Proxcelan™
Cesium-131

^{131}Cs
Source Specification Data, Rev 2

Conversion Factor [U/mCi-app]:	0.637
Dose Rate Constant [cGy/h-U]:	1.053
Anisotropy Constant [$\overline{\Phi_{an}}$]	0.964
Half-Life [days]:	9.689
Physical Diameter [cm]:	0.08
Physical Length [cm]:	0.45
Active Length [cm]:	0.40

Radial Dose Function

r[cm]	$g_{line}(r)$
0.10	0.960
0.25	0.989
0.50	1.006
0.75	1.009
1.00	1.000
1.50	0.962
2.00	0.908
3.00	0.777
4.00	0.642
5.00	0.518
6.00	0.411
7.00	0.323
8.00	0.251
9.00	0.193
10.00	0.148

Radial Dose Function

r[cm]	$g_{point}(r)$
0.10	0.538
0.25	0.845
0.50	0.970
0.75	0.999
1.00	1.000
1.50	0.969
2.00	0.917
3.00	0.786
4.00	0.650
5.00	0.525
6.00	0.416
7.00	0.327
8.00	0.254
9.00	0.196
10.00	0.150

Anisotropy Factor

r[cm]	$\Phi_{an}(r)$
0.10	1.395
0.25	1.223
0.50	1.008
0.75	0.976
1.0	0.966
1.5	0.961
2.0	0.960
3.0	0.961
4.0	0.963
5.0	0.963
7.0	0.964
10.0	0.965
15.0	0.966

Anisotropy Function F(r,θ)

	θ[degrees]									
r[cm]	**0°**	**10°**	**20°**	**30°**	**40°**	**50°**	**60°**	**70°**	**80°**	**90°**
0.10	0.622*	0.707*	0.843*	1.113	1.031	1.009	1.002	1.000	1.000	1.000
0.25	0.622	0.707	0.843	0.915	0.949	0.971	0.985	0.993	0.998	1.000
0.50	0.814	0.68	0.779	0.868	0.923	0.958	0.978	0.99	0.998	1.000
0.75	0.830	0.694	0.791	0.871	0.923	0.957	0.979	0.991	0.998	1.000
1.0	0.833	0.709	0.803	0.878	0.926	0.958	0.980	0.992	0.998	1.000
1.5	0.836	0.734	0.820	0.887	0.932	0.961	0.980	0.993	0.998	1.000
2.0	0.839	0.753	0.832	0.894	0.935	0.963	0.981	0.993	0.998	1.000
3.0	0.842	0.776	0.846	0.902	0.939	0.965	0.982	0.993	0.998	1.000
4.0	0.846	0.792	0.856	0.907	0.942	0.966	0.983	0.993	0.999	1.000
5.0	0.848	0.802	0.861	0.909	0.943	0.966	0.982	0.993	0.999	1.000
7.0	0.852	0.815	0.868	0.912	0.944	0.966	0.982	0.993	0.998	1.000
10.0	0.845	0.826	0.872	0.915	0.944	0.967	0.982	0.992	0.998	1.000
15.0	0.841	0.836	0.878	0.917	0.948	0.968	0.984	0.992	0.999	1.000

Notes:

Data are based on the following:

Rivard, *Brachytherapy dosimetry parameters calculated for a ^{131}Cs source* , Med Phys 34:2, February 2007.

Wittman and Fisher, *Multiple-estimate Monte Carlo calculation of the dose rate constant for a cesium-131 interstitial brachytherapy seed* , Med Phys, 34:1, January 2007

Ibbott, GS, *Advice to Customers of IsoRay ^{131}Cs Brachytherapy Sources Recommended Dosimetry Data*, May 21, 2007.

Dose Rate Constant [cGy/(h-U)] is the Dose Rate [cGy/h] at the Reference Position per unit Air Kerma [U]
Reference Position: r_0 = 1.0 cm and q_0 = 90°

TG-43 Dose Rate Calculation - see TG-43 Update 1 Equation (10):

$D(r)\ [cGy/h] = L\ [cGy/(h\text{-}U)] * S_k\ [U] * (1.0/r)^2 * g_{point}(r) * f_{an}(r)$

Dose to Total Decay Calculation:

$Dose(r)\ [cGy] = D(r)\ [cGy/h] * 1.44 * 24\ [h/day] * T_{1/2}\ [days]$

*Footnote: These Anisotropy values conform to TG-43, Update 1, Appendix C.

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