.466E+01	.9990
4.500E+02	2.786E+00	6.526E-04	2.787E+00	1.022E+02	1.021E+02	.9990
5.000E+02	2.662E+00	5.904E-04	2.663E+00	1.206E+02	1.205E+02	.9991
5.500E+02	2.562E+00	5.393E-04	2.563E+00	1.397E+02	1.396E+02	.9991
6.000E+02	2.480E+00	4.966E-04	2.480E+00	1.596E+02	1.594E+02	.9991
6.500E+02	2.412E+00	4.603E-04	2.412E+00	1.800E+02	1.799E+02	.9991
7.000E+02	2.354E+00	4.290E-04	2.355E+00	2.010E+02	2.008E+02	.9991
7.500E+02	2.306E+00	4.019E-04	2.306E+00	2.225E+02	2.223E+02	.9992
8.000E+02	2.264E+00	3.780E-04	2.264E+00	2.444E+02	2.442E+02	.9992
8.500E+02	2.228E+00	3.569E-04	2.228E+00	2.666E+02	2.664E+02	.9992
9.000E+02	2.195E+00	3.381E-04	2.196E+00	2.892E+02	2.890E+02	.9992
9.500E+02	2.167E+00	3.212E-04	2.168E+00	3.122E+02	3.119E+02	.9992
1.000E+03	2.142E+00	3.060E-04	2.143E+00	3.354E+02	3.351E+02	.9992
1.500E+03	2.004E+00	2.086E-04	2.004E+00	5.781E+02	5.777E+02	.9994
2.000E+03	1.956E+00	1.591E-04	1.956E+00	8.311E+02	8.306E+02	.9994
2.500E+03	1.940E+00	1.289E-04	1.940E+00	1.088E+03	1.087E+03	.9995
3.000E+03	1.938E+00	1.086E-04	1.938E+00	1.346E+03	1.345E+03	.9995
4.000E+03	1.951E+00	8.291E-05	1.951E+00	1.860E+03	1.860E+03	.9996
5.000E+03	1.971E+00	6.726E-05	1.971E+00	2.370E+03	2.369E+03	.9996
6.000E+03	1.993E+00	5.670E-05	1.993E+00	2.875E+03	2.874E+03	.9997
7.000E+03	2.013E+00	4.907E-05	2.013E+00	3.374E+03	3.373E+03	.9997
8.000E+03	2.033E+00	4.331E-05	2.033E+00	3.868E+03	3.867E+03	.9997
9.000E+03	2.051E+00	3.878E-05	2.051E+00	4.358E+03	4.357E+03	.9997
1.000E+04	2.068E+00	3.514E-05	2.068E+00	4.844E+03	4.842E+03	.9998

PROTON STOPPING POWER AND RANGE

BONE, COMPACT (ICRU)

T = Proton kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	1.416E+02	3.228E+01	1.738E+02	7.040E-06	2.977E-06	.4228
1.500E-03	1.734E+02	2.629E+01	1.997E+02	9.701E-06	4.471E-06	.4609
2.000E-03	2.002E+02	2.248E+01	2.227E+02	1.207E-05	5.934E-06	.4916
2.500E-03	2.238E+02	1.978E+01	2.436E+02	1.422E-05	7.351E-06	.5171
3.000E-03	2.452E+02	1.776E+01	2.629E+02	1.619E-05	8.722E-06	.5387
4.000E-03	2.813E+02	1.488E+01	2.962E+02	1.977E-05	1.134E-05	.5740
5.000E-03	3.133E+02	1.290E+01	3.262E+02	2.298E-05	1.383E-05	.6018
6.000E-03	3.422E+02	1.144E+01	3.537E+02	2.592E-05	1.619E-05	.6246
7.000E-03	3.688E+02	1.031E+01	3.791E+02	2.865E-05	1.844E-05	.6437
8.000E-03	3.931E+02	9.414E+00	4.025E+02	3.121E-05	2.060E-05	.6600
9.000E-03	4.156E+02	8.675E+00	4.243E+02	3.363E-05	2.268E-05	.6743
1.000E-02	4.368E+02	8.056E+00	4.449E+02	3.593E-05	2.468E-05	.6869
1.250E-02	4.790E+02	6.869E+00	4.859E+02	4.129E-05	2.944E-05	.7129
1.500E-02	5.152E+02	6.014E+00	5.212E+02	4.626E-05	3.394E-05	.7336
1.750E-02	5.470E+02	5.366E+00	5.523E+02	5.091E-05	3.821E-05	.7506
2.000E-02	5.753E+02	4.856E+00	5.802E+02	5.533E-05	4.232E-05	.7648
2.250E-02	6.007E+02	4.442E+00	6.051E+02	5.954E-05	4.627E-05	.7770
2.500E-02	6.234E+02	4.099E+00	6.275E+02	6.360E-05	5.009E-05	.7876
2.750E-02	6.438E+02	3.810E+00	6.476E+02	6.752E-05	5.381E-05	.7970
3.000E-02	6.621E+02	3.562E+00	6.657E+02	7.133E-05	5.744E-05	.8053
3.500E-02	6.942E+02	3.159E+00	6.974E+02	7.866E-05	6.447E-05	.8196
4.000E-02	7.210E+02	2.844E+00	7.239E+02	8.569E-05	7.125E-05	.8314
4.500E-02	7.432E+02	2.591E+00	7.457E+02	9.249E-05	7.783E-05	.8415
5.000E-02	7.609E+02	2.382E+00	7.633E+02	9.912E-05	8.427E-05	.8502
5.500E-02	7.748E+02	2.207E+00	7.770E+02	1.056E-04	9.059E-05	.8578
6.000E-02	7.852E+02	2.058E+00	7.872E+02	1.120E-04	9.683E-05	.8646
6.500E-02	7.926E+02	1.929E+00	7.946E+02	1.183E-04	1.030E-04	.8706
7.000E-02	7.976E+02	1.817E+00	7.994E+02	1.246E-04	1.092E-04	.8761
7.500E-02	8.003E+02	1.717E+00	8.020E+02	1.308E-04	1.153E-04	.8812
8.000E-02	8.011E+02	1.629E+00	8.027E+02	1.371E-04	1.214E-04	.8858
8.500E-02	8.003E+02	1.550E+00	8.018E+02	1.433E-04	1.275E-04	.8900
9.000E-02	7.979E+02	1.479E+00	7.994E+02	1.495E-04	1.337E-04	.8940
9.500E-02	7.944E+02	1.415E+00	7.958E+02	1.558E-04	1.399E-04	.8977
1.000E-01	7.899E+02	1.356E+00	7.912E+02	1.621E-04	1.461E-04	.9011
1.250E-01	7.564E+02	1.128E+00	7.575E+02	1.944E-04	1.779E-04	.9155
1.500E-01	7.145E+02	9.684E-01	7.154E+02	2.283E-04	2.115E-04	.9265
1.750E-01	6.714E+02	8.508E-01	6.722E+02	2.643E-04	2.472E-04	.9353
2.000E-01	6.305E+02	7.602E-01	6.312E+02	3.027E-04	2.853E-04	.9425
2.250E-01	5.932E+02	6.880E-01	5.939E+02	3.436E-04	3.259E-04	.9485
2.500E-01	5.597E+02	6.291E-01	5.604E+02	3.869E-04	3.689E-04	.9535
2.750E-01	5.300E+02	5.797E-01	5.306E+02	4.328E-04	4.145E-04	.9578
3.000E-01	5.035E+02	5.377E-01	5.041E+02	4.812E-04	4.626E-04	.9614

3.500E-01	4.590E+02	4.704E-01	4.595E+02	5.852E-04	5.661E-04	.9673
4.000E-01	4.230E+02	4.187E-01	4.234E+02	6.987E-04	6.789E-04	.9718
4.500E-01	3.933E+02	3.778E-01	3.937E+02	8.212E-04	8.009E-04	.9752
5.000E-01	3.683E+02	3.445E-01	3.687E+02	9.526E-04	9.316E-04	.9780
5.500E-01	3.469E+02	3.169E-01	3.472E+02	1.092E-03	1.071E-03	.9802
6.000E-01	3.281E+02	2.935E-01	3.284E+02	1.241E-03	1.218E-03	.9821
6.500E-01	3.116E+02	2.735E-01	3.119E+02	1.397E-03	1.374E-03	.9836
7.000E-01	2.969E+02	2.561E-01	2.972E+02	1.561E-03	1.538E-03	.9849
7.500E-01	2.837E+02	2.409E-01	2.840E+02	1.733E-03	1.709E-03	.9860
8.000E-01	2.718E+02	2.275E-01	2.720E+02	1.913E-03	1.888E-03	.9870
8.500E-01	2.610E+02	2.155E-01	2.612E+02	2.101E-03	2.075E-03	.9878
9.000E-01	2.511E+02	2.048E-01	2.513E+02	2.296E-03	2.270E-03	.9885
9.500E-01	2.420E+02	1.952E-01	2.422E+02	2.499E-03	2.472E-03	.9891
1.000E+00	2.337E+02	1.864E-01	2.339E+02	2.709E-03	2.681E-03	.9897
1.250E+00	2.003E+02	1.526E-01	2.005E+02	3.867E-03	3.835E-03	.9917
1.500E+00	1.763E+02	1.295E-01	1.764E+02	5.200E-03	5.163E-03	.9930
1.750E+00	1.580E+02	1.127E-01	1.581E+02	6.699E-03	6.658E-03	.9938
2.000E+00	1.435E+02	9.986E-02	1.436E+02	8.361E-03	8.315E-03	.9945
2.250E+00	1.317E+02	8.973E-02	1.318E+02	1.018E-02	1.013E-02	.9949
2.500E+00	1.219E+02	8.153E-02	1.220E+02	1.215E-02	1.210E-02	.9953
2.750E+00	1.136E+02	7.474E-02	1.137E+02	1.428E-02	1.422E-02	.9955
3.000E+00	1.065E+02	6.903E-02	1.065E+02	1.655E-02	1.648E-02	.9958
3.500E+00	9.484E+01	5.994E-02	9.490E+01	2.153E-02	2.145E-02	.9961
4.000E+00	8.571E+01	5.303E-02	8.576E+01	2.708E-02	2.699E-02	.9963
4.500E+00	7.834E+01	4.759E-02	7.838E+01	3.319E-02	3.308E-02	.9965
5.000E+00	7.224E+01	4.318E-02	7.228E+01	3.984E-02	3.971E-02	.9967
5.500E+00	6.711E+01	3.955E-02	6.715E+01	4.702E-02	4.687E-02	.9968
6.000E+00	6.272E+01	3.649E-02	6.276E+01	5.473E-02	5.456E-02	.9969
6.500E+00	5.892E+01	3.388E-02	5.896E+01	6.295E-02	6.276E-02	.9970
7.000E+00	5.560E+01	3.163E-02	5.563E+01	7.169E-02	7.148E-02	.9971
7.500E+00	5.266E+01	2.967E-02	5.269E+01	8.093E-02	8.069E-02	.9971
8.000E+00	5.005E+01	2.795E-02	5.008E+01	9.067E-02	9.041E-02	.9972
8.500E+00	4.771E+01	2.641E-02	4.774E+01	1.009E-01	1.006E-01	.9972
9.000E+00	4.560E+01	2.505E-02	4.562E+01	1.116E-01	1.113E-01	.9973
9.500E+00	4.368E+01	2.382E-02	4.371E+01	1.228E-01	1.225E-01	.9973
1.000E+01	4.194E+01	2.271E-02	4.196E+01	1.345E-01	1.341E-01	.9973
1.250E+01	3.509E+01	1.844E-02	3.511E+01	1.999E-01	1.994E-01	.9975
1.500E+01	3.032E+01	1.554E-02	3.033E+01	2.768E-01	2.761E-01	.9976
1.750E+01	2.678E+01	1.345E-02	2.679E+01	3.647E-01	3.638E-01	.9976
2.000E+01	2.405E+01	1.187E-02	2.406E+01	4.633E-01	4.622E-01	.9977
2.500E+01	2.009E+01	9.619E-03	2.010E+01	6.917E-01	6.902E-01	.9978
2.750E+01	1.861E+01	8.793E-03	1.861E+01	8.211E-01	8.193E-01	.9978
3.000E+01	1.735E+01	8.100E-03	1.736E+01	9.602E-01	9.582E-01	.9978
3.500E+01	1.533E+01	7.003E-03	1.534E+01	1.267E+00	1.265E+00	.9979
4.000E+01	1.378E+01	6.173E-03	1.378E+01	1.612E+00	1.609E+00	.9979
4.500E+01	1.254E+01	5.522E-03	1.255E+01	1.993E+00	1.989E+00	.9980
5.000E+01	1.154E+01	4.998E-03	1.155E+01	2.408E+00	2.404E+00	.9980
5.500E+01	1.071E+01	4.567E-03	1.071E+01	2.858E+00	2.853E+00	.9980
6.000E+01	1.000E+01	4.205E-03	1.001E+01	3.342E+00	3.335E+00	.9981
6.500E+01	9.398E+00	3.898E-03	9.401E+00	3.858E+00	3.850E+00	.9981
7.000E+01	8.874E+00	3.633E-03	8.878E+00	4.405E+00	4.397E+00	.9981
7.500E+01	8.416E+00	3.403E-03	8.420E+00	4.984E+00	4.974E+00	.9981
8.000E+01	8.012E+00	3.201E-03	8.015E+00	5.593E+00	5.582E+00	.9981
8.500E+01	7.652E+00	3.022E-03	7.655E+00	6.231E+00	6.220E+00	.9982
9.000E+01	7.329E+00	2.862E-03	7.332E+00	6.899E+00	6.886E+00	.9982
9.500E+01	7.039E+00	2.719E-03	7.042E+00	7.595E+00	7.581E+00	.9982
1.000E+02	6.776E+00	2.590E-03	6.778E+00	8.319E+00	8.304E+00	.9982

1.250E+02	5.760E+00	2.095E-03	5.762E+00	1.234E+01	1.232E+01	.9983
1.500E+02	5.068E+00	1.762E-03	5.070E+00	1.698E+01	1.695E+01	.9983
1.750E+02	4.566E+00	1.522E-03	4.567E+00	2.218E+01	2.215E+01	.9984
2.000E+02	4.185E+00	1.340E-03	4.186E+00	2.791E+01	2.786E+01	.9984
2.250E+02	3.886E+00	1.198E-03	3.887E+00	3.411E+01	3.406E+01	.9984
2.500E+02	3.645E+00	1.084E-03	3.646E+00	4.076E+01	4.070E+01	.9985
2.750E+02	3.448E+00	9.902E-04	3.449E+00	4.782E+01	4.774E+01	.9985
3.000E+02	3.283E+00	9.116E-04	3.284E+00	5.525E+01	5.517E+01	.9985
3.500E+02	3.024E+00	7.874E-04	3.024E+00	7.115E+01	7.104E+01	.9986
4.000E+02	2.830E+00	6.936E-04	2.830E+00	8.826E+01	8.814E+01	.9986
4.500E+02	2.680E+00	6.202E-04	2.681E+00	1.064E+02	1.063E+02	.9987
5.000E+02	2.561E+00	5.612E-04	2.562E+00	1.255E+02	1.254E+02	.9987
5.500E+02	2.466E+00	5.126E-04	2.466E+00	1.454E+02	1.452E+02	.9987
6.000E+02	2.385E+00	4.720E-04	2.386E+00	1.660E+02	1.658E+02	.9988
6.500E+02	2.318E+00	4.375E-04	2.318E+00	1.873E+02	1.871E+02	.9988
7.000E+02	2.261E+00	4.079E-04	2.261E+00	2.092E+02	2.089E+02	.9988
7.500E+02	2.212E+00	3.820E-04	2.213E+00	2.315E+02	2.312E+02	.9988
8.000E+02	2.171E+00	3.594E-04	2.171E+00	2.543E+02	2.540E+02	.9989
8.500E+02	2.135E+00	3.393E-04	2.135E+00	2.776E+02	2.772E+02	.9989
9.000E+02	2.103E+00	3.215E-04	2.103E+00	3.012E+02	3.008E+02	.9989
9.500E+02	2.076E+00	3.054E-04	2.076E+00	3.251E+02	3.247E+02	.9989
1.000E+03	2.051E+00	2.910E-04	2.052E+00	3.493E+02	3.490E+02	.9990
1.500E+03	1.916E+00	1.984E-04	1.916E+00	6.030E+02	6.025E+02	.9991
2.000E+03	1.869E+00	1.513E-04	1.869E+00	8.677E+02	8.670E+02	.9992
2.500E+03	1.854E+00	1.227E-04	1.854E+00	1.137E+03	1.136E+03	.9993
3.000E+03	1.852E+00	1.033E-04	1.852E+00	1.406E+03	1.406E+03	.9993
4.000E+03	1.865E+00	7.889E-05	1.865E+00	1.945E+03	1.944E+03	.9994
5.000E+03	1.885E+00	6.400E-05	1.885E+00	2.478E+03	2.477E+03	.9995
6.000E+03	1.907E+00	5.396E-05	1.907E+00	3.005E+03	3.004E+03	.9995
7.000E+03	1.927E+00	4.670E-05	1.927E+00	3.527E+03	3.526E+03	.9996
8.000E+03	1.947E+00	4.122E-05	1.947E+00	4.043E+03	4.042E+03	.9996
9.000E+03	1.965E+00	3.692E-05	1.965E+00	4.554E+03	4.553E+03	.9996
1.000E+04	1.982E+00	3.345E-05	1.982E+00	5.061E+03	5.059E+03	.9997

Electrons in HYDROGEN

Density, g/cm³
8.3748E-05 I, eV
19.2

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²		
1.000E-02	5.124E+01	9.702E-04	5.124E+01	1.076E-04	1.029E-05	0.000E+00
1.250E-02	4.271E+01	9.793E-04	4.271E+01	1.613E-04	1.242E-05	0.000E+00
1.500E-02	3.681E+01	9.881E-04	3.682E+01	2.245E-04	1.450E-05	0.000E+00
1.750E-02	3.249E+01	9.964E-04	3.249E+01	2.970E-04	1.654E-05	0.000E+00
2.000E-02	2.916E+01	1.004E-03	2.916E+01	3.783E-04	1.854E-05	0.000E+00
2.500E-02	2.439E+01	1.019E-03	2.439E+01	5.667E-04	2.246E-05	0.000E+00
3.000E-02	2.110E+01	1.034E-03	2.110E+01	7.878E-04	2.628E-05	0.000E+00
3.500E-02	1.870E+01	1.048E-03	1.870E+01	1.040E-03	3.003E-05	0.000E+00
4.000E-02	1.687E+01	1.061E-03	1.687E+01	1.322E-03	3.371E-05	0.000E+00
4.500E-02	1.542E+01	1.075E-03	1.542E+01	1.633E-03	3.733E-05	0.000E+00
5.000E-02	1.424E+01	1.088E-03	1.424E+01	1.970E-03	4.091E-05	0.000E+00
5.500E-02	1.327E+01	1.101E-03	1.327E+01	2.334E-03	4.443E-05	0.000E+00
6.000E-02	1.245E+01	1.113E-03	1.245E+01	2.724E-03	4.791E-05	0.000E+00
7.000E-02	1.114E+01	1.138E-03	1.114E+01	3.575E-03	5.476E-05	0.000E+00
8.000E-02	1.015E+01	1.164E-03	1.015E+01	4.517E-03	6.147E-05	0.000E+00
9.000E-02	9.367E+00	1.190E-03	9.368E+00	5.544E-03	6.807E-05	0.000E+00
1.000E-01	8.737E+00	1.216E-03	8.738E+00	6.650E-03	7.457E-05	0.000E+00
1.250E-01	7.590E+00	1.285E-03	7.591E+00	9.733E-03	9.051E-05	0.000E+00
1.500E-01	6.818E+00	1.357E-03	6.820E+00	1.322E-02	1.061E-04	0.000E+00
1.750E-01	6.265E+00	1.433E-03	6.267E+00	1.705E-02	1.215E-04	0.000E+00
2.000E-01	5.851E+00	1.511E-03	5.852E+00	2.118E-02	1.367E-04	0.000E+00
2.500E-01	5.274E+00	1.677E-03	5.276E+00	3.021E-02	1.670E-04	0.000E+00
3.000E-01	4.897E+00	1.852E-03	4.899E+00	4.007E-02	1.971E-04	0.000E+00
3.500E-01	4.635E+00	2.037E-03	4.637E+00	5.057E-02	2.273E-04	0.000E+00
4.000E-01	4.445E+00	2.232E-03	4.447E+00	6.159E-02	2.577E-04	0.000E+00
4.500E-01	4.302E+00	2.436E-03	4.305E+00	7.303E-02	2.884E-04	0.000E+00
5.000E-01	4.193E+00	2.648E-03	4.196E+00	8.480E-02	3.194E-04	0.000E+00
5.500E-01	4.108E+00	2.869E-03	4.111E+00	9.684E-02	3.508E-04	0.000E+00
6.000E-01	4.041E+00	3.096E-03	4.044E+00	1.091E-01	3.825E-04	0.000E+00
7.000E-01	3.945E+00	3.573E-03	3.949E+00	1.342E-01	4.471E-04	0.000E+00
8.000E-01	3.883E+00	4.076E-03	3.887E+00	1.597E-01	5.133E-04	0.000E+00
9.000E-01	3.842E+00	4.603E-03	3.846E+00	1.856E-01	5.810E-04	0.000E+00
1.000E+00	3.815E+00	5.152E-03	3.821E+00	2.117E-01	6.501E-04	0.000E+00
1.250E+00	3.787E+00	6.614E-03	3.794E+00	2.774E-01	8.289E-04	0.000E+00
1.500E+00	3.788E+00	8.190E-03	3.796E+00	3.433E-01	1.016E-03	0.000E+00
1.750E+00	3.802E+00	9.862E-03	3.812E+00	4.090E-01	1.209E-03	0.000E+00
2.000E+00	3.823E+00	1.162E-02	3.835E+00	4.744E-01	1.409E-03	0.000E+00
2.500E+00	3.873E+00	1.534E-02	3.888E+00	6.039E-01	1.824E-03	0.000E+00
3.000E+00	3.924E+00	1.931E-02	3.943E+00	7.316E-01	2.257E-03	0.000E+00
3.500E+00	3.973E+00	2.348E-02	3.997E+00	8.576E-01	2.703E-03	0.000E+00
4.000E+00	4.020E+00	2.782E-02	4.047E+00	9.819E-01	3.162E-03	0.000E+00

4.500E+00	4.063E+00	3.230E-02	4.095E+00	1.105E+00	3.631E-03	0.000E+00
5.000E+00	4.103E+00	3.693E-02	4.140E+00	1.226E+00	4.108E-03	0.000E+00
5.500E+00	4.140E+00	4.166E-02	4.182E+00	1.346E+00	4.593E-03	0.000E+00
6.000E+00	4.175E+00	4.650E-02	4.222E+00	1.465E+00	5.084E-03	0.000E+00
7.000E+00	4.238E+00	5.647E-02	4.295E+00	1.700E+00	6.083E-03	0.000E+00
8.000E+00	4.295E+00	6.675E-02	4.361E+00	1.931E+00	7.101E-03	0.000E+00
9.000E+00	4.345E+00	7.731E-02	4.422E+00	2.159E+00	8.134E-03	0.000E+00
1.000E+01	4.390E+00	8.809E-02	4.479E+00	2.383E+00	9.178E-03	0.000E+00
1.250E+01	4.488E+00	1.159E-01	4.604E+00	2.934E+00	1.183E-02	0.000E+00
1.500E+01	4.569E+00	1.448E-01	4.714E+00	3.470E+00	1.451E-02	0.000E+00
1.750E+01	4.638E+00	1.744E-01	4.812E+00	3.995E+00	1.722E-02	0.000E+00
2.000E+01	4.698E+00	2.046E-01	4.903E+00	4.510E+00	1.994E-02	0.000E+00
2.500E+01	4.799E+00	2.667E-01	5.065E+00	5.513E+00	2.540E-02	0.000E+00
3.000E+01	4.881E+00	3.305E-01	5.212E+00	6.486E+00	3.084E-02	0.000E+00
3.500E+01	4.951E+00	3.955E-01	5.347E+00	7.433E+00	3.625E-02	0.000E+00
4.000E+01	5.010E+00	4.615E-01	5.471E+00	8.357E+00	4.161E-02	1.249E-02
4.500E+01	5.055E+00	5.283E-01	5.583E+00	9.261E+00	4.693E-02	6.872E-02
5.000E+01	5.090E+00	5.959E-01	5.686E+00	1.015E+01	5.221E-02	1.504E-01
5.500E+01	5.119E+00	6.640E-01	5.783E+00	1.102E+01	5.745E-02	2.451E-01
6.000E+01	5.144E+00	7.326E-01	5.876E+00	1.188E+01	6.264E-02	3.459E-01
7.000E+01	5.183E+00	8.713E-01	6.054E+00	1.355E+01	7.289E-02	5.514E-01
8.000E+01	5.213E+00	1.011E+00	6.224E+00	1.518E+01	8.293E-02	7.512E-01
9.000E+01	5.238E+00	1.153E+00	6.390E+00	1.677E+01	9.277E-02	9.405E-01
1.000E+02	5.259E+00	1.295E+00	6.554E+00	1.831E+01	1.024E-01	1.118E+00
1.250E+02	5.301E+00	1.654E+00	6.955E+00	2.202E+01	1.255E-01	1.513E+00
1.500E+02	5.333E+00	2.017E+00	7.350E+00	2.551E+01	1.473E-01	1.849E+00
1.750E+02	5.359E+00	2.383E+00	7.742E+00	2.883E+01	1.679E-01	2.140E+00
2.000E+02	5.381E+00	2.752E+00	8.133E+00	3.198E+01	1.873E-01	2.396E+00
2.500E+02	5.417E+00	3.496E+00	8.913E+00	3.785E+01	2.231E-01	2.828E+00
3.000E+02	5.446E+00	4.246E+00	9.692E+00	4.322E+01	2.552E-01	3.186E+00
3.500E+02	5.470E+00	5.001E+00	1.047E+01	4.819E+01	2.842E-01	3.489E+00
4.000E+02	5.491E+00	5.760E+00	1.125E+01	5.279E+01	3.106E-01	3.753E+00
4.500E+02	5.509E+00	6.522E+00	1.203E+01	5.709E+01	3.347E-01	3.987E+00
5.000E+02	5.525E+00	7.286E+00	1.281E+01	6.112E+01	3.568E-01	4.196E+00
5.500E+02	5.540E+00	8.053E+00	1.359E+01	6.490E+01	3.771E-01	4.385E+00
6.000E+02	5.553E+00	8.821E+00	1.437E+01	6.848E+01	3.960E-01	4.559E+00
7.000E+02	5.577E+00	1.036E+01	1.594E+01	7.508E+01	4.298E-01	4.866E+00
8.000E+02	5.597E+00	1.191E+01	1.751E+01	8.107E+01	4.593E-01	5.132E+00
9.000E+02	5.616E+00	1.346E+01	1.908E+01	8.654E+01	4.853E-01	5.367E+00
1.000E+03	5.632E+00	1.502E+01	2.065E+01	9.157E+01	5.084E-01	5.577E+00

Electrons in HELIUM

Density, g/cm³
1.6632E-04 I, eV
41.8

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²		
1.000E-02	2.267E+01	9.885E-04	2.267E+01	2.467E-04	2.412E-05	0.000E+00
1.250E-02	1.898E+01	9.941E-04	1.898E+01	3.678E-04	2.890E-05	0.000E+00
1.500E-02	1.642E+01	9.995E-04	1.642E+01	5.098E-04	3.352E-05	0.000E+00
1.750E-02	1.453E+01	1.005E-03	1.453E+01	6.721E-04	3.802E-05	0.000E+00
2.000E-02	1.307E+01	1.010E-03	1.307E+01	8.537E-04	4.242E-05	0.000E+00
2.500E-02	1.097E+01	1.020E-03	1.097E+01	1.273E-03	5.096E-05	0.000E+00
3.000E-02	9.521E+00	1.029E-03	9.522E+00	1.764E-03	5.923E-05	0.000E+00
3.500E-02	8.457E+00	1.039E-03	8.458E+00	2.322E-03	6.727E-05	0.000E+00
4.000E-02	7.642E+00	1.048E-03	7.643E+00	2.945E-03	7.510E-05	0.000E+00
4.500E-02	6.996E+00	1.057E-03	6.997E+00	3.630E-03	8.277E-05	0.000E+00
5.000E-02	6.471E+00	1.066E-03	6.472E+00	4.374E-03	9.029E-05	0.000E+00
5.500E-02	6.035E+00	1.075E-03	6.037E+00	5.174E-03	9.766E-05	0.000E+00
6.000E-02	5.669E+00	1.084E-03	5.670E+00	6.029E-03	1.049E-04	0.000E+00
7.000E-02	5.084E+00	1.101E-03	5.085E+00	7.896E-03	1.191E-04	0.000E+00
8.000E-02	4.638E+00	1.119E-03	4.639E+00	9.958E-03	1.328E-04	0.000E+00
9.000E-02	4.287E+00	1.138E-03	4.288E+00	1.220E-02	1.462E-04	0.000E+00
1.000E-01	4.003E+00	1.157E-03	4.004E+00	1.462E-02	1.593E-04	0.000E+00
1.250E-01	3.486E+00	1.207E-03	3.487E+00	2.134E-02	1.910E-04	0.000E+00
1.500E-01	3.137E+00	1.260E-03	3.139E+00	2.891E-02	2.215E-04	0.000E+00
1.750E-01	2.887E+00	1.316E-03	2.889E+00	3.723E-02	2.511E-04	0.000E+00
2.000E-01	2.700E+00	1.375E-03	2.701E+00	4.619E-02	2.800E-04	0.000E+00
2.500E-01	2.439E+00	1.499E-03	2.441E+00	6.574E-02	3.363E-04	0.000E+00
3.000E-01	2.269E+00	1.632E-03	2.270E+00	8.702E-02	3.914E-04	0.000E+00
3.500E-01	2.150E+00	1.774E-03	2.152E+00	1.097E-01	4.457E-04	0.000E+00
4.000E-01	2.064E+00	1.924E-03	2.066E+00	1.334E-01	4.997E-04	0.000E+00
4.500E-01	2.000E+00	2.081E-03	2.002E+00	1.580E-01	5.536E-04	0.000E+00
5.000E-01	1.952E+00	2.245E-03	1.954E+00	1.833E-01	6.076E-04	0.000E+00
5.500E-01	1.914E+00	2.416E-03	1.916E+00	2.092E-01	6.619E-04	0.000E+00
6.000E-01	1.884E+00	2.592E-03	1.887E+00	2.355E-01	7.165E-04	0.000E+00
7.000E-01	1.842E+00	2.961E-03	1.845E+00	2.891E-01	8.269E-04	0.000E+00
8.000E-01	1.815E+00	3.350E-03	1.818E+00	3.437E-01	9.389E-04	0.000E+00
9.000E-01	1.798E+00	3.757E-03	1.801E+00	3.990E-01	1.053E-03	0.000E+00
1.000E+00	1.787E+00	4.180E-03	1.791E+00	4.547E-01	1.168E-03	0.000E+00
1.250E+00	1.777E+00	5.306E-03	1.782E+00	5.948E-01	1.465E-03	0.000E+00
1.500E+00	1.780E+00	6.515E-03	1.787E+00	7.349E-01	1.773E-03	0.000E+00
1.750E+00	1.789E+00	7.793E-03	1.797E+00	8.744E-01	2.089E-03	0.000E+00
2.000E+00	1.801E+00	9.132E-03	1.810E+00	1.013E+00	2.414E-03	0.000E+00
2.500E+00	1.827E+00	1.196E-02	1.839E+00	1.287E+00	3.085E-03	0.000E+00
3.000E+00	1.854E+00	1.495E-02	1.869E+00	1.557E+00	3.779E-03	0.000E+00
3.500E+00	1.880E+00	1.809E-02	1.898E+00	1.822E+00	4.491E-03	0.000E+00
4.000E+00	1.903E+00	2.134E-02	1.925E+00	2.084E+00	5.218E-03	0.000E+00

4.500E+00	1.926E+00	2.469E-02	1.950E+00	2.342E+00	5.957E-03	0.000E+00
5.000E+00	1.946E+00	2.813E-02	1.974E+00	2.597E+00	6.707E-03	0.000E+00
5.500E+00	1.965E+00	3.165E-02	1.997E+00	2.848E+00	7.465E-03	0.000E+00
6.000E+00	1.983E+00	3.523E-02	2.018E+00	3.098E+00	8.231E-03	0.000E+00
7.000E+00	2.015E+00	4.260E-02	2.057E+00	3.588E+00	9.781E-03	0.000E+00
8.000E+00	2.043E+00	5.018E-02	2.093E+00	4.070E+00	1.135E-02	0.000E+00
9.000E+00	2.069E+00	5.793E-02	2.126E+00	4.544E+00	1.293E-02	0.000E+00
1.000E+01	2.092E+00	6.584E-02	2.157E+00	5.011E+00	1.453E-02	0.000E+00
1.250E+01	2.141E+00	8.617E-02	2.227E+00	6.151E+00	1.855E-02	0.000E+00
1.500E+01	2.182E+00	1.071E-01	2.289E+00	7.258E+00	2.258E-02	0.000E+00
1.750E+01	2.216E+00	1.286E-01	2.345E+00	8.337E+00	2.662E-02	0.000E+00
2.000E+01	2.247E+00	1.505E-01	2.397E+00	9.391E+00	3.064E-02	0.000E+00
2.500E+01	2.297E+00	1.952E-01	2.493E+00	1.144E+01	3.863E-02	0.000E+00
3.000E+01	2.339E+00	2.410E-01	2.580E+00	1.341E+01	4.651E-02	0.000E+00
3.500E+01	2.374E+00	2.875E-01	2.662E+00	1.531E+01	5.426E-02	0.000E+00
4.000E+01	2.405E+00	3.346E-01	2.739E+00	1.717E+01	6.187E-02	0.000E+00
4.500E+01	2.432E+00	3.822E-01	2.814E+00	1.897E+01	6.933E-02	0.000E+00
5.000E+01	2.456E+00	4.303E-01	2.886E+00	2.072E+01	7.665E-02	0.000E+00
5.500E+01	2.478E+00	4.786E-01	2.956E+00	2.243E+01	8.382E-02	0.000E+00
6.000E+01	2.498E+00	5.272E-01	3.025E+00	2.410E+01	9.085E-02	0.000E+00
7.000E+01	2.533E+00	6.252E-01	3.158E+00	2.734E+01	1.045E-01	0.000E+00
8.000E+01	2.564E+00	7.239E-01	3.288E+00	3.044E+01	1.176E-01	0.000E+00
9.000E+01	2.589E+00	8.231E-01	3.412E+00	3.343E+01	1.301E-01	2.142E-02
1.000E+02	2.609E+00	9.229E-01	3.532E+00	3.631E+01	1.423E-01	7.842E-02
1.250E+02	2.644E+00	1.174E+00	3.818E+00	4.311E+01	1.708E-01	2.879E-01
1.500E+02	2.668E+00	1.427E+00	4.095E+00	4.943E+01	1.970E-01	5.234E-01
1.750E+02	2.686E+00	1.681E+00	4.367E+00	5.534E+01	2.213E-01	7.535E-01
2.000E+02	2.700E+00	1.937E+00	4.637E+00	6.090E+01	2.439E-01	9.696E-01
2.500E+02	2.722E+00	2.451E+00	5.173E+00	7.110E+01	2.844E-01	1.356E+00
3.000E+02	2.738E+00	2.967E+00	5.705E+00	8.030E+01	3.200E-01	1.688E+00
3.500E+02	2.752E+00	3.486E+00	6.237E+00	8.868E+01	3.514E-01	1.976E+00
4.000E+02	2.763E+00	4.006E+00	6.768E+00	9.637E+01	3.794E-01	2.230E+00
4.500E+02	2.773E+00	4.527E+00	7.300E+00	1.035E+02	4.047E-01	2.457E+00
5.000E+02	2.781E+00	5.049E+00	7.831E+00	1.101E+02	4.275E-01	2.661E+00
5.500E+02	2.789E+00	5.573E+00	8.362E+00	1.163E+02	4.482E-01	2.847E+00
6.000E+02	2.796E+00	6.097E+00	8.892E+00	1.221E+02	4.672E-01	3.017E+00
7.000E+02	2.808E+00	7.147E+00	9.955E+00	1.327E+02	5.008E-01	3.321E+00
8.000E+02	2.818E+00	8.199E+00	1.102E+01	1.422E+02	5.297E-01	3.584E+00
9.000E+02	2.828E+00	9.253E+00	1.208E+01	1.509E+02	5.547E-01	3.818E+00
1.000E+03	2.836E+00	1.031E+01	1.314E+01	1.588E+02	5.768E-01	4.027E+00

Electrons in AMORPHOUS CARBON

		Density, g/cm ³				I, eV	
		2.0000E+00				81.0	
KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA	
	COLLISION	RADIATIVE	TOTAL				
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²			
1.000E-02	1.999E+01	3.150E-03	1.999E+01	2.845E-04	8.740E-05	2.143E-03	
1.250E-02	1.682E+01	3.161E-03	1.682E+01	4.214E-04	1.045E-04	2.761E-03	
1.500E-02	1.460E+01	3.168E-03	1.461E+01	5.813E-04	1.208E-04	3.410E-03	
1.750E-02	1.296E+01	3.172E-03	1.296E+01	7.634E-04	1.365E-04	4.090E-03	
2.000E-02	1.169E+01	3.176E-03	1.169E+01	9.667E-04	1.518E-04	4.800E-03	
2.500E-02	9.849E+00	3.184E-03	9.852E+00	1.435E-03	1.809E-04	6.307E-03	
3.000E-02	8.572E+00	3.194E-03	8.575E+00	1.980E-03	2.088E-04	7.927E-03	
3.500E-02	7.631E+00	3.204E-03	7.635E+00	2.600E-03	2.356E-04	9.655E-03	
4.000E-02	6.908E+00	3.215E-03	6.911E+00	3.289E-03	2.614E-04	1.149E-02	
4.500E-02	6.334E+00	3.228E-03	6.337E+00	4.045E-03	2.865E-04	1.342E-02	
5.000E-02	5.866E+00	3.241E-03	5.869E+00	4.866E-03	3.110E-04	1.544E-02	
5.500E-02	5.478E+00	3.255E-03	5.481E+00	5.748E-03	3.348E-04	1.756E-02	
6.000E-02	5.150E+00	3.270E-03	5.153E+00	6.690E-03	3.581E-04	1.976E-02	
7.000E-02	4.626E+00	3.303E-03	4.629E+00	8.742E-03	4.033E-04	2.442E-02	
8.000E-02	4.226E+00	3.337E-03	4.229E+00	1.101E-02	4.468E-04	2.939E-02	
9.000E-02	3.910E+00	3.375E-03	3.913E+00	1.347E-02	4.889E-04	3.464E-02	
1.000E-01	3.654E+00	3.414E-03	3.657E+00	1.611E-02	5.299E-04	4.015E-02	
1.250E-01	3.187E+00	3.523E-03	3.190E+00	2.346E-02	6.278E-04	5.495E-02	
1.500E-01	2.871E+00	3.640E-03	2.874E+00	3.174E-02	7.208E-04	7.100E-02	
1.750E-01	2.643E+00	3.764E-03	2.647E+00	4.082E-02	8.099E-04	8.807E-02	
2.000E-01	2.472E+00	3.896E-03	2.476E+00	5.059E-02	8.959E-04	1.060E-01	
2.500E-01	2.234E+00	4.179E-03	2.238E+00	7.191E-02	1.061E-03	1.437E-01	
3.000E-01	2.076E+00	4.489E-03	2.081E+00	9.513E-02	1.220E-03	1.832E-01	
3.500E-01	1.966E+00	4.820E-03	1.971E+00	1.198E-01	1.374E-03	2.238E-01	
4.000E-01	1.886E+00	5.173E-03	1.891E+00	1.458E-01	1.526E-03	2.650E-01	
4.500E-01	1.826E+00	5.545E-03	1.831E+00	1.727E-01	1.677E-03	3.065E-01	
5.000E-01	1.779E+00	5.935E-03	1.785E+00	2.003E-01	1.827E-03	3.479E-01	
5.500E-01	1.742E+00	6.340E-03	1.749E+00	2.286E-01	1.976E-03	3.892E-01	
6.000E-01	1.713E+00	6.759E-03	1.720E+00	2.575E-01	2.127E-03	4.301E-01	
7.000E-01	1.670E+00	7.637E-03	1.678E+00	3.164E-01	2.428E-03	5.104E-01	
8.000E-01	1.641E+00	8.559E-03	1.650E+00	3.765E-01	2.733E-03	5.884E-01	
9.000E-01	1.622E+00	9.523E-03	1.631E+00	4.375E-01	3.042E-03	6.637E-01	
1.000E+00	1.608E+00	1.053E-02	1.619E+00	4.991E-01	3.355E-03	7.364E-01	
1.250E+00	1.590E+00	1.318E-02	1.603E+00	6.544E-01	4.155E-03	9.063E-01	
1.500E+00	1.584E+00	1.602E-02	1.600E+00	8.106E-01	4.981E-03	1.061E+00	
1.750E+00	1.585E+00	1.901E-02	1.604E+00	9.667E-01	5.831E-03	1.202E+00	
2.000E+00	1.588E+00	2.213E-02	1.610E+00	1.122E+00	6.702E-03	1.331E+00	
2.500E+00	1.599E+00	2.870E-02	1.628E+00	1.431E+00	8.497E-03	1.561E+00	
3.000E+00	1.612E+00	3.561E-02	1.648E+00	1.736E+00	1.035E-02	1.760E+00	
3.500E+00	1.625E+00	4.281E-02	1.668E+00	2.038E+00	1.225E-02	1.936E+00	
4.000E+00	1.637E+00	5.026E-02	1.688E+00	2.336E+00	1.418E-02	2.094E+00	

4.500E+00	1.649E+00	5.792E-02	1.707E+00	2.631E+00	1.615E-02	2.237E+00
5.000E+00	1.660E+00	6.576E-02	1.726E+00	2.922E+00	1.813E-02	2.368E+00
5.500E+00	1.670E+00	7.378E-02	1.744E+00	3.210E+00	2.014E-02	2.489E+00
6.000E+00	1.679E+00	8.193E-02	1.761E+00	3.495E+00	2.216E-02	2.602E+00
7.000E+00	1.696E+00	9.865E-02	1.795E+00	4.058E+00	2.625E-02	2.807E+00
8.000E+00	1.710E+00	1.158E-01	1.826E+00	4.610E+00	3.036E-02	2.991E+00
9.000E+00	1.723E+00	1.334E-01	1.857E+00	5.153E+00	3.450E-02	3.158E+00
1.000E+01	1.735E+00	1.513E-01	1.886E+00	5.688E+00	3.866E-02	3.312E+00
1.250E+01	1.758E+00	1.971E-01	1.955E+00	6.989E+00	4.904E-02	3.652E+00
1.500E+01	1.777E+00	2.444E-01	2.021E+00	8.247E+00	5.935E-02	3.945E+00
1.750E+01	1.792E+00	2.927E-01	2.084E+00	9.465E+00	6.955E-02	4.203E+00
2.000E+01	1.804E+00	3.417E-01	2.146E+00	1.065E+01	7.959E-02	4.433E+00
2.500E+01	1.824E+00	4.417E-01	2.266E+00	1.291E+01	9.913E-02	4.832E+00
3.000E+01	1.840E+00	5.435E-01	2.384E+00	1.506E+01	1.179E-01	5.167E+00
3.500E+01	1.853E+00	6.466E-01	2.500E+00	1.711E+01	1.358E-01	5.457E+00
4.000E+01	1.865E+00	7.508E-01	2.615E+00	1.907E+01	1.530E-01	5.711E+00
4.500E+01	1.874E+00	8.559E-01	2.730E+00	2.094E+01	1.694E-01	5.937E+00
5.000E+01	1.883E+00	9.617E-01	2.844E+00	2.273E+01	1.850E-01	6.141E+00
5.500E+01	1.890E+00	1.068E+00	2.959E+00	2.446E+01	2.000E-01	6.326E+00
6.000E+01	1.897E+00	1.175E+00	3.073E+00	2.611E+01	2.143E-01	6.495E+00
7.000E+01	1.910E+00	1.391E+00	3.300E+00	2.925E+01	2.412E-01	6.797E+00
8.000E+01	1.920E+00	1.608E+00	3.528E+00	3.218E+01	2.659E-01	7.060E+00
9.000E+01	1.929E+00	1.827E+00	3.756E+00	3.493E+01	2.887E-01	7.292E+00
1.000E+02	1.938E+00	2.046E+00	3.984E+00	3.751E+01	3.099E-01	7.501E+00
1.250E+02	1.955E+00	2.598E+00	4.553E+00	4.338E+01	3.566E-01	7.943E+00
1.500E+02	1.969E+00	3.155E+00	5.124E+00	4.855E+01	3.961E-01	8.305E+00
1.750E+02	1.981E+00	3.714E+00	5.695E+00	5.318E+01	4.302E-01	8.612E+00
2.000E+02	1.991E+00	4.276E+00	6.268E+00	5.736E+01	4.599E-01	8.878E+00
2.500E+02	2.009E+00	5.405E+00	7.414E+00	6.469E+01	5.093E-01	9.323E+00
3.000E+02	2.023E+00	6.540E+00	8.563E+00	7.096E+01	5.490E-01	9.686E+00
3.500E+02	2.034E+00	7.678E+00	9.713E+00	7.644E+01	5.816E-01	9.994E+00
4.000E+02	2.045E+00	8.820E+00	1.086E+01	8.130E+01	6.091E-01	1.026E+01
4.500E+02	2.054E+00	9.964E+00	1.202E+01	8.568E+01	6.326E-01	1.050E+01
5.000E+02	2.062E+00	1.111E+01	1.317E+01	8.965E+01	6.530E-01	1.071E+01
5.500E+02	2.069E+00	1.226E+01	1.433E+01	9.329E+01	6.709E-01	1.090E+01
6.000E+02	2.076E+00	1.340E+01	1.548E+01	9.664E+01	6.867E-01	1.107E+01
7.000E+02	2.088E+00	1.570E+01	1.779E+01	1.027E+02	7.136E-01	1.138E+01
8.000E+02	2.098E+00	1.801E+01	2.011E+01	1.079E+02	7.356E-01	1.165E+01
9.000E+02	2.107E+00	2.031E+01	2.242E+01	1.127E+02	7.539E-01	1.188E+01
1.000E+03	2.115E+00	2.262E+01	2.474E+01	1.169E+02	7.696E-01	1.209E+01

Electrons in ALUMINUM

		Density, g/cm ³				I, eV	
		2.6989E+00				166.0	
KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA	
	COLLISION	RADIATIVE	TOTAL				
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²			
1.000E-02	1.649E+01	6.559E-03	1.650E+01	3.539E-04	2.132E-04	3.534E-04	
1.250E-02	1.398E+01	6.700E-03	1.398E+01	5.192E-04	2.583E-04	4.937E-04	
1.500E-02	1.220E+01	6.798E-03	1.221E+01	7.111E-04	3.017E-04	6.538E-04	
1.750E-02	1.088E+01	6.871E-03	1.088E+01	9.284E-04	3.435E-04	8.332E-04	
2.000E-02	9.844E+00	6.926E-03	9.851E+00	1.170E-03	3.840E-04	1.031E-03	
2.500E-02	8.338E+00	7.004E-03	8.345E+00	1.724E-03	4.616E-04	1.483E-03	
3.000E-02	7.287E+00	7.059E-03	7.294E+00	2.367E-03	5.353E-04	2.005E-03	
3.500E-02	6.509E+00	7.100E-03	6.516E+00	3.094E-03	6.058E-04	2.594E-03	
4.000E-02	5.909E+00	7.133E-03	5.916E+00	3.900E-03	6.736E-04	3.246E-03	
4.500E-02	5.430E+00	7.162E-03	5.437E+00	4.783E-03	7.390E-04	3.960E-03	
5.000E-02	5.039E+00	7.191E-03	5.046E+00	5.738E-03	8.022E-04	4.732E-03	
5.500E-02	4.714E+00	7.217E-03	4.721E+00	6.763E-03	8.636E-04	5.560E-03	
6.000E-02	4.439E+00	7.243E-03	4.446E+00	7.855E-03	9.232E-04	6.440E-03	
7.000E-02	3.998E+00	7.295E-03	4.005E+00	1.023E-02	1.038E-03	8.351E-03	
8.000E-02	3.661E+00	7.350E-03	3.668E+00	1.284E-02	1.147E-03	1.045E-02	
9.000E-02	3.394E+00	7.411E-03	3.401E+00	1.568E-02	1.252E-03	1.271E-02	
1.000E-01	3.177E+00	7.476E-03	3.185E+00	1.872E-02	1.353E-03	1.513E-02	
1.250E-01	2.781E+00	7.659E-03	2.789E+00	2.714E-02	1.593E-03	2.175E-02	
1.500E-01	2.513E+00	7.865E-03	2.521E+00	3.659E-02	1.816E-03	2.907E-02	
1.750E-01	2.320E+00	8.096E-03	2.328E+00	4.693E-02	2.028E-03	3.694E-02	
2.000E-01	2.174E+00	8.344E-03	2.183E+00	5.804E-02	2.231E-03	4.525E-02	
2.500E-01	1.972E+00	8.888E-03	1.981E+00	8.217E-02	2.616E-03	6.280E-02	
3.000E-01	1.839E+00	9.487E-03	1.849E+00	1.083E-01	2.982E-03	8.116E-02	
3.500E-01	1.747E+00	1.013E-02	1.757E+00	1.361E-01	3.335E-03	9.997E-02	
4.000E-01	1.680E+00	1.082E-02	1.691E+00	1.652E-01	3.678E-03	1.190E-01	
4.500E-01	1.630E+00	1.154E-02	1.642E+00	1.952E-01	4.016E-03	1.380E-01	
5.000E-01	1.592E+00	1.230E-02	1.604E+00	2.260E-01	4.349E-03	1.569E-01	
5.500E-01	1.563E+00	1.309E-02	1.576E+00	2.575E-01	4.680E-03	1.757E-01	
6.000E-01	1.540E+00	1.390E-02	1.554E+00	2.894E-01	5.009E-03	1.943E-01	
7.000E-01	1.507E+00	1.560E-02	1.522E+00	3.545E-01	5.664E-03	2.307E-01	
8.000E-01	1.486E+00	1.739E-02	1.503E+00	4.206E-01	6.319E-03	2.661E-01	
9.000E-01	1.473E+00	1.925E-02	1.492E+00	4.874E-01	6.976E-03	3.005E-01	
1.000E+00	1.465E+00	2.119E-02	1.486E+00	5.546E-01	7.636E-03	3.339E-01	
1.250E+00	1.457E+00	2.630E-02	1.484E+00	7.231E-01	9.306E-03	4.138E-01	
1.500E+00	1.460E+00	3.177E-02	1.491E+00	8.913E-01	1.101E-02	4.898E-01	
1.750E+00	1.466E+00	3.752E-02	1.504E+00	1.058E+00	1.274E-02	5.632E-01	
2.000E+00	1.475E+00	4.350E-02	1.518E+00	1.224E+00	1.449E-02	6.349E-01	
2.500E+00	1.493E+00	5.605E-02	1.549E+00	1.550E+00	1.808E-02	7.757E-01	
3.000E+00	1.510E+00	6.924E-02	1.580E+00	1.869E+00	2.173E-02	9.145E-01	
3.500E+00	1.526E+00	8.292E-02	1.609E+00	2.183E+00	2.544E-02	1.051E+00	
4.000E+00	1.540E+00	9.702E-02	1.637E+00	2.491E+00	2.918E-02	1.183E+00	

4.500E+00	1.552E+00	1.115E-01	1.664E+00	2.794E+00	3.296E-02	1.311E+00
5.000E+00	1.564E+00	1.263E-01	1.690E+00	3.092E+00	3.675E-02	1.433E+00
5.500E+00	1.574E+00	1.413E-01	1.715E+00	3.386E+00	4.055E-02	1.550E+00
6.000E+00	1.583E+00	1.567E-01	1.739E+00	3.675E+00	4.436E-02	1.661E+00
7.000E+00	1.599E+00	1.879E-01	1.787E+00	4.242E+00	5.197E-02	1.868E+00
8.000E+00	1.613E+00	2.200E-01	1.833E+00	4.795E+00	5.955E-02	2.055E+00
9.000E+00	1.625E+00	2.526E-01	1.877E+00	5.334E+00	6.708E-02	2.226E+00
1.000E+01	1.636E+00	2.858E-01	1.921E+00	5.861E+00	7.454E-02	2.384E+00
1.250E+01	1.658E+00	3.706E-01	2.029E+00	7.127E+00	9.281E-02	2.727E+00
1.500E+01	1.676E+00	4.574E-01	2.134E+00	8.328E+00	1.105E-01	3.016E+00
1.750E+01	1.691E+00	5.459E-01	2.237E+00	9.472E+00	1.275E-01	3.265E+00
2.000E+01	1.704E+00	6.357E-01	2.340E+00	1.056E+01	1.438E-01	3.484E+00
2.500E+01	1.726E+00	8.179E-01	2.544E+00	1.261E+01	1.745E-01	3.857E+00
3.000E+01	1.743E+00	1.003E+00	2.746E+00	1.450E+01	2.027E-01	4.168E+00
3.500E+01	1.757E+00	1.190E+00	2.947E+00	1.626E+01	2.287E-01	4.435E+00
4.000E+01	1.769E+00	1.379E+00	3.148E+00	1.790E+01	2.528E-01	4.669E+00
4.500E+01	1.780E+00	1.569E+00	3.349E+00	1.944E+01	2.751E-01	4.878E+00
5.000E+01	1.789E+00	1.761E+00	3.550E+00	2.089E+01	2.959E-01	5.068E+00
5.500E+01	1.797E+00	1.953E+00	3.751E+00	2.226E+01	3.152E-01	5.241E+00
6.000E+01	1.805E+00	2.147E+00	3.951E+00	2.356E+01	3.333E-01	5.401E+00
7.000E+01	1.818E+00	2.535E+00	4.353E+00	2.597E+01	3.662E-01	5.687E+00
8.000E+01	1.829E+00	2.927E+00	4.755E+00	2.817E+01	3.953E-01	5.938E+00
9.000E+01	1.838E+00	3.320E+00	5.158E+00	3.019E+01	4.214E-01	6.161E+00
1.000E+02	1.847E+00	3.714E+00	5.561E+00	3.205E+01	4.448E-01	6.363E+00
1.250E+02	1.864E+00	4.707E+00	6.571E+00	3.619E+01	4.945E-01	6.794E+00
1.500E+02	1.879E+00	5.705E+00	7.583E+00	3.972E+01	5.346E-01	7.150E+00
1.750E+02	1.890E+00	6.708E+00	8.598E+00	4.282E+01	5.678E-01	7.452E+00
2.000E+02	1.900E+00	7.714E+00	9.614E+00	4.557E+01	5.958E-01	7.716E+00
2.500E+02	1.917E+00	9.734E+00	1.165E+01	5.028E+01	6.406E-01	8.157E+00
3.000E+02	1.931E+00	1.176E+01	1.369E+01	5.424E+01	6.751E-01	8.519E+00
3.500E+02	1.943E+00	1.380E+01	1.574E+01	5.764E+01	7.027E-01	8.826E+00
4.000E+02	1.952E+00	1.583E+01	1.778E+01	6.063E+01	7.253E-01	9.091E+00
4.500E+02	1.961E+00	1.787E+01	1.983E+01	6.329E+01	7.443E-01	9.326E+00
5.000E+02	1.969E+00	1.992E+01	2.189E+01	6.569E+01	7.604E-01	9.536E+00
5.500E+02	1.976E+00	2.196E+01	2.394E+01	6.787E+01	7.744E-01	9.726E+00
6.000E+02	1.983E+00	2.401E+01	2.599E+01	6.988E+01	7.866E-01	9.900E+00
7.000E+02	1.994E+00	2.811E+01	3.010E+01	7.345E+01	8.069E-01	1.021E+01
8.000E+02	2.004E+00	3.221E+01	3.421E+01	7.656E+01	8.233E-01	1.047E+01
9.000E+02	2.013E+00	3.631E+01	3.833E+01	7.932E+01	8.367E-01	1.071E+01
1.000E+03	2.021E+00	4.042E+01	4.244E+01	8.180E+01	8.481E-01	1.092E+01

Electrons in SILICON

Density, g/cm³
2.3300E+00 I, eV
173.0

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²		
1.000E-02	1.689E+01	7.255E-03	1.690E+01	3.461E-04	2.289E-04	1.037E-03
1.250E-02	1.432E+01	7.431E-03	1.433E+01	5.074E-04	2.780E-04	1.332E-03
1.500E-02	1.251E+01	7.555E-03	1.252E+01	6.946E-04	3.252E-04	1.641E-03
1.750E-02	1.115E+01	7.648E-03	1.116E+01	9.065E-04	3.709E-04	1.963E-03
2.000E-02	1.010E+01	7.720E-03	1.011E+01	1.142E-03	4.151E-04	2.298E-03
2.500E-02	8.556E+00	7.822E-03	8.564E+00	1.682E-03	5.000E-04	3.007E-03
3.000E-02	7.480E+00	7.892E-03	7.487E+00	2.308E-03	5.807E-04	3.766E-03
3.500E-02	6.682E+00	7.946E-03	6.690E+00	3.016E-03	6.579E-04	4.572E-03
4.000E-02	6.067E+00	7.988E-03	6.075E+00	3.802E-03	7.322E-04	5.424E-03
4.500E-02	5.576E+00	8.026E-03	5.584E+00	4.661E-03	8.038E-04	6.320E-03
5.000E-02	5.175E+00	8.061E-03	5.183E+00	5.592E-03	8.731E-04	7.257E-03
5.500E-02	4.842E+00	8.092E-03	4.850E+00	6.590E-03	9.403E-04	8.235E-03
6.000E-02	4.559E+00	8.123E-03	4.568E+00	7.653E-03	1.006E-03	9.252E-03
7.000E-02	4.107E+00	8.185E-03	4.116E+00	9.964E-03	1.131E-03	1.139E-02
8.000E-02	3.761E+00	8.248E-03	3.769E+00	1.251E-02	1.251E-03	1.368E-02
9.000E-02	3.487E+00	8.317E-03	3.496E+00	1.526E-02	1.366E-03	1.608E-02
1.000E-01	3.265E+00	8.389E-03	3.274E+00	1.822E-02	1.476E-03	1.861E-02
1.250E-01	2.859E+00	8.591E-03	2.867E+00	2.642E-02	1.737E-03	2.538E-02
1.500E-01	2.583E+00	8.821E-03	2.592E+00	3.561E-02	1.981E-03	3.271E-02
1.750E-01	2.385E+00	9.075E-03	2.394E+00	4.566E-02	2.212E-03	4.050E-02
2.000E-01	2.236E+00	9.349E-03	2.245E+00	5.646E-02	2.433E-03	4.868E-02
2.500E-01	2.028E+00	9.951E-03	2.038E+00	7.991E-02	2.852E-03	6.592E-02
3.000E-01	1.892E+00	1.062E-02	1.903E+00	1.054E-01	3.249E-03	8.402E-02
3.500E-01	1.797E+00	1.133E-02	1.809E+00	1.323E-01	3.631E-03	1.027E-01
4.000E-01	1.729E+00	1.209E-02	1.741E+00	1.606E-01	4.003E-03	1.216E-01
4.500E-01	1.677E+00	1.290E-02	1.690E+00	1.897E-01	4.368E-03	1.407E-01
5.000E-01	1.638E+00	1.374E-02	1.652E+00	2.197E-01	4.728E-03	1.599E-01
5.500E-01	1.608E+00	1.461E-02	1.623E+00	2.502E-01	5.085E-03	1.790E-01
6.000E-01	1.585E+00	1.551E-02	1.600E+00	2.812E-01	5.441E-03	1.980E-01
7.000E-01	1.551E+00	1.740E-02	1.568E+00	3.444E-01	6.148E-03	2.355E-01
8.000E-01	1.529E+00	1.938E-02	1.549E+00	4.086E-01	6.855E-03	2.721E-01
9.000E-01	1.516E+00	2.145E-02	1.537E+00	4.734E-01	7.564E-03	3.077E-01
1.000E+00	1.507E+00	2.360E-02	1.531E+00	5.386E-01	8.275E-03	3.424E-01
1.250E+00	1.500E+00	2.927E-02	1.529E+00	7.022E-01	1.007E-02	4.248E-01
1.500E+00	1.502E+00	3.533E-02	1.538E+00	8.652E-01	1.190E-02	5.020E-01
1.750E+00	1.509E+00	4.171E-02	1.551E+00	1.027E+00	1.376E-02	5.747E-01
2.000E+00	1.518E+00	4.833E-02	1.567E+00	1.188E+00	1.565E-02	6.439E-01
2.500E+00	1.538E+00	6.223E-02	1.600E+00	1.503E+00	1.949E-02	7.743E-01
3.000E+00	1.558E+00	7.682E-02	1.634E+00	1.812E+00	2.340E-02	8.976E-01
3.500E+00	1.575E+00	9.197E-02	1.667E+00	2.115E+00	2.736E-02	1.016E+00
4.000E+00	1.591E+00	1.076E-01	1.699E+00	2.412E+00	3.134E-02	1.131E+00

4.500E+00	1.605E+00	1.236E-01	1.729E+00	2.704E+00	3.535E-02	1.243E+00
5.000E+00	1.618E+00	1.399E-01	1.758E+00	2.991E+00	3.937E-02	1.351E+00
5.500E+00	1.629E+00	1.566E-01	1.786E+00	3.273E+00	4.340E-02	1.456E+00
6.000E+00	1.639E+00	1.735E-01	1.813E+00	3.551E+00	4.742E-02	1.557E+00
7.000E+00	1.657E+00	2.081E-01	1.865E+00	4.095E+00	5.546E-02	1.748E+00
8.000E+00	1.672E+00	2.435E-01	1.916E+00	4.624E+00	6.344E-02	1.925E+00
9.000E+00	1.685E+00	2.795E-01	1.965E+00	5.139E+00	7.136E-02	2.088E+00
1.000E+01	1.697E+00	3.161E-01	2.013E+00	5.642E+00	7.919E-02	2.239E+00
1.250E+01	1.721E+00	4.098E-01	2.130E+00	6.849E+00	9.833E-02	2.574E+00
1.500E+01	1.740E+00	5.057E-01	2.245E+00	7.992E+00	1.168E-01	2.858E+00
1.750E+01	1.756E+00	6.033E-01	2.359E+00	9.078E+00	1.345E-01	3.105E+00
2.000E+01	1.769E+00	7.023E-01	2.472E+00	1.011E+01	1.514E-01	3.323E+00
2.500E+01	1.791E+00	9.035E-01	2.695E+00	1.205E+01	1.832E-01	3.694E+00
3.000E+01	1.809E+00	1.108E+00	2.917E+00	1.383E+01	2.123E-01	4.003E+00
3.500E+01	1.824E+00	1.314E+00	3.139E+00	1.548E+01	2.391E-01	4.268E+00
4.000E+01	1.837E+00	1.523E+00	3.360E+00	1.702E+01	2.638E-01	4.501E+00
4.500E+01	1.848E+00	1.733E+00	3.581E+00	1.847E+01	2.865E-01	4.709E+00
5.000E+01	1.858E+00	1.944E+00	3.802E+00	1.982E+01	3.077E-01	4.897E+00
5.500E+01	1.866E+00	2.156E+00	4.023E+00	2.110E+01	3.273E-01	5.068E+00
6.000E+01	1.874E+00	2.369E+00	4.244E+00	2.231E+01	3.457E-01	5.226E+00
7.000E+01	1.888E+00	2.798E+00	4.686E+00	2.455E+01	3.789E-01	5.509E+00
8.000E+01	1.900E+00	3.230E+00	5.129E+00	2.659E+01	4.083E-01	5.757E+00
9.000E+01	1.910E+00	3.663E+00	5.573E+00	2.846E+01	4.344E-01	5.979E+00
1.000E+02	1.919E+00	4.099E+00	6.017E+00	3.019E+01	4.580E-01	6.179E+00
1.250E+02	1.937E+00	5.193E+00	7.130E+00	3.400E+01	5.076E-01	6.606E+00
1.500E+02	1.952E+00	6.294E+00	8.246E+00	3.726E+01	5.474E-01	6.960E+00
1.750E+02	1.964E+00	7.401E+00	9.365E+00	4.010E+01	5.803E-01	7.261E+00
2.000E+02	1.975E+00	8.511E+00	1.049E+01	4.262E+01	6.079E-01	7.524E+00
2.500E+02	1.992E+00	1.074E+01	1.273E+01	4.694E+01	6.520E-01	7.964E+00
3.000E+02	2.006E+00	1.298E+01	1.498E+01	5.056E+01	6.859E-01	8.325E+00
3.500E+02	2.018E+00	1.522E+01	1.724E+01	5.367E+01	7.129E-01	8.631E+00
4.000E+02	2.029E+00	1.747E+01	1.950E+01	5.639E+01	7.350E-01	8.897E+00
4.500E+02	2.038E+00	1.972E+01	2.176E+01	5.882E+01	7.535E-01	9.131E+00
5.000E+02	2.046E+00	2.197E+01	2.402E+01	6.101E+01	7.692E-01	9.341E+00
5.500E+02	2.053E+00	2.423E+01	2.628E+01	6.299E+01	7.828E-01	9.531E+00
6.000E+02	2.060E+00	2.648E+01	2.854E+01	6.482E+01	7.946E-01	9.705E+00
7.000E+02	2.072E+00	3.100E+01	3.308E+01	6.807E+01	8.144E-01	1.001E+01
8.000E+02	2.082E+00	3.553E+01	3.761E+01	7.090E+01	8.302E-01	1.028E+01
9.000E+02	2.091E+00	4.006E+01	4.215E+01	7.341E+01	8.433E-01	1.051E+01
1.000E+03	2.099E+00	4.459E+01	4.669E+01	7.567E+01	8.542E-01	1.072E+01

Electrons in IRON

Density, g/cm³
7.8740E+00 I, eV
286.0

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²		
1.000E-02	1.388E+01	1.138E-02	1.390E+01	4.330E-04	4.203E-04	2.474E-03
1.250E-02	1.185E+01	1.193E-02	1.186E+01	6.284E-04	5.188E-04	3.157E-03
1.500E-02	1.040E+01	1.235E-02	1.041E+01	8.539E-04	6.151E-04	3.866E-03
1.750E-02	9.310E+00	1.269E-02	9.323E+00	1.108E-03	7.092E-04	4.602E-03
2.000E-02	8.456E+00	1.296E-02	8.468E+00	1.390E-03	8.013E-04	5.365E-03
2.500E-02	7.199E+00	1.338E-02	7.213E+00	2.032E-03	9.800E-04	6.975E-03
3.000E-02	6.316E+00	1.369E-02	6.330E+00	2.774E-03	1.152E-03	8.696E-03
3.500E-02	5.658E+00	1.394E-02	5.672E+00	3.610E-03	1.317E-03	1.053E-02
4.000E-02	5.149E+00	1.414E-02	5.163E+00	4.536E-03	1.478E-03	1.248E-02
4.500E-02	4.741E+00	1.431E-02	4.756E+00	5.546E-03	1.633E-03	1.455E-02
5.000E-02	4.408E+00	1.446E-02	4.422E+00	6.637E-03	1.784E-03	1.673E-02
5.500E-02	4.129E+00	1.459E-02	4.144E+00	7.806E-03	1.930E-03	1.902E-02
6.000E-02	3.893E+00	1.471E-02	3.908E+00	9.050E-03	2.073E-03	2.143E-02
7.000E-02	3.514E+00	1.493E-02	3.529E+00	1.175E-02	2.348E-03	2.657E-02
8.000E-02	3.223E+00	1.512E-02	3.238E+00	1.471E-02	2.611E-03	3.211E-02
9.000E-02	2.992E+00	1.531E-02	3.007E+00	1.792E-02	2.863E-03	3.801E-02
1.000E-01	2.804E+00	1.548E-02	2.820E+00	2.136E-02	3.106E-03	4.422E-02
1.250E-01	2.460E+00	1.593E-02	2.476E+00	3.085E-02	3.679E-03	6.070E-02
1.500E-01	2.226E+00	1.639E-02	2.242E+00	4.149E-02	4.212E-03	7.794E-02
1.750E-01	2.057E+00	1.687E-02	2.074E+00	5.310E-02	4.714E-03	9.538E-02
2.000E-01	1.930E+00	1.736E-02	1.947E+00	6.556E-02	5.190E-03	1.127E-01
2.500E-01	1.753E+00	1.842E-02	1.771E+00	9.257E-02	6.085E-03	1.467E-01
3.000E-01	1.636E+00	1.956E-02	1.656E+00	1.218E-01	6.923E-03	1.797E-01
3.500E-01	1.556E+00	2.079E-02	1.576E+00	1.528E-01	7.720E-03	2.116E-01
4.000E-01	1.497E+00	2.209E-02	1.519E+00	1.851E-01	8.489E-03	2.427E-01
4.500E-01	1.453E+00	2.346E-02	1.477E+00	2.186E-01	9.236E-03	2.731E-01
5.000E-01	1.420E+00	2.489E-02	1.445E+00	2.528E-01	9.968E-03	3.027E-01
5.500E-01	1.394E+00	2.638E-02	1.421E+00	2.877E-01	1.069E-02	3.317E-01
6.000E-01	1.374E+00	2.791E-02	1.402E+00	3.232E-01	1.140E-02	3.601E-01
7.000E-01	1.345E+00	3.112E-02	1.376E+00	3.952E-01	1.281E-02	4.152E-01
8.000E-01	1.327E+00	3.448E-02	1.362E+00	4.683E-01	1.420E-02	4.682E-01
9.000E-01	1.316E+00	3.797E-02	1.354E+00	5.420E-01	1.559E-02	5.195E-01
1.000E+00	1.308E+00	4.160E-02	1.350E+00	6.159E-01	1.697E-02	5.690E-01
1.250E+00	1.302E+00	5.117E-02	1.353E+00	8.011E-01	2.044E-02	6.865E-01
1.500E+00	1.304E+00	6.137E-02	1.365E+00	9.851E-01	2.393E-02	7.962E-01
1.750E+00	1.310E+00	7.206E-02	1.382E+00	1.167E+00	2.745E-02	8.990E-01
2.000E+00	1.317E+00	8.315E-02	1.400E+00	1.347E+00	3.099E-02	9.959E-01
2.500E+00	1.333E+00	1.063E-01	1.440E+00	1.699E+00	3.812E-02	1.174E+00
3.000E+00	1.349E+00	1.306E-01	1.480E+00	2.042E+00	4.527E-02	1.333E+00
3.500E+00	1.365E+00	1.557E-01	1.520E+00	2.375E+00	5.242E-02	1.478E+00
4.000E+00	1.378E+00	1.814E-01	1.560E+00	2.700E+00	5.954E-02	1.610E+00

4.500E+00	1.391E+00	2.077E-01	1.599E+00	3.016E+00	6.661E-02	1.730E+00
5.000E+00	1.403E+00	2.346E-01	1.638E+00	3.325E+00	7.361E-02	1.842E+00
5.500E+00	1.414E+00	2.619E-01	1.676E+00	3.627E+00	8.053E-02	1.946E+00
6.000E+00	1.424E+00	2.896E-01	1.713E+00	3.922E+00	8.738E-02	2.043E+00
7.000E+00	1.442E+00	3.460E-01	1.788E+00	4.493E+00	1.008E-01	2.219E+00
8.000E+00	1.457E+00	4.036E-01	1.861E+00	5.042E+00	1.139E-01	2.377E+00
9.000E+00	1.471E+00	4.622E-01	1.933E+00	5.569E+00	1.266E-01	2.521E+00
1.000E+01	1.483E+00	5.216E-01	2.005E+00	6.077E+00	1.389E-01	2.652E+00
1.250E+01	1.509E+00	6.731E-01	2.182E+00	7.272E+00	1.681E-01	2.942E+00
1.500E+01	1.529E+00	8.279E-01	2.357E+00	8.374E+00	1.951E-01	3.192E+00
1.750E+01	1.546E+00	9.852E-01	2.531E+00	9.397E+00	2.202E-01	3.412E+00
2.000E+01	1.560E+00	1.145E+00	2.704E+00	1.035E+01	2.435E-01	3.610E+00
2.500E+01	1.583E+00	1.468E+00	3.050E+00	1.209E+01	2.854E-01	3.956E+00
3.000E+01	1.600E+00	1.795E+00	3.396E+00	1.365E+01	3.221E-01	4.251E+00
3.500E+01	1.615E+00	2.126E+00	3.741E+00	1.505E+01	3.546E-01	4.508E+00
4.000E+01	1.627E+00	2.460E+00	4.087E+00	1.633E+01	3.834E-01	4.736E+00
4.500E+01	1.638E+00	2.797E+00	4.434E+00	1.750E+01	4.094E-01	4.941E+00
5.000E+01	1.647E+00	3.135E+00	4.782E+00	1.859E+01	4.328E-01	5.126E+00
5.500E+01	1.655E+00	3.475E+00	5.130E+00	1.959E+01	4.540E-01	5.295E+00
6.000E+01	1.663E+00	3.816E+00	5.479E+00	2.054E+01	4.735E-01	5.451E+00
7.000E+01	1.676E+00	4.503E+00	6.178E+00	2.226E+01	5.077E-01	5.729E+00
8.000E+01	1.687E+00	5.193E+00	6.880E+00	2.379E+01	5.370E-01	5.973E+00
9.000E+01	1.697E+00	5.887E+00	7.584E+00	2.517E+01	5.625E-01	6.189E+00
1.000E+02	1.705E+00	6.584E+00	8.289E+00	2.643E+01	5.848E-01	6.384E+00
1.250E+02	1.723E+00	8.336E+00	1.006E+01	2.917E+01	6.303E-01	6.801E+00
1.500E+02	1.738E+00	1.010E+01	1.184E+01	3.146E+01	6.655E-01	7.146E+00
1.750E+02	1.750E+00	1.187E+01	1.362E+01	3.342E+01	6.937E-01	7.440E+00
2.000E+02	1.760E+00	1.364E+01	1.540E+01	3.515E+01	7.169E-01	7.696E+00
2.500E+02	1.777E+00	1.720E+01	1.898E+01	3.807E+01	7.528E-01	8.128E+00
3.000E+02	1.791E+00	2.077E+01	2.256E+01	4.048E+01	7.797E-01	8.484E+00
3.500E+02	1.802E+00	2.435E+01	2.615E+01	4.254E+01	8.006E-01	8.787E+00
4.000E+02	1.812E+00	2.793E+01	2.974E+01	4.433E+01	8.174E-01	9.050E+00
4.500E+02	1.820E+00	3.152E+01	3.334E+01	4.592E+01	8.313E-01	9.283E+00
5.000E+02	1.828E+00	3.512E+01	3.694E+01	4.734E+01	8.430E-01	9.491E+00
5.500E+02	1.835E+00	3.871E+01	4.055E+01	4.863E+01	8.530E-01	9.680E+00
6.000E+02	1.841E+00	4.231E+01	4.415E+01	4.981E+01	8.616E-01	9.853E+00
7.000E+02	1.852E+00	4.951E+01	5.137E+01	5.191E+01	8.758E-01	1.016E+01
8.000E+02	1.862E+00	5.673E+01	5.859E+01	5.373E+01	8.871E-01	1.043E+01
9.000E+02	1.871E+00	6.394E+01	6.581E+01	5.534E+01	8.963E-01	1.066E+01
1.000E+03	1.878E+00	7.116E+01	7.304E+01	5.678E+01	9.040E-01	1.087E+01

Electrons in COPPER

Density, g/cm³
8.9600E+00 I, eV
322.0

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²		
1.000E-02	1.318E+01	1.213E-02	1.319E+01	4.601E-04	4.701E-04	1.244E-03
1.250E-02	1.127E+01	1.277E-02	1.128E+01	6.658E-04	5.814E-04	1.585E-03
1.500E-02	9.904E+00	1.327E-02	9.917E+00	9.028E-04	6.904E-04	1.938E-03
1.750E-02	8.874E+00	1.366E-02	8.887E+00	1.170E-03	7.972E-04	2.304E-03
2.000E-02	8.066E+00	1.399E-02	8.080E+00	1.465E-03	9.019E-04	2.683E-03
2.500E-02	6.877E+00	1.449E-02	6.892E+00	2.138E-03	1.105E-03	3.481E-03
3.000E-02	6.040E+00	1.488E-02	6.055E+00	2.914E-03	1.301E-03	4.334E-03
3.500E-02	5.416E+00	1.518E-02	5.431E+00	3.788E-03	1.491E-03	5.247E-03
4.000E-02	4.931E+00	1.543E-02	4.947E+00	4.754E-03	1.674E-03	6.220E-03
4.500E-02	4.544E+00	1.564E-02	4.560E+00	5.808E-03	1.852E-03	7.259E-03
5.000E-02	4.226E+00	1.583E-02	4.242E+00	6.946E-03	2.025E-03	8.365E-03
5.500E-02	3.961E+00	1.600E-02	3.977E+00	8.164E-03	2.194E-03	9.542E-03
6.000E-02	3.736E+00	1.615E-02	3.753E+00	9.459E-03	2.358E-03	1.080E-02
7.000E-02	3.375E+00	1.641E-02	3.392E+00	1.227E-02	2.674E-03	1.354E-02
8.000E-02	3.098E+00	1.665E-02	3.114E+00	1.535E-02	2.977E-03	1.664E-02
9.000E-02	2.877E+00	1.688E-02	2.894E+00	1.868E-02	3.268E-03	2.013E-02
1.000E-01	2.698E+00	1.710E-02	2.715E+00	2.225E-02	3.547E-03	2.404E-02
1.250E-01	2.369E+00	1.763E-02	2.387E+00	3.211E-02	4.208E-03	3.583E-02
1.500E-01	2.146E+00	1.816E-02	2.164E+00	4.314E-02	4.822E-03	5.053E-02
1.750E-01	1.984E+00	1.870E-02	2.002E+00	5.517E-02	5.401E-03	6.758E-02
2.000E-01	1.861E+00	1.926E-02	1.881E+00	6.807E-02	5.950E-03	8.595E-02
2.500E-01	1.691E+00	2.045E-02	1.711E+00	9.603E-02	6.981E-03	1.236E-01
3.000E-01	1.579E+00	2.172E-02	1.601E+00	1.263E-01	7.945E-03	1.604E-01
3.500E-01	1.501E+00	2.307E-02	1.524E+00	1.584E-01	8.860E-03	1.958E-01
4.000E-01	1.444E+00	2.450E-02	1.469E+00	1.918E-01	9.741E-03	2.302E-01
4.500E-01	1.402E+00	2.600E-02	1.428E+00	2.263E-01	1.060E-02	2.635E-01
5.000E-01	1.370E+00	2.757E-02	1.398E+00	2.617E-01	1.143E-02	2.958E-01
5.500E-01	1.345E+00	2.919E-02	1.375E+00	2.978E-01	1.226E-02	3.273E-01
6.000E-01	1.326E+00	3.087E-02	1.357E+00	3.345E-01	1.307E-02	3.581E-01
7.000E-01	1.298E+00	3.437E-02	1.333E+00	4.089E-01	1.467E-02	4.173E-01
8.000E-01	1.281E+00	3.803E-02	1.319E+00	4.843E-01	1.625E-02	4.739E-01
9.000E-01	1.270E+00	4.185E-02	1.312E+00	5.604E-01	1.782E-02	5.280E-01
1.000E+00	1.263E+00	4.580E-02	1.309E+00	6.367E-01	1.938E-02	5.799E-01
1.250E+00	1.257E+00	5.623E-02	1.313E+00	8.276E-01	2.328E-02	7.011E-01
1.500E+00	1.259E+00	6.733E-02	1.327E+00	1.017E+00	2.720E-02	8.121E-01
1.750E+00	1.265E+00	7.896E-02	1.344E+00	1.204E+00	3.113E-02	9.149E-01
2.000E+00	1.273E+00	9.103E-02	1.364E+00	1.389E+00	3.509E-02	1.011E+00
2.500E+00	1.289E+00	1.162E-01	1.405E+00	1.750E+00	4.302E-02	1.186E+00
3.000E+00	1.305E+00	1.425E-01	1.448E+00	2.101E+00	5.095E-02	1.343E+00
3.500E+00	1.320E+00	1.697E-01	1.490E+00	2.441E+00	5.885E-02	1.486E+00
4.000E+00	1.334E+00	1.976E-01	1.531E+00	2.772E+00	6.668E-02	1.617E+00

4.500E+00	1.346E+00	2.261E-01	1.573E+00	3.094E+00	7.443E-02	1.738E+00
5.000E+00	1.358E+00	2.552E-01	1.613E+00	3.408E+00	8.209E-02	1.850E+00
5.500E+00	1.368E+00	2.847E-01	1.653E+00	3.715E+00	8.965E-02	1.954E+00
6.000E+00	1.378E+00	3.146E-01	1.693E+00	4.013E+00	9.710E-02	2.052E+00
7.000E+00	1.396E+00	3.756E-01	1.771E+00	4.591E+00	1.117E-01	2.229E+00
8.000E+00	1.411E+00	4.378E-01	1.849E+00	5.143E+00	1.258E-01	2.388E+00
9.000E+00	1.424E+00	5.009E-01	1.925E+00	5.673E+00	1.394E-01	2.532E+00
1.000E+01	1.436E+00	5.650E-01	2.001E+00	6.183E+00	1.526E-01	2.664E+00
1.250E+01	1.462E+00	7.282E-01	2.190E+00	7.376E+00	1.837E-01	2.951E+00
1.500E+01	1.482E+00	8.949E-01	2.377E+00	8.472E+00	2.122E-01	3.194E+00
1.750E+01	1.499E+00	1.064E+00	2.563E+00	9.484E+00	2.385E-01	3.407E+00
2.000E+01	1.513E+00	1.236E+00	2.749E+00	1.043E+01	2.628E-01	3.597E+00
2.500E+01	1.537E+00	1.583E+00	3.120E+00	1.213E+01	3.061E-01	3.927E+00
3.000E+01	1.555E+00	1.936E+00	3.491E+00	1.365E+01	3.437E-01	4.209E+00
3.500E+01	1.570E+00	2.291E+00	3.861E+00	1.501E+01	3.767E-01	4.456E+00
4.000E+01	1.582E+00	2.650E+00	4.233E+00	1.624E+01	4.059E-01	4.676E+00
4.500E+01	1.593E+00	3.012E+00	4.605E+00	1.738E+01	4.320E-01	4.874E+00
5.000E+01	1.603E+00	3.375E+00	4.978E+00	1.842E+01	4.554E-01	5.054E+00
5.500E+01	1.611E+00	3.740E+00	5.351E+00	1.939E+01	4.766E-01	5.219E+00
6.000E+01	1.619E+00	4.107E+00	5.725E+00	2.029E+01	4.959E-01	5.372E+00
7.000E+01	1.632E+00	4.844E+00	6.476E+00	2.193E+01	5.298E-01	5.646E+00
8.000E+01	1.643E+00	5.586E+00	7.229E+00	2.339E+01	5.587E-01	5.886E+00
9.000E+01	1.653E+00	6.330E+00	7.983E+00	2.471E+01	5.836E-01	6.100E+00
1.000E+02	1.661E+00	7.079E+00	8.740E+00	2.591E+01	6.054E-01	6.292E+00
1.250E+02	1.679E+00	8.958E+00	1.064E+01	2.850E+01	6.498E-01	6.705E+00
1.500E+02	1.694E+00	1.085E+01	1.254E+01	3.066E+01	6.838E-01	7.046E+00
1.750E+02	1.706E+00	1.275E+01	1.445E+01	3.251E+01	7.110E-01	7.336E+00
2.000E+02	1.716E+00	1.465E+01	1.637E+01	3.414E+01	7.332E-01	7.590E+00
2.500E+02	1.733E+00	1.847E+01	2.020E+01	3.688E+01	7.676E-01	8.017E+00
3.000E+02	1.747E+00	2.230E+01	2.404E+01	3.915E+01	7.932E-01	8.370E+00
3.500E+02	1.758E+00	2.613E+01	2.789E+01	4.108E+01	8.131E-01	8.670E+00
4.000E+02	1.768E+00	2.998E+01	3.174E+01	4.276E+01	8.291E-01	8.931E+00
4.500E+02	1.776E+00	3.382E+01	3.560E+01	4.424E+01	8.422E-01	9.162E+00
5.000E+02	1.784E+00	3.767E+01	3.946E+01	4.558E+01	8.532E-01	9.369E+00
5.500E+02	1.791E+00	4.153E+01	4.332E+01	4.679E+01	8.626E-01	9.558E+00
6.000E+02	1.797E+00	4.539E+01	4.718E+01	4.789E+01	8.708E-01	9.730E+00
7.000E+02	1.808E+00	5.311E+01	5.491E+01	4.985E+01	8.842E-01	1.004E+01
8.000E+02	1.817E+00	6.083E+01	6.265E+01	5.156E+01	8.948E-01	1.030E+01
9.000E+02	1.826E+00	6.856E+01	7.039E+01	5.306E+01	9.034E-01	1.053E+01
1.000E+03	1.833E+00	7.630E+01	7.813E+01	5.441E+01	9.106E-01	1.074E+01

Electrons in GERMANIUM

Density, g/cm³
5.3230E+00 I, eV
350.0

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²		
1.000E-02	1.243E+01	1.267E-02	1.244E+01	4.909E-04	5.173E-04	5.174E-04
1.250E-02	1.064E+01	1.339E-02	1.066E+01	7.089E-04	6.415E-04	6.631E-04
1.500E-02	9.365E+00	1.395E-02	9.379E+00	9.595E-04	7.633E-04	8.151E-04
1.750E-02	8.397E+00	1.439E-02	8.412E+00	1.242E-03	8.828E-04	9.732E-04
2.000E-02	7.638E+00	1.475E-02	7.653E+00	1.554E-03	9.999E-04	1.137E-03
2.500E-02	6.519E+00	1.532E-02	6.534E+00	2.263E-03	1.227E-03	1.483E-03
3.000E-02	5.730E+00	1.575E-02	5.745E+00	3.082E-03	1.447E-03	1.852E-03
3.500E-02	5.141E+00	1.609E-02	5.157E+00	4.002E-03	1.659E-03	2.243E-03
4.000E-02	4.683E+00	1.638E-02	4.700E+00	5.019E-03	1.865E-03	2.655E-03
4.500E-02	4.317E+00	1.663E-02	4.334E+00	6.128E-03	2.064E-03	3.088E-03
5.000E-02	4.017E+00	1.684E-02	4.034E+00	7.325E-03	2.259E-03	3.540E-03
5.500E-02	3.766E+00	1.704E-02	3.784E+00	8.606E-03	2.448E-03	4.012E-03
6.000E-02	3.554E+00	1.722E-02	3.571E+00	9.967E-03	2.633E-03	4.501E-03
7.000E-02	3.212E+00	1.755E-02	3.230E+00	1.292E-02	2.990E-03	5.534E-03
8.000E-02	2.949E+00	1.784E-02	2.967E+00	1.615E-02	3.331E-03	6.632E-03
9.000E-02	2.741E+00	1.811E-02	2.759E+00	1.965E-02	3.660E-03	7.793E-03
1.000E-01	2.572E+00	1.837E-02	2.590E+00	2.340E-02	3.977E-03	9.013E-03
1.250E-01	2.261E+00	1.900E-02	2.280E+00	3.372E-02	4.726E-03	1.230E-02
1.500E-01	2.050E+00	1.960E-02	2.069E+00	4.526E-02	5.423E-03	1.588E-02
1.750E-01	1.898E+00	2.020E-02	1.918E+00	5.783E-02	6.078E-03	1.972E-02
2.000E-01	1.783E+00	2.081E-02	1.804E+00	7.129E-02	6.698E-03	2.380E-02
2.500E-01	1.623E+00	2.208E-02	1.646E+00	1.004E-01	7.856E-03	3.258E-02
3.000E-01	1.519E+00	2.344E-02	1.543E+00	1.318E-01	8.933E-03	4.208E-02
3.500E-01	1.447E+00	2.488E-02	1.472E+00	1.651E-01	9.950E-03	5.224E-02
4.000E-01	1.395E+00	2.641E-02	1.421E+00	1.997E-01	1.092E-02	6.299E-02
4.500E-01	1.356E+00	2.802E-02	1.384E+00	2.353E-01	1.187E-02	7.431E-02
5.000E-01	1.327E+00	2.971E-02	1.357E+00	2.718E-01	1.279E-02	8.617E-02
5.500E-01	1.305E+00	3.146E-02	1.336E+00	3.090E-01	1.369E-02	9.855E-02
6.000E-01	1.287E+00	3.326E-02	1.321E+00	3.466E-01	1.458E-02	1.114E-01
7.000E-01	1.263E+00	3.702E-02	1.300E+00	4.230E-01	1.633E-02	1.385E-01
8.000E-01	1.248E+00	4.095E-02	1.289E+00	5.003E-01	1.805E-02	1.672E-01
9.000E-01	1.239E+00	4.504E-02	1.284E+00	5.780E-01	1.976E-02	1.972E-01
1.000E+00	1.234E+00	4.926E-02	1.283E+00	6.560E-01	2.146E-02	2.282E-01
1.250E+00	1.231E+00	6.036E-02	1.291E+00	8.503E-01	2.568E-02	3.082E-01
1.500E+00	1.235E+00	7.213E-02	1.307E+00	1.043E+00	2.990E-02	3.893E-01
1.750E+00	1.242E+00	8.442E-02	1.326E+00	1.233E+00	3.412E-02	4.694E-01
2.000E+00	1.250E+00	9.714E-02	1.347E+00	1.420E+00	3.834E-02	5.473E-01
2.500E+00	1.267E+00	1.236E-01	1.391E+00	1.785E+00	4.677E-02	6.952E-01
3.000E+00	1.284E+00	1.512E-01	1.435E+00	2.139E+00	5.517E-02	8.322E-01
3.500E+00	1.300E+00	1.797E-01	1.479E+00	2.482E+00	6.350E-02	9.592E-01
4.000E+00	1.314E+00	2.089E-01	1.523E+00	2.815E+00	7.173E-02	1.077E+00

4.500E+00	1.326E+00	2.387E-01	1.565E+00	3.139E+00	7.986E-02	1.188E+00
5.000E+00	1.338E+00	2.691E-01	1.607E+00	3.454E+00	8.788E-02	1.291E+00
5.500E+00	1.349E+00	2.999E-01	1.649E+00	3.762E+00	9.577E-02	1.389E+00
6.000E+00	1.358E+00	3.312E-01	1.690E+00	4.061E+00	1.035E-01	1.481E+00
7.000E+00	1.376E+00	3.949E-01	1.771E+00	4.639E+00	1.187E-01	1.651E+00
8.000E+00	1.391E+00	4.598E-01	1.851E+00	5.192E+00	1.333E-01	1.805E+00
9.000E+00	1.404E+00	5.258E-01	1.930E+00	5.721E+00	1.475E-01	1.945E+00
1.000E+01	1.416E+00	5.926E-01	2.008E+00	6.229E+00	1.611E-01	2.074E+00
1.250E+01	1.441E+00	7.631E-01	2.204E+00	7.416E+00	1.931E-01	2.357E+00
1.500E+01	1.460E+00	9.373E-01	2.398E+00	8.504E+00	2.225E-01	2.597E+00
1.750E+01	1.477E+00	1.114E+00	2.591E+00	9.506E+00	2.494E-01	2.806E+00
2.000E+01	1.491E+00	1.294E+00	2.785E+00	1.044E+01	2.742E-01	2.991E+00
2.500E+01	1.514E+00	1.659E+00	3.173E+00	1.212E+01	3.183E-01	3.311E+00
3.000E+01	1.533E+00	2.029E+00	3.562E+00	1.360E+01	3.564E-01	3.583E+00
3.500E+01	1.548E+00	2.403E+00	3.951E+00	1.494E+01	3.897E-01	3.820E+00
4.000E+01	1.561E+00	2.781E+00	4.342E+00	1.614E+01	4.191E-01	4.031E+00
4.500E+01	1.571E+00	3.162E+00	4.734E+00	1.725E+01	4.453E-01	4.221E+00
5.000E+01	1.581E+00	3.545E+00	5.126E+00	1.826E+01	4.688E-01	4.395E+00
5.500E+01	1.589E+00	3.930E+00	5.519E+00	1.920E+01	4.900E-01	4.555E+00
6.000E+01	1.597E+00	4.316E+00	5.913E+00	2.008E+01	5.092E-01	4.704E+00
7.000E+01	1.610E+00	5.093E+00	6.703E+00	2.166E+01	5.430E-01	4.971E+00
8.000E+01	1.621E+00	5.874E+00	7.495E+00	2.307E+01	5.716E-01	5.206E+00
9.000E+01	1.631E+00	6.658E+00	8.289E+00	2.434E+01	5.963E-01	5.416E+00
1.000E+02	1.640E+00	7.445E+00	9.084E+00	2.549E+01	6.178E-01	5.607E+00
1.250E+02	1.657E+00	9.420E+00	1.108E+01	2.798E+01	6.615E-01	6.014E+00
1.500E+02	1.671E+00	1.141E+01	1.308E+01	3.006E+01	6.949E-01	6.352E+00
1.750E+02	1.683E+00	1.340E+01	1.508E+01	3.183E+01	7.214E-01	6.640E+00
2.000E+02	1.693E+00	1.540E+01	1.709E+01	3.339E+01	7.431E-01	6.891E+00
2.500E+02	1.710E+00	1.940E+01	2.111E+01	3.602E+01	7.766E-01	7.314E+00
3.000E+02	1.723E+00	2.342E+01	2.514E+01	3.819E+01	8.014E-01	7.663E+00
3.500E+02	1.734E+00	2.744E+01	2.918E+01	4.003E+01	8.207E-01	7.961E+00
4.000E+02	1.744E+00	3.148E+01	3.322E+01	4.164E+01	8.361E-01	8.220E+00
4.500E+02	1.752E+00	3.552E+01	3.727E+01	4.306E+01	8.488E-01	8.449E+00
5.000E+02	1.760E+00	3.956E+01	4.132E+01	4.433E+01	8.595E-01	8.655E+00
5.500E+02	1.766E+00	4.360E+01	4.537E+01	4.548E+01	8.685E-01	8.842E+00
6.000E+02	1.773E+00	4.765E+01	4.942E+01	4.654E+01	8.764E-01	9.013E+00
7.000E+02	1.783E+00	5.576E+01	5.754E+01	4.841E+01	8.893E-01	9.317E+00
8.000E+02	1.793E+00	6.387E+01	6.566E+01	5.004E+01	8.995E-01	9.582E+00
9.000E+02	1.801E+00	7.199E+01	7.379E+01	5.147E+01	9.078E-01	9.815E+00
1.000E+03	1.808E+00	8.011E+01	8.192E+01	5.276E+01	9.147E-01	1.002E+01

Electrons in TUNGSTEN

		Density, g/cm ³		I, eV			
		1.9300E+01		727.0			
KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA	
	COLLISION	RADIATIVE	TOTAL				
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²			
1.000E-02	8.974E+00	1.977E-02	8.993E+00	7.490E-04	1.076E-03	9.911E-04	
1.250E-02	7.806E+00	2.165E-02	7.828E+00	1.048E-03	1.357E-03	1.263E-03	
1.500E-02	6.945E+00	2.320E-02	6.968E+00	1.387E-03	1.639E-03	1.544E-03	
1.750E-02	6.281E+00	2.450E-02	6.306E+00	1.765E-03	1.920E-03	1.834E-03	
2.000E-02	5.753E+00	2.563E-02	5.779E+00	2.179E-03	2.200E-03	2.133E-03	
2.500E-02	4.961E+00	2.752E-02	4.989E+00	3.114E-03	2.756E-03	2.758E-03	
3.000E-02	4.394E+00	2.908E-02	4.423E+00	4.181E-03	3.305E-03	3.417E-03	
3.500E-02	3.966E+00	3.042E-02	3.996E+00	5.372E-03	3.846E-03	4.109E-03	
4.000E-02	3.631E+00	3.160E-02	3.662E+00	6.681E-03	4.381E-03	4.834E-03	
4.500E-02	3.360E+00	3.267E-02	3.393E+00	8.101E-03	4.908E-03	5.591E-03	
5.000E-02	3.137E+00	3.364E-02	3.171E+00	9.627E-03	5.430E-03	6.378E-03	
5.500E-02	2.950E+00	3.454E-02	2.985E+00	1.125E-02	5.944E-03	7.195E-03	
6.000E-02	2.791E+00	3.539E-02	2.826E+00	1.298E-02	6.453E-03	8.041E-03	
7.000E-02	2.533E+00	3.694E-02	2.570E+00	1.669E-02	7.453E-03	9.817E-03	
8.000E-02	2.334E+00	3.834E-02	2.373E+00	2.075E-02	8.430E-03	1.170E-02	
9.000E-02	2.176E+00	3.964E-02	2.216E+00	2.511E-02	9.385E-03	1.369E-02	
1.000E-01	2.047E+00	4.084E-02	2.088E+00	2.977E-02	1.032E-02	1.577E-02	
1.250E-01	1.808E+00	4.355E-02	1.852E+00	4.253E-02	1.257E-02	2.139E-02	
1.500E-01	1.646E+00	4.595E-02	1.692E+00	5.668E-02	1.470E-02	2.755E-02	
1.750E-01	1.528E+00	4.814E-02	1.576E+00	7.202E-02	1.673E-02	3.420E-02	
2.000E-01	1.439E+00	5.021E-02	1.489E+00	8.835E-02	1.865E-02	4.131E-02	
2.500E-01	1.315E+00	5.414E-02	1.370E+00	1.235E-01	2.226E-02	5.677E-02	
3.000E-01	1.234E+00	5.797E-02	1.292E+00	1.611E-01	2.558E-02	7.370E-02	
3.500E-01	1.178E+00	6.179E-02	1.240E+00	2.007E-01	2.870E-02	9.188E-02	
4.000E-01	1.138E+00	6.565E-02	1.203E+00	2.416E-01	3.164E-02	1.111E-01	
4.500E-01	1.108E+00	6.956E-02	1.177E+00	2.836E-01	3.443E-02	1.310E-01	
5.000E-01	1.085E+00	7.353E-02	1.159E+00	3.265E-01	3.712E-02	1.515E-01	
5.500E-01	1.068E+00	7.755E-02	1.146E+00	3.699E-01	3.971E-02	1.723E-01	
6.000E-01	1.055E+00	8.162E-02	1.136E+00	4.137E-01	4.221E-02	1.932E-01	
7.000E-01	1.036E+00	8.993E-02	1.126E+00	5.022E-01	4.702E-02	2.352E-01	
8.000E-01	1.025E+00	9.841E-02	1.124E+00	5.911E-01	5.161E-02	2.768E-01	
9.000E-01	1.019E+00	1.071E-01	1.126E+00	6.800E-01	5.602E-02	3.176E-01	
1.000E+00	1.016E+00	1.159E-01	1.132E+00	7.686E-01	6.030E-02	3.575E-01	
1.250E+00	1.016E+00	1.387E-01	1.154E+00	9.875E-01	7.051E-02	4.528E-01	
1.500E+00	1.021E+00	1.624E-01	1.183E+00	1.201E+00	8.022E-02	5.416E-01	
1.750E+00	1.029E+00	1.868E-01	1.215E+00	1.410E+00	8.955E-02	6.242E-01	
2.000E+00	1.037E+00	2.117E-01	1.249E+00	1.613E+00	9.856E-02	7.015E-01	
2.500E+00	1.055E+00	2.630E-01	1.318E+00	2.003E+00	1.158E-01	8.423E-01	
3.000E+00	1.072E+00	3.158E-01	1.388E+00	2.372E+00	1.321E-01	9.684E-01	
3.500E+00	1.087E+00	3.698E-01	1.457E+00	2.724E+00	1.476E-01	1.083E+00	
4.000E+00	1.101E+00	4.248E-01	1.526E+00	3.059E+00	1.625E-01	1.188E+00	

4.500E+00	1.114E+00	4.806E-01	1.595E+00	3.380E+00	1.766E-01	1.286E+00
5.000E+00	1.126E+00	5.372E-01	1.663E+00	3.687E+00	1.902E-01	1.378E+00
5.500E+00	1.136E+00	5.945E-01	1.731E+00	3.981E+00	2.032E-01	1.463E+00
6.000E+00	1.146E+00	6.523E-01	1.798E+00	4.265E+00	2.157E-01	1.544E+00
7.000E+00	1.163E+00	7.697E-01	1.933E+00	4.801E+00	2.393E-01	1.694E+00
8.000E+00	1.178E+00	8.890E-01	2.067E+00	5.301E+00	2.612E-01	1.830E+00
9.000E+00	1.191E+00	1.010E+00	2.201E+00	5.770E+00	2.816E-01	1.955E+00
1.000E+01	1.203E+00	1.132E+00	2.335E+00	6.211E+00	3.006E-01	2.070E+00
1.250E+01	1.227E+00	1.443E+00	2.670E+00	7.212E+00	3.432E-01	2.324E+00
1.500E+01	1.247E+00	1.759E+00	3.006E+00	8.094E+00	3.800E-01	2.544E+00
1.750E+01	1.263E+00	2.081E+00	3.343E+00	8.882E+00	4.120E-01	2.737E+00
2.000E+01	1.277E+00	2.406E+00	3.682E+00	9.594E+00	4.403E-01	2.910E+00
2.500E+01	1.299E+00	3.065E+00	4.364E+00	1.084E+01	4.881E-01	3.212E+00
3.000E+01	1.316E+00	3.735E+00	5.051E+00	1.190E+01	5.270E-01	3.471E+00
3.500E+01	1.331E+00	4.412E+00	5.743E+00	1.283E+01	5.595E-01	3.698E+00
4.000E+01	1.343E+00	5.096E+00	6.439E+00	1.365E+01	5.871E-01	3.901E+00
4.500E+01	1.353E+00	5.784E+00	7.138E+00	1.439E+01	6.109E-01	4.084E+00
5.000E+01	1.362E+00	6.477E+00	7.840E+00	1.506E+01	6.316E-01	4.252E+00
5.500E+01	1.371E+00	7.174E+00	8.544E+00	1.567E+01	6.500E-01	4.405E+00
6.000E+01	1.378E+00	7.873E+00	9.251E+00	1.623E+01	6.662E-01	4.548E+00
7.000E+01	1.391E+00	9.280E+00	1.067E+01	1.724E+01	6.940E-01	4.804E+00
8.000E+01	1.401E+00	1.070E+01	1.210E+01	1.812E+01	7.169E-01	5.031E+00
9.000E+01	1.411E+00	1.212E+01	1.353E+01	1.890E+01	7.362E-01	5.233E+00
1.000E+02	1.419E+00	1.355E+01	1.496E+01	1.960E+01	7.526E-01	5.417E+00
1.250E+02	1.436E+00	1.713E+01	1.857E+01	2.110E+01	7.850E-01	5.812E+00
1.500E+02	1.449E+00	2.074E+01	2.219E+01	2.233E+01	8.090E-01	6.141E+00
1.750E+02	1.460E+00	2.436E+01	2.582E+01	2.337E+01	8.276E-01	6.423E+00
2.000E+02	1.470E+00	2.798E+01	2.945E+01	2.428E+01	8.425E-01	6.670E+00
2.500E+02	1.485E+00	3.525E+01	3.674E+01	2.579E+01	8.651E-01	7.088E+00
3.000E+02	1.498E+00	4.254E+01	4.404E+01	2.704E+01	8.814E-01	7.433E+00
3.500E+02	1.508E+00	4.984E+01	5.135E+01	2.809E+01	8.938E-01	7.728E+00
4.000E+02	1.517E+00	5.715E+01	5.866E+01	2.900E+01	9.036E-01	7.984E+00
4.500E+02	1.525E+00	6.446E+01	6.599E+01	2.980E+01	9.116E-01	8.212E+00
5.000E+02	1.532E+00	7.178E+01	7.331E+01	3.052E+01	9.183E-01	8.416E+00
5.500E+02	1.538E+00	7.911E+01	8.065E+01	3.117E+01	9.239E-01	8.601E+00
6.000E+02	1.544E+00	8.645E+01	8.799E+01	3.176E+01	9.287E-01	8.770E+00
7.000E+02	1.554E+00	1.011E+02	1.027E+02	3.281E+01	9.366E-01	9.071E+00
8.000E+02	1.562E+00	1.158E+02	1.174E+02	3.372E+01	9.427E-01	9.333E+00
9.000E+02	1.570E+00	1.305E+02	1.321E+02	3.453E+01	9.477E-01	9.564E+00
1.000E+03	1.576E+00	1.452E+02	1.468E+02	3.524E+01	9.518E-01	9.771E+00

Electrons in LEAD

Density, g/cm3
1.1350E+01 I, eV
823.0

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm2/g	MeV cm2/g	MeV cm2/g	g/cm2		
1.000E-02	8.428E+00	2.045E-02	8.448E+00	8.255E-04	1.191E-03	4.841E-04
1.250E-02	7.356E+00	2.251E-02	7.379E+00	1.143E-03	1.500E-03	6.147E-04
1.500E-02	6.561E+00	2.421E-02	6.585E+00	1.502E-03	1.810E-03	7.491E-04
1.750E-02	5.945E+00	2.566E-02	5.971E+00	1.902E-03	2.121E-03	8.872E-04
2.000E-02	5.453E+00	2.693E-02	5.480E+00	2.339E-03	2.432E-03	1.029E-03
2.500E-02	4.714E+00	2.908E-02	4.743E+00	3.323E-03	3.051E-03	1.324E-03
3.000E-02	4.182E+00	3.086E-02	4.212E+00	4.445E-03	3.664E-03	1.633E-03
3.500E-02	3.779E+00	3.240E-02	3.812E+00	5.695E-03	4.271E-03	1.956E-03
4.000E-02	3.463E+00	3.376E-02	3.497E+00	7.066E-03	4.872E-03	2.294E-03
4.500E-02	3.208E+00	3.500E-02	3.243E+00	8.552E-03	5.467E-03	2.646E-03
5.000E-02	2.997E+00	3.613E-02	3.034E+00	1.015E-02	6.055E-03	3.011E-03
5.500E-02	2.821E+00	3.718E-02	2.858E+00	1.185E-02	6.638E-03	3.390E-03
6.000E-02	2.670E+00	3.817E-02	2.708E+00	1.365E-02	7.214E-03	3.783E-03
7.000E-02	2.426E+00	3.998E-02	2.466E+00	1.752E-02	8.349E-03	4.608E-03
8.000E-02	2.237E+00	4.162E-02	2.279E+00	2.175E-02	9.461E-03	5.485E-03
9.000E-02	2.087E+00	4.313E-02	2.130E+00	2.629E-02	1.055E-02	6.413E-03
1.000E-01	1.964E+00	4.454E-02	2.008E+00	3.113E-02	1.162E-02	7.392E-03
1.250E-01	1.737E+00	4.772E-02	1.785E+00	4.438E-02	1.419E-02	1.005E-02
1.500E-01	1.583E+00	5.054E-02	1.633E+00	5.905E-02	1.664E-02	1.300E-02
1.750E-01	1.471E+00	5.312E-02	1.524E+00	7.492E-02	1.896E-02	1.623E-02
2.000E-01	1.387E+00	5.555E-02	1.442E+00	9.180E-02	2.118E-02	1.971E-02
2.500E-01	1.269E+00	6.015E-02	1.329E+00	1.280E-01	2.533E-02	2.736E-02
3.000E-01	1.193E+00	6.460E-02	1.257E+00	1.668E-01	2.917E-02	3.579E-02
3.500E-01	1.140E+00	6.900E-02	1.209E+00	2.074E-01	3.276E-02	4.484E-02
4.000E-01	1.102E+00	7.340E-02	1.175E+00	2.494E-01	3.614E-02	5.437E-02
4.500E-01	1.074E+00	7.781E-02	1.152E+00	2.924E-01	3.935E-02	6.426E-02
5.000E-01	1.053E+00	8.228E-02	1.135E+00	3.361E-01	4.241E-02	7.443E-02
5.500E-01	1.037E+00	8.677E-02	1.124E+00	3.804E-01	4.536E-02	8.479E-02
6.000E-01	1.026E+00	9.132E-02	1.117E+00	4.250E-01	4.820E-02	9.529E-02
7.000E-01	1.009E+00	1.005E-01	1.110E+00	5.149E-01	5.363E-02	1.166E-01
8.000E-01	1.000E+00	1.098E-01	1.110E+00	6.050E-01	5.877E-02	1.380E-01
9.000E-01	9.957E-01	1.193E-01	1.115E+00	6.949E-01	6.369E-02	1.595E-01
1.000E+00	9.939E-01	1.290E-01	1.123E+00	7.843E-01	6.842E-02	1.809E-01
1.250E+00	9.966E-01	1.537E-01	1.150E+00	1.004E+00	7.960E-02	2.337E-01
1.500E+00	1.004E+00	1.792E-01	1.183E+00	1.219E+00	9.009E-02	2.854E-01
1.750E+00	1.014E+00	2.053E-01	1.219E+00	1.427E+00	1.001E-01	3.360E-01
2.000E+00	1.024E+00	2.319E-01	1.256E+00	1.629E+00	1.096E-01	3.855E-01
2.500E+00	1.044E+00	2.866E-01	1.331E+00	2.016E+00	1.277E-01	4.817E-01
3.000E+00	1.063E+00	3.427E-01	1.406E+00	2.381E+00	1.447E-01	5.743E-01
3.500E+00	1.080E+00	3.999E-01	1.480E+00	2.728E+00	1.608E-01	6.631E-01
4.000E+00	1.095E+00	4.582E-01	1.553E+00	3.057E+00	1.761E-01	7.479E-01

4.500E+00	1.108E+00	5.174E-01	1.626E+00	3.372E+00	1.906E-01	8.289E-01
5.000E+00	1.120E+00	5.773E-01	1.698E+00	3.673E+00	2.045E-01	9.061E-01
5.500E+00	1.132E+00	6.379E-01	1.769E+00	3.962E+00	2.177E-01	9.798E-01
6.000E+00	1.142E+00	6.991E-01	1.841E+00	4.239E+00	2.304E-01	1.050E+00
7.000E+00	1.160E+00	8.233E-01	1.983E+00	4.762E+00	2.543E-01	1.182E+00
8.000E+00	1.175E+00	9.495E-01	2.125E+00	5.249E+00	2.765E-01	1.304E+00
9.000E+00	1.189E+00	1.077E+00	2.266E+00	5.705E+00	2.970E-01	1.417E+00
1.000E+01	1.201E+00	1.206E+00	2.407E+00	6.133E+00	3.162E-01	1.523E+00
1.250E+01	1.226E+00	1.535E+00	2.761E+00	7.102E+00	3.589E-01	1.759E+00
1.500E+01	1.246E+00	1.870E+00	3.116E+00	7.954E+00	3.955E-01	1.964E+00
1.750E+01	1.262E+00	2.210E+00	3.472E+00	8.713E+00	4.274E-01	2.147E+00
2.000E+01	1.277E+00	2.554E+00	3.830E+00	9.399E+00	4.555E-01	2.310E+00
2.500E+01	1.299E+00	3.252E+00	4.551E+00	1.059E+01	5.028E-01	2.596E+00
3.000E+01	1.318E+00	3.961E+00	5.279E+00	1.161E+01	5.412E-01	2.841E+00
3.500E+01	1.332E+00	4.678E+00	6.011E+00	1.250E+01	5.731E-01	3.055E+00
4.000E+01	1.345E+00	5.402E+00	6.747E+00	1.329E+01	6.002E-01	3.247E+00
4.500E+01	1.356E+00	6.132E+00	7.488E+00	1.399E+01	6.235E-01	3.420E+00
5.000E+01	1.365E+00	6.865E+00	8.231E+00	1.463E+01	6.439E-01	3.579E+00
5.500E+01	1.374E+00	7.603E+00	8.977E+00	1.521E+01	6.618E-01	3.725E+00
6.000E+01	1.381E+00	8.345E+00	9.726E+00	1.574E+01	6.777E-01	3.861E+00
7.000E+01	1.395E+00	9.836E+00	1.123E+01	1.670E+01	7.048E-01	4.107E+00
8.000E+01	1.406E+00	1.134E+01	1.274E+01	1.753E+01	7.270E-01	4.326E+00
9.000E+01	1.415E+00	1.284E+01	1.426E+01	1.828E+01	7.457E-01	4.521E+00
1.000E+02	1.423E+00	1.436E+01	1.578E+01	1.894E+01	7.617E-01	4.699E+00
1.250E+02	1.441E+00	1.816E+01	1.960E+01	2.036E+01	7.931E-01	5.083E+00
1.500E+02	1.455E+00	2.198E+01	2.344E+01	2.153E+01	8.164E-01	5.404E+00
1.750E+02	1.466E+00	2.582E+01	2.729E+01	2.251E+01	8.343E-01	5.679E+00
2.000E+02	1.476E+00	2.966E+01	3.114E+01	2.337E+01	8.488E-01	5.921E+00
2.500E+02	1.491E+00	3.737E+01	3.886E+01	2.480E+01	8.705E-01	6.330E+00
3.000E+02	1.504E+00	4.509E+01	4.660E+01	2.598E+01	8.862E-01	6.670E+00
3.500E+02	1.514E+00	5.283E+01	5.435E+01	2.697E+01	8.982E-01	6.960E+00
4.000E+02	1.523E+00	6.058E+01	6.210E+01	2.783E+01	9.077E-01	7.213E+00
4.500E+02	1.531E+00	6.833E+01	6.986E+01	2.859E+01	9.153E-01	7.438E+00
5.000E+02	1.538E+00	7.609E+01	7.763E+01	2.927E+01	9.217E-01	7.640E+00
5.500E+02	1.544E+00	8.386E+01	8.540E+01	2.988E+01	9.271E-01	7.824E+00
6.000E+02	1.550E+00	9.163E+01	9.318E+01	3.044E+01	9.317E-01	7.992E+00
7.000E+02	1.560E+00	1.072E+02	1.087E+02	3.143E+01	9.393E-01	8.290E+00
8.000E+02	1.568E+00	1.227E+02	1.243E+02	3.229E+01	9.452E-01	8.550E+00
9.000E+02	1.576E+00	1.383E+02	1.399E+02	3.305E+01	9.500E-01	8.780E+00
1.000E+03	1.583E+00	1.539E+02	1.555E+02	3.373E+01	9.539E-01	8.986E+00

Electrons in URANIUM

Density, g/cm³
1.8950E+01 I, eV
890.0

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²		
1.000E-02	7.984E+00	2.101E-02	8.005E+00	8.983E-04	1.292E-03	1.810E-03
1.250E-02	6.986E+00	2.327E-02	7.009E+00	1.233E-03	1.629E-03	2.324E-03
1.500E-02	6.240E+00	2.516E-02	6.266E+00	1.611E-03	1.968E-03	2.863E-03
1.750E-02	5.662E+00	2.679E-02	5.688E+00	2.030E-03	2.310E-03	3.423E-03
2.000E-02	5.198E+00	2.822E-02	5.226E+00	2.489E-03	2.653E-03	4.006E-03
2.500E-02	4.499E+00	3.067E-02	4.530E+00	3.521E-03	3.340E-03	5.231E-03
3.000E-02	3.995E+00	3.273E-02	4.028E+00	4.694E-03	4.025E-03	6.526E-03
3.500E-02	3.613E+00	3.452E-02	3.648E+00	6.001E-03	4.707E-03	7.882E-03
4.000E-02	3.313E+00	3.612E-02	3.349E+00	7.433E-03	5.384E-03	9.289E-03
4.500E-02	3.070E+00	3.756E-02	3.108E+00	8.984E-03	6.057E-03	1.074E-02
5.000E-02	2.870E+00	3.888E-02	2.909E+00	1.065E-02	6.724E-03	1.222E-02
5.500E-02	2.701E+00	4.011E-02	2.741E+00	1.242E-02	7.385E-03	1.372E-02
6.000E-02	2.557E+00	4.127E-02	2.598E+00	1.430E-02	8.042E-03	1.525E-02
7.000E-02	2.325E+00	4.339E-02	2.368E+00	1.833E-02	9.337E-03	1.834E-02
8.000E-02	2.144E+00	4.531E-02	2.190E+00	2.273E-02	1.061E-02	2.147E-02
9.000E-02	2.001E+00	4.709E-02	2.048E+00	2.746E-02	1.186E-02	2.462E-02
1.000E-01	1.883E+00	4.875E-02	1.932E+00	3.249E-02	1.308E-02	2.776E-02
1.250E-01	1.666E+00	5.249E-02	1.719E+00	4.626E-02	1.605E-02	3.560E-02
1.500E-01	1.518E+00	5.585E-02	1.574E+00	6.149E-02	1.888E-02	4.337E-02
1.750E-01	1.411E+00	5.894E-02	1.470E+00	7.795E-02	2.159E-02	5.103E-02
2.000E-01	1.330E+00	6.184E-02	1.392E+00	9.545E-02	2.417E-02	5.860E-02
2.500E-01	1.218E+00	6.735E-02	1.285E+00	1.329E-01	2.903E-02	7.344E-02
3.000E-01	1.144E+00	7.263E-02	1.217E+00	1.730E-01	3.355E-02	8.794E-02
3.500E-01	1.093E+00	7.782E-02	1.171E+00	2.149E-01	3.777E-02	1.021E-01
4.000E-01	1.057E+00	8.294E-02	1.140E+00	2.582E-01	4.175E-02	1.160E-01
4.500E-01	1.031E+00	8.805E-02	1.119E+00	3.025E-01	4.553E-02	1.296E-01
5.000E-01	1.011E+00	9.316E-02	1.104E+00	3.475E-01	4.913E-02	1.430E-01
5.500E-01	9.956E-01	9.828E-02	1.094E+00	3.931E-01	5.259E-02	1.561E-01
6.000E-01	9.842E-01	1.034E-01	1.088E+00	4.389E-01	5.591E-02	1.691E-01
7.000E-01	9.690E-01	1.137E-01	1.083E+00	5.311E-01	6.223E-02	1.945E-01
8.000E-01	9.604E-01	1.241E-01	1.084E+00	6.234E-01	6.817E-02	2.192E-01
9.000E-01	9.560E-01	1.346E-01	1.091E+00	7.154E-01	7.382E-02	2.434E-01
1.000E+00	9.544E-01	1.452E-01	1.100E+00	8.068E-01	7.921E-02	2.672E-01
1.250E+00	9.572E-01	1.721E-01	1.129E+00	1.031E+00	9.184E-02	3.247E-01
1.500E+00	9.649E-01	1.995E-01	1.164E+00	1.249E+00	1.035E-01	3.799E-01
1.750E+00	9.744E-01	2.275E-01	1.202E+00	1.461E+00	1.145E-01	4.332E-01
2.000E+00	9.844E-01	2.559E-01	1.240E+00	1.665E+00	1.249E-01	4.847E-01
2.500E+00	1.004E+00	3.139E-01	1.318E+00	2.056E+00	1.444E-01	5.832E-01
3.000E+00	1.022E+00	3.732E-01	1.396E+00	2.425E+00	1.625E-01	6.762E-01
3.500E+00	1.039E+00	4.338E-01	1.473E+00	2.774E+00	1.795E-01	7.646E-01
4.000E+00	1.054E+00	4.955E-01	1.549E+00	3.105E+00	1.955E-01	8.488E-01

4.500E+00	1.067E+00	5.580E-01	1.625E+00	3.420E+00	2.106E-01	9.294E-01
5.000E+00	1.079E+00	6.214E-01	1.700E+00	3.721E+00	2.250E-01	1.007E+00
5.500E+00	1.090E+00	6.856E-01	1.775E+00	4.008E+00	2.387E-01	1.081E+00
6.000E+00	1.100E+00	7.504E-01	1.850E+00	4.284E+00	2.518E-01	1.152E+00
7.000E+00	1.117E+00	8.818E-01	1.999E+00	4.804E+00	2.764E-01	1.287E+00
8.000E+00	1.132E+00	1.015E+00	2.147E+00	5.287E+00	2.990E-01	1.412E+00
9.000E+00	1.145E+00	1.151E+00	2.296E+00	5.737E+00	3.199E-01	1.529E+00
1.000E+01	1.157E+00	1.288E+00	2.444E+00	6.159E+00	3.394E-01	1.639E+00
1.250E+01	1.180E+00	1.636E+00	2.816E+00	7.111E+00	3.825E-01	1.886E+00
1.500E+01	1.199E+00	1.991E+00	3.191E+00	7.945E+00	4.193E-01	2.102E+00
1.750E+01	1.215E+00	2.352E+00	3.567E+00	8.685E+00	4.511E-01	2.294E+00
2.000E+01	1.228E+00	2.717E+00	3.945E+00	9.352E+00	4.790E-01	2.467E+00
2.500E+01	1.250E+00	3.457E+00	4.706E+00	1.051E+01	5.258E-01	2.768E+00
3.000E+01	1.266E+00	4.208E+00	5.474E+00	1.149E+01	5.636E-01	3.026E+00
3.500E+01	1.280E+00	4.967E+00	6.248E+00	1.235E+01	5.948E-01	3.252E+00
4.000E+01	1.292E+00	5.733E+00	7.025E+00	1.310E+01	6.212E-01	3.453E+00
4.500E+01	1.302E+00	6.505E+00	7.807E+00	1.378E+01	6.438E-01	3.635E+00
5.000E+01	1.311E+00	7.282E+00	8.593E+00	1.439E+01	6.635E-01	3.802E+00
5.500E+01	1.319E+00	8.063E+00	9.382E+00	1.495E+01	6.808E-01	3.954E+00
6.000E+01	1.326E+00	8.847E+00	1.017E+01	1.546E+01	6.961E-01	4.096E+00
7.000E+01	1.338E+00	1.043E+01	1.176E+01	1.637E+01	7.221E-01	4.352E+00
8.000E+01	1.349E+00	1.201E+01	1.336E+01	1.717E+01	7.435E-01	4.577E+00
9.000E+01	1.357E+00	1.361E+01	1.497E+01	1.787E+01	7.614E-01	4.779E+00
1.000E+02	1.365E+00	1.521E+01	1.658E+01	1.851E+01	7.766E-01	4.962E+00
1.250E+02	1.382E+00	1.924E+01	2.062E+01	1.986E+01	8.064E-01	5.357E+00
1.500E+02	1.395E+00	2.329E+01	2.469E+01	2.096E+01	8.285E-01	5.685E+00
1.750E+02	1.405E+00	2.736E+01	2.877E+01	2.190E+01	8.455E-01	5.966E+00
2.000E+02	1.414E+00	3.144E+01	3.286E+01	2.271E+01	8.591E-01	6.213E+00
2.500E+02	1.429E+00	3.962E+01	4.105E+01	2.407E+01	8.795E-01	6.630E+00
3.000E+02	1.441E+00	4.782E+01	4.926E+01	2.518E+01	8.943E-01	6.975E+00
3.500E+02	1.451E+00	5.604E+01	5.749E+01	2.612E+01	9.055E-01	7.268E+00
4.000E+02	1.460E+00	6.426E+01	6.572E+01	2.693E+01	9.144E-01	7.525E+00
4.500E+02	1.467E+00	7.250E+01	7.397E+01	2.765E+01	9.215E-01	7.752E+00
5.000E+02	1.474E+00	8.074E+01	8.221E+01	2.829E+01	9.275E-01	7.956E+00
5.500E+02	1.480E+00	8.899E+01	9.047E+01	2.887E+01	9.325E-01	8.141E+00
6.000E+02	1.486E+00	9.724E+01	9.872E+01	2.940E+01	9.369E-01	8.310E+00
7.000E+02	1.495E+00	1.137E+02	1.152E+02	3.034E+01	9.439E-01	8.611E+00
8.000E+02	1.503E+00	1.303E+02	1.318E+02	3.115E+01	9.494E-01	8.872E+00
9.000E+02	1.511E+00	1.468E+02	1.483E+02	3.186E+01	9.538E-01	9.103E+00
1.000E+03	1.517E+00	1.633E+02	1.648E+02	3.250E+01	9.575E-01	9.310E+00

Electrons in AIR, DRY (NEAR SEA LEVEL)

Density, g/cm³
1.2048E-03 I, eV
85.7

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²		
1.000E-02	1.975E+01	3.897E-03	1.976E+01	2.884E-04	1.082E-04	0.000E+00
1.250E-02	1.663E+01	3.921E-03	1.663E+01	4.269E-04	1.299E-04	0.000E+00
1.500E-02	1.444E+01	3.937E-03	1.445E+01	5.886E-04	1.506E-04	0.000E+00
1.750E-02	1.282E+01	3.946E-03	1.283E+01	7.727E-04	1.706E-04	0.000E+00
2.000E-02	1.157E+01	3.954E-03	1.158E+01	9.782E-04	1.898E-04	0.000E+00
2.500E-02	9.753E+00	3.966E-03	9.757E+00	1.451E-03	2.267E-04	0.000E+00
3.000E-02	8.491E+00	3.976E-03	8.495E+00	2.002E-03	2.619E-04	0.000E+00
3.500E-02	7.562E+00	3.986E-03	7.566E+00	2.627E-03	2.955E-04	0.000E+00
4.000E-02	6.848E+00	3.998E-03	6.852E+00	3.322E-03	3.280E-04	0.000E+00
4.500E-02	6.280E+00	4.011E-03	6.284E+00	4.085E-03	3.595E-04	0.000E+00
5.000E-02	5.818E+00	4.025E-03	5.822E+00	4.913E-03	3.900E-04	0.000E+00
5.500E-02	5.434E+00	4.040E-03	5.438E+00	5.802E-03	4.198E-04	0.000E+00
6.000E-02	5.110E+00	4.057E-03	5.114E+00	6.751E-03	4.488E-04	0.000E+00
7.000E-02	4.593E+00	4.093E-03	4.597E+00	8.817E-03	5.050E-04	0.000E+00
8.000E-02	4.197E+00	4.133E-03	4.201E+00	1.110E-02	5.590E-04	0.000E+00
9.000E-02	3.885E+00	4.175E-03	3.889E+00	1.357E-02	6.112E-04	0.000E+00
1.000E-01	3.633E+00	4.222E-03	3.637E+00	1.623E-02	6.618E-04	0.000E+00
1.250E-01	3.172E+00	4.348E-03	3.176E+00	2.362E-02	7.826E-04	0.000E+00
1.500E-01	2.861E+00	4.485E-03	2.865E+00	3.193E-02	8.968E-04	0.000E+00
1.750E-01	2.637E+00	4.633E-03	2.642E+00	4.103E-02	1.006E-03	0.000E+00
2.000E-01	2.469E+00	4.789E-03	2.474E+00	5.082E-02	1.111E-03	0.000E+00
2.500E-01	2.236E+00	5.126E-03	2.241E+00	7.213E-02	1.311E-03	0.000E+00
3.000E-01	2.084E+00	5.495E-03	2.089E+00	9.528E-02	1.502E-03	0.000E+00
3.500E-01	1.978E+00	5.890E-03	1.984E+00	1.199E-01	1.688E-03	0.000E+00
4.000E-01	1.902E+00	6.311E-03	1.908E+00	1.456E-01	1.869E-03	0.000E+00
4.500E-01	1.845E+00	6.757E-03	1.852E+00	1.722E-01	2.048E-03	0.000E+00
5.000E-01	1.802E+00	7.223E-03	1.809E+00	1.995E-01	2.225E-03	0.000E+00
5.500E-01	1.769E+00	7.708E-03	1.776E+00	2.274E-01	2.401E-03	0.000E+00
6.000E-01	1.743E+00	8.210E-03	1.751E+00	2.558E-01	2.577E-03	0.000E+00
7.000E-01	1.706E+00	9.258E-03	1.715E+00	3.136E-01	2.930E-03	0.000E+00
8.000E-01	1.683E+00	1.036E-02	1.694E+00	3.723E-01	3.283E-03	0.000E+00
9.000E-01	1.669E+00	1.151E-02	1.681E+00	4.316E-01	3.639E-03	0.000E+00
1.000E+00	1.661E+00	1.271E-02	1.674E+00	4.912E-01	3.997E-03	0.000E+00
1.250E+00	1.655E+00	1.588E-02	1.671E+00	6.408E-01	4.907E-03	0.000E+00
1.500E+00	1.661E+00	1.927E-02	1.680E+00	7.901E-01	5.836E-03	0.000E+00
1.750E+00	1.671E+00	2.284E-02	1.694E+00	9.383E-01	6.784E-03	0.000E+00
2.000E+00	1.684E+00	2.656E-02	1.711E+00	1.085E+00	7.748E-03	0.000E+00
2.500E+00	1.712E+00	3.437E-02	1.747E+00	1.374E+00	9.717E-03	0.000E+00
3.000E+00	1.740E+00	4.260E-02	1.783E+00	1.658E+00	1.173E-02	0.000E+00
3.500E+00	1.766E+00	5.115E-02	1.817E+00	1.935E+00	1.377E-02	0.000E+00
4.000E+00	1.790E+00	5.999E-02	1.850E+00	2.208E+00	1.583E-02	0.000E+00

4.500E+00	1.812E+00	6.908E-02	1.881E+00	2.476E+00	1.792E-02	0.000E+00
5.000E+00	1.833E+00	7.838E-02	1.911E+00	2.740E+00	2.001E-02	0.000E+00
5.500E+00	1.852E+00	8.787E-02	1.940E+00	2.999E+00	2.211E-02	0.000E+00
6.000E+00	1.870E+00	9.754E-02	1.967E+00	3.255E+00	2.422E-02	0.000E+00
7.000E+00	1.902E+00	1.173E-01	2.020E+00	3.757E+00	2.846E-02	0.000E+00
8.000E+00	1.931E+00	1.376E-01	2.068E+00	4.246E+00	3.269E-02	0.000E+00
9.000E+00	1.956E+00	1.584E-01	2.115E+00	4.724E+00	3.692E-02	0.000E+00
1.000E+01	1.979E+00	1.795E-01	2.159E+00	5.192E+00	4.113E-02	0.000E+00
1.250E+01	2.029E+00	2.337E-01	2.262E+00	6.323E+00	5.156E-02	0.000E+00
1.500E+01	2.069E+00	2.895E-01	2.359E+00	7.405E+00	6.182E-02	0.000E+00
1.750E+01	2.104E+00	3.464E-01	2.450E+00	8.445E+00	7.186E-02	0.000E+00
2.000E+01	2.134E+00	4.042E-01	2.539E+00	9.447E+00	8.167E-02	0.000E+00
2.500E+01	2.185E+00	5.219E-01	2.707E+00	1.135E+01	1.006E-01	0.000E+00
3.000E+01	2.226E+00	6.417E-01	2.868E+00	1.315E+01	1.186E-01	7.563E-03
3.500E+01	2.257E+00	7.630E-01	3.020E+00	1.485E+01	1.357E-01	5.965E-02
4.000E+01	2.282E+00	8.855E-01	3.167E+00	1.646E+01	1.520E-01	1.375E-01
4.500E+01	2.302E+00	1.009E+00	3.311E+00	1.801E+01	1.676E-01	2.263E-01
5.000E+01	2.319E+00	1.133E+00	3.452E+00	1.948E+01	1.825E-01	3.189E-01
5.500E+01	2.334E+00	1.258E+00	3.592E+00	2.090E+01	1.968E-01	4.116E-01
6.000E+01	2.347E+00	1.384E+00	3.731E+00	2.227E+01	2.104E-01	5.025E-01
7.000E+01	2.369E+00	1.637E+00	4.006E+00	2.486E+01	2.361E-01	6.758E-01
8.000E+01	2.387E+00	1.892E+00	4.279E+00	2.727E+01	2.598E-01	8.361E-01
9.000E+01	2.403E+00	2.148E+00	4.551E+00	2.954E+01	2.818E-01	9.837E-01
1.000E+02	2.417E+00	2.405E+00	4.822E+00	3.167E+01	3.022E-01	1.120E+00
1.250E+02	2.445E+00	3.053E+00	5.498E+00	3.652E+01	3.474E-01	1.418E+00
1.500E+02	2.468E+00	3.705E+00	6.173E+00	4.081E+01	3.859E-01	1.670E+00
1.750E+02	2.486E+00	4.360E+00	6.847E+00	4.466E+01	4.192E-01	1.887E+00
2.000E+02	2.502E+00	5.018E+00	7.520E+00	4.814E+01	4.484E-01	2.078E+00
2.500E+02	2.529E+00	6.340E+00	8.868E+00	5.425E+01	4.972E-01	2.403E+00
3.000E+02	2.550E+00	7.667E+00	1.022E+01	5.950E+01	5.365E-01	2.674E+00
3.500E+02	2.567E+00	8.998E+00	1.157E+01	6.410E+01	5.691E-01	2.909E+00
4.000E+02	2.582E+00	1.033E+01	1.292E+01	6.819E+01	5.967E-01	3.116E+00
4.500E+02	2.595E+00	1.167E+01	1.427E+01	7.187E+01	6.203E-01	3.302E+00
5.000E+02	2.606E+00	1.301E+01	1.562E+01	7.522E+01	6.409E-01	3.471E+00
5.500E+02	2.616E+00	1.435E+01	1.697E+01	7.829E+01	6.589E-01	3.627E+00
6.000E+02	2.625E+00	1.569E+01	1.832E+01	8.113E+01	6.750E-01	3.772E+00
7.000E+02	2.641E+00	1.838E+01	2.102E+01	8.622E+01	7.022E-01	4.034E+00
8.000E+02	2.653E+00	2.107E+01	2.372E+01	9.069E+01	7.247E-01	4.267E+00
9.000E+02	2.664E+00	2.376E+01	2.643E+01	9.468E+01	7.435E-01	4.476E+00
1.000E+03	2.674E+00	2.646E+01	2.913E+01	9.829E+01	7.595E-01	4.667E+00

Electrons in WATER, LIQUID

		Density, g/cm ³				I, eV	
		1.0000E+00				75.0	
KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA	
	COLLISION	RADIATIVE	TOTAL				
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²			
1.000E-02	2.256E+01	3.898E-03	2.256E+01	2.515E-04	9.408E-05	0.000E+00	
1.250E-02	1.897E+01	3.927E-03	1.898E+01	3.728E-04	1.133E-04	0.000E+00	
1.500E-02	1.647E+01	3.944E-03	1.647E+01	5.147E-04	1.316E-04	0.000E+00	
1.750E-02	1.461E+01	3.955E-03	1.461E+01	6.762E-04	1.493E-04	0.000E+00	
2.000E-02	1.317E+01	3.963E-03	1.318E+01	8.566E-04	1.663E-04	0.000E+00	
2.500E-02	1.109E+01	3.974E-03	1.110E+01	1.272E-03	1.990E-04	0.000E+00	
3.000E-02	9.653E+00	3.984E-03	9.657E+00	1.756E-03	2.301E-04	0.000E+00	
3.500E-02	8.592E+00	3.994E-03	8.596E+00	2.306E-03	2.599E-04	0.000E+00	
4.000E-02	7.777E+00	4.005E-03	7.781E+00	2.919E-03	2.886E-04	0.000E+00	
4.500E-02	7.130E+00	4.018E-03	7.134E+00	3.591E-03	3.165E-04	0.000E+00	
5.000E-02	6.603E+00	4.031E-03	6.607E+00	4.320E-03	3.435E-04	0.000E+00	
5.500E-02	6.166E+00	4.046E-03	6.170E+00	5.103E-03	3.698E-04	0.000E+00	
6.000E-02	5.797E+00	4.062E-03	5.801E+00	5.940E-03	3.955E-04	0.000E+00	
7.000E-02	5.207E+00	4.098E-03	5.211E+00	7.762E-03	4.453E-04	0.000E+00	
8.000E-02	4.757E+00	4.138E-03	4.761E+00	9.773E-03	4.931E-04	0.000E+00	
9.000E-02	4.402E+00	4.181E-03	4.407E+00	1.196E-02	5.393E-04	0.000E+00	
1.000E-01	4.115E+00	4.228E-03	4.119E+00	1.431E-02	5.842E-04	0.000E+00	
1.250E-01	3.591E+00	4.355E-03	3.596E+00	2.083E-02	6.912E-04	0.000E+00	
1.500E-01	3.238E+00	4.494E-03	3.242E+00	2.817E-02	7.926E-04	0.000E+00	
1.750E-01	2.984E+00	4.643E-03	2.988E+00	3.622E-02	8.894E-04	0.000E+00	
2.000E-01	2.793E+00	4.801E-03	2.798E+00	4.488E-02	9.826E-04	0.000E+00	
2.500E-01	2.528E+00	5.141E-03	2.533E+00	6.372E-02	1.161E-03	0.000E+00	
3.000E-01	2.355E+00	5.514E-03	2.360E+00	8.421E-02	1.331E-03	0.000E+00	
3.500E-01	2.235E+00	5.914E-03	2.241E+00	1.060E-01	1.496E-03	0.000E+00	
4.000E-01	2.148E+00	6.339E-03	2.154E+00	1.288E-01	1.658E-03	0.000E+00	
4.500E-01	2.083E+00	6.787E-03	2.090E+00	1.523E-01	1.818E-03	0.000E+00	
5.000E-01	2.034E+00	7.257E-03	2.041E+00	1.766E-01	1.976E-03	0.000E+00	
5.500E-01	1.995E+00	7.747E-03	2.003E+00	2.013E-01	2.134E-03	1.103E-02	
6.000E-01	1.963E+00	8.254E-03	1.972E+00	2.265E-01	2.292E-03	2.938E-02	
7.000E-01	1.917E+00	9.313E-03	1.926E+00	2.778E-01	2.608E-03	7.435E-02	
8.000E-01	1.886E+00	1.042E-02	1.896E+00	3.302E-01	2.928E-03	1.267E-01	
9.000E-01	1.864E+00	1.159E-02	1.876E+00	3.832E-01	3.251E-03	1.835E-01	
1.000E+00	1.849E+00	1.280E-02	1.862E+00	4.367E-01	3.579E-03	2.428E-01	
1.250E+00	1.829E+00	1.600E-02	1.845E+00	5.717E-01	4.416E-03	3.944E-01	
1.500E+00	1.822E+00	1.942E-02	1.841E+00	7.075E-01	5.281E-03	5.437E-01	
1.750E+00	1.821E+00	2.303E-02	1.844E+00	8.432E-01	6.171E-03	6.866E-01	
2.000E+00	1.824E+00	2.678E-02	1.850E+00	9.785E-01	7.085E-03	8.218E-01	
2.500E+00	1.834E+00	3.468E-02	1.868E+00	1.247E+00	8.969E-03	1.069E+00	
3.000E+00	1.846E+00	4.299E-02	1.889E+00	1.514E+00	1.092E-02	1.288E+00	
3.500E+00	1.858E+00	5.164E-02	1.910E+00	1.777E+00	1.291E-02	1.484E+00	
4.000E+00	1.870E+00	6.058E-02	1.931E+00	2.037E+00	1.495E-02	1.660E+00	

4.500E+00	1.882E+00	6.976E-02	1.951E+00	2.295E+00	1.702E-02	1.821E+00
5.000E+00	1.892E+00	7.917E-02	1.971E+00	2.550E+00	1.911E-02	1.967E+00
5.500E+00	1.902E+00	8.876E-02	1.991E+00	2.802E+00	2.123E-02	2.102E+00
6.000E+00	1.911E+00	9.854E-02	2.010E+00	3.052E+00	2.336E-02	2.227E+00
7.000E+00	1.928E+00	1.185E-01	2.047E+00	3.545E+00	2.766E-02	2.453E+00
8.000E+00	1.943E+00	1.391E-01	2.082E+00	4.030E+00	3.200E-02	2.652E+00
9.000E+00	1.956E+00	1.601E-01	2.116E+00	4.506E+00	3.636E-02	2.831E+00
1.000E+01	1.968E+00	1.814E-01	2.149E+00	4.975E+00	4.072E-02	2.992E+00
1.250E+01	1.993E+00	2.362E-01	2.230E+00	6.117E+00	5.163E-02	3.341E+00
1.500E+01	2.014E+00	2.926E-01	2.306E+00	7.219E+00	6.243E-02	3.633E+00
1.750E+01	2.031E+00	3.501E-01	2.381E+00	8.286E+00	7.309E-02	3.885E+00
2.000E+01	2.046E+00	4.086E-01	2.454E+00	9.320E+00	8.355E-02	4.107E+00
2.500E+01	2.070E+00	5.277E-01	2.598E+00	1.130E+01	1.039E-01	4.487E+00
3.000E+01	2.089E+00	6.489E-01	2.738E+00	1.317E+01	1.233E-01	4.806E+00
3.500E+01	2.105E+00	7.716E-01	2.876E+00	1.496E+01	1.418E-01	5.082E+00
4.000E+01	2.118E+00	8.955E-01	3.013E+00	1.665E+01	1.594E-01	5.326E+00
4.500E+01	2.129E+00	1.021E+00	3.150E+00	1.828E+01	1.762E-01	5.544E+00
5.000E+01	2.139E+00	1.146E+00	3.286E+00	1.983E+01	1.923E-01	5.741E+00
5.500E+01	2.148E+00	1.273E+00	3.421E+00	2.132E+01	2.076E-01	5.921E+00
6.000E+01	2.156E+00	1.400E+00	3.556E+00	2.276E+01	2.222E-01	6.087E+00
7.000E+01	2.170E+00	1.656E+00	3.827E+00	2.547E+01	2.496E-01	6.383E+00
8.000E+01	2.182E+00	1.914E+00	4.096E+00	2.799E+01	2.747E-01	6.641E+00
9.000E+01	2.193E+00	2.173E+00	4.366E+00	3.035E+01	2.978E-01	6.871E+00
1.000E+02	2.202E+00	2.434E+00	4.636E+00	3.258E+01	3.192E-01	7.077E+00
1.250E+02	2.222E+00	3.089E+00	5.311E+00	3.761E+01	3.662E-01	7.516E+00
1.500E+02	2.238E+00	3.749E+00	5.987E+00	4.204E+01	4.060E-01	7.876E+00
1.750E+02	2.251E+00	4.412E+00	6.663E+00	4.600E+01	4.401E-01	8.182E+00
2.000E+02	2.263E+00	5.078E+00	7.341E+00	4.957E+01	4.698E-01	8.447E+00
2.500E+02	2.282E+00	6.416E+00	8.698E+00	5.582E+01	5.190E-01	8.891E+00
3.000E+02	2.297E+00	7.760E+00	1.006E+01	6.116E+01	5.584E-01	9.254E+00
3.500E+02	2.311E+00	9.107E+00	1.142E+01	6.583E+01	5.908E-01	9.561E+00
4.000E+02	2.322E+00	1.046E+01	1.278E+01	6.996E+01	6.180E-01	9.827E+00
4.500E+02	2.332E+00	1.181E+01	1.414E+01	7.368E+01	6.412E-01	1.006E+01
5.000E+02	2.341E+00	1.317E+01	1.551E+01	7.706E+01	6.613E-01	1.027E+01
5.500E+02	2.349E+00	1.453E+01	1.688E+01	8.014E+01	6.789E-01	1.046E+01
6.000E+02	2.357E+00	1.589E+01	1.824E+01	8.299E+01	6.945E-01	1.064E+01
7.000E+02	2.370E+00	1.861E+01	2.098E+01	8.810E+01	7.209E-01	1.094E+01
8.000E+02	2.381E+00	2.133E+01	2.371E+01	9.258E+01	7.425E-01	1.121E+01
9.000E+02	2.391E+00	2.406E+01	2.645E+01	9.657E+01	7.605E-01	1.145E+01
1.000E+03	2.400E+00	2.679E+01	2.919E+01	1.002E+02	7.759E-01	1.166E+01

Electrons in CONCRETE, PORTLAND

Density, g/cm³
2.3000E+00 I, eV
135.2

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²		
1.000E-02	1.804E+01	5.754E-03	1.805E+01	3.207E-04	1.710E-04	0.000E+00
1.250E-02	1.526E+01	5.864E-03	1.526E+01	4.720E-04	2.072E-04	0.000E+00
1.500E-02	1.330E+01	5.942E-03	1.330E+01	6.480E-04	2.419E-04	0.000E+00
1.750E-02	1.184E+01	5.999E-03	1.184E+01	8.476E-04	2.755E-04	0.000E+00
2.000E-02	1.070E+01	6.044E-03	1.071E+01	1.070E-03	3.080E-04	0.000E+00
2.500E-02	9.049E+00	6.107E-03	9.056E+00	1.580E-03	3.704E-04	0.000E+00
3.000E-02	7.899E+00	6.153E-03	7.905E+00	2.173E-03	4.298E-04	0.000E+00
3.500E-02	7.049E+00	6.189E-03	7.055E+00	2.844E-03	4.867E-04	0.000E+00
4.000E-02	6.393E+00	6.220E-03	6.400E+00	3.589E-03	5.415E-04	0.000E+00
4.500E-02	5.872E+00	6.249E-03	5.878E+00	4.405E-03	5.944E-04	0.000E+00
5.000E-02	5.446E+00	6.276E-03	5.453E+00	5.289E-03	6.457E-04	0.000E+00
5.500E-02	5.092E+00	6.302E-03	5.099E+00	6.238E-03	6.955E-04	0.000E+00
6.000E-02	4.793E+00	6.328E-03	4.799E+00	7.250E-03	7.440E-04	0.000E+00
7.000E-02	4.315E+00	6.381E-03	4.321E+00	9.450E-03	8.375E-04	0.000E+00
8.000E-02	3.948E+00	6.437E-03	3.955E+00	1.187E-02	9.269E-04	0.000E+00
9.000E-02	3.659E+00	6.497E-03	3.665E+00	1.450E-02	1.013E-03	0.000E+00
1.000E-01	3.425E+00	6.560E-03	3.431E+00	1.732E-02	1.096E-03	0.000E+00
1.250E-01	2.996E+00	6.733E-03	3.003E+00	2.514E-02	1.292E-03	0.000E+00
1.500E-01	2.706E+00	6.925E-03	2.713E+00	3.393E-02	1.477E-03	0.000E+00
1.750E-01	2.498E+00	7.134E-03	2.505E+00	4.353E-02	1.652E-03	0.000E+00
2.000E-01	2.341E+00	7.357E-03	2.349E+00	5.385E-02	1.819E-03	0.000E+00
2.500E-01	2.124E+00	7.843E-03	2.132E+00	7.627E-02	2.137E-03	0.000E+00
3.000E-01	1.982E+00	8.377E-03	1.990E+00	1.006E-01	2.438E-03	0.000E+00
3.500E-01	1.883E+00	8.952E-03	1.892E+00	1.264E-01	2.728E-03	8.781E-04
4.000E-01	1.811E+00	9.563E-03	1.820E+00	1.534E-01	3.011E-03	1.827E-02
4.500E-01	1.756E+00	1.021E-02	1.766E+00	1.813E-01	3.290E-03	3.821E-02
5.000E-01	1.714E+00	1.088E-02	1.725E+00	2.099E-01	3.565E-03	5.986E-02
5.500E-01	1.681E+00	1.159E-02	1.693E+00	2.392E-01	3.839E-03	8.276E-02
6.000E-01	1.655E+00	1.231E-02	1.668E+00	2.690E-01	4.112E-03	1.066E-01
7.000E-01	1.618E+00	1.383E-02	1.632E+00	3.296E-01	4.657E-03	1.562E-01
8.000E-01	1.593E+00	1.543E-02	1.609E+00	3.914E-01	5.204E-03	2.072E-01
9.000E-01	1.577E+00	1.709E-02	1.594E+00	4.539E-01	5.754E-03	2.587E-01
1.000E+00	1.566E+00	1.882E-02	1.585E+00	5.168E-01	6.308E-03	3.102E-01
1.250E+00	1.553E+00	2.339E-02	1.577E+00	6.751E-01	7.716E-03	4.363E-01
1.500E+00	1.551E+00	2.828E-02	1.580E+00	8.335E-01	9.157E-03	5.566E-01
1.750E+00	1.555E+00	3.342E-02	1.588E+00	9.914E-01	1.063E-02	6.704E-01
2.000E+00	1.560E+00	3.876E-02	1.599E+00	1.148E+00	1.213E-02	7.777E-01
2.500E+00	1.575E+00	4.998E-02	1.625E+00	1.459E+00	1.520E-02	9.746E-01
3.000E+00	1.590E+00	6.176E-02	1.651E+00	1.764E+00	1.835E-02	1.152E+00
3.500E+00	1.604E+00	7.400E-02	1.678E+00	2.064E+00	2.155E-02	1.312E+00
4.000E+00	1.617E+00	8.662E-02	1.704E+00	2.360E+00	2.479E-02	1.459E+00

4.500E+00	1.630E+00	9.956E-02	1.729E+00	2.651E+00	2.805E-02	1.595E+00
5.000E+00	1.641E+00	1.128E-01	1.754E+00	2.938E+00	3.134E-02	1.721E+00
5.500E+00	1.651E+00	1.263E-01	1.778E+00	3.221E+00	3.465E-02	1.839E+00
6.000E+00	1.661E+00	1.400E-01	1.801E+00	3.501E+00	3.796E-02	1.949E+00
7.000E+00	1.678E+00	1.680E-01	1.846E+00	4.049E+00	4.459E-02	2.152E+00
8.000E+00	1.693E+00	1.968E-01	1.890E+00	4.584E+00	5.122E-02	2.334E+00
9.000E+00	1.706E+00	2.261E-01	1.932E+00	5.108E+00	5.781E-02	2.500E+00
1.000E+01	1.718E+00	2.558E-01	1.973E+00	5.620E+00	6.437E-02	2.652E+00
1.250E+01	1.742E+00	3.320E-01	2.074E+00	6.855E+00	8.050E-02	2.984E+00
1.500E+01	1.761E+00	4.102E-01	2.171E+00	8.033E+00	9.619E-02	3.267E+00
1.750E+01	1.777E+00	4.899E-01	2.267E+00	9.160E+00	1.114E-01	3.513E+00
2.000E+01	1.791E+00	5.707E-01	2.362E+00	1.024E+01	1.261E-01	3.731E+00
2.500E+01	1.813E+00	7.350E-01	2.548E+00	1.228E+01	1.540E-01	4.106E+00
3.000E+01	1.831E+00	9.020E-01	2.733E+00	1.417E+01	1.799E-01	4.422E+00
3.500E+01	1.845E+00	1.071E+00	2.916E+00	1.594E+01	2.041E-01	4.694E+00
4.000E+01	1.857E+00	1.241E+00	3.099E+00	1.761E+01	2.266E-01	4.934E+00
4.500E+01	1.868E+00	1.413E+00	3.281E+00	1.917E+01	2.476E-01	5.148E+00
5.000E+01	1.877E+00	1.586E+00	3.463E+00	2.066E+01	2.673E-01	5.342E+00
5.500E+01	1.886E+00	1.760E+00	3.646E+00	2.206E+01	2.858E-01	5.519E+00
6.000E+01	1.893E+00	1.934E+00	3.828E+00	2.340E+01	3.032E-01	5.681E+00
7.000E+01	1.906E+00	2.286E+00	4.192E+00	2.590E+01	3.350E-01	5.971E+00
8.000E+01	1.918E+00	2.639E+00	4.557E+00	2.819E+01	3.634E-01	6.225E+00
9.000E+01	1.928E+00	2.994E+00	4.922E+00	3.030E+01	3.891E-01	6.451E+00
1.000E+02	1.936E+00	3.351E+00	5.288E+00	3.226E+01	4.123E-01	6.654E+00
1.250E+02	1.954E+00	4.248E+00	6.203E+00	3.662E+01	4.620E-01	7.087E+00
1.500E+02	1.969E+00	5.151E+00	7.120E+00	4.038E+01	5.025E-01	7.443E+00
1.750E+02	1.981E+00	6.059E+00	8.040E+00	4.368E+01	5.363E-01	7.746E+00
2.000E+02	1.992E+00	6.969E+00	8.961E+00	4.662E+01	5.650E-01	8.010E+00
2.500E+02	2.010E+00	8.797E+00	1.081E+01	5.170E+01	6.114E-01	8.451E+00
3.000E+02	2.024E+00	1.063E+01	1.266E+01	5.597E+01	6.474E-01	8.813E+00
3.500E+02	2.036E+00	1.247E+01	1.451E+01	5.965E+01	6.764E-01	9.119E+00
4.000E+02	2.046E+00	1.432E+01	1.636E+01	6.290E+01	7.003E-01	9.385E+00
4.500E+02	2.055E+00	1.616E+01	1.822E+01	6.579E+01	7.204E-01	9.620E+00
5.000E+02	2.064E+00	1.801E+01	2.008E+01	6.841E+01	7.376E-01	9.830E+00
5.500E+02	2.071E+00	1.986E+01	2.194E+01	7.079E+01	7.525E-01	1.002E+01
6.000E+02	2.078E+00	2.172E+01	2.379E+01	7.298E+01	7.656E-01	1.019E+01
7.000E+02	2.090E+00	2.543E+01	2.752E+01	7.688E+01	7.874E-01	1.050E+01
8.000E+02	2.100E+00	2.914E+01	3.124E+01	8.029E+01	8.051E-01	1.077E+01
9.000E+02	2.109E+00	3.286E+01	3.497E+01	8.331E+01	8.197E-01	1.100E+01
1.000E+03	2.117E+00	3.658E+01	3.870E+01	8.603E+01	8.320E-01	1.121E+01

Electrons in SODIUM IODIDE

Density, g/cm³
3.6670E+00 I, eV
452.0

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²		
1.000E-02	1.116E+01	1.518E-02	1.117E+01	5.598E-04	6.717E-04	0.000E+00
1.250E-02	9.603E+00	1.632E-02	9.619E+00	8.018E-04	8.430E-04	0.000E+00
1.500E-02	8.477E+00	1.723E-02	8.494E+00	1.079E-03	1.013E-03	0.000E+00
1.750E-02	7.622E+00	1.798E-02	7.640E+00	1.390E-03	1.181E-03	0.000E+00
2.000E-02	6.948E+00	1.862E-02	6.966E+00	1.733E-03	1.348E-03	0.000E+00
2.500E-02	5.949E+00	1.967E-02	5.968E+00	2.512E-03	1.675E-03	0.000E+00
3.000E-02	5.241E+00	2.050E-02	5.262E+00	3.406E-03	1.996E-03	0.000E+00
3.500E-02	4.711E+00	2.120E-02	4.733E+00	4.410E-03	2.309E-03	0.000E+00
4.000E-02	4.299E+00	2.180E-02	4.321E+00	5.517E-03	2.616E-03	0.000E+00
4.500E-02	3.968E+00	2.234E-02	3.990E+00	6.723E-03	2.917E-03	0.000E+00
5.000E-02	3.696E+00	2.282E-02	3.719E+00	8.022E-03	3.212E-03	0.000E+00
5.500E-02	3.469E+00	2.326E-02	3.492E+00	9.410E-03	3.502E-03	0.000E+00
6.000E-02	3.276E+00	2.367E-02	3.300E+00	1.088E-02	3.786E-03	0.000E+00
7.000E-02	2.965E+00	2.442E-02	2.990E+00	1.407E-02	4.342E-03	0.000E+00
8.000E-02	2.726E+00	2.509E-02	2.751E+00	1.757E-02	4.880E-03	0.000E+00
9.000E-02	2.536E+00	2.571E-02	2.562E+00	2.134E-02	5.402E-03	0.000E+00
1.000E-01	2.382E+00	2.628E-02	2.408E+00	2.536E-02	5.910E-03	0.000E+00
1.250E-01	2.098E+00	2.760E-02	2.126E+00	3.646E-02	7.120E-03	0.000E+00
1.500E-01	1.905E+00	2.878E-02	1.934E+00	4.882E-02	8.258E-03	0.000E+00
1.750E-01	1.766E+00	2.989E-02	1.796E+00	6.225E-02	9.332E-03	0.000E+00
2.000E-01	1.661E+00	3.096E-02	1.692E+00	7.661E-02	1.035E-02	0.000E+00
2.500E-01	1.516E+00	3.306E-02	1.549E+00	1.076E-01	1.225E-02	0.000E+00
3.000E-01	1.421E+00	3.519E-02	1.456E+00	1.410E-01	1.400E-02	0.000E+00
3.500E-01	1.355E+00	3.739E-02	1.393E+00	1.761E-01	1.565E-02	1.130E-03
4.000E-01	1.308E+00	3.967E-02	1.348E+00	2.126E-01	1.721E-02	5.584E-03
4.500E-01	1.273E+00	4.204E-02	1.315E+00	2.502E-01	1.871E-02	1.097E-02
5.000E-01	1.247E+00	4.448E-02	1.291E+00	2.886E-01	2.016E-02	1.711E-02
5.500E-01	1.227E+00	4.698E-02	1.274E+00	3.276E-01	2.157E-02	2.389E-02
6.000E-01	1.211E+00	4.956E-02	1.261E+00	3.671E-01	2.295E-02	3.119E-02
7.000E-01	1.190E+00	5.486E-02	1.245E+00	4.469E-01	2.562E-02	4.711E-02
8.000E-01	1.178E+00	6.037E-02	1.238E+00	5.275E-01	2.822E-02	6.443E-02
9.000E-01	1.170E+00	6.605E-02	1.236E+00	6.084E-01	3.076E-02	8.284E-02
1.000E+00	1.167E+00	7.189E-02	1.239E+00	6.892E-01	3.326E-02	1.021E-01
1.250E+00	1.167E+00	8.714E-02	1.254E+00	8.899E-01	3.936E-02	1.531E-01
1.500E+00	1.173E+00	1.031E-01	1.276E+00	1.088E+00	4.533E-02	2.065E-01
1.750E+00	1.182E+00	1.198E-01	1.302E+00	1.282E+00	5.120E-02	2.611E-01
2.000E+00	1.192E+00	1.369E-01	1.329E+00	1.472E+00	5.700E-02	3.159E-01
2.500E+00	1.212E+00	1.725E-01	1.384E+00	1.840E+00	6.838E-02	4.239E-01
3.000E+00	1.230E+00	2.093E-01	1.439E+00	2.195E+00	7.949E-02	5.276E-01
3.500E+00	1.247E+00	2.471E-01	1.494E+00	2.536E+00	9.034E-02	6.258E-01
4.000E+00	1.263E+00	2.857E-01	1.548E+00	2.864E+00	1.009E-01	7.184E-01

4.500E+00	1.277E+00	3.250E-01	1.602E+00	3.182E+00	1.112E-01	8.057E-01
5.000E+00	1.289E+00	3.649E-01	1.654E+00	3.489E+00	1.213E-01	8.881E-01
5.500E+00	1.301E+00	4.055E-01	1.706E+00	3.787E+00	1.311E-01	9.660E-01
6.000E+00	1.311E+00	4.464E-01	1.758E+00	4.075E+00	1.407E-01	1.040E+00
7.000E+00	1.330E+00	5.297E-01	1.860E+00	4.628E+00	1.591E-01	1.177E+00
8.000E+00	1.347E+00	6.145E-01	1.961E+00	5.152E+00	1.766E-01	1.301E+00
9.000E+00	1.361E+00	7.005E-01	2.062E+00	5.649E+00	1.933E-01	1.416E+00
1.000E+01	1.374E+00	7.876E-01	2.162E+00	6.122E+00	2.092E-01	1.522E+00
1.250E+01	1.401E+00	1.009E+00	2.410E+00	7.217E+00	2.458E-01	1.759E+00
1.500E+01	1.423E+00	1.235E+00	2.658E+00	8.204E+00	2.785E-01	1.964E+00
1.750E+01	1.441E+00	1.465E+00	2.906E+00	9.103E+00	3.080E-01	2.147E+00
2.000E+01	1.456E+00	1.697E+00	3.153E+00	9.929E+00	3.347E-01	2.313E+00
2.500E+01	1.480E+00	2.169E+00	3.649E+00	1.140E+01	3.813E-01	2.605E+00
3.000E+01	1.499E+00	2.648E+00	4.147E+00	1.269E+01	4.206E-01	2.858E+00
3.500E+01	1.514E+00	3.133E+00	4.647E+00	1.382E+01	4.544E-01	3.081E+00
4.000E+01	1.527E+00	3.622E+00	5.149E+00	1.485E+01	4.837E-01	3.281E+00
4.500E+01	1.539E+00	4.114E+00	5.652E+00	1.577E+01	5.095E-01	3.463E+00
5.000E+01	1.548E+00	4.609E+00	6.158E+00	1.662E+01	5.324E-01	3.628E+00
5.500E+01	1.557E+00	5.107E+00	6.664E+00	1.740E+01	5.529E-01	3.780E+00
6.000E+01	1.565E+00	5.607E+00	7.172E+00	1.812E+01	5.714E-01	3.921E+00
7.000E+01	1.579E+00	6.612E+00	8.191E+00	1.943E+01	6.033E-01	4.175E+00
8.000E+01	1.590E+00	7.623E+00	9.213E+00	2.058E+01	6.301E-01	4.399E+00
9.000E+01	1.600E+00	8.639E+00	1.024E+01	2.161E+01	6.530E-01	4.600E+00
1.000E+02	1.609E+00	9.659E+00	1.127E+01	2.254E+01	6.727E-01	4.782E+00
1.250E+02	1.627E+00	1.222E+01	1.385E+01	2.454E+01	7.123E-01	5.175E+00
1.500E+02	1.641E+00	1.479E+01	1.644E+01	2.619E+01	7.422E-01	5.502E+00
1.750E+02	1.653E+00	1.738E+01	1.903E+01	2.760E+01	7.658E-01	5.783E+00
2.000E+02	1.663E+00	1.997E+01	2.163E+01	2.883E+01	7.848E-01	6.029E+00
2.500E+02	1.680E+00	2.516E+01	2.684E+01	3.091E+01	8.140E-01	6.445E+00
3.000E+02	1.693E+00	3.037E+01	3.207E+01	3.261E+01	8.354E-01	6.790E+00
3.500E+02	1.704E+00	3.560E+01	3.730E+01	3.405E+01	8.519E-01	7.083E+00
4.000E+02	1.714E+00	4.082E+01	4.254E+01	3.531E+01	8.651E-01	7.339E+00
4.500E+02	1.722E+00	4.606E+01	4.778E+01	3.641E+01	8.759E-01	7.566E+00
5.000E+02	1.729E+00	5.130E+01	5.303E+01	3.741E+01	8.848E-01	7.769E+00
5.500E+02	1.736E+00	5.654E+01	5.827E+01	3.831E+01	8.925E-01	7.954E+00
6.000E+02	1.742E+00	6.178E+01	6.353E+01	3.913E+01	8.991E-01	8.123E+00
7.000E+02	1.753E+00	7.229E+01	7.404E+01	4.058E+01	9.098E-01	8.423E+00
8.000E+02	1.762E+00	8.280E+01	8.456E+01	4.185E+01	9.183E-01	8.684E+00
9.000E+02	1.770E+00	9.332E+01	9.509E+01	4.296E+01	9.252E-01	8.915E+00
1.000E+03	1.777E+00	1.038E+02	1.056E+02	4.396E+01	9.309E-01	9.122E+00

Electrons in SILVER HALIDES IN PHOTOGRAPHIC EMULSION

		Density, g/cm ³					
		6.4700E+00		I, eV		487.1	
KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA	
	COLLISION	RADIATIVE	TOTAL				
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²			
1.000E-02	1.115E+01	1.512E-02	1.116E+01	5.651E-04	6.843E-04	0.000E+00	
1.250E-02	9.608E+00	1.615E-02	9.624E+00	8.071E-04	8.507E-04	0.000E+00	
1.500E-02	8.491E+00	1.696E-02	8.508E+00	1.084E-03	1.015E-03	0.000E+00	
1.750E-02	7.640E+00	1.763E-02	7.658E+00	1.394E-03	1.177E-03	0.000E+00	
2.000E-02	6.969E+00	1.818E-02	6.987E+00	1.737E-03	1.336E-03	0.000E+00	
2.500E-02	5.973E+00	1.908E-02	5.992E+00	2.512E-03	1.648E-03	0.000E+00	
3.000E-02	5.267E+00	1.978E-02	5.287E+00	3.403E-03	1.951E-03	0.000E+00	
3.500E-02	4.737E+00	2.036E-02	4.758E+00	4.402E-03	2.245E-03	0.000E+00	
4.000E-02	4.325E+00	2.086E-02	4.345E+00	5.503E-03	2.532E-03	0.000E+00	
4.500E-02	3.993E+00	2.129E-02	4.015E+00	6.701E-03	2.812E-03	0.000E+00	
5.000E-02	3.721E+00	2.167E-02	3.743E+00	7.992E-03	3.086E-03	0.000E+00	
5.500E-02	3.493E+00	2.202E-02	3.515E+00	9.372E-03	3.353E-03	0.000E+00	
6.000E-02	3.300E+00	2.235E-02	3.322E+00	1.084E-02	3.615E-03	0.000E+00	
7.000E-02	2.988E+00	2.293E-02	3.011E+00	1.400E-02	4.124E-03	0.000E+00	
8.000E-02	2.748E+00	2.345E-02	2.772E+00	1.747E-02	4.613E-03	0.000E+00	
9.000E-02	2.558E+00	2.393E-02	2.582E+00	2.121E-02	5.086E-03	0.000E+00	
1.000E-01	2.402E+00	2.438E-02	2.427E+00	2.521E-02	5.544E-03	0.000E+00	
1.250E-01	2.117E+00	2.542E-02	2.143E+00	3.621E-02	6.628E-03	0.000E+00	
1.500E-01	1.923E+00	2.638E-02	1.950E+00	4.848E-02	7.642E-03	0.000E+00	
1.750E-01	1.783E+00	2.729E-02	1.811E+00	6.180E-02	8.594E-03	0.000E+00	
2.000E-01	1.678E+00	2.819E-02	1.706E+00	7.604E-02	9.496E-03	0.000E+00	
2.500E-01	1.531E+00	3.000E-02	1.561E+00	1.068E-01	1.117E-02	2.306E-03	
3.000E-01	1.434E+00	3.187E-02	1.466E+00	1.399E-01	1.273E-02	1.848E-02	
3.500E-01	1.367E+00	3.384E-02	1.401E+00	1.748E-01	1.419E-02	3.463E-02	
4.000E-01	1.319E+00	3.589E-02	1.354E+00	2.111E-01	1.558E-02	5.075E-02	
4.500E-01	1.283E+00	3.804E-02	1.321E+00	2.485E-01	1.692E-02	6.682E-02	
5.000E-01	1.256E+00	4.027E-02	1.296E+00	2.868E-01	1.822E-02	8.284E-02	
5.500E-01	1.235E+00	4.258E-02	1.278E+00	3.257E-01	1.949E-02	9.877E-02	
6.000E-01	1.219E+00	4.495E-02	1.264E+00	3.650E-01	2.074E-02	1.146E-01	
7.000E-01	1.197E+00	4.987E-02	1.247E+00	4.447E-01	2.317E-02	1.458E-01	
8.000E-01	1.184E+00	5.500E-02	1.239E+00	5.252E-01	2.555E-02	1.765E-01	
9.000E-01	1.176E+00	6.031E-02	1.236E+00	6.061E-01	2.789E-02	2.065E-01	
1.000E+00	1.172E+00	6.578E-02	1.238E+00	6.869E-01	3.020E-02	2.358E-01	
1.250E+00	1.171E+00	8.010E-02	1.251E+00	8.880E-01	3.588E-02	3.064E-01	
1.500E+00	1.177E+00	9.521E-02	1.272E+00	1.086E+00	4.147E-02	3.733E-01	
1.750E+00	1.186E+00	1.109E-01	1.297E+00	1.281E+00	4.701E-02	4.373E-01	
2.000E+00	1.195E+00	1.272E-01	1.323E+00	1.472E+00	5.249E-02	4.986E-01	
2.500E+00	1.216E+00	1.609E-01	1.376E+00	1.842E+00	6.331E-02	6.144E-01	
3.000E+00	1.234E+00	1.959E-01	1.430E+00	2.199E+00	7.392E-02	7.225E-01	
3.500E+00	1.252E+00	2.319E-01	1.484E+00	2.542E+00	8.431E-02	8.237E-01	
4.000E+00	1.267E+00	2.687E-01	1.536E+00	2.873E+00	9.448E-02	9.189E-01	

4.500E+00	1.282E+00	3.063E-01	1.588E+00	3.193E+00	1.044E-01	1.009E+00
5.000E+00	1.294E+00	3.445E-01	1.639E+00	3.503E+00	1.141E-01	1.093E+00
5.500E+00	1.306E+00	3.833E-01	1.689E+00	3.804E+00	1.236E-01	1.174E+00
6.000E+00	1.317E+00	4.225E-01	1.739E+00	4.095E+00	1.329E-01	1.251E+00
7.000E+00	1.336E+00	5.023E-01	1.838E+00	4.654E+00	1.508E-01	1.394E+00
8.000E+00	1.352E+00	5.836E-01	1.936E+00	5.185E+00	1.679E-01	1.525E+00
9.000E+00	1.367E+00	6.661E-01	2.033E+00	5.689E+00	1.842E-01	1.647E+00
1.000E+01	1.379E+00	7.496E-01	2.129E+00	6.169E+00	1.998E-01	1.761E+00
1.250E+01	1.406E+00	9.625E-01	2.368E+00	7.282E+00	2.358E-01	2.016E+00
1.500E+01	1.427E+00	1.180E+00	2.606E+00	8.288E+00	2.682E-01	2.239E+00
1.750E+01	1.444E+00	1.400E+00	2.844E+00	9.206E+00	2.975E-01	2.437E+00
2.000E+01	1.458E+00	1.624E+00	3.082E+00	1.005E+01	3.240E-01	2.616E+00
2.500E+01	1.482E+00	2.078E+00	3.560E+00	1.156E+01	3.705E-01	2.928E+00
3.000E+01	1.500E+00	2.539E+00	4.039E+00	1.288E+01	4.099E-01	3.194E+00
3.500E+01	1.516E+00	3.005E+00	4.520E+00	1.405E+01	4.438E-01	3.426E+00
4.000E+01	1.528E+00	3.475E+00	5.003E+00	1.510E+01	4.734E-01	3.633E+00
4.500E+01	1.540E+00	3.948E+00	5.488E+00	1.605E+01	4.994E-01	3.819E+00
5.000E+01	1.549E+00	4.425E+00	5.974E+00	1.692E+01	5.225E-01	3.989E+00
5.500E+01	1.558E+00	4.903E+00	6.461E+00	1.773E+01	5.431E-01	4.144E+00
6.000E+01	1.566E+00	5.384E+00	6.950E+00	1.847E+01	5.618E-01	4.289E+00
7.000E+01	1.579E+00	6.350E+00	7.930E+00	1.982E+01	5.942E-01	4.549E+00
8.000E+01	1.591E+00	7.322E+00	8.913E+00	2.101E+01	6.213E-01	4.778E+00
9.000E+01	1.601E+00	8.298E+00	9.898E+00	2.207E+01	6.445E-01	4.983E+00
1.000E+02	1.609E+00	9.277E+00	1.089E+01	2.304E+01	6.646E-01	5.170E+00
1.250E+02	1.627E+00	1.174E+01	1.336E+01	2.511E+01	7.049E-01	5.570E+00
1.500E+02	1.642E+00	1.421E+01	1.585E+01	2.682E+01	7.354E-01	5.904E+00
1.750E+02	1.653E+00	1.669E+01	1.834E+01	2.829E+01	7.594E-01	6.189E+00
2.000E+02	1.664E+00	1.918E+01	2.084E+01	2.956E+01	7.789E-01	6.438E+00
2.500E+02	1.680E+00	2.416E+01	2.584E+01	3.171E+01	8.087E-01	6.859E+00
3.000E+02	1.694E+00	2.916E+01	3.086E+01	3.348E+01	8.307E-01	7.206E+00
3.500E+02	1.705E+00	3.417E+01	3.588E+01	3.498E+01	8.476E-01	7.502E+00
4.000E+02	1.714E+00	3.919E+01	4.091E+01	3.629E+01	8.610E-01	7.759E+00
4.500E+02	1.723E+00	4.422E+01	4.594E+01	3.744E+01	8.721E-01	7.987E+00
5.000E+02	1.730E+00	4.925E+01	5.098E+01	3.847E+01	8.813E-01	8.192E+00
5.500E+02	1.737E+00	5.428E+01	5.602E+01	3.941E+01	8.891E-01	8.378E+00
6.000E+02	1.743E+00	5.932E+01	6.106E+01	4.026E+01	8.959E-01	8.548E+00
7.000E+02	1.754E+00	6.940E+01	7.115E+01	4.178E+01	9.070E-01	8.850E+00
8.000E+02	1.763E+00	7.949E+01	8.125E+01	4.309E+01	9.157E-01	9.113E+00
9.000E+02	1.771E+00	8.959E+01	9.136E+01	4.425E+01	9.228E-01	9.346E+00
1.000E+03	1.778E+00	9.969E+01	1.015E+02	4.529E+01	9.287E-01	9.554E+00

Electrons in PLASTIC SCINTILLATOR

Density, g/cm³
1.0320E+00 I, eV
64.7

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²		
1.000E-02	2.265E+01	2.965E-03	2.265E+01	2.495E-04	7.218E-05	0.000E+00
1.250E-02	1.903E+01	2.975E-03	1.903E+01	3.704E-04	8.649E-05	0.000E+00
1.500E-02	1.650E+01	2.982E-03	1.650E+01	5.119E-04	1.002E-04	0.000E+00
1.750E-02	1.463E+01	2.987E-03	1.463E+01	6.732E-04	1.134E-04	0.000E+00
2.000E-02	1.318E+01	2.992E-03	1.319E+01	8.535E-04	1.262E-04	0.000E+00
2.500E-02	1.109E+01	3.000E-03	1.109E+01	1.269E-03	1.507E-04	0.000E+00
3.000E-02	9.643E+00	3.010E-03	9.646E+00	1.754E-03	1.741E-04	0.000E+00
3.500E-02	8.578E+00	3.021E-03	8.581E+00	2.304E-03	1.967E-04	0.000E+00
4.000E-02	7.761E+00	3.032E-03	7.764E+00	2.918E-03	2.186E-04	0.000E+00
4.500E-02	7.112E+00	3.045E-03	7.115E+00	3.592E-03	2.397E-04	0.000E+00
5.000E-02	6.585E+00	3.058E-03	6.588E+00	4.323E-03	2.604E-04	0.000E+00
5.500E-02	6.147E+00	3.072E-03	6.150E+00	5.109E-03	2.805E-04	0.000E+00
6.000E-02	5.777E+00	3.087E-03	5.780E+00	5.948E-03	3.002E-04	0.000E+00
7.000E-02	5.187E+00	3.119E-03	5.191E+00	7.777E-03	3.384E-04	0.000E+00
8.000E-02	4.737E+00	3.153E-03	4.741E+00	9.796E-03	3.753E-04	0.000E+00
9.000E-02	4.383E+00	3.189E-03	4.386E+00	1.199E-02	4.109E-04	0.000E+00
1.000E-01	4.096E+00	3.228E-03	4.099E+00	1.435E-02	4.456E-04	0.000E+00
1.250E-01	3.572E+00	3.333E-03	3.576E+00	2.091E-02	5.285E-04	0.000E+00
1.500E-01	3.219E+00	3.446E-03	3.222E+00	2.829E-02	6.073E-04	0.000E+00
1.750E-01	2.965E+00	3.566E-03	2.969E+00	3.639E-02	6.828E-04	0.000E+00
2.000E-01	2.775E+00	3.693E-03	2.779E+00	4.511E-02	7.556E-04	0.000E+00
2.500E-01	2.511E+00	3.966E-03	2.514E+00	6.409E-02	8.953E-04	0.000E+00
3.000E-01	2.338E+00	4.264E-03	2.342E+00	8.474E-02	1.029E-03	0.000E+00
3.500E-01	2.218E+00	4.583E-03	2.222E+00	1.067E-01	1.160E-03	0.000E+00
4.000E-01	2.129E+00	4.923E-03	2.134E+00	1.297E-01	1.288E-03	1.617E-02
4.500E-01	2.061E+00	5.281E-03	2.066E+00	1.535E-01	1.415E-03	4.469E-02
5.000E-01	2.009E+00	5.655E-03	2.014E+00	1.780E-01	1.541E-03	7.577E-02
5.500E-01	1.967E+00	6.045E-03	1.973E+00	2.031E-01	1.668E-03	1.087E-01
6.000E-01	1.934E+00	6.448E-03	1.941E+00	2.287E-01	1.795E-03	1.429E-01
7.000E-01	1.886E+00	7.291E-03	1.893E+00	2.809E-01	2.051E-03	2.137E-01
8.000E-01	1.853E+00	8.178E-03	1.861E+00	3.342E-01	2.310E-03	2.858E-01
9.000E-01	1.830E+00	9.105E-03	1.839E+00	3.883E-01	2.572E-03	3.578E-01
1.000E+00	1.814E+00	1.007E-02	1.824E+00	4.429E-01	2.839E-03	4.288E-01
1.250E+00	1.792E+00	1.262E-02	1.804E+00	5.808E-01	3.521E-03	5.994E-01
1.500E+00	1.784E+00	1.535E-02	1.799E+00	7.196E-01	4.228E-03	7.580E-01
1.750E+00	1.783E+00	1.823E-02	1.801E+00	8.585E-01	4.956E-03	9.047E-01
2.000E+00	1.785E+00	2.124E-02	1.807E+00	9.971E-01	5.704E-03	1.040E+00
2.500E+00	1.796E+00	2.756E-02	1.823E+00	1.273E+00	7.249E-03	1.283E+00
3.000E+00	1.808E+00	3.423E-02	1.842E+00	1.546E+00	8.847E-03	1.494E+00
3.500E+00	1.821E+00	4.117E-02	1.862E+00	1.815E+00	1.049E-02	1.681E+00
4.000E+00	1.833E+00	4.835E-02	1.882E+00	2.083E+00	1.217E-02	1.848E+00

4.500E+00	1.845E+00	5.574E-02	1.901E+00	2.347E+00	1.387E-02	2.001E+00
5.000E+00	1.856E+00	6.331E-02	1.919E+00	2.609E+00	1.560E-02	2.140E+00
5.500E+00	1.866E+00	7.105E-02	1.937E+00	2.868E+00	1.735E-02	2.268E+00
6.000E+00	1.875E+00	7.892E-02	1.954E+00	3.125E+00	1.911E-02	2.388E+00
7.000E+00	1.892E+00	9.507E-02	1.988E+00	3.632E+00	2.268E-02	2.605E+00
8.000E+00	1.907E+00	1.116E-01	2.019E+00	4.132E+00	2.629E-02	2.799E+00
9.000E+00	1.921E+00	1.286E-01	2.049E+00	4.623E+00	2.993E-02	2.974E+00
1.000E+01	1.932E+00	1.459E-01	2.078E+00	5.108E+00	3.359E-02	3.135E+00
1.250E+01	1.957E+00	1.902E-01	2.147E+00	6.291E+00	4.275E-02	3.487E+00
1.500E+01	1.976E+00	2.359E-01	2.212E+00	7.438E+00	5.191E-02	3.789E+00
1.750E+01	1.992E+00	2.826E-01	2.274E+00	8.553E+00	6.099E-02	4.052E+00
2.000E+01	2.005E+00	3.301E-01	2.335E+00	9.637E+00	6.998E-02	4.287E+00
2.500E+01	2.027E+00	4.268E-01	2.453E+00	1.173E+01	8.755E-02	4.690E+00
3.000E+01	2.043E+00	5.254E-01	2.569E+00	1.372E+01	1.045E-01	5.029E+00
3.500E+01	2.058E+00	6.252E-01	2.683E+00	1.562E+01	1.209E-01	5.320E+00
4.000E+01	2.069E+00	7.262E-01	2.796E+00	1.745E+01	1.366E-01	5.575E+00
4.500E+01	2.080E+00	8.281E-01	2.908E+00	1.920E+01	1.517E-01	5.802E+00
5.000E+01	2.089E+00	9.306E-01	3.020E+00	2.089E+01	1.662E-01	6.006E+00
5.500E+01	2.097E+00	1.034E+00	3.131E+00	2.251E+01	1.801E-01	6.192E+00
6.000E+01	2.105E+00	1.138E+00	3.243E+00	2.408E+01	1.935E-01	6.362E+00
7.000E+01	2.118E+00	1.347E+00	3.465E+00	2.707E+01	2.187E-01	6.664E+00
8.000E+01	2.129E+00	1.557E+00	3.687E+00	2.986E+01	2.421E-01	6.927E+00
9.000E+01	2.139E+00	1.769E+00	3.909E+00	3.250E+01	2.638E-01	7.160E+00
1.000E+02	2.148E+00	1.982E+00	4.130E+00	3.499E+01	2.841E-01	7.368E+00
1.250E+02	2.167E+00	2.518E+00	4.685E+00	4.066E+01	3.292E-01	7.811E+00
1.500E+02	2.182E+00	3.058E+00	5.241E+00	4.571E+01	3.679E-01	8.173E+00
1.750E+02	2.195E+00	3.601E+00	5.797E+00	5.024E+01	4.015E-01	8.480E+00
2.000E+02	2.207E+00	4.147E+00	6.353E+00	5.436E+01	4.310E-01	8.746E+00
2.500E+02	2.225E+00	5.243E+00	7.468E+00	6.161E+01	4.805E-01	9.191E+00
3.000E+02	2.240E+00	6.345E+00	8.585E+00	6.785E+01	5.207E-01	9.555E+00
3.500E+02	2.253E+00	7.451E+00	9.704E+00	7.332E+01	5.540E-01	9.862E+00
4.000E+02	2.264E+00	8.560E+00	1.082E+01	7.820E+01	5.822E-01	1.013E+01
4.500E+02	2.274E+00	9.671E+00	1.195E+01	8.260E+01	6.065E-01	1.036E+01
5.000E+02	2.283E+00	1.078E+01	1.307E+01	8.660E+01	6.276E-01	1.057E+01
5.500E+02	2.291E+00	1.190E+01	1.419E+01	9.027E+01	6.462E-01	1.076E+01
6.000E+02	2.298E+00	1.301E+01	1.531E+01	9.366E+01	6.627E-01	1.094E+01
7.000E+02	2.311E+00	1.525E+01	1.756E+01	9.975E+01	6.908E-01	1.125E+01
8.000E+02	2.322E+00	1.749E+01	1.981E+01	1.051E+02	7.140E-01	1.151E+01
9.000E+02	2.332E+00	1.973E+01	2.206E+01	1.099E+02	7.334E-01	1.175E+01
1.000E+03	2.341E+00	2.198E+01	2.432E+01	1.142E+02	7.500E-01	1.196E+01

Electrons in LEAD GLASS

Density, g/cm³
6.2200E+00 I, eV
526.4

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²		
1.000E-02	1.049E+01	1.674E-02	1.050E+01	6.065E-04	7.624E-04	0.000E+00
1.250E-02	9.051E+00	1.832E-02	9.069E+00	8.635E-04	9.713E-04	0.000E+00
1.500E-02	8.008E+00	1.962E-02	8.028E+00	1.157E-03	1.181E-03	0.000E+00
1.750E-02	7.213E+00	2.072E-02	7.234E+00	1.486E-03	1.392E-03	0.000E+00
2.000E-02	6.584E+00	2.168E-02	6.606E+00	1.848E-03	1.602E-03	0.000E+00
2.500E-02	5.649E+00	2.331E-02	5.673E+00	2.668E-03	2.021E-03	0.000E+00
3.000E-02	4.985E+00	2.466E-02	5.010E+00	3.608E-03	2.437E-03	0.000E+00
3.500E-02	4.487E+00	2.583E-02	4.513E+00	4.662E-03	2.849E-03	0.000E+00
4.000E-02	4.098E+00	2.686E-02	4.125E+00	5.822E-03	3.258E-03	0.000E+00
4.500E-02	3.786E+00	2.779E-02	3.814E+00	7.084E-03	3.663E-03	0.000E+00
5.000E-02	3.529E+00	2.865E-02	3.558E+00	8.443E-03	4.064E-03	0.000E+00
5.500E-02	3.314E+00	2.945E-02	3.344E+00	9.894E-03	4.461E-03	0.000E+00
6.000E-02	3.131E+00	3.020E-02	3.162E+00	1.143E-02	4.854E-03	0.000E+00
7.000E-02	2.837E+00	3.157E-02	2.869E+00	1.476E-02	5.629E-03	0.000E+00
8.000E-02	2.610E+00	3.282E-02	2.643E+00	1.840E-02	6.390E-03	0.000E+00
9.000E-02	2.430E+00	3.397E-02	2.464E+00	2.232E-02	7.136E-03	0.000E+00
1.000E-01	2.283E+00	3.504E-02	2.318E+00	2.651E-02	7.868E-03	0.000E+00
1.250E-01	2.013E+00	3.748E-02	2.051E+00	3.802E-02	9.638E-03	0.000E+00
1.500E-01	1.830E+00	3.964E-02	1.869E+00	5.081E-02	1.132E-02	0.000E+00
1.750E-01	1.697E+00	4.163E-02	1.739E+00	6.471E-02	1.293E-02	0.000E+00
2.000E-01	1.597E+00	4.351E-02	1.641E+00	7.952E-02	1.447E-02	0.000E+00
2.500E-01	1.459E+00	4.709E-02	1.506E+00	1.114E-01	1.737E-02	0.000E+00
3.000E-01	1.367E+00	5.056E-02	1.418E+00	1.457E-01	2.005E-02	7.930E-03
3.500E-01	1.304E+00	5.401E-02	1.358E+00	1.818E-01	2.258E-02	2.136E-02
4.000E-01	1.258E+00	5.746E-02	1.316E+00	2.192E-01	2.497E-02	3.553E-02
4.500E-01	1.224E+00	6.094E-02	1.285E+00	2.577E-01	2.726E-02	5.021E-02
5.000E-01	1.199E+00	6.445E-02	1.263E+00	2.970E-01	2.946E-02	6.527E-02
5.500E-01	1.179E+00	6.800E-02	1.247E+00	3.368E-01	3.158E-02	8.060E-02
6.000E-01	1.164E+00	7.159E-02	1.236E+00	3.771E-01	3.363E-02	9.612E-02
7.000E-01	1.143E+00	7.886E-02	1.222E+00	4.585E-01	3.758E-02	1.274E-01
8.000E-01	1.131E+00	8.626E-02	1.217E+00	5.406E-01	4.135E-02	1.589E-01
9.000E-01	1.123E+00	9.380E-02	1.217E+00	6.227E-01	4.497E-02	1.901E-01
1.000E+00	1.120E+00	1.015E-01	1.221E+00	7.048E-01	4.848E-02	2.210E-01
1.250E+00	1.119E+00	1.211E-01	1.240E+00	9.081E-01	5.687E-02	2.960E-01
1.500E+00	1.124E+00	1.414E-01	1.266E+00	1.108E+00	6.485E-02	3.675E-01
1.750E+00	1.133E+00	1.623E-01	1.295E+00	1.303E+00	7.253E-02	4.353E-01
2.000E+00	1.142E+00	1.836E-01	1.326E+00	1.494E+00	7.996E-02	4.998E-01
2.500E+00	1.161E+00	2.274E-01	1.389E+00	1.862E+00	9.422E-02	6.202E-01
3.000E+00	1.179E+00	2.724E-01	1.452E+00	2.214E+00	1.078E-01	7.309E-01
3.500E+00	1.196E+00	3.184E-01	1.514E+00	2.552E+00	1.208E-01	8.339E-01
4.000E+00	1.211E+00	3.652E-01	1.576E+00	2.875E+00	1.334E-01	9.302E-01

4.500E+00	1.225E+00	4.128E-01	1.637E+00	3.186E+00	1.454E-01	1.021E+00
5.000E+00	1.237E+00	4.610E-01	1.698E+00	3.486E+00	1.571E-01	1.107E+00
5.500E+00	1.248E+00	5.098E-01	1.758E+00	3.775E+00	1.683E-01	1.188E+00
6.000E+00	1.259E+00	5.591E-01	1.818E+00	4.055E+00	1.792E-01	1.265E+00
7.000E+00	1.277E+00	6.591E-01	1.936E+00	4.588E+00	1.999E-01	1.409E+00
8.000E+00	1.293E+00	7.609E-01	2.054E+00	5.089E+00	2.194E-01	1.540E+00
9.000E+00	1.307E+00	8.639E-01	2.171E+00	5.563E+00	2.377E-01	1.662E+00
1.000E+01	1.319E+00	9.682E-01	2.287E+00	6.012E+00	2.550E-01	1.774E+00
1.250E+01	1.345E+00	1.233E+00	2.578E+00	7.041E+00	2.944E-01	2.026E+00
1.500E+01	1.365E+00	1.504E+00	2.869E+00	7.959E+00	3.290E-01	2.244E+00
1.750E+01	1.382E+00	1.778E+00	3.160E+00	8.789E+00	3.597E-01	2.436E+00
2.000E+01	1.396E+00	2.056E+00	3.453E+00	9.546E+00	3.872E-01	2.609E+00
2.500E+01	1.420E+00	2.621E+00	4.040E+00	1.088E+01	4.344E-01	2.910E+00
3.000E+01	1.438E+00	3.194E+00	4.632E+00	1.204E+01	4.736E-01	3.166E+00
3.500E+01	1.454E+00	3.773E+00	5.227E+00	1.305E+01	5.069E-01	3.389E+00
4.000E+01	1.467E+00	4.358E+00	5.825E+00	1.396E+01	5.354E-01	3.587E+00
4.500E+01	1.478E+00	4.948E+00	6.426E+00	1.478E+01	5.603E-01	3.765E+00
5.000E+01	1.488E+00	5.541E+00	7.029E+00	1.552E+01	5.822E-01	3.928E+00
5.500E+01	1.497E+00	6.137E+00	7.634E+00	1.620E+01	6.017E-01	4.077E+00
6.000E+01	1.504E+00	6.737E+00	8.241E+00	1.683E+01	6.191E-01	4.215E+00
7.000E+01	1.518E+00	7.942E+00	9.460E+00	1.796E+01	6.491E-01	4.464E+00
8.000E+01	1.530E+00	9.154E+00	1.068E+01	1.896E+01	6.740E-01	4.684E+00
9.000E+01	1.540E+00	1.037E+01	1.191E+01	1.984E+01	6.951E-01	4.882E+00
1.000E+02	1.549E+00	1.160E+01	1.314E+01	2.064E+01	7.133E-01	5.061E+00
1.250E+02	1.567E+00	1.467E+01	1.624E+01	2.235E+01	7.493E-01	5.448E+00
1.500E+02	1.581E+00	1.776E+01	1.934E+01	2.376E+01	7.763E-01	5.770E+00
1.750E+02	1.593E+00	2.086E+01	2.246E+01	2.496E+01	7.974E-01	6.046E+00
2.000E+02	1.604E+00	2.397E+01	2.557E+01	2.600E+01	8.144E-01	6.288E+00
2.500E+02	1.621E+00	3.020E+01	3.182E+01	2.775E+01	8.402E-01	6.697E+00
3.000E+02	1.634E+00	3.645E+01	3.808E+01	2.919E+01	8.591E-01	7.036E+00
3.500E+02	1.645E+00	4.271E+01	4.435E+01	3.040E+01	8.735E-01	7.326E+00
4.000E+02	1.655E+00	4.897E+01	5.063E+01	3.146E+01	8.850E-01	7.578E+00
4.500E+02	1.663E+00	5.524E+01	5.690E+01	3.239E+01	8.943E-01	7.802E+00
5.000E+02	1.670E+00	6.152E+01	6.319E+01	3.322E+01	9.021E-01	8.004E+00
5.500E+02	1.677E+00	6.780E+01	6.948E+01	3.397E+01	9.087E-01	8.187E+00
6.000E+02	1.683E+00	7.409E+01	7.577E+01	3.466E+01	9.144E-01	8.355E+00
7.000E+02	1.694E+00	8.667E+01	8.836E+01	3.588E+01	9.237E-01	8.653E+00
8.000E+02	1.703E+00	9.926E+01	1.010E+02	3.694E+01	9.310E-01	8.912E+00
9.000E+02	1.711E+00	1.119E+02	1.136E+02	3.788E+01	9.369E-01	9.142E+00
1.000E+03	1.718E+00	1.245E+02	1.262E+02	3.871E+01	9.418E-01	9.348E+00

Electrons in TISSUE, SOFT (ICRU FOUR-COMPONENT)

		Density, g/cm ³					
		1.0000E+00		I, eV		74.9	
KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA	
	COLLISION	RADIATIVE	TOTAL				
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²			
1.000E-02	2.235E+01	3.795E-03	2.235E+01	2.538E-04	9.262E-05	0.000E+00	
1.250E-02	1.879E+01	3.821E-03	1.880E+01	3.763E-04	1.114E-04	0.000E+00	
1.500E-02	1.631E+01	3.837E-03	1.632E+01	5.195E-04	1.294E-04	0.000E+00	
1.750E-02	1.447E+01	3.847E-03	1.448E+01	6.825E-04	1.467E-04	0.000E+00	
2.000E-02	1.305E+01	3.855E-03	1.305E+01	8.647E-04	1.635E-04	0.000E+00	
2.500E-02	1.099E+01	3.866E-03	1.099E+01	1.284E-03	1.955E-04	0.000E+00	
3.000E-02	9.562E+00	3.876E-03	9.566E+00	1.773E-03	2.260E-04	0.000E+00	
3.500E-02	8.511E+00	3.885E-03	8.515E+00	2.328E-03	2.553E-04	0.000E+00	
4.000E-02	7.704E+00	3.897E-03	7.708E+00	2.946E-03	2.835E-04	0.000E+00	
4.500E-02	7.063E+00	3.909E-03	7.067E+00	3.625E-03	3.108E-04	0.000E+00	
5.000E-02	6.541E+00	3.923E-03	6.545E+00	4.361E-03	3.374E-04	0.000E+00	
5.500E-02	6.108E+00	3.937E-03	6.112E+00	5.152E-03	3.633E-04	0.000E+00	
6.000E-02	5.742E+00	3.953E-03	5.746E+00	5.996E-03	3.885E-04	0.000E+00	
7.000E-02	5.158E+00	3.989E-03	5.162E+00	7.836E-03	4.374E-04	0.000E+00	
8.000E-02	4.712E+00	4.028E-03	4.717E+00	9.866E-03	4.844E-04	0.000E+00	
9.000E-02	4.361E+00	4.070E-03	4.365E+00	1.207E-02	5.299E-04	0.000E+00	
1.000E-01	4.076E+00	4.116E-03	4.081E+00	1.444E-02	5.740E-04	0.000E+00	
1.250E-01	3.557E+00	4.240E-03	3.562E+00	2.103E-02	6.793E-04	0.000E+00	
1.500E-01	3.207E+00	4.377E-03	3.211E+00	2.844E-02	7.790E-04	0.000E+00	
1.750E-01	2.955E+00	4.523E-03	2.960E+00	3.656E-02	8.742E-04	0.000E+00	
2.000E-01	2.767E+00	4.677E-03	2.771E+00	4.530E-02	9.660E-04	0.000E+00	
2.500E-01	2.504E+00	5.010E-03	2.509E+00	6.433E-02	1.141E-03	0.000E+00	
3.000E-01	2.333E+00	5.374E-03	2.338E+00	8.502E-02	1.309E-03	0.000E+00	
3.500E-01	2.214E+00	5.764E-03	2.219E+00	1.070E-01	1.472E-03	0.000E+00	
4.000E-01	2.128E+00	6.179E-03	2.134E+00	1.300E-01	1.631E-03	0.000E+00	
4.500E-01	2.064E+00	6.618E-03	2.070E+00	1.538E-01	1.788E-03	0.000E+00	
5.000E-01	2.015E+00	7.077E-03	2.022E+00	1.783E-01	1.944E-03	0.000E+00	
5.500E-01	1.976E+00	7.555E-03	1.983E+00	2.032E-01	2.100E-03	1.374E-02	
6.000E-01	1.944E+00	8.050E-03	1.952E+00	2.286E-01	2.255E-03	3.374E-02	
7.000E-01	1.898E+00	9.084E-03	1.907E+00	2.805E-01	2.568E-03	8.114E-02	
8.000E-01	1.867E+00	1.017E-02	1.877E+00	3.334E-01	2.883E-03	1.351E-01	
9.000E-01	1.846E+00	1.131E-02	1.857E+00	3.870E-01	3.202E-03	1.930E-01	
1.000E+00	1.831E+00	1.249E-02	1.843E+00	4.410E-01	3.525E-03	2.529E-01	
1.250E+00	1.810E+00	1.562E-02	1.826E+00	5.774E-01	4.351E-03	4.052E-01	
1.500E+00	1.803E+00	1.896E-02	1.822E+00	7.145E-01	5.205E-03	5.542E-01	
1.750E+00	1.803E+00	2.248E-02	1.825E+00	8.516E-01	6.084E-03	6.963E-01	
2.000E+00	1.806E+00	2.615E-02	1.832E+00	9.884E-01	6.985E-03	8.304E-01	
2.500E+00	1.816E+00	3.387E-02	1.850E+00	1.260E+00	8.844E-03	1.075E+00	
3.000E+00	1.828E+00	4.199E-02	1.870E+00	1.529E+00	1.077E-02	1.292E+00	
3.500E+00	1.841E+00	5.045E-02	1.891E+00	1.795E+00	1.274E-02	1.486E+00	
4.000E+00	1.853E+00	5.919E-02	1.912E+00	2.058E+00	1.475E-02	1.660E+00	

4.500E+00	1.864E+00	6.816E-02	1.932E+00	2.318E+00	1.679E-02	1.818E+00
5.000E+00	1.875E+00	7.736E-02	1.952E+00	2.575E+00	1.885E-02	1.963E+00
5.500E+00	1.884E+00	8.674E-02	1.971E+00	2.830E+00	2.094E-02	2.096E+00
6.000E+00	1.894E+00	9.629E-02	1.990E+00	3.083E+00	2.305E-02	2.220E+00
7.000E+00	1.911E+00	1.159E-01	2.026E+00	3.581E+00	2.729E-02	2.443E+00
8.000E+00	1.925E+00	1.359E-01	2.061E+00	4.070E+00	3.158E-02	2.640E+00
9.000E+00	1.939E+00	1.565E-01	2.095E+00	4.551E+00	3.588E-02	2.817E+00
1.000E+01	1.950E+00	1.774E-01	2.128E+00	5.025E+00	4.020E-02	2.978E+00
1.250E+01	1.976E+00	2.310E-01	2.207E+00	6.178E+00	5.097E-02	3.325E+00
1.500E+01	1.996E+00	2.861E-01	2.282E+00	7.292E+00	6.165E-02	3.616E+00
1.750E+01	2.013E+00	3.424E-01	2.356E+00	8.370E+00	7.219E-02	3.868E+00
2.000E+01	2.028E+00	3.996E-01	2.427E+00	9.416E+00	8.255E-02	4.090E+00
2.500E+01	2.051E+00	5.161E-01	2.568E+00	1.142E+01	1.026E-01	4.472E+00
3.000E+01	2.070E+00	6.347E-01	2.705E+00	1.331E+01	1.219E-01	4.792E+00
3.500E+01	2.086E+00	7.548E-01	2.840E+00	1.512E+01	1.402E-01	5.070E+00
4.000E+01	2.099E+00	8.761E-01	2.975E+00	1.684E+01	1.577E-01	5.314E+00
4.500E+01	2.110E+00	9.984E-01	3.108E+00	1.848E+01	1.744E-01	5.533E+00
5.000E+01	2.120E+00	1.122E+00	3.241E+00	2.006E+01	1.904E-01	5.731E+00
5.500E+01	2.129E+00	1.246E+00	3.374E+00	2.157E+01	2.056E-01	5.911E+00
6.000E+01	2.137E+00	1.370E+00	3.507E+00	2.302E+01	2.201E-01	6.077E+00
7.000E+01	2.150E+00	1.621E+00	3.771E+00	2.577E+01	2.473E-01	6.374E+00
8.000E+01	2.162E+00	1.873E+00	4.035E+00	2.834E+01	2.723E-01	6.633E+00
9.000E+01	2.173E+00	2.127E+00	4.300E+00	3.074E+01	2.954E-01	6.863E+00
1.000E+02	2.182E+00	2.382E+00	4.564E+00	3.299E+01	3.167E-01	7.069E+00
1.250E+02	2.201E+00	3.023E+00	5.225E+00	3.811E+01	3.636E-01	7.508E+00
1.500E+02	2.217E+00	3.669E+00	5.886E+00	4.261E+01	4.033E-01	7.869E+00
1.750E+02	2.230E+00	4.319E+00	6.549E+00	4.664E+01	4.374E-01	8.174E+00
2.000E+02	2.242E+00	4.971E+00	7.212E+00	5.028E+01	4.671E-01	8.439E+00
2.500E+02	2.261E+00	6.280E+00	8.541E+00	5.664E+01	5.164E-01	8.883E+00
3.000E+02	2.276E+00	7.596E+00	9.872E+00	6.208E+01	5.559E-01	9.247E+00
3.500E+02	2.289E+00	8.916E+00	1.121E+01	6.683E+01	5.883E-01	9.554E+00
4.000E+02	2.301E+00	1.024E+01	1.254E+01	7.105E+01	6.156E-01	9.820E+00
4.500E+02	2.311E+00	1.157E+01	1.388E+01	7.483E+01	6.389E-01	1.006E+01
5.000E+02	2.319E+00	1.289E+01	1.521E+01	7.827E+01	6.591E-01	1.027E+01
5.500E+02	2.328E+00	1.422E+01	1.655E+01	8.142E+01	6.768E-01	1.046E+01
6.000E+02	2.335E+00	1.555E+01	1.789E+01	8.433E+01	6.924E-01	1.063E+01
7.000E+02	2.348E+00	1.822E+01	2.057E+01	8.954E+01	7.189E-01	1.094E+01
8.000E+02	2.359E+00	2.089E+01	2.325E+01	9.411E+01	7.406E-01	1.120E+01
9.000E+02	2.369E+00	2.356E+01	2.593E+01	9.818E+01	7.587E-01	1.144E+01
1.000E+03	2.378E+00	2.623E+01	2.861E+01	1.019E+02	7.742E-01	1.165E+01

Electrons in A-150 TISSUE-EQUIVALENT PLASTIC

Density, g/cm³
1.1270E+00 I, eV
65.1

KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA
	COLLISION	RADIATIVE	TOTAL			
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²		
1.000E-02	2.294E+01	3.156E-03	2.295E+01	2.463E-04	7.529E-05	0.000E+00
1.250E-02	1.927E+01	3.174E-03	1.927E+01	3.657E-04	9.048E-05	0.000E+00
1.500E-02	1.671E+01	3.188E-03	1.671E+01	5.055E-04	1.050E-04	0.000E+00
1.750E-02	1.482E+01	3.197E-03	1.482E+01	6.646E-04	1.191E-04	0.000E+00
2.000E-02	1.335E+01	3.205E-03	1.336E+01	8.426E-04	1.327E-04	0.000E+00
2.500E-02	1.124E+01	3.219E-03	1.124E+01	1.253E-03	1.588E-04	0.000E+00
3.000E-02	9.769E+00	3.232E-03	9.772E+00	1.731E-03	1.838E-04	0.000E+00
3.500E-02	8.691E+00	3.245E-03	8.694E+00	2.275E-03	2.079E-04	0.000E+00
4.000E-02	7.863E+00	3.258E-03	7.866E+00	2.880E-03	2.311E-04	0.000E+00
4.500E-02	7.206E+00	3.273E-03	7.209E+00	3.545E-03	2.537E-04	0.000E+00
5.000E-02	6.671E+00	3.287E-03	6.675E+00	4.267E-03	2.756E-04	0.000E+00
5.500E-02	6.228E+00	3.302E-03	6.231E+00	5.043E-03	2.971E-04	0.000E+00
6.000E-02	5.853E+00	3.319E-03	5.857E+00	5.871E-03	3.180E-04	0.000E+00
7.000E-02	5.256E+00	3.352E-03	5.259E+00	7.677E-03	3.586E-04	0.000E+00
8.000E-02	4.800E+00	3.388E-03	4.803E+00	9.669E-03	3.977E-04	0.000E+00
9.000E-02	4.441E+00	3.427E-03	4.444E+00	1.184E-02	4.356E-04	0.000E+00
1.000E-01	4.150E+00	3.467E-03	4.153E+00	1.417E-02	4.723E-04	0.000E+00
1.250E-01	3.620E+00	3.578E-03	3.623E+00	2.064E-02	5.602E-04	0.000E+00
1.500E-01	3.262E+00	3.697E-03	3.265E+00	2.793E-02	6.436E-04	0.000E+00
1.750E-01	3.005E+00	3.824E-03	3.008E+00	3.592E-02	7.234E-04	0.000E+00
2.000E-01	2.812E+00	3.959E-03	2.816E+00	4.452E-02	8.003E-04	0.000E+00
2.500E-01	2.544E+00	4.247E-03	2.548E+00	6.325E-02	9.476E-04	0.000E+00
3.000E-01	2.369E+00	4.563E-03	2.373E+00	8.362E-02	1.089E-03	0.000E+00
3.500E-01	2.247E+00	4.901E-03	2.252E+00	1.053E-01	1.226E-03	0.000E+00
4.000E-01	2.156E+00	5.260E-03	2.161E+00	1.280E-01	1.361E-03	2.970E-02
4.500E-01	2.086E+00	5.639E-03	2.092E+00	1.515E-01	1.495E-03	6.264E-02
5.000E-01	2.033E+00	6.036E-03	2.039E+00	1.757E-01	1.628E-03	9.751E-02
5.500E-01	1.991E+00	6.448E-03	1.997E+00	2.005E-01	1.761E-03	1.337E-01
6.000E-01	1.957E+00	6.875E-03	1.964E+00	2.258E-01	1.895E-03	1.708E-01
7.000E-01	1.907E+00	7.768E-03	1.915E+00	2.774E-01	2.164E-03	2.464E-01
8.000E-01	1.874E+00	8.706E-03	1.883E+00	3.300E-01	2.436E-03	3.223E-01
9.000E-01	1.851E+00	9.687E-03	1.860E+00	3.835E-01	2.711E-03	3.975E-01
1.000E+00	1.834E+00	1.071E-02	1.845E+00	4.375E-01	2.990E-03	4.712E-01
1.250E+00	1.812E+00	1.341E-02	1.825E+00	5.739E-01	3.706E-03	6.472E-01
1.500E+00	1.803E+00	1.630E-02	1.819E+00	7.111E-01	4.447E-03	8.100E-01
1.750E+00	1.802E+00	1.934E-02	1.821E+00	8.485E-01	5.209E-03	9.601E-01
2.000E+00	1.804E+00	2.252E-02	1.827E+00	9.856E-01	5.992E-03	1.099E+00
2.500E+00	1.814E+00	2.920E-02	1.843E+00	1.258E+00	7.609E-03	1.346E+00
3.000E+00	1.827E+00	3.625E-02	1.863E+00	1.528E+00	9.281E-03	1.561E+00
3.500E+00	1.839E+00	4.358E-02	1.883E+00	1.795E+00	1.100E-02	1.751E+00
4.000E+00	1.852E+00	5.116E-02	1.903E+00	2.059E+00	1.275E-02	1.922E+00

4.500E+00	1.863E+00	5.896E-02	1.922E+00	2.320E+00	1.453E-02	2.077E+00
5.000E+00	1.874E+00	6.695E-02	1.941E+00	2.579E+00	1.633E-02	2.218E+00
5.500E+00	1.884E+00	7.511E-02	1.959E+00	2.836E+00	1.816E-02	2.349E+00
6.000E+00	1.894E+00	8.341E-02	1.977E+00	3.090E+00	2.000E-02	2.470E+00
7.000E+00	1.911E+00	1.004E-01	2.011E+00	3.591E+00	2.372E-02	2.691E+00
8.000E+00	1.926E+00	1.179E-01	2.044E+00	4.084E+00	2.749E-02	2.887E+00
9.000E+00	1.939E+00	1.358E-01	2.075E+00	4.570E+00	3.127E-02	3.064E+00
1.000E+01	1.951E+00	1.540E-01	2.105E+00	5.048E+00	3.508E-02	3.227E+00
1.250E+01	1.975E+00	2.007E-01	2.176E+00	6.217E+00	4.461E-02	3.582E+00
1.500E+01	1.995E+00	2.488E-01	2.243E+00	7.348E+00	5.411E-02	3.885E+00
1.750E+01	2.010E+00	2.979E-01	2.308E+00	8.446E+00	6.352E-02	4.150E+00
2.000E+01	2.024E+00	3.478E-01	2.372E+00	9.515E+00	7.282E-02	4.385E+00
2.500E+01	2.046E+00	4.496E-01	2.495E+00	1.157E+01	9.098E-02	4.788E+00
3.000E+01	2.063E+00	5.532E-01	2.616E+00	1.353E+01	1.085E-01	5.126E+00
3.500E+01	2.077E+00	6.582E-01	2.735E+00	1.540E+01	1.253E-01	5.417E+00
4.000E+01	2.089E+00	7.643E-01	2.854E+00	1.718E+01	1.414E-01	5.671E+00
4.500E+01	2.100E+00	8.714E-01	2.971E+00	1.890E+01	1.569E-01	5.897E+00
5.000E+01	2.109E+00	9.792E-01	3.089E+00	2.055E+01	1.717E-01	6.101E+00
5.500E+01	2.118E+00	1.088E+00	3.205E+00	2.214E+01	1.860E-01	6.286E+00
6.000E+01	2.125E+00	1.197E+00	3.322E+00	2.367E+01	1.996E-01	6.456E+00
7.000E+01	2.139E+00	1.416E+00	3.555E+00	2.658E+01	2.254E-01	6.758E+00
8.000E+01	2.150E+00	1.638E+00	3.788E+00	2.931E+01	2.491E-01	7.020E+00
9.000E+01	2.161E+00	1.860E+00	4.021E+00	3.187E+01	2.712E-01	7.253E+00
1.000E+02	2.170E+00	2.084E+00	4.254E+00	3.429E+01	2.917E-01	7.461E+00
1.250E+02	2.189E+00	2.647E+00	4.836E+00	3.979E+01	3.373E-01	7.903E+00
1.500E+02	2.204E+00	3.214E+00	5.418E+00	4.468E+01	3.763E-01	8.265E+00
1.750E+02	2.218E+00	3.784E+00	6.002E+00	4.906E+01	4.100E-01	8.571E+00
2.000E+02	2.229E+00	4.357E+00	6.586E+00	5.303E+01	4.396E-01	8.837E+00
2.500E+02	2.248E+00	5.508E+00	7.756E+00	6.002E+01	4.891E-01	9.281E+00
3.000E+02	2.263E+00	6.665E+00	8.928E+00	6.603E+01	5.291E-01	9.645E+00
3.500E+02	2.276E+00	7.826E+00	1.010E+01	7.129E+01	5.623E-01	9.952E+00
4.000E+02	2.288E+00	8.990E+00	1.128E+01	7.597E+01	5.903E-01	1.022E+01
4.500E+02	2.298E+00	1.016E+01	1.245E+01	8.019E+01	6.143E-01	1.045E+01
5.000E+02	2.307E+00	1.132E+01	1.363E+01	8.402E+01	6.352E-01	1.066E+01
5.500E+02	2.315E+00	1.249E+01	1.481E+01	8.754E+01	6.536E-01	1.085E+01
6.000E+02	2.322E+00	1.367E+01	1.599E+01	9.079E+01	6.699E-01	1.103E+01
7.000E+02	2.335E+00	1.601E+01	1.835E+01	9.662E+01	6.977E-01	1.134E+01
8.000E+02	2.346E+00	1.836E+01	2.071E+01	1.018E+02	7.204E-01	1.160E+01
9.000E+02	2.356E+00	2.072E+01	2.307E+01	1.063E+02	7.396E-01	1.184E+01
1.000E+03	2.365E+00	2.307E+01	2.544E+01	1.105E+02	7.559E-01	1.205E+01

Electrons in BONE, COMPACT (ICRU)

		Density, g/cm ³					
		1.8500E+00		I, eV		91.9	
KINETIC ENERGY	STOPPING POWER			CSDA RANGE	RADIATION YIELD	DENSITY EFFECT DELTA	
	COLLISION	RADIATIVE	TOTAL				
MeV	MeV cm ² /g	MeV cm ² /g	MeV cm ² /g	g/cm ²			
1.000E-02	2.068E+01	4.793E-03	2.068E+01	2.761E-04	1.236E-04	0.000E+00	
1.250E-02	1.742E+01	4.880E-03	1.742E+01	4.084E-04	1.501E-04	0.000E+00	
1.500E-02	1.514E+01	4.942E-03	1.514E+01	5.627E-04	1.756E-04	0.000E+00	
1.750E-02	1.344E+01	4.989E-03	1.345E+01	7.383E-04	2.004E-04	0.000E+00	
2.000E-02	1.213E+01	5.026E-03	1.214E+01	9.343E-04	2.244E-04	0.000E+00	
2.500E-02	1.023E+01	5.080E-03	1.024E+01	1.385E-03	2.706E-04	0.000E+00	
3.000E-02	8.912E+00	5.121E-03	8.917E+00	1.910E-03	3.148E-04	0.000E+00	
3.500E-02	7.939E+00	5.155E-03	7.944E+00	2.505E-03	3.572E-04	0.000E+00	
4.000E-02	7.191E+00	5.184E-03	7.196E+00	3.167E-03	3.982E-04	0.000E+00	
4.500E-02	6.596E+00	5.211E-03	6.601E+00	3.894E-03	4.378E-04	0.000E+00	
5.000E-02	6.112E+00	5.237E-03	6.117E+00	4.681E-03	4.764E-04	0.000E+00	
5.500E-02	5.709E+00	5.263E-03	5.715E+00	5.528E-03	5.138E-04	0.000E+00	
6.000E-02	5.370E+00	5.288E-03	5.375E+00	6.431E-03	5.504E-04	0.000E+00	
7.000E-02	4.827E+00	5.338E-03	4.832E+00	8.397E-03	6.210E-04	0.000E+00	
8.000E-02	4.412E+00	5.390E-03	4.418E+00	1.056E-02	6.887E-04	0.000E+00	
9.000E-02	4.085E+00	5.445E-03	4.090E+00	1.292E-02	7.540E-04	0.000E+00	
1.000E-01	3.820E+00	5.502E-03	3.826E+00	1.545E-02	8.171E-04	0.000E+00	
1.250E-01	3.336E+00	5.657E-03	3.342E+00	2.247E-02	9.670E-04	0.000E+00	
1.500E-01	3.010E+00	5.826E-03	3.016E+00	3.037E-02	1.108E-03	0.000E+00	
1.750E-01	2.775E+00	6.007E-03	2.781E+00	3.901E-02	1.242E-03	0.000E+00	
2.000E-01	2.599E+00	6.200E-03	2.605E+00	4.831E-02	1.371E-03	0.000E+00	
2.500E-01	2.354E+00	6.618E-03	2.361E+00	6.855E-02	1.615E-03	0.000E+00	
3.000E-01	2.194E+00	7.075E-03	2.201E+00	9.052E-02	1.848E-03	0.000E+00	
3.500E-01	2.080E+00	7.567E-03	2.087E+00	1.139E-01	2.072E-03	2.850E-02	
4.000E-01	1.996E+00	8.090E-03	2.004E+00	1.384E-01	2.292E-03	6.259E-02	
4.500E-01	1.932E+00	8.643E-03	1.941E+00	1.637E-01	2.509E-03	9.809E-02	
5.000E-01	1.883E+00	9.221E-03	1.893E+00	1.898E-01	2.724E-03	1.344E-01	
5.500E-01	1.845E+00	9.823E-03	1.855E+00	2.165E-01	2.939E-03	1.711E-01	
6.000E-01	1.815E+00	1.045E-02	1.825E+00	2.437E-01	3.153E-03	2.080E-01	
7.000E-01	1.770E+00	1.175E-02	1.782E+00	2.992E-01	3.582E-03	2.819E-01	
8.000E-01	1.740E+00	1.311E-02	1.753E+00	3.558E-01	4.014E-03	3.550E-01	
9.000E-01	1.719E+00	1.454E-02	1.734E+00	4.132E-01	4.449E-03	4.267E-01	
1.000E+00	1.705E+00	1.602E-02	1.721E+00	4.711E-01	4.889E-03	4.966E-01	
1.250E+00	1.686E+00	1.995E-02	1.706E+00	6.171E-01	6.009E-03	6.628E-01	
1.500E+00	1.680E+00	2.414E-02	1.705E+00	7.638E-01	7.161E-03	8.162E-01	
1.750E+00	1.681E+00	2.854E-02	1.709E+00	9.102E-01	8.341E-03	9.578E-01	
2.000E+00	1.684E+00	3.313E-02	1.718E+00	1.056E+00	9.547E-03	1.089E+00	
2.500E+00	1.696E+00	4.277E-02	1.739E+00	1.346E+00	1.202E-02	1.323E+00	
3.000E+00	1.709E+00	5.289E-02	1.762E+00	1.631E+00	1.457E-02	1.527E+00	
3.500E+00	1.722E+00	6.341E-02	1.786E+00	1.913E+00	1.717E-02	1.709E+00	
4.000E+00	1.735E+00	7.427E-02	1.809E+00	2.191E+00	1.981E-02	1.872E+00	

4.500E+00	1.747E+00	8.541E-02	1.832E+00	2.466E+00	2.248E-02	2.020E+00
5.000E+00	1.758E+00	9.680E-02	1.855E+00	2.737E+00	2.517E-02	2.156E+00
5.500E+00	1.768E+00	1.084E-01	1.877E+00	3.005E+00	2.788E-02	2.282E+00
6.000E+00	1.778E+00	1.202E-01	1.898E+00	3.270E+00	3.060E-02	2.399E+00
7.000E+00	1.795E+00	1.444E-01	1.939E+00	3.791E+00	3.607E-02	2.612E+00
8.000E+00	1.810E+00	1.692E-01	1.979E+00	4.301E+00	4.156E-02	2.801E+00
9.000E+00	1.823E+00	1.945E-01	2.018E+00	4.802E+00	4.705E-02	2.973E+00
1.000E+01	1.835E+00	2.202E-01	2.055E+00	5.293E+00	5.252E-02	3.130E+00
1.250E+01	1.860E+00	2.860E-01	2.146E+00	6.483E+00	6.608E-02	3.473E+00
1.500E+01	1.879E+00	3.537E-01	2.233E+00	7.625E+00	7.939E-02	3.766E+00
1.750E+01	1.896E+00	4.226E-01	2.318E+00	8.724E+00	9.240E-02	4.021E+00
2.000E+01	1.909E+00	4.926E-01	2.402E+00	9.783E+00	1.051E-01	4.248E+00
2.500E+01	1.931E+00	6.351E-01	2.566E+00	1.180E+01	1.294E-01	4.638E+00
3.000E+01	1.949E+00	7.799E-01	2.729E+00	1.369E+01	1.523E-01	4.965E+00
3.500E+01	1.963E+00	9.264E-01	2.890E+00	1.547E+01	1.739E-01	5.248E+00
4.000E+01	1.976E+00	1.074E+00	3.050E+00	1.715E+01	1.943E-01	5.496E+00
4.500E+01	1.986E+00	1.224E+00	3.210E+00	1.875E+01	2.134E-01	5.716E+00
5.000E+01	1.996E+00	1.374E+00	3.369E+00	2.027E+01	2.316E-01	5.916E+00
5.500E+01	2.004E+00	1.525E+00	3.529E+00	2.172E+01	2.487E-01	6.097E+00
6.000E+01	2.012E+00	1.676E+00	3.688E+00	2.310E+01	2.649E-01	6.263E+00
7.000E+01	2.025E+00	1.982E+00	4.007E+00	2.570E+01	2.949E-01	6.559E+00
8.000E+01	2.037E+00	2.289E+00	4.326E+00	2.811E+01	3.221E-01	6.818E+00
9.000E+01	2.047E+00	2.598E+00	4.645E+00	3.034E+01	3.468E-01	7.046E+00
1.000E+02	2.056E+00	2.909E+00	4.965E+00	3.242E+01	3.694E-01	7.251E+00
1.250E+02	2.075E+00	3.690E+00	5.765E+00	3.709E+01	4.184E-01	7.688E+00
1.500E+02	2.090E+00	4.476E+00	6.566E+00	4.115E+01	4.590E-01	8.047E+00
1.750E+02	2.103E+00	5.266E+00	7.369E+00	4.474E+01	4.932E-01	8.351E+00
2.000E+02	2.114E+00	6.059E+00	8.173E+00	4.796E+01	5.226E-01	8.615E+00
2.500E+02	2.133E+00	7.652E+00	9.784E+00	5.354E+01	5.707E-01	9.057E+00
3.000E+02	2.148E+00	9.251E+00	1.140E+01	5.827E+01	6.085E-01	9.419E+00
3.500E+02	2.160E+00	1.086E+01	1.302E+01	6.238E+01	6.392E-01	9.726E+00
4.000E+02	2.171E+00	1.246E+01	1.464E+01	6.600E+01	6.647E-01	9.992E+00
4.500E+02	2.181E+00	1.407E+01	1.626E+01	6.924E+01	6.863E-01	1.023E+01
5.000E+02	2.189E+00	1.569E+01	1.788E+01	7.217E+01	7.048E-01	1.044E+01
5.500E+02	2.197E+00	1.730E+01	1.950E+01	7.485E+01	7.210E-01	1.063E+01
6.000E+02	2.204E+00	1.892E+01	2.112E+01	7.731E+01	7.352E-01	1.080E+01
7.000E+02	2.217E+00	2.216E+01	2.437E+01	8.171E+01	7.591E-01	1.111E+01
8.000E+02	2.228E+00	2.540E+01	2.763E+01	8.556E+01	7.785E-01	1.137E+01
9.000E+02	2.237E+00	2.864E+01	3.088E+01	8.898E+01	7.947E-01	1.161E+01
1.000E+03	2.246E+00	3.189E+01	3.414E+01	9.206E+01	8.083E-01	1.182E+01

ALPHA PARTICLE STOPPING POWER AND RANGE

HYDROGEN

T = alpha particle (helium ion) kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	2.120E+02	1.052E+03	1.264E+03	7.480E-07	6.860E-07	.9171
1.500E-03	2.754E+02	9.262E+02	1.202E+03	1.154E-06	1.062E-06	.9203
2.000E-03	3.317E+02	8.312E+02	1.163E+03	1.577E-06	1.456E-06	.9233
2.500E-03	3.830E+02	7.568E+02	1.140E+03	2.012E-06	1.863E-06	.9260
3.000E-03	4.309E+02	6.965E+02	1.127E+03	2.453E-06	2.278E-06	.9285
4.000E-03	5.188E+02	6.044E+02	1.123E+03	3.344E-06	3.119E-06	.9327
5.000E-03	5.992E+02	5.367E+02	1.136E+03	4.230E-06	3.960E-06	.9363
6.000E-03	6.740E+02	4.843E+02	1.158E+03	5.102E-06	4.792E-06	.9393
7.000E-03	7.445E+02	4.425E+02	1.187E+03	5.955E-06	5.610E-06	.9420
8.000E-03	8.115E+02	4.082E+02	1.220E+03	6.786E-06	6.408E-06	.9443
9.000E-03	8.756E+02	3.794E+02	1.255E+03	7.595E-06	7.188E-06	.9464
1.000E-02	9.371E+02	3.549E+02	1.292E+03	8.380E-06	7.947E-06	.9483
1.250E-02	1.082E+03	3.068E+02	1.389E+03	1.025E-05	9.757E-06	.9523
1.500E-02	1.217E+03	2.713E+02	1.488E+03	1.198E-05	1.145E-05	.9554
1.750E-02	1.344E+03	2.439E+02	1.588E+03	1.361E-05	1.304E-05	.9581
2.000E-02	1.465E+03	2.220E+02	1.687E+03	1.514E-05	1.454E-05	.9603
2.250E-02	1.580E+03	2.041E+02	1.784E+03	1.658E-05	1.595E-05	.9622
2.500E-02	1.691E+03	1.891E+02	1.880E+03	1.794E-05	1.729E-05	.9638
2.750E-02	1.798E+03	1.764E+02	1.974E+03	1.924E-05	1.857E-05	.9653
3.000E-02	1.901E+03	1.654E+02	2.066E+03	2.048E-05	1.979E-05	.9666
3.500E-02	2.098E+03	1.475E+02	2.246E+03	2.280E-05	2.209E-05	.9688
4.000E-02	2.285E+03	1.333E+02	2.418E+03	2.494E-05	2.421E-05	.9706
4.500E-02	2.463E+03	1.219E+02	2.585E+03	2.694E-05	2.619E-05	.9721
5.000E-02	2.634E+03	1.124E+02	2.746E+03	2.882E-05	2.805E-05	.9734
5.500E-02	2.798E+03	1.044E+02	2.902E+03	3.059E-05	2.981E-05	.9745
6.000E-02	2.956E+03	9.752E+01	3.053E+03	3.227E-05	3.148E-05	.9755
6.500E-02	3.108E+03	9.159E+01	3.200E+03	3.387E-05	3.307E-05	.9764
7.000E-02	3.256E+03	8.639E+01	3.342E+03	3.540E-05	3.459E-05	.9772
7.500E-02	3.399E+03	8.180E+01	3.481E+03	3.686E-05	3.605E-05	.9779
8.000E-02	3.538E+03	7.771E+01	3.616E+03	3.827E-05	3.745E-05	.9785
8.500E-02	3.674E+03	7.405E+01	3.748E+03	3.963E-05	3.880E-05	.9791
9.000E-02	3.805E+03	7.074E+01	3.876E+03	4.094E-05	4.011E-05	.9797
9.500E-02	3.933E+03	6.773E+01	4.001E+03	4.221E-05	4.137E-05	.9802
1.000E-01	4.058E+03	6.500E+01	4.123E+03	4.344E-05	4.260E-05	.9807
1.250E-01	4.637E+03	5.425E+01	4.691E+03	4.912E-05	4.826E-05	.9826
1.500E-01	5.152E+03	4.674E+01	5.198E+03	5.417E-05	5.330E-05	.9840
1.750E-01	5.610E+03	4.117E+01	5.652E+03	5.878E-05	5.790E-05	.9851
2.000E-01	6.019E+03	3.686E+01	6.056E+03	6.305E-05	6.216E-05	.9860
2.250E-01	6.383E+03	3.342E+01	6.416E+03	6.705E-05	6.617E-05	.9868
2.500E-01	6.705E+03	3.061E+01	6.735E+03	7.086E-05	6.996E-05	.9874
2.750E-01	6.988E+03	2.826E+01	7.016E+03	7.449E-05	7.359E-05	.9880
3.000E-01	7.235E+03	2.626E+01	7.261E+03	7.799E-05	7.709E-05	.9885

3.500E-01	7.632E+03	2.306E+01	7.655E+03	8.469E-05	8.378E-05	.9893
4.000E-01	7.915E+03	2.059E+01	7.935E+03	9.110E-05	9.019E-05	.9900
4.500E-01	8.100E+03	1.863E+01	8.118E+03	9.732E-05	9.641E-05	.9906
5.000E-01	8.203E+03	1.703E+01	8.220E+03	1.034E-04	1.025E-04	.9912
5.500E-01	8.240E+03	1.570E+01	8.255E+03	1.095E-04	1.086E-04	.9916
6.000E-01	8.222E+03	1.457E+01	8.237E+03	1.156E-04	1.146E-04	.9921
6.500E-01	8.161E+03	1.360E+01	8.175E+03	1.217E-04	1.207E-04	.9924
7.000E-01	8.067E+03	1.276E+01	8.079E+03	1.278E-04	1.269E-04	.9928
7.500E-01	7.947E+03	1.202E+01	7.959E+03	1.340E-04	1.331E-04	.9931
8.000E-01	7.808E+03	1.137E+01	7.819E+03	1.404E-04	1.394E-04	.9934
8.500E-01	7.655E+03	1.079E+01	7.666E+03	1.468E-04	1.459E-04	.9937
9.000E-01	7.494E+03	1.027E+01	7.504E+03	1.534E-04	1.525E-04	.9940
9.500E-01	7.327E+03	9.801E+00	7.337E+03	1.602E-04	1.592E-04	.9942
1.000E+00	7.157E+03	9.374E+00	7.167E+03	1.671E-04	1.661E-04	.9944
1.250E+00	6.345E+03	7.719E+00	6.352E+03	2.041E-04	2.032E-04	.9954
1.500E+00	5.647E+03	6.582E+00	5.654E+03	2.459E-04	2.450E-04	.9962
1.750E+00	5.068E+03	5.750E+00	5.074E+03	2.926E-04	2.917E-04	.9968
2.000E+00	4.588E+03	5.113E+00	4.593E+03	3.445E-04	3.435E-04	.9972
2.250E+00	4.188E+03	4.609E+00	4.193E+03	4.015E-04	4.005E-04	.9976
2.500E+00	3.860E+03	4.199E+00	3.865E+03	4.637E-04	4.627E-04	.9979
2.750E+00	3.585E+03	3.859E+00	3.589E+03	5.309E-04	5.299E-04	.9982
3.000E+00	3.351E+03	3.573E+00	3.354E+03	6.030E-04	6.020E-04	.9984
3.500E+00	2.971E+03	3.115E+00	2.974E+03	7.616E-04	7.606E-04	.9987
4.000E+00	2.675E+03	2.766E+00	2.678E+03	9.391E-04	9.381E-04	.9989
4.500E+00	2.438E+03	2.490E+00	2.440E+03	1.135E-03	1.134E-03	.9991
5.000E+00	2.242E+03	2.266E+00	2.244E+03	1.349E-03	1.348E-03	.9992
5.500E+00	2.078E+03	2.080E+00	2.080E+03	1.580E-03	1.579E-03	.9993
6.000E+00	1.939E+03	1.924E+00	1.941E+03	1.829E-03	1.828E-03	.9994
6.500E+00	1.818E+03	1.790E+00	1.820E+03	2.096E-03	2.094E-03	.9995
7.000E+00	1.713E+03	1.674E+00	1.715E+03	2.379E-03	2.378E-03	.9995
7.500E+00	1.620E+03	1.573E+00	1.622E+03	2.679E-03	2.678E-03	.9996
8.000E+00	1.538E+03	1.484E+00	1.539E+03	2.995E-03	2.994E-03	.9996
8.500E+00	1.464E+03	1.405E+00	1.466E+03	3.328E-03	3.327E-03	.9996
9.000E+00	1.398E+03	1.334E+00	1.399E+03	3.678E-03	3.676E-03	.9997
9.500E+00	1.337E+03	1.270E+00	1.339E+03	4.043E-03	4.042E-03	.9997
1.000E+01	1.283E+03	1.213E+00	1.284E+03	4.424E-03	4.423E-03	.9997
1.250E+01	1.068E+03	9.895E-01	1.069E+03	6.568E-03	6.567E-03	.9998
1.500E+01	9.191E+02	8.373E-01	9.200E+02	9.097E-03	9.095E-03	.9998
1.750E+01	8.089E+02	7.267E-01	8.096E+02	1.200E-02	1.200E-02	.9999
2.000E+01	7.238E+02	6.425E-01	7.245E+02	1.527E-02	1.527E-02	.9999
2.500E+01	6.007E+02	5.225E-01	6.013E+02	2.288E-02	2.288E-02	.9999
2.750E+01	5.546E+02	4.781E-01	5.551E+02	2.721E-02	2.721E-02	.9999
3.000E+01	5.156E+02	4.407E-01	5.160E+02	3.189E-02	3.189E-02	.9999
3.500E+01	4.529E+02	3.814E-01	4.533E+02	4.225E-02	4.225E-02	.9999
4.000E+01	4.047E+02	3.364E-01	4.051E+02	5.394E-02	5.394E-02	.9999
4.500E+01	3.665E+02	3.011E-01	3.668E+02	6.693E-02	6.693E-02	.9999
5.000E+01	3.353E+02	2.725E-01	3.356E+02	8.120E-02	8.119E-02	.9999
5.500E+01	3.094E+02	2.489E-01	3.096E+02	9.672E-02	9.672E-02	.9999
6.000E+01	2.875E+02	2.290E-01	2.877E+02	1.135E-01	1.135E-01	.9999
6.500E+01	2.687E+02	2.121E-01	2.689E+02	1.315E-01	1.315E-01	.9999
7.000E+01	2.524E+02	1.975E-01	2.526E+02	1.507E-01	1.507E-01	.9999
7.500E+01	2.382E+02	1.848E-01	2.384E+02	1.710E-01	1.710E-01	.9999
8.000E+01	2.256E+02	1.737E-01	2.258E+02	1.926E-01	1.926E-01	.9999
8.500E+01	2.144E+02	1.639E-01	2.145E+02	2.153E-01	2.153E-01	.9999
9.000E+01	2.043E+02	1.551E-01	2.045E+02	2.392E-01	2.392E-01	.9999
9.500E+01	1.952E+02	1.472E-01	1.954E+02	2.642E-01	2.642E-01	.9999
1.000E+02	1.870E+02	1.401E-01	1.871E+02	2.904E-01	2.904E-01	.9999

1.250E+02	1.552E+02	1.129E-01	1.553E+02	4.378E-01	4.378E-01	.9999
1.500E+02	1.334E+02	9.448E-02	1.335E+02	6.120E-01	6.120E-01	.9999
1.750E+02	1.174E+02	8.119E-02	1.175E+02	8.121E-01	8.121E-01	.9999
2.000E+02	1.053E+02	7.121E-02	1.053E+02	1.037E+00	1.037E+00	.9999
2.250E+02	9.568E+01	6.344E-02	9.574E+01	1.287E+00	1.286E+00	1.0000
2.500E+02	8.790E+01	5.720E-02	8.795E+01	1.559E+00	1.559E+00	1.0000
2.750E+02	8.146E+01	5.205E-02	8.151E+01	1.855E+00	1.855E+00	1.0000
3.000E+02	7.604E+01	4.772E-02	7.609E+01	2.172E+00	2.172E+00	1.0000
3.500E+02	6.741E+01	4.094E-02	6.746E+01	2.872E+00	2.872E+00	1.0000
4.000E+02	6.085E+01	3.587E-02	6.089E+01	3.654E+00	3.653E+00	1.0000
4.500E+02	5.568E+01	3.192E-02	5.572E+01	4.513E+00	4.513E+00	1.0000
5.000E+02	5.151E+01	2.874E-02	5.154E+01	5.447E+00	5.447E+00	1.0000
5.500E+02	4.807E+01	2.614E-02	4.809E+01	6.452E+00	6.452E+00	1.0000
6.000E+02	4.517E+01	2.398E-02	4.520E+01	7.526E+00	7.525E+00	1.0000
6.500E+02	4.271E+01	2.214E-02	4.274E+01	8.664E+00	8.664E+00	1.0000
7.000E+02	4.059E+01	2.057E-02	4.061E+01	9.865E+00	9.864E+00	1.0000
7.500E+02	3.875E+01	1.920E-02	3.877E+01	1.113E+01	1.112E+01	1.0000
8.000E+02	3.713E+01	1.801E-02	3.714E+01	1.244E+01	1.244E+01	1.0000
8.500E+02	3.569E+01	1.695E-02	3.571E+01	1.382E+01	1.382E+01	1.0000
9.000E+02	3.441E+01	1.601E-02	3.443E+01	1.524E+01	1.524E+01	1.0000
9.500E+02	3.327E+01	1.517E-02	3.328E+01	1.672E+01	1.672E+01	1.0000
1.000E+03	3.223E+01	1.441E-02	3.225E+01	1.825E+01	1.825E+01	1.0000

ALPHA PARTICLE STOPPING POWER AND RANGE

HELIUM

T = alpha particle (helium ion) kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	8.726E+01	2.949E+02	3.822E+02	2.488E-06	1.700E-06	.6832
1.500E-03	1.108E+02	2.570E+02	3.678E+02	3.822E-06	2.682E-06	.7018
2.000E-03	1.313E+02	2.290E+02	3.603E+02	5.197E-06	3.725E-06	.7168
2.500E-03	1.498E+02	2.074E+02	3.572E+02	6.592E-06	4.808E-06	.7293
3.000E-03	1.668E+02	1.901E+02	3.569E+02	7.993E-06	5.916E-06	.7401
4.000E-03	1.977E+02	1.639E+02	3.616E+02	1.078E-05	8.171E-06	.7580
5.000E-03	2.255E+02	1.448E+02	3.703E+02	1.352E-05	1.044E-05	.7724
6.000E-03	2.511E+02	1.302E+02	3.814E+02	1.618E-05	1.269E-05	.7845
7.000E-03	2.750E+02	1.187E+02	3.937E+02	1.876E-05	1.491E-05	.7948
8.000E-03	2.975E+02	1.092E+02	4.067E+02	2.126E-05	1.709E-05	.8037
9.000E-03	3.189E+02	1.013E+02	4.202E+02	2.368E-05	1.922E-05	.8116
1.000E-02	3.394E+02	9.458E+01	4.339E+02	2.602E-05	2.130E-05	.8186
1.250E-02	3.870E+02	8.149E+01	4.685E+02	3.156E-05	2.630E-05	.8332
1.500E-02	4.309E+02	7.189E+01	5.028E+02	3.671E-05	3.101E-05	.8448
1.750E-02	4.718E+02	6.450E+01	5.363E+02	4.152E-05	3.547E-05	.8543
2.000E-02	5.104E+02	5.862E+01	5.690E+02	4.605E-05	3.970E-05	.8622
2.250E-02	5.470E+02	5.382E+01	6.008E+02	5.032E-05	4.373E-05	.8690
2.500E-02	5.819E+02	4.982E+01	6.317E+02	5.438E-05	4.758E-05	.8749
2.750E-02	6.153E+02	4.642E+01	6.618E+02	5.825E-05	5.126E-05	.8800
3.000E-02	6.475E+02	4.350E+01	6.910E+02	6.194E-05	5.479E-05	.8846
3.500E-02	7.087E+02	3.872E+01	7.474E+02	6.889E-05	6.148E-05	.8924
4.000E-02	7.661E+02	3.496E+01	8.011E+02	7.535E-05	6.773E-05	.8988
4.500E-02	8.205E+02	3.193E+01	8.525E+02	8.140E-05	7.360E-05	.9041
5.000E-02	8.723E+02	2.942E+01	9.017E+02	8.710E-05	7.915E-05	.9087
5.500E-02	9.218E+02	2.730E+01	9.491E+02	9.251E-05	8.443E-05	.9127
6.000E-02	9.693E+02	2.549E+01	9.948E+02	9.765E-05	8.947E-05	.9162
6.500E-02	1.015E+03	2.393E+01	1.039E+03	1.026E-04	9.429E-05	.9193
7.000E-02	1.059E+03	2.256E+01	1.082E+03	1.073E-04	9.893E-05	.9221
7.500E-02	1.102E+03	2.135E+01	1.123E+03	1.118E-04	1.034E-04	.9246
8.000E-02	1.143E+03	2.028E+01	1.163E+03	1.162E-04	1.077E-04	.9269
8.500E-02	1.183E+03	1.931E+01	1.202E+03	1.204E-04	1.119E-04	.9290
9.000E-02	1.221E+03	1.844E+01	1.240E+03	1.245E-04	1.159E-04	.9309
9.500E-02	1.259E+03	1.766E+01	1.277E+03	1.285E-04	1.198E-04	.9327
1.000E-01	1.296E+03	1.694E+01	1.313E+03	1.324E-04	1.237E-04	.9343
1.250E-01	1.465E+03	1.412E+01	1.479E+03	1.503E-04	1.414E-04	.9410
1.500E-01	1.614E+03	1.215E+01	1.627E+03	1.664E-04	1.574E-04	.9460
1.750E-01	1.748E+03	1.070E+01	1.759E+03	1.811E-04	1.721E-04	.9499
2.000E-01	1.867E+03	9.573E+00	1.877E+03	1.949E-04	1.857E-04	.9531
2.250E-01	1.975E+03	8.676E+00	1.983E+03	2.078E-04	1.986E-04	.9558
2.500E-01	2.071E+03	7.942E+00	2.078E+03	2.201E-04	2.109E-04	.9580
2.750E-01	2.156E+03	7.329E+00	2.164E+03	2.319E-04	2.226E-04	.9600
3.000E-01	2.233E+03	6.810E+00	2.240E+03	2.433E-04	2.340E-04	.9617

3.500E-01	2.361E+03	5.977E+00	2.367E+03	2.650E-04	2.556E-04	.9647
4.000E-01	2.460E+03	5.335E+00	2.466E+03	2.856E-04	2.762E-04	.9671
4.500E-01	2.535E+03	4.825E+00	2.540E+03	3.056E-04	2.962E-04	.9691
5.000E-01	2.588E+03	4.409E+00	2.593E+03	3.251E-04	3.156E-04	.9709
5.500E-01	2.624E+03	4.062E+00	2.628E+03	3.442E-04	3.347E-04	.9724
6.000E-01	2.644E+03	3.769E+00	2.648E+03	3.632E-04	3.536E-04	.9738
6.500E-01	2.652E+03	3.518E+00	2.656E+03	3.820E-04	3.725E-04	.9750
7.000E-01	2.650E+03	3.300E+00	2.653E+03	4.008E-04	3.913E-04	.9762
7.500E-01	2.639E+03	3.109E+00	2.642E+03	4.197E-04	4.102E-04	.9772
8.000E-01	2.621E+03	2.940E+00	2.624E+03	4.387E-04	4.291E-04	.9781
8.500E-01	2.598E+03	2.789E+00	2.601E+03	4.578E-04	4.482E-04	.9790
9.000E-01	2.571E+03	2.654E+00	2.574E+03	4.772E-04	4.675E-04	.9798
9.500E-01	2.540E+03	2.532E+00	2.543E+03	4.967E-04	4.871E-04	.9806
1.000E+00	2.507E+03	2.422E+00	2.510E+03	5.165E-04	5.069E-04	.9813
1.250E+00	2.323E+03	1.993E+00	2.325E+03	6.199E-04	6.102E-04	.9843
1.500E+00	2.139E+03	1.699E+00	2.141E+03	7.320E-04	7.222E-04	.9867
1.750E+00	1.976E+03	1.483E+00	1.977E+03	8.536E-04	8.438E-04	.9885
2.000E+00	1.832E+03	1.319E+00	1.834E+03	9.850E-04	9.751E-04	.9900
2.250E+00	1.706E+03	1.188E+00	1.707E+03	1.126E-03	1.116E-03	.9912
2.500E+00	1.593E+03	1.082E+00	1.594E+03	1.278E-03	1.268E-03	.9922
2.750E+00	1.493E+03	9.946E-01	1.493E+03	1.440E-03	1.430E-03	.9931
3.000E+00	1.402E+03	9.206E-01	1.403E+03	1.613E-03	1.603E-03	.9938
3.500E+00	1.249E+03	8.025E-01	1.250E+03	1.991E-03	1.981E-03	.9949
4.000E+00	1.130E+03	7.123E-01	1.130E+03	2.412E-03	2.402E-03	.9958
4.500E+00	1.033E+03	6.410E-01	1.034E+03	2.875E-03	2.865E-03	.9964
5.000E+00	9.538E+02	5.831E-01	9.544E+02	3.379E-03	3.369E-03	.9969
5.500E+00	8.868E+02	5.352E-01	8.873E+02	3.923E-03	3.912E-03	.9973
6.000E+00	8.295E+02	4.948E-01	8.300E+02	4.506E-03	4.495E-03	.9976
6.500E+00	7.798E+02	4.604E-01	7.803E+02	5.128E-03	5.117E-03	.9979
7.000E+00	7.364E+02	4.306E-01	7.368E+02	5.787E-03	5.776E-03	.9981
7.500E+00	6.979E+02	4.045E-01	6.983E+02	6.485E-03	6.474E-03	.9983
8.000E+00	6.637E+02	3.815E-01	6.640E+02	7.219E-03	7.208E-03	.9985
8.500E+00	6.329E+02	3.611E-01	6.333E+02	7.990E-03	7.979E-03	.9986
9.000E+00	6.052E+02	3.429E-01	6.055E+02	8.798E-03	8.787E-03	.9987
9.500E+00	5.800E+02	3.264E-01	5.803E+02	9.642E-03	9.630E-03	.9988
1.000E+01	5.570E+02	3.115E-01	5.573E+02	1.052E-02	1.051E-02	.9989
1.250E+01	4.666E+02	2.540E-01	4.669E+02	1.544E-02	1.543E-02	.9992
1.500E+01	4.033E+02	2.148E-01	4.035E+02	2.122E-02	2.121E-02	.9994
1.750E+01	3.562E+02	1.864E-01	3.564E+02	2.783E-02	2.781E-02	.9995
2.000E+01	3.197E+02	1.647E-01	3.199E+02	3.525E-02	3.523E-02	.9996
2.500E+01	2.666E+02	1.338E-01	2.667E+02	5.244E-02	5.243E-02	.9997
2.750E+01	2.466E+02	1.224E-01	2.467E+02	6.220E-02	6.218E-02	.9997
3.000E+01	2.296E+02	1.128E-01	2.297E+02	7.271E-02	7.269E-02	.9997
3.500E+01	2.023E+02	9.757E-02	2.024E+02	9.595E-02	9.592E-02	.9997
4.000E+01	1.812E+02	8.603E-02	1.813E+02	1.221E-01	1.221E-01	.9998
4.500E+01	1.644E+02	7.694E-02	1.645E+02	1.511E-01	1.511E-01	.9998
5.000E+01	1.507E+02	6.958E-02	1.508E+02	1.829E-01	1.828E-01	.9998
5.500E+01	1.393E+02	6.351E-02	1.393E+02	2.174E-01	2.174E-01	.9998
6.000E+01	1.296E+02	5.842E-02	1.296E+02	2.546E-01	2.546E-01	.9998
6.500E+01	1.213E+02	5.409E-02	1.213E+02	2.945E-01	2.945E-01	.9998
7.000E+01	1.141E+02	5.037E-02	1.141E+02	3.370E-01	3.370E-01	.9998
7.500E+01	1.077E+02	4.713E-02	1.078E+02	3.821E-01	3.821E-01	.9998
8.000E+01	1.021E+02	4.429E-02	1.022E+02	4.298E-01	4.298E-01	.9998
8.500E+01	9.712E+01	4.177E-02	9.716E+01	4.800E-01	4.799E-01	.9998
9.000E+01	9.264E+01	3.953E-02	9.268E+01	5.327E-01	5.327E-01	.9999
9.500E+01	8.859E+01	3.752E-02	8.863E+01	5.879E-01	5.878E-01	.9999
1.000E+02	8.492E+01	3.571E-02	8.495E+01	6.456E-01	6.455E-01	.9999

1.250E+02	7.066E+01	2.873E-02	7.069E+01	9.697E-01	9.696E-01	.9999
1.500E+02	6.087E+01	2.402E-02	6.089E+01	1.352E+00	1.352E+00	.9999
1.750E+02	5.370E+01	2.064E-02	5.372E+01	1.790E+00	1.790E+00	.9999
2.000E+02	4.821E+01	1.811E-02	4.823E+01	2.282E+00	2.282E+00	.9999
2.250E+02	4.387E+01	1.613E-02	4.388E+01	2.826E+00	2.826E+00	.9999
2.500E+02	4.034E+01	1.452E-02	4.036E+01	3.421E+00	3.421E+00	.9999
2.750E+02	3.743E+01	1.321E-02	3.744E+01	4.065E+00	4.064E+00	.9999
3.000E+02	3.497E+01	1.211E-02	3.498E+01	4.756E+00	4.756E+00	.9999
3.500E+02	3.105E+01	1.040E-02	3.106E+01	6.277E+00	6.276E+00	.9999
4.000E+02	2.806E+01	9.109E-03	2.807E+01	7.973E+00	7.972E+00	.9999
4.500E+02	2.570E+01	8.101E-03	2.571E+01	9.837E+00	9.836E+00	.9999
5.000E+02	2.380E+01	7.296E-03	2.380E+01	1.186E+01	1.186E+01	.9999
5.500E+02	2.222E+01	6.637E-03	2.223E+01	1.404E+01	1.403E+01	.9999
6.000E+02	2.090E+01	6.087E-03	2.091E+01	1.636E+01	1.636E+01	.9999
6.500E+02	1.977E+01	5.621E-03	1.978E+01	1.882E+01	1.882E+01	.9999
7.000E+02	1.880E+01	5.220E-03	1.881E+01	2.141E+01	2.141E+01	.9999
7.500E+02	1.796E+01	4.873E-03	1.796E+01	2.413E+01	2.413E+01	.9999
8.000E+02	1.722E+01	4.569E-03	1.722E+01	2.698E+01	2.697E+01	.9999
8.500E+02	1.656E+01	4.300E-03	1.656E+01	2.994E+01	2.993E+01	.9999
9.000E+02	1.597E+01	4.060E-03	1.598E+01	3.301E+01	3.301E+01	.9999
9.500E+02	1.545E+01	3.846E-03	1.545E+01	3.620E+01	3.619E+01	.9999
1.000E+03	1.497E+01	3.653E-03	1.497E+01	3.948E+01	3.948E+01	.9999

ALPHA PARTICLE STOPPING POWER AND RANGE

CARBON (amorphous, density 2.0 g/cm³)

T = alpha particle (helium ion) kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP(e)	STOP(n)	STOP(t)	RANGE(c)	RANGE(p)	DETOUR
1.000E-03	1.906E+02	1.557E+02	3.463E+02	3.644E-06	1.689E-06	.4636
1.500E-03	2.256E+02	1.441E+02	3.697E+02	5.033E-06	2.483E-06	.4934
2.000E-03	2.543E+02	1.340E+02	3.882E+02	6.352E-06	3.289E-06	.5177
2.500E-03	2.790E+02	1.253E+02	4.043E+02	7.614E-06	4.097E-06	.5381
3.000E-03	3.009E+02	1.179E+02	4.188E+02	8.828E-06	4.905E-06	.5556
4.000E-03	3.392E+02	1.058E+02	4.449E+02	1.114E-05	6.515E-06	.5847
5.000E-03	3.721E+02	9.627E+01	4.684E+02	1.333E-05	8.108E-06	.6082
6.000E-03	4.014E+02	8.860E+01	4.900E+02	1.542E-05	9.680E-06	.6278
7.000E-03	4.279E+02	8.223E+01	5.102E+02	1.742E-05	1.123E-05	.6445
8.000E-03	4.523E+02	7.685E+01	5.292E+02	1.934E-05	1.275E-05	.6591
9.000E-03	4.750E+02	7.224E+01	5.472E+02	2.120E-05	1.425E-05	.6720
1.000E-02	4.962E+02	6.822E+01	5.644E+02	2.300E-05	1.572E-05	.6835
1.250E-02	5.443E+02	6.012E+01	6.044E+02	2.728E-05	1.930E-05	.7077
1.500E-02	5.869E+02	5.395E+01	6.409E+02	3.129E-05	2.275E-05	.7270
1.750E-02	6.255E+02	4.907E+01	6.746E+02	3.509E-05	2.608E-05	.7431
2.000E-02	6.610E+02	4.509E+01	7.061E+02	3.871E-05	2.929E-05	.7566
2.250E-02	6.938E+02	4.178E+01	7.356E+02	4.218E-05	3.241E-05	.7683
2.500E-02	7.246E+02	3.897E+01	7.635E+02	4.552E-05	3.543E-05	.7785
2.750E-02	7.535E+02	3.656E+01	7.900E+02	4.874E-05	3.838E-05	.7875
3.000E-02	7.808E+02	3.446E+01	8.153E+02	5.185E-05	4.125E-05	.7955
3.500E-02	8.315E+02	3.098E+01	8.625E+02	5.781E-05	4.679E-05	.8093
4.000E-02	8.779E+02	2.820E+01	9.061E+02	6.346E-05	5.209E-05	.8208
4.500E-02	9.208E+02	2.592E+01	9.467E+02	6.886E-05	5.719E-05	.8305
5.000E-02	9.606E+02	2.402E+01	9.847E+02	7.404E-05	6.210E-05	.8388
5.500E-02	9.980E+02	2.240E+01	1.020E+03	7.902E-05	6.687E-05	.8462
6.000E-02	1.033E+03	2.101E+01	1.054E+03	8.384E-05	7.149E-05	.8526
6.500E-02	1.066E+03	1.979E+01	1.086E+03	8.852E-05	7.598E-05	.8584
7.000E-02	1.098E+03	1.872E+01	1.117E+03	9.306E-05	8.036E-05	.8636
7.500E-02	1.128E+03	1.778E+01	1.146E+03	9.748E-05	8.464E-05	.8683
8.000E-02	1.156E+03	1.693E+01	1.173E+03	1.018E-04	8.881E-05	.8725
8.500E-02	1.184E+03	1.616E+01	1.200E+03	1.060E-04	9.291E-05	.8765
9.000E-02	1.210E+03	1.547E+01	1.225E+03	1.101E-04	9.692E-05	.8801
9.500E-02	1.235E+03	1.484E+01	1.250E+03	1.142E-04	1.009E-04	.8834
1.000E-01	1.259E+03	1.427E+01	1.273E+03	1.181E-04	1.047E-04	.8865
1.250E-01	1.366E+03	1.199E+01	1.378E+03	1.370E-04	1.232E-04	.8993
1.500E-01	1.455E+03	1.038E+01	1.466E+03	1.546E-04	1.405E-04	.9088
1.750E-01	1.531E+03	9.183E+00	1.540E+03	1.712E-04	1.569E-04	.9163
2.000E-01	1.595E+03	8.249E+00	1.604E+03	1.871E-04	1.726E-04	.9224
2.250E-01	1.650E+03	7.500E+00	1.658E+03	2.024E-04	1.877E-04	.9275
2.500E-01	1.698E+03	6.885E+00	1.704E+03	2.173E-04	2.025E-04	.9318
2.750E-01	1.738E+03	6.370E+00	1.744E+03	2.318E-04	2.168E-04	.9356
3.000E-01	1.772E+03	5.931E+00	1.778E+03	2.460E-04	2.309E-04	.9388

3.500E-01	1.825E+03	5.224E+00	1.831E+03	2.737E-04	2.584E-04	.9444
4.000E-01	1.862E+03	4.677E+00	1.867E+03	3.007E-04	2.853E-04	.9489
4.500E-01	1.886E+03	4.241E+00	1.891E+03	3.273E-04	3.118E-04	.9526
5.000E-01	1.900E+03	3.884E+00	1.904E+03	3.536E-04	3.380E-04	.9558
5.500E-01	1.906E+03	3.585E+00	1.910E+03	3.798E-04	3.641E-04	.9586
6.000E-01	1.906E+03	3.333E+00	1.910E+03	4.060E-04	3.902E-04	.9611
6.500E-01	1.901E+03	3.115E+00	1.904E+03	4.322E-04	4.163E-04	.9632
7.000E-01	1.892E+03	2.926E+00	1.895E+03	4.585E-04	4.426E-04	.9652
7.500E-01	1.880E+03	2.760E+00	1.883E+03	4.850E-04	4.690E-04	.9669
8.000E-01	1.866E+03	2.613E+00	1.869E+03	5.117E-04	4.955E-04	.9685
8.500E-01	1.850E+03	2.482E+00	1.853E+03	5.385E-04	5.223E-04	.9699
9.000E-01	1.833E+03	2.364E+00	1.835E+03	5.656E-04	5.494E-04	.9713
9.500E-01	1.814E+03	2.258E+00	1.816E+03	5.930E-04	5.767E-04	.9725
1.000E+00	1.795E+03	2.161E+00	1.797E+03	6.207E-04	6.043E-04	.9736
1.250E+00	1.684E+03	1.785E+00	1.686E+03	7.642E-04	7.476E-04	.9782
1.500E+00	1.571E+03	1.526E+00	1.573E+03	9.177E-04	9.009E-04	.9816
1.750E+00	1.466E+03	1.335E+00	1.468E+03	1.082E-03	1.065E-03	.9842
2.000E+00	1.372E+03	1.189E+00	1.373E+03	1.259E-03	1.241E-03	.9863
2.250E+00	1.288E+03	1.073E+00	1.289E+03	1.447E-03	1.429E-03	.9879
2.500E+00	1.213E+03	9.793E-01	1.214E+03	1.647E-03	1.629E-03	.9893
2.750E+00	1.145E+03	9.011E-01	1.146E+03	1.859E-03	1.841E-03	.9904
3.000E+00	1.085E+03	8.350E-01	1.086E+03	2.083E-03	2.065E-03	.9913
3.500E+00	9.819E+02	7.294E-01	9.826E+02	2.567E-03	2.549E-03	.9928
4.000E+00	8.982E+02	6.486E-01	8.989E+02	3.100E-03	3.081E-03	.9939
4.500E+00	8.296E+02	5.846E-01	8.302E+02	3.679E-03	3.660E-03	.9947
5.000E+00	7.720E+02	5.327E-01	7.726E+02	4.304E-03	4.284E-03	.9954
5.500E+00	7.229E+02	4.896E-01	7.234E+02	4.973E-03	4.953E-03	.9959
6.000E+00	6.804E+02	4.532E-01	6.809E+02	5.686E-03	5.666E-03	.9963
6.500E+00	6.431E+02	4.221E-01	6.435E+02	6.442E-03	6.421E-03	.9967
7.000E+00	6.102E+02	3.952E-01	6.106E+02	7.240E-03	7.218E-03	.9970
7.500E+00	5.808E+02	3.716E-01	5.812E+02	8.080E-03	8.057E-03	.9972
8.000E+00	5.544E+02	3.509E-01	5.548E+02	8.960E-03	8.938E-03	.9975
8.500E+00	5.306E+02	3.324E-01	5.309E+02	9.882E-03	9.859E-03	.9976
9.000E+00	5.090E+02	3.158E-01	5.093E+02	1.084E-02	1.082E-02	.9978
9.500E+00	4.892E+02	3.009E-01	4.895E+02	1.185E-02	1.182E-02	.9979
1.000E+01	4.712E+02	2.874E-01	4.715E+02	1.289E-02	1.286E-02	.9981
1.250E+01	3.992E+02	2.352E-01	3.994E+02	1.867E-02	1.864E-02	.9985
1.500E+01	3.478E+02	1.996E-01	3.480E+02	2.539E-02	2.536E-02	.9987
1.750E+01	3.091E+02	1.736E-01	3.092E+02	3.303E-02	3.299E-02	.9989
2.000E+01	2.788E+02	1.538E-01	2.789E+02	4.155E-02	4.151E-02	.9990
2.500E+01	2.342E+02	1.255E-01	2.343E+02	6.120E-02	6.115E-02	.9992
2.750E+01	2.172E+02	1.150E-01	2.173E+02	7.229E-02	7.223E-02	.9992
3.000E+01	2.028E+02	1.062E-01	2.029E+02	8.420E-02	8.414E-02	.9993
3.500E+01	1.794E+02	9.217E-02	1.795E+02	1.105E-01	1.104E-01	.9993
4.000E+01	1.612E+02	8.149E-02	1.613E+02	1.399E-01	1.398E-01	.9994
4.500E+01	1.467E+02	7.307E-02	1.468E+02	1.724E-01	1.723E-01	.9994
5.000E+01	1.348E+02	6.626E-02	1.348E+02	2.080E-01	2.079E-01	.9995
5.500E+01	1.248E+02	6.062E-02	1.249E+02	2.466E-01	2.464E-01	.9995
6.000E+01	1.163E+02	5.588E-02	1.164E+02	2.881E-01	2.879E-01	.9995
6.500E+01	1.090E+02	5.184E-02	1.091E+02	3.325E-01	3.323E-01	.9995
7.000E+01	1.027E+02	4.836E-02	1.027E+02	3.797E-01	3.796E-01	.9995
7.500E+01	9.709E+01	4.533E-02	9.714E+01	4.298E-01	4.296E-01	.9995
8.000E+01	9.214E+01	4.266E-02	9.218E+01	4.827E-01	4.825E-01	.9995
8.500E+01	8.772E+01	4.030E-02	8.776E+01	5.383E-01	5.380E-01	.9995
9.000E+01	8.375E+01	3.818E-02	8.379E+01	5.966E-01	5.963E-01	.9995
9.500E+01	8.016E+01	3.628E-02	8.019E+01	6.576E-01	6.573E-01	.9996
1.000E+02	7.690E+01	3.455E-02	7.693E+01	7.213E-01	7.210E-01	.9996

1.250E+02	6.420E+01	2.792E-02	6.423E+01	1.079E+00	1.078E+00	.9996
1.500E+02	5.543E+01	2.344E-02	5.545E+01	1.499E+00	1.498E+00	.9996
1.750E+02	4.899E+01	2.020E-02	4.901E+01	1.980E+00	1.979E+00	.9996
2.000E+02	4.406E+01	1.776E-02	4.407E+01	2.518E+00	2.517E+00	.9996
2.250E+02	4.014E+01	1.585E-02	4.016E+01	3.113E+00	3.112E+00	.9996
2.500E+02	3.696E+01	1.431E-02	3.697E+01	3.763E+00	3.762E+00	.9996
2.750E+02	3.432E+01	1.304E-02	3.433E+01	4.465E+00	4.464E+00	.9996
3.000E+02	3.209E+01	1.198E-02	3.210E+01	5.219E+00	5.217E+00	.9996
3.500E+02	2.853E+01	1.029E-02	2.854E+01	6.875E+00	6.872E+00	.9997
4.000E+02	2.581E+01	9.027E-03	2.582E+01	8.720E+00	8.717E+00	.9997
4.500E+02	2.367E+01	8.043E-03	2.367E+01	1.074E+01	1.074E+01	.9997
5.000E+02	2.193E+01	7.251E-03	2.193E+01	1.294E+01	1.294E+01	.9997
5.500E+02	2.049E+01	6.598E-03	2.050E+01	1.530E+01	1.530E+01	.9997
6.000E+02	1.928E+01	6.049E-03	1.929E+01	1.782E+01	1.781E+01	.9997
6.500E+02	1.825E+01	5.585E-03	1.826E+01	2.048E+01	2.048E+01	.9997
7.000E+02	1.736E+01	5.189E-03	1.737E+01	2.329E+01	2.329E+01	.9997
7.500E+02	1.659E+01	4.847E-03	1.659E+01	2.624E+01	2.623E+01	.9997
8.000E+02	1.590E+01	4.548E-03	1.591E+01	2.932E+01	2.931E+01	.9997
8.500E+02	1.530E+01	4.282E-03	1.530E+01	3.252E+01	3.251E+01	.9997
9.000E+02	1.476E+01	4.046E-03	1.477E+01	3.585E+01	3.584E+01	.9997
9.500E+02	1.428E+01	3.834E-03	1.428E+01	3.929E+01	3.928E+01	.9997
1.000E+03	1.384E+01	3.643E-03	1.384E+01	4.285E+01	4.284E+01	.9997

ALPHA PARTICLE STOPPING POWER AND RANGE

ALUMINUM

T = alpha particle (helium ion) kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP(e)	STOP(n)	STOP(t)	RANGE(c)	RANGE(p)	DETOUR
1.000E-03	5.580E+01	7.469E+01	1.305E+02	9.964E-06	2.529E-06	.2538
1.500E-03	7.189E+01	7.285E+01	1.447E+02	1.358E-05	3.704E-06	.2728
2.000E-03	8.605E+01	7.032E+01	1.564E+02	1.690E-05	4.895E-06	.2896
2.500E-03	9.892E+01	6.773E+01	1.667E+02	1.999E-05	6.094E-06	.3048
3.000E-03	1.109E+02	6.525E+01	1.761E+02	2.291E-05	7.300E-06	.3186
4.000E-03	1.327E+02	6.078E+01	1.935E+02	2.832E-05	9.717E-06	.3431
5.000E-03	1.525E+02	5.693E+01	2.095E+02	3.329E-05	1.213E-05	.3644
6.000E-03	1.709E+02	5.361E+01	2.245E+02	3.790E-05	1.452E-05	.3832
7.000E-03	1.882E+02	5.072E+01	2.389E+02	4.221E-05	1.689E-05	.4001
8.000E-03	2.045E+02	4.818E+01	2.527E+02	4.628E-05	1.922E-05	.4154
9.000E-03	2.201E+02	4.593E+01	2.661E+02	5.014E-05	2.153E-05	.4294
1.000E-02	2.351E+02	4.391E+01	2.790E+02	5.381E-05	2.379E-05	.4422
1.250E-02	2.701E+02	3.969E+01	3.098E+02	6.230E-05	2.931E-05	.4704
1.500E-02	3.025E+02	3.632E+01	3.388E+02	7.001E-05	3.460E-05	.4942
1.750E-02	3.328E+02	3.355E+01	3.664E+02	7.710E-05	3.969E-05	.5147
2.000E-02	3.615E+02	3.124E+01	3.927E+02	8.369E-05	4.458E-05	.5327
2.250E-02	3.886E+02	2.927E+01	4.179E+02	8.986E-05	4.929E-05	.5485
2.500E-02	4.146E+02	2.756E+01	4.421E+02	9.567E-05	5.384E-05	.5627
2.750E-02	4.394E+02	2.607E+01	4.655E+02	1.012E-04	5.824E-05	.5756
3.000E-02	4.633E+02	2.475E+01	4.880E+02	1.064E-04	6.250E-05	.5872
3.500E-02	5.084E+02	2.253E+01	5.309E+02	1.162E-04	7.064E-05	.6077
4.000E-02	5.504E+02	2.071E+01	5.711E+02	1.253E-04	7.835E-05	.6252
4.500E-02	5.896E+02	1.920E+01	6.088E+02	1.338E-04	8.568E-05	.6404
5.000E-02	6.265E+02	1.792E+01	6.444E+02	1.418E-04	9.269E-05	.6538
5.500E-02	6.611E+02	1.681E+01	6.779E+02	1.493E-04	9.941E-05	.6657
6.000E-02	6.937E+02	1.585E+01	7.095E+02	1.565E-04	1.059E-04	.6764
6.500E-02	7.243E+02	1.501E+01	7.393E+02	1.634E-04	1.121E-04	.6861
7.000E-02	7.532E+02	1.426E+01	7.674E+02	1.701E-04	1.182E-04	.6949
7.500E-02	7.803E+02	1.359E+01	7.939E+02	1.765E-04	1.241E-04	.7030
8.000E-02	8.059E+02	1.298E+01	8.189E+02	1.827E-04	1.298E-04	.7105
8.500E-02	8.301E+02	1.244E+01	8.425E+02	1.887E-04	1.354E-04	.7175
9.000E-02	8.528E+02	1.194E+01	8.648E+02	1.946E-04	1.409E-04	.7240
9.500E-02	8.743E+02	1.148E+01	8.858E+02	2.003E-04	1.462E-04	.7301
1.000E-01	8.945E+02	1.107E+01	9.056E+02	2.059E-04	1.515E-04	.7358
1.250E-01	9.800E+02	9.395E+00	9.894E+02	2.322E-04	1.764E-04	.7599
1.500E-01	1.045E+03	8.198E+00	1.053E+03	2.567E-04	1.999E-04	.7788
1.750E-01	1.096E+03	7.293E+00	1.103E+03	2.798E-04	2.222E-04	.7942
2.000E-01	1.136E+03	6.583E+00	1.142E+03	3.021E-04	2.438E-04	.8071
2.250E-01	1.168E+03	6.009E+00	1.174E+03	3.237E-04	2.648E-04	.8183
2.500E-01	1.195E+03	5.535E+00	1.200E+03	3.447E-04	2.854E-04	.8280
2.750E-01	1.216E+03	5.136E+00	1.222E+03	3.654E-04	3.056E-04	.8365
3.000E-01	1.234E+03	4.795E+00	1.239E+03	3.857E-04	3.256E-04	.8441

3.500E-01	1.262E+03	4.242E+00	1.266E+03	4.256E-04	3.648E-04	.8572
4.000E-01	1.280E+03	3.811E+00	1.284E+03	4.648E-04	4.034E-04	.8680
4.500E-01	1.291E+03	3.466E+00	1.294E+03	5.035E-04	4.417E-04	.8772
5.000E-01	1.297E+03	3.182E+00	1.300E+03	5.421E-04	4.798E-04	.8852
5.500E-01	1.298E+03	2.944E+00	1.301E+03	5.805E-04	5.179E-04	.8921
6.000E-01	1.297E+03	2.742E+00	1.300E+03	6.189E-04	5.560E-04	.8982
6.500E-01	1.293E+03	2.567E+00	1.295E+03	6.575E-04	5.942E-04	.9037
7.000E-01	1.286E+03	2.415E+00	1.289E+03	6.962E-04	6.326E-04	.9086
7.500E-01	1.279E+03	2.282E+00	1.281E+03	7.351E-04	6.712E-04	.9131
8.000E-01	1.269E+03	2.163E+00	1.271E+03	7.743E-04	7.101E-04	.9171
8.500E-01	1.259E+03	2.057E+00	1.261E+03	8.137E-04	7.493E-04	.9208
9.000E-01	1.248E+03	1.961E+00	1.250E+03	8.536E-04	7.889E-04	.9242
9.500E-01	1.237E+03	1.875E+00	1.238E+03	8.937E-04	8.289E-04	.9274
1.000E+00	1.225E+03	1.796E+00	1.226E+03	9.343E-04	8.692E-04	.9303
1.250E+00	1.161E+03	1.490E+00	1.163E+03	1.144E-03	1.077E-03	.9422
1.500E+00	1.098E+03	1.277E+00	1.100E+03	1.365E-03	1.298E-03	.9509
1.750E+00	1.039E+03	1.120E+00	1.040E+03	1.598E-03	1.531E-03	.9575
2.000E+00	9.849E+02	1.000E+00	9.859E+02	1.845E-03	1.777E-03	.9628
2.250E+00	9.376E+02	9.042E-01	9.385E+02	2.105E-03	2.036E-03	.9670
2.500E+00	8.954E+02	8.261E-01	8.962E+02	2.378E-03	2.308E-03	.9705
2.750E+00	8.568E+02	7.612E-01	8.576E+02	2.663E-03	2.592E-03	.9734
3.000E+00	8.210E+02	7.062E-01	8.217E+02	2.961E-03	2.890E-03	.9758
3.500E+00	7.561E+02	6.182E-01	7.568E+02	3.596E-03	3.523E-03	.9797
4.000E+00	6.986E+02	5.506E-01	6.991E+02	4.283E-03	4.209E-03	.9826
4.500E+00	6.478E+02	4.971E-01	6.483E+02	5.027E-03	4.951E-03	.9849
5.000E+00	6.048E+02	4.535E-01	6.053E+02	5.825E-03	5.748E-03	.9867
5.500E+00	5.678E+02	4.173E-01	5.683E+02	6.678E-03	6.600E-03	.9882
6.000E+00	5.357E+02	3.867E-01	5.361E+02	7.585E-03	7.504E-03	.9894
6.500E+00	5.074E+02	3.605E-01	5.078E+02	8.544E-03	8.462E-03	.9904
7.000E+00	4.824E+02	3.379E-01	4.827E+02	9.554E-03	9.470E-03	.9913
7.500E+00	4.600E+02	3.180E-01	4.603E+02	1.061E-02	1.053E-02	.9920
8.000E+00	4.398E+02	3.004E-01	4.401E+02	1.173E-02	1.164E-02	.9926
8.500E+00	4.216E+02	2.848E-01	4.219E+02	1.289E-02	1.280E-02	.9931
9.000E+00	4.051E+02	2.708E-01	4.053E+02	1.410E-02	1.401E-02	.9936
9.500E+00	3.899E+02	2.582E-01	3.902E+02	1.535E-02	1.526E-02	.9940
1.000E+01	3.760E+02	2.468E-01	3.762E+02	1.666E-02	1.656E-02	.9944
1.250E+01	3.205E+02	2.025E-01	3.207E+02	2.388E-02	2.378E-02	.9957
1.500E+01	2.807E+02	1.722E-01	2.809E+02	3.224E-02	3.212E-02	.9964
1.750E+01	2.507E+02	1.501E-01	2.509E+02	4.167E-02	4.155E-02	.9970
2.000E+01	2.271E+02	1.332E-01	2.272E+02	5.216E-02	5.202E-02	.9973
2.500E+01	1.922E+02	1.090E-01	1.923E+02	7.617E-02	7.601E-02	.9978
2.750E+01	1.789E+02	1.001E-01	1.790E+02	8.966E-02	8.948E-02	.9980
3.000E+01	1.675E+02	9.251E-02	1.676E+02	1.041E-01	1.039E-01	.9981
3.500E+01	1.489E+02	8.048E-02	1.490E+02	1.358E-01	1.356E-01	.9983
4.000E+01	1.344E+02	7.131E-02	1.345E+02	1.712E-01	1.709E-01	.9984
4.500E+01	1.227E+02	6.407E-02	1.228E+02	2.102E-01	2.098E-01	.9985
5.000E+01	1.131E+02	5.820E-02	1.132E+02	2.526E-01	2.523E-01	.9986
5.500E+01	1.050E+02	5.334E-02	1.051E+02	2.985E-01	2.981E-01	.9987
6.000E+01	9.812E+01	4.925E-02	9.817E+01	3.478E-01	3.473E-01	.9987
6.500E+01	9.217E+01	4.577E-02	9.222E+01	4.003E-01	3.999E-01	.9988
7.000E+01	8.697E+01	4.275E-02	8.701E+01	4.562E-01	4.556E-01	.9988
7.500E+01	8.239E+01	4.012E-02	8.243E+01	5.153E-01	5.147E-01	.9988
8.000E+01	7.831E+01	3.780E-02	7.835E+01	5.775E-01	5.768E-01	.9988
8.500E+01	7.467E+01	3.574E-02	7.470E+01	6.429E-01	6.422E-01	.9989
9.000E+01	7.138E+01	3.390E-02	7.142E+01	7.114E-01	7.106E-01	.9989
9.500E+01	6.841E+01	3.225E-02	6.844E+01	7.829E-01	7.820E-01	.9989
1.000E+02	6.570E+01	3.075E-02	6.573E+01	8.575E-01	8.565E-01	.9989

1.250E+02	5.511E+01	2.496E-02	5.514E+01	1.275E+00	1.273E+00	.9990
1.500E+02	4.776E+01	2.104E-02	4.778E+01	1.763E+00	1.761E+00	.9990
1.750E+02	4.233E+01	1.820E-02	4.235E+01	2.320E+00	2.318E+00	.9991
2.000E+02	3.816E+01	1.604E-02	3.817E+01	2.943E+00	2.940E+00	.9991
2.250E+02	3.483E+01	1.434E-02	3.485E+01	3.629E+00	3.626E+00	.9991
2.500E+02	3.213E+01	1.297E-02	3.214E+01	4.377E+00	4.373E+00	.9991
2.750E+02	2.987E+01	1.184E-02	2.989E+01	5.184E+00	5.180E+00	.9991
3.000E+02	2.797E+01	1.089E-02	2.798E+01	6.050E+00	6.044E+00	.9992
3.500E+02	2.492E+01	9.385E-03	2.493E+01	7.947E+00	7.940E+00	.9992
4.000E+02	2.259E+01	8.252E-03	2.260E+01	1.006E+01	1.005E+01	.9992
4.500E+02	2.075E+01	7.365E-03	2.075E+01	1.237E+01	1.236E+01	.9992
5.000E+02	1.925E+01	6.651E-03	1.925E+01	1.487E+01	1.486E+01	.9992
5.500E+02	1.801E+01	6.062E-03	1.801E+01	1.756E+01	1.755E+01	.9993
6.000E+02	1.696E+01	5.568E-03	1.697E+01	2.042E+01	2.041E+01	.9993
6.500E+02	1.607E+01	5.147E-03	1.608E+01	2.345E+01	2.343E+01	.9993
7.000E+02	1.530E+01	4.785E-03	1.531E+01	2.664E+01	2.662E+01	.9993
7.500E+02	1.463E+01	4.471E-03	1.464E+01	2.998E+01	2.996E+01	.9993
8.000E+02	1.404E+01	4.196E-03	1.405E+01	3.347E+01	3.345E+01	.9993
8.500E+02	1.352E+01	3.954E-03	1.352E+01	3.710E+01	3.707E+01	.9993
9.000E+02	1.305E+01	3.738E-03	1.305E+01	4.086E+01	4.084E+01	.9993
9.500E+02	1.263E+01	3.545E-03	1.263E+01	4.476E+01	4.473E+01	.9993
1.000E+03	1.225E+01	3.371E-03	1.225E+01	4.878E+01	4.874E+01	.9993

ALPHA PARTICLE STOPPING POWER AND RANGE

SILICON

T = alpha particle (helium ion) kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	4.732E+01	7.396E+01	1.213E+02	1.066E-05	2.534E-06	.2377
1.500E-03	6.163E+01	7.254E+01	1.342E+02	1.455E-05	3.711E-06	.2550
2.000E-03	7.434E+01	7.031E+01	1.447E+02	1.814E-05	4.907E-06	.2705
2.500E-03	8.598E+01	6.794E+01	1.539E+02	2.149E-05	6.114E-06	.2845
3.000E-03	9.682E+01	6.562E+01	1.624E+02	2.465E-05	7.332E-06	.2974
4.000E-03	1.168E+02	6.137E+01	1.782E+02	3.052E-05	9.782E-06	.3205
5.000E-03	1.351E+02	5.767E+01	1.927E+02	3.592E-05	1.224E-05	.3407
6.000E-03	1.521E+02	5.445E+01	2.066E+02	4.092E-05	1.468E-05	.3587
7.000E-03	1.682E+02	5.163E+01	2.198E+02	4.562E-05	1.711E-05	.3750
8.000E-03	1.834E+02	4.913E+01	2.326E+02	5.004E-05	1.950E-05	.3898
9.000E-03	1.981E+02	4.691E+01	2.450E+02	5.423E-05	2.188E-05	.4034
1.000E-02	2.121E+02	4.492E+01	2.570E+02	5.821E-05	2.421E-05	.4160
1.250E-02	2.453E+02	4.072E+01	2.860E+02	6.742E-05	2.991E-05	.4437
1.500E-02	2.761E+02	3.735E+01	3.135E+02	7.577E-05	3.540E-05	.4672
1.750E-02	3.052E+02	3.457E+01	3.397E+02	8.342E-05	4.068E-05	.4877
2.000E-02	3.327E+02	3.224E+01	3.650E+02	9.052E-05	4.577E-05	.5056
2.250E-02	3.591E+02	3.024E+01	3.893E+02	9.715E-05	5.067E-05	.5216
2.500E-02	3.844E+02	2.851E+01	4.129E+02	1.034E-04	5.541E-05	.5359
2.750E-02	4.087E+02	2.700E+01	4.357E+02	1.093E-04	5.998E-05	.5489
3.000E-02	4.322E+02	2.566E+01	4.579E+02	1.149E-04	6.441E-05	.5607
3.500E-02	4.770E+02	2.339E+01	5.004E+02	1.253E-04	7.287E-05	.5815
4.000E-02	5.193E+02	2.153E+01	5.408E+02	1.349E-04	8.086E-05	.5993
4.500E-02	5.594E+02	1.998E+01	5.793E+02	1.438E-04	8.844E-05	.6148
5.000E-02	5.975E+02	1.866E+01	6.162E+02	1.522E-04	9.567E-05	.6285
5.500E-02	6.339E+02	1.753E+01	6.514E+02	1.601E-04	1.026E-04	.6407
6.000E-02	6.686E+02	1.654E+01	6.852E+02	1.676E-04	1.092E-04	.6516
6.500E-02	7.019E+02	1.567E+01	7.176E+02	1.747E-04	1.156E-04	.6616
7.000E-02	7.337E+02	1.489E+01	7.486E+02	1.815E-04	1.217E-04	.6706
7.500E-02	7.643E+02	1.420E+01	7.785E+02	1.881E-04	1.277E-04	.6789
8.000E-02	7.935E+02	1.357E+01	8.071E+02	1.944E-04	1.335E-04	.6866
8.500E-02	8.216E+02	1.301E+01	8.346E+02	2.005E-04	1.391E-04	.6937
9.000E-02	8.485E+02	1.249E+01	8.610E+02	2.064E-04	1.445E-04	.7003
9.500E-02	8.744E+02	1.202E+01	8.864E+02	2.121E-04	1.498E-04	.7065
1.000E-01	8.991E+02	1.159E+01	9.107E+02	2.177E-04	1.550E-04	.7123
1.250E-01	1.008E+03	9.850E+00	1.018E+03	2.436E-04	1.794E-04	.7367
1.500E-01	1.097E+03	8.603E+00	1.105E+03	2.671E-04	2.019E-04	.7558
1.750E-01	1.168E+03	7.660E+00	1.175E+03	2.890E-04	2.229E-04	.7714
2.000E-01	1.225E+03	6.918E+00	1.232E+03	3.097E-04	2.430E-04	.7846
2.250E-01	1.270E+03	6.318E+00	1.277E+03	3.297E-04	2.624E-04	.7959
2.500E-01	1.307E+03	5.822E+00	1.312E+03	3.490E-04	2.812E-04	.8058
2.750E-01	1.336E+03	5.405E+00	1.341E+03	3.678E-04	2.996E-04	.8146
3.000E-01	1.359E+03	5.047E+00	1.364E+03	3.863E-04	3.177E-04	.8225

3.500E-01	1.390E+03	4.468E+00	1.395E+03	4.225E-04	3.533E-04	.8362
4.000E-01	1.408E+03	4.016E+00	1.412E+03	4.581E-04	3.884E-04	.8478
4.500E-01	1.416E+03	3.653E+00	1.420E+03	4.934E-04	4.232E-04	.8577
5.000E-01	1.417E+03	3.355E+00	1.420E+03	5.286E-04	4.580E-04	.8664
5.500E-01	1.413E+03	3.105E+00	1.416E+03	5.639E-04	4.929E-04	.8741
6.000E-01	1.405E+03	2.893E+00	1.408E+03	5.993E-04	5.279E-04	.8810
6.500E-01	1.395E+03	2.709E+00	1.398E+03	6.349E-04	5.632E-04	.8872
7.000E-01	1.383E+03	2.549E+00	1.386E+03	6.708E-04	5.989E-04	.8928
7.500E-01	1.370E+03	2.409E+00	1.372E+03	7.071E-04	6.348E-04	.8979
8.000E-01	1.356E+03	2.284E+00	1.358E+03	7.437E-04	6.712E-04	.9026
8.500E-01	1.341E+03	2.172E+00	1.343E+03	7.807E-04	7.080E-04	.9069
9.000E-01	1.326E+03	2.071E+00	1.328E+03	8.181E-04	7.452E-04	.9108
9.500E-01	1.310E+03	1.980E+00	1.312E+03	8.560E-04	7.829E-04	.9145
1.000E+00	1.295E+03	1.897E+00	1.296E+03	8.944E-04	8.210E-04	.9179
1.250E+00	1.218E+03	1.574E+00	1.219E+03	1.093E-03	1.019E-03	.9319
1.500E+00	1.146E+03	1.350E+00	1.148E+03	1.305E-03	1.229E-03	.9423
1.750E+00	1.081E+03	1.185E+00	1.082E+03	1.529E-03	1.453E-03	.9502
2.000E+00	1.023E+03	1.058E+00	1.024E+03	1.767E-03	1.690E-03	.9565
2.250E+00	9.706E+02	9.568E-01	9.715E+02	2.017E-03	1.940E-03	.9615
2.500E+00	9.239E+02	8.743E-01	9.248E+02	2.281E-03	2.203E-03	.9656
2.750E+00	8.814E+02	8.057E-01	8.822E+02	2.558E-03	2.479E-03	.9690
3.000E+00	8.424E+02	7.476E-01	8.432E+02	2.848E-03	2.768E-03	.9719
3.500E+00	7.731E+02	6.546E-01	7.738E+02	3.468E-03	3.386E-03	.9765
4.000E+00	7.131E+02	5.832E-01	7.137E+02	4.141E-03	4.058E-03	.9800
4.500E+00	6.612E+02	5.266E-01	6.618E+02	4.869E-03	4.785E-03	.9827
5.000E+00	6.174E+02	4.805E-01	6.179E+02	5.651E-03	5.566E-03	.9848
5.500E+00	5.797E+02	4.422E-01	5.802E+02	6.487E-03	6.400E-03	.9865
6.000E+00	5.470E+02	4.098E-01	5.474E+02	7.375E-03	7.286E-03	.9879
6.500E+00	5.182E+02	3.821E-01	5.186E+02	8.314E-03	8.223E-03	.9891
7.000E+00	4.927E+02	3.581E-01	4.931E+02	9.303E-03	9.210E-03	.9901
7.500E+00	4.700E+02	3.371E-01	4.703E+02	1.034E-02	1.025E-02	.9909
8.000E+00	4.495E+02	3.185E-01	4.498E+02	1.143E-02	1.133E-02	.9916
8.500E+00	4.309E+02	3.020E-01	4.312E+02	1.256E-02	1.247E-02	.9922
9.000E+00	4.140E+02	2.872E-01	4.143E+02	1.375E-02	1.365E-02	.9928
9.500E+00	3.986E+02	2.738E-01	3.989E+02	1.498E-02	1.488E-02	.9932
1.000E+01	3.844E+02	2.617E-01	3.847E+02	1.625E-02	1.615E-02	.9936
1.250E+01	3.278E+02	2.148E-01	3.280E+02	2.332E-02	2.321E-02	.9951
1.500E+01	2.872E+02	1.827E-01	2.874E+02	3.148E-02	3.136E-02	.9960
1.750E+01	2.565E+02	1.593E-01	2.567E+02	4.070E-02	4.057E-02	.9966
2.000E+01	2.325E+02	1.414E-01	2.326E+02	5.095E-02	5.080E-02	.9970
2.500E+01	1.968E+02	1.158E-01	1.969E+02	7.440E-02	7.422E-02	.9976
2.750E+01	1.832E+02	1.063E-01	1.833E+02	8.757E-02	8.738E-02	.9978
3.000E+01	1.715E+02	9.825E-02	1.716E+02	1.017E-01	1.015E-01	.9979
3.500E+01	1.526E+02	8.549E-02	1.526E+02	1.326E-01	1.324E-01	.9981
4.000E+01	1.377E+02	7.576E-02	1.378E+02	1.672E-01	1.669E-01	.9983
4.500E+01	1.258E+02	6.809E-02	1.259E+02	2.052E-01	2.048E-01	.9984
5.000E+01	1.159E+02	6.186E-02	1.160E+02	2.466E-01	2.462E-01	.9985
5.500E+01	1.077E+02	5.671E-02	1.077E+02	2.914E-01	2.909E-01	.9985
6.000E+01	1.006E+02	5.237E-02	1.007E+02	3.394E-01	3.389E-01	.9986
6.500E+01	9.454E+01	4.867E-02	9.458E+01	3.907E-01	3.901E-01	.9986
7.000E+01	8.922E+01	4.547E-02	8.926E+01	4.451E-01	4.445E-01	.9987
7.500E+01	8.453E+01	4.267E-02	8.457E+01	5.027E-01	5.020E-01	.9987
8.000E+01	8.036E+01	4.021E-02	8.040E+01	5.633E-01	5.626E-01	.9988
8.500E+01	7.662E+01	3.803E-02	7.666E+01	6.270E-01	6.263E-01	.9988
9.000E+01	7.326E+01	3.607E-02	7.330E+01	6.938E-01	6.929E-01	.9988
9.500E+01	7.021E+01	3.431E-02	7.025E+01	7.635E-01	7.626E-01	.9988
1.000E+02	6.744E+01	3.272E-02	6.747E+01	8.361E-01	8.351E-01	.9988

1.250E+02	5.659E+01	2.659E-02	5.662E+01	1.242E+00	1.241E+00	.9989
1.500E+02	4.905E+01	2.241E-02	4.908E+01	1.718E+00	1.716E+00	.9990
1.750E+02	4.349E+01	1.939E-02	4.351E+01	2.260E+00	2.258E+00	.9990
2.000E+02	3.920E+01	1.710E-02	3.922E+01	2.867E+00	2.864E+00	.9990
2.250E+02	3.580E+01	1.529E-02	3.581E+01	3.535E+00	3.531E+00	.9990
2.500E+02	3.302E+01	1.383E-02	3.303E+01	4.262E+00	4.258E+00	.9991
2.750E+02	3.070E+01	1.263E-02	3.072E+01	5.048E+00	5.043E+00	.9991
3.000E+02	2.875E+01	1.162E-02	2.876E+01	5.889E+00	5.884E+00	.9991
3.500E+02	2.562E+01	1.002E-02	2.563E+01	7.735E+00	7.728E+00	.9991
4.000E+02	2.323E+01	8.807E-03	2.324E+01	9.787E+00	9.779E+00	.9991
4.500E+02	2.133E+01	7.862E-03	2.134E+01	1.204E+01	1.203E+01	.9992
5.000E+02	1.979E+01	7.101E-03	1.980E+01	1.447E+01	1.446E+01	.9992
5.500E+02	1.852E+01	6.475E-03	1.853E+01	1.708E+01	1.707E+01	.9992
6.000E+02	1.745E+01	5.949E-03	1.745E+01	1.987E+01	1.985E+01	.9992
6.500E+02	1.653E+01	5.501E-03	1.654E+01	2.281E+01	2.279E+01	.9992
7.000E+02	1.574E+01	5.115E-03	1.575E+01	2.591E+01	2.589E+01	.9992
7.500E+02	1.505E+01	4.780E-03	1.506E+01	2.916E+01	2.914E+01	.9992
8.000E+02	1.444E+01	4.485E-03	1.445E+01	3.255E+01	3.253E+01	.9993
8.500E+02	1.391E+01	4.226E-03	1.391E+01	3.608E+01	3.605E+01	.9993
9.000E+02	1.343E+01	3.995E-03	1.343E+01	3.974E+01	3.971E+01	.9993
9.500E+02	1.299E+01	3.789E-03	1.300E+01	4.352E+01	4.349E+01	.9993
1.000E+03	1.260E+01	3.603E-03	1.261E+01	4.743E+01	4.740E+01	.9993

ALPHA PARTICLE STOPPING POWER AND RANGE

IRON

T = alpha particle (helium ion) kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	5.406E+01	3.304E+01	8.709E+01	1.738E-05	3.181E-06	.1830
1.500E-03	6.542E+01	3.382E+01	9.924E+01	2.272E-05	4.489E-06	.1976
2.000E-03	7.491E+01	3.384E+01	1.088E+02	2.752E-05	5.797E-06	.2106
2.500E-03	8.320E+01	3.354E+01	1.167E+02	3.195E-05	7.104E-06	.2223
3.000E-03	9.066E+01	3.308E+01	1.237E+02	3.611E-05	8.414E-06	.2330
4.000E-03	1.038E+02	3.198E+01	1.358E+02	4.381E-05	1.105E-05	.2521
5.000E-03	1.153E+02	3.084E+01	1.461E+02	5.090E-05	1.369E-05	.2689
6.000E-03	1.256E+02	2.974E+01	1.554E+02	5.754E-05	1.634E-05	.2841
7.000E-03	1.351E+02	2.871E+01	1.638E+02	6.380E-05	1.900E-05	.2979
8.000E-03	1.438E+02	2.775E+01	1.716E+02	6.977E-05	2.167E-05	.3106
9.000E-03	1.520E+02	2.685E+01	1.789E+02	7.547E-05	2.433E-05	.3223
1.000E-02	1.598E+02	2.602E+01	1.858E+02	8.096E-05	2.698E-05	.3333
1.250E-02	1.774E+02	2.419E+01	2.016E+02	9.386E-05	3.360E-05	.3579
1.500E-02	1.933E+02	2.264E+01	2.159E+02	1.058E-04	4.015E-05	.3794
1.750E-02	2.078E+02	2.131E+01	2.291E+02	1.171E-04	4.665E-05	.3984
2.000E-02	2.213E+02	2.015E+01	2.414E+02	1.277E-04	5.306E-05	.4155
2.250E-02	2.339E+02	1.913E+01	2.530E+02	1.378E-04	5.940E-05	.4310
2.500E-02	2.457E+02	1.823E+01	2.639E+02	1.475E-04	6.566E-05	.4452
2.750E-02	2.569E+02	1.742E+01	2.744E+02	1.568E-04	7.184E-05	.4582
3.000E-02	2.676E+02	1.670E+01	2.843E+02	1.657E-04	7.793E-05	.4703
3.500E-02	2.877E+02	1.544E+01	3.031E+02	1.827E-04	8.990E-05	.4919
4.000E-02	3.062E+02	1.438E+01	3.206E+02	1.988E-04	1.016E-04	.5110
4.500E-02	3.235E+02	1.348E+01	3.370E+02	2.140E-04	1.129E-04	.5278
5.000E-02	3.398E+02	1.270E+01	3.525E+02	2.285E-04	1.241E-04	.5430
5.500E-02	3.552E+02	1.202E+01	3.672E+02	2.424E-04	1.349E-04	.5567
6.000E-02	3.698E+02	1.141E+01	3.812E+02	2.557E-04	1.456E-04	.5692
6.500E-02	3.838E+02	1.088E+01	3.946E+02	2.686E-04	1.560E-04	.5807
7.000E-02	3.971E+02	1.039E+01	4.075E+02	2.811E-04	1.662E-04	.5913
7.500E-02	4.100E+02	9.958E+00	4.199E+02	2.932E-04	1.762E-04	.6010
8.000E-02	4.223E+02	9.561E+00	4.319E+02	3.049E-04	1.860E-04	.6101
8.500E-02	4.342E+02	9.199E+00	4.434E+02	3.163E-04	1.957E-04	.6186
9.000E-02	4.457E+02	8.867E+00	4.546E+02	3.275E-04	2.052E-04	.6266
9.500E-02	4.569E+02	8.561E+00	4.654E+02	3.384E-04	2.145E-04	.6341
1.000E-01	4.676E+02	8.277E+00	4.759E+02	3.490E-04	2.237E-04	.6411
1.250E-01	5.171E+02	7.128E+00	5.243E+02	3.990E-04	2.677E-04	.6711
1.500E-01	5.606E+02	6.285E+00	5.669E+02	4.448E-04	3.090E-04	.6947
1.750E-01	5.994E+02	5.638E+00	6.050E+02	4.874E-04	3.480E-04	.7139
2.000E-01	6.343E+02	5.123E+00	6.394E+02	5.276E-04	3.851E-04	.7300
2.250E-01	6.659E+02	4.702E+00	6.706E+02	5.658E-04	4.208E-04	.7437
2.500E-01	6.946E+02	4.351E+00	6.990E+02	6.023E-04	4.551E-04	.7557
2.750E-01	7.208E+02	4.054E+00	7.249E+02	6.374E-04	4.884E-04	.7662
3.000E-01	7.448E+02	3.798E+00	7.486E+02	6.713E-04	5.206E-04	.7755

3.500E-01	7.866E+02	3.380E+00	7.900E+02	7.363E-04	5.828E-04	.7915
4.000E-01	8.215E+02	3.052E+00	8.246E+02	7.982E-04	6.424E-04	.8048
4.500E-01	8.504E+02	2.786E+00	8.532E+02	8.577E-04	7.000E-04	.8161
5.000E-01	8.741E+02	2.567E+00	8.766E+02	9.155E-04	7.561E-04	.8259
5.500E-01	8.931E+02	2.382E+00	8.955E+02	9.719E-04	8.111E-04	.8345
6.000E-01	9.081E+02	2.224E+00	9.104E+02	1.027E-03	8.651E-04	.8421
6.500E-01	9.196E+02	2.088E+00	9.217E+02	1.082E-03	9.185E-04	.8490
7.000E-01	9.280E+02	1.968E+00	9.300E+02	1.136E-03	9.714E-04	.8552
7.500E-01	9.336E+02	1.862E+00	9.355E+02	1.189E-03	1.024E-03	.8609
8.000E-01	9.368E+02	1.769E+00	9.386E+02	1.243E-03	1.076E-03	.8661
8.500E-01	9.380E+02	1.684E+00	9.397E+02	1.296E-03	1.129E-03	.8710
9.000E-01	9.373E+02	1.608E+00	9.389E+02	1.349E-03	1.181E-03	.8754
9.500E-01	9.351E+02	1.540E+00	9.366E+02	1.403E-03	1.234E-03	.8796
1.000E+00	9.315E+02	1.477E+00	9.330E+02	1.456E-03	1.286E-03	.8835
1.250E+00	8.999E+02	1.231E+00	9.012E+02	1.728E-03	1.555E-03	.9000
1.500E+00	8.567E+02	1.059E+00	8.577E+02	2.012E-03	1.837E-03	.9127
1.750E+00	8.109E+02	9.325E-01	8.118E+02	2.312E-03	2.134E-03	.9229
2.000E+00	7.669E+02	8.343E-01	7.677E+02	2.629E-03	2.448E-03	.9313
2.250E+00	7.273E+02	7.560E-01	7.281E+02	2.963E-03	2.780E-03	.9383
2.500E+00	6.919E+02	6.920E-01	6.926E+02	3.315E-03	3.130E-03	.9442
2.750E+00	6.602E+02	6.386E-01	6.608E+02	3.685E-03	3.498E-03	.9492
3.000E+00	6.315E+02	5.934E-01	6.321E+02	4.072E-03	3.882E-03	.9535
3.500E+00	5.818E+02	5.207E-01	5.823E+02	4.897E-03	4.703E-03	.9604
4.000E+00	5.401E+02	4.647E-01	5.405E+02	5.789E-03	5.591E-03	.9658
4.500E+00	5.046E+02	4.203E-01	5.050E+02	6.747E-03	6.544E-03	.9700
5.000E+00	4.739E+02	3.840E-01	4.743E+02	7.769E-03	7.562E-03	.9734
5.500E+00	4.472E+02	3.538E-01	4.476E+02	8.854E-03	8.644E-03	.9762
6.000E+00	4.236E+02	3.283E-01	4.239E+02	1.000E-02	9.788E-03	.9785
6.500E+00	4.026E+02	3.064E-01	4.029E+02	1.121E-02	1.099E-02	.9804
7.000E+00	3.835E+02	2.874E-01	3.838E+02	1.249E-02	1.226E-02	.9820
7.500E+00	3.669E+02	2.707E-01	3.672E+02	1.382E-02	1.359E-02	.9834
8.000E+00	3.520E+02	2.560E-01	3.522E+02	1.521E-02	1.497E-02	.9846
8.500E+00	3.383E+02	2.429E-01	3.385E+02	1.666E-02	1.642E-02	.9857
9.000E+00	3.257E+02	2.311E-01	3.259E+02	1.816E-02	1.792E-02	.9866
9.500E+00	3.141E+02	2.205E-01	3.143E+02	1.972E-02	1.948E-02	.9874
1.000E+01	3.036E+02	2.109E-01	3.038E+02	2.134E-02	2.109E-02	.9881
1.250E+01	2.611E+02	1.735E-01	2.613E+02	3.025E-02	2.996E-02	.9907
1.500E+01	2.304E+02	1.479E-01	2.305E+02	4.046E-02	4.015E-02	.9923
1.750E+01	2.069E+02	1.291E-01	2.070E+02	5.192E-02	5.158E-02	.9934
2.000E+01	1.883E+02	1.148E-01	1.884E+02	6.459E-02	6.422E-02	.9942
2.500E+01	1.606E+02	9.422E-02	1.607E+02	9.343E-02	9.299E-02	.9952
2.750E+01	1.499E+02	8.657E-02	1.500E+02	1.095E-01	1.091E-01	.9956
3.000E+01	1.407E+02	8.012E-02	1.408E+02	1.268E-01	1.262E-01	.9958
3.500E+01	1.257E+02	6.984E-02	1.258E+02	1.644E-01	1.638E-01	.9963
4.000E+01	1.139E+02	6.199E-02	1.140E+02	2.062E-01	2.055E-01	.9966
4.500E+01	1.044E+02	5.578E-02	1.044E+02	2.521E-01	2.513E-01	.9968
5.000E+01	9.645E+01	5.074E-02	9.650E+01	3.020E-01	3.010E-01	.9970
5.500E+01	8.978E+01	4.657E-02	8.983E+01	3.557E-01	3.547E-01	.9971
6.000E+01	8.408E+01	4.306E-02	8.412E+01	4.133E-01	4.121E-01	.9972
6.500E+01	7.913E+01	4.006E-02	7.917E+01	4.746E-01	4.733E-01	.9973
7.000E+01	7.481E+01	3.746E-02	7.485E+01	5.396E-01	5.381E-01	.9974
7.500E+01	7.098E+01	3.519E-02	7.102E+01	6.082E-01	6.066E-01	.9974
8.000E+01	6.758E+01	3.320E-02	6.761E+01	6.803E-01	6.786E-01	.9975
8.500E+01	6.452E+01	3.142E-02	6.456E+01	7.560E-01	7.542E-01	.9976
9.000E+01	6.177E+01	2.983E-02	6.180E+01	8.352E-01	8.332E-01	.9976
9.500E+01	5.927E+01	2.839E-02	5.929E+01	9.179E-01	9.157E-01	.9976
1.000E+02	5.699E+01	2.710E-02	5.701E+01	1.004E+00	1.002E+00	.9977

1.250E+02	4.803E+01	2.209E-02	4.806E+01	1.484E+00	1.480E+00	.9978
1.500E+02	4.178E+01	1.868E-02	4.180E+01	2.043E+00	2.039E+00	.9979
1.750E+02	3.714E+01	1.621E-02	3.715E+01	2.679E+00	2.673E+00	.9980
2.000E+02	3.355E+01	1.432E-02	3.357E+01	3.388E+00	3.381E+00	.9981
2.250E+02	3.069E+01	1.284E-02	3.071E+01	4.167E+00	4.160E+00	.9981
2.500E+02	2.835E+01	1.163E-02	2.837E+01	5.015E+00	5.006E+00	.9981
2.750E+02	2.640E+01	1.064E-02	2.641E+01	5.929E+00	5.919E+00	.9982
3.000E+02	2.475E+01	9.803E-03	2.476E+01	6.908E+00	6.895E+00	.9982
3.500E+02	2.210E+01	8.482E-03	2.211E+01	9.049E+00	9.033E+00	.9983
4.000E+02	2.007E+01	7.478E-03	2.007E+01	1.143E+01	1.141E+01	.9983
4.500E+02	1.845E+01	6.686E-03	1.846E+01	1.403E+01	1.400E+01	.9984
5.000E+02	1.714E+01	6.047E-03	1.715E+01	1.684E+01	1.681E+01	.9984
5.500E+02	1.605E+01	5.519E-03	1.606E+01	1.986E+01	1.982E+01	.9984
6.000E+02	1.513E+01	5.076E-03	1.514E+01	2.307E+01	2.303E+01	.9984
6.500E+02	1.435E+01	4.700E-03	1.435E+01	2.646E+01	2.642E+01	.9985
7.000E+02	1.367E+01	4.376E-03	1.367E+01	3.003E+01	2.999E+01	.9985
7.500E+02	1.308E+01	4.095E-03	1.308E+01	3.377E+01	3.372E+01	.9985
8.000E+02	1.255E+01	3.848E-03	1.256E+01	3.767E+01	3.762E+01	.9985
8.500E+02	1.209E+01	3.629E-03	1.209E+01	4.173E+01	4.167E+01	.9986
9.000E+02	1.168E+01	3.435E-03	1.168E+01	4.594E+01	4.588E+01	.9986
9.500E+02	1.130E+01	3.260E-03	1.131E+01	5.029E+01	5.022E+01	.9986
1.000E+03	1.097E+01	3.102E-03	1.097E+01	5.478E+01	5.471E+01	.9986

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COPPER

T = alpha particle (helium ion) kinetic energy, MeV
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 DETOUR = detour factor

T	STOP(e)	STOP(n)	STOP(t)	RANGE(c)	RANGE(p)	DETOUR
1.000E-03	2.951E+01	2.791E+01	5.742E+01	2.560E-05	3.573E-06	.1396
1.500E-03	3.649E+01	2.878E+01	6.527E+01	3.370E-05	5.065E-06	.1503
2.000E-03	4.242E+01	2.896E+01	7.138E+01	4.102E-05	6.563E-06	.1600
2.500E-03	4.768E+01	2.883E+01	7.651E+01	4.778E-05	8.070E-06	.1689
3.000E-03	5.245E+01	2.854E+01	8.099E+01	5.412E-05	9.590E-06	.1772
4.000E-03	6.098E+01	2.776E+01	8.874E+01	6.590E-05	1.267E-05	.1923
5.000E-03	6.854E+01	2.690E+01	9.543E+01	7.676E-05	1.580E-05	.2059
6.000E-03	7.540E+01	2.604E+01	1.014E+02	8.691E-05	1.898E-05	.2183
7.000E-03	8.174E+01	2.521E+01	1.069E+02	9.651E-05	2.218E-05	.2298
8.000E-03	8.765E+01	2.444E+01	1.121E+02	1.056E-04	2.541E-05	.2405
9.000E-03	9.323E+01	2.371E+01	1.169E+02	1.144E-04	2.866E-05	.2506
1.000E-02	9.851E+01	2.303E+01	1.215E+02	1.228E-04	3.193E-05	.2601
1.250E-02	1.107E+02	2.150E+01	1.322E+02	1.425E-04	4.014E-05	.2818
1.500E-02	1.218E+02	2.020E+01	1.420E+02	1.607E-04	4.838E-05	.3010
1.750E-02	1.320E+02	1.907E+01	1.511E+02	1.778E-04	5.660E-05	.3184
2.000E-02	1.415E+02	1.809E+01	1.596E+02	1.938E-04	6.480E-05	.3343
2.250E-02	1.505E+02	1.721E+01	1.677E+02	2.091E-04	7.295E-05	.3488
2.500E-02	1.590E+02	1.644E+01	1.755E+02	2.237E-04	8.105E-05	.3623
2.750E-02	1.672E+02	1.574E+01	1.829E+02	2.376E-04	8.908E-05	.3748
3.000E-02	1.749E+02	1.511E+01	1.900E+02	2.510E-04	9.704E-05	.3865
3.500E-02	1.895E+02	1.401E+01	2.036E+02	2.765E-04	1.127E-04	.4078
4.000E-02	2.032E+02	1.308E+01	2.163E+02	3.003E-04	1.281E-04	.4267
4.500E-02	2.160E+02	1.229E+01	2.283E+02	3.228E-04	1.432E-04	.4438
5.000E-02	2.281E+02	1.160E+01	2.397E+02	3.441E-04	1.580E-04	.4592
5.500E-02	2.397E+02	1.099E+01	2.507E+02	3.645E-04	1.726E-04	.4734
6.000E-02	2.507E+02	1.045E+01	2.612E+02	3.841E-04	1.868E-04	.4863
6.500E-02	2.613E+02	9.973E+00	2.712E+02	4.029E-04	2.007E-04	.4983
7.000E-02	2.714E+02	9.541E+00	2.810E+02	4.210E-04	2.145E-04	.5094
7.500E-02	2.812E+02	9.150E+00	2.904E+02	4.385E-04	2.279E-04	.5198
8.000E-02	2.907E+02	8.793E+00	2.995E+02	4.554E-04	2.411E-04	.5295
8.500E-02	2.998E+02	8.468E+00	3.083E+02	4.719E-04	2.542E-04	.5386
9.000E-02	3.087E+02	8.168E+00	3.168E+02	4.879E-04	2.669E-04	.5472
9.500E-02	3.173E+02	7.892E+00	3.251E+02	5.034E-04	2.795E-04	.5552
1.000E-01	3.256E+02	7.636E+00	3.332E+02	5.186E-04	2.919E-04	.5629
1.250E-01	3.642E+02	6.593E+00	3.708E+02	5.897E-04	3.513E-04	.5957
1.500E-01	3.984E+02	5.826E+00	4.042E+02	6.542E-04	4.069E-04	.6220
1.750E-01	4.291E+02	5.234E+00	4.343E+02	7.138E-04	4.594E-04	.6436
2.000E-01	4.568E+02	4.762E+00	4.616E+02	7.696E-04	5.094E-04	.6619
2.250E-01	4.821E+02	4.376E+00	4.865E+02	8.223E-04	5.572E-04	.6776
2.500E-01	5.051E+02	4.053E+00	5.092E+02	8.725E-04	6.033E-04	.6914
2.750E-01	5.262E+02	3.779E+00	5.300E+02	9.206E-04	6.478E-04	.7036
3.000E-01	5.454E+02	3.543E+00	5.489E+02	9.670E-04	6.909E-04	.7145

3.500E-01	5.790E+02	3.157E+00	5.822E+02	1.055E-03	7.739E-04	.7333
4.000E-01	6.070E+02	2.853E+00	6.098E+02	1.139E-03	8.534E-04	.7491
4.500E-01	6.301E+02	2.607E+00	6.327E+02	1.220E-03	9.301E-04	.7626
5.000E-01	6.491E+02	2.403E+00	6.515E+02	1.297E-03	1.005E-03	.7744
5.500E-01	6.644E+02	2.231E+00	6.666E+02	1.373E-03	1.078E-03	.7848
6.000E-01	6.766E+02	2.085E+00	6.787E+02	1.448E-03	1.150E-03	.7941
6.500E-01	6.862E+02	1.957E+00	6.881E+02	1.521E-03	1.220E-03	.8026
7.000E-01	6.934E+02	1.846E+00	6.953E+02	1.593E-03	1.291E-03	.8102
7.500E-01	6.988E+02	1.748E+00	7.005E+02	1.665E-03	1.360E-03	.8173
8.000E-01	7.024E+02	1.660E+00	7.041E+02	1.736E-03	1.430E-03	.8237
8.500E-01	7.046E+02	1.582E+00	7.062E+02	1.807E-03	1.499E-03	.8298
9.000E-01	7.057E+02	1.511E+00	7.072E+02	1.877E-03	1.568E-03	.8353
9.500E-01	7.057E+02	1.446E+00	7.072E+02	1.948E-03	1.638E-03	.8406
1.000E+00	7.049E+02	1.388E+00	7.063E+02	2.019E-03	1.707E-03	.8455
1.250E+00	6.925E+02	1.158E+00	6.936E+02	2.376E-03	2.058E-03	.8661
1.500E+00	6.726E+02	9.973E-01	6.736E+02	2.741E-03	2.418E-03	.8821
1.750E+00	6.503E+02	8.782E-01	6.512E+02	3.118E-03	2.791E-03	.8949
2.000E+00	6.276E+02	7.861E-01	6.283E+02	3.509E-03	3.178E-03	.9054
2.250E+00	6.060E+02	7.127E-01	6.067E+02	3.914E-03	3.579E-03	.9142
2.500E+00	5.856E+02	6.525E-01	5.863E+02	4.334E-03	3.994E-03	.9217
2.750E+00	5.663E+02	6.024E-01	5.669E+02	4.767E-03	4.424E-03	.9281
3.000E+00	5.480E+02	5.598E-01	5.485E+02	5.216E-03	4.869E-03	.9336
3.500E+00	5.140E+02	4.915E-01	5.145E+02	6.157E-03	5.804E-03	.9427
4.000E+00	4.834E+02	4.388E-01	4.838E+02	7.160E-03	6.801E-03	.9499
4.500E+00	4.558E+02	3.970E-01	4.562E+02	8.224E-03	7.859E-03	.9556
5.000E+00	4.310E+02	3.628E-01	4.313E+02	9.352E-03	8.981E-03	.9603
5.500E+00	4.084E+02	3.344E-01	4.088E+02	1.054E-02	1.017E-02	.9642
6.000E+00	3.880E+02	3.103E-01	3.883E+02	1.180E-02	1.142E-02	.9675
6.500E+00	3.696E+02	2.897E-01	3.699E+02	1.312E-02	1.273E-02	.9703
7.000E+00	3.537E+02	2.718E-01	3.539E+02	1.450E-02	1.411E-02	.9727
7.500E+00	3.391E+02	2.561E-01	3.394E+02	1.594E-02	1.554E-02	.9748
8.000E+00	3.257E+02	2.422E-01	3.260E+02	1.745E-02	1.704E-02	.9766
8.500E+00	3.134E+02	2.298E-01	3.136E+02	1.901E-02	1.860E-02	.9782
9.000E+00	3.020E+02	2.187E-01	3.022E+02	2.064E-02	2.022E-02	.9796
9.500E+00	2.917E+02	2.087E-01	2.919E+02	2.232E-02	2.189E-02	.9809
1.000E+01	2.823E+02	1.996E-01	2.825E+02	2.406E-02	2.363E-02	.9820
1.250E+01	2.439E+02	1.643E-01	2.441E+02	3.361E-02	3.314E-02	.9861
1.500E+01	2.159E+02	1.401E-01	2.160E+02	4.452E-02	4.402E-02	.9886
1.750E+01	1.944E+02	1.224E-01	1.945E+02	5.674E-02	5.620E-02	.9904
2.000E+01	1.773E+02	1.088E-01	1.774E+02	7.022E-02	6.963E-02	.9917
2.500E+01	1.516E+02	8.933E-02	1.517E+02	1.008E-01	1.001E-01	.9933
2.750E+01	1.417E+02	8.210E-02	1.418E+02	1.179E-01	1.171E-01	.9939
3.000E+01	1.332E+02	7.600E-02	1.332E+02	1.361E-01	1.353E-01	.9943
3.500E+01	1.191E+02	6.626E-02	1.192E+02	1.758E-01	1.749E-01	.9950
4.000E+01	1.081E+02	5.882E-02	1.082E+02	2.199E-01	2.189E-01	.9955
4.500E+01	9.916E+01	5.295E-02	9.921E+01	2.682E-01	2.671E-01	.9958
5.000E+01	9.173E+01	4.818E-02	9.178E+01	3.207E-01	3.194E-01	.9961
5.500E+01	8.546E+01	4.423E-02	8.551E+01	3.771E-01	3.758E-01	.9963
6.000E+01	8.009E+01	4.090E-02	8.013E+01	4.376E-01	4.361E-01	.9965
6.500E+01	7.543E+01	3.805E-02	7.546E+01	5.019E-01	5.002E-01	.9966
7.000E+01	7.134E+01	3.559E-02	7.138E+01	5.701E-01	5.682E-01	.9968
7.500E+01	6.773E+01	3.344E-02	6.776E+01	6.420E-01	6.400E-01	.9969
8.000E+01	6.451E+01	3.155E-02	6.454E+01	7.176E-01	7.155E-01	.9970
8.500E+01	6.162E+01	2.986E-02	6.165E+01	7.969E-01	7.946E-01	.9970
9.000E+01	5.900E+01	2.835E-02	5.903E+01	8.798E-01	8.773E-01	.9971
9.500E+01	5.663E+01	2.700E-02	5.666E+01	9.663E-01	9.636E-01	.9972
1.000E+02	5.447E+01	2.577E-02	5.450E+01	1.056E+00	1.053E+00	.9972

1.250E+02	4.597E+01	2.102E-02	4.599E+01	1.558E+00	1.554E+00	.9974
1.500E+02	4.002E+01	1.779E-02	4.004E+01	2.142E+00	2.137E+00	.9976
1.750E+02	3.561E+01	1.543E-02	3.562E+01	2.805E+00	2.799E+00	.9977
2.000E+02	3.219E+01	1.364E-02	3.220E+01	3.545E+00	3.537E+00	.9978
2.250E+02	2.946E+01	1.223E-02	2.947E+01	4.357E+00	4.348E+00	.9978
2.500E+02	2.723E+01	1.109E-02	2.724E+01	5.240E+00	5.229E+00	.9979
2.750E+02	2.537E+01	1.015E-02	2.538E+01	6.192E+00	6.179E+00	.9979
3.000E+02	2.379E+01	9.351E-03	2.380E+01	7.210E+00	7.195E+00	.9980
3.500E+02	2.126E+01	8.093E-03	2.126E+01	9.437E+00	9.419E+00	.9980
4.000E+02	1.931E+01	7.138E-03	1.932E+01	1.191E+01	1.189E+01	.9981
4.500E+02	1.776E+01	6.387E-03	1.777E+01	1.461E+01	1.458E+01	.9981
5.000E+02	1.651E+01	5.779E-03	1.651E+01	1.753E+01	1.750E+01	.9982
5.500E+02	1.546E+01	5.277E-03	1.547E+01	2.066E+01	2.063E+01	.9982
6.000E+02	1.458E+01	4.855E-03	1.459E+01	2.399E+01	2.395E+01	.9982
6.500E+02	1.383E+01	4.496E-03	1.384E+01	2.751E+01	2.747E+01	.9983
7.000E+02	1.318E+01	4.187E-03	1.319E+01	3.122E+01	3.116E+01	.9983
7.500E+02	1.261E+01	3.918E-03	1.262E+01	3.510E+01	3.504E+01	.9983
8.000E+02	1.211E+01	3.682E-03	1.212E+01	3.914E+01	3.908E+01	.9983
8.500E+02	1.167E+01	3.473E-03	1.167E+01	4.335E+01	4.328E+01	.9984
9.000E+02	1.127E+01	3.287E-03	1.127E+01	4.771E+01	4.763E+01	.9984
9.500E+02	1.091E+01	3.120E-03	1.092E+01	5.221E+01	5.213E+01	.9984
1.000E+03	1.059E+01	2.969E-03	1.060E+01	5.686E+01	5.677E+01	.9984

ALPHA PARTICLE STOPPING POWER AND RANGE

GERMANIUM

T = alpha particle (helium ion) kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	4.765E+01	2.314E+01	7.079E+01	2.217E-05	3.632E-06	.1638
1.500E-03	5.757E+01	2.401E+01	8.158E+01	2.869E-05	5.075E-06	.1769
2.000E-03	6.583E+01	2.428E+01	9.011E+01	3.451E-05	6.507E-06	.1885
2.500E-03	7.305E+01	2.426E+01	9.731E+01	3.985E-05	7.930E-06	.1990
3.000E-03	7.953E+01	2.410E+01	1.036E+02	4.482E-05	9.351E-06	.2086
4.000E-03	9.094E+01	2.357E+01	1.145E+02	5.398E-05	1.220E-05	.2259
5.000E-03	1.009E+02	2.293E+01	1.238E+02	6.237E-05	1.505E-05	.2413
6.000E-03	1.099E+02	2.228E+01	1.321E+02	7.018E-05	1.791E-05	.2552
7.000E-03	1.180E+02	2.163E+01	1.397E+02	7.754E-05	2.077E-05	.2679
8.000E-03	1.256E+02	2.102E+01	1.466E+02	8.453E-05	2.364E-05	.2796
9.000E-03	1.327E+02	2.044E+01	1.531E+02	9.120E-05	2.650E-05	.2906
1.000E-02	1.394E+02	1.989E+01	1.592E+02	9.760E-05	2.936E-05	.3008
1.250E-02	1.546E+02	1.866E+01	1.733E+02	1.126E-04	3.649E-05	.3239
1.500E-02	1.683E+02	1.759E+01	1.859E+02	1.266E-04	4.357E-05	.3443
1.750E-02	1.808E+02	1.665E+01	1.974E+02	1.396E-04	5.059E-05	.3624
2.000E-02	1.923E+02	1.583E+01	2.082E+02	1.519E-04	5.755E-05	.3788
2.250E-02	2.031E+02	1.510E+01	2.182E+02	1.637E-04	6.444E-05	.3938
2.500E-02	2.133E+02	1.444E+01	2.277E+02	1.749E-04	7.126E-05	.4075
2.750E-02	2.229E+02	1.385E+01	2.367E+02	1.856E-04	7.801E-05	.4202
3.000E-02	2.320E+02	1.332E+01	2.453E+02	1.960E-04	8.468E-05	.4320
3.500E-02	2.491E+02	1.238E+01	2.615E+02	2.157E-04	9.781E-05	.4534
4.000E-02	2.648E+02	1.159E+01	2.764E+02	2.343E-04	1.107E-04	.4723
4.500E-02	2.795E+02	1.091E+01	2.904E+02	2.520E-04	1.232E-04	.4891
5.000E-02	2.932E+02	1.031E+01	3.035E+02	2.688E-04	1.356E-04	.5044
5.500E-02	3.061E+02	9.786E+00	3.159E+02	2.849E-04	1.477E-04	.5183
6.000E-02	3.184E+02	9.319E+00	3.277E+02	3.005E-04	1.596E-04	.5310
6.500E-02	3.300E+02	8.902E+00	3.389E+02	3.155E-04	1.712E-04	.5427
7.000E-02	3.411E+02	8.525E+00	3.496E+02	3.300E-04	1.827E-04	.5535
7.500E-02	3.517E+02	8.183E+00	3.598E+02	3.441E-04	1.939E-04	.5636
8.000E-02	3.618E+02	7.871E+00	3.697E+02	3.578E-04	2.050E-04	.5730
8.500E-02	3.715E+02	7.586E+00	3.791E+02	3.712E-04	2.160E-04	.5818
9.000E-02	3.808E+02	7.323E+00	3.881E+02	3.842E-04	2.267E-04	.5901
9.500E-02	3.898E+02	7.080E+00	3.969E+02	3.969E-04	2.373E-04	.5979
1.000E-01	3.984E+02	6.855E+00	4.053E+02	4.094E-04	2.478E-04	.6053
1.250E-01	4.372E+02	5.934E+00	4.431E+02	4.683E-04	2.983E-04	.6370
1.500E-01	4.699E+02	5.254E+00	4.751E+02	5.227E-04	3.461E-04	.6622
1.750E-01	4.978E+02	4.727E+00	5.025E+02	5.739E-04	3.919E-04	.6830
2.000E-01	5.217E+02	4.306E+00	5.260E+02	6.224E-04	4.361E-04	.7006
2.250E-01	5.423E+02	3.961E+00	5.463E+02	6.691E-04	4.789E-04	.7157
2.500E-01	5.601E+02	3.672E+00	5.638E+02	7.141E-04	5.206E-04	.7290
2.750E-01	5.755E+02	3.427E+00	5.790E+02	7.578E-04	5.614E-04	.7408
3.000E-01	5.889E+02	3.215E+00	5.921E+02	8.005E-04	6.014E-04	.7513

3.500E-01	6.107E+02	2.867E+00	6.136E+02	8.834E-04	6.797E-04	.7695
4.000E-01	6.274E+02	2.594E+00	6.300E+02	9.638E-04	7.563E-04	.7847
4.500E-01	6.401E+02	2.372E+00	6.425E+02	1.042E-03	8.315E-04	.7977
5.000E-01	6.499E+02	2.188E+00	6.521E+02	1.120E-03	9.057E-04	.8090
5.500E-01	6.573E+02	2.033E+00	6.593E+02	1.196E-03	9.793E-04	.8190
6.000E-01	6.628E+02	1.900E+00	6.647E+02	1.271E-03	1.052E-03	.8278
6.500E-01	6.668E+02	1.785E+00	6.686E+02	1.346E-03	1.125E-03	.8358
7.000E-01	6.696E+02	1.684E+00	6.713E+02	1.421E-03	1.198E-03	.8430
7.500E-01	6.714E+02	1.594E+00	6.730E+02	1.495E-03	1.270E-03	.8495
8.000E-01	6.723E+02	1.515E+00	6.738E+02	1.570E-03	1.343E-03	.8555
8.500E-01	6.724E+02	1.444E+00	6.738E+02	1.644E-03	1.415E-03	.8610
9.000E-01	6.719E+02	1.379E+00	6.733E+02	1.718E-03	1.488E-03	.8661
9.500E-01	6.709E+02	1.321E+00	6.722E+02	1.792E-03	1.561E-03	.8708
1.000E+00	6.694E+02	1.268E+00	6.707E+02	1.867E-03	1.634E-03	.8752
1.250E+00	6.569E+02	1.059E+00	6.580E+02	2.243E-03	2.003E-03	.8932
1.500E+00	6.395E+02	9.125E-01	6.404E+02	2.628E-03	2.383E-03	.9068
1.750E+00	6.198E+02	8.040E-01	6.206E+02	3.024E-03	2.774E-03	.9174
2.000E+00	5.994E+02	7.201E-01	6.001E+02	3.434E-03	3.179E-03	.9259
2.250E+00	5.784E+02	6.530E-01	5.791E+02	3.858E-03	3.599E-03	.9330
2.500E+00	5.576E+02	5.981E-01	5.582E+02	4.298E-03	4.035E-03	.9389
2.750E+00	5.375E+02	5.523E-01	5.381E+02	4.754E-03	4.487E-03	.9439
3.000E+00	5.185E+02	5.134E-01	5.190E+02	5.227E-03	4.957E-03	.9483
3.500E+00	4.836E+02	4.509E-01	4.840E+02	6.225E-03	5.947E-03	.9554
4.000E+00	4.529E+02	4.028E-01	4.533E+02	7.293E-03	7.008E-03	.9609
4.500E+00	4.258E+02	3.644E-01	4.261E+02	8.431E-03	8.139E-03	.9654
5.000E+00	4.018E+02	3.332E-01	4.022E+02	9.640E-03	9.341E-03	.9690
5.500E+00	3.805E+02	3.071E-01	3.808E+02	1.092E-02	1.061E-02	.9720
6.000E+00	3.615E+02	2.851E-01	3.618E+02	1.227E-02	1.195E-02	.9745
6.500E+00	3.443E+02	2.662E-01	3.445E+02	1.368E-02	1.336E-02	.9766
7.000E+00	3.286E+02	2.498E-01	3.288E+02	1.517E-02	1.484E-02	.9784
7.500E+00	3.151E+02	2.354E-01	3.154E+02	1.672E-02	1.639E-02	.9800
8.000E+00	3.031E+02	2.226E-01	3.033E+02	1.834E-02	1.800E-02	.9813
8.500E+00	2.921E+02	2.113E-01	2.923E+02	2.002E-02	1.967E-02	.9825
9.000E+00	2.820E+02	2.011E-01	2.822E+02	2.176E-02	2.140E-02	.9835
9.500E+00	2.726E+02	1.919E-01	2.728E+02	2.356E-02	2.320E-02	.9845
1.000E+01	2.638E+02	1.835E-01	2.640E+02	2.543E-02	2.505E-02	.9853
1.250E+01	2.282E+02	1.512E-01	2.283E+02	3.564E-02	3.523E-02	.9884
1.500E+01	2.022E+02	1.289E-01	2.024E+02	4.730E-02	4.684E-02	.9903
1.750E+01	1.823E+02	1.126E-01	1.824E+02	6.033E-02	5.982E-02	.9916
2.000E+01	1.664E+02	1.002E-01	1.665E+02	7.469E-02	7.413E-02	.9926
2.500E+01	1.426E+02	8.229E-02	1.427E+02	1.072E-01	1.066E-01	.9938
2.750E+01	1.334E+02	7.564E-02	1.334E+02	1.254E-01	1.247E-01	.9943
3.000E+01	1.254E+02	7.003E-02	1.255E+02	1.447E-01	1.439E-01	.9946
3.500E+01	1.123E+02	6.108E-02	1.124E+02	1.869E-01	1.860E-01	.9951
4.000E+01	1.020E+02	5.423E-02	1.021E+02	2.336E-01	2.326E-01	.9955
4.500E+01	9.363E+01	4.882E-02	9.368E+01	2.848E-01	2.836E-01	.9958
5.000E+01	8.667E+01	4.444E-02	8.672E+01	3.404E-01	3.390E-01	.9961
5.500E+01	8.079E+01	4.080E-02	8.083E+01	4.001E-01	3.986E-01	.9962
6.000E+01	7.575E+01	3.774E-02	7.579E+01	4.640E-01	4.624E-01	.9964
6.500E+01	7.137E+01	3.512E-02	7.141E+01	5.320E-01	5.302E-01	.9965
7.000E+01	6.753E+01	3.285E-02	6.757E+01	6.041E-01	6.020E-01	.9966
7.500E+01	6.414E+01	3.087E-02	6.417E+01	6.800E-01	6.778E-01	.9967
8.000E+01	6.110E+01	2.912E-02	6.113E+01	7.599E-01	7.574E-01	.9968
8.500E+01	5.838E+01	2.757E-02	5.841E+01	8.436E-01	8.409E-01	.9969
9.000E+01	5.592E+01	2.618E-02	5.595E+01	9.311E-01	9.282E-01	.9969
9.500E+01	5.369E+01	2.493E-02	5.372E+01	1.022E+00	1.019E+00	.9970
1.000E+02	5.165E+01	2.380E-02	5.168E+01	1.117E+00	1.114E+00	.9970

1.250E+02	4.363E+01	1.942E-02	4.365E+01	1.646E+00	1.641E+00	.9972
1.500E+02	3.801E+01	1.644E-02	3.803E+01	2.261E+00	2.255E+00	.9974
1.750E+02	3.384E+01	1.427E-02	3.385E+01	2.959E+00	2.952E+00	.9975
2.000E+02	3.060E+01	1.262E-02	3.062E+01	3.737E+00	3.728E+00	.9975
2.250E+02	2.802E+01	1.132E-02	2.803E+01	4.592E+00	4.581E+00	.9976
2.500E+02	2.591E+01	1.027E-02	2.592E+01	5.520E+00	5.507E+00	.9977
2.750E+02	2.414E+01	9.396E-03	2.415E+01	6.520E+00	6.505E+00	.9977
3.000E+02	2.265E+01	8.663E-03	2.265E+01	7.590E+00	7.573E+00	.9977
3.500E+02	2.024E+01	7.498E-03	2.025E+01	9.929E+00	9.907E+00	.9978
4.000E+02	1.840E+01	6.615E-03	1.840E+01	1.252E+01	1.250E+01	.9979
4.500E+02	1.693E+01	5.921E-03	1.694E+01	1.536E+01	1.533E+01	.9979
5.000E+02	1.574E+01	5.361E-03	1.574E+01	1.842E+01	1.839E+01	.9980
5.500E+02	1.475E+01	4.897E-03	1.475E+01	2.171E+01	2.166E+01	.9980
6.000E+02	1.391E+01	4.507E-03	1.392E+01	2.520E+01	2.515E+01	.9980
6.500E+02	1.320E+01	4.175E-03	1.320E+01	2.889E+01	2.883E+01	.9981
7.000E+02	1.258E+01	3.888E-03	1.259E+01	3.277E+01	3.271E+01	.9981
7.500E+02	1.204E+01	3.639E-03	1.205E+01	3.683E+01	3.676E+01	.9981
8.000E+02	1.157E+01	3.420E-03	1.157E+01	4.107E+01	4.099E+01	.9982
8.500E+02	1.115E+01	3.226E-03	1.115E+01	4.547E+01	4.539E+01	.9982
9.000E+02	1.077E+01	3.053E-03	1.077E+01	5.003E+01	4.995E+01	.9982
9.500E+02	1.043E+01	2.898E-03	1.043E+01	5.475E+01	5.465E+01	.9982
1.000E+03	1.013E+01	2.759E-03	1.013E+01	5.962E+01	5.951E+01	.9982

ALPHA PARTICLE STOPPING POWER AND RANGE

LEAD

T = alpha particle (helium ion) kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	1.796E+01	5.342E+00	2.330E+01	7.305E-05	6.359E-06	.0870
1.500E-03	2.218E+01	5.854E+00	2.803E+01	9.240E-05	8.567E-06	.0927
2.000E-03	2.576E+01	6.176E+00	3.193E+01	1.091E-04	1.069E-05	.0980
2.500E-03	2.892E+01	6.393E+00	3.532E+01	1.240E-04	1.274E-05	.1028
3.000E-03	3.180E+01	6.543E+00	3.834E+01	1.375E-04	1.477E-05	.1074
4.000E-03	3.693E+01	6.721E+00	4.365E+01	1.619E-04	1.875E-05	.1158
5.000E-03	4.147E+01	6.805E+00	4.828E+01	1.837E-04	2.269E-05	.1236
6.000E-03	4.560E+01	6.833E+00	5.243E+01	2.035E-04	2.661E-05	.1308
7.000E-03	4.940E+01	6.828E+00	5.623E+01	2.219E-04	3.052E-05	.1375
8.000E-03	5.295E+01	6.802E+00	5.975E+01	2.392E-04	3.442E-05	.1439
9.000E-03	5.630E+01	6.762E+00	6.306E+01	2.555E-04	3.831E-05	.1500
1.000E-02	5.946E+01	6.712E+00	6.618E+01	2.709E-04	4.220E-05	.1558
1.250E-02	6.677E+01	6.566E+00	7.334E+01	3.068E-04	5.193E-05	.1693
1.500E-02	7.341E+01	6.407E+00	7.981E+01	3.394E-04	6.166E-05	.1817
1.750E-02	7.952E+01	6.246E+00	8.577E+01	3.696E-04	7.137E-05	.1931
2.000E-02	8.523E+01	6.089E+00	9.132E+01	3.978E-04	8.107E-05	.2038
2.250E-02	9.060E+01	5.938E+00	9.654E+01	4.245E-04	9.075E-05	.2138
2.500E-02	9.569E+01	5.794E+00	1.015E+02	4.497E-04	1.004E-04	.2233
2.750E-02	1.005E+02	5.657E+00	1.062E+02	4.738E-04	1.100E-04	.2322
3.000E-02	1.052E+02	5.527E+00	1.107E+02	4.968E-04	1.196E-04	.2407
3.500E-02	1.139E+02	5.285E+00	1.192E+02	5.403E-04	1.387E-04	.2566
4.000E-02	1.220E+02	5.068E+00	1.271E+02	5.809E-04	1.576E-04	.2712
4.500E-02	1.297E+02	4.870E+00	1.345E+02	6.192E-04	1.763E-04	.2847
5.000E-02	1.369E+02	4.690E+00	1.416E+02	6.554E-04	1.948E-04	.2973
5.500E-02	1.438E+02	4.525E+00	1.483E+02	6.899E-04	2.132E-04	.3090
6.000E-02	1.503E+02	4.373E+00	1.547E+02	7.229E-04	2.314E-04	.3201
6.500E-02	1.566E+02	4.234E+00	1.609E+02	7.545E-04	2.494E-04	.3305
7.000E-02	1.627E+02	4.104E+00	1.668E+02	7.851E-04	2.672E-04	.3403
7.500E-02	1.685E+02	3.984E+00	1.725E+02	8.145E-04	2.848E-04	.3496
8.000E-02	1.741E+02	3.872E+00	1.780E+02	8.431E-04	3.023E-04	.3585
8.500E-02	1.795E+02	3.767E+00	1.833E+02	8.708E-04	3.195E-04	.3670
9.000E-02	1.848E+02	3.668E+00	1.885E+02	8.977E-04	3.366E-04	.3750
9.500E-02	1.899E+02	3.576E+00	1.935E+02	9.238E-04	3.536E-04	.3827
1.000E-01	1.949E+02	3.489E+00	1.983E+02	9.494E-04	3.704E-04	.3901
1.250E-01	2.177E+02	3.119E+00	2.208E+02	1.069E-03	4.521E-04	.4230
1.500E-01	2.379E+02	2.829E+00	2.407E+02	1.177E-03	5.304E-04	.4506
1.750E-01	2.560E+02	2.596E+00	2.586E+02	1.277E-03	6.057E-04	.4743
2.000E-01	2.723E+02	2.403E+00	2.747E+02	1.371E-03	6.786E-04	.4950
2.250E-01	2.870E+02	2.240E+00	2.893E+02	1.459E-03	7.492E-04	.5133
2.500E-01	3.004E+02	2.100E+00	3.025E+02	1.544E-03	8.179E-04	.5298
2.750E-01	3.126E+02	1.979E+00	3.145E+02	1.625E-03	8.850E-04	.5446
3.000E-01	3.236E+02	1.873E+00	3.255E+02	1.703E-03	9.506E-04	.5582

3.500E-01	3.426E+02	1.695E+00	3.443E+02	1.852E-03	1.078E-03	.5821
4.000E-01	3.582E+02	1.552E+00	3.597E+02	1.994E-03	1.202E-03	.6027
4.500E-01	3.707E+02	1.433E+00	3.721E+02	2.131E-03	1.323E-03	.6208
5.000E-01	3.806E+02	1.333E+00	3.820E+02	2.263E-03	1.441E-03	.6368
5.500E-01	3.883E+02	1.247E+00	3.896E+02	2.393E-03	1.558E-03	.6513
6.000E-01	3.942E+02	1.173E+00	3.954E+02	2.520E-03	1.675E-03	.6645
6.500E-01	3.984E+02	1.108E+00	3.995E+02	2.646E-03	1.790E-03	.6765
7.000E-01	4.013E+02	1.051E+00	4.024E+02	2.771E-03	1.905E-03	.6876
7.500E-01	4.031E+02	9.995E-01	4.041E+02	2.895E-03	2.020E-03	.6979
8.000E-01	4.040E+02	9.536E-01	4.049E+02	3.018E-03	2.135E-03	.7075
8.500E-01	4.041E+02	9.121E-01	4.050E+02	3.142E-03	2.251E-03	.7164
9.000E-01	4.035E+02	8.745E-01	4.044E+02	3.265E-03	2.367E-03	.7248
9.500E-01	4.024E+02	8.401E-01	4.033E+02	3.389E-03	2.483E-03	.7328
1.000E+00	4.010E+02	8.086E-01	4.018E+02	3.513E-03	2.601E-03	.7402
1.250E+00	3.925E+02	6.833E-01	3.932E+02	4.142E-03	3.198E-03	.7721
1.500E+00	3.804E+02	5.942E-01	3.810E+02	4.787E-03	3.816E-03	.7971
1.750E+00	3.653E+02	5.272E-01	3.658E+02	5.456E-03	4.460E-03	.8175
2.000E+00	3.486E+02	4.748E-01	3.491E+02	6.156E-03	5.137E-03	.8345
2.250E+00	3.320E+02	4.327E-01	3.324E+02	6.890E-03	5.848E-03	.8489
2.500E+00	3.176E+02	3.979E-01	3.180E+02	7.659E-03	6.596E-03	.8612
2.750E+00	3.049E+02	3.687E-01	3.053E+02	8.462E-03	7.377E-03	.8719
3.000E+00	2.937E+02	3.438E-01	2.940E+02	9.297E-03	8.191E-03	.8811
3.500E+00	2.744E+02	3.036E-01	2.747E+02	1.106E-02	9.911E-03	.8963
4.000E+00	2.583E+02	2.723E-01	2.586E+02	1.294E-02	1.175E-02	.9083
4.500E+00	2.447E+02	2.473E-01	2.449E+02	1.492E-02	1.370E-02	.9178
5.000E+00	2.329E+02	2.268E-01	2.331E+02	1.702E-02	1.575E-02	.9256
5.500E+00	2.225E+02	2.096E-01	2.227E+02	1.921E-02	1.791E-02	.9320
6.000E+00	2.132E+02	1.951E-01	2.134E+02	2.151E-02	2.016E-02	.9374
6.500E+00	2.050E+02	1.825E-01	2.051E+02	2.390E-02	2.251E-02	.9420
7.000E+00	1.975E+02	1.716E-01	1.976E+02	2.638E-02	2.495E-02	.9459
7.500E+00	1.907E+02	1.620E-01	1.908E+02	2.896E-02	2.749E-02	.9494
8.000E+00	1.844E+02	1.535E-01	1.846E+02	3.162E-02	3.011E-02	.9523
8.500E+00	1.787E+02	1.458E-01	1.788E+02	3.437E-02	3.283E-02	.9550
9.000E+00	1.734E+02	1.390E-01	1.735E+02	3.721E-02	3.562E-02	.9573
9.500E+00	1.684E+02	1.328E-01	1.686E+02	4.014E-02	3.851E-02	.9594
1.000E+01	1.639E+02	1.272E-01	1.640E+02	4.314E-02	4.147E-02	.9613
1.250E+01	1.449E+02	1.053E-01	1.450E+02	5.939E-02	5.751E-02	.9683
1.500E+01	1.306E+02	9.015E-02	1.307E+02	7.758E-02	7.548E-02	.9729
1.750E+01	1.194E+02	7.901E-02	1.195E+02	9.762E-02	9.528E-02	.9761
2.000E+01	1.102E+02	7.046E-02	1.103E+02	1.194E-01	1.168E-01	.9785
2.500E+01	9.618E+01	5.812E-02	9.624E+01	1.681E-01	1.650E-01	.9817
2.750E+01	9.063E+01	5.352E-02	9.068E+01	1.949E-01	1.915E-01	.9829
3.000E+01	8.578E+01	4.963E-02	8.583E+01	2.232E-01	2.196E-01	.9838
3.500E+01	7.772E+01	4.341E-02	7.777E+01	2.845E-01	2.803E-01	.9853
4.000E+01	7.126E+01	3.863E-02	7.130E+01	3.517E-01	3.470E-01	.9864
4.500E+01	6.594E+01	3.485E-02	6.598E+01	4.247E-01	4.193E-01	.9873
5.000E+01	6.147E+01	3.178E-02	6.150E+01	5.033E-01	4.972E-01	.9880
5.500E+01	5.765E+01	2.923E-02	5.768E+01	5.873E-01	5.805E-01	.9885
6.000E+01	5.435E+01	2.708E-02	5.438E+01	6.766E-01	6.691E-01	.9890
6.500E+01	5.146E+01	2.523E-02	5.149E+01	7.711E-01	7.629E-01	.9894
7.000E+01	4.891E+01	2.363E-02	4.893E+01	8.708E-01	8.618E-01	.9898
7.500E+01	4.663E+01	2.224E-02	4.665E+01	9.755E-01	9.657E-01	.9900
8.000E+01	4.459E+01	2.100E-02	4.461E+01	1.085E+00	1.075E+00	.9903
8.500E+01	4.275E+01	1.990E-02	4.277E+01	1.200E+00	1.188E+00	.9905
9.000E+01	4.107E+01	1.892E-02	4.109E+01	1.319E+00	1.307E+00	.9907
9.500E+01	3.954E+01	1.803E-02	3.956E+01	1.443E+00	1.430E+00	.9909
1.000E+02	3.814E+01	1.723E-02	3.816E+01	1.572E+00	1.558E+00	.9911

1.250E+02	3.254E+01	1.413E-02	3.255E+01	2.284E+00	2.265E+00	.9918
1.500E+02	2.852E+01	1.200E-02	2.853E+01	3.106E+00	3.082E+00	.9922
1.750E+02	2.550E+01	1.045E-02	2.551E+01	4.035E+00	4.005E+00	.9926
2.000E+02	2.314E+01	9.268E-03	2.315E+01	5.065E+00	5.029E+00	.9928
2.250E+02	2.124E+01	8.334E-03	2.125E+01	6.194E+00	6.150E+00	.9930
2.500E+02	1.969E+01	7.577E-03	1.970E+01	7.417E+00	7.366E+00	.9932
2.750E+02	1.839E+01	6.951E-03	1.840E+01	8.731E+00	8.673E+00	.9934
3.000E+02	1.728E+01	6.423E-03	1.729E+01	1.013E+01	1.007E+01	.9935
3.500E+02	1.551E+01	5.583E-03	1.551E+01	1.319E+01	1.311E+01	.9937
4.000E+02	1.414E+01	4.942E-03	1.415E+01	1.657E+01	1.647E+01	.9939
4.500E+02	1.306E+01	4.436E-03	1.306E+01	2.025E+01	2.013E+01	.9941
5.000E+02	1.217E+01	4.027E-03	1.218E+01	2.422E+01	2.408E+01	.9942
5.500E+02	1.143E+01	3.689E-03	1.144E+01	2.846E+01	2.830E+01	.9943
6.000E+02	1.081E+01	3.404E-03	1.081E+01	3.296E+01	3.278E+01	.9944
6.500E+02	1.027E+01	3.162E-03	1.028E+01	3.771E+01	3.750E+01	.9945
7.000E+02	9.809E+00	2.952E-03	9.812E+00	4.269E+01	4.246E+01	.9946
7.500E+02	9.403E+00	2.769E-03	9.406E+00	4.790E+01	4.764E+01	.9947
8.000E+02	9.045E+00	2.607E-03	9.047E+00	5.332E+01	5.304E+01	.9948
8.500E+02	8.726E+00	2.464E-03	8.729E+00	5.895E+01	5.864E+01	.9949
9.000E+02	8.441E+00	2.335E-03	8.444E+00	6.477E+01	6.444E+01	.9949
9.500E+02	8.185E+00	2.220E-03	8.188E+00	7.079E+01	7.043E+01	.9950
1.000E+03	7.954E+00	2.116E-03	7.956E+00	7.698E+01	7.660E+01	.9951

ALPHA PARTICLE STOPPING POWER AND RANGE

AIR (dry, near sea level)

T = alpha particle (helium ion) kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP(e)	STOP(n)	STOP(t)	RANGE(c)	RANGE(p)	DETOUR
1.000E-03	8.750E+01	1.340E+02	2.215E+02	5.377E-06	2.025E-06	.3767
1.500E-03	1.086E+02	1.256E+02	2.342E+02	7.562E-06	3.034E-06	.4012
2.000E-03	1.267E+02	1.178E+02	2.444E+02	9.651E-06	4.073E-06	.4220
2.500E-03	1.427E+02	1.109E+02	2.536E+02	1.166E-05	5.129E-06	.4399
3.000E-03	1.573E+02	1.049E+02	2.622E+02	1.360E-05	6.198E-06	.4558
4.000E-03	1.835E+02	9.494E+01	2.784E+02	1.730E-05	8.355E-06	.4830
5.000E-03	2.067E+02	8.698E+01	2.937E+02	2.079E-05	1.052E-05	.5058
6.000E-03	2.279E+02	8.047E+01	3.084E+02	2.411E-05	1.267E-05	.5255
7.000E-03	2.475E+02	7.501E+01	3.225E+02	2.728E-05	1.481E-05	.5427
8.000E-03	2.659E+02	7.036E+01	3.362E+02	3.032E-05	1.692E-05	.5580
9.000E-03	2.832E+02	6.635E+01	3.495E+02	3.324E-05	1.900E-05	.5717
1.000E-02	2.996E+02	6.283E+01	3.625E+02	3.605E-05	2.106E-05	.5841
1.250E-02	3.377E+02	5.568E+01	3.933E+02	4.266E-05	2.606E-05	.6108
1.500E-02	3.723E+02	5.018E+01	4.225E+02	4.879E-05	3.087E-05	.6327
1.750E-02	4.043E+02	4.579E+01	4.501E+02	5.452E-05	3.550E-05	.6511
2.000E-02	4.343E+02	4.220E+01	4.765E+02	5.992E-05	3.996E-05	.6670
2.250E-02	4.626E+02	3.919E+01	5.018E+02	6.503E-05	4.427E-05	.6808
2.500E-02	4.894E+02	3.663E+01	5.260E+02	6.989E-05	4.843E-05	.6930
2.750E-02	5.150E+02	3.443E+01	5.494E+02	7.454E-05	5.247E-05	.7038
3.000E-02	5.395E+02	3.250E+01	5.720E+02	7.900E-05	5.638E-05	.7136
3.500E-02	5.858E+02	2.929E+01	6.150E+02	8.743E-05	6.387E-05	.7305
4.000E-02	6.290E+02	2.672E+01	6.557E+02	9.530E-05	7.097E-05	.7447
4.500E-02	6.696E+02	2.461E+01	6.942E+02	1.027E-04	7.774E-05	.7569
5.000E-02	7.081E+02	2.284E+01	7.310E+02	1.097E-04	8.420E-05	.7674
5.500E-02	7.448E+02	2.133E+01	7.661E+02	1.164E-04	9.041E-05	.7767
6.000E-02	7.798E+02	2.002E+01	7.998E+02	1.228E-04	9.638E-05	.7850
6.500E-02	8.134E+02	1.888E+01	8.323E+02	1.289E-04	1.021E-04	.7923
7.000E-02	8.457E+02	1.788E+01	8.636E+02	1.348E-04	1.077E-04	.7990
7.500E-02	8.768E+02	1.699E+01	8.938E+02	1.405E-04	1.131E-04	.8051
8.000E-02	9.068E+02	1.619E+01	9.230E+02	1.460E-04	1.184E-04	.8107
8.500E-02	9.359E+02	1.547E+01	9.514E+02	1.513E-04	1.235E-04	.8158
9.000E-02	9.640E+02	1.482E+01	9.788E+02	1.565E-04	1.284E-04	.8205
9.500E-02	9.913E+02	1.422E+01	1.006E+03	1.616E-04	1.333E-04	.8248
1.000E-01	1.018E+03	1.368E+01	1.031E+03	1.665E-04	1.380E-04	.8289
1.250E-01	1.140E+03	1.152E+01	1.151E+03	1.894E-04	1.602E-04	.8457
1.500E-01	1.247E+03	9.991E+00	1.257E+03	2.101E-04	1.804E-04	.8585
1.750E-01	1.343E+03	8.848E+00	1.352E+03	2.293E-04	1.991E-04	.8685
2.000E-01	1.429E+03	7.956E+00	1.437E+03	2.472E-04	2.167E-04	.8768
2.250E-01	1.506E+03	7.240E+00	1.513E+03	2.642E-04	2.334E-04	.8837
2.500E-01	1.575E+03	6.651E+00	1.582E+03	2.803E-04	2.494E-04	.8896
2.750E-01	1.637E+03	6.157E+00	1.643E+03	2.958E-04	2.647E-04	.8948
3.000E-01	1.693E+03	5.736E+00	1.698E+03	3.108E-04	2.795E-04	.8993

3.500E-01	1.787E+03	5.057E+00	1.792E+03	3.394E-04	3.078E-04	.9070
4.000E-01	1.861E+03	4.531E+00	1.866E+03	3.667E-04	3.350E-04	.9134
4.500E-01	1.918E+03	4.111E+00	1.923E+03	3.931E-04	3.612E-04	.9187
5.000E-01	1.961E+03	3.767E+00	1.964E+03	4.188E-04	3.867E-04	.9234
5.500E-01	1.990E+03	3.479E+00	1.993E+03	4.441E-04	4.118E-04	.9274
6.000E-01	2.008E+03	3.235E+00	2.012E+03	4.690E-04	4.367E-04	.9310
6.500E-01	2.017E+03	3.025E+00	2.020E+03	4.938E-04	4.614E-04	.9343
7.000E-01	2.019E+03	2.843E+00	2.021E+03	5.186E-04	4.860E-04	.9372
7.500E-01	2.013E+03	2.682E+00	2.016E+03	5.433E-04	5.107E-04	.9399
8.000E-01	2.002E+03	2.540E+00	2.005E+03	5.682E-04	5.355E-04	.9424
8.500E-01	1.987E+03	2.413E+00	1.989E+03	5.932E-04	5.604E-04	.9447
9.000E-01	1.968E+03	2.299E+00	1.970E+03	6.185E-04	5.856E-04	.9469
9.500E-01	1.946E+03	2.196E+00	1.948E+03	6.440E-04	6.111E-04	.9488
1.000E+00	1.922E+03	2.103E+00	1.924E+03	6.698E-04	6.368E-04	.9507
1.250E+00	1.774E+03	1.738E+00	1.776E+03	8.049E-04	7.716E-04	.9586
1.500E+00	1.625E+03	1.487E+00	1.626E+03	9.520E-04	9.184E-04	.9647
1.750E+00	1.494E+03	1.302E+00	1.495E+03	1.112E-03	1.079E-03	.9696
2.000E+00	1.382E+03	1.160E+00	1.383E+03	1.287E-03	1.252E-03	.9735
2.250E+00	1.287E+03	1.048E+00	1.288E+03	1.474E-03	1.440E-03	.9767
2.500E+00	1.205E+03	9.560E-01	1.206E+03	1.675E-03	1.640E-03	.9793
2.750E+00	1.133E+03	8.799E-01	1.134E+03	1.889E-03	1.854E-03	.9816
3.000E+00	1.072E+03	8.157E-01	1.072E+03	2.116E-03	2.080E-03	.9834
3.500E+00	9.686E+02	7.129E-01	9.693E+02	2.607E-03	2.571E-03	.9863
4.000E+00	8.859E+02	6.341E-01	8.865E+02	3.147E-03	3.111E-03	.9885
4.500E+00	8.180E+02	5.718E-01	8.186E+02	3.734E-03	3.698E-03	.9902
5.000E+00	7.607E+02	5.211E-01	7.612E+02	4.368E-03	4.331E-03	.9915
5.500E+00	7.117E+02	4.791E-01	7.122E+02	5.048E-03	5.010E-03	.9925
6.000E+00	6.696E+02	4.436E-01	6.700E+02	5.772E-03	5.734E-03	.9934
6.500E+00	6.327E+02	4.133E-01	6.331E+02	6.540E-03	6.501E-03	.9940
7.000E+00	6.002E+02	3.870E-01	6.005E+02	7.351E-03	7.312E-03	.9946
7.500E+00	5.712E+02	3.640E-01	5.716E+02	8.205E-03	8.165E-03	.9951
8.000E+00	5.453E+02	3.437E-01	5.456E+02	9.100E-03	9.060E-03	.9955
8.500E+00	5.219E+02	3.257E-01	5.222E+02	1.004E-02	9.996E-03	.9959
9.000E+00	5.006E+02	3.095E-01	5.009E+02	1.102E-02	1.097E-02	.9962
9.500E+00	4.812E+02	2.949E-01	4.815E+02	1.203E-02	1.199E-02	.9964
1.000E+01	4.634E+02	2.817E-01	4.637E+02	1.309E-02	1.305E-02	.9967
1.250E+01	3.926E+02	2.308E-01	3.929E+02	1.897E-02	1.893E-02	.9975
1.500E+01	3.423E+02	1.959E-01	3.425E+02	2.581E-02	2.576E-02	.9980
1.750E+01	3.044E+02	1.705E-01	3.046E+02	3.356E-02	3.351E-02	.9983
2.000E+01	2.747E+02	1.511E-01	2.748E+02	4.222E-02	4.216E-02	.9985
2.500E+01	2.309E+02	1.234E-01	2.311E+02	6.214E-02	6.207E-02	.9988
2.750E+01	2.143E+02	1.131E-01	2.144E+02	7.338E-02	7.330E-02	.9989
3.000E+01	2.001E+02	1.045E-01	2.002E+02	8.546E-02	8.537E-02	.9990
3.500E+01	1.771E+02	9.074E-02	1.772E+02	1.121E-01	1.120E-01	.9991
4.000E+01	1.593E+02	8.026E-02	1.593E+02	1.419E-01	1.417E-01	.9992
4.500E+01	1.449E+02	7.201E-02	1.450E+02	1.748E-01	1.747E-01	.9992
5.000E+01	1.332E+02	6.533E-02	1.333E+02	2.108E-01	2.106E-01	.9993
5.500E+01	1.234E+02	5.981E-02	1.234E+02	2.498E-01	2.496E-01	.9993
6.000E+01	1.150E+02	5.516E-02	1.151E+02	2.918E-01	2.916E-01	.9993
6.500E+01	1.078E+02	5.119E-02	1.079E+02	3.367E-01	3.365E-01	.9994
7.000E+01	1.016E+02	4.776E-02	1.016E+02	3.845E-01	3.842E-01	.9994
7.500E+01	9.607E+01	4.477E-02	9.612E+01	4.351E-01	4.348E-01	.9994
8.000E+01	9.119E+01	4.215E-02	9.123E+01	4.885E-01	4.882E-01	.9994
8.500E+01	8.683E+01	3.982E-02	8.687E+01	5.447E-01	5.444E-01	.9994
9.000E+01	8.291E+01	3.774E-02	8.295E+01	6.036E-01	6.033E-01	.9994
9.500E+01	7.936E+01	3.587E-02	7.940E+01	6.652E-01	6.649E-01	.9994
1.000E+02	7.614E+01	3.418E-02	7.618E+01	7.295E-01	7.291E-01	.9994

1.250E+02	6.360E+01	2.767E-02	6.363E+01	1.090E+00	1.090E+00	.9995
1.500E+02	5.493E+01	2.324E-02	5.496E+01	1.514E+00	1.514E+00	.9995
1.750E+02	4.857E+01	2.004E-02	4.859E+01	1.999E+00	1.998E+00	.9995
2.000E+02	4.368E+01	1.763E-02	4.370E+01	2.543E+00	2.542E+00	.9995
2.250E+02	3.981E+01	1.573E-02	3.983E+01	3.143E+00	3.141E+00	.9995
2.500E+02	3.666E+01	1.421E-02	3.668E+01	3.798E+00	3.796E+00	.9995
2.750E+02	3.405E+01	1.296E-02	3.406E+01	4.506E+00	4.504E+00	.9996
3.000E+02	3.184E+01	1.191E-02	3.185E+01	5.265E+00	5.263E+00	.9996
3.500E+02	2.832E+01	1.025E-02	2.833E+01	6.933E+00	6.930E+00	.9996
4.000E+02	2.563E+01	8.987E-03	2.564E+01	8.791E+00	8.788E+00	.9996
4.500E+02	2.351E+01	8.005E-03	2.352E+01	1.083E+01	1.083E+01	.9996
5.000E+02	2.179E+01	7.219E-03	2.179E+01	1.304E+01	1.304E+01	.9996
5.500E+02	2.036E+01	6.574E-03	2.037E+01	1.542E+01	1.541E+01	.9996
6.000E+02	1.917E+01	6.034E-03	1.917E+01	1.795E+01	1.794E+01	.9996
6.500E+02	1.815E+01	5.574E-03	1.815E+01	2.063E+01	2.062E+01	.9996
7.000E+02	1.727E+01	5.177E-03	1.727E+01	2.345E+01	2.345E+01	.9996
7.500E+02	1.650E+01	4.833E-03	1.651E+01	2.642E+01	2.641E+01	.9996
8.000E+02	1.583E+01	4.533E-03	1.583E+01	2.951E+01	2.950E+01	.9996
8.500E+02	1.523E+01	4.269E-03	1.524E+01	3.273E+01	3.272E+01	.9996
9.000E+02	1.470E+01	4.035E-03	1.470E+01	3.607E+01	3.606E+01	.9997
9.500E+02	1.422E+01	3.824E-03	1.422E+01	3.953E+01	3.952E+01	.9997
1.000E+03	1.379E+01	3.635E-03	1.379E+01	4.310E+01	4.309E+01	.9997

ALPHA PARTICLE STOPPING POWER AND RANGE

WATER, LIQUID

T = alpha particle (helium ion) kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP(e)	STOP(n)	STOP(t)	RANGE(c)	RANGE(p)	DETOUR
1.000E-03	9.891E+01	2.282E+02	3.271E+02	3.273E-06	1.706E-06	.5212
1.500E-03	1.227E+02	2.078E+02	3.305E+02	4.789E-06	2.569E-06	.5364
2.000E-03	1.431E+02	1.912E+02	3.342E+02	6.294E-06	3.463E-06	.5501
2.500E-03	1.611E+02	1.775E+02	3.386E+02	7.781E-06	4.376E-06	.5625
3.000E-03	1.775E+02	1.660E+02	3.435E+02	9.247E-06	5.305E-06	.5737
4.000E-03	2.069E+02	1.477E+02	3.546E+02	1.211E-05	7.188E-06	.5934
5.000E-03	2.330E+02	1.336E+02	3.667E+02	1.489E-05	9.084E-06	.6102
6.000E-03	2.568E+02	1.225E+02	3.793E+02	1.757E-05	1.098E-05	.6250
7.000E-03	2.788E+02	1.133E+02	3.921E+02	2.016E-05	1.286E-05	.6380
8.000E-03	2.993E+02	1.056E+02	4.049E+02	2.267E-05	1.473E-05	.6497
9.000E-03	3.186E+02	9.908E+01	4.177E+02	2.510E-05	1.658E-05	.6603
1.000E-02	3.370E+02	9.341E+01	4.304E+02	2.746E-05	1.840E-05	.6700
1.250E-02	3.795E+02	8.206E+01	4.615E+02	3.307E-05	2.284E-05	.6908
1.500E-02	4.181E+02	7.347E+01	4.916E+02	3.831E-05	2.713E-05	.7080
1.750E-02	4.538E+02	6.671E+01	5.205E+02	4.325E-05	3.126E-05	.7226
2.000E-02	4.871E+02	6.123E+01	5.484E+02	4.793E-05	3.524E-05	.7352
2.250E-02	5.186E+02	5.667E+01	5.752E+02	5.238E-05	3.909E-05	.7462
2.500E-02	5.483E+02	5.282E+01	6.012E+02	5.663E-05	4.281E-05	.7559
2.750E-02	5.767E+02	4.952E+01	6.263E+02	6.071E-05	4.641E-05	.7646
3.000E-02	6.039E+02	4.665E+01	6.506E+02	6.462E-05	4.991E-05	.7724
3.500E-02	6.552E+02	4.189E+01	6.971E+02	7.204E-05	5.662E-05	.7859
4.000E-02	7.030E+02	3.811E+01	7.411E+02	7.900E-05	6.299E-05	.7973
4.500E-02	7.480E+02	3.501E+01	7.830E+02	8.556E-05	6.905E-05	.8071
5.000E-02	7.905E+02	3.242E+01	8.230E+02	9.179E-05	7.486E-05	.8155
5.500E-02	8.310E+02	3.023E+01	8.612E+02	9.772E-05	8.043E-05	.8230
6.000E-02	8.696E+02	2.834E+01	8.980E+02	1.034E-04	8.579E-05	.8296
6.500E-02	9.066E+02	2.669E+01	9.333E+02	1.089E-04	9.097E-05	.8356
7.000E-02	9.422E+02	2.524E+01	9.674E+02	1.141E-04	9.597E-05	.8409
7.500E-02	9.764E+02	2.396E+01	1.000E+03	1.192E-04	1.008E-04	.8458
8.000E-02	1.009E+03	2.281E+01	1.032E+03	1.241E-04	1.055E-04	.8503
8.500E-02	1.041E+03	2.178E+01	1.063E+03	1.289E-04	1.101E-04	.8544
9.000E-02	1.072E+03	2.084E+01	1.093E+03	1.335E-04	1.146E-04	.8581
9.500E-02	1.102E+03	1.999E+01	1.122E+03	1.381E-04	1.190E-04	.8616
1.000E-01	1.131E+03	1.921E+01	1.151E+03	1.425E-04	1.232E-04	.8649
1.250E-01	1.265E+03	1.614E+01	1.281E+03	1.630E-04	1.432E-04	.8784
1.500E-01	1.383E+03	1.397E+01	1.397E+03	1.817E-04	1.614E-04	.8886
1.750E-01	1.488E+03	1.235E+01	1.500E+03	1.989E-04	1.784E-04	.8966
2.000E-01	1.582E+03	1.109E+01	1.593E+03	2.151E-04	1.943E-04	.9032
2.250E-01	1.666E+03	1.008E+01	1.677E+03	2.304E-04	2.094E-04	.9088
2.500E-01	1.743E+03	9.253E+00	1.752E+03	2.450E-04	2.238E-04	.9135
2.750E-01	1.811E+03	8.559E+00	1.820E+03	2.590E-04	2.376E-04	.9176

3.000E-01	1.873E+03	7.969E+00	1.881E+03	2.725E-04	2.510E-04	.9212
3.500E-01	1.978E+03	7.017E+00	1.985E+03	2.983E-04	2.766E-04	.9273
4.000E-01	2.062E+03	6.282E+00	2.069E+03	3.230E-04	3.011E-04	.9323
4.500E-01	2.128E+03	5.694E+00	2.134E+03	3.467E-04	3.247E-04	.9366
5.000E-01	2.178E+03	5.214E+00	2.184E+03	3.699E-04	3.478E-04	.9402
5.500E-01	2.215E+03	4.813E+00	2.220E+03	3.926E-04	3.704E-04	.9434
6.000E-01	2.240E+03	4.473E+00	2.245E+03	4.150E-04	3.927E-04	.9462
6.500E-01	2.255E+03	4.181E+00	2.260E+03	4.372E-04	4.148E-04	.9488
7.000E-01	2.262E+03	3.927E+00	2.266E+03	4.593E-04	4.368E-04	.9511
7.500E-01	2.262E+03	3.703E+00	2.266E+03	4.813E-04	4.588E-04	.9532
8.000E-01	2.256E+03	3.506E+00	2.260E+03	5.034E-04	4.808E-04	.9551
8.500E-01	2.245E+03	3.330E+00	2.248E+03	5.256E-04	5.029E-04	.9569
9.000E-01	2.230E+03	3.171E+00	2.233E+03	5.479E-04	5.252E-04	.9585
9.500E-01	2.211E+03	3.028E+00	2.215E+03	5.704E-04	5.476E-04	.9601
1.000E+00	2.190E+03	2.898E+00	2.193E+03	5.931E-04	5.702E-04	.9615
1.250E+00	2.050E+03	2.393E+00	2.052E+03	7.107E-04	6.876E-04	.9675
1.500E+00	1.896E+03	2.045E+00	1.898E+03	8.374E-04	8.141E-04	.9722
1.750E+00	1.752E+03	1.790E+00	1.754E+03	9.744E-04	9.509E-04	.9759
2.000E+00	1.624E+03	1.594E+00	1.625E+03	1.123E-03	1.099E-03	.9789
2.250E+00	1.511E+03	1.439E+00	1.512E+03	1.282E-03	1.258E-03	.9814
2.500E+00	1.414E+03	1.312E+00	1.415E+03	1.453E-03	1.429E-03	.9835
2.750E+00	1.329E+03	1.207E+00	1.330E+03	1.635E-03	1.611E-03	.9852
3.000E+00	1.255E+03	1.119E+00	1.257E+03	1.829E-03	1.804E-03	.9867
3.500E+00	1.132E+03	9.770E-01	1.133E+03	2.249E-03	2.224E-03	.9890
4.000E+00	1.034E+03	8.686E-01	1.035E+03	2.711E-03	2.686E-03	.9907
4.500E+00	9.527E+02	7.828E-01	9.535E+02	3.215E-03	3.189E-03	.9921
5.000E+00	8.848E+02	7.132E-01	8.855E+02	3.759E-03	3.733E-03	.9931
5.500E+00	8.269E+02	6.554E-01	8.275E+02	4.344E-03	4.318E-03	.9939
6.000E+00	7.771E+02	6.066E-01	7.777E+02	4.967E-03	4.941E-03	.9946
6.500E+00	7.334E+02	5.649E-01	7.340E+02	5.630E-03	5.602E-03	.9952
7.000E+00	6.949E+02	5.288E-01	6.954E+02	6.330E-03	6.302E-03	.9956
7.500E+00	6.607E+02	4.973E-01	6.612E+02	7.067E-03	7.039E-03	.9960
8.000E+00	6.301E+02	4.694E-01	6.306E+02	7.842E-03	7.813E-03	.9963
8.500E+00	6.025E+02	4.447E-01	6.030E+02	8.653E-03	8.624E-03	.9966
9.000E+00	5.776E+02	4.225E-01	5.780E+02	9.500E-03	9.471E-03	.9969
9.500E+00	5.548E+02	4.025E-01	5.552E+02	1.038E-02	1.035E-02	.9971
1.000E+01	5.340E+02	3.844E-01	5.344E+02	1.130E-02	1.127E-02	.9973
1.250E+01	4.514E+02	3.145E-01	4.517E+02	1.641E-02	1.638E-02	.9979
1.500E+01	3.927E+02	2.667E-01	3.930E+02	2.236E-02	2.232E-02	.9983
1.750E+01	3.487E+02	2.319E-01	3.489E+02	2.913E-02	2.909E-02	.9986
2.000E+01	3.144E+02	2.054E-01	3.146E+02	3.668E-02	3.664E-02	.9988
2.500E+01	2.639E+02	1.676E-01	2.641E+02	5.411E-02	5.405E-02	.9990
2.750E+01	2.448E+02	1.535E-01	2.449E+02	6.394E-02	6.389E-02	.9991
3.000E+01	2.284E+02	1.417E-01	2.286E+02	7.452E-02	7.446E-02	.9992
3.500E+01	2.020E+02	1.229E-01	2.021E+02	9.783E-02	9.776E-02	.9992
4.000E+01	1.815E+02	1.087E-01	1.816E+02	1.240E-01	1.239E-01	.9993
4.500E+01	1.651E+02	9.743E-02	1.652E+02	1.529E-01	1.528E-01	.9993
5.000E+01	1.516E+02	8.833E-02	1.517E+02	1.845E-01	1.844E-01	.9994
5.500E+01	1.404E+02	8.081E-02	1.405E+02	2.188E-01	2.186E-01	.9994
6.000E+01	1.308E+02	7.448E-02	1.309E+02	2.557E-01	2.555E-01	.9994
6.500E+01	1.226E+02	6.909E-02	1.227E+02	2.951E-01	2.950E-01	.9994
7.000E+01	1.155E+02	6.443E-02	1.155E+02	3.372E-01	3.370E-01	.9995
7.500E+01	1.092E+02	6.037E-02	1.092E+02	3.817E-01	3.815E-01	.9995
8.000E+01	1.036E+02	5.679E-02	1.037E+02	4.287E-01	4.285E-01	.9995
8.500E+01	9.863E+01	5.363E-02	9.869E+01	4.781E-01	4.779E-01	.9995
9.000E+01	9.416E+01	5.080E-02	9.421E+01	5.300E-01	5.297E-01	.9995
9.500E+01	9.012E+01	4.827E-02	9.017E+01	5.843E-01	5.840E-01	.9995

1.000E+02	8.645E+01	4.598E-02	8.649E+01	6.409E-01	6.406E-01	.9995
1.250E+02	7.215E+01	3.718E-02	7.219E+01	9.588E-01	9.584E-01	.9995
1.500E+02	6.229E+01	3.121E-02	6.232E+01	1.333E+00	1.332E+00	.9996
1.750E+02	5.505E+01	2.689E-02	5.508E+01	1.760E+00	1.760E+00	.9996
2.000E+02	4.950E+01	2.362E-02	4.952E+01	2.240E+00	2.239E+00	.9996
2.250E+02	4.510E+01	2.108E-02	4.512E+01	2.770E+00	2.768E+00	.9996
2.500E+02	4.152E+01	1.903E-02	4.154E+01	3.348E+00	3.346E+00	.9996
2.750E+02	3.855E+01	1.734E-02	3.857E+01	3.973E+00	3.971E+00	.9996
3.000E+02	3.604E+01	1.593E-02	3.606E+01	4.644E+00	4.642E+00	.9996
3.500E+02	3.205E+01	1.370E-02	3.206E+01	6.118E+00	6.115E+00	.9996
4.000E+02	2.900E+01	1.201E-02	2.901E+01	7.760E+00	7.757E+00	.9996
4.500E+02	2.659E+01	1.069E-02	2.660E+01	9.562E+00	9.559E+00	.9996
5.000E+02	2.464E+01	9.637E-03	2.465E+01	1.152E+01	1.151E+01	.9997
5.500E+02	2.302E+01	8.773E-03	2.303E+01	1.362E+01	1.361E+01	.9997
6.000E+02	2.167E+01	8.053E-03	2.168E+01	1.586E+01	1.585E+01	.9997
6.500E+02	2.051E+01	7.441E-03	2.052E+01	1.823E+01	1.822E+01	.9997
7.000E+02	1.952E+01	6.914E-03	1.952E+01	2.073E+01	2.072E+01	.9997
7.500E+02	1.865E+01	6.455E-03	1.865E+01	2.335E+01	2.334E+01	.9997
8.000E+02	1.788E+01	6.052E-03	1.789E+01	2.609E+01	2.608E+01	.9997
8.500E+02	1.721E+01	5.697E-03	1.721E+01	2.894E+01	2.893E+01	.9997
9.000E+02	1.660E+01	5.382E-03	1.661E+01	3.190E+01	3.189E+01	.9997
9.500E+02	1.606E+01	5.101E-03	1.607E+01	3.496E+01	3.495E+01	.9997
1.000E+03	1.557E+01	4.848E-03	1.558E+01	3.812E+01	3.811E+01	.9997

ALPHA PARTICLE STOPPING POWER AND RANGE

SODIUM IODIDE

T = alpha particle (helium ion) kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	3.586E+01	2.248E+01	5.834E+01	2.512E-05	4.192E-06	.1669
1.500E-03	4.419E+01	2.264E+01	6.683E+01	3.306E-05	5.850E-06	.1770
2.000E-03	5.124E+01	2.245E+01	7.369E+01	4.017E-05	7.478E-06	.1862
2.500E-03	5.748E+01	2.211E+01	7.959E+01	4.669E-05	9.085E-06	.1946
3.000E-03	6.313E+01	2.173E+01	8.486E+01	5.277E-05	1.068E-05	.2024
4.000E-03	7.321E+01	2.092E+01	9.413E+01	6.394E-05	1.385E-05	.2166
5.000E-03	8.212E+01	2.014E+01	1.023E+02	7.413E-05	1.700E-05	.2293
6.000E-03	9.020E+01	1.941E+01	1.096E+02	8.357E-05	2.014E-05	.2410
7.000E-03	9.764E+01	1.874E+01	1.164E+02	9.241E-05	2.326E-05	.2517
8.000E-03	1.046E+02	1.813E+01	1.227E+02	1.008E-04	2.638E-05	.2617
9.000E-03	1.111E+02	1.757E+01	1.287E+02	1.087E-04	2.948E-05	.2711
1.000E-02	1.173E+02	1.705E+01	1.344E+02	1.163E-04	3.257E-05	.2800
1.250E-02	1.316E+02	1.591E+01	1.475E+02	1.341E-04	4.023E-05	.3001
1.500E-02	1.445E+02	1.495E+01	1.595E+02	1.504E-04	4.781E-05	.3180
1.750E-02	1.564E+02	1.413E+01	1.706E+02	1.655E-04	5.529E-05	.3341
2.000E-02	1.676E+02	1.342E+01	1.810E+02	1.797E-04	6.268E-05	.3487
2.250E-02	1.780E+02	1.279E+01	1.908E+02	1.932E-04	6.997E-05	.3622
2.500E-02	1.879E+02	1.223E+01	2.001E+02	2.060E-04	7.717E-05	.3746
2.750E-02	1.973E+02	1.174E+01	2.091E+02	2.182E-04	8.427E-05	.3862
3.000E-02	2.063E+02	1.129E+01	2.176E+02	2.299E-04	9.128E-05	.3970
3.500E-02	2.233E+02	1.050E+01	2.338E+02	2.521E-04	1.050E-04	.4167
4.000E-02	2.391E+02	9.842E+00	2.489E+02	2.728E-04	1.185E-04	.4343
4.500E-02	2.539E+02	9.275E+00	2.632E+02	2.923E-04	1.316E-04	.4501
5.000E-02	2.680E+02	8.782E+00	2.767E+02	3.108E-04	1.444E-04	.4645
5.500E-02	2.813E+02	8.347E+00	2.896E+02	3.285E-04	1.569E-04	.4776
6.000E-02	2.940E+02	7.961E+00	3.020E+02	3.454E-04	1.692E-04	.4897
6.500E-02	3.062E+02	7.615E+00	3.138E+02	3.616E-04	1.812E-04	.5010
7.000E-02	3.179E+02	7.302E+00	3.252E+02	3.773E-04	1.929E-04	.5114
7.500E-02	3.292E+02	7.019E+00	3.362E+02	3.924E-04	2.045E-04	.5211
8.000E-02	3.401E+02	6.760E+00	3.468E+02	4.070E-04	2.158E-04	.5303
8.500E-02	3.506E+02	6.522E+00	3.571E+02	4.212E-04	2.270E-04	.5389
9.000E-02	3.608E+02	6.304E+00	3.671E+02	4.350E-04	2.379E-04	.5469
9.500E-02	3.706E+02	6.101E+00	3.767E+02	4.485E-04	2.487E-04	.5546
1.000E-01	3.802E+02	5.913E+00	3.862E+02	4.616E-04	2.593E-04	.5618
1.250E-01	4.245E+02	5.143E+00	4.296E+02	5.229E-04	3.101E-04	.5932
1.500E-01	4.635E+02	4.570E+00	4.681E+02	5.786E-04	3.578E-04	.6184
1.750E-01	4.984E+02	4.125E+00	5.026E+02	6.301E-04	4.028E-04	.6393
2.000E-01	5.299E+02	3.768E+00	5.336E+02	6.783E-04	4.457E-04	.6570
2.250E-01	5.582E+02	3.474E+00	5.617E+02	7.240E-04	4.868E-04	.6724
2.500E-01	5.838E+02	3.227E+00	5.871E+02	7.675E-04	5.264E-04	.6860
2.750E-01	6.070E+02	3.016E+00	6.100E+02	8.092E-04	5.648E-04	.6980
3.000E-01	6.278E+02	2.834E+00	6.307E+02	8.495E-04	6.021E-04	.7088

3.500E-01	6.634E+02	2.534E+00	6.659E+02	9.266E-04	6.741E-04	.7275
4.000E-01	6.916E+02	2.297E+00	6.939E+02	1.000E-03	7.434E-04	.7433
4.500E-01	7.134E+02	2.104E+00	7.155E+02	1.071E-03	8.107E-04	.7569
5.000E-01	7.296E+02	1.944E+00	7.315E+02	1.140E-03	8.766E-04	.7689
5.500E-01	7.409E+02	1.809E+00	7.427E+02	1.208E-03	9.416E-04	.7796
6.000E-01	7.481E+02	1.692E+00	7.498E+02	1.275E-03	1.006E-03	.7892
6.500E-01	7.517E+02	1.592E+00	7.533E+02	1.341E-03	1.070E-03	.7979
7.000E-01	7.524E+02	1.503E+00	7.539E+02	1.408E-03	1.134E-03	.8059
7.500E-01	7.507E+02	1.425E+00	7.521E+02	1.474E-03	1.199E-03	.8133
8.000E-01	7.470E+02	1.355E+00	7.483E+02	1.541E-03	1.264E-03	.8202
8.500E-01	7.417E+02	1.292E+00	7.430E+02	1.608E-03	1.329E-03	.8266
9.000E-01	7.351E+02	1.235E+00	7.364E+02	1.675E-03	1.395E-03	.8326
9.500E-01	7.276E+02	1.184E+00	7.288E+02	1.744E-03	1.461E-03	.8382
1.000E+00	7.195E+02	1.136E+00	7.206E+02	1.813E-03	1.529E-03	.8435
1.250E+00	6.644E+02	9.512E-01	6.654E+02	2.173E-03	1.882E-03	.8661
1.500E+00	6.112E+02	8.213E-01	6.120E+02	2.565E-03	2.268E-03	.8840
1.750E+00	5.694E+02	7.246E-01	5.701E+02	2.989E-03	2.685E-03	.8983
2.000E+00	5.383E+02	6.496E-01	5.389E+02	3.441E-03	3.130E-03	.9099
2.250E+00	5.140E+02	5.897E-01	5.146E+02	3.916E-03	3.599E-03	.9193
2.500E+00	4.916E+02	5.405E-01	4.921E+02	4.412E-03	4.091E-03	.9270
2.750E+00	4.721E+02	4.995E-01	4.726E+02	4.931E-03	4.603E-03	.9335
3.000E+00	4.540E+02	4.646E-01	4.545E+02	5.471E-03	5.137E-03	.9391
3.500E+00	4.229E+02	4.085E-01	4.233E+02	6.611E-03	6.266E-03	.9479
4.000E+00	3.937E+02	3.652E-01	3.941E+02	7.836E-03	7.480E-03	.9546
4.500E+00	3.702E+02	3.306E-01	3.705E+02	9.146E-03	8.779E-03	.9599
5.000E+00	3.496E+02	3.025E-01	3.499E+02	1.053E-02	1.016E-02	.9641
5.500E+00	3.314E+02	2.790E-01	3.317E+02	1.200E-02	1.161E-02	.9675
6.000E+00	3.153E+02	2.591E-01	3.156E+02	1.355E-02	1.315E-02	.9704
6.500E+00	3.012E+02	2.420E-01	3.015E+02	1.517E-02	1.476E-02	.9728
7.000E+00	2.885E+02	2.271E-01	2.887E+02	1.687E-02	1.644E-02	.9748
7.500E+00	2.768E+02	2.141E-01	2.770E+02	1.863E-02	1.820E-02	.9766
8.000E+00	2.661E+02	2.026E-01	2.663E+02	2.048E-02	2.003E-02	.9781
8.500E+00	2.563E+02	1.923E-01	2.565E+02	2.239E-02	2.193E-02	.9794
9.000E+00	2.471E+02	1.831E-01	2.473E+02	2.437E-02	2.390E-02	.9805
9.500E+00	2.389E+02	1.748E-01	2.391E+02	2.643E-02	2.594E-02	.9816
1.000E+01	2.315E+02	1.672E-01	2.316E+02	2.856E-02	2.806E-02	.9825
1.250E+01	2.009E+02	1.378E-01	2.010E+02	4.018E-02	3.961E-02	.9859
1.500E+01	1.787E+02	1.177E-01	1.788E+02	5.339E-02	5.275E-02	.9880
1.750E+01	1.616E+02	1.029E-01	1.617E+02	6.812E-02	6.740E-02	.9895
2.000E+01	1.478E+02	9.151E-02	1.479E+02	8.430E-02	8.350E-02	.9905
2.500E+01	1.272E+02	7.523E-02	1.273E+02	1.209E-01	1.199E-01	.9919
2.750E+01	1.192E+02	6.917E-02	1.193E+02	1.412E-01	1.401E-01	.9924
3.000E+01	1.123E+02	6.406E-02	1.123E+02	1.628E-01	1.616E-01	.9928
3.500E+01	1.008E+02	5.589E-02	1.009E+02	2.098E-01	2.085E-01	.9934
4.000E+01	9.177E+01	4.965E-02	9.182E+01	2.619E-01	2.603E-01	.9939
4.500E+01	8.440E+01	4.471E-02	8.445E+01	3.187E-01	3.169E-01	.9942
5.000E+01	7.827E+01	4.070E-02	7.831E+01	3.803E-01	3.782E-01	.9945
5.500E+01	7.308E+01	3.738E-02	7.311E+01	4.464E-01	4.440E-01	.9947
6.000E+01	6.862E+01	3.458E-02	6.865E+01	5.170E-01	5.144E-01	.9949
6.500E+01	6.474E+01	3.218E-02	6.477E+01	5.920E-01	5.891E-01	.9951
7.000E+01	6.133E+01	3.011E-02	6.136E+01	6.714E-01	6.681E-01	.9952
7.500E+01	5.831E+01	2.830E-02	5.834E+01	7.550E-01	7.514E-01	.9953
8.000E+01	5.562E+01	2.671E-02	5.564E+01	8.427E-01	8.389E-01	.9954
8.500E+01	5.319E+01	2.529E-02	5.321E+01	9.347E-01	9.305E-01	.9955
9.000E+01	5.099E+01	2.402E-02	5.102E+01	1.031E+00	1.026E+00	.9956
9.500E+01	4.900E+01	2.287E-02	4.902E+01	1.131E+00	1.126E+00	.9957
1.000E+02	4.717E+01	2.183E-02	4.719E+01	1.235E+00	1.229E+00	.9957

1.250E+02	3.997E+01	1.783E-02	3.999E+01	1.813E+00	1.805E+00	.9960
1.500E+02	3.490E+01	1.510E-02	3.492E+01	2.483E+00	2.474E+00	.9962
1.750E+02	3.112E+01	1.312E-02	3.113E+01	3.243E+00	3.231E+00	.9963
2.000E+02	2.819E+01	1.160E-02	2.820E+01	4.088E+00	4.074E+00	.9964
2.250E+02	2.584E+01	1.041E-02	2.585E+01	5.015E+00	4.998E+00	.9965
2.500E+02	2.391E+01	9.445E-03	2.392E+01	6.022E+00	6.001E+00	.9966
2.750E+02	2.230E+01	8.647E-03	2.231E+01	7.105E+00	7.081E+00	.9967
3.000E+02	2.094E+01	7.977E-03	2.095E+01	8.262E+00	8.235E+00	.9967
3.500E+02	1.874E+01	6.912E-03	1.875E+01	1.079E+01	1.076E+01	.9968
4.000E+02	1.705E+01	6.102E-03	1.706E+01	1.359E+01	1.355E+01	.9969
4.500E+02	1.571E+01	5.465E-03	1.571E+01	1.665E+01	1.660E+01	.9970
5.000E+02	1.461E+01	4.950E-03	1.462E+01	1.995E+01	1.989E+01	.9970
5.500E+02	1.370E+01	4.523E-03	1.371E+01	2.349E+01	2.342E+01	.9971
6.000E+02	1.294E+01	4.166E-03	1.294E+01	2.724E+01	2.716E+01	.9972
6.500E+02	1.228E+01	3.862E-03	1.228E+01	3.121E+01	3.112E+01	.9972
7.000E+02	1.171E+01	3.600E-03	1.172E+01	3.538E+01	3.528E+01	.9972
7.500E+02	1.121E+01	3.372E-03	1.122E+01	3.974E+01	3.963E+01	.9973
8.000E+02	1.078E+01	3.172E-03	1.078E+01	4.429E+01	4.417E+01	.9973
8.500E+02	1.039E+01	2.994E-03	1.039E+01	4.902E+01	4.889E+01	.9974
9.000E+02	1.004E+01	2.835E-03	1.005E+01	5.391E+01	5.377E+01	.9974
9.500E+02	9.731E+00	2.692E-03	9.734E+00	5.897E+01	5.882E+01	.9974
1.000E+03	9.449E+00	2.562E-03	9.452E+00	6.418E+01	6.402E+01	.9975

ALPHA PARTICLE STOPPING POWER AND RANGE

PHOTOGRAPHIC EMULSION

T = alpha particle (helium ion) kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	4.669E+01	5.085E+01	9.754E+01	1.271E-05	3.397E-06	.2673
1.500E-03	5.718E+01	4.832E+01	1.055E+02	1.761E-05	4.835E-06	.2746
2.000E-03	6.606E+01	4.597E+01	1.120E+02	2.221E-05	6.265E-06	.2821
2.500E-03	7.391E+01	4.389E+01	1.178E+02	2.656E-05	7.687E-06	.2895
3.000E-03	8.104E+01	4.204E+01	1.231E+02	3.071E-05	9.106E-06	.2965
4.000E-03	9.375E+01	3.892E+01	1.327E+02	3.853E-05	1.194E-05	.3099
5.000E-03	1.050E+02	3.638E+01	1.414E+02	4.582E-05	1.477E-05	.3222
6.000E-03	1.152E+02	3.426E+01	1.495E+02	5.270E-05	1.758E-05	.3337
7.000E-03	1.247E+02	3.246E+01	1.571E+02	5.922E-05	2.039E-05	.3443
8.000E-03	1.335E+02	3.089E+01	1.644E+02	6.544E-05	2.319E-05	.3543
9.000E-03	1.418E+02	2.952E+01	1.713E+02	7.140E-05	2.597E-05	.3637
1.000E-02	1.496E+02	2.830E+01	1.779E+02	7.713E-05	2.874E-05	.3726
1.250E-02	1.678E+02	2.576E+01	1.936E+02	9.059E-05	3.558E-05	.3928
1.500E-02	1.843E+02	2.375E+01	2.081E+02	1.030E-04	4.231E-05	.4107
1.750E-02	1.996E+02	2.210E+01	2.217E+02	1.147E-04	4.893E-05	.4267
2.000E-02	2.138E+02	2.072E+01	2.346E+02	1.256E-04	5.543E-05	.4412
2.250E-02	2.273E+02	1.954E+01	2.468E+02	1.360E-04	6.182E-05	.4545
2.500E-02	2.400E+02	1.851E+01	2.585E+02	1.459E-04	6.810E-05	.4667
2.750E-02	2.521E+02	1.761E+01	2.698E+02	1.554E-04	7.428E-05	.4780
3.000E-02	2.638E+02	1.681E+01	2.806E+02	1.645E-04	8.035E-05	.4886
3.500E-02	2.857E+02	1.545E+01	3.012E+02	1.817E-04	9.220E-05	.5076
4.000E-02	3.062E+02	1.432E+01	3.205E+02	1.977E-04	1.037E-04	.5243
4.500E-02	3.254E+02	1.338E+01	3.388E+02	2.129E-04	1.148E-04	.5393
5.000E-02	3.436E+02	1.257E+01	3.562E+02	2.273E-04	1.257E-04	.5529
5.500E-02	3.610E+02	1.187E+01	3.728E+02	2.410E-04	1.362E-04	.5652
6.000E-02	3.775E+02	1.125E+01	3.888E+02	2.541E-04	1.465E-04	.5764
6.500E-02	3.934E+02	1.071E+01	4.041E+02	2.668E-04	1.565E-04	.5868
7.000E-02	4.087E+02	1.022E+01	4.189E+02	2.789E-04	1.663E-04	.5964
7.500E-02	4.233E+02	9.782E+00	4.331E+02	2.906E-04	1.759E-04	.6053
8.000E-02	4.375E+02	9.385E+00	4.469E+02	3.020E-04	1.853E-04	.6136
8.500E-02	4.512E+02	9.022E+00	4.602E+02	3.130E-04	1.945E-04	.6213
9.000E-02	4.645E+02	8.691E+00	4.731E+02	3.237E-04	2.035E-04	.6286
9.500E-02	4.773E+02	8.386E+00	4.857E+02	3.342E-04	2.124E-04	.6355
1.000E-01	4.898E+02	8.105E+00	4.979E+02	3.443E-04	2.211E-04	.6420
1.250E-01	5.470E+02	6.968E+00	5.540E+02	3.919E-04	2.625E-04	.6697
1.500E-01	5.973E+02	6.139E+00	6.034E+02	4.351E-04	3.010E-04	.6918
1.750E-01	6.417E+02	5.503E+00	6.472E+02	4.750E-04	3.372E-04	.7099
2.000E-01	6.812E+02	4.999E+00	6.862E+02	5.125E-04	3.717E-04	.7252
2.250E-01	7.163E+02	4.587E+00	7.209E+02	5.480E-04	4.047E-04	.7384
2.500E-01	7.476E+02	4.245E+00	7.519E+02	5.820E-04	4.364E-04	.7499
2.750E-01	7.755E+02	3.954E+00	7.794E+02	6.146E-04	4.671E-04	.7601
3.000E-01	8.002E+02	3.705E+00	8.039E+02	6.462E-04	4.970E-04	.7692

3.500E-01	8.415E+02	3.296E+00	8.448E+02	7.068E-04	5.548E-04	.7849
4.000E-01	8.735E+02	2.976E+00	8.764E+02	7.648E-04	6.105E-04	.7982
4.500E-01	8.978E+02	2.717E+00	9.005E+02	8.211E-04	6.647E-04	.8095
5.000E-01	9.158E+02	2.503E+00	9.183E+02	8.760E-04	7.179E-04	.8195
5.500E-01	9.286E+02	2.323E+00	9.309E+02	9.301E-04	7.704E-04	.8283
6.000E-01	9.371E+02	2.169E+00	9.393E+02	9.836E-04	8.225E-04	.8362
6.500E-01	9.400E+02	2.036E+00	9.420E+02	1.037E-03	8.743E-04	.8434
7.000E-01	9.384E+02	1.919E+00	9.404E+02	1.090E-03	9.262E-04	.8499
7.500E-01	9.338E+02	1.816E+00	9.356E+02	1.143E-03	9.784E-04	.8559
8.000E-01	9.270E+02	1.725E+00	9.287E+02	1.197E-03	1.031E-03	.8615
8.500E-01	9.186E+02	1.643E+00	9.203E+02	1.251E-03	1.084E-03	.8667
9.000E-01	9.092E+02	1.569E+00	9.108E+02	1.305E-03	1.138E-03	.8716
9.500E-01	8.991E+02	1.502E+00	9.006E+02	1.361E-03	1.192E-03	.8761
1.000E+00	8.885E+02	1.440E+00	8.899E+02	1.416E-03	1.247E-03	.8804
1.250E+00	8.337E+02	1.201E+00	8.349E+02	1.706E-03	1.533E-03	.8983
1.500E+00	7.818E+02	1.033E+00	7.828E+02	2.016E-03	1.839E-03	.9121
1.750E+00	7.351E+02	9.095E-01	7.360E+02	2.345E-03	2.165E-03	.9230
2.000E+00	6.937E+02	8.138E-01	6.945E+02	2.695E-03	2.511E-03	.9318
2.250E+00	6.571E+02	7.374E-01	6.578E+02	3.065E-03	2.878E-03	.9390
2.500E+00	6.246E+02	6.750E-01	6.252E+02	3.455E-03	3.265E-03	.9450
2.750E+00	5.955E+02	6.229E-01	5.962E+02	3.865E-03	3.672E-03	.9501
3.000E+00	5.694E+02	5.787E-01	5.700E+02	4.294E-03	4.098E-03	.9544
3.500E+00	5.245E+02	5.078E-01	5.250E+02	5.209E-03	5.007E-03	.9612
4.000E+00	4.872E+02	4.532E-01	4.876E+02	6.198E-03	5.990E-03	.9664
4.500E+00	4.556E+02	4.098E-01	4.560E+02	7.259E-03	7.045E-03	.9705
5.000E+00	4.285E+02	3.745E-01	4.289E+02	8.390E-03	8.170E-03	.9737
5.500E+00	4.049E+02	3.450E-01	4.052E+02	9.590E-03	9.363E-03	.9764
6.000E+00	3.839E+02	3.201E-01	3.842E+02	1.086E-02	1.062E-02	.9785
6.500E+00	3.652E+02	2.987E-01	3.655E+02	1.219E-02	1.195E-02	.9804
7.000E+00	3.486E+02	2.802E-01	3.488E+02	1.359E-02	1.335E-02	.9819
7.500E+00	3.338E+02	2.639E-01	3.341E+02	1.506E-02	1.481E-02	.9832
8.000E+00	3.205E+02	2.496E-01	3.207E+02	1.659E-02	1.633E-02	.9843
8.500E+00	3.083E+02	2.368E-01	3.086E+02	1.818E-02	1.791E-02	.9853
9.000E+00	2.972E+02	2.253E-01	2.974E+02	1.983E-02	1.955E-02	.9862
9.500E+00	2.870E+02	2.149E-01	2.873E+02	2.154E-02	2.126E-02	.9869
1.000E+01	2.778E+02	2.055E-01	2.780E+02	2.331E-02	2.302E-02	.9876
1.250E+01	2.400E+02	1.691E-01	2.402E+02	3.301E-02	3.269E-02	.9901
1.500E+01	2.125E+02	1.441E-01	2.126E+02	4.410E-02	4.373E-02	.9916
1.750E+01	1.914E+02	1.257E-01	1.915E+02	5.651E-02	5.610E-02	.9927
2.000E+01	1.746E+02	1.117E-01	1.747E+02	7.020E-02	6.974E-02	.9934
2.500E+01	1.494E+02	9.167E-02	1.495E+02	1.013E-01	1.007E-01	.9944
2.750E+01	1.396E+02	8.421E-02	1.397E+02	1.186E-01	1.179E-01	.9947
3.000E+01	1.312E+02	7.792E-02	1.313E+02	1.370E-01	1.364E-01	.9950
3.500E+01	1.175E+02	6.788E-02	1.175E+02	1.774E-01	1.766E-01	.9955
4.000E+01	1.066E+02	6.022E-02	1.067E+02	2.221E-01	2.211E-01	.9958
4.500E+01	9.781E+01	5.417E-02	9.786E+01	2.711E-01	2.700E-01	.9960
5.000E+01	9.051E+01	4.926E-02	9.056E+01	3.242E-01	3.230E-01	.9962
5.500E+01	8.434E+01	4.520E-02	8.439E+01	3.815E-01	3.801E-01	.9963
6.000E+01	7.906E+01	4.177E-02	7.910E+01	4.427E-01	4.411E-01	.9965
6.500E+01	7.448E+01	3.885E-02	7.452E+01	5.079E-01	5.061E-01	.9966
7.000E+01	7.046E+01	3.632E-02	7.050E+01	5.769E-01	5.750E-01	.9967
7.500E+01	6.690E+01	3.411E-02	6.694E+01	6.497E-01	6.476E-01	.9967
8.000E+01	6.373E+01	3.216E-02	6.376E+01	7.263E-01	7.239E-01	.9968
8.500E+01	6.089E+01	3.043E-02	6.092E+01	8.065E-01	8.040E-01	.9969
9.000E+01	5.831E+01	2.888E-02	5.834E+01	8.904E-01	8.877E-01	.9969
9.500E+01	5.598E+01	2.749E-02	5.601E+01	9.779E-01	9.749E-01	.9970
1.000E+02	5.385E+01	2.623E-02	5.387E+01	1.069E+00	1.066E+00	.9970

1.250E+02	4.547E+01	2.137E-02	4.549E+01	1.576E+00	1.572E+00	.9972
1.500E+02	3.960E+01	1.806E-02	3.961E+01	2.167E+00	2.161E+00	.9973
1.750E+02	3.524E+01	1.565E-02	3.525E+01	2.837E+00	2.830E+00	.9974
2.000E+02	3.186E+01	1.383E-02	3.187E+01	3.584E+00	3.575E+00	.9975
2.250E+02	2.917E+01	1.239E-02	2.918E+01	4.405E+00	4.394E+00	.9975
2.500E+02	2.696E+01	1.123E-02	2.697E+01	5.297E+00	5.284E+00	.9976
2.750E+02	2.512E+01	1.027E-02	2.513E+01	6.258E+00	6.243E+00	.9976
3.000E+02	2.356E+01	9.464E-03	2.357E+01	7.286E+00	7.269E+00	.9977
3.500E+02	2.106E+01	8.183E-03	2.107E+01	9.534E+00	9.513E+00	.9977
4.000E+02	1.914E+01	7.213E-03	1.914E+01	1.203E+01	1.200E+01	.9978
4.500E+02	1.761E+01	6.450E-03	1.762E+01	1.475E+01	1.472E+01	.9978
5.000E+02	1.637E+01	5.835E-03	1.637E+01	1.770E+01	1.766E+01	.9979
5.500E+02	1.534E+01	5.329E-03	1.534E+01	2.086E+01	2.081E+01	.9979
6.000E+02	1.447E+01	4.904E-03	1.447E+01	2.422E+01	2.417E+01	.9979
6.500E+02	1.373E+01	4.542E-03	1.373E+01	2.776E+01	2.771E+01	.9980
7.000E+02	1.308E+01	4.230E-03	1.309E+01	3.150E+01	3.143E+01	.9980
7.500E+02	1.252E+01	3.959E-03	1.253E+01	3.540E+01	3.533E+01	.9980
8.000E+02	1.203E+01	3.720E-03	1.203E+01	3.947E+01	3.940E+01	.9981
8.500E+02	1.159E+01	3.508E-03	1.160E+01	4.371E+01	4.363E+01	.9981
9.000E+02	1.120E+01	3.320E-03	1.120E+01	4.810E+01	4.801E+01	.9981
9.500E+02	1.085E+01	3.151E-03	1.085E+01	5.263E+01	5.253E+01	.9981
1.000E+03	1.053E+01	2.998E-03	1.053E+01	5.731E+01	5.720E+01	.9982

ALPHA PARTICLE STOPPING POWER AND RANGE

MUSCLE-EQUIVALENT LIQUID (with sucrose)

T = alpha particle (helium ion) kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	1.117E+02	2.209E+02	3.326E+02	3.278E-06	1.696E-06	.5174
1.500E-03	1.375E+02	2.014E+02	3.389E+02	4.763E-06	2.546E-06	.5345
2.000E-03	1.594E+02	1.854E+02	3.448E+02	6.226E-06	3.423E-06	.5498
2.500E-03	1.788E+02	1.722E+02	3.510E+02	7.663E-06	4.317E-06	.5633
3.000E-03	1.965E+02	1.610E+02	3.575E+02	9.075E-06	5.222E-06	.5754
4.000E-03	2.279E+02	1.433E+02	3.712E+02	1.182E-05	7.050E-06	.5965
5.000E-03	2.557E+02	1.298E+02	3.855E+02	1.446E-05	8.884E-06	.6143
6.000E-03	2.810E+02	1.189E+02	4.000E+02	1.701E-05	1.071E-05	.6297
7.000E-03	3.044E+02	1.100E+02	4.144E+02	1.947E-05	1.252E-05	.6433
8.000E-03	3.262E+02	1.026E+02	4.288E+02	2.184E-05	1.431E-05	.6553
9.000E-03	3.467E+02	9.623E+01	4.430E+02	2.413E-05	1.608E-05	.6662
1.000E-02	3.662E+02	9.073E+01	4.569E+02	2.636E-05	1.782E-05	.6761
1.250E-02	4.112E+02	7.971E+01	4.909E+02	3.163E-05	2.206E-05	.6973
1.500E-02	4.520E+02	7.136E+01	5.234E+02	3.656E-05	2.613E-05	.7147
1.750E-02	4.897E+02	6.479E+01	5.545E+02	4.120E-05	3.005E-05	.7294
2.000E-02	5.250E+02	5.946E+01	5.844E+02	4.559E-05	3.383E-05	.7420
2.250E-02	5.581E+02	5.504E+01	6.131E+02	4.977E-05	3.747E-05	.7529
2.500E-02	5.895E+02	5.130E+01	6.408E+02	5.375E-05	4.099E-05	.7626
2.750E-02	6.195E+02	4.809E+01	6.676E+02	5.757E-05	4.441E-05	.7713
3.000E-02	6.481E+02	4.530E+01	6.934E+02	6.125E-05	4.771E-05	.7790
3.500E-02	7.022E+02	4.068E+01	7.428E+02	6.821E-05	5.405E-05	.7924
4.000E-02	7.525E+02	3.700E+01	7.895E+02	7.474E-05	6.006E-05	.8037
4.500E-02	7.999E+02	3.400E+01	8.339E+02	8.090E-05	6.579E-05	.8133
5.000E-02	8.446E+02	3.148E+01	8.761E+02	8.675E-05	7.127E-05	.8216
5.500E-02	8.872E+02	2.935E+01	9.166E+02	9.232E-05	7.653E-05	.8289
6.000E-02	9.279E+02	2.751E+01	9.554E+02	9.767E-05	8.159E-05	.8354
6.500E-02	9.668E+02	2.592E+01	9.927E+02	1.028E-04	8.648E-05	.8412
7.000E-02	1.004E+03	2.451E+01	1.029E+03	1.077E-04	9.120E-05	.8465
7.500E-02	1.040E+03	2.326E+01	1.063E+03	1.125E-04	9.578E-05	.8512
8.000E-02	1.075E+03	2.215E+01	1.097E+03	1.172E-04	1.002E-04	.8556
8.500E-02	1.108E+03	2.114E+01	1.130E+03	1.216E-04	1.046E-04	.8596
9.000E-02	1.141E+03	2.023E+01	1.161E+03	1.260E-04	1.088E-04	.8633
9.500E-02	1.172E+03	1.941E+01	1.192E+03	1.303E-04	1.129E-04	.8667
1.000E-01	1.203E+03	1.865E+01	1.222E+03	1.344E-04	1.169E-04	.8699
1.250E-01	1.343E+03	1.566E+01	1.359E+03	1.538E-04	1.358E-04	.8830
1.500E-01	1.467E+03	1.356E+01	1.480E+03	1.714E-04	1.530E-04	.8929
1.750E-01	1.576E+03	1.199E+01	1.588E+03	1.877E-04	1.690E-04	.9007
2.000E-01	1.674E+03	1.076E+01	1.685E+03	2.029E-04	1.841E-04	.9071
2.250E-01	1.762E+03	9.785E+00	1.772E+03	2.174E-04	1.984E-04	.9124
2.500E-01	1.841E+03	8.981E+00	1.850E+03	2.312E-04	2.120E-04	.9170
2.750E-01	1.912E+03	8.307E+00	1.920E+03	2.445E-04	2.251E-04	.9210
3.000E-01	1.975E+03	7.734E+00	1.982E+03	2.573E-04	2.378E-04	.9245

3.500E-01	2.081E+03	6.810E+00	2.088E+03	2.818E-04	2.622E-04	.9304
4.000E-01	2.165E+03	6.096E+00	2.171E+03	3.053E-04	2.855E-04	.9353
4.500E-01	2.230E+03	5.526E+00	2.235E+03	3.280E-04	3.081E-04	.9394
5.000E-01	2.277E+03	5.059E+00	2.282E+03	3.501E-04	3.301E-04	.9429
5.500E-01	2.310E+03	4.670E+00	2.315E+03	3.718E-04	3.517E-04	.9460
6.000E-01	2.331E+03	4.340E+00	2.336E+03	3.933E-04	3.732E-04	.9487
6.500E-01	2.342E+03	4.057E+00	2.346E+03	4.147E-04	3.944E-04	.9512
7.000E-01	2.344E+03	3.810E+00	2.348E+03	4.360E-04	4.157E-04	.9534
7.500E-01	2.339E+03	3.594E+00	2.343E+03	4.573E-04	4.369E-04	.9554
8.000E-01	2.329E+03	3.402E+00	2.332E+03	4.787E-04	4.582E-04	.9573
8.500E-01	2.313E+03	3.231E+00	2.316E+03	5.002E-04	4.797E-04	.9590
9.000E-01	2.293E+03	3.077E+00	2.296E+03	5.219E-04	5.013E-04	.9606
9.500E-01	2.270E+03	2.938E+00	2.273E+03	5.437E-04	5.232E-04	.9621
1.000E+00	2.244E+03	2.812E+00	2.247E+03	5.659E-04	5.452E-04	.9635
1.250E+00	2.074E+03	2.322E+00	2.077E+03	6.814E-04	6.605E-04	.9694
1.500E+00	1.896E+03	1.984E+00	1.898E+03	8.073E-04	7.863E-04	.9739
1.750E+00	1.739E+03	1.737E+00	1.741E+03	9.449E-04	9.237E-04	.9775
2.000E+00	1.607E+03	1.546E+00	1.608E+03	1.094E-03	1.073E-03	.9804
2.250E+00	1.494E+03	1.396E+00	1.496E+03	1.256E-03	1.234E-03	.9828
2.500E+00	1.398E+03	1.273E+00	1.399E+03	1.429E-03	1.407E-03	.9848
2.750E+00	1.314E+03	1.171E+00	1.316E+03	1.613E-03	1.591E-03	.9864
3.000E+00	1.241E+03	1.085E+00	1.243E+03	1.809E-03	1.787E-03	.9878
3.500E+00	1.120E+03	9.479E-01	1.121E+03	2.233E-03	2.211E-03	.9899
4.000E+00	1.022E+03	8.427E-01	1.023E+03	2.701E-03	2.678E-03	.9915
4.500E+00	9.424E+02	7.595E-01	9.432E+02	3.210E-03	3.187E-03	.9928
5.000E+00	8.753E+02	6.919E-01	8.760E+02	3.761E-03	3.737E-03	.9937
5.500E+00	8.181E+02	6.358E-01	8.188E+02	4.351E-03	4.327E-03	.9945
6.000E+00	7.689E+02	5.885E-01	7.695E+02	4.982E-03	4.957E-03	.9951
6.500E+00	7.258E+02	5.481E-01	7.263E+02	5.651E-03	5.626E-03	.9956
7.000E+00	6.877E+02	5.131E-01	6.882E+02	6.358E-03	6.333E-03	.9960
7.500E+00	6.539E+02	4.824E-01	6.544E+02	7.103E-03	7.078E-03	.9964
8.000E+00	6.237E+02	4.554E-01	6.242E+02	7.886E-03	7.860E-03	.9967
8.500E+00	5.964E+02	4.314E-01	5.969E+02	8.705E-03	8.679E-03	.9969
9.000E+00	5.717E+02	4.099E-01	5.721E+02	9.561E-03	9.534E-03	.9971
9.500E+00	5.492E+02	3.905E-01	5.496E+02	1.045E-02	1.043E-02	.9973
1.000E+01	5.286E+02	3.729E-01	5.290E+02	1.138E-02	1.135E-02	.9975
1.250E+01	4.469E+02	3.051E-01	4.472E+02	1.654E-02	1.651E-02	.9981
1.500E+01	3.888E+02	2.588E-01	3.890E+02	2.255E-02	2.252E-02	.9985
1.750E+01	3.452E+02	2.250E-01	3.454E+02	2.939E-02	2.935E-02	.9987
2.000E+01	3.112E+02	1.993E-01	3.114E+02	3.702E-02	3.698E-02	.9989
2.500E+01	2.612E+02	1.626E-01	2.614E+02	5.462E-02	5.457E-02	.9991
2.750E+01	2.422E+02	1.490E-01	2.424E+02	6.456E-02	6.451E-02	.9991
3.000E+01	2.261E+02	1.375E-01	2.262E+02	7.525E-02	7.519E-02	.9992
3.500E+01	1.999E+02	1.193E-01	2.000E+02	9.880E-02	9.873E-02	.9993
4.000E+01	1.796E+02	1.054E-01	1.797E+02	1.252E-01	1.251E-01	.9993
4.500E+01	1.634E+02	9.452E-02	1.635E+02	1.544E-01	1.543E-01	.9994
5.000E+01	1.500E+02	8.569E-02	1.501E+02	1.864E-01	1.863E-01	.9994
5.500E+01	1.389E+02	7.840E-02	1.390E+02	2.210E-01	2.209E-01	.9994
6.000E+01	1.295E+02	7.226E-02	1.295E+02	2.583E-01	2.582E-01	.9995
6.500E+01	1.213E+02	6.702E-02	1.214E+02	2.982E-01	2.981E-01	.9995
7.000E+01	1.142E+02	6.250E-02	1.143E+02	3.407E-01	3.405E-01	.9995
7.500E+01	1.080E+02	5.856E-02	1.081E+02	3.857E-01	3.855E-01	.9995
8.000E+01	1.025E+02	5.510E-02	1.026E+02	4.332E-01	4.330E-01	.9995
8.500E+01	9.758E+01	5.203E-02	9.763E+01	4.832E-01	4.829E-01	.9995
9.000E+01	9.315E+01	4.929E-02	9.320E+01	5.356E-01	5.354E-01	.9995
9.500E+01	8.915E+01	4.683E-02	8.920E+01	5.905E-01	5.902E-01	.9995
1.000E+02	8.552E+01	4.460E-02	8.556E+01	6.477E-01	6.474E-01	.9995

1.250E+02	7.137E+01	3.607E-02	7.141E+01	9.691E-01	9.686E-01	.9996
1.500E+02	6.161E+01	3.027E-02	6.164E+01	1.347E+00	1.347E+00	.9996
1.750E+02	5.445E+01	2.608E-02	5.448E+01	1.779E+00	1.779E+00	.9996
2.000E+02	4.896E+01	2.291E-02	4.898E+01	2.264E+00	2.263E+00	.9996
2.250E+02	4.460E+01	2.044E-02	4.462E+01	2.800E+00	2.799E+00	.9996
2.500E+02	4.106E+01	1.846E-02	4.108E+01	3.384E+00	3.383E+00	.9996
2.750E+02	3.813E+01	1.682E-02	3.814E+01	4.016E+00	4.015E+00	.9996
3.000E+02	3.565E+01	1.545E-02	3.566E+01	4.695E+00	4.693E+00	.9996
3.500E+02	3.169E+01	1.328E-02	3.171E+01	6.185E+00	6.183E+00	.9996
4.000E+02	2.867E+01	1.165E-02	2.869E+01	7.846E+00	7.843E+00	.9996
4.500E+02	2.629E+01	1.037E-02	2.630E+01	9.668E+00	9.665E+00	.9997
5.000E+02	2.436E+01	9.347E-03	2.437E+01	1.165E+01	1.164E+01	.9997
5.500E+02	2.277E+01	8.508E-03	2.278E+01	1.377E+01	1.376E+01	.9997
6.000E+02	2.143E+01	7.808E-03	2.143E+01	1.603E+01	1.603E+01	.9997
6.500E+02	2.028E+01	7.214E-03	2.029E+01	1.843E+01	1.843E+01	.9997
7.000E+02	1.930E+01	6.703E-03	1.930E+01	2.096E+01	2.095E+01	.9997
7.500E+02	1.844E+01	6.258E-03	1.845E+01	2.361E+01	2.360E+01	.9997
8.000E+02	1.768E+01	5.868E-03	1.769E+01	2.638E+01	2.637E+01	.9997
8.500E+02	1.701E+01	5.525E-03	1.702E+01	2.926E+01	2.925E+01	.9997
9.000E+02	1.642E+01	5.219E-03	1.642E+01	3.225E+01	3.224E+01	.9997
9.500E+02	1.588E+01	4.947E-03	1.589E+01	3.535E+01	3.534E+01	.9997
1.000E+03	1.540E+01	4.701E-03	1.541E+01	3.855E+01	3.853E+01	.9997

ALPHA PARTICLE STOPPING POWER AND RANGE

A-150 TISSUE-EQUIVALENT PLASTIC

T = alpha particle (helium ion) kinetic energy, MeV
STOP(e) = electronic stopping power, MeV cm²/g
STOP(n) = nuclear stopping power, MeV cm²/g
STOP(t) = total stopping power, MeV cm²/g
RANGE(c) = csda range, g/cm²
RANGE(p) = projected range, g/cm²
DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	1.688E+02	2.414E+02	4.102E+02	2.736E-06	1.536E-06	.5615
1.500E-03	2.042E+02	2.189E+02	4.231E+02	3.932E-06	2.288E-06	.5819
2.000E-03	2.338E+02	2.007E+02	4.345E+02	5.098E-06	3.056E-06	.5994
2.500E-03	2.597E+02	1.858E+02	4.455E+02	6.235E-06	3.831E-06	.6144
3.000E-03	2.830E+02	1.733E+02	4.563E+02	7.344E-06	4.609E-06	.6276
4.000E-03	3.243E+02	1.536E+02	4.778E+02	9.485E-06	6.164E-06	.6498
5.000E-03	3.604E+02	1.385E+02	4.990E+02	1.153E-05	7.705E-06	.6681
6.000E-03	3.930E+02	1.266E+02	5.196E+02	1.350E-05	9.227E-06	.6837
7.000E-03	4.228E+02	1.169E+02	5.397E+02	1.538E-05	1.072E-05	.6971
8.000E-03	4.505E+02	1.087E+02	5.592E+02	1.720E-05	1.220E-05	.7088
9.000E-03	4.765E+02	1.018E+02	5.783E+02	1.896E-05	1.364E-05	.7193
1.000E-02	5.010E+02	9.583E+01	5.968E+02	2.066E-05	1.506E-05	.7287
1.250E-02	5.571E+02	8.392E+01	6.411E+02	2.470E-05	1.849E-05	.7485
1.500E-02	6.077E+02	7.495E+01	6.827E+02	2.848E-05	2.177E-05	.7645
1.750E-02	6.541E+02	6.791E+01	7.220E+02	3.204E-05	2.492E-05	.7778
2.000E-02	6.971E+02	6.222E+01	7.593E+02	3.542E-05	2.795E-05	.7891
2.250E-02	7.374E+02	5.751E+01	7.949E+02	3.863E-05	3.086E-05	.7988
2.500E-02	7.754E+02	5.354E+01	8.290E+02	4.171E-05	3.368E-05	.8074
2.750E-02	8.115E+02	5.013E+01	8.616E+02	4.467E-05	3.640E-05	.8149
3.000E-02	8.459E+02	4.718E+01	8.930E+02	4.752E-05	3.905E-05	.8217
3.500E-02	9.103E+02	4.231E+01	9.526E+02	5.294E-05	4.411E-05	.8333
4.000E-02	9.700E+02	3.843E+01	1.008E+03	5.804E-05	4.892E-05	.8429
4.500E-02	1.026E+03	3.527E+01	1.061E+03	6.287E-05	5.351E-05	.8511
5.000E-02	1.078E+03	3.263E+01	1.111E+03	6.747E-05	5.790E-05	.8581
5.500E-02	1.128E+03	3.040E+01	1.158E+03	7.188E-05	6.213E-05	.8643
6.000E-02	1.175E+03	2.848E+01	1.204E+03	7.611E-05	6.620E-05	.8698
6.500E-02	1.220E+03	2.680E+01	1.247E+03	8.019E-05	7.014E-05	.8746
7.000E-02	1.263E+03	2.534E+01	1.289E+03	8.414E-05	7.396E-05	.8790
7.500E-02	1.305E+03	2.403E+01	1.329E+03	8.796E-05	7.767E-05	.8830
8.000E-02	1.344E+03	2.287E+01	1.367E+03	9.167E-05	8.127E-05	.8866
8.500E-02	1.383E+03	2.183E+01	1.404E+03	9.527E-05	8.479E-05	.8899
9.000E-02	1.419E+03	2.088E+01	1.440E+03	9.879E-05	8.822E-05	.8930
9.500E-02	1.455E+03	2.002E+01	1.475E+03	1.022E-04	9.157E-05	.8958
1.000E-01	1.489E+03	1.923E+01	1.509E+03	1.056E-04	9.485E-05	.8984
1.250E-01	1.646E+03	1.613E+01	1.662E+03	1.213E-04	1.103E-04	.9092
1.500E-01	1.782E+03	1.395E+01	1.796E+03	1.358E-04	1.246E-04	.9173
1.750E-01	1.901E+03	1.232E+01	1.913E+03	1.493E-04	1.379E-04	.9237
2.000E-01	2.005E+03	1.106E+01	2.016E+03	1.620E-04	1.505E-04	.9289
2.250E-01	2.097E+03	1.005E+01	2.107E+03	1.741E-04	1.625E-04	.9332
2.500E-01	2.178E+03	9.218E+00	2.187E+03	1.857E-04	1.740E-04	.9369
2.750E-01	2.249E+03	8.523E+00	2.258E+03	1.970E-04	1.852E-04	.9401
3.000E-01	2.312E+03	7.933E+00	2.320E+03	2.079E-04	1.960E-04	.9429

3.500E-01	2.413E+03	6.981E+00	2.420E+03	2.290E-04	2.170E-04	.9477
4.000E-01	2.488E+03	6.246E+00	2.494E+03	2.493E-04	2.372E-04	.9516
4.500E-01	2.539E+03	5.660E+00	2.545E+03	2.692E-04	2.570E-04	.9548
5.000E-01	2.572E+03	5.180E+00	2.577E+03	2.887E-04	2.764E-04	.9576
5.500E-01	2.589E+03	4.780E+00	2.594E+03	3.080E-04	2.957E-04	.9601
6.000E-01	2.593E+03	4.441E+00	2.598E+03	3.273E-04	3.149E-04	.9623
6.500E-01	2.586E+03	4.150E+00	2.590E+03	3.465E-04	3.341E-04	.9642
7.000E-01	2.571E+03	3.897E+00	2.575E+03	3.659E-04	3.534E-04	.9660
7.500E-01	2.548E+03	3.675E+00	2.552E+03	3.854E-04	3.729E-04	.9676
8.000E-01	2.521E+03	3.478E+00	2.524E+03	4.051E-04	3.926E-04	.9691
8.500E-01	2.489E+03	3.303E+00	2.492E+03	4.250E-04	4.125E-04	.9705
9.000E-01	2.453E+03	3.145E+00	2.456E+03	4.452E-04	4.326E-04	.9717
9.500E-01	2.416E+03	3.003E+00	2.419E+03	4.657E-04	4.531E-04	.9729
1.000E+00	2.377E+03	2.874E+00	2.380E+03	4.866E-04	4.739E-04	.9740
1.250E+00	2.176E+03	2.372E+00	2.178E+03	5.963E-04	5.835E-04	.9785
1.500E+00	1.989E+03	2.026E+00	1.991E+03	7.165E-04	7.035E-04	.9819
1.750E+00	1.825E+03	1.772E+00	1.826E+03	8.477E-04	8.346E-04	.9846
2.000E+00	1.683E+03	1.578E+00	1.684E+03	9.903E-04	9.771E-04	.9866
2.250E+00	1.561E+03	1.424E+00	1.562E+03	1.145E-03	1.131E-03	.9883
2.500E+00	1.457E+03	1.298E+00	1.459E+03	1.310E-03	1.297E-03	.9897
2.750E+00	1.369E+03	1.194E+00	1.371E+03	1.487E-03	1.474E-03	.9908
3.000E+00	1.292E+03	1.106E+00	1.294E+03	1.675E-03	1.661E-03	.9918
3.500E+00	1.165E+03	9.659E-01	1.166E+03	2.083E-03	2.069E-03	.9933
4.000E+00	1.062E+03	8.585E-01	1.063E+03	2.532E-03	2.518E-03	.9943
4.500E+00	9.785E+02	7.736E-01	9.793E+02	3.023E-03	3.008E-03	.9952
5.000E+00	9.084E+02	7.046E-01	9.091E+02	3.553E-03	3.538E-03	.9958
5.500E+00	8.488E+02	6.474E-01	8.494E+02	4.123E-03	4.107E-03	.9963
6.000E+00	7.974E+02	5.991E-01	7.980E+02	4.730E-03	4.715E-03	.9967
6.500E+00	7.524E+02	5.579E-01	7.530E+02	5.376E-03	5.360E-03	.9970
7.000E+00	7.129E+02	5.221E-01	7.134E+02	6.058E-03	6.042E-03	.9973
7.500E+00	6.777E+02	4.909E-01	6.781E+02	6.777E-03	6.761E-03	.9975
8.000E+00	6.461E+02	4.634E-01	6.466E+02	7.533E-03	7.516E-03	.9977
8.500E+00	6.177E+02	4.389E-01	6.181E+02	8.324E-03	8.306E-03	.9979
9.000E+00	5.919E+02	4.170E-01	5.923E+02	9.150E-03	9.132E-03	.9980
9.500E+00	5.684E+02	3.972E-01	5.688E+02	1.001E-02	9.994E-03	.9982
1.000E+01	5.470E+02	3.793E-01	5.474E+02	1.091E-02	1.089E-02	.9983
1.250E+01	4.618E+02	3.102E-01	4.621E+02	1.590E-02	1.588E-02	.9987
1.500E+01	4.013E+02	2.629E-01	4.016E+02	2.172E-02	2.170E-02	.9989
1.750E+01	3.560E+02	2.286E-01	3.562E+02	2.834E-02	2.832E-02	.9991
2.000E+01	3.206E+02	2.024E-01	3.208E+02	3.575E-02	3.572E-02	.9992
2.500E+01	2.687E+02	1.650E-01	2.689E+02	5.285E-02	5.281E-02	.9993
2.750E+01	2.490E+02	1.511E-01	2.492E+02	6.252E-02	6.247E-02	.9994
3.000E+01	2.323E+02	1.395E-01	2.324E+02	7.291E-02	7.287E-02	.9994
3.500E+01	2.053E+02	1.210E-01	2.054E+02	9.585E-02	9.579E-02	.9994
4.000E+01	1.843E+02	1.069E-01	1.844E+02	1.216E-01	1.215E-01	.9995
4.500E+01	1.675E+02	9.579E-02	1.676E+02	1.501E-01	1.500E-01	.9995
5.000E+01	1.538E+02	8.682E-02	1.539E+02	1.812E-01	1.811E-01	.9995
5.500E+01	1.423E+02	7.939E-02	1.424E+02	2.150E-01	2.149E-01	.9995
6.000E+01	1.326E+02	7.315E-02	1.326E+02	2.514E-01	2.513E-01	.9996
6.500E+01	1.242E+02	6.783E-02	1.243E+02	2.904E-01	2.903E-01	.9996
7.000E+01	1.169E+02	6.325E-02	1.170E+02	3.319E-01	3.318E-01	.9996
7.500E+01	1.105E+02	5.925E-02	1.106E+02	3.759E-01	3.757E-01	.9996
8.000E+01	1.048E+02	5.574E-02	1.049E+02	4.223E-01	4.222E-01	.9996
8.500E+01	9.978E+01	5.263E-02	9.984E+01	4.712E-01	4.710E-01	.9996
9.000E+01	9.524E+01	4.985E-02	9.529E+01	5.225E-01	5.223E-01	.9996
9.500E+01	9.113E+01	4.735E-02	9.118E+01	5.761E-01	5.759E-01	.9996
1.000E+02	8.740E+01	4.510E-02	8.744E+01	6.322E-01	6.319E-01	.9996

1.250E+02	7.289E+01	3.642E-02	7.293E+01	9.467E-01	9.464E-01	.9996
1.500E+02	6.289E+01	3.055E-02	6.292E+01	1.317E+00	1.317E+00	.9996
1.750E+02	5.555E+01	2.631E-02	5.558E+01	1.741E+00	1.740E+00	.9997
2.000E+02	4.993E+01	2.311E-02	4.995E+01	2.216E+00	2.215E+00	.9997
2.250E+02	4.548E+01	2.062E-02	4.550E+01	2.741E+00	2.740E+00	.9997
2.500E+02	4.186E+01	1.861E-02	4.187E+01	3.314E+00	3.313E+00	.9997
2.750E+02	3.885E+01	1.695E-02	3.887E+01	3.935E+00	3.933E+00	.9997
3.000E+02	3.632E+01	1.556E-02	3.634E+01	4.600E+00	4.599E+00	.9997
3.500E+02	3.228E+01	1.337E-02	3.230E+01	6.063E+00	6.061E+00	.9997
4.000E+02	2.920E+01	1.172E-02	2.921E+01	7.694E+00	7.692E+00	.9997
4.500E+02	2.677E+01	1.044E-02	2.678E+01	9.484E+00	9.481E+00	.9997
5.000E+02	2.480E+01	9.410E-03	2.481E+01	1.143E+01	1.142E+01	.9997
5.500E+02	2.317E+01	8.561E-03	2.318E+01	1.351E+01	1.351E+01	.9997
6.000E+02	2.180E+01	7.852E-03	2.181E+01	1.574E+01	1.573E+01	.9997
6.500E+02	2.064E+01	7.251E-03	2.064E+01	1.810E+01	1.809E+01	.9997
7.000E+02	1.963E+01	6.737E-03	1.964E+01	2.058E+01	2.057E+01	.9997
7.500E+02	1.876E+01	6.292E-03	1.876E+01	2.319E+01	2.318E+01	.9997
8.000E+02	1.799E+01	5.902E-03	1.799E+01	2.591E+01	2.590E+01	.9997
8.500E+02	1.730E+01	5.557E-03	1.731E+01	2.874E+01	2.874E+01	.9997
9.000E+02	1.670E+01	5.249E-03	1.670E+01	3.168E+01	3.168E+01	.9997
9.500E+02	1.615E+01	4.974E-03	1.615E+01	3.473E+01	3.472E+01	.9998
1.000E+03	1.566E+01	4.726E-03	1.566E+01	3.787E+01	3.786E+01	.9998

ALPHA PARTICLE STOPPING POWER AND RANGE

TISSUE-EQUIVALENT GAS (methane-based)

T = alpha particle (helium ion) kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP (e)	STOP (n)	STOP (t)	RANGE (c)	RANGE (p)	DETOUR
1.000E-03	1.351E+02	2.337E+02	3.688E+02	2.985E-06	1.615E-06	.5408
1.500E-03	1.656E+02	2.124E+02	3.779E+02	4.320E-06	2.417E-06	.5595
2.000E-03	1.913E+02	1.950E+02	3.863E+02	5.629E-06	3.241E-06	.5758
2.500E-03	2.139E+02	1.808E+02	3.947E+02	6.910E-06	4.077E-06	.5901
3.000E-03	2.344E+02	1.688E+02	4.032E+02	8.163E-06	4.920E-06	.6027
4.000E-03	2.707E+02	1.499E+02	4.206E+02	1.059E-05	6.613E-06	.6244
5.000E-03	3.028E+02	1.354E+02	4.382E+02	1.292E-05	8.301E-06	.6425
6.000E-03	3.318E+02	1.239E+02	4.557E+02	1.516E-05	9.973E-06	.6580
7.000E-03	3.584E+02	1.145E+02	4.729E+02	1.731E-05	1.162E-05	.6715
8.000E-03	3.832E+02	1.066E+02	4.899E+02	1.939E-05	1.325E-05	.6834
9.000E-03	4.065E+02	9.992E+01	5.065E+02	2.140E-05	1.485E-05	.6941
1.000E-02	4.286E+02	9.413E+01	5.227E+02	2.334E-05	1.643E-05	.7038
1.250E-02	4.793E+02	8.254E+01	5.619E+02	2.795E-05	2.024E-05	.7243
1.500E-02	5.252E+02	7.379E+01	5.990E+02	3.226E-05	2.390E-05	.7410
1.750E-02	5.674E+02	6.692E+01	6.343E+02	3.631E-05	2.742E-05	.7550
2.000E-02	6.067E+02	6.136E+01	6.680E+02	4.015E-05	3.080E-05	.7670
2.250E-02	6.436E+02	5.675E+01	7.003E+02	4.381E-05	3.405E-05	.7773
2.500E-02	6.785E+02	5.285E+01	7.313E+02	4.730E-05	3.720E-05	.7864
2.750E-02	7.117E+02	4.952E+01	7.612E+02	5.065E-05	4.024E-05	.7945
3.000E-02	7.434E+02	4.662E+01	7.900E+02	5.387E-05	4.319E-05	.8018
3.500E-02	8.031E+02	4.183E+01	8.449E+02	5.999E-05	4.884E-05	.8142
4.000E-02	8.586E+02	3.802E+01	8.966E+02	6.573E-05	5.420E-05	.8246
4.500E-02	9.107E+02	3.491E+01	9.457E+02	7.116E-05	5.931E-05	.8335
5.000E-02	9.601E+02	3.231E+01	9.924E+02	7.632E-05	6.420E-05	.8411
5.500E-02	1.007E+03	3.011E+01	1.037E+03	8.125E-05	6.889E-05	.8479
6.000E-02	1.052E+03	2.821E+01	1.080E+03	8.597E-05	7.340E-05	.8538
6.500E-02	1.095E+03	2.656E+01	1.121E+03	9.051E-05	7.776E-05	.8591
7.000E-02	1.136E+03	2.511E+01	1.161E+03	9.490E-05	8.198E-05	.8639
7.500E-02	1.176E+03	2.383E+01	1.199E+03	9.913E-05	8.607E-05	.8682
8.000E-02	1.214E+03	2.268E+01	1.237E+03	1.032E-04	9.004E-05	.8722
8.500E-02	1.251E+03	2.165E+01	1.273E+03	1.072E-04	9.391E-05	.8758
9.000E-02	1.287E+03	2.071E+01	1.308E+03	1.111E-04	9.767E-05	.8792
9.500E-02	1.322E+03	1.986E+01	1.342E+03	1.149E-04	1.013E-04	.8822
1.000E-01	1.356E+03	1.908E+01	1.375E+03	1.186E-04	1.049E-04	.8851
1.250E-01	1.514E+03	1.602E+01	1.530E+03	1.358E-04	1.218E-04	.8969
1.500E-01	1.655E+03	1.386E+01	1.669E+03	1.514E-04	1.371E-04	.9058
1.750E-01	1.783E+03	1.224E+01	1.795E+03	1.658E-04	1.514E-04	.9128
2.000E-01	1.899E+03	1.099E+01	1.910E+03	1.793E-04	1.647E-04	.9184
2.250E-01	2.006E+03	9.988E+00	2.016E+03	1.920E-04	1.773E-04	.9231
2.500E-01	2.104E+03	9.164E+00	2.113E+03	2.042E-04	1.893E-04	.9272
2.750E-01	2.193E+03	8.475E+00	2.202E+03	2.157E-04	2.008E-04	.9306
3.000E-01	2.275E+03	7.889E+00	2.283E+03	2.269E-04	2.118E-04	.9337

3.500E-01	2.418E+03	6.944E+00	2.425E+03	2.481E-04	2.329E-04	.9388
4.000E-01	2.535E+03	6.214E+00	2.541E+03	2.682E-04	2.530E-04	.9430
4.500E-01	2.626E+03	5.632E+00	2.632E+03	2.876E-04	2.722E-04	.9466
5.000E-01	2.693E+03	5.155E+00	2.698E+03	3.063E-04	2.909E-04	.9496
5.500E-01	2.737E+03	4.758E+00	2.742E+03	3.247E-04	3.092E-04	.9522
6.000E-01	2.760E+03	4.421E+00	2.764E+03	3.428E-04	3.273E-04	.9546
6.500E-01	2.764E+03	4.132E+00	2.768E+03	3.609E-04	3.453E-04	.9567
7.000E-01	2.752E+03	3.880E+00	2.756E+03	3.790E-04	3.633E-04	.9587
7.500E-01	2.728E+03	3.659E+00	2.732E+03	3.972E-04	3.815E-04	.9605
8.000E-01	2.695E+03	3.464E+00	2.698E+03	4.156E-04	3.999E-04	.9621
8.500E-01	2.655E+03	3.289E+00	2.659E+03	4.343E-04	4.185E-04	.9637
9.000E-01	2.612E+03	3.132E+00	2.615E+03	4.532E-04	4.374E-04	.9651
9.500E-01	2.566E+03	2.991E+00	2.569E+03	4.725E-04	4.567E-04	.9664
1.000E+00	2.519E+03	2.862E+00	2.522E+03	4.922E-04	4.763E-04	.9677
1.250E+00	2.278E+03	2.363E+00	2.280E+03	5.964E-04	5.804E-04	.9731
1.500E+00	2.060E+03	2.019E+00	2.062E+03	7.118E-04	6.956E-04	.9773
1.750E+00	1.878E+03	1.766E+00	1.880E+03	8.389E-04	8.226E-04	.9805
2.000E+00	1.727E+03	1.572E+00	1.729E+03	9.777E-04	9.613E-04	.9832
2.250E+00	1.602E+03	1.419E+00	1.603E+03	1.128E-03	1.111E-03	.9853
2.500E+00	1.494E+03	1.294E+00	1.496E+03	1.290E-03	1.273E-03	.9870
2.750E+00	1.403E+03	1.191E+00	1.404E+03	1.462E-03	1.445E-03	.9885
3.000E+00	1.323E+03	1.103E+00	1.324E+03	1.646E-03	1.629E-03	.9897
3.500E+00	1.191E+03	9.632E-01	1.192E+03	2.044E-03	2.027E-03	.9915
4.000E+00	1.085E+03	8.562E-01	1.086E+03	2.485E-03	2.467E-03	.9929
4.500E+00	9.982E+02	7.715E-01	9.990E+02	2.965E-03	2.947E-03	.9940
5.000E+00	9.260E+02	7.028E-01	9.267E+02	3.485E-03	3.467E-03	.9948
5.500E+00	8.646E+02	6.458E-01	8.652E+02	4.044E-03	4.026E-03	.9954
6.000E+00	8.117E+02	5.977E-01	8.123E+02	4.641E-03	4.622E-03	.9959
6.500E+00	7.656E+02	5.566E-01	7.661E+02	5.275E-03	5.256E-03	.9964
7.000E+00	7.249E+02	5.210E-01	7.254E+02	5.946E-03	5.926E-03	.9967
7.500E+00	6.888E+02	4.898E-01	6.893E+02	6.653E-03	6.633E-03	.9970
8.000E+00	6.565E+02	4.624E-01	6.570E+02	7.397E-03	7.376E-03	.9972
8.500E+00	6.274E+02	4.379E-01	6.279E+02	8.175E-03	8.154E-03	.9975
9.000E+00	6.011E+02	4.161E-01	6.015E+02	8.989E-03	8.968E-03	.9976
9.500E+00	5.771E+02	3.964E-01	5.775E+02	9.838E-03	9.816E-03	.9978
1.000E+01	5.552E+02	3.785E-01	5.556E+02	1.072E-02	1.070E-02	.9979
1.250E+01	4.683E+02	3.096E-01	4.686E+02	1.564E-02	1.562E-02	.9984
1.500E+01	4.068E+02	2.625E-01	4.070E+02	2.138E-02	2.135E-02	.9987
1.750E+01	3.607E+02	2.282E-01	3.609E+02	2.792E-02	2.789E-02	.9989
2.000E+01	3.248E+02	2.021E-01	3.250E+02	3.523E-02	3.519E-02	.9991
2.500E+01	2.721E+02	1.648E-01	2.723E+02	5.211E-02	5.207E-02	.9992
2.750E+01	2.521E+02	1.510E-01	2.523E+02	6.166E-02	6.161E-02	.9993
3.000E+01	2.352E+02	1.394E-01	2.353E+02	7.193E-02	7.188E-02	.9993
3.500E+01	2.077E+02	1.209E-01	2.078E+02	9.459E-02	9.453E-02	.9994
4.000E+01	1.865E+02	1.068E-01	1.866E+02	1.200E-01	1.199E-01	.9994
4.500E+01	1.695E+02	9.575E-02	1.696E+02	1.482E-01	1.481E-01	.9995
5.000E+01	1.556E+02	8.679E-02	1.556E+02	1.790E-01	1.789E-01	.9995
5.500E+01	1.439E+02	7.938E-02	1.440E+02	2.124E-01	2.123E-01	.9995
6.000E+01	1.341E+02	7.315E-02	1.341E+02	2.484E-01	2.483E-01	.9995
6.500E+01	1.256E+02	6.784E-02	1.257E+02	2.869E-01	2.868E-01	.9995
7.000E+01	1.182E+02	6.326E-02	1.183E+02	3.280E-01	3.278E-01	.9995
7.500E+01	1.117E+02	5.927E-02	1.118E+02	3.715E-01	3.713E-01	.9996
8.000E+01	1.060E+02	5.576E-02	1.061E+02	4.174E-01	4.172E-01	.9996
8.500E+01	1.009E+02	5.265E-02	1.009E+02	4.657E-01	4.656E-01	.9996
9.000E+01	9.627E+01	4.987E-02	9.632E+01	5.165E-01	5.163E-01	.9996
9.500E+01	9.211E+01	4.737E-02	9.216E+01	5.696E-01	5.693E-01	.9996
1.000E+02	8.834E+01	4.512E-02	8.838E+01	6.250E-01	6.247E-01	.9996

1.250E+02	7.365E+01	3.646E-02	7.369E+01	9.363E-01	9.359E-01	.9996
1.500E+02	6.354E+01	3.059E-02	6.357E+01	1.303E+00	1.302E+00	.9996
1.750E+02	5.612E+01	2.635E-02	5.614E+01	1.722E+00	1.722E+00	.9996
2.000E+02	5.043E+01	2.315E-02	5.045E+01	2.193E+00	2.192E+00	.9996
2.250E+02	4.592E+01	2.065E-02	4.595E+01	2.713E+00	2.712E+00	.9997
2.500E+02	4.226E+01	1.864E-02	4.228E+01	3.280E+00	3.279E+00	.9997
2.750E+02	3.923E+01	1.698E-02	3.925E+01	3.895E+00	3.893E+00	.9997
3.000E+02	3.667E+01	1.560E-02	3.669E+01	4.554E+00	4.553E+00	.9997
3.500E+02	3.259E+01	1.340E-02	3.260E+01	6.003E+00	6.001E+00	.9997
4.000E+02	2.947E+01	1.175E-02	2.948E+01	7.619E+00	7.616E+00	.9997
4.500E+02	2.702E+01	1.046E-02	2.703E+01	9.392E+00	9.389E+00	.9997
5.000E+02	2.503E+01	9.431E-03	2.504E+01	1.132E+01	1.131E+01	.9997
5.500E+02	2.338E+01	8.583E-03	2.339E+01	1.338E+01	1.338E+01	.9997
6.000E+02	2.200E+01	7.874E-03	2.201E+01	1.559E+01	1.559E+01	.9997
6.500E+02	2.082E+01	7.273E-03	2.083E+01	1.793E+01	1.792E+01	.9997
7.000E+02	1.981E+01	6.758E-03	1.981E+01	2.039E+01	2.038E+01	.9997
7.500E+02	1.892E+01	6.310E-03	1.893E+01	2.297E+01	2.297E+01	.9997
8.000E+02	1.814E+01	5.918E-03	1.815E+01	2.567E+01	2.566E+01	.9997
8.500E+02	1.746E+01	5.572E-03	1.746E+01	2.848E+01	2.847E+01	.9997
9.000E+02	1.684E+01	5.264E-03	1.685E+01	3.140E+01	3.139E+01	.9997
9.500E+02	1.629E+01	4.988E-03	1.630E+01	3.441E+01	3.441E+01	.9997
1.000E+03	1.579E+01	4.740E-03	1.580E+01	3.753E+01	3.752E+01	.9997

ALPHA PARTICLE STOPPING POWER AND RANGE

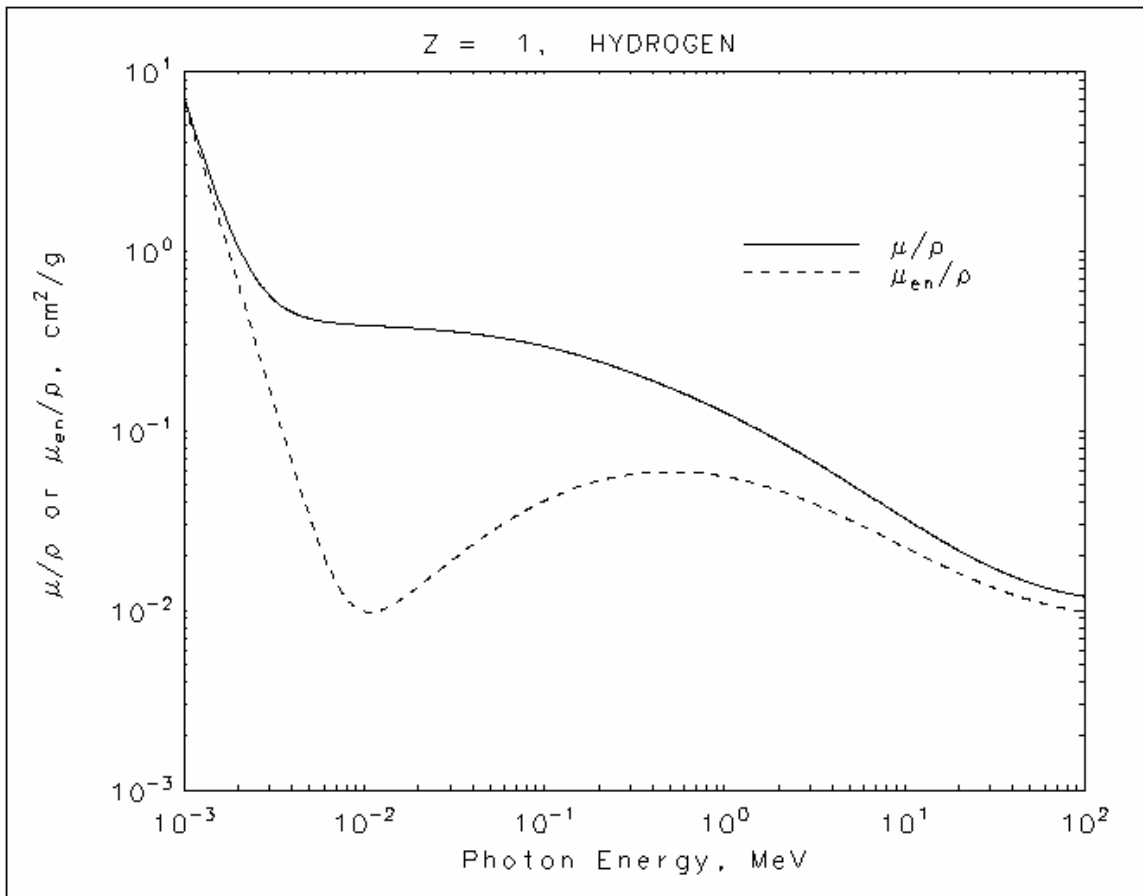
BONE, COMPACT (ICRU)

T = alpha particle (helium ion) kinetic energy, MeV
 STOP(e) = electronic stopping power, MeV cm²/g
 STOP(n) = nuclear stopping power, MeV cm²/g
 STOP(t) = total stopping power, MeV cm²/g
 RANGE(c) = csda range, g/cm²
 RANGE(p) = projected range, g/cm²
 DETOUR = detour factor

T	STOP(e)	STOP(n)	STOP(t)	RANGE(c)	RANGE(p)	DETOUR
1.000E-03	1.259E+02	1.777E+02	3.035E+02	3.783E-06	1.806E-06	.4776
1.500E-03	1.526E+02	1.632E+02	3.158E+02	5.391E-06	2.675E-06	.4962
2.000E-03	1.750E+02	1.511E+02	3.262E+02	6.949E-06	3.562E-06	.5126
2.500E-03	1.948E+02	1.410E+02	3.357E+02	8.459E-06	4.458E-06	.5270
3.000E-03	2.125E+02	1.324E+02	3.449E+02	9.928E-06	5.360E-06	.5399
4.000E-03	2.441E+02	1.185E+02	3.626E+02	1.276E-05	7.170E-06	.5621
5.000E-03	2.718E+02	1.078E+02	3.796E+02	1.545E-05	8.974E-06	.5809
6.000E-03	2.968E+02	9.921E+01	3.960E+02	1.803E-05	1.076E-05	.5971
7.000E-03	3.198E+02	9.210E+01	4.118E+02	2.051E-05	1.253E-05	.6113
8.000E-03	3.411E+02	8.610E+01	4.272E+02	2.289E-05	1.428E-05	.6240
9.000E-03	3.612E+02	8.097E+01	4.422E+02	2.519E-05	1.601E-05	.6354
1.000E-02	3.802E+02	7.651E+01	4.567E+02	2.741E-05	1.770E-05	.6458
1.250E-02	4.238E+02	6.752E+01	4.913E+02	3.269E-05	2.184E-05	.6680
1.500E-02	4.631E+02	6.068E+01	5.238E+02	3.762E-05	2.582E-05	.6864
1.750E-02	4.993E+02	5.526E+01	5.546E+02	4.225E-05	2.966E-05	.7020
2.000E-02	5.330E+02	5.084E+01	5.838E+02	4.664E-05	3.337E-05	.7154
2.250E-02	5.646E+02	4.716E+01	6.118E+02	5.083E-05	3.695E-05	.7271
2.500E-02	5.945E+02	4.404E+01	6.385E+02	5.483E-05	4.043E-05	.7374
2.750E-02	6.228E+02	4.136E+01	6.642E+02	5.866E-05	4.380E-05	.7467
3.000E-02	6.499E+02	3.902E+01	6.889E+02	6.236E-05	4.708E-05	.7550
3.500E-02	7.008E+02	3.513E+01	7.360E+02	6.938E-05	5.338E-05	.7694
4.000E-02	7.481E+02	3.202E+01	7.801E+02	7.597E-05	5.938E-05	.7816
4.500E-02	7.924E+02	2.947E+01	8.219E+02	8.221E-05	6.512E-05	.7920
5.000E-02	8.342E+02	2.733E+01	8.615E+02	8.816E-05	7.062E-05	.8011
5.500E-02	8.737E+02	2.552E+01	8.993E+02	9.383E-05	7.592E-05	.8091
6.000E-02	9.114E+02	2.395E+01	9.354E+02	9.929E-05	8.104E-05	.8163
6.500E-02	9.474E+02	2.258E+01	9.700E+02	1.045E-04	8.599E-05	.8226
7.000E-02	9.819E+02	2.138E+01	1.003E+03	1.096E-04	9.080E-05	.8284
7.500E-02	1.015E+03	2.031E+01	1.035E+03	1.145E-04	9.546E-05	.8337
8.000E-02	1.047E+03	1.935E+01	1.066E+03	1.193E-04	1.000E-04	.8385
8.500E-02	1.078E+03	1.848E+01	1.096E+03	1.239E-04	1.044E-04	.8429
9.000E-02	1.107E+03	1.770E+01	1.125E+03	1.284E-04	1.087E-04	.8470
9.500E-02	1.136E+03	1.699E+01	1.153E+03	1.328E-04	1.130E-04	.8508
1.000E-01	1.164E+03	1.634E+01	1.180E+03	1.371E-04	1.171E-04	.8544
1.250E-01	1.291E+03	1.375E+01	1.305E+03	1.572E-04	1.366E-04	.8690
1.500E-01	1.401E+03	1.193E+01	1.413E+03	1.756E-04	1.545E-04	.8801
1.750E-01	1.498E+03	1.056E+01	1.509E+03	1.927E-04	1.713E-04	.8889
2.000E-01	1.584E+03	9.494E+00	1.594E+03	2.088E-04	1.871E-04	.8961
2.250E-01	1.660E+03	8.638E+00	1.669E+03	2.241E-04	2.022E-04	.9022
2.500E-01	1.727E+03	7.934E+00	1.735E+03	2.388E-04	2.167E-04	.9073
2.750E-01	1.787E+03	7.344E+00	1.794E+03	2.530E-04	2.307E-04	.9119
3.000E-01	1.839E+03	6.842E+00	1.846E+03	2.667E-04	2.442E-04	.9158

3.500E-01	1.926E+03	6.031E+00	1.932E+03	2.931E-04	2.704E-04	.9226
4.000E-01	1.991E+03	5.403E+00	1.997E+03	3.186E-04	2.957E-04	.9281
4.500E-01	2.039E+03	4.902E+00	2.044E+03	3.433E-04	3.202E-04	.9328
5.000E-01	2.072E+03	4.491E+00	2.076E+03	3.676E-04	3.443E-04	.9368
5.500E-01	2.092E+03	4.148E+00	2.096E+03	3.915E-04	3.682E-04	.9403
6.000E-01	2.103E+03	3.857E+00	2.106E+03	4.153E-04	3.918E-04	.9435
6.500E-01	2.105E+03	3.606E+00	2.108E+03	4.390E-04	4.154E-04	.9463
7.000E-01	2.100E+03	3.388E+00	2.103E+03	4.628E-04	4.391E-04	.9488
7.500E-01	2.089E+03	3.197E+00	2.093E+03	4.866E-04	4.628E-04	.9511
8.000E-01	2.075E+03	3.027E+00	2.078E+03	5.106E-04	4.867E-04	.9533
8.500E-01	2.056E+03	2.876E+00	2.059E+03	5.347E-04	5.108E-04	.9552
9.000E-01	2.035E+03	2.740E+00	2.038E+03	5.591E-04	5.351E-04	.9571
9.500E-01	2.011E+03	2.617E+00	2.014E+03	5.838E-04	5.597E-04	.9587
1.000E+00	1.986E+03	2.505E+00	1.989E+03	6.088E-04	5.846E-04	.9603
1.250E+00	1.846E+03	2.071E+00	1.848E+03	7.391E-04	7.146E-04	.9669
1.500E+00	1.705E+03	1.771E+00	1.707E+03	8.798E-04	8.551E-04	.9718
1.750E+00	1.576E+03	1.551E+00	1.577E+03	1.032E-03	1.007E-03	.9757
2.000E+00	1.460E+03	1.382E+00	1.461E+03	1.197E-03	1.172E-03	.9789
2.250E+00	1.358E+03	1.248E+00	1.359E+03	1.374E-03	1.349E-03	.9814
2.500E+00	1.271E+03	1.138E+00	1.272E+03	1.565E-03	1.539E-03	.9835
2.750E+00	1.196E+03	1.048E+00	1.197E+03	1.768E-03	1.741E-03	.9852
3.000E+00	1.130E+03	9.712E-01	1.131E+03	1.983E-03	1.956E-03	.9867
3.500E+00	1.020E+03	8.486E-01	1.021E+03	2.449E-03	2.422E-03	.9890
4.000E+00	9.316E+02	7.548E-01	9.324E+02	2.962E-03	2.934E-03	.9907
4.500E+00	8.594E+02	6.805E-01	8.601E+02	3.521E-03	3.493E-03	.9920
5.000E+00	7.988E+02	6.202E-01	7.994E+02	4.124E-03	4.096E-03	.9931
5.500E+00	7.474E+02	5.701E-01	7.479E+02	4.771E-03	4.742E-03	.9939
6.000E+00	7.029E+02	5.279E-01	7.035E+02	5.461E-03	5.431E-03	.9945
6.500E+00	6.640E+02	4.917E-01	6.645E+02	6.193E-03	6.162E-03	.9951
7.000E+00	6.297E+02	4.604E-01	6.301E+02	6.966E-03	6.935E-03	.9955
7.500E+00	5.991E+02	4.330E-01	5.995E+02	7.780E-03	7.748E-03	.9959
8.000E+00	5.717E+02	4.089E-01	5.722E+02	8.633E-03	8.601E-03	.9962
8.500E+00	5.471E+02	3.874E-01	5.474E+02	9.527E-03	9.494E-03	.9965
9.000E+00	5.247E+02	3.681E-01	5.250E+02	1.046E-02	1.043E-02	.9967
9.500E+00	5.043E+02	3.508E-01	5.046E+02	1.143E-02	1.140E-02	.9969
1.000E+01	4.856E+02	3.350E-01	4.859E+02	1.244E-02	1.241E-02	.9971
1.250E+01	4.113E+02	2.743E-01	4.115E+02	1.805E-02	1.801E-02	.9978
1.500E+01	3.584E+02	2.328E-01	3.586E+02	2.458E-02	2.454E-02	.9982
1.750E+01	3.186E+02	2.025E-01	3.188E+02	3.199E-02	3.194E-02	.9984
2.000E+01	2.875E+02	1.795E-01	2.877E+02	4.026E-02	4.020E-02	.9986
2.500E+01	2.417E+02	1.465E-01	2.419E+02	5.929E-02	5.922E-02	.9988
2.750E+01	2.244E+02	1.343E-01	2.245E+02	7.003E-02	6.995E-02	.9989
3.000E+01	2.095E+02	1.240E-01	2.096E+02	8.156E-02	8.148E-02	.9990
3.500E+01	1.855E+02	1.076E-01	1.856E+02	1.070E-01	1.069E-01	.9991
4.000E+01	1.668E+02	9.519E-02	1.669E+02	1.354E-01	1.353E-01	.9991
4.500E+01	1.519E+02	8.538E-02	1.520E+02	1.668E-01	1.667E-01	.9992
5.000E+01	1.396E+02	7.745E-02	1.397E+02	2.012E-01	2.010E-01	.9992
5.500E+01	1.293E+02	7.088E-02	1.294E+02	2.384E-01	2.383E-01	.9992
6.000E+01	1.206E+02	6.536E-02	1.207E+02	2.785E-01	2.783E-01	.9993
6.500E+01	1.131E+02	6.065E-02	1.131E+02	3.213E-01	3.211E-01	.9993
7.000E+01	1.065E+02	5.658E-02	1.066E+02	3.669E-01	3.666E-01	.9993
7.500E+01	1.008E+02	5.303E-02	1.008E+02	4.151E-01	4.148E-01	.9993
8.000E+01	9.566E+01	4.991E-02	9.571E+01	4.660E-01	4.657E-01	.9993
8.500E+01	9.110E+01	4.715E-02	9.114E+01	5.196E-01	5.192E-01	.9993
9.000E+01	8.699E+01	4.468E-02	8.704E+01	5.757E-01	5.754E-01	.9994
9.500E+01	8.328E+01	4.246E-02	8.333E+01	6.345E-01	6.341E-01	.9994
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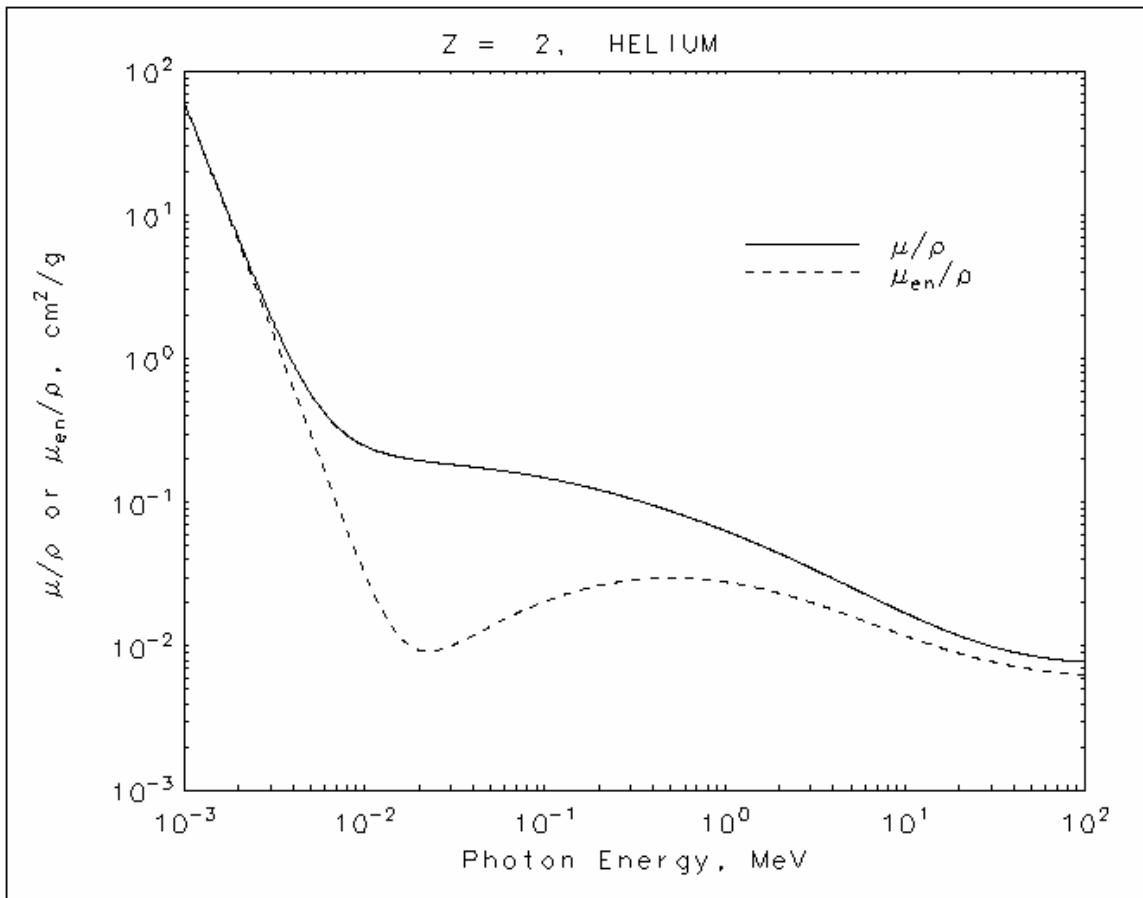
1.250E+02	6.678E+01	3.274E-02	6.681E+01	1.039E+00	1.039E+00	.9994
1.500E+02	5.770E+01	2.750E-02	5.773E+01	1.443E+00	1.442E+00	.9994
1.750E+02	5.103E+01	2.372E-02	5.106E+01	1.905E+00	1.904E+00	.9994
2.000E+02	4.591E+01	2.086E-02	4.593E+01	2.422E+00	2.421E+00	.9995
2.250E+02	4.185E+01	1.862E-02	4.187E+01	2.993E+00	2.991E+00	.9995
2.500E+02	3.855E+01	1.682E-02	3.856E+01	3.616E+00	3.614E+00	.9995
2.750E+02	3.580E+01	1.533E-02	3.582E+01	4.289E+00	4.287E+00	.9995
3.000E+02	3.349E+01	1.409E-02	3.350E+01	5.011E+00	5.009E+00	.9995
3.500E+02	2.979E+01	1.212E-02	2.980E+01	6.597E+00	6.594E+00	.9995
4.000E+02	2.696E+01	1.064E-02	2.698E+01	8.363E+00	8.359E+00	.9995
4.500E+02	2.473E+01	9.475E-03	2.474E+01	1.030E+01	1.030E+01	.9995
5.000E+02	2.293E+01	8.544E-03	2.294E+01	1.240E+01	1.240E+01	.9995
5.500E+02	2.143E+01	7.779E-03	2.144E+01	1.466E+01	1.465E+01	.9995
6.000E+02	2.018E+01	7.140E-03	2.018E+01	1.706E+01	1.706E+01	.9995
6.500E+02	1.910E+01	6.598E-03	1.911E+01	1.961E+01	1.960E+01	.9996
7.000E+02	1.818E+01	6.133E-03	1.819E+01	2.229E+01	2.228E+01	.9996
7.500E+02	1.737E+01	5.728E-03	1.738E+01	2.511E+01	2.510E+01	.9996
8.000E+02	1.667E+01	5.373E-03	1.667E+01	2.805E+01	2.803E+01	.9996
8.500E+02	1.604E+01	5.059E-03	1.604E+01	3.111E+01	3.109E+01	.9996
9.000E+02	1.548E+01	4.780E-03	1.548E+01	3.428E+01	3.426E+01	.9996
9.500E+02	1.498E+01	4.531E-03	1.498E+01	3.756E+01	3.755E+01	.9996
1.000E+03	1.452E+01	4.306E-03	1.453E+01	4.095E+01	4.094E+01	.9996



HYDROGEN
Z = 1

Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
1.00000E-03	7.217E+00	6.820E+00
1.50000E-03	2.148E+00	1.752E+00
2.00000E-03	1.059E+00	6.643E-01
3.00000E-03	5.612E-01	1.693E-01
4.00000E-03	4.546E-01	6.549E-02
5.00000E-03	4.193E-01	3.278E-02
6.00000E-03	4.042E-01	1.996E-02
8.00000E-03	3.914E-01	1.160E-02
1.00000E-02	3.854E-01	9.849E-03
1.50000E-02	3.764E-01	1.102E-02
2.00000E-02	3.695E-01	1.355E-02
3.00000E-02	3.570E-01	1.863E-02
4.00000E-02	3.458E-01	2.315E-02
5.00000E-02	3.355E-01	2.709E-02
6.00000E-02	3.260E-01	3.053E-02
8.00000E-02	3.091E-01	3.620E-02
1.00000E-01	2.944E-01	4.063E-02
1.50000E-01	2.651E-01	4.813E-02

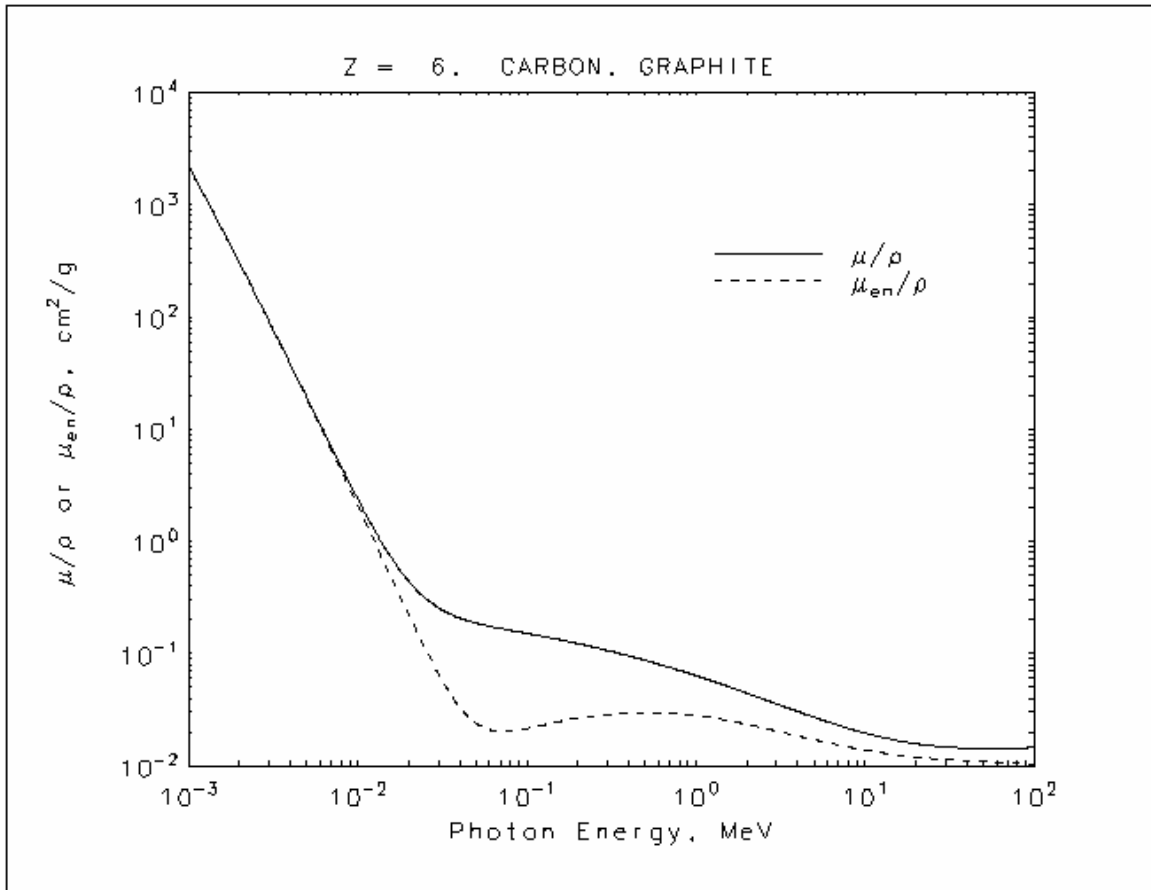
2.00000E-01	2.429E-01	5.254E-02
3.00000E-01	2.112E-01	5.695E-02
4.00000E-01	1.893E-01	5.860E-02
5.00000E-01	1.729E-01	5.900E-02
6.00000E-01	1.599E-01	5.875E-02
8.00000E-01	1.405E-01	5.739E-02
1.00000E+00	1.263E-01	5.556E-02
1.25000E+00	1.129E-01	5.311E-02
1.50000E+00	1.027E-01	5.075E-02
2.00000E+00	8.769E-02	4.650E-02
3.00000E+00	6.921E-02	3.992E-02
4.00000E+00	5.806E-02	3.523E-02
5.00000E+00	5.049E-02	3.174E-02
6.00000E+00	4.498E-02	2.905E-02
8.00000E+00	3.746E-02	2.515E-02
1.00000E+01	3.254E-02	2.247E-02
1.50000E+01	2.539E-02	1.837E-02
2.00000E+01	2.153E-02	1.606E-02



HELIUM
Z = 2

Energy (MeV)	μ/ρ (cm ² /g)	μ_{en}/ρ (cm ² /g)
1.00000E-03	6.084E+01	6.045E+01
1.50000E-03	1.676E+01	1.638E+01
2.00000E-03	6.863E+00	6.503E+00
3.00000E-03	2.007E+00	1.681E+00
4.00000E-03	9.329E-01	6.379E-01
5.00000E-03	5.766E-01	3.061E-01
6.00000E-03	4.195E-01	1.671E-01
8.00000E-03	2.933E-01	6.446E-02
1.00000E-02	2.476E-01	3.260E-02
1.50000E-02	2.092E-01	1.246E-02
2.00000E-02	1.960E-01	9.410E-03
3.00000E-02	1.838E-01	1.003E-02
4.00000E-02	1.763E-01	1.190E-02
5.00000E-02	1.703E-01	1.375E-02
6.00000E-02	1.651E-01	1.544E-02
8.00000E-02	1.562E-01	1.826E-02
1.00000E-01	1.486E-01	2.047E-02
1.50000E-01	1.336E-01	2.424E-02

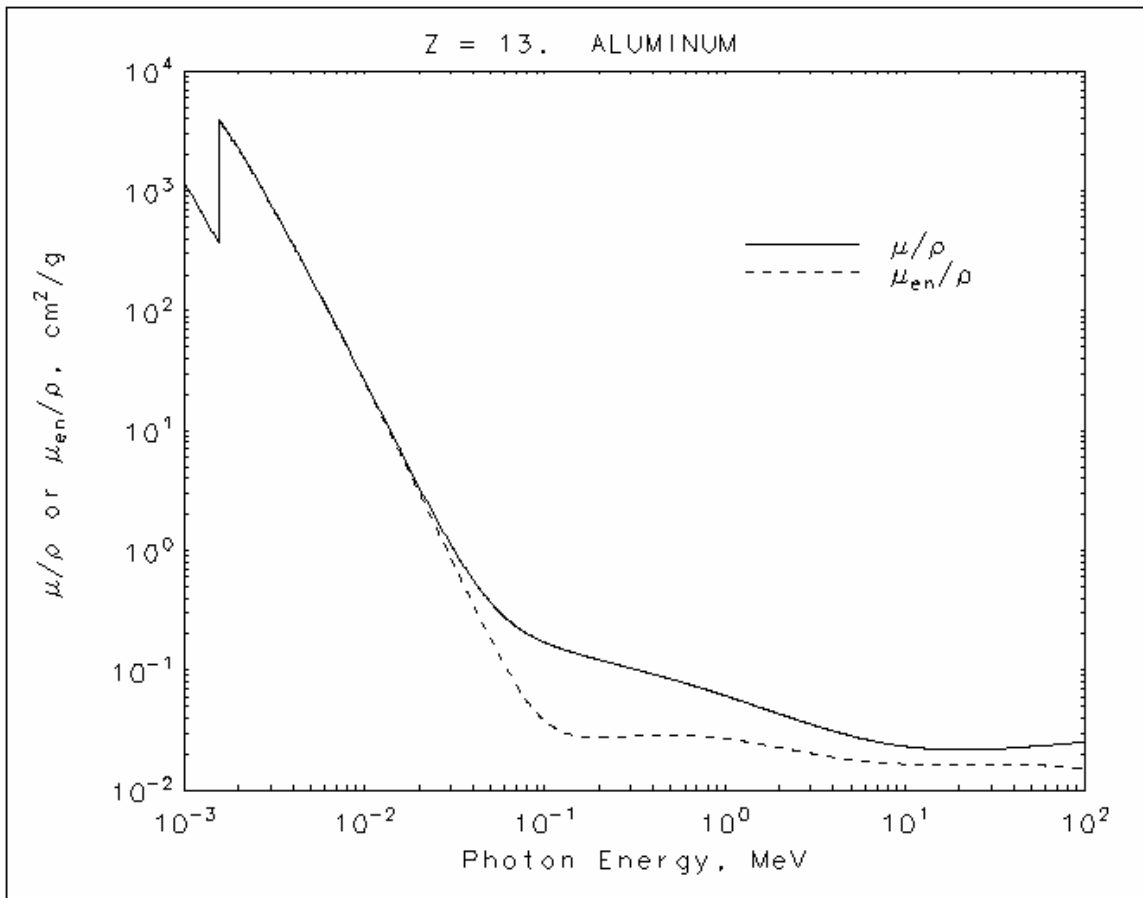
2.00000E-01	1.224E-01	2.647E-02
3.00000E-01	1.064E-01	2.868E-02
4.00000E-01	9.535E-02	2.951E-02
5.00000E-01	8.707E-02	2.971E-02
6.00000E-01	8.054E-02	2.959E-02
8.00000E-01	7.076E-02	2.890E-02
1.00000E+00	6.362E-02	2.797E-02
1.25000E+00	5.688E-02	2.674E-02
1.50000E+00	5.173E-02	2.555E-02
2.00000E+00	4.422E-02	2.343E-02
3.00000E+00	3.503E-02	2.019E-02
4.00000E+00	2.949E-02	1.790E-02
5.00000E+00	2.577E-02	1.622E-02
6.00000E+00	2.307E-02	1.493E-02
8.00000E+00	1.940E-02	1.308E-02
1.00000E+01	1.703E-02	1.183E-02
1.50000E+01	1.363E-02	9.948E-03
2.00000E+01	1.183E-02	8.914E-03



CARBON, GRAPHITE
Z = 6

Energy (MeV)	μ/ρ (cm ² /g)	μ_{en}/ρ (cm ² /g)
1.00000E-03	2.211E+03	2.209E+03
1.50000E-03	7.002E+02	6.990E+02
2.00000E-03	3.026E+02	3.016E+02
3.00000E-03	9.033E+01	8.963E+01
4.00000E-03	3.778E+01	3.723E+01
5.00000E-03	1.912E+01	1.866E+01
6.00000E-03	1.095E+01	1.054E+01
8.00000E-03	4.576E+00	4.242E+00
1.00000E-02	2.373E+00	2.078E+00
1.50000E-02	8.071E-01	5.627E-01
2.00000E-02	4.420E-01	2.238E-01
3.00000E-02	2.562E-01	6.614E-02
4.00000E-02	2.076E-01	3.343E-02
5.00000E-02	1.871E-01	2.397E-02
6.00000E-02	1.753E-01	2.098E-02
8.00000E-02	1.610E-01	2.037E-02
1.00000E-01	1.514E-01	2.147E-02
1.50000E-01	1.347E-01	2.449E-02

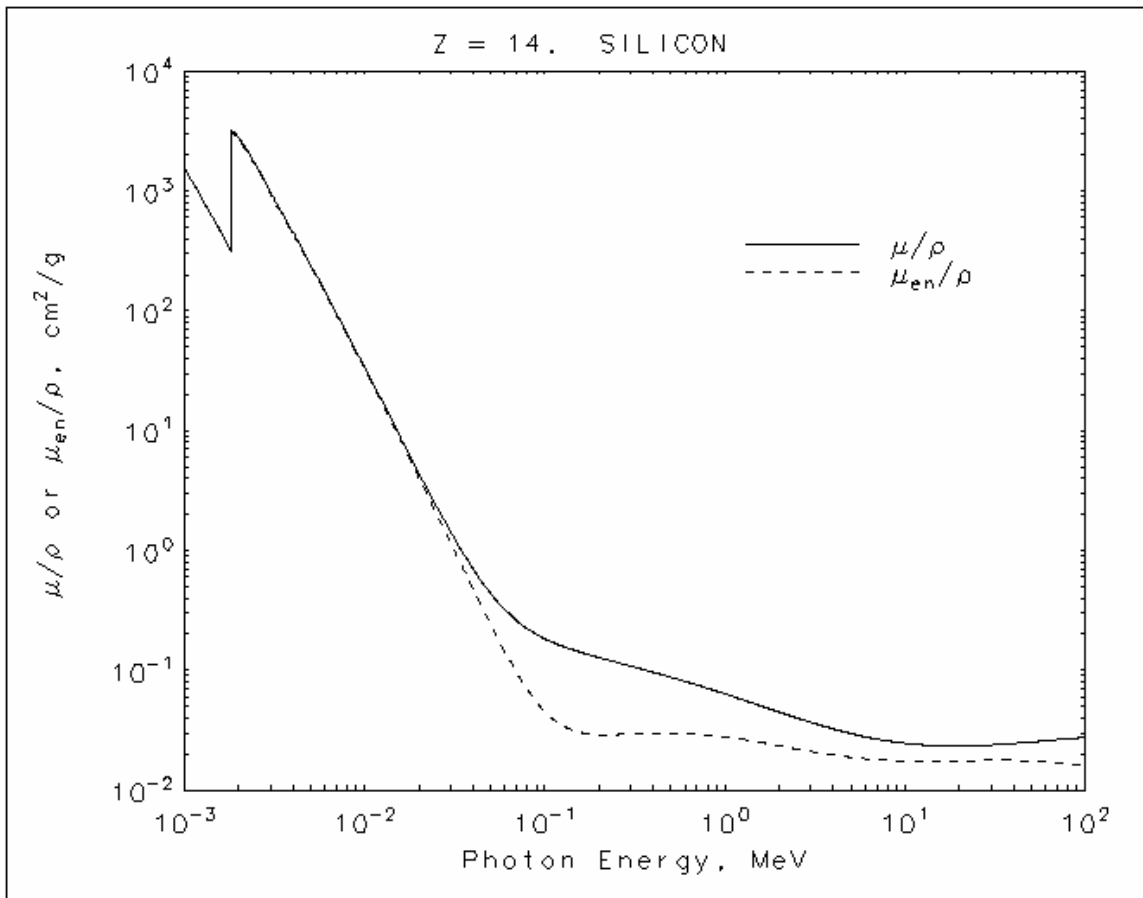
2.00000E-01	1.229E-01	2.655E-02
3.00000E-01	1.066E-01	2.870E-02
4.00000E-01	9.546E-02	2.950E-02
5.00000E-01	8.715E-02	2.969E-02
6.00000E-01	8.058E-02	2.956E-02
8.00000E-01	7.076E-02	2.885E-02
1.00000E+00	6.361E-02	2.792E-02
1.25000E+00	5.690E-02	2.669E-02
1.50000E+00	5.179E-02	2.551E-02
2.00000E+00	4.442E-02	2.345E-02
3.00000E+00	3.562E-02	2.048E-02
4.00000E+00	3.047E-02	1.849E-02
5.00000E+00	2.708E-02	1.710E-02
6.00000E+00	2.469E-02	1.607E-02
8.00000E+00	2.154E-02	1.468E-02
1.00000E+01	1.959E-02	1.380E-02
1.50000E+01	1.698E-02	1.258E-02
2.00000E+01	1.575E-02	1.198E-02



ALUMINUM
Z = 13

	Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
	1.00000E-03	1.185E+03	1.183E+03
	1.50000E-03	4.022E+02	4.001E+02
	1.55960E-03	3.621E+02	3.600E+02
K	1.55960E-03	3.957E+03	3.829E+03
	2.00000E-03	2.263E+03	2.204E+03
	3.00000E-03	7.880E+02	7.732E+02
	4.00000E-03	3.605E+02	3.545E+02
	5.00000E-03	1.934E+02	1.902E+02
	6.00000E-03	1.153E+02	1.133E+02
	8.00000E-03	5.033E+01	4.918E+01
	1.00000E-02	2.623E+01	2.543E+01
	1.50000E-02	7.955E+00	7.487E+00
	2.00000E-02	3.441E+00	3.094E+00
	3.00000E-02	1.128E+00	8.778E-01
	4.00000E-02	5.685E-01	3.601E-01
	5.00000E-02	3.681E-01	1.840E-01
	6.00000E-02	2.778E-01	1.099E-01
	8.00000E-02	2.018E-01	5.511E-02

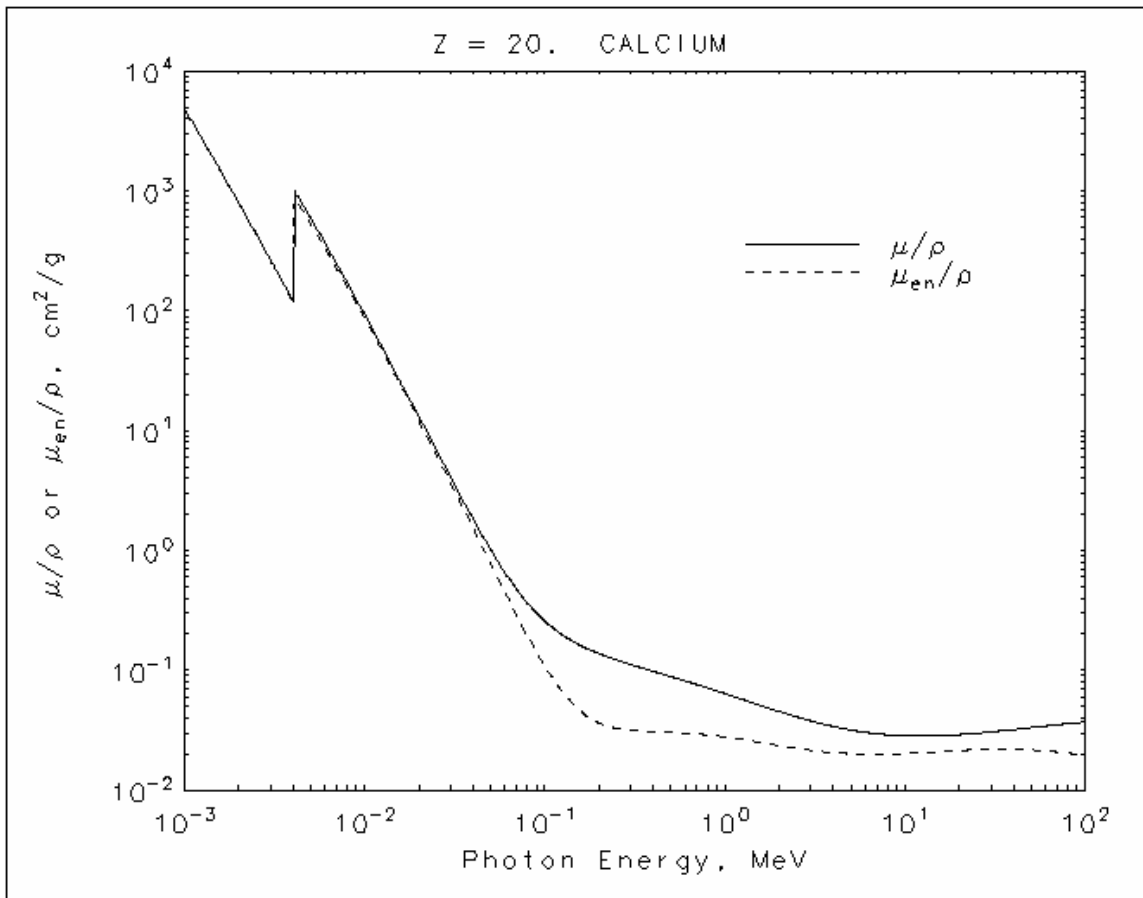
1.00000E-01	1.704E-01	3.794E-02
1.50000E-01	1.378E-01	2.827E-02
2.00000E-01	1.223E-01	2.745E-02
3.00000E-01	1.042E-01	2.816E-02
4.00000E-01	9.276E-02	2.862E-02
5.00000E-01	8.445E-02	2.868E-02
6.00000E-01	7.802E-02	2.851E-02
8.00000E-01	6.841E-02	2.778E-02
1.00000E+00	6.146E-02	2.686E-02
1.25000E+00	5.496E-02	2.565E-02
1.50000E+00	5.006E-02	2.451E-02
2.00000E+00	4.324E-02	2.266E-02
3.00000E+00	3.541E-02	2.024E-02
4.00000E+00	3.106E-02	1.882E-02
5.00000E+00	2.836E-02	1.795E-02
6.00000E+00	2.655E-02	1.739E-02
8.00000E+00	2.437E-02	1.678E-02
1.00000E+01	2.318E-02	1.650E-02
1.50000E+01	2.195E-02	1.631E-02
2.00000E+01	2.168E-02	1.633E-02



SILICON
Z = 14

	Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
	1.00000E-03	1.570E+03	1.567E+03
	1.50000E-03	5.355E+02	5.331E+02
	1.83890E-03	3.092E+02	3.070E+02
K	1.83890E-03	3.192E+03	3.059E+03
	2.00000E-03	2.777E+03	2.669E+03
	3.00000E-03	9.784E+02	9.516E+02
	4.00000E-03	4.529E+02	4.427E+02
	5.00000E-03	2.450E+02	2.400E+02
	6.00000E-03	1.470E+02	1.439E+02
	8.00000E-03	6.468E+01	6.313E+01
	1.00000E-02	3.389E+01	3.289E+01
	1.50000E-02	1.034E+01	9.794E+00
	2.00000E-02	4.464E+00	4.076E+00
	3.00000E-02	1.436E+00	1.164E+00
	4.00000E-02	7.012E-01	4.782E-01
	5.00000E-02	4.385E-01	2.430E-01
	6.00000E-02	3.207E-01	1.434E-01
	8.00000E-02	2.228E-01	6.896E-02

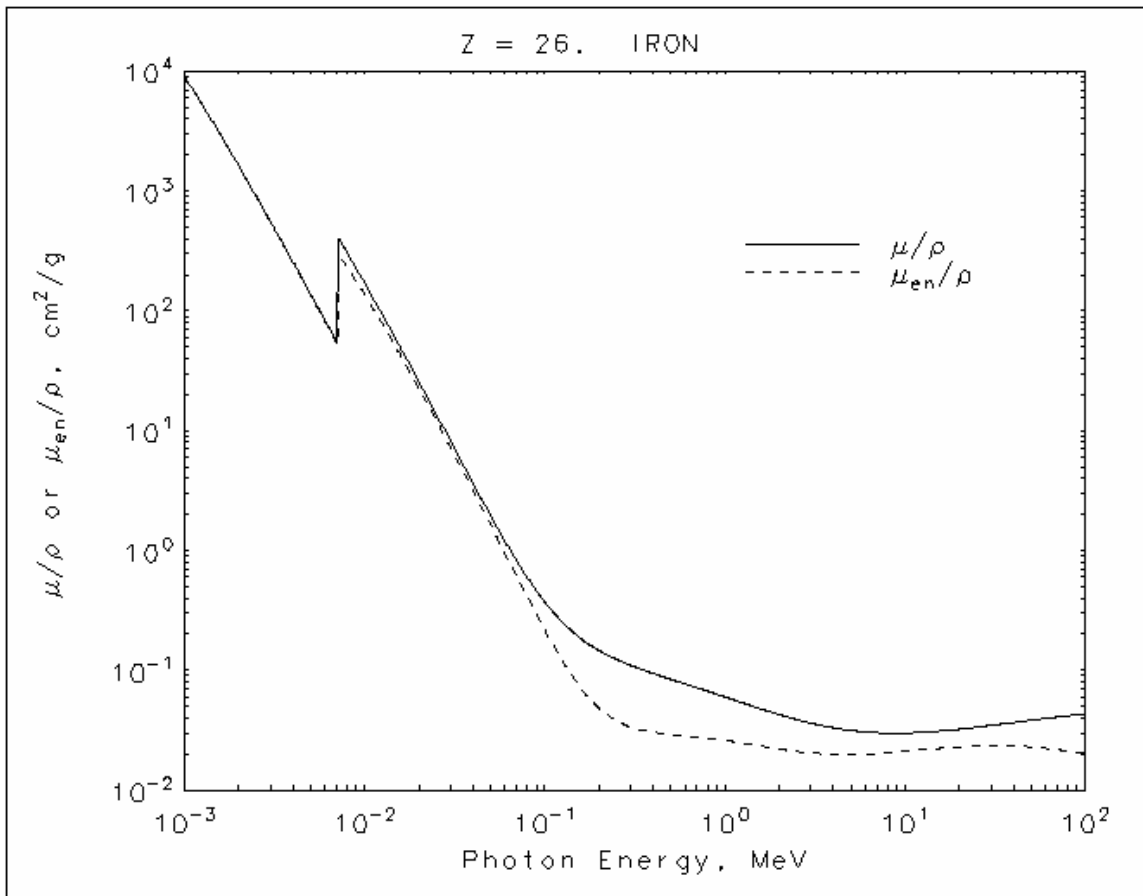
1.00000E-01	1.835E-01	4.513E-02
1.50000E-01	1.448E-01	3.086E-02
2.00000E-01	1.275E-01	2.905E-02
3.00000E-01	1.082E-01	2.932E-02
4.00000E-01	9.614E-02	2.968E-02
5.00000E-01	8.748E-02	2.971E-02
6.00000E-01	8.077E-02	2.951E-02
8.00000E-01	7.082E-02	2.875E-02
1.00000E+00	6.361E-02	2.778E-02
1.25000E+00	5.688E-02	2.652E-02
1.50000E+00	5.183E-02	2.535E-02
2.00000E+00	4.480E-02	2.345E-02
3.00000E+00	3.678E-02	2.101E-02
4.00000E+00	3.240E-02	1.963E-02
5.00000E+00	2.967E-02	1.878E-02
6.00000E+00	2.788E-02	1.827E-02
8.00000E+00	2.574E-02	1.773E-02
1.00000E+01	2.462E-02	1.753E-02
1.50000E+01	2.352E-02	1.746E-02
2.00000E+01	2.338E-02	1.757E-02



CALCIUM
Z = 20

Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
1.00000E-03	4.867E+03	4.861E+03
1.50000E-03	1.714E+03	1.710E+03
2.00000E-03	7.999E+02	7.966E+02
3.00000E-03	2.676E+02	2.650E+02
4.00000E-03	1.218E+02	1.197E+02
4.03810E-03	1.187E+02	1.166E+02
K 4.03810E-03	1.023E+03	8.887E+02
5.00000E-03	6.026E+02	5.373E+02
6.00000E-03	3.731E+02	3.387E+02
8.00000E-03	1.726E+02	1.600E+02
1.00000E-02	9.341E+01	8.744E+01
1.50000E-02	2.979E+01	2.804E+01
2.00000E-02	1.306E+01	1.220E+01
3.00000E-02	4.080E+00	3.665E+00
4.00000E-02	1.830E+00	1.538E+00
5.00000E-02	1.019E+00	7.822E-01
6.00000E-02	6.578E-01	4.520E-01
8.00000E-02	3.656E-01	1.958E-01

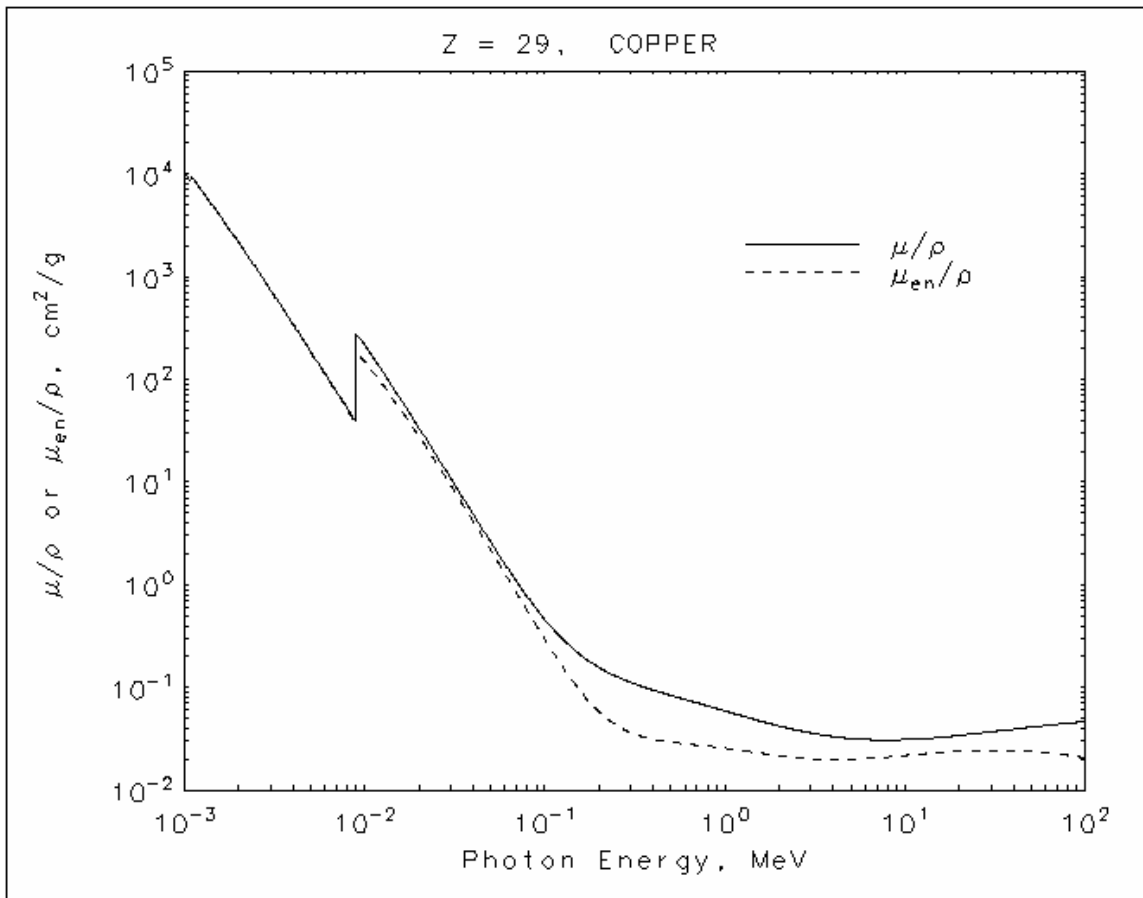
1.00000E-01	2.571E-01	1.085E-01
1.50000E-01	1.674E-01	4.876E-02
2.00000E-01	1.376E-01	3.639E-02
3.00000E-01	1.116E-01	3.146E-02
4.00000E-01	9.783E-02	3.060E-02
5.00000E-01	8.851E-02	3.019E-02
6.00000E-01	8.148E-02	2.979E-02
8.00000E-01	7.122E-02	2.884E-02
1.00000E+00	6.388E-02	2.780E-02
1.25000E+00	5.709E-02	2.650E-02
1.50000E+00	5.207E-02	2.532E-02
2.00000E+00	4.524E-02	2.352E-02
3.00000E+00	3.780E-02	2.147E-02
4.00000E+00	3.395E-02	2.052E-02
5.00000E+00	3.170E-02	2.007E-02
6.00000E+00	3.035E-02	1.992E-02
8.00000E+00	2.892E-02	1.997E-02
1.00000E+01	2.839E-02	2.022E-02
1.50000E+01	2.838E-02	2.088E-02
2.00000E+01	2.903E-02	2.140E-02



IRON
Z = 26

	Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
	1.00000E-03	9.085E+03	9.052E+03
	1.50000E-03	3.399E+03	3.388E+03
	2.00000E-03	1.626E+03	1.620E+03
	3.00000E-03	5.576E+02	5.535E+02
	4.00000E-03	2.567E+02	2.536E+02
	5.00000E-03	1.398E+02	1.372E+02
	6.00000E-03	8.484E+01	8.265E+01
	7.11200E-03	5.319E+01	5.133E+01
K	7.11200E-03	4.076E+02	2.978E+02
	8.00000E-03	3.056E+02	2.316E+02
	1.00000E-02	1.706E+02	1.369E+02
	1.50000E-02	5.708E+01	4.896E+01
	2.00000E-02	2.568E+01	2.260E+01
	3.00000E-02	8.176E+00	7.251E+00
	4.00000E-02	3.629E+00	3.155E+00
	5.00000E-02	1.958E+00	1.638E+00
	6.00000E-02	1.205E+00	9.555E-01
	8.00000E-02	5.952E-01	4.104E-01

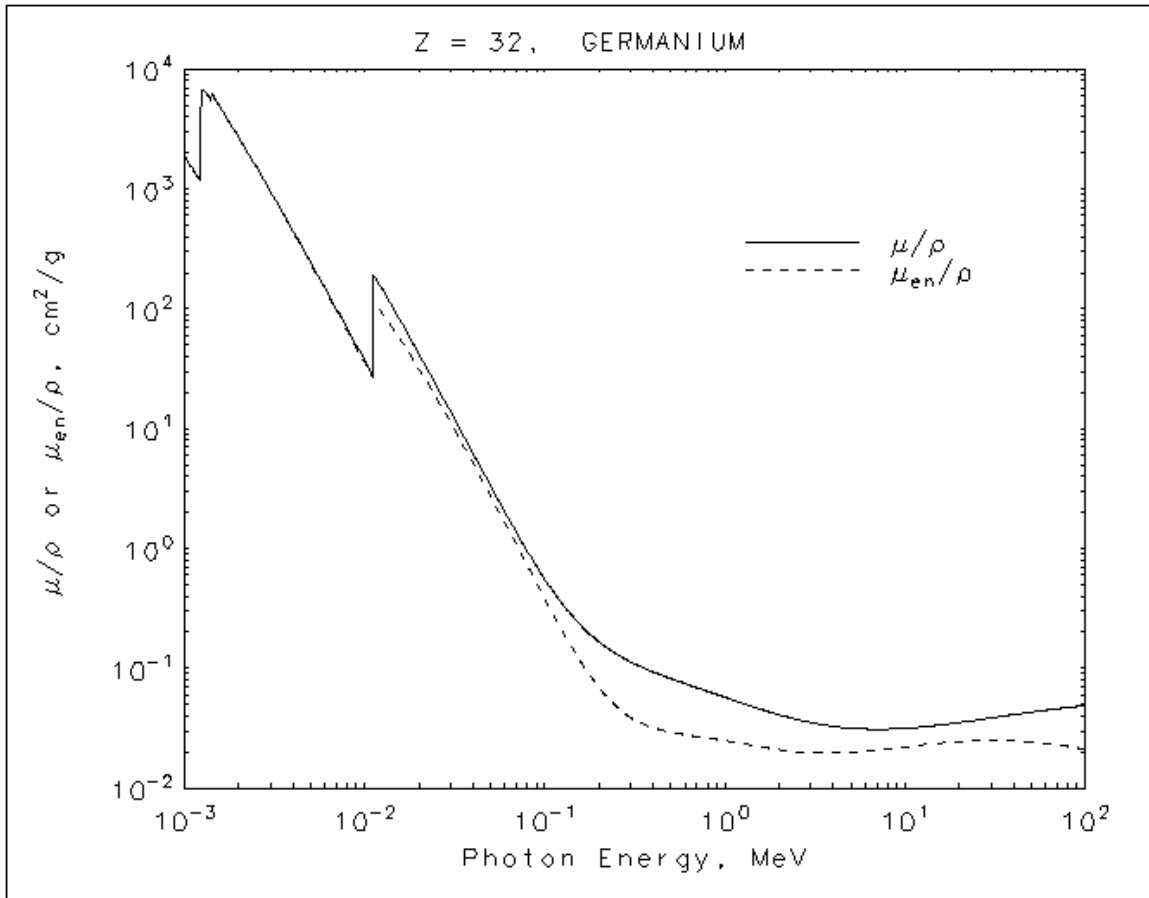
1.00000E-01	3.717E-01	2.177E-01
1.50000E-01	1.964E-01	7.961E-02
2.00000E-01	1.460E-01	4.825E-02
3.00000E-01	1.099E-01	3.361E-02
4.00000E-01	9.400E-02	3.039E-02
5.00000E-01	8.414E-02	2.914E-02
6.00000E-01	7.704E-02	2.836E-02
8.00000E-01	6.699E-02	2.714E-02
1.00000E+00	5.995E-02	2.603E-02
1.25000E+00	5.350E-02	2.472E-02
1.50000E+00	4.883E-02	2.360E-02
2.00000E+00	4.265E-02	2.199E-02
3.00000E+00	3.621E-02	2.042E-02
4.00000E+00	3.312E-02	1.990E-02
5.00000E+00	3.146E-02	1.983E-02
6.00000E+00	3.057E-02	1.997E-02
8.00000E+00	2.991E-02	2.050E-02
1.00000E+01	2.994E-02	2.108E-02
1.50000E+01	3.092E-02	2.221E-02
2.00000E+01	3.224E-02	2.292E-02



COPPER
Z = 29

	Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
	1.00000E-03	1.057E+04	1.049E+04
	1.04695E-03	9.307E+03	9.241E+03
	1.09610E-03	8.242E+03	8.186E+03
L1	1.09610E-03	9.347E+03	9.282E+03
	1.50000E-03	4.418E+03	4.393E+03
	2.00000E-03	2.154E+03	2.142E+03
	3.00000E-03	7.488E+02	7.430E+02
	4.00000E-03	3.473E+02	3.432E+02
	5.00000E-03	1.899E+02	1.866E+02
	6.00000E-03	1.156E+02	1.128E+02
	8.00000E-03	5.255E+01	5.054E+01
	8.97890E-03	3.829E+01	3.652E+01
K	8.97890E-03	2.784E+02	1.824E+02
	1.00000E-02	2.159E+02	1.484E+02
	1.50000E-02	7.405E+01	5.788E+01
	2.00000E-02	3.379E+01	2.788E+01
	3.00000E-02	1.092E+01	9.349E+00
	4.00000E-02	4.862E+00	4.163E+00

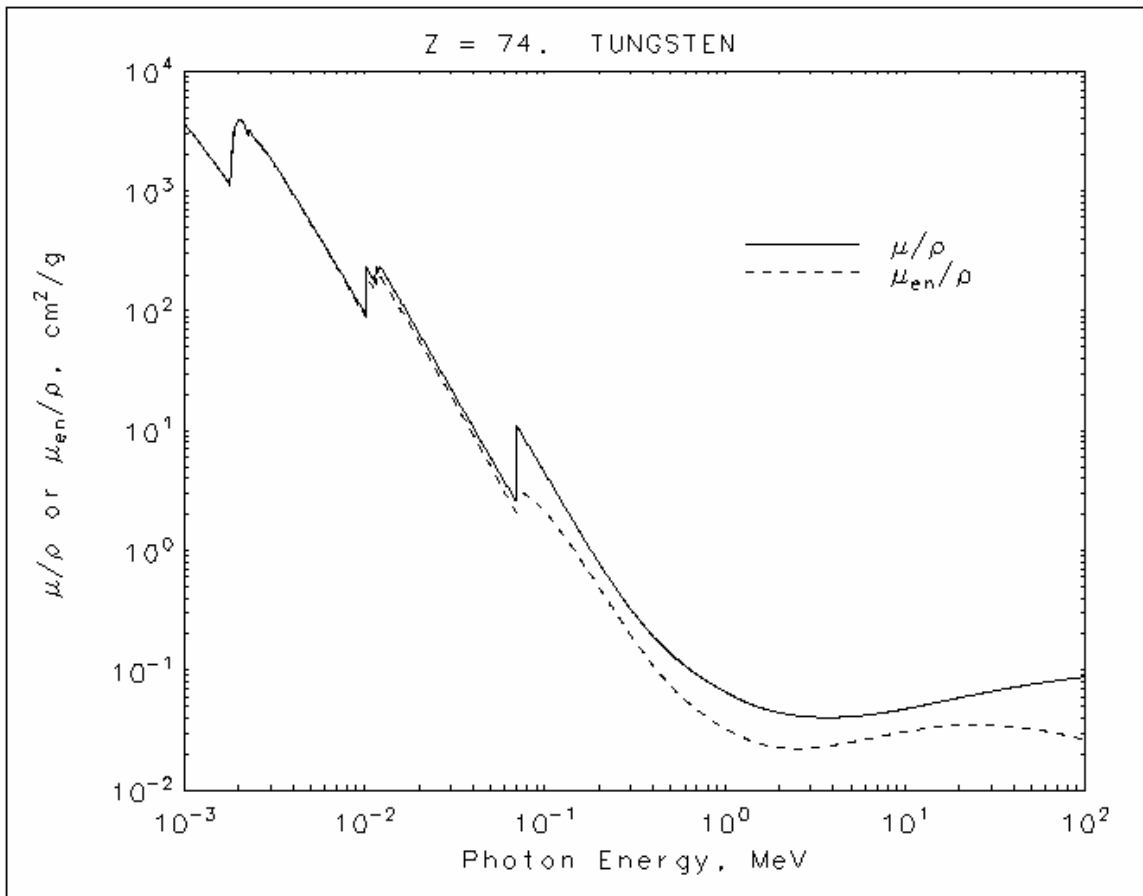
5.00000E-02	2.613E+00	2.192E+00
6.00000E-02	1.593E+00	1.290E+00
8.00000E-02	7.630E-01	5.581E-01
1.00000E-01	4.584E-01	2.949E-01
1.50000E-01	2.217E-01	1.027E-01
2.00000E-01	1.559E-01	5.781E-02
3.00000E-01	1.119E-01	3.617E-02
4.00000E-01	9.413E-02	3.121E-02
5.00000E-01	8.362E-02	2.933E-02
6.00000E-01	7.625E-02	2.826E-02
8.00000E-01	6.605E-02	2.681E-02
1.00000E+00	5.901E-02	2.562E-02
1.25000E+00	5.261E-02	2.428E-02
1.50000E+00	4.803E-02	2.316E-02
2.00000E+00	4.205E-02	2.160E-02
3.00000E+00	3.599E-02	2.023E-02
4.00000E+00	3.318E-02	1.989E-02
5.00000E+00	3.177E-02	1.998E-02
6.00000E+00	3.108E-02	2.027E-02
8.00000E+00	3.074E-02	2.100E-02
1.00000E+01	3.103E-02	2.174E-02
1.50000E+01	3.247E-02	2.309E-02
2.00000E+01	3.408E-02	2.387E-02



GERMANIUM
Z = 32

	Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
	1.00000E-03	1.893E+03	1.887E+03
	1.10304E-03	1.502E+03	1.496E+03
	1.21670E-03	1.190E+03	1.185E+03
L3	1.21670E-03	4.389E+03	4.343E+03
	1.23215E-03	4.734E+03	4.684E+03
	1.24780E-03	4.974E+03	4.922E+03
L2	1.24780E-03	6.698E+03	6.622E+03
	1.32844E-03	6.348E+03	6.279E+03
	1.41430E-03	5.554E+03	5.495E+03
L1	1.41430E-03	6.287E+03	6.221E+03
	1.50000E-03	5.475E+03	5.420E+03
	2.00000E-03	2.711E+03	2.688E+03
	3.00000E-03	9.613E+02	9.527E+02
	4.00000E-03	4.497E+02	4.445E+02
	5.00000E-03	2.472E+02	2.433E+02
	6.00000E-03	1.509E+02	1.477E+02
	8.00000E-03	6.890E+01	6.660E+01
	1.00000E-02	3.742E+01	3.564E+01

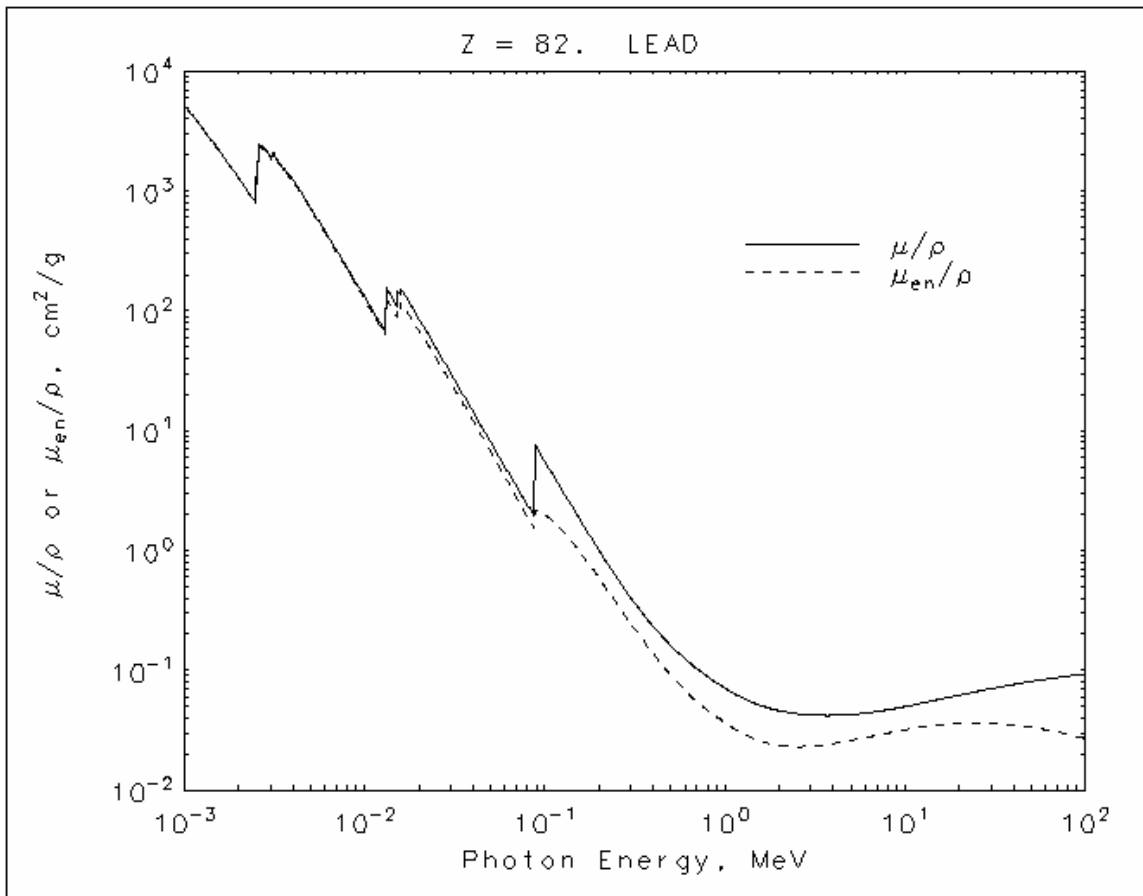
	1.11031E-02	2.811E+01	2.653E+01
K	1.11031E-02	1.981E+02	1.157E+02
	1.50000E-02	9.152E+01	6.256E+01
	2.00000E-02	4.222E+01	3.178E+01
	3.00000E-02	1.385E+01	1.126E+01
	4.00000E-02	6.207E+00	5.152E+00
	5.00000E-02	3.335E+00	2.759E+00
	6.00000E-02	2.023E+00	1.642E+00
	8.00000E-02	9.501E-01	7.184E-01
	1.00000E-01	5.550E-01	3.803E-01
	1.50000E-01	2.491E-01	1.288E-01
	2.00000E-01	1.661E-01	6.865E-02
	3.00000E-01	1.131E-01	3.891E-02
	4.00000E-01	9.327E-02	3.193E-02
	5.00000E-01	8.212E-02	2.930E-02
	6.00000E-01	7.452E-02	2.790E-02
	8.00000E-01	6.426E-02	2.618E-02
	1.00000E+00	5.727E-02	2.489E-02
	1.25000E+00	5.101E-02	2.353E-02
	1.50000E+00	4.657E-02	2.242E-02
	2.00000E+00	4.086E-02	2.094E-02
	3.00000E+00	3.524E-02	1.977E-02
	4.00000E+00	3.275E-02	1.962E-02
	5.00000E+00	3.158E-02	1.987E-02
	6.00000E+00	3.107E-02	2.027E-02
	8.00000E+00	3.103E-02	2.120E-02
	1.00000E+01	3.156E-02	2.208E-02
	1.50000E+01	3.340E-02	2.364E-02
	2.00000E+01	3.528E-02	2.452E-02



TUNGSTEN
Z = 74

	Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
	1.00000E-03	3.683E+03	3.671E+03
	1.50000E-03	1.643E+03	1.632E+03
	1.80920E-03	1.108E+03	1.097E+03
M5	1.80920E-03	1.327E+03	1.311E+03
	1.84014E-03	1.911E+03	1.883E+03
	1.87160E-03	2.901E+03	2.853E+03
M4	1.87160E-03	3.170E+03	3.116E+03
	2.00000E-03	3.922E+03	3.853E+03
	2.28100E-03	2.828E+03	2.781E+03
M3	2.28100E-03	3.279E+03	3.226E+03
	2.42350E-03	2.833E+03	2.786E+03
	2.57490E-03	2.445E+03	2.407E+03
M2	2.57490E-03	2.599E+03	2.558E+03
	2.69447E-03	2.339E+03	2.301E+03
	2.81960E-03	2.104E+03	2.071E+03
M1	2.81960E-03	2.194E+03	2.160E+03
	3.00000E-03	1.902E+03	1.873E+03
	4.00000E-03	9.564E+02	9.405E+02

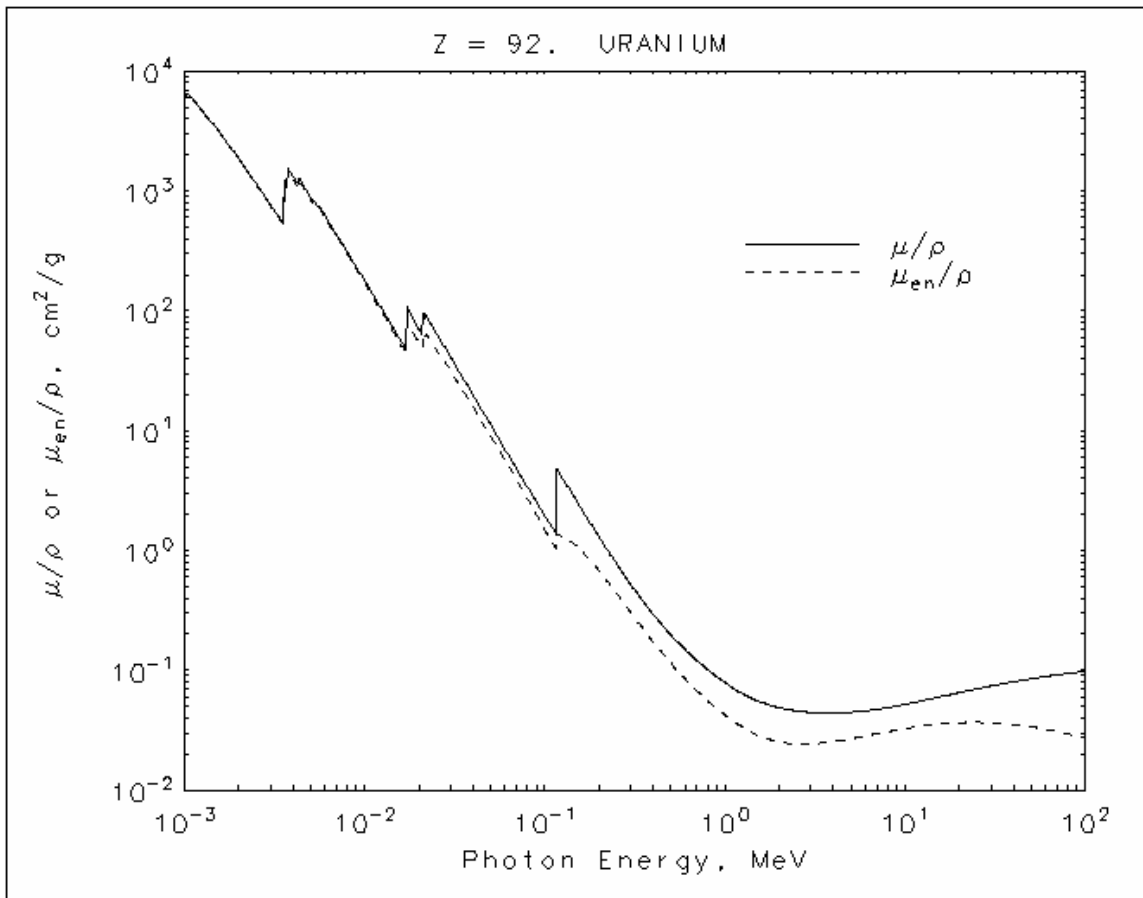
	5.00000E-03	5.534E+02	5.423E+02
	6.00000E-03	3.514E+02	3.428E+02
	8.00000E-03	1.705E+02	1.643E+02
	1.00000E-02	9.691E+01	9.204E+01
	1.02068E-02	9.201E+01	8.724E+01
L3	1.02068E-02	2.334E+02	1.966E+02
	1.08548E-02	1.983E+02	1.684E+02
	1.15440E-02	1.689E+02	1.444E+02
L2	1.15440E-02	2.312E+02	1.889E+02
	1.18186E-02	2.268E+02	1.797E+02
	1.20998E-02	2.065E+02	1.699E+02
L1	1.20998E-02	2.382E+02	1.948E+02
	1.50000E-02	1.389E+02	1.172E+02
	2.00000E-02	6.573E+01	5.697E+01
	3.00000E-02	2.273E+01	1.991E+01
	4.00000E-02	1.067E+01	9.240E+00
	5.00000E-02	5.949E+00	5.050E+00
	6.00000E-02	3.713E+00	3.070E+00
	6.95250E-02	2.552E+00	2.049E+00
K	6.95250E-02	1.123E+01	3.212E+00
	8.00000E-02	7.810E+00	2.879E+00
	1.00000E-01	4.438E+00	2.100E+00
	1.50000E-01	1.581E+00	9.378E-01
	2.00000E-01	7.844E-01	4.913E-01
	3.00000E-01	3.238E-01	1.973E-01
	4.00000E-01	1.925E-01	1.100E-01
	5.00000E-01	1.378E-01	7.440E-02
	6.00000E-01	1.093E-01	5.673E-02
	8.00000E-01	8.066E-02	4.028E-02
	1.00000E+00	6.618E-02	3.276E-02
	1.25000E+00	5.577E-02	2.761E-02
	1.50000E+00	5.000E-02	2.484E-02
	2.00000E+00	4.433E-02	2.256E-02
	3.00000E+00	4.075E-02	2.236E-02
	4.00000E+00	4.038E-02	2.363E-02
	5.00000E+00	4.103E-02	2.510E-02
	6.00000E+00	4.210E-02	2.649E-02
	8.00000E+00	4.472E-02	2.886E-02
	1.00000E+01	4.747E-02	3.072E-02
	1.50000E+01	5.384E-02	3.360E-02
	2.00000E+01	5.893E-02	3.475E-02



LEAD
Z = 82

Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
1.00000E-03	5.210E+03	5.197E+03
1.50000E-03	2.356E+03	2.344E+03
2.00000E-03	1.285E+03	1.274E+03
2.48400E-03	8.006E+02	7.895E+02
M5 2.48400E-03	1.397E+03	1.366E+03
2.53429E-03	1.726E+03	1.682E+03
2.58560E-03	1.944E+03	1.895E+03
M4 2.58560E-03	2.458E+03	2.390E+03
3.00000E-03	1.965E+03	1.913E+03
3.06640E-03	1.857E+03	1.808E+03
M3 3.06640E-03	2.146E+03	2.090E+03
3.30130E-03	1.796E+03	1.748E+03
3.55420E-03	1.496E+03	1.459E+03
M2 3.55420E-03	1.585E+03	1.546E+03
3.69948E-03	1.442E+03	1.405E+03
3.85070E-03	1.311E+03	1.279E+03
M1 3.85070E-03	1.368E+03	1.335E+03
4.00000E-03	1.251E+03	1.221E+03

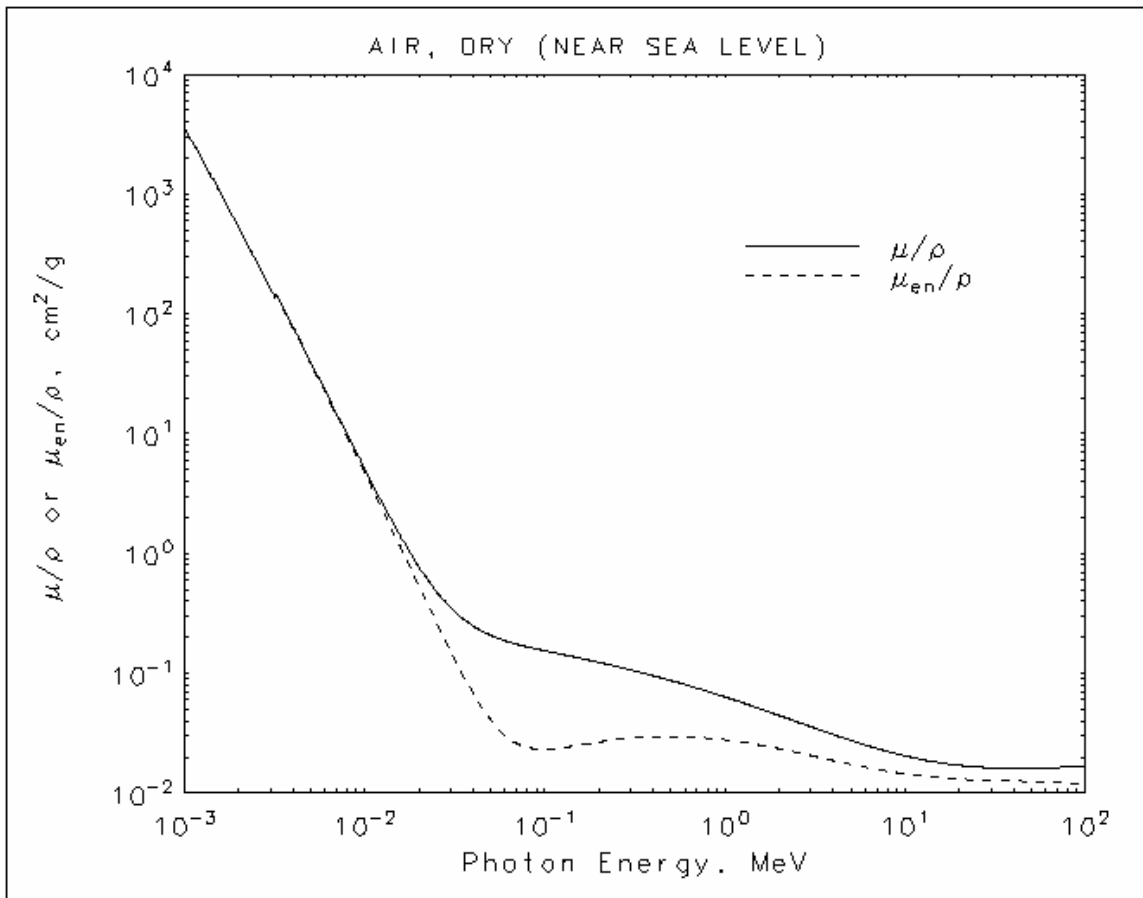
	5.00000E-03	7.304E+02	7.124E+02
	6.00000E-03	4.672E+02	4.546E+02
	8.00000E-03	2.287E+02	2.207E+02
	1.00000E-02	1.306E+02	1.247E+02
	1.30352E-02	6.701E+01	6.270E+01
L3	1.30352E-02	1.621E+02	1.291E+02
	1.50000E-02	1.116E+02	9.100E+01
	1.52000E-02	1.078E+02	8.807E+01
L2	1.52000E-02	1.485E+02	1.131E+02
	1.55269E-02	1.416E+02	1.083E+02
	1.58608E-02	1.344E+02	1.032E+02
L1	1.58608E-02	1.548E+02	1.180E+02
	2.00000E-02	8.636E+01	6.899E+01
	3.00000E-02	3.032E+01	2.536E+01
	4.00000E-02	1.436E+01	1.211E+01
	5.00000E-02	8.041E+00	6.740E+00
	6.00000E-02	5.021E+00	4.149E+00
	8.00000E-02	2.419E+00	1.916E+00
	8.80045E-02	1.910E+00	1.482E+00
K	8.80045E-02	7.683E+00	2.160E+00
	1.00000E-01	5.549E+00	1.976E+00
	1.50000E-01	2.014E+00	1.056E+00
	2.00000E-01	9.985E-01	5.870E-01
	3.00000E-01	4.031E-01	2.455E-01
	4.00000E-01	2.323E-01	1.370E-01
	5.00000E-01	1.614E-01	9.128E-02
	6.00000E-01	1.248E-01	6.819E-02
	8.00000E-01	8.870E-02	4.644E-02
	1.00000E+00	7.102E-02	3.654E-02
	1.25000E+00	5.876E-02	2.988E-02
	1.50000E+00	5.222E-02	2.640E-02
	2.00000E+00	4.606E-02	2.360E-02
	3.00000E+00	4.234E-02	2.322E-02
	4.00000E+00	4.197E-02	2.449E-02
	5.00000E+00	4.272E-02	2.600E-02
	6.00000E+00	4.391E-02	2.744E-02
	8.00000E+00	4.675E-02	2.989E-02
	1.00000E+01	4.972E-02	3.181E-02
	1.50000E+01	5.658E-02	3.478E-02
	2.00000E+01	6.206E-02	3.595E-02



URANIUM
Z = 92

	Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
	1.00000E-03	6.626E+03	6.612E+03
	1.02220E-03	6.375E+03	6.360E+03
	1.04490E-03	6.127E+03	6.112E+03
N3	1.04490E-03	6.519E+03	6.504E+03
	1.15314E-03	5.446E+03	5.431E+03
	1.27260E-03	4.526E+03	4.511E+03
N2	1.27260E-03	4.589E+03	4.575E+03
	1.35409E-03	4.065E+03	4.051E+03
	1.44080E-03	3.598E+03	3.584E+03
N1	1.44080E-03	3.668E+03	3.654E+03
	1.50000E-03	3.382E+03	3.368E+03
	2.00000E-03	1.865E+03	1.852E+03
	3.00000E-03	7.692E+02	7.578E+02
	3.55170E-03	5.257E+02	5.151E+02
M5	3.55170E-03	1.266E+03	1.220E+03
	3.63859E-03	1.188E+03	1.142E+03
	3.72760E-03	1.112E+03	1.072E+03
M4	3.72760E-03	1.582E+03	1.517E+03

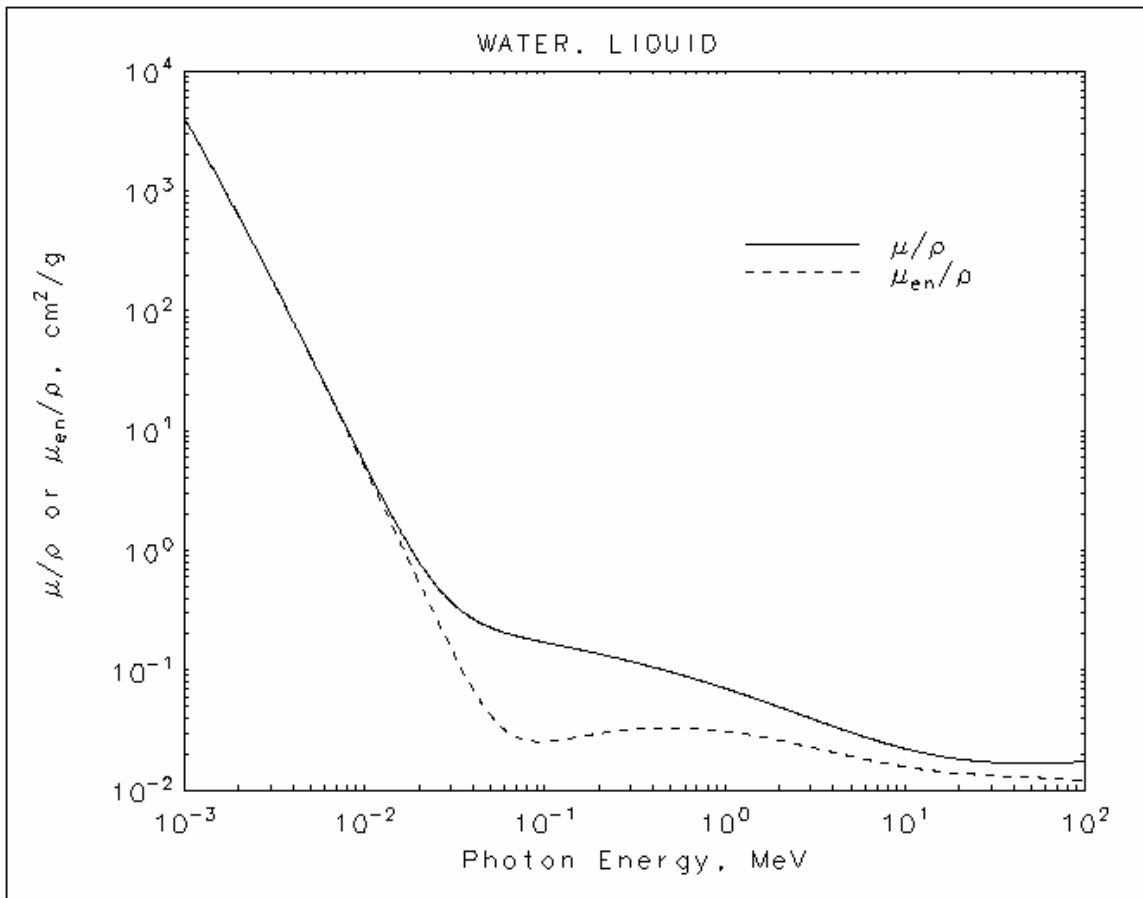
	4.00000E-03	1.329E+03	1.277E+03
	4.30340E-03	1.110E+03	1.068E+03
M3	4.30340E-03	1.292E+03	1.242E+03
	5.00000E-03	8.891E+02	8.569E+02
	5.18220E-03	8.118E+02	7.825E+02
M2	5.18220E-03	8.611E+02	8.301E+02
	5.36198E-03	7.915E+02	7.632E+02
	5.54800E-03	7.282E+02	7.022E+02
M1	5.54800E-03	7.592E+02	7.322E+02
	6.00000E-03	6.284E+02	6.062E+02
	8.00000E-03	3.108E+02	2.989E+02
	1.00000E-02	1.791E+02	1.711E+02
	1.50000E-02	6.528E+01	6.084E+01
	1.71663E-02	4.663E+01	4.293E+01
L3	1.71663E-02	1.070E+02	7.980E+01
	2.00000E-02	7.106E+01	5.496E+01
	2.09476E-02	6.300E+01	4.914E+01
L2	2.09476E-02	8.838E+01	6.222E+01
	2.13487E-02	9.515E+01	5.959E+01
	2.17574E-02	8.023E+01	5.715E+01
L1	2.17574E-02	9.222E+01	6.487E+01
	3.00000E-02	4.128E+01	3.149E+01
	4.00000E-02	1.983E+01	1.576E+01
	5.00000E-02	1.121E+01	9.034E+00
	6.00000E-02	7.035E+00	5.678E+00
	8.00000E-02	3.395E+00	2.695E+00
	1.00000E-01	1.954E+00	1.502E+00
	1.15606E-01	1.378E+00	1.027E+00
K	1.15606E-01	4.893E+00	1.382E+00
	1.50000E-01	2.591E+00	1.083E+00
	2.00000E-01	1.298E+00	6.746E-01
	3.00000E-01	5.192E-01	3.050E-01
	4.00000E-01	2.922E-01	1.732E-01
	5.00000E-01	1.976E-01	1.152E-01
	6.00000E-01	1.490E-01	8.494E-02
	8.00000E-01	1.016E-01	5.574E-02
	1.00000E+00	7.896E-02	4.241E-02
	1.25000E+00	6.370E-02	3.351E-02
	1.50000E+00	5.587E-02	2.891E-02
	2.00000E+00	4.878E-02	2.523E-02
	3.00000E+00	4.447E-02	2.434E-02
	4.00000E+00	4.392E-02	2.546E-02
	5.00000E+00	4.463E-02	2.689E-02
	6.00000E+00	4.583E-02	2.829E-02
	8.00000E+00	4.879E-02	3.068E-02
	1.00000E+01	5.195E-02	3.259E-02
	1.50000E+01	5.927E-02	3.552E-02
	2.00000E+01	6.512E-02	3.662E-02



AIR, DRY (NEAR SEA LEVEL)

	Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
	1.00000E-03	3.606E+03	3.599E+03
	1.50000E-03	1.191E+03	1.188E+03
	2.00000E-03	5.279E+02	5.262E+02
	3.00000E-03	1.625E+02	1.614E+02
	3.20290E-03	1.340E+02	1.330E+02
18 K	3.20290E-03	1.485E+02	1.460E+02
	4.00000E-03	7.788E+01	7.636E+01
	5.00000E-03	4.027E+01	3.931E+01
	6.00000E-03	2.341E+01	2.270E+01
	8.00000E-03	9.921E+00	9.446E+00
	1.00000E-02	5.120E+00	4.742E+00
	1.50000E-02	1.614E+00	1.334E+00
	2.00000E-02	7.779E-01	5.389E-01
	3.00000E-02	3.538E-01	1.537E-01
	4.00000E-02	2.485E-01	6.833E-02
	5.00000E-02	2.080E-01	4.098E-02
	6.00000E-02	1.875E-01	3.041E-02
	8.00000E-02	1.662E-01	2.407E-02
	1.00000E-01	1.541E-01	2.325E-02

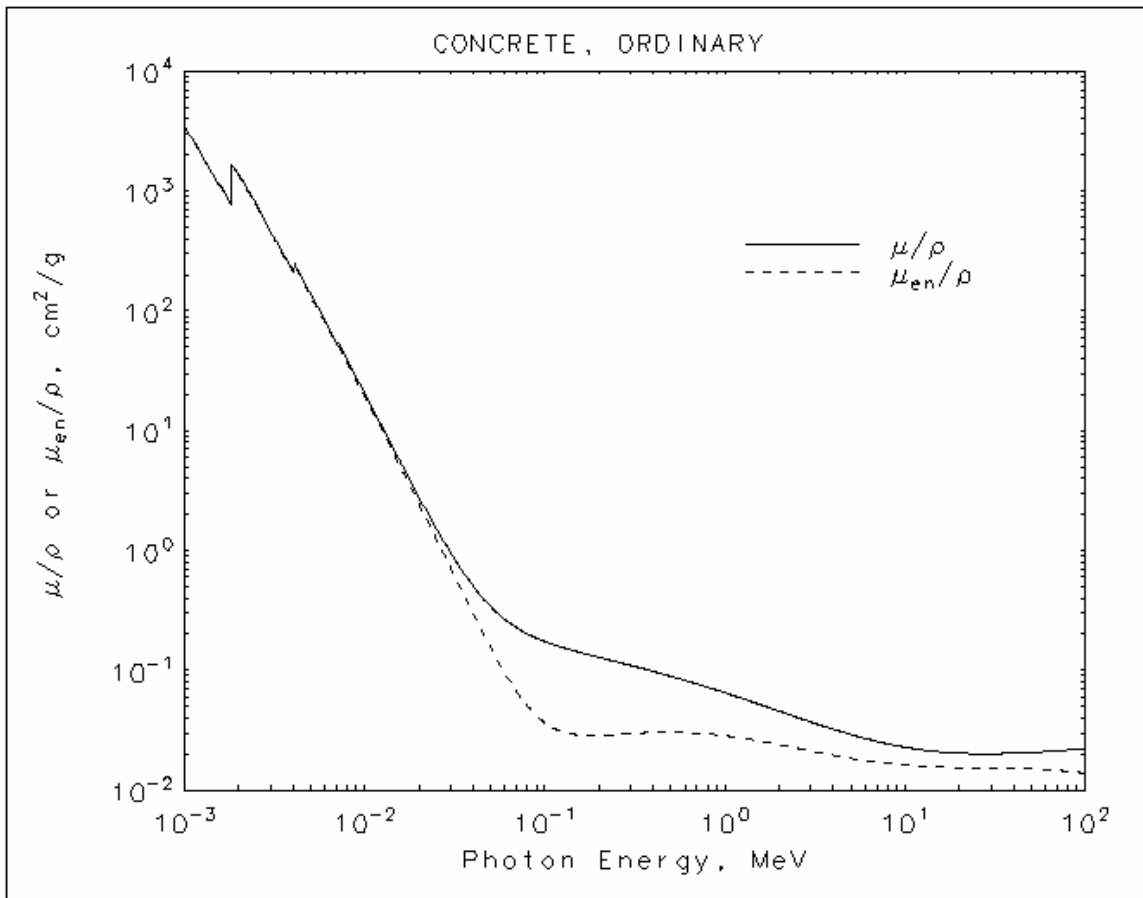
1.50000E-01	1.356E-01	2.496E-02
2.00000E-01	1.233E-01	2.672E-02
3.00000E-01	1.067E-01	2.872E-02
4.00000E-01	9.549E-02	2.949E-02
5.00000E-01	8.712E-02	2.966E-02
6.00000E-01	8.055E-02	2.953E-02
8.00000E-01	7.074E-02	2.882E-02
1.00000E+00	6.358E-02	2.789E-02
1.25000E+00	5.687E-02	2.666E-02
1.50000E+00	5.175E-02	2.547E-02
2.00000E+00	4.447E-02	2.345E-02
3.00000E+00	3.581E-02	2.057E-02
4.00000E+00	3.079E-02	1.870E-02
5.00000E+00	2.751E-02	1.740E-02
6.00000E+00	2.522E-02	1.647E-02
8.00000E+00	2.225E-02	1.525E-02
1.00000E+01	2.045E-02	1.450E-02
1.50000E+01	1.810E-02	1.353E-02
2.00000E+01	1.705E-02	1.311E-02



WATER, LIQUID

Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
1.00000E-03	4.078E+03	4.065E+03
1.50000E-03	1.376E+03	1.372E+03
2.00000E-03	6.173E+02	6.152E+02
3.00000E-03	1.929E+02	1.917E+02
4.00000E-03	8.278E+01	8.191E+01
5.00000E-03	4.258E+01	4.188E+01
6.00000E-03	2.464E+01	2.405E+01
8.00000E-03	1.037E+01	9.915E+00
1.00000E-02	5.329E+00	4.944E+00
1.50000E-02	1.673E+00	1.374E+00
2.00000E-02	8.096E-01	5.503E-01
3.00000E-02	3.756E-01	1.557E-01
4.00000E-02	2.683E-01	6.947E-02
5.00000E-02	2.269E-01	4.223E-02
6.00000E-02	2.059E-01	3.190E-02
8.00000E-02	1.837E-01	2.597E-02
1.00000E-01	1.707E-01	2.546E-02
1.50000E-01	1.505E-01	2.764E-02
2.00000E-01	1.370E-01	2.967E-02

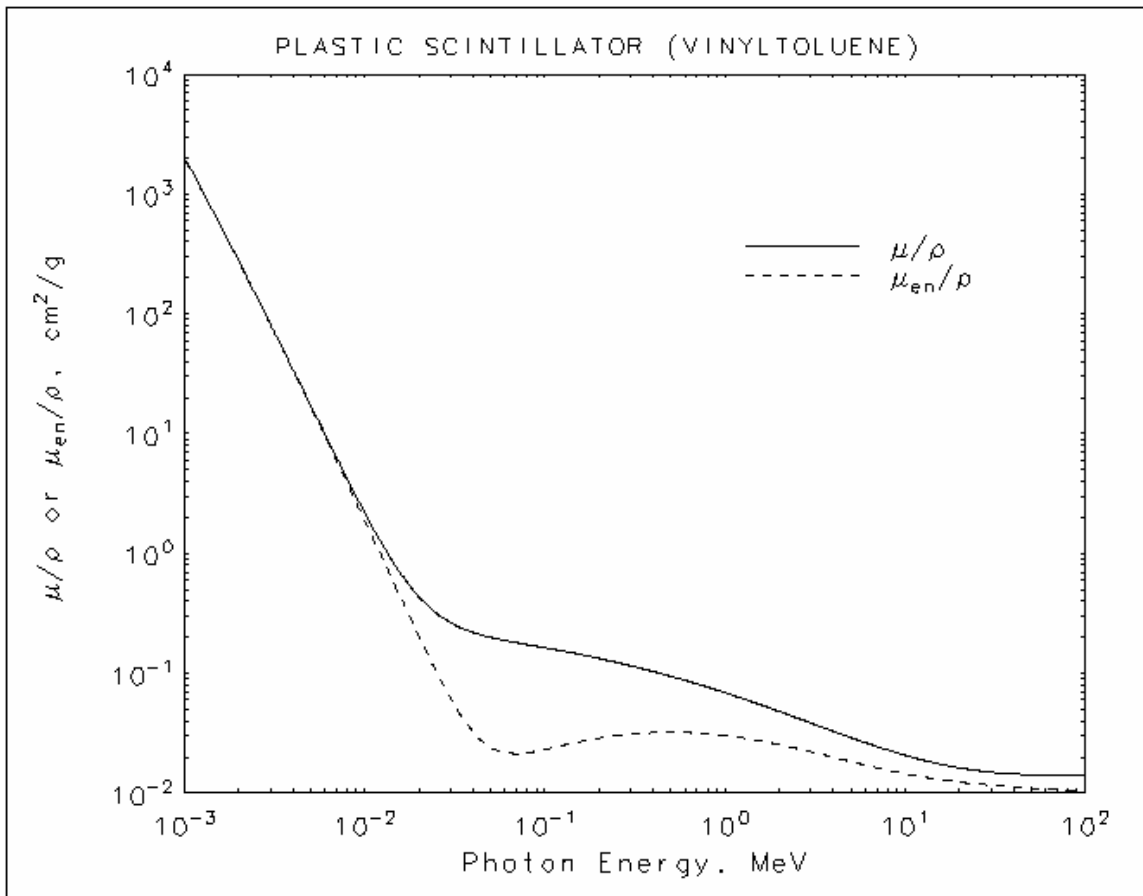
3.00000E-01	1.186E-01	3.192E-02
4.00000E-01	1.061E-01	3.279E-02
5.00000E-01	9.687E-02	3.299E-02
6.00000E-01	8.956E-02	3.284E-02
8.00000E-01	7.865E-02	3.206E-02
1.00000E+00	7.072E-02	3.103E-02
1.25000E+00	6.323E-02	2.965E-02
1.50000E+00	5.754E-02	2.833E-02
2.00000E+00	4.942E-02	2.608E-02
3.00000E+00	3.969E-02	2.281E-02
4.00000E+00	3.403E-02	2.066E-02
5.00000E+00	3.031E-02	1.915E-02
6.00000E+00	2.770E-02	1.806E-02
8.00000E+00	2.429E-02	1.658E-02
1.00000E+01	2.219E-02	1.566E-02
1.50000E+01	1.941E-02	1.441E-02
2.00000E+01	1.813E-02	1.382E-02



CONCRETE, ORDINARY

	Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
	1.00000E-03	3.466E+03	3.456E+03
	1.03542E-03	3.164E+03	3.156E+03
	1.07210E-03	2.889E+03	2.880E+03
11 K	1.07210E-03	2.978E+03	2.968E+03
	1.18283E-03	2.302E+03	2.295E+03
	1.30500E-03	1.775E+03	1.769E+03
12 K	1.30500E-03	1.781E+03	1.775E+03
	1.50000E-03	1.227E+03	1.223E+03
	1.55960E-03	1.104E+03	1.100E+03
13 K	1.55960E-03	1.176E+03	1.169E+03
	1.69350E-03	9.419E+02	9.365E+02
	1.83890E-03	7.525E+02	7.482E+02
14 K	1.83890E-03	1.631E+03	1.587E+03
	2.00000E-03	1.368E+03	1.333E+03
	3.00000E-03	4.646E+02	4.552E+02
	3.60740E-03	2.804E+02	2.751E+02
19 K	3.60740E-03	2.911E+02	2.844E+02
	4.00000E-03	2.188E+02	2.139E+02
	4.03810E-03	2.131E+02	2.084E+02

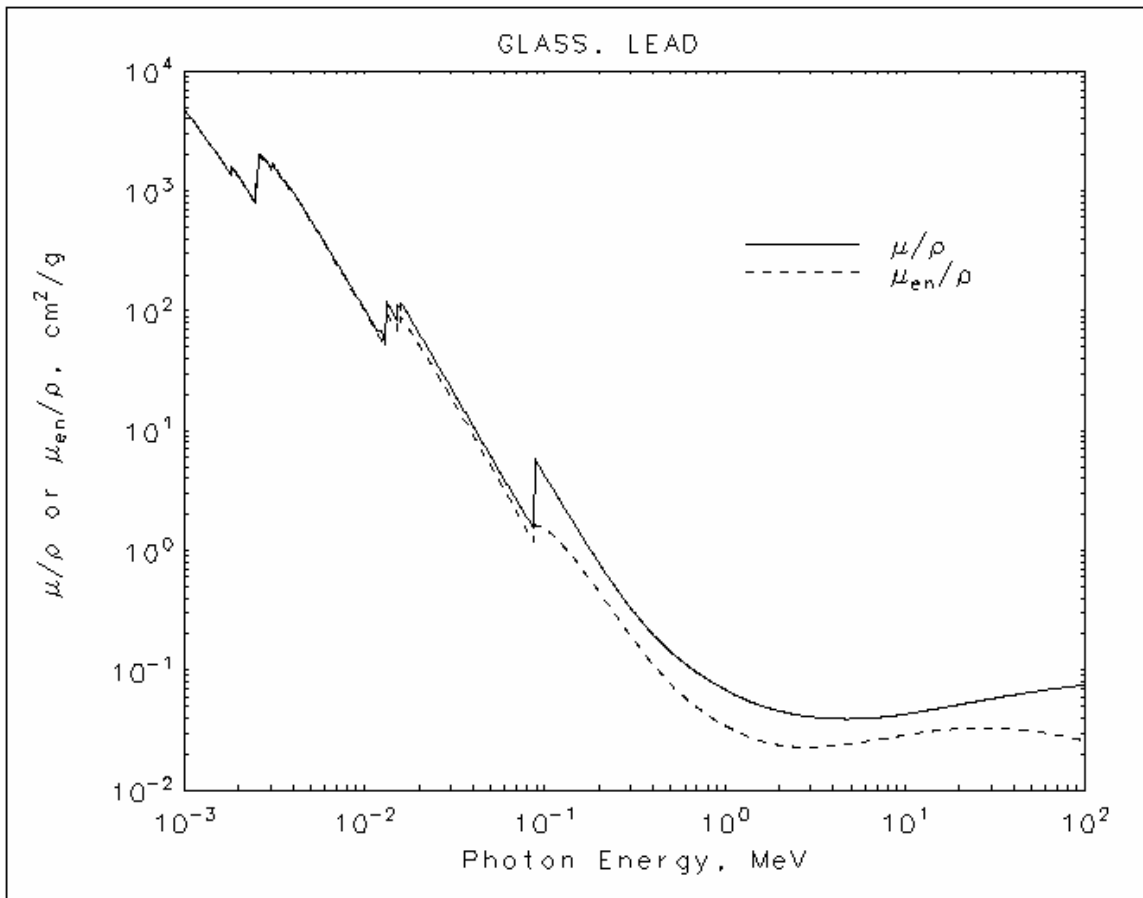
20 K	4.03810E-03	2.520E+02	2.415E+02
	5.00000E-03	1.401E+02	1.348E+02
	6.00000E-03	8.401E+01	8.094E+01
	7.11200E-03	5.187E+01	4.995E+01
26 K	7.11200E-03	5.415E+01	5.153E+01
	8.00000E-03	3.878E+01	3.689E+01
	1.00000E-02	2.045E+01	1.937E+01
	1.50000E-02	6.351E+00	5.855E+00
	2.00000E-02	2.806E+00	2.462E+00
	3.00000E-02	9.601E-01	7.157E-01
	4.00000E-02	5.058E-01	2.995E-01
	5.00000E-02	3.412E-01	1.563E-01
	6.00000E-02	2.660E-01	9.554E-02
	8.00000E-02	2.014E-01	5.050E-02
	1.00000E-01	1.738E-01	3.649E-02
	1.50000E-01	1.436E-01	2.897E-02
	2.00000E-01	1.282E-01	2.868E-02
	3.00000E-01	1.097E-01	2.969E-02
	4.00000E-01	9.783E-02	3.024E-02
	5.00000E-01	8.915E-02	3.033E-02
	6.00000E-01	8.236E-02	3.015E-02
	8.00000E-01	7.227E-02	2.940E-02
	1.00000E+00	6.495E-02	2.843E-02
	1.25000E+00	5.807E-02	2.716E-02
	1.50000E+00	5.288E-02	2.595E-02
	2.00000E+00	4.557E-02	2.395E-02
	3.00000E+00	3.701E-02	2.120E-02
	4.00000E+00	3.217E-02	1.951E-02
	5.00000E+00	2.908E-02	1.840E-02
	6.00000E+00	2.697E-02	1.763E-02
	8.00000E+00	2.432E-02	1.669E-02
	1.00000E+01	2.278E-02	1.617E-02
	1.50000E+01	2.096E-02	1.559E-02
	2.00000E+01	2.030E-02	1.539E-02



PLASTIC SCINTILLATOR (VINYL TOLUENE)

Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
1.00000E-03	2.024E+03	2.022E+03
1.50000E-03	6.409E+02	6.397E+02
2.00000E-03	2.770E+02	2.760E+02
3.00000E-03	8.270E+01	8.203E+01
4.00000E-03	3.461E+01	3.407E+01
5.00000E-03	1.753E+01	1.707E+01
6.00000E-03	1.005E+01	9.650E+00
8.00000E-03	4.220E+00	3.883E+00
1.00000E-02	2.204E+00	1.903E+00
1.50000E-02	7.705E-01	5.158E-01
2.00000E-02	4.358E-01	2.059E-01
3.00000E-02	2.647E-01	6.210E-02
4.00000E-02	2.194E-01	3.256E-02
5.00000E-02	1.997E-01	2.424E-02
6.00000E-02	1.881E-01	2.180E-02
8.00000E-02	1.736E-01	2.172E-02
1.00000E-01	1.635E-01	2.310E-02
1.50000E-01	1.458E-01	2.650E-02
2.00000E-01	1.331E-01	2.876E-02

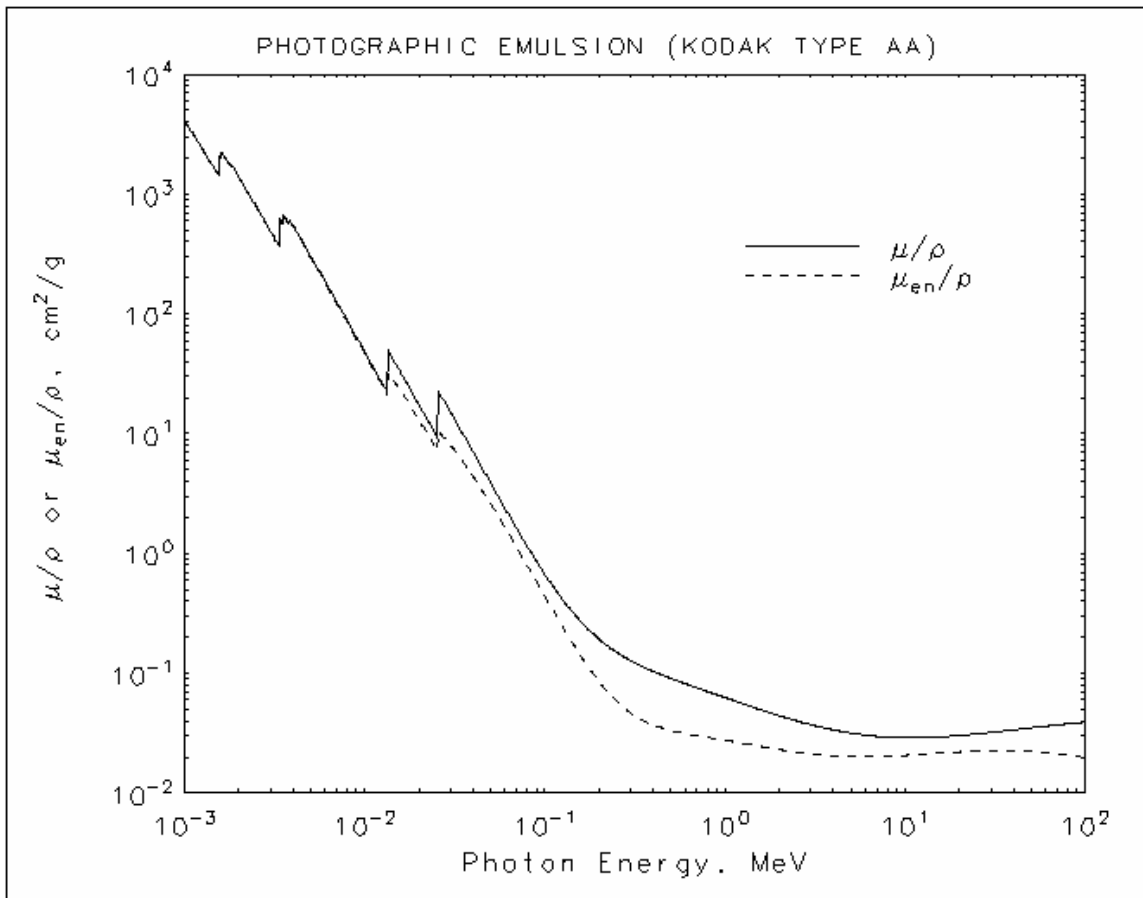
3.00000E-01	1.155E-01	3.110E-02
4.00000E-01	1.034E-01	3.197E-02
5.00000E-01	9.443E-02	3.218E-02
6.00000E-01	8.732E-02	3.204E-02
8.00000E-01	7.668E-02	3.128E-02
1.00000E+00	6.894E-02	3.027E-02
1.25000E+00	6.166E-02	2.894E-02
1.50000E+00	5.611E-02	2.766E-02
2.00000E+00	4.810E-02	2.542E-02
3.00000E+00	3.848E-02	2.214E-02
4.00000E+00	3.282E-02	1.992E-02
5.00000E+00	2.907E-02	1.835E-02
6.00000E+00	2.641E-02	1.718E-02
8.00000E+00	2.290E-02	1.558E-02
1.00000E+01	2.069E-02	1.455E-02
1.50000E+01	1.770E-02	1.309E-02
2.00000E+01	1.624E-02	1.236E-02



GLASS, LEAD

	Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
	1.00000E-03	4.816E+03	4.804E+03
	1.15026E-03	3.619E+03	3.607E+03
	1.32310E-03	2.704E+03	2.693E+03
33 L3	1.32310E-03	2.713E+03	2.702E+03
	1.34073E-03	2.639E+03	2.628E+03
	1.35860E-03	2.567E+03	2.556E+03
33 L2	1.35860E-03	2.571E+03	2.560E+03
	1.50000E-03	2.088E+03	2.078E+03
	1.52650E-03	2.012E+03	2.002E+03
33 L1	1.52650E-03	2.014E+03	2.004E+03
	1.67543E-03	1.646E+03	1.636E+03
	1.83890E-03	1.339E+03	1.330E+03
14 K	1.83890E-03	1.573E+03	1.552E+03
	2.00000E-03	1.316E+03	1.298E+03
	2.48400E-03	8.026E+02	7.897E+02
82 M5	2.48400E-03	1.251E+03	1.223E+03
	2.53429E-03	1.488E+03	1.451E+03
	2.58560E-03	1.641E+03	1.600E+03
82 M4	2.58560E-03	2.027E+03	1.973E+03

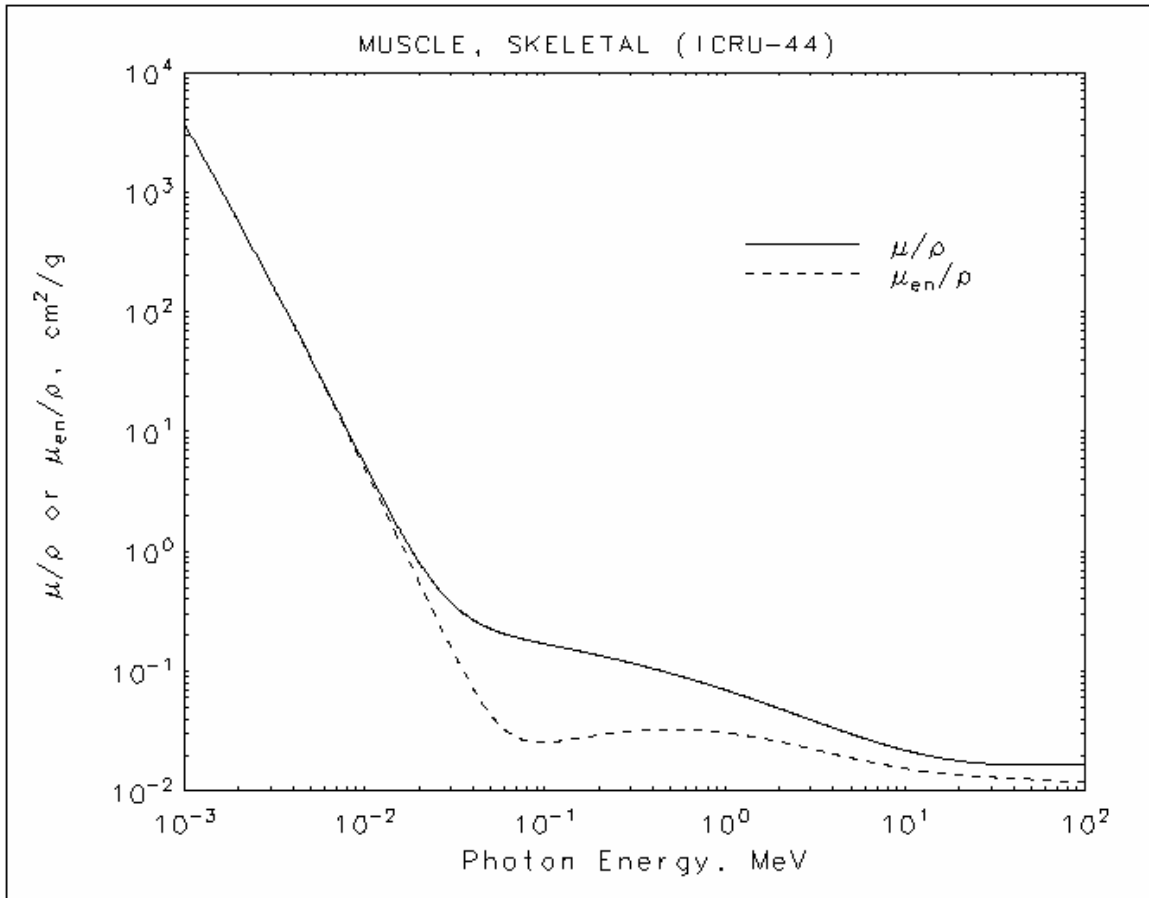
		3.00000E-03	1.596E+03	1.555E+03
		3.06640E-03	1.508E+03	1.469E+03
82	M3	3.06640E-03	1.726E+03	1.681E+03
		3.30130E-03	1.440E+03	1.404E+03
		3.55420E-03	1.199E+03	1.170E+03
82	M2	3.55420E-03	1.266E+03	1.235E+03
		3.69948E-03	1.150E+03	1.122E+03
		3.85070E-03	1.045E+03	1.020E+03
82	M1	3.85070E-03	1.088E+03	1.062E+03
		4.00000E-03	9.945E+02	9.709E+02
		4.96640E-03	5.875E+02	5.733E+02
22	K	4.96640E-03	5.924E+02	5.772E+02
		5.00000E-03	5.828E+02	5.678E+02
		6.00000E-03	3.715E+02	3.612E+02
		8.00000E-03	1.808E+02	1.744E+02
		1.00000E-02	1.029E+02	9.821E+01
		1.18667E-02	6.666E+01	6.288E+01
33	K	1.18667E-02	6.707E+01	6.308E+01
		1.24372E-02	6.625E+01	5.580E+01
		1.30352E-02	5.288E+01	4.937E+01
82	L3	1.30352E-02	1.244E+02	9.927E+01
		1.50000E-02	8.557E+01	6.991E+01
		1.52000E-02	8.266E+01	6.766E+01
82	L2	1.52000E-02	1.132E+02	8.649E+01
		1.55269E-02	1.080E+02	8.279E+01
		1.58608E-02	1.025E+02	7.888E+01
82	L1	1.58608E-02	1.178E+02	8.998E+01
		2.00000E-02	6.568E+01	5.252E+01
		3.00000E-02	2.305E+01	1.927E+01
		4.00000E-02	1.093E+01	9.198E+00
		5.00000E-02	6.134E+00	5.118E+00
		6.00000E-02	3.843E+00	3.152E+00
		8.00000E-02	1.869E+00	1.458E+00
		8.80045E-02	1.483E+00	1.129E+00
8	82	8.80045E-02	5.824E+00	1.639E+00
		1.00000E-01	4.216E+00	1.498E+00
		1.50000E-01	1.550E+00	8.042E-01
		2.00000E-01	7.820E-01	4.508E-01
		3.00000E-01	3.297E-01	1.934E-01
		4.00000E-01	1.984E-01	1.114E-01
		5.00000E-01	1.429E-01	7.676E-02
		6.00000E-01	1.138E-01	5.918E-02
		8.00000E-01	8.421E-02	4.246E-02
		1.00000E+00	6.914E-02	3.468E-02
		1.25000E+00	5.826E-02	2.931E-02
		1.50000E+00	5.208E-02	2.636E-02
		2.00000E+00	4.568E-02	2.373E-02
		3.00000E+00	4.082E-02	2.281E-02
		4.00000E+00	3.938E-02	2.343E-02
		5.00000E+00	3.919E-02	2.439E-02
		6.00000E+00	3.958E-02	2.540E-02
		8.00000E+00	4.108E-02	2.724E-02
		1.00000E+01	4.295E-02	2.878E-02
		1.50000E+01	4.768E-02	3.137E-02
		2.00000E+01	5.165E-02	3.257E-02



PHOTOGRAPHIC EMULSION (KODAK TYPE AA)

	Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
	1.00000E-03	4.155E+03	4.148E+03
	1.50000E-03	1.541E+03	1.536E+03
	1.54990E-03	1.420E+03	1.415E+03
35 L3	1.54990E-03	2.169E+03	2.151E+03
	1.57278E-03	2.025E+03	2.008E+03
	1.59600E-03	1.927E+03	1.911E+03
35 L2	1.59600E-03	2.263E+03	2.241E+03
	1.68644E-03	2.003E+03	1.985E+03
	1.78200E-03	1.736E+03	1.720E+03
35 L1	1.78200E-03	1.853E+03	1.835E+03
	2.00000E-03	1.392E+03	1.378E+03
	3.00000E-03	4.936E+02	4.880E+02
	3.35110E-03	3.698E+02	3.651E+02
47 L3	3.35110E-03	6.361E+02	6.179E+02
	3.43632E-03	5.966E+02	5.798E+02
	3.52370E-03	5.596E+02	5.439E+02
47 L2	3.52370E-03	6.862E+02	6.633E+02
	3.66203E-03	6.236E+02	6.022E+02
	3.80580E-03	5.651E+02	5.470E+02

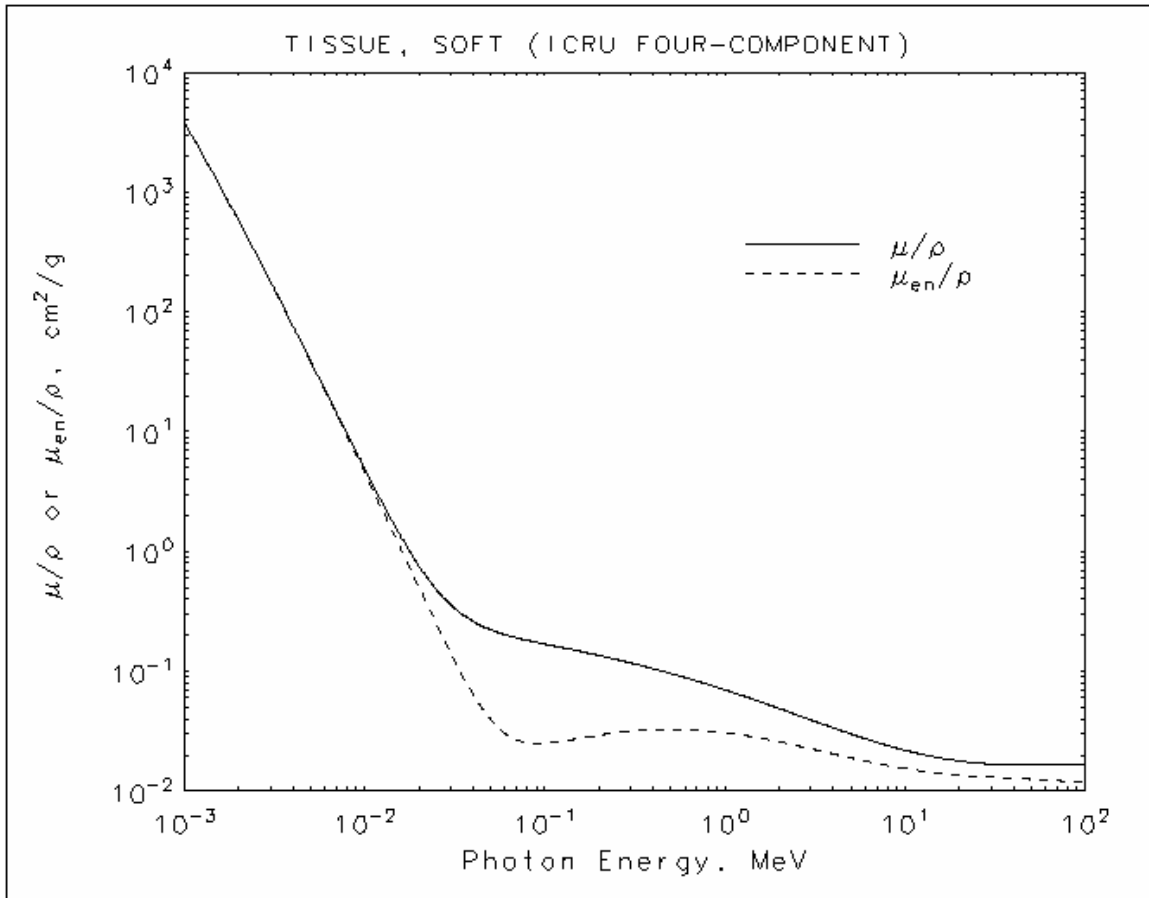
47	L1	3.80580E-03	6.211E+02	6.003E+02
		4.00000E-03	5.496E+02	5.317E+02
		5.00000E-03	3.078E+02	2.985E+02
		6.00000E-03	1.906E+02	1.849E+02
		8.00000E-03	8.859E+01	8.565E+01
		1.00000E-02	4.857E+01	4.663E+01
		1.34737E-02	2.166E+01	2.044E+01
35	K	1.34737E-02	4.958E+01	3.300E+01
		1.50000E-02	3.752E+01	2.593E+01
		2.00000E-02	1.754E+01	1.308E+01
		2.55140E-02	9.135E+00	7.074E+00
47	K	2.55140E-02	2.293E+01	1.061E+01
		3.00000E-02	1.508E+01	8.007E+00
		4.00000E-02	7.044E+00	4.392E+00
		5.00000E-02	3.889E+00	2.608E+00
		6.00000E-02	2.400E+00	1.661E+00
		8.00000E-02	1.147E+00	7.915E-01
		1.00000E-01	6.720E-01	4.412E-01
		1.50000E-01	2.962E-01	1.586E-01
		2.00000E-01	1.927E-01	8.527E-02
		3.00000E-01	1.274E-01	4.670E-02
		4.00000E-01	1.037E-01	3.709E-02
		5.00000E-01	9.075E-02	3.339E-02
		6.00000E-01	8.210E-02	3.147E-02
		8.00000E-01	7.057E-02	2.923E-02
		1.00000E+00	6.281E-02	2.768E-02
		1.25000E+00	5.587E-02	2.610E-02
		1.50000E+00	5.090E-02	2.483E-02
		2.00000E+00	4.429E-02	2.302E-02
		3.00000E+00	3.727E-02	2.116E-02
		4.00000E+00	3.372E-02	2.038E-02
		5.00000E+00	3.171E-02	2.009E-02
		6.00000E+00	3.049E-02	2.003E-02
		8.00000E+00	2.933E-02	2.024E-02
		1.00000E+01	2.900E-02	2.062E-02
		1.50000E+01	2.939E-02	2.150E-02
		2.00000E+01	3.026E-02	2.210E-02



MUSCLE, SKELETAL (ICRU-44)

	Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
	1.00000E-03	3.719E+03	3.709E+03
	1.03542E-03	3.393E+03	3.383E+03
	1.07210E-03	3.094E+03	3.085E+03
11 K	1.07210E-03	3.100E+03	3.091E+03
	1.50000E-03	1.251E+03	1.247E+03
	2.00000E-03	5.594E+02	5.574E+02
	2.14550E-03	4.581E+02	4.564E+02
15 K	2.14550E-03	4.626E+02	4.606E+02
	2.30297E-03	3.776E+02	3.762E+02
	2.47200E-03	3.085E+02	3.069E+02
16 K	2.47200E-03	3.140E+02	3.121E+02
	2.64140E-03	2.597E+02	2.579E+02
	2.82240E-03	2.145E+02	2.130E+02
17 K	2.82240E-03	2.160E+02	2.143E+02
	3.00000E-03	1.812E+02	1.796E+02
	3.60740E-03	1.057E+02	1.046E+02
19 K	3.60740E-03	1.100E+02	1.083E+02
	4.00000E-03	8.127E+01	7.992E+01
	5.00000E-03	4.206E+01	4.116E+01

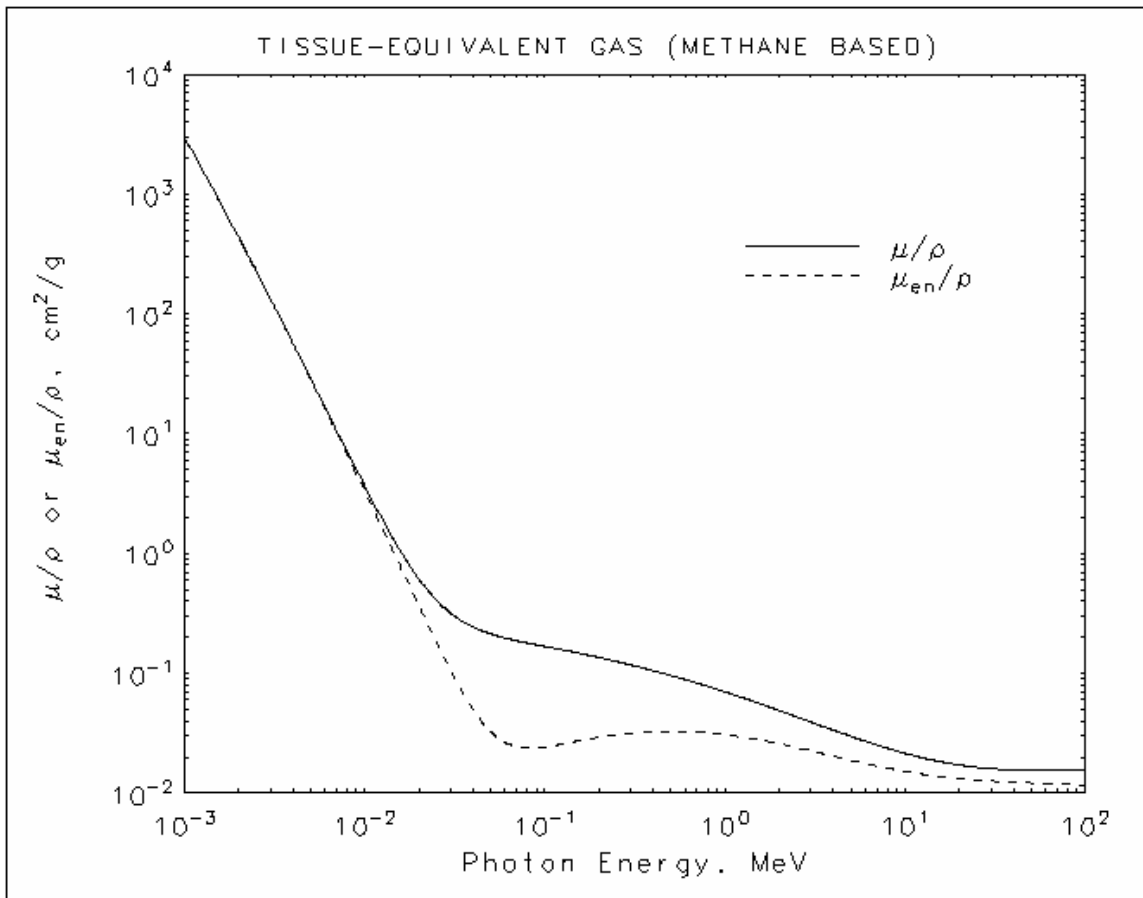
6.00000E-03	2.446E+01	2.377E+01
8.00000E-03	1.037E+01	9.888E+00
1.00000E-02	5.356E+00	4.964E+00
1.50000E-02	1.693E+00	1.396E+00
2.00000E-02	8.205E-01	5.638E-01
3.00000E-02	3.783E-01	1.610E-01
4.00000E-02	2.685E-01	7.192E-02
5.00000E-02	2.262E-01	4.349E-02
6.00000E-02	2.048E-01	3.258E-02
8.00000E-02	1.823E-01	2.615E-02
1.00000E-01	1.693E-01	2.544E-02
1.50000E-01	1.492E-01	2.745E-02
2.00000E-01	1.358E-01	2.942E-02
3.00000E-01	1.176E-01	3.164E-02
4.00000E-01	1.052E-01	3.249E-02
5.00000E-01	9.598E-02	3.269E-02
6.00000E-01	8.874E-02	3.254E-02
8.00000E-01	7.793E-02	3.177E-02
1.00000E+00	7.007E-02	3.074E-02
1.25000E+00	6.265E-02	2.938E-02
1.50000E+00	5.701E-02	2.808E-02
2.00000E+00	4.896E-02	2.584E-02
3.00000E+00	3.931E-02	2.259E-02
4.00000E+00	3.369E-02	2.045E-02
5.00000E+00	3.000E-02	1.895E-02
6.00000E+00	2.741E-02	1.786E-02
8.00000E+00	2.401E-02	1.639E-02
1.00000E+01	2.192E-02	1.547E-02
1.50000E+01	1.915E-02	1.421E-02
2.00000E+01	1.786E-02	1.361E-02



TISSUE, SOFT (ICRU FOUR-COMPONENT)

Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
1.00000E-03	3.829E+03	3.818E+03
1.50000E-03	1.286E+03	1.283E+03
2.00000E-03	5.755E+02	5.736E+02
3.00000E-03	1.792E+02	1.781E+02
4.00000E-03	7.681E+01	7.598E+01
5.00000E-03	3.947E+01	3.880E+01
6.00000E-03	2.283E+01	2.226E+01
8.00000E-03	9.604E+00	9.163E+00
1.00000E-02	4.937E+00	4.564E+00
1.50000E-02	1.558E+00	1.266E+00
2.00000E-02	7.616E-01	5.070E-01
3.00000E-02	3.604E-01	1.438E-01
4.00000E-02	2.609E-01	6.474E-02
5.00000E-02	2.223E-01	3.987E-02
6.00000E-02	2.025E-01	3.051E-02
8.00000E-02	1.813E-01	2.530E-02
1.00000E-01	1.688E-01	2.501E-02
1.50000E-01	1.490E-01	2.732E-02
2.00000E-01	1.356E-01	2.936E-02

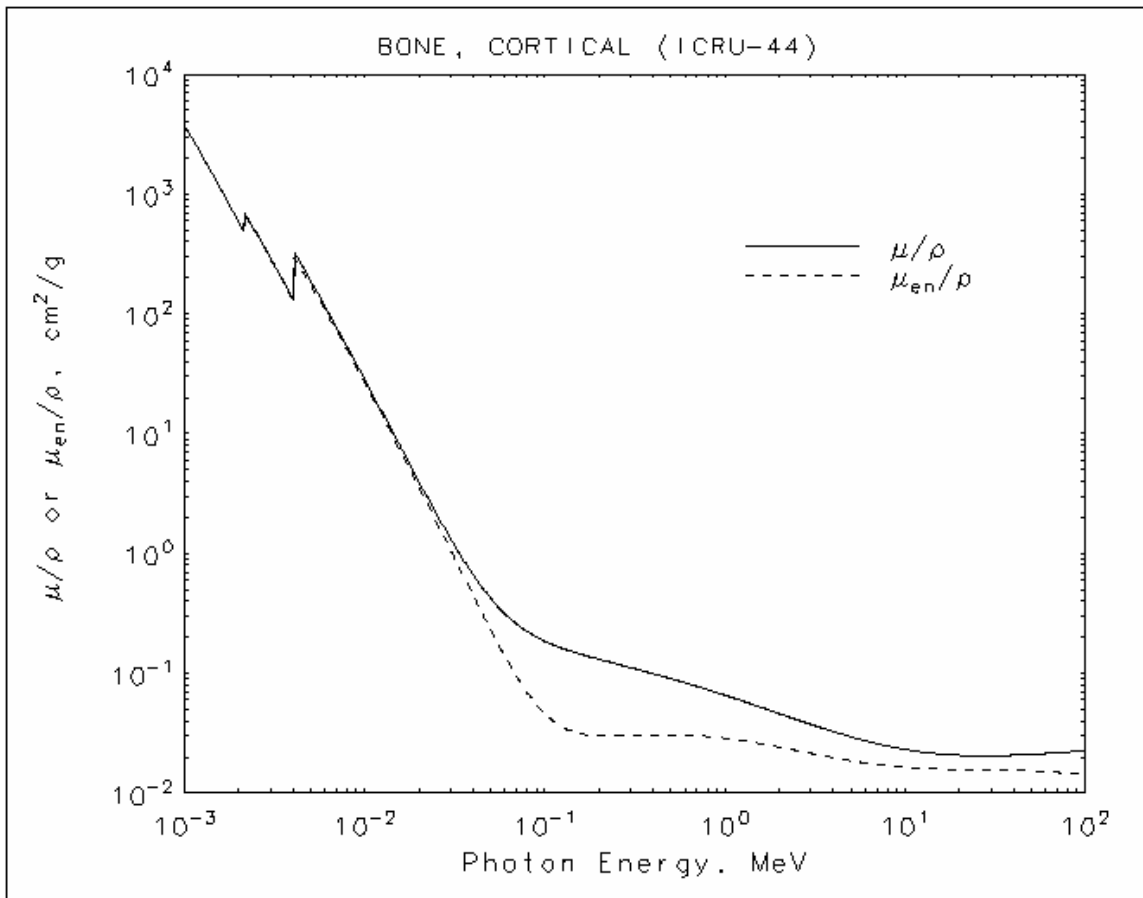
3.00000E-01	1.175E-01	3.161E-02
4.00000E-01	1.051E-01	3.247E-02
5.00000E-01	9.593E-02	3.267E-02
6.00000E-01	8.870E-02	3.252E-02
8.00000E-01	7.789E-02	3.175E-02
1.00000E+00	7.003E-02	3.073E-02
1.25000E+00	6.262E-02	2.937E-02
1.50000E+00	5.699E-02	2.806E-02
2.00000E+00	4.893E-02	2.582E-02
3.00000E+00	3.929E-02	2.258E-02
4.00000E+00	3.367E-02	2.044E-02
5.00000E+00	2.998E-02	1.894E-02
6.00000E+00	2.739E-02	1.785E-02
8.00000E+00	2.400E-02	1.638E-02
1.00000E+01	2.191E-02	1.546E-02
1.50000E+01	1.913E-02	1.420E-02
2.00000E+01	1.785E-02	1.360E-02



TISSUE-EQUIVALENT GAS (METHANE BASED)

Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
1.00000E-03	2.993E+03	2.986E+03
1.50000E-03	9.878E+02	9.854E+02
2.00000E-03	4.376E+02	4.361E+02
3.00000E-03	1.347E+02	1.338E+02
4.00000E-03	5.734E+01	5.665E+01
5.00000E-03	2.935E+01	2.878E+01
6.00000E-03	1.694E+01	1.645E+01
8.00000E-03	7.124E+00	6.730E+00
1.00000E-02	3.679E+00	3.338E+00
1.50000E-02	1.197E+00	9.207E-01
2.00000E-02	6.129E-01	3.685E-01
3.00000E-02	3.177E-01	1.063E-01
4.00000E-02	2.431E-01	5.002E-02
5.00000E-02	2.132E-01	3.278E-02
6.00000E-02	1.972E-01	2.663E-02
8.00000E-02	1.790E-01	2.380E-02
1.00000E-01	1.675E-01	2.430E-02
1.50000E-01	1.486E-01	2.714E-02
2.00000E-01	1.355E-01	2.930E-02

3.00000E-01	1.174E-01	3.161E-02
4.00000E-01	1.051E-01	3.248E-02
5.00000E-01	9.594E-02	3.269E-02
6.00000E-01	8.871E-02	3.254E-02
8.00000E-01	7.790E-02	3.177E-02
1.00000E+00	7.004E-02	3.075E-02
1.25000E+00	6.264E-02	2.938E-02
1.50000E+00	5.700E-02	2.809E-02
2.00000E+00	4.890E-02	2.583E-02
3.00000E+00	3.919E-02	2.254E-02
4.00000E+00	3.351E-02	2.035E-02
5.00000E+00	2.976E-02	1.881E-02
6.00000E+00	2.711E-02	1.767E-02
8.00000E+00	2.363E-02	1.614E-02
1.00000E+01	2.146E-02	1.516E-02
1.50000E+01	1.855E-02	1.383E-02
2.00000E+01	1.717E-02	1.318E-02



BONE, CORTICAL (ICRU-44)

	Energy (MeV)	μ/ρ (cm^2/g)	μ_{en}/ρ (cm^2/g)
	1.00000E-03	3.781E+03	3.772E+03
	1.03542E-03	3.452E+03	3.444E+03
	1.07210E-03	3.150E+03	3.143E+03
11 K	1.07210E-03	3.156E+03	3.149E+03
	1.18283E-03	2.434E+03	2.429E+03
	1.30500E-03	1.873E+03	1.869E+03
12 K	1.30500E-03	1.883E+03	1.878E+03
	1.50000E-03	1.295E+03	1.291E+03
	2.00000E-03	5.869E+02	5.846E+02
	2.14550E-03	4.824E+02	4.803E+02
15 K	2.14550E-03	7.114E+02	6.961E+02
	2.30297E-03	5.916E+02	5.789E+02
	2.47200E-03	4.907E+02	4.805E+02
16 K	2.47200E-03	4.962E+02	4.857E+02
	3.00000E-03	2.958E+02	2.897E+02
	4.00000E-03	1.331E+02	1.303E+02
	4.03810E-03	1.296E+02	1.269E+02
20 K	4.03810E-03	3.332E+02	3.006E+02
	5.00000E-03	1.917E+02	1.757E+02

6.00000E-03	1.171E+02	1.085E+02
8.00000E-03	5.323E+01	4.987E+01
1.00000E-02	2.851E+01	2.680E+01
1.50000E-02	9.032E+00	8.388E+00
2.00000E-02	4.001E+00	3.601E+00
3.00000E-02	1.331E+00	1.070E+00
4.00000E-02	6.655E-01	4.507E-01
5.00000E-02	4.242E-01	2.336E-01
6.00000E-02	3.148E-01	1.400E-01
8.00000E-02	2.229E-01	6.896E-02
1.00000E-01	1.855E-01	4.585E-02
1.50000E-01	1.480E-01	3.183E-02
2.00000E-01	1.309E-01	3.003E-02
3.00000E-01	1.113E-01	3.032E-02
4.00000E-01	9.908E-02	3.069E-02
5.00000E-01	9.022E-02	3.073E-02
6.00000E-01	8.332E-02	3.052E-02
8.00000E-01	7.308E-02	2.973E-02
1.00000E+00	6.566E-02	2.875E-02
1.25000E+00	5.871E-02	2.745E-02
1.50000E+00	5.346E-02	2.623E-02
2.00000E+00	4.607E-02	2.421E-02
3.00000E+00	3.745E-02	2.145E-02
4.00000E+00	3.257E-02	1.975E-02
5.00000E+00	2.946E-02	1.864E-02
6.00000E+00	2.734E-02	1.788E-02
8.00000E+00	2.467E-02	1.695E-02
1.00000E+01	2.314E-02	1.644E-02
1.50000E+01	2.132E-02	1.587E-02
2.00000E+01	2.068E-02	1.568E-02