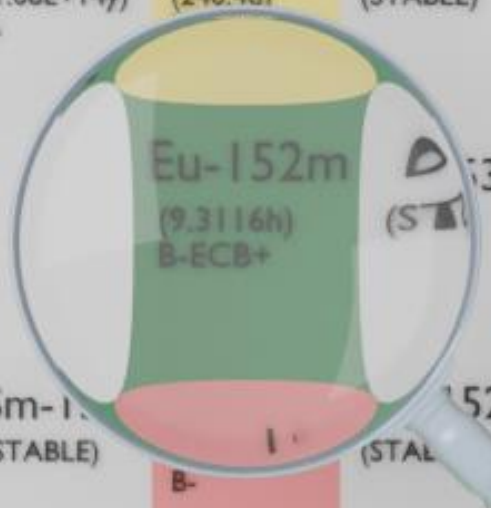




Gd-147 (2.28d) CB+	Gd-150 (1.79E+6y) A	Gd-151 (124d) ECA	Gd-152 (1.08E+14y) A	Gd-153 (240.4d)	Gd-154 (STABLE)	Gd-155 (STABLE)	Gd-156 (STABLE)	Gd-157 (STABLE)
Eu-148 (54.5d) CB+A	Eu-149 (93.1d) EC	Eu-150 (36.9y) ECB+	Eu-152m (9.3116h) B-ECB+	Eu-153 (10.1y) B-	Eu-154 (8.593y) B-EC	Eu-155 (4.7611y) B-	Eu-156 (15.19d) B-	Eu-157 (15.19d) B-
Sm-147 (1.060E11y) A	Sm-148 (7E+15y) A	Sm-149 (STABLE)	Sm-150 (STABLE)	Sm-151 (STABLE)	Sm-152 (STABLE)	Sm-153 (46.50h) B-	Sm-154 (STABLE)	Sm-155 (22.3m) B-

EUROPIUM-152M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Eu-152m
Atomic number (Z): 63
Mass number (A): 152
Neutron number (N): 89

RADIOACTIVE DECAY

Decay modes: β^- , β^+ , Electron capture
Half-life: 9.312 [h]
Decay constant: 2.0678×10^{-5} [1/s]
Daughters: Gd-152 (72.0%), Sm-152 (28.0%)
Radioactive daughters: Gd-152

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.50598 [MeV]
Mean photon energy: 0.29632 [MeV]
Air kerma rate constant, Γ_{10} : 1.111×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 1.112×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 8.107×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 8.107×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 4.748×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

Dose point kernel source: **Graves, et al. Medical Physics. 2019 Nov.; 46(11):5284-5293.**

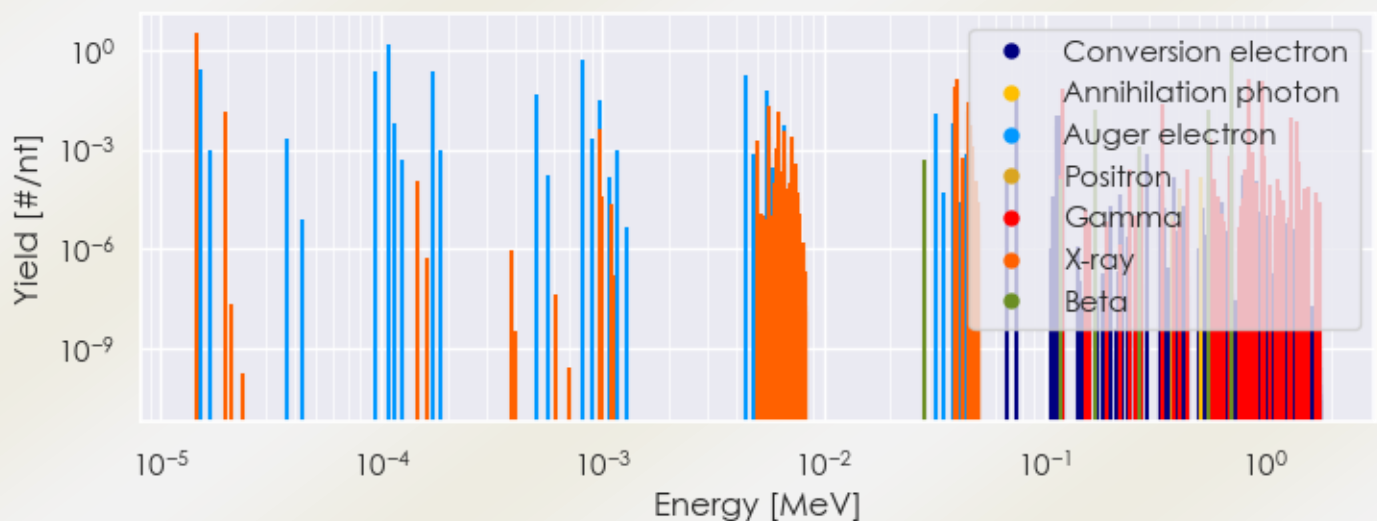
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Eu-152m DPK.csv

SUMMARY SPECTRA (PLOT)

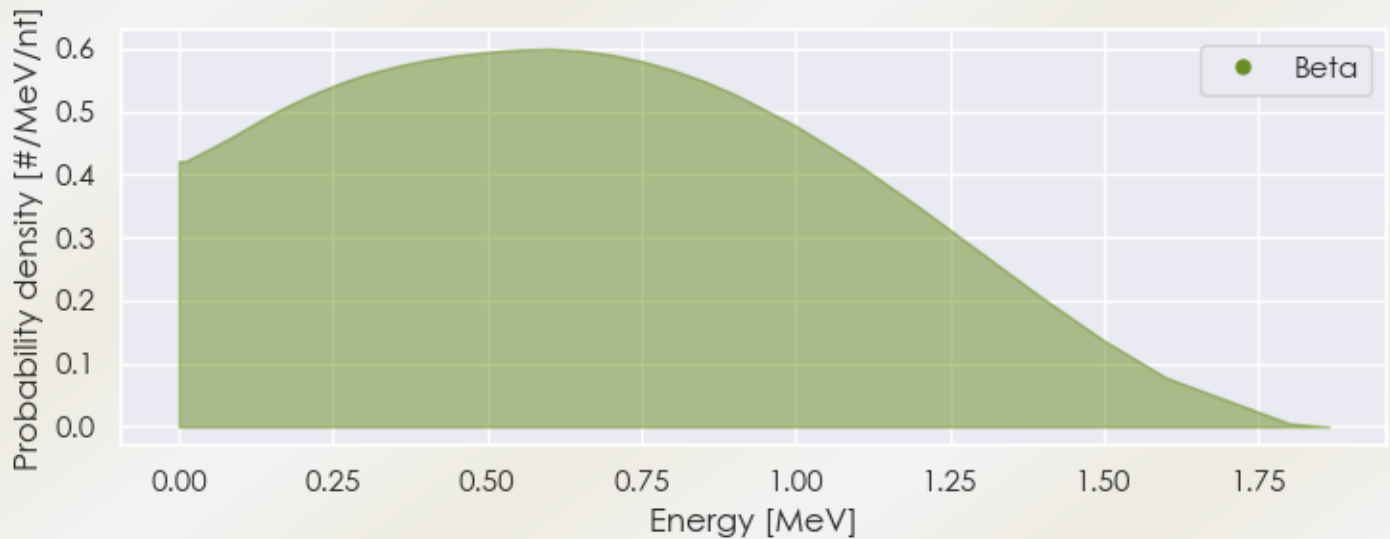
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Eu-152m Summary Spectrum.csv

BETA SPECTRA (PLOT)

Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated beta spectra file here: www.mirdsoft.org/products/MIRDspecs/Eu-152m Beta Spectrum.csv

TABULATED DATA

SUMMARY SPECTRA (TABLE)

Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**

Note: Radiations with yield < 0.01 are excluded from the table, but are available in the linked *.csv data.

Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Eu-152m Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.45281e-05	3.506e+00	X-ray
1.94278e-05	1.383e-02	X-ray
5.62210e-03	2.051e-02	X-ray
6.20531e-03	1.348e-02	X-ray
3.95578e-02	7.488e-02	X-ray
4.01680e-02	1.355e-01	X-ray
4.53441e-02	1.358e-02	X-ray
4.54683e-02	2.628e-02	X-ray
1.21777e-01	6.999e-02	Gamma

3.44310e-01	2.381e-02	Gamma
8.41594e-01	1.417e-01	Gamma
9.63390e-01	1.166e-01	Gamma
1.68671e-01	1.567e-02	Beta
5.53893e-01	1.656e-02	Beta
7.03855e-01	6.860e-01	Beta
1.51033e-05	2.740e-01	Auger electron
9.41836e-05	2.247e-01	Auger electron
1.06724e-04	1.465e+00	Auger electron
1.69203e-04	2.338e-01	Auger electron
5.05038e-04	4.480e-02	Auger electron
8.03763e-04	5.035e-01	Auger electron
9.73690e-04	3.223e-02	Auger electron
4.45853e-03	1.872e-01	Auger electron
5.50837e-03	6.400e-02	Auger electron
3.25196e-02	1.293e-02	Auger electron
7.49010e-02	4.735e-02	Conversion electron
1.14459e-01	1.109e-02	Conversion electron
1.15069e-01	1.095e-02	Conversion electron

USEFUL LINKS

Isotope decay characteristics are periodically updated as better measurements can be made - changes that may not be reflected on this page. Please see useful links:

National Nuclear Data Center (NNDC): <https://www.nndc.bnl.gov/nudat3/mird/>

International Atomic Energy Agency (IAEA) Livechart: <https://www-nds.iaea.org/relnsd/vcharthtml/VChartHTML.html>

REFERENCE LINKS

ICRP Report 107: <https://www.icrp.org/publication.asp?id=ICRP%20Publication%20107>

Graves et al. Dose Point Kernels: <https://doi.org/10.1002/mp.13789>

MIRD Decay Schemes 2nd Edition: https://sites.snmmi.org/SNMMI-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6