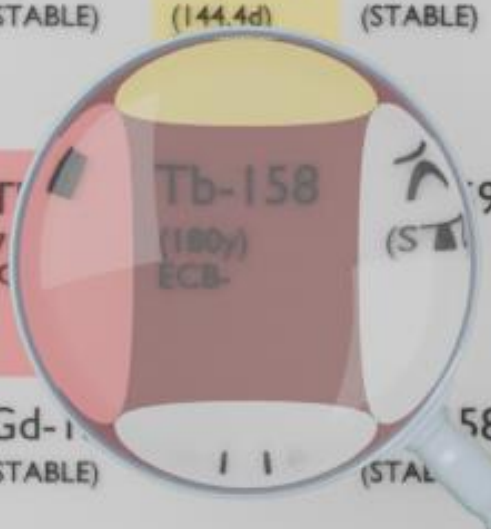




Dy-153 (2.9h) CB+	Dy-156 (STABLE)	Dy-157 (8.14h) EC	Dy-158 (STABLE)	Dy-159 (144.4d)	Dy-160 (STABLE)	Dy-161 (STABLE)	Dy-162 (STABLE)	Dy-163 (STABLE)
Tb-154 (21.5h) CB+	Tb-155 (5.32d) EC	Tb-156 (5.35d) EC	Tb-157 (7.9d) EC	Tb-158 (180y) ECB-	Tb-159 (STABLE)	Tb-160 (72.3d) B-	Tb-161 (6.906d) B-	Tb-162 (7.60m) B-
Gd-153 (140.4d) C	Gd-154 (STABLE)	Gd-155 (STABLE)	Gd-156 (STABLE)	Gd-157 (STABLE)	Gd-158 (STABLE)	Gd-159 (18.479h)	Gd-160 (STABLE)	Gd-161 (STABLE)

TERBIUM-158

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Tb-158
Atomic number (Z): 65
Mass number (A): 158
Neutron number (N): 93

RADIOACTIVE DECAY

Decay modes: β^- , Electron capture
Half-life: 180.0 [y]
Decay constant: 1.2203×10^{-10} [1/s]
Daughters: Gd-158 (83.4%), Dy-158 (16.6%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.11165 [MeV]
Mean photon energy: 0.80481 [MeV]
Air kerma rate constant, Γ_{10} : 3.001×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 3.001×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.789×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000×10^0 [Gy $\cdot$ kg/Bq $\cdot$ s]

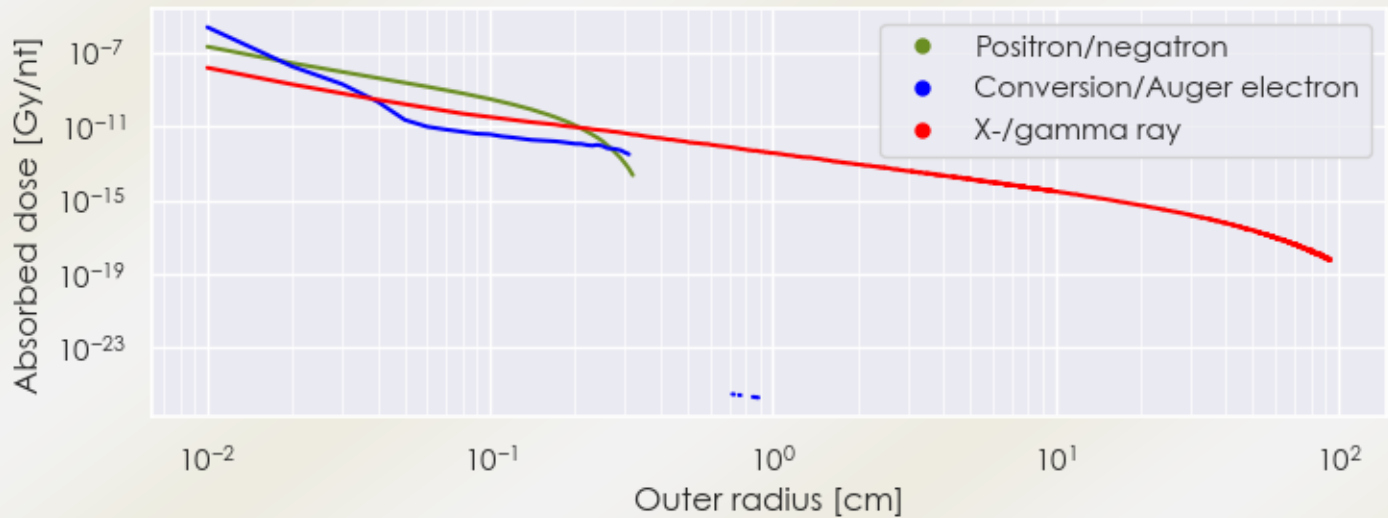
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 1.789×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.289×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

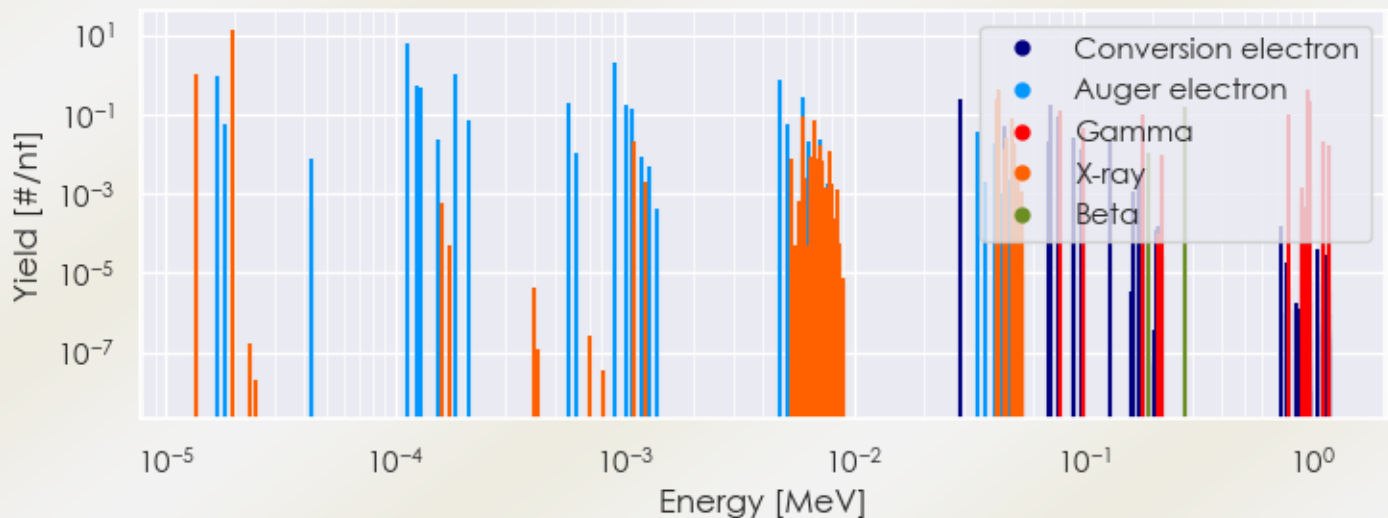
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Tb-158 DPK.csv

SUMMARY SPECTRA (PLOT)

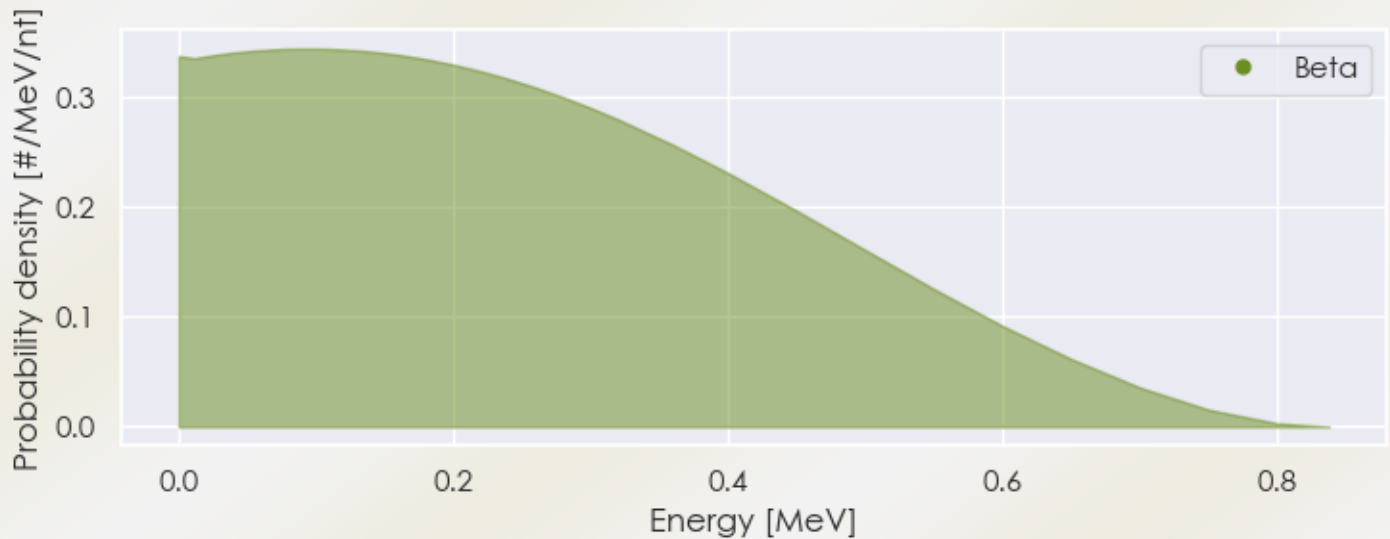
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Tb-158 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/Tb-158 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/Tb-158 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.36933e-05	1.005e+00	X-ray
1.94331e-05	1.378e+01	X-ray
1.09539e-03	2.094e-02	X-ray
6.01111e-03	1.035e-02	X-ray
6.04290e-03	9.157e-02	X-ray
6.71540e-03	6.734e-02	X-ray
7.08639e-03	1.557e-02	X-ray
7.78484e-03	1.183e-02	X-ray
4.23559e-02	2.296e-01	X-ray
4.30603e-02	4.129e-01	X-ray

4.52703e-02	1.354e-02	X-ray
4.60801e-02	2.420e-02	X-ray
4.86161e-02	4.196e-02	X-ray
4.87612e-02	8.115e-02	X-ray
5.00239e-02	1.790e-02	X-ray
7.95130e-02	1.163e-01	Gamma
9.89180e-02	4.295e-02	Gamma
1.81944e-01	9.914e-02	Gamma
7.80183e-01	9.563e-02	Gamma
9.44189e-01	4.387e-01	Gamma
9.62126e-01	2.027e-01	Gamma
1.10763e+00	2.145e-02	Gamma
1.18714e+00	1.685e-02	Gamma
1.93196e-01	1.100e-02	Beta
2.74601e-01	1.550e-01	Beta
1.68638e-05	9.267e-01	Auger electron
1.81686e-05	5.495e-02	Auger electron
1.13381e-04	6.201e+00	Auger electron
1.23753e-04	5.132e-01	Auger electron
1.28595e-04	4.586e-01	Auger electron
1.52865e-04	2.260e-02	Auger electron
1.83495e-04	9.819e-01	Auger electron
2.11335e-04	7.293e-02	Auger electron
5.69329e-04	1.981e-01	Auger electron
6.22635e-04	1.014e-02	Auger electron
8.98630e-04	2.079e+00	Auger electron
1.01685e-03	1.626e-01	Auger electron
1.07712e-03	1.413e-01	Auger electron
4.78706e-03	7.564e-01	Auger electron
5.12315e-03	5.737e-02	Auger electron
5.94388e-03	2.655e-01	Auger electron
6.38313e-03	2.018e-02	Auger electron
7.13576e-03	2.308e-02	Auger electron
2.92100e-02	2.324e-01	Conversion electron
3.47387e-02	3.582e-02	Auger electron
4.11460e-02	1.774e-02	Auger electron
4.50570e-02	4.899e-02	Conversion electron
7.11632e-02	2.088e-02	Conversion electron

7.15660e-02	1.618e-01	Conversion electron
7.22703e-02	1.756e-01	Conversion electron
7.79712e-02	8.478e-02	Conversion electron
7.95130e-02	2.239e-02	Conversion electron
9.03273e-02	2.589e-02	Conversion electron
9.11370e-02	2.583e-02	Conversion electron
9.72559e-02	1.349e-02	Conversion electron
1.31641e-01	2.042e-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