

**MicroShield 6.20 (6.20-0000)**  
Duratek Inc.

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DOS File : Th-232c Unshielded Deep Surf.ms6  
Run Date : February 21, 2008  
Run Time : 3:16:06 PM  
Duration : 00:00:00

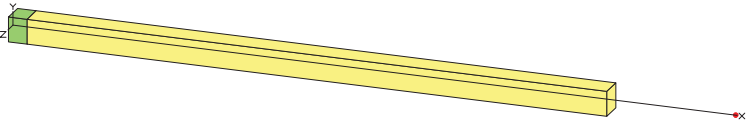
File Ref: \_\_\_\_\_  
Date: \_\_\_\_\_  
By: \_\_\_\_\_  
Checked: \_\_\_\_\_

**Case Title: Hematite**  
**Description: Ind. Occ., Infinite Slab Unshielded Deep Surf - Th-232+C**  
**Geometry: 16 - Infinite Slab**

**Source Dimensions**  
Thick 15.0 cm 5.9 in

**Dose Points**

	<u>X</u>	<u>Y</u>	<u>Z</u>
# 1	580 cm 19 ft 0.3 in	0 cm 0.0 in	0 cm 0.0 in



**Shields**

<u>Shield Name</u>	<u>Dimension</u>	<u>Material</u>	<u>Density</u>
Source	Infinite	Concrete	1.6
Shield 1	4.65 m	Concrete	1.6
Air Gap		Air	0.00122

**Source Input**  
**Grouping Method : Standard Indices**  
**Number of Groups : 25**  
**Lower Energy Cutoff : 0.015**  
**Photons < 0.015 : Included**  
**Library : Grove**

<u>Nuclide</u>	<u>μCi/cm<sup>3</sup></u>	<u>Bq/cm<sup>3</sup></u>
Ac-228	9.7312e-001	3.6005e+004
Bi-212	9.5964e-001	3.5507e+004
Pb-212	9.5964e-001	3.5507e+004
Po-212	6.1484e-001	2.2749e+004
Po-216	9.5965e-001	3.5507e+004
Ra-224	9.5965e-001	3.5507e+004
Ra-228	9.7312e-001	3.6005e+004
Rn-220	9.5965e-001	3.5507e+004
Th-228	9.5972e-001	3.5510e+004
Th-232	1.0000e+000	3.7000e+004
Tl-208	3.4480e-001	1.2758e+004

**Buildup**  
**The material reference is : Source**

**Results**

<u>Energy</u> <u>MeV</u>	<u>Activity</u> <u>photons/sec</u>	<u>Fluence Rate</u>		<u>Exposure Rate</u>	
		<u>No Buildup</u> <u>MeV/cm<sup>2</sup>/sec</u>	<u>With Buildup</u> <u>MeV/cm<sup>2</sup>/sec</u>	<u>No Buildup</u> <u>mR/hr</u>	<u>With Buildup</u> <u>mR/hr</u>
0.015	2.933e+04	0.000e+00	0.000e+00	0.000e+00	0.000e+00
0.04	3.631e+02	0.000e+00	0.000e+00	0.000e+00	0.000e+00
0.06	2.508e+02	0.000e+00	0.000e+00	0.000e+00	0.000e+00
0.08	1.533e+04	0.000e+00	0.000e+00	0.000e+00	0.000e+00
0.1	2.551e+03	0.000e+00	0.000e+00	0.000e+00	0.000e+00
0.15	1.513e+03	0.000e+00	0.000e+00	0.000e+00	0.000e+00
0.2	1.931e+04	4.196e-39	4.196e-39	7.406e-42	7.406e-42
0.3	9.354e+03	2.097e-33	1.177e-28	3.977e-36	2.232e-31
0.4	8.514e+02	1.602e-30	2.202e-26	3.121e-33	4.290e-29
0.5	4.953e+03	7.258e-27	4.204e-23	1.425e-29	8.251e-26
0.6	1.130e+04	3.043e-24	7.268e-21	5.940e-27	1.419e-23
0.8	1.137e+04	7.687e-21	5.970e-18	1.462e-23	1.136e-20

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<u>Energy</u> <u>MeV</u>	<u>Activity</u> <u>photons/sec</u>	<u>Fluence Rate</u> <u>MeV/cm<sup>2</sup>/sec</u> <u>No Buildup</u>	<u>Fluence Rate</u> <u>MeV/cm<sup>2</sup>/sec</u> <u>With Buildup</u>	<u>Exposure Rate</u> <u>mR/hr</u> <u>No Buildup</u>	<u>Exposure Rate</u> <u>mR/hr</u> <u>With Buildup</u>
1.0	2.096e+04	4.316e-18	1.466e-15	7.956e-21	2.702e-18
1.5	4.812e+03	1.332e-14	1.331e-12	2.241e-17	2.239e-15
2.0	1.083e+02	1.012e-13	5.370e-12	1.566e-16	8.304e-15
3.0	1.273e+04	1.110e-08	2.871e-07	1.506e-11	3.895e-10
TOTALS:	1.451e+05	1.110e-08	2.871e-07	1.506e-11	3.895e-10