

**MicroShield 7.02**  
**Dominion (07-MSD-7.02-1318)**

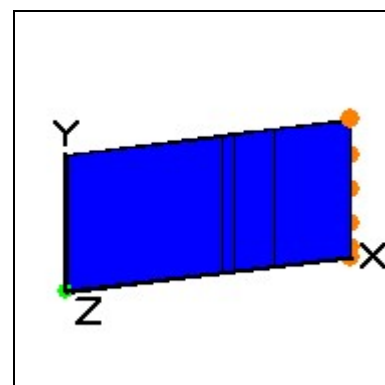
Date	By	Checked

Filename	Run Date	Run Time	Duration
synthConcrete.ms7	November 14, 2022	9:53:38 AM	-01:59:6

Project Info	
Case Title	synthetic benchmark
Description	Case 1
Geometry	1 - Point

Dose Points			
A	X	Y	Z
#1	167.64 cm (5 ft 6.0 in)	0.0 cm (0.0 in)	0.0 cm (0.0 in)
#2	167.64 cm (5 ft 6.0 in)	6.0 cm (2.4 in)	0.0 cm (0.0 in)
#3	167.64 cm (5 ft 6.0 in)	20.0 cm (7.9 in)	0.0 cm (0.0 in)
#4	167.64 cm (5 ft 6.0 in)	40.0 cm (1 ft 3.7 in)	0.0 cm (0.0 in)
#5	167.64 cm (5 ft 6.0 in)	60.0 cm (1 ft 11.6 in)	0.0 cm (0.0 in)
#6	167.64 cm (5 ft 6.0 in)	80.7 cm (2 ft 7.8 in)	0.0 cm (0.0 in)

Shields			
Shield N	Dimension	Material	Density
Shield 1	91.44 cm	Air	0.00122
Shield 2	7.62 cm	Iron	7.874
Shield 3	22.86 cm	Air	0.00122
Shield 4	45.72 cm	Concrete	2.34
Air Gap		Air	0.00122



Source Input: Grouping Method - Linear Energy		
Number of Groups: 25		
Lower Energy Cutoff: 0.015		
Photons < 0.015: Excluded		
Library: Grove		
Nuclide	Ci	Bq
Ba-137m	1.4190e-004	5.2503e+006
Co-58	2.2500e-005	8.3250e+005
Co-60	3.2400e-005	1.1988e+006
Cs-137	1.5000e-004	5.5500e+006
Mn-54	1.2500e-005	4.6250e+005
Sb-125	1.1300e-005	4.1810e+005

Buildup: The material reference is Shield 4	
Integration Parameters	

Results - Dose Point # 1 - (167.64,0,0) cm					
Energy (MeV)	Activity (Photons/sec)	Fluence Rate MeV/cm <sup>2</sup> /sec	Fluence Rate MeV/cm <sup>2</sup> /sec	Exposure Rate mR/hr	Exposure Rate mR/hr

		No Buildup	With Buildup	No Buildup	With Buildup
0.0314	5.875e+05	4.326e-230	9.708e-28	3.740e-232	8.392e-30
0.117	1.091e+03	3.464e-18	8.382e-16	5.388e-21	1.304e-18
0.1761	2.987e+04	1.120e-12	2.848e-10	1.919e-15	4.880e-13
0.21	2.915e+03	1.158e-12	2.687e-10	2.065e-15	4.792e-13
0.321	1.744e+03	4.643e-11	6.525e-09	8.878e-14	1.248e-11
0.3804	6.254e+03	6.735e-10	7.307e-08	1.308e-12	1.419e-10
0.4371	1.679e+05	5.303e-08	4.601e-06	1.038e-10	9.006e-09
0.511	2.486e+05	2.490e-07	1.665e-05	4.887e-10	3.267e-08
0.6006	7.431e+04	2.325e-07	1.182e-05	4.537e-10	2.307e-08
0.6612	4.793e+06	2.892e-05	1.249e-03	5.607e-08	2.422e-06
0.672	7.774e+03	5.234e-08	2.199e-06	1.013e-10	4.258e-09
0.8196	1.296e+06	3.222e-05	9.713e-04	6.110e-08	1.842e-06
1.1732	1.199e+06	2.701e-04	4.603e-03	4.827e-07	8.225e-06
1.3325	1.199e+06	5.590e-04	7.893e-03	9.698e-07	1.369e-05
1.6747	4.470e+03	6.998e-06	7.269e-05	1.142e-08	1.186e-07
<b>Totals</b>	<b>9.619e+06</b>	<b>8.978e-04</b>	<b>1.482e-02</b>	<b>1.582e-06</b>	<b>2.637e-05</b>

Results - Dose Point # 2 - (167.64,6,0) cm					
Energy (MeV)	Activity (Photons/sec)	Fluence Rate MeV/cm <sup>2</sup> /sec No Buildup	Fluence Rate MeV/cm <sup>2</sup> /sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.0314	5.875e+05	3.087e-230	9.696e-28	2.668e-232	8.381e-30
0.117	1.091e+03	3.389e-18	8.211e-16	5.272e-21	1.277e-18
0.1761	2.987e+04	1.102e-12	2.806e-10	1.888e-15	4.808e-13
0.21	2.915e+03	1.141e-12	2.651e-10	2.035e-15	4.729e-13
0.321	1.744e+03	4.585e-11	6.453e-09	8.769e-14	1.234e-11
0.3804	6.254e+03	6.657e-10	7.232e-08	1.293e-12	1.405e-10
0.4371	1.679e+05	5.245e-08	4.557e-06	1.027e-10	8.919e-09
0.511	2.486e+05	2.464e-07	1.649e-05	4.837e-10	3.237e-08
0.6006	7.431e+04	2.302e-07	1.172e-05	4.493e-10	2.287e-08
0.6612	4.793e+06	2.865e-05	1.239e-03	5.554e-08	2.402e-06
0.672	7.774e+03	5.185e-08	2.181e-06	1.004e-10	4.223e-09
0.8196	1.296e+06	3.194e-05	9.639e-04	6.058e-08	1.828e-06
1.1732	1.199e+06	2.681e-04	4.572e-03	4.791e-07	8.171e-06
1.3325	1.199e+06	5.551e-04	7.844e-03	9.630e-07	1.361e-05
1.6747	4.470e+03	6.953e-06	7.228e-05	1.134e-08	1.179e-07
<b>Totals</b>	<b>9.619e+06</b>	<b>8.913e-04</b>	<b>1.473e-02</b>	<b>1.571e-06</b>	<b>2.620e-05</b>

Results - Dose Point # 3 - (167.64,20,0) cm					
Energy (MeV)	Activity (Photons/sec)	Fluence Rate MeV/cm <sup>2</sup> /sec No Buildup	Fluence Rate MeV/cm <sup>2</sup> /sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.0314	5.875e+05	1.029e-231	9.572e-28	8.897e-234	8.274e-30
0.117	1.091e+03	2.717e-18	6.666e-16	4.226e-21	1.037e-18
0.1761	2.987e+04	9.359e-13	2.417e-10	1.604e-15	4.141e-13
0.21	2.915e+03	9.829e-13	2.317e-10	1.753e-15	4.132e-13

0.321	1.744e+03	4.048e-11	5.774e-09	7.740e-14	1.104e-11
0.3804	6.254e+03	5.923e-10	6.519e-08	1.150e-12	1.266e-10
0.4371	1.679e+05	4.695e-08	4.130e-06	9.190e-11	8.083e-09
0.511	2.486e+05	2.220e-07	1.504e-05	4.357e-10	2.951e-08
0.6006	7.431e+04	2.087e-07	1.074e-05	4.074e-10	2.097e-08
0.6612	4.793e+06	2.607e-05	1.139e-03	5.054e-08	2.209e-06
0.672	7.774e+03	4.721e-08	2.007e-06	9.140e-11	3.887e-09
0.8196	1.296e+06	2.929e-05	8.927e-04	5.555e-08	1.693e-06
1.1732	1.199e+06	2.488e-04	4.279e-03	4.446e-07	7.647e-06
1.3325	1.199e+06	5.171e-04	7.366e-03	8.971e-07	1.278e-05
1.6747	4.470e+03	6.518e-06	6.825e-05	1.063e-08	1.113e-07
<b>Totals</b>	<b>9.619e+06</b>	<b>8.283e-04</b>	<b>1.378e-02</b>	<b>1.459e-06</b>	<b>2.450e-05</b>

**Results - Dose Point # 4 - (167.64,40,0) cm**

<b>Energy (MeV)</b>	<b>Activity (Photons/sec)</b>	<b>Fluence Rate MeV/cm<sup>2</sup>/sec No Buildup</b>	<b>Fluence Rate MeV/cm<sup>2</sup>/sec With Buildup</b>	<b>Exposure Rate mR/hr No Buildup</b>	<b>Exposure Rate mR/hr With Buildup</b>
0.0314	5.875e+05	1.619e-236	9.186e-28	1.399e-238	7.940e-30
0.117	1.091e+03	1.324e-18	3.385e-16	2.060e-21	5.265e-19
0.1761	2.987e+04	5.507e-13	1.487e-10	9.437e-16	2.549e-13
0.21	2.915e+03	6.055e-13	1.495e-10	1.080e-15	2.666e-13
0.321	1.744e+03	2.699e-11	4.023e-09	5.162e-14	7.694e-12
0.3804	6.254e+03	4.053e-10	4.651e-08	7.871e-13	9.031e-11
0.4371	1.679e+05	3.276e-08	3.000e-06	6.413e-11	5.871e-09
0.511	2.486e+05	1.582e-07	1.113e-05	3.105e-10	2.184e-08
0.6006	7.431e+04	1.518e-07	8.098e-06	2.963e-10	1.581e-08
0.6612	4.793e+06	1.918e-05	8.681e-04	3.719e-08	1.683e-06
0.672	7.774e+03	3.481e-08	1.532e-06	6.740e-11	2.967e-09
0.8196	1.296e+06	2.211e-05	6.956e-04	4.192e-08	1.319e-06
1.1732	1.199e+06	1.952e-04	3.450e-03	3.488e-07	6.166e-06
1.3325	1.199e+06	4.108e-04	6.004e-03	7.127e-07	1.042e-05
1.6747	4.470e+03	5.287e-06	5.667e-05	8.624e-09	9.245e-08
<b>Totals</b>	<b>9.619e+06</b>	<b>6.530e-04</b>	<b>1.110e-02</b>	<b>1.150e-06</b>	<b>1.972e-05</b>

**Results - Dose Point # 5 - (167.64,60,0) cm**

<b>Energy (MeV)</b>	<b>Activity (Photons/sec)</b>	<b>Fluence Rate MeV/cm<sup>2</sup>/sec No Buildup</b>	<b>Fluence Rate MeV/cm<sup>2</sup>/sec With Buildup</b>	<b>Exposure Rate mR/hr No Buildup</b>	<b>Exposure Rate mR/hr With Buildup</b>
0.0314	5.875e+05	2.602e-244	8.606e-28	2.249e-246	7.439e-30
0.117	1.091e+03	4.135e-19	1.127e-16	6.431e-22	1.754e-19
0.1761	2.987e+04	2.333e-13	6.767e-11	3.998e-16	1.160e-13
0.21	2.915e+03	2.763e-13	7.338e-11	4.928e-16	1.309e-13
0.321	1.744e+03	1.401e-11	2.239e-09	2.679e-14	4.281e-12
0.3804	6.254e+03	2.194e-10	2.689e-08	4.260e-13	5.222e-11
0.4371	1.679e+05	1.831e-08	1.786e-06	3.583e-11	3.496e-09
0.511	2.486e+05	9.145e-08	6.833e-06	1.795e-10	1.341e-08
0.6006	7.431e+04	9.073e-08	5.123e-06	1.771e-10	9.999e-09

0.6612	4.793e+06	1.169e-05	5.587e-04	2.266e-08	1.083e-06
0.672	7.774e+03	2.127e-08	9.889e-07	4.119e-11	1.915e-09
0.8196	1.296e+06	1.403e-05	4.644e-04	2.660e-08	8.807e-07
1.1732	1.199e+06	1.319e-04	2.435e-03	2.357e-07	4.351e-06
1.3325	1.199e+06	2.833e-04	4.313e-03	4.915e-07	7.483e-06
1.6747	4.470e+03	3.770e-06	4.194e-05	6.150e-09	6.842e-08
<b>Totals</b>	<b>9.619e+06</b>	<b>4.449e-04</b>	<b>7.828e-03</b>	<b>7.831e-07</b>	<b>1.390e-05</b>

<b>Results - Dose Point # 6 - (167.64,80.7,0) cm</b>					
<b>Energy (MeV)</b>	<b>Activity (Photons/sec)</b>	<b>Fluence Rate MeV/cm<sup>2</sup>/sec No Buildup</b>	<b>Fluence Rate MeV/cm<sup>2</sup>/sec With Buildup</b>	<b>Exposure Rate mR/hr No Buildup</b>	<b>Exposure Rate mR/hr With Buildup</b>
0.0314	5.875e+05	3.119e-255	7.882e-28	2.696e-257	6.813e-30
0.117	1.091e+03	8.117e-20	2.416e-17	1.262e-22	3.758e-20
0.1761	2.987e+04	7.025e-14	2.246e-11	1.204e-16	3.849e-14
0.21	2.915e+03	9.235e-14	2.709e-11	1.647e-16	4.832e-14
0.321	1.744e+03	5.608e-12	9.850e-10	1.072e-14	1.884e-12
0.3804	6.254e+03	9.310e-11	1.249e-08	1.808e-13	2.425e-11
0.4371	1.679e+05	8.126e-09	8.640e-07	1.590e-11	1.691e-09
0.511	2.486e+05	4.257e-08	3.452e-06	8.355e-11	6.776e-09
0.6006	7.431e+04	4.425e-08	2.699e-06	8.637e-11	5.268e-09
0.6612	4.793e+06	5.854e-06	3.016e-04	1.135e-08	5.847e-07
0.672	7.774e+03	1.070e-08	5.360e-07	2.072e-11	1.038e-09
0.8196	1.296e+06	7.441e-06	2.639e-04	1.411e-08	5.005e-07
1.1732	1.199e+06	7.641e-05	1.496e-03	1.366e-07	2.674e-06
1.3325	1.199e+06	1.689e-04	2.717e-03	2.930e-07	4.714e-06
1.6747	4.470e+03	2.355e-06	2.755e-05	3.843e-09	4.494e-08
<b>Totals</b>	<b>9.619e+06</b>	<b>2.611e-04</b>	<b>4.814e-03</b>	<b>4.591e-07</b>	<b>8.533e-06</b>