



Ho-154 (1.76m) CB+A	Ho-155 (48m) ECB+	Ho-156 (56m) ECB+	Ho-157 (12.6m) ECB+	Ho-159 (33.05m) ECB+	Ho-160 (25.6m) ECB+	Ho-161 (2.48h) EC	Ho-162 (15.0m) ECB+
Dy-153 (4.4h) CB+A	Dy-154 (3.0E+6y) A	Dy-155 (9.9h) ECB+	Dy-157 (8.14h) EC	Dy-158 (S)	Dy-159 (144.4d) EC	Dy-160 (STABLE)	Dy-161 (STABLE)
Tb-152 (17.5h) CB+	Tb-153 (2.34d) ECB+	Tb-154 (21.5h) ECB+	Tb-157 (5.32d) EC	Tb-158 (71y) EC	Tb-159 (180y) ECB-	Tb-160 (STABLE)	Tb-161 (72.3d) B-

DYSPROSIUM-157

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Dy-157
Atomic number (Z): 66
Mass number (A): 157
Neutron number (N): 91

RADIOACTIVE DECAY

Decay modes: Electron capture
Half-life: 8.14 [h]
Decay constant: 2.3654×10^{-5} [1/s]
Daughters: Tb-157 (100.0%)
Radioactive daughters: Tb-157

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.01378 [MeV]
Mean photon energy: 0.34717 [MeV]
Air kerma rate constant, Γ_{10} : 1.383×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 1.383×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 2.208×10^{-15} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

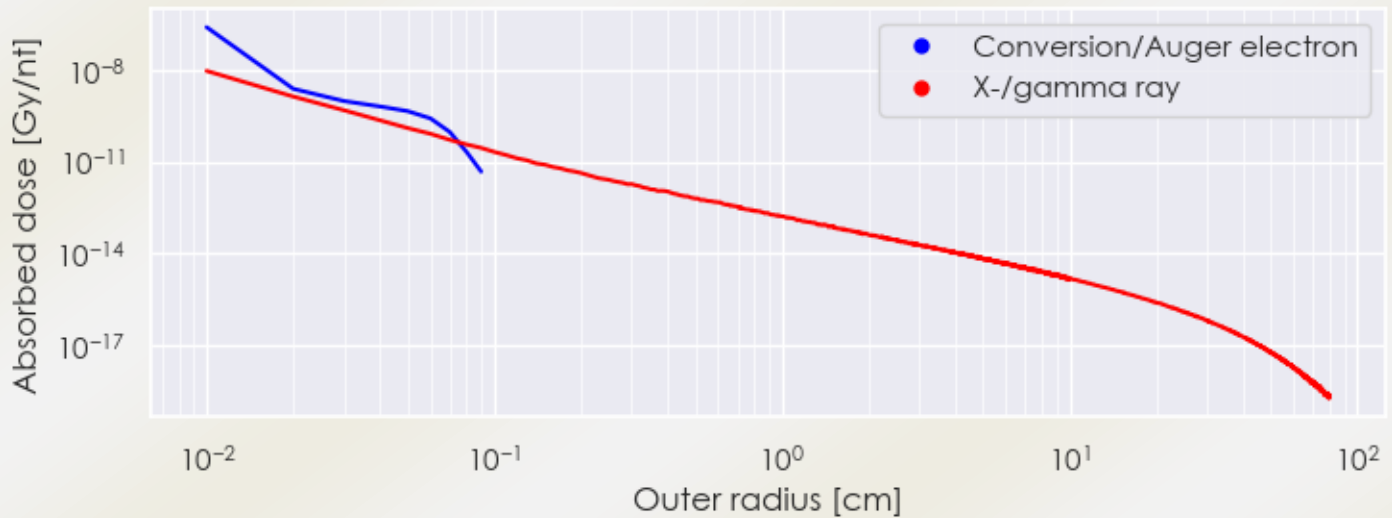
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 2.208×10^{-15} [Gy · kg/Bq · s]

Equilibrium dose constant for photons, Δ_p : 5.562×10^{-14} [Gy · kg/Bq · s]

DOSE POINT KERNELS (PLOT)

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

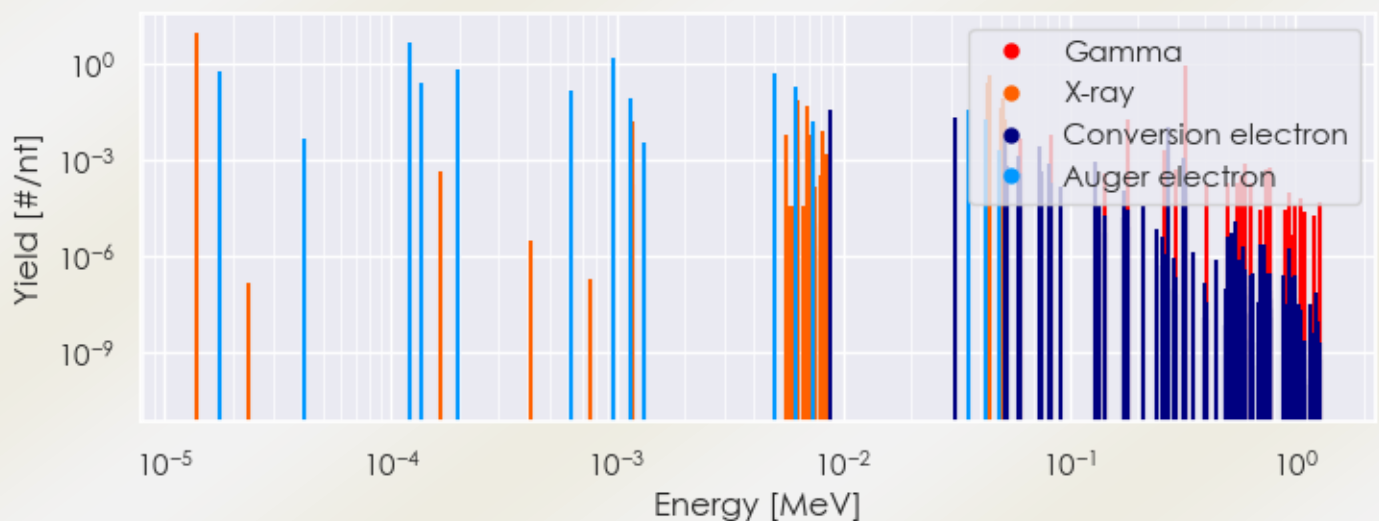
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Dy-157 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/Dy-157 Summary 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/Dy-157 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Dy-157%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [# / n ^t] if > 0.01	Radiation type
1.38232e-05	9.560e+00	X-ray
1.16047e-03	1.622e-02	X-ray
6.26069e-03	7.139e-02	X-ray
6.98190e-03	4.679e-02	X-ray
7.35101e-03	1.205e-02	X-ray
4.37992e-02	2.417e-01	X-ray
4.45546e-02	4.332e-01	X-ray
5.03066e-02	4.431e-02	X-ray
5.04632e-02	8.571e-02	X-ray
5.17791e-02	1.885e-02	X-ray
1.82200e-01	1.840e-02	Gamma
3.26160e-01	9.200e-01	Gamma
1.73725e-05	5.695e-01	Auger electron
1.22007e-04	4.368e+00	Auger electron
1.35553e-04	2.690e-01	Auger electron
1.97314e-04	6.924e-01	Auger electron
6.20224e-04	1.406e-01	Auger electron
9.60957e-04	1.479e+00	Auger electron
1.13641e-03	8.410e-02	Auger electron
4.95252e-03	5.348e-01	Auger electron
6.16044e-03	1.869e-01	Auger electron
7.40249e-03	1.641e-02	Auger electron
8.76000e-03	3.678e-02	Conversion electron
3.09500e-02	1.984e-02	Conversion electron
3.58945e-02	3.598e-02	Auger electron
4.25487e-02	1.789e-02	Auger electron
2.74100e-01	1.054e-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/SNMML-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6