

Table 1 Assessment of Maximum NSTX Activation Products (After 1E17 DD Neutrons)

Isotope	Half-Life	Bq/gm ¹	Ci/lb	Maximum Total Ci ²	Cat 3 Threshold (Ci)	Max Ci/Cat 3 ³
H-3	1.23E+01 Yr	1.98E-06	2.42E-14	3.15E-09	1.60E+04	1.97E-13
C-14	5.73E+03 Yr	5.54E-05	6.78E-13	8.82E-08	4.20E+02	2.10E-10
Na-24	1.50E+01 Hr	7.40E+01	9.06E-07	1.18E-01	3.00E+02	3.93E-04
Si-31	2.62E+00 Hr	1.71E+02	2.09E-06	2.72E-01	3.20E+05	8.50E-07
P-32	1.43E+01 Dy	1.28E-01	1.57E-09	2.04E-04	1.20E+01	1.70E-05
P-33	2.53E+01 Dy	3.97E-04	4.86E-12	6.31E-07	9.40E+01	6.71E-09
S-35	8.72E+01 Dy	9.54E-04	1.17E-11	1.52E-06	7.80E+01	1.95E-08
Cl-36	3.01E+05 Yr	2.25E-08	2.76E-16	3.59E-11	3.40E+02	1.06E-13
Ar-39	2.69E+02 Yr	1.04E-05	1.27E-13	1.65E-08	4.00E+04	4.13E-13
K-42	1.24E+01 Hr	1.31E+01	1.61E-07	2.09E-02	4.60E+03	4.54E-06
K-43	2.23E+01 Hr	1.94E-03	2.38E-11	3.09E-06	1.16E+03	2.66E-09
Ca-45	1.63E+02 Dy	3.58E-02	4.39E-10	5.70E-05	1.10E+03	5.18E-08
Ca-47	4.54E+00 Dy	2.24E-03	2.75E-11	3.57E-06	7.00E+02	5.10E-09
Sc-47	3.43E+00 Dy	2.36E-01	2.90E-09	3.76E-04	5.80E+03	6.48E-08
Cr-51	2.77E+01 Dy	3.10E+01	3.80E-07	4.94E-02	2.20E+04	2.25E-06
Mn-54	3.12E+02 Dy	2.52E-01	3.09E-09	4.01E-04	8.80E+02	4.56E-07
Mn-56	2.58E+00 Hr	1.81E+04	2.22E-04	2.89E+01	2.80E+03	1.03E-02
Fe-55	2.68E+00 Yr	5.45E-01	6.68E-09	8.68E-04	5.40E+03	1.61E-07
Fe-59	4.46E+01 Dy	4.86E-01	5.96E-09	7.74E-04	6.00E+02	1.29E-06
Co-58	7.08E+01 Dy	5.78E+00	7.08E-08	9.21E-03	9.00E+02	1.02E-05
Co-58m	9.10E+00 Hr	1.07E+03	1.31E-05	1.70E+00	6.20E+06	2.74E-07
Co-60	5.27E+00 Yr	4.80E-01	5.88E-09	7.64E-04	2.80E+02	2.73E-06
Co-60m	1.05E+01 Mn	9.88E+04	1.21E-03	1.57E+02	5.80E+07	2.71E-06
Co-61	1.65E+00 Hr	7.86E-01	9.63E-09	1.25E-03	8.00E+04	1.56E-08
Ni-59	8.00E+04 Yr	1.55E-04	1.90E-12	2.47E-07	1.18E+04	2.09E-11
Ni-63	1.00E+02 Yr	5.02E-02	6.15E-10	8.00E-05	5.40E+03	1.48E-08
Ni-65	2.52E+00 Hr	2.84E+02	3.48E-06	4.52E-01	9.00E+03	5.02E-05
Cu-64	1.27E+01 Hr	1.27E+05	1.55E-03	2.02E+02	1.54E+05	1.31E-03

As-76	1.10E+00 Dy	2.35E+00	2.88E-08	3.74E-03	2.60E+03	1.44E-06
Zr-93	1.50E+06 Yr	1.10E-09	1.35E-17	1.75E-12	6.20E+01	2.82E-14
Zr-95	6.40E+01 Dy	3.80E-03	4.66E-11	6.06E-06	7.00E+02	8.66E-09
Nb-93m	1.36E+01 Yr	5.95E-02	7.29E-10	9.47E-05	2.00E+03	4.74E-08
Nb-94	2.00E+04 Yr	2.47E-04	3.03E-12	3.93E-07	2.00E+02	1.97E-09
Mo-93	3.50E+03 Yr	6.60E-05	8.08E-13	1.05E-07	2.00E+03	5.25E-11
Mo-99	2.75E+00 Dy	6.00E+01	7.35E-07	9.55E-02	3.40E+03	2.81E-05
Mo-101	1.46E+01 Mn	3.94E+03	4.83E-05	6.28E+00	9.00E+04	6.98E-05
Ag-108m	1.30E+02 Yr	4.23E-04	5.18E-12	6.73E-07	2.00E+02	3.37E-09
Ag-110m	2.50E+02 Dy	5.10E-01	6.24E-09	8.11E-04	2.60E+02	3.12E-06
Pb-205	1.51E+07 Yr	4.27E-14	5.22E-22	6.79E-17	2.40E+03	2.83E-20
Pb-209	3.28E+00 Hr	7.13E-03	8.73E-11	1.14E-05	6.20E+05	1.84E-11
Bi-210	5.01E+00 Dy	4.93E-05	6.04E-13	7.85E-08	3.20E+02	2.45E-10
Bi-210m	3.00E+06 Yr	4.31E-13	5.28E-21	6.87E-16	7.20E+00	9.54E-17

Summation of Radionuclide Threshold Ratios

1.22E-02

NOTES

1 Specific activity 0 seconds after generation of 1.00 E17 DD neutrons at the rate of 2.00 E14 neutrons per second for 500 seconds.

2 Maximum total Ci for each isotope is obtained by multiplying the T=0 specific activity in Ci/lb by the total combined weight of the NSTX structure, which includes the vacuum vessel, center stack, support structure, and external PF and TF coils. This total combined weight is 130,000 lbs (from the NSTX Status Report dated 2/10/95).

3 Sum of Max Ci/Cat 3 ratios for Na-24, Mn-56 and Cu-64 is 1.20E-02, representing 98.3% of the total NSTX Summation of Radionuclide Threshold Ratios.