

Theoretical calculations of relevant radionuclides that could be produced at TATTOOS, using 100 μ A proton beams at 590 MeV on a Tantalum or an Uranium-carbide target

- The presented data were calculated with a two-step calculation scheme as activation script. The Monte Carlo calculation yields the spectrum for neutrons with energy less than 20 MeV and the production rates of the residual nuclides caused by neutrons of energy larger than 20 MeV or other particles like protons and pions of any energy. In the energy range below 20 MeV, the nuclear reactions in Monte Carlo N-Particle (MCNP) are taken from tabulated cross sections (ENDF/B-VIII)¹, whereas reactions of neutrons above 20 MeV and with all other particles are taken from models, here CEM03.03² or INCL4.6+ABLA. In either SP-FISPACT or CINDER the neutron tabulated nuclear data (EASY-2013) are superimposed with the neutron flux computed by MCNP6.2 to produce flux weighted reaction rates. Together with the production rates of the residual nuclides obtained by models in MCNP these reaction rates are subsequently used as input parameters for solving the Bateman system of equations in either SP-FISPACT or CINDER. For this, the inventory codes SP-FISPACT and CINDER need the irradiation and cooling history of the piece of interest as input.
- Radionuclides with $T_{1/2} < 60$ sec are not listed

¹ Brown, D. A., Chadwick, M. B., Capote, R., Kahler, A. C., Trkov, A., Herman, M. W., Sonzogni, A. A., Danon, Y., Carlson, A. D., Dunn, M., Smith, D. L., Hale, G. M., Arbanas, G., Arcilla, R., Bates, C. R., Beck, B., Becker, B., Brown, F., Casperson, R. J., Conlin, J., Cullen, D. E., Descalle, M. A., Firestone, R., Gaines, T., Guber, K. H., Hawari, A. I., Holmes, J., Johnson, T. D., Kawano, T., Kiedrowski, B. C., Koning, A. J., Kopecky, S., Leal, L., Lestone, J. P., Lubitz, C., Márquez Damián, J. I., Mattoon, C. M., McCutchan, E. A., Mughabghab, S., Navratil, P., Neudecker, D., Nobre, G. P. A., Noguere, G., Paris, M., Pigni, M. T., Plompen, A. J., Pritychenko, B., Pronyaev, V. G., Roubtsov, D., Rochman, D., Romano, P., Schillebeeckx, P., Simakov, S., Sin, M., Sirakov, I., Sleaford, B., Sobes, V., Soukhovitskii, E. S., Stetcu, I., Talou, P., Thompson, I., van der Marck, S., Welsch-Sherrill, L., Wiarda, D., White, M., Wormald, J. L., Wright, R. Q., Zerkle, M., Žerovnik, G. and Zhu, Y., (2018), ENDF/B-VIII.0: The 8th Major Release of the Nuclear Reaction Data Library with CIELO-project Cross Sections, New Standards and Thermal Scattering Data. *Nuclear Data Sheets* 148, 1-142.

² [arXiv:0805.0751](https://arxiv.org/abs/0805.0751)

Isotope	Integral activity [Bq] produced in a 12 h irradiation of <i>Tantalum</i> target	Released from target matrix
H-3	5.04E+09	yes
BE-7	1.22E+08	yes
BE-10	4.26E+01	yes
BE-12	3.34E+08	yes
C-11	2.22E+09	no
C-14	2.44E+03	no
N-13	3.25E+08	unlikely
O-14	4.46E+06	no
O-15	2.45E+08	no
F-17	4.01E+07	yes
F-18	6.18E+08	yes
NE-24	5.31E+08	yes
NA-22	3.90E+04	yes
NA-24	4.22E+08	yes
MG-27	7.76E+08	yes
MG-28	1.41E+08	yes
AL-26	5.90E-02	unlikely
AL-28	1.04E+09	unlikely
AL-29	1.13E+09	unlikely
SI-31	1.61E+09	unlikely
SI-32	7.91E+03	unlikely
P-29	8.92E+06	yes
P-30	8.92E+07	yes
P-32	4.19E+07	yes
P-33	4.06E+07	yes
S-31	8.92E+06	yes
S-35	1.33E+07	yes
S-37	1.09E+09	yes
S-38	8.48E+08	yes
CL-34	7.95E+07	yes
CL-34M	3.57E+07	yes
CL-36	7.21E+00	yes
CL-38	3.48E+09	yes
CL-39	2.66E+09	yes
CL-40	1.35E+09	yes
AR-35	4.46E+06	yes
AR-37	7.28E+06	yes
AR-39	1.99E+04	yes

Isotope	Integral activity [Bq] produced in a 6-day irradiation of <i>Uranium-carbide</i> target	Released from target matrix
H-3	2.46E+10	yes
BE-7	1.66E+11	yes
BE-10	5.41E+03	yes
BE-11	3.57E+07	yes
C-11	4.64E+12	no
C-14	2.28E+04	no
N-13	2.23E+10	yes
O-14	2.85E+08	no
O-15	1.12E+09	no
F-17	4.46E+06	yes
F-18	9.81E+07	yes
NE-24	1.84E+09	yes
NA-22	1.32E+06	yes
NA-24	3.74E+09	yes
NA-25	4.22E+09	yes
MG-27	2.65E+09	yes
MG-28	2.79E+09	yes
AL-26	1.13E+00	unlikely
AL-28	4.47E+09	unlikely
AL-29	4.26E+09	unlikely
SI-31	4.38E+09	no
SI-32	3.51E+05	no
P-30	5.35E+07	yes
P-32	4.29E+08	yes
P-33	8.31E+08	yes
S-35	3.03E+08	yes
S-37	3.16E+09	yes
S-38	2.53E+09	yes
CL-34M	1.34E+07	yes
CL-36	6.26E+01	yes
CL-38	6.74E+09	yes
CL-38M	3.52E+08	yes
CL-39	6.46E+09	yes
CL-40	2.55E+09	yes
AR-37	7.04E+07	yes
AR-39	4.57E+05	yes
AR-41	6.76E+09	yes
AR-42	2.09E+06	yes

AR-41	3.21E+09	yes
AR-42	7.27E+04	yes
AR-43	1.09E+09	yes
AR-44	6.29E+08	yes
K-38	3.57E+07	yes
K-40	1.60E-03	yes
K-42	2.37E+09	yes
K-43	2.03E+09	yes
K-44	4.12E+09	yes
K-45	2.63E+09	yes
K-46	1.02E+09	yes
CA-41	5.79E+00	yes
CA-45	2.00E+07	yes
CA-47	3.33E+08	yes
CA-48	4.00E-14	yes
SC-42	1.34E+07	yes
SC-42M	4.46E+06	yes
SC-43	2.67E+08	yes
SC-44	1.38E+09	yes
SC-44M	1.53E+07	yes
SC-46	3.37E+07	yes
SC-47	1.20E+09	yes
SC-48	1.56E+09	yes
SC-49	7.37E+09	yes
SC-50	2.11E+09	yes
TI-44	1.34E+03	yes
TI-45	3.04E+08	yes
TI-51	6.05E+09	yes
TI-52	3.77E+09	yes
V-47	2.50E+08	no
V-48	3.75E+07	no
V-49	6.32E+06	no
V-50	7.39E-11	no
V-52	1.48E+10	no
V-53	9.64E+09	no
CR-48	1.28E+07	yes
CR-49	3.25E+08	yes
CR-50	1.42E-11	yes
CR-51	8.63E+07	yes
CR-55	1.03E+10	yes
CR-56	6.79E+09	yes
MN-50M	8.92E+06	yes
MN-51	9.81E+07	yes
MN-52	1.69E+07	yes
MN-52M	8.06E+08	yes
MN-53	1.89E+00	yes
MN-54	1.65E+07	yes
MN-56	2.50E+10	yes
MN-57	1.87E+10	yes

AR-43	2.42E+09	yes
AR-44	1.51E+09	yes
K-38	2.68E+07	yes
K-40	2.01E-02	yes
K-42	6.08E+09	yes
K-43	1.29E+10	yes
K-44	8.42E+09	yes
K-45	6.22E+09	yes
K-46	1.95E+09	yes
CA-41	6.47E+01	yes
CA-45	4.20E+08	yes
CA-47	5.17E+09	yes
CA-48	2.56E-12	yes
CA-49	1.22E+09	yes
SC-42M	8.92E+06	yes
SC-43	3.83E+08	yes
SC-44	1.26E+09	yes
SC-44M	7.29E+07	yes
SC-45M	3.58E+09	yes
SC-46	4.60E+08	yes
SC-47	1.66E+10	yes
SC-48	1.36E+10	yes
SC-49	1.86E+10	yes
SC-50	6.08E+09	yes
SC-50M	4.23E+09	yes
TI-44	1.02E+04	no
TI-45	1.92E+08	no
TI-51	2.12E+10	no
TI-52	1.53E+10	no
V-47	9.81E+07	no
V-48	2.66E+08	no
V-49	7.39E+07	no
V-50	1.22E-09	no
V-52	4.41E+10	no
V-53	4.07E+10	no
CR-48	4.41E+06	unlikely
CR-49	1.96E+08	unlikely
CR-51	1.06E+09	unlikely
CR-55	5.17E+10	unlikely
CR-56	4.79E+10	unlikely
MN-50	4.46E+06	yes
MN-51	1.11E+08	yes
MN-52	1.73E+08	yes
MN-52M	8.02E+08	yes
MN-53	2.36E+01	yes
MN-54	2.29E+08	yes
MN-56	9.04E+10	yes
MN-57	9.28E+10	yes
MN-58M	2.14E+10	yes

MN-58M	3.55E+09	yes	FE-52	3.61E-03	unlikely
FE-52	8.48E+06	yes	FE-53	1.38E+08	unlikely
FE-53	5.80E+07	yes	FE-53M	1.73E-01	unlikely
FE-53M	1.87E+00	yes	FE-55	3.23E+07	unlikely
FE-55	2.52E+06	yes	FE-59	1.07E+10	unlikely
FE-59	1.65E+08	yes	FE-60	9.34E+02	unlikely
FE-60	9.49E+00	yes	FE-61	7.11E+10	unlikely
FE-61	6.19E+09	yes	FE-62	6.11E+10	unlikely
FE-62	3.83E+09	yes	CO-54M	4.00E-02	unlikely
FE-65	1.20E+08	yes	CO-55	1.91E+08	unlikely
CO-54M	9.31E-03	yes	CO-56	5.93E+07	unlikely
CO-55	2.53E+07	yes	CO-57	1.13E+08	unlikely
CO-56	3.63E+06	yes	CO-58	8.31E+08	unlikely
CO-57	7.71E+06	yes	CO-58M	2.34E+09	unlikely
CO-58	6.26E+07	yes	CO-60	1.28E+08	unlikely
CO-58M	1.34E+09	yes	CO-60M	3.91E+10	unlikely
CO-60	4.59E+06	yes	CO-61	1.85E+11	unlikely
CO-60M	1.89E+10	yes	CO-62	1.30E+11	unlikely
CO-61	3.33E+10	yes	CO-62M	2.16E+10	unlikely
CO-62	1.49E+10	yes	NI-57	7.96E+07	unlikely
CO-62M	3.84E+09	yes	NI-59	7.47E+02	unlikely
NI-56	2.47E+05	yes	NI-63	2.79E+07	unlikely
NI-57	1.20E+07	yes	NI-65	2.00E+11	unlikely
NI-58	1.51E-15	yes	NI-66	1.59E+11	unlikely
NI-59	6.03E+01	yes	CU-59	1.34E+07	yes
NI-63	3.70E+05	yes	CU-60	1.69E+08	yes
NI-65	1.46E+10	yes	CU-61	2.28E+09	yes
NI-66	1.29E+09	yes	CU-62	9.76E+09	yes
CU-59	2.23E+07	yes	CU-64	6.21E+10	yes
CU-60	2.32E+08	yes	CU-66	3.06E+11	yes
CU-61	2.26E+09	yes	CU-67	2.78E+11	yes
CU-62	7.89E+09	yes	CU-68	2.32E+11	yes
CU-64	1.24E+10	yes	CU-68M	2.11E+10	yes
CU-66	2.25E+10	yes	CU-69	2.18E+11	yes
CU-67	2.58E+09	yes	ZN-62	2.90E+08	yes
CU-68	7.84E+09	yes	ZN-63	1.30E+09	yes
CU-68M	1.04E+09	yes	ZN-65	4.79E+08	yes
CU-69	4.39E+09	yes	ZN-69	4.23E+11	yes
ZN-61	2.23E+07	yes	ZN-69M	5.62E+10	yes
ZN-62	5.34E+08	yes	ZN-71	2.20E+11	yes
ZN-63	2.95E+09	yes	ZN-71M	7.24E+10	yes
ZN-64	8.70E-12	yes	ZN-72	2.55E+11	yes
ZN-65	3.72E+07	yes	ZN-74	1.56E+11	yes
ZN-69	2.15E+10	yes	GA-64	5.35E+07	yes
ZN-69M	2.73E+09	yes	GA-65	1.03E+09	yes
ZN-71	3.48E+09	yes	GA-66	4.92E+09	yes
ZN-71M	1.76E+09	yes	GA-67	1.90E+10	yes
ZN-72	5.28E+08	yes	GA-68	5.51E+10	yes
ZN-74	4.06E+08	yes	GA-70	1.84E+11	yes

GA-64	3.12E+07	yes
GA-65	4.59E+08	yes
GA-66	2.19E+09	yes
GA-67	1.66E+09	yes
GA-68	2.49E+10	yes
GA-70	3.35E+10	yes
GA-72	5.34E+09	yes
GA-72M	9.89E+08	yes
GA-73	7.44E+09	yes
GA-74	3.31E+09	yes
GA-75	1.61E+09	yes
GE-66	2.13E+08	yes
GE-67	6.73E+08	yes
GE-68	1.15E+07	yes
GE-69	3.03E+09	yes
GE-71	1.36E+09	yes
GE-71M	1.34E+10	yes
GE-73M	1.98E+10	yes
GE-75	1.08E+10	yes
GE-76	3.81E-15	yes
GE-77	5.02E+08	yes
GE-78	7.24E+08	yes
AS-68	3.57E+07	yes
AS-69	4.06E+08	yes
AS-70	2.79E+09	yes
AS-71	1.46E+09	yes
AS-72	8.14E+09	yes
AS-73	2.22E+08	yes
AS-74	8.36E+08	yes
AS-76	6.82E+09	yes
AS-77	3.82E+09	yes
AS-78	7.89E+09	yes
AS-79	4.03E+09	yes
SE-70	2.23E+07	yes
SE-71	1.60E+08	yes
SE-72	1.07E+08	yes
SE-73	4.86E+09	yes
SE-73M	6.56E+09	yes
SE-75	1.11E+08	yes
SE-79	4.20E+01	yes
SE-79M	1.05E+10	yes
SE-81	3.39E+09	yes
SE-81M	1.13E+09	yes
SE-82	1.43E-14	yes
SE-83	1.79E+08	yes
SE-83M	2.80E+08	yes
SE-84	1.78E+08	yes
BR-73	2.23E+07	yes
BR-74	1.10E+09	yes

GA-72	5.23E+11	yes
GA-72M	2.16E+10	yes
GA-73	5.75E+11	yes
GA-74	4.39E+11	yes
GA-75	3.97E+11	yes
GA-76	2.42E+11	yes
GA-77	2.32E+11	yes
GA-78	1.17E+11	yes
GE-66	8.47E+07	yes
GE-67	4.28E+08	yes
GE-68	1.08E+08	yes
GE-69	1.83E+10	yes
GE-69M	4.14E+04	yes
GE-71	3.79E+10	yes
GE-71M	3.60E+10	yes
GE-73M	1.64E+11	yes
GE-75	7.87E+11	yes
GE-76	7.30E-12	yes
GE-77	2.55E+11	yes
GE-78	6.13E+11	yes
GE-79	3.42E+11	yes
AS-68	4.46E+06	yes
AS-69	2.14E+08	yes
AS-70	1.75E+09	yes
AS-71	1.22E+10	yes
AS-72	4.22E+10	yes
AS-73	7.22E+09	yes
AS-74	4.01E+10	yes
AS-75M	7.25E+10	yes
AS-76	3.96E+11	yes
AS-77	1.20E+12	yes
AS-78	1.16E+12	yes
AS-79	1.20E+12	yes
SE-71	1.07E+08	yes
SE-72	7.10E+08	yes
SE-73	6.47E+09	yes
SE-73M	5.34E+09	yes
SE-75	3.28E+09	yes
SE-79	6.94E+04	yes
SE-79M	1.42E+12	yes
SE-81	1.80E+12	yes
SE-81M	2.62E+11	yes
SE-82	2.40E-10	yes
SE-83	6.89E+11	yes
SE-83M	9.43E+11	yes
SE-84	1.80E+12	yes
BR-72	4.46E+06	yes
BR-73	9.36E+07	yes
BR-74	4.10E+08	yes

BR-74M	7.18E+08	yes
BR-75	9.01E+09	yes
BR-76	8.62E+09	yes
BR-76M	9.33E+09	yes
BR-77	5.97E+09	yes
BR-77M	7.92E+09	yes
BR-78	3.86E+10	yes
BR-79M	1.34E+10	yes
BR-80	2.74E+10	yes
BR-80M	9.60E+09	yes
BR-82	2.17E+09	yes
BR-82M	7.84E+09	yes
BR-83	6.38E+09	yes
BR-84	1.66E+09	yes
BR-84M	3.17E+08	yes
BR-85	8.34E+08	yes
KR-74	1.78E+07	yes
KR-75	2.90E+08	yes
KR-76	1.14E+09	yes
KR-77	8.31E+09	yes
KR-78	2.30E-13	yes
KR-79	7.34E+09	yes
KR-81	2.42E+02	yes
KR-83M	1.55E+10	yes
KR-85	3.03E+05	yes
KR-85M	3.09E+09	yes
KR-87	7.17E+08	yes
KR-88	2.44E+08	yes
KR-89	4.90E+07	yes
RB-77	2.23E+07	yes
RB-78	1.03E+08	yes
RB-78M	3.57E+08	yes
RB-79	3.21E+09	yes
RB-81	2.21E+10	yes
RB-81M	4.84E+09	yes
RB-82	2.04E+10	yes
RB-82M	7.96E+09	yes
RB-83	1.92E+08	yes
RB-84	3.81E+08	yes
RB-84M	8.44E+09	yes
RB-86	3.29E+08	yes
RB-86M	3.33E+09	yes
RB-87	2.01E-04	yes
RB-88	2.69E+09	yes
RB-89	1.17E+09	yes
RB-90	2.02E+08	yes
RB-90M	1.09E+08	yes
SR-78	4.46E+06	yes
SR-79	4.01E+07	yes

BR-74M	3.21E+08	yes
BR-75	6.25E+09	yes
BR-76	2.33E+10	yes
BR-77	7.71E+10	yes
BR-78	1.60E+11	yes
BR-80	5.11E+11	yes
BR-80M	1.97E+11	yes
BR-82	8.18E+11	yes
BR-82M	6.16E+11	yes
BR-83	2.98E+12	yes
BR-84	2.66E+12	yes
BR-84M	2.08E+11	yes
BR-85	2.74E+12	yes
KR-74	1.34E+07	yes
KR-75	9.81E+07	yes
KR-76	1.26E+09	yes
KR-77	3.03E+09	yes
KR-79	6.20E+10	yes
KR-81	1.76E+04	yes
KR-83M	3.29E+12	yes
KR-85	1.46E+09	yes
KR-85M	3.26E+12	yes
KR-87	3.36E+12	no
KR-88	3.59E+12	yes
KR-89	3.17E+12	yes
RB-77	8.92E+07	yes
RB-78	8.78E+07	yes
RB-78M	2.99E+08	yes
RB-79	2.15E+09	yes
RB-81	5.18E+10	yes
RB-81M	1.10E+10	yes
RB-82	7.94E+10	yes
RB-82M	4.26E+10	yes
RB-83	1.82E+10	yes
RB-84	6.48E+10	yes
RB-84M	1.17E+11	yes
RB-86	2.42E+11	yes
RB-86M	2.00E+11	yes
RB-87	1.24E+00	yes
RB-88	4.92E+12	yes
RB-89	5.13E+12	yes
RB-90	3.44E+12	yes
RB-90M	1.13E+12	yes
SR-79	3.12E+07	yes
SR-80	7.13E+07	yes
SR-81	9.76E+08	yes
SR-82	1.90E+09	yes
SR-83	3.69E+10	yes
SR-85	1.87E+10	yes

SR-80	8.17E+08	yes
SR-81	2.70E+09	yes
SR-82	1.80E+08	yes
SR-83	4.81E+09	yes
SR-85	2.29E+08	yes
SR-85M	1.78E+10	yes
SR-87M	1.34E+10	yes
SR-89	5.72E+07	yes
SR-90	1.44E+05	yes
Y-81	8.92E+06	no
Y-83	8.57E+07	no
Y-83M	3.11E+08	no
Y-84	1.78E+09	no
Y-85	6.24E+09	no
Y-85M	2.72E+09	no
Y-86	8.32E+09	no
Y-86M	1.76E+09	no
Y-87	2.29E+09	no
Y-87M	1.17E+10	no
Y-88	9.00E+07	no
Y-89M	1.84E+10	no
Y-90	1.47E+09	no
Y-90M	2.04E+09	no
Y-91	5.02E+07	no
Y-91M	4.32E+09	no
Y-92	3.74E+09	no
Y-93	1.15E+09	no
Y-93M	6.12E+08	no
Y-94	7.18E+08	no
Y-95	2.18E+08	no
ZR-84	2.81E+08	no
ZR-85	1.72E+09	no
ZR-86	3.16E+09	no
ZR-87	1.58E+10	no
ZR-88	1.48E+08	no
ZR-89	4.10E+09	no
ZR-89M	1.36E+10	no
ZR-90M	2.14E+10	no
ZR-93	8.16E+00	no
ZR-94	1.34E-09	no
ZR-95	1.59E+07	no
ZR-96	3.12E-14	no
ZR-97	1.12E+08	no
NB-87	4.01E+07	no
NB-87M	6.69E+07	no
NB-88	1.38E+08	no
NB-88M	9.14E+08	no
NB-89	1.10E+09	no
NB-89M	1.77E+09	no

SR-85M	1.24E+11	yes
SR-86M	2.71E+01	yes
SR-87M	7.01E+11	yes
SR-89	5.05E+11	yes
SR-90	2.58E+09	yes
SR-91	6.26E+12	yes
SR-92	6.14E+12	yes
SR-93	5.59E+12	yes
SR-94	5.47E+12	yes
Y-82	4.46E+06	unlikely
Y-83	1.92E+08	unlikely
Y-83M	3.17E+08	unlikely
Y-84	2.61E+09	unlikely
Y-85	1.64E+10	unlikely
Y-85M	1.57E+10	unlikely
Y-86	1.00E+11	unlikely
Y-86M	9.24E+09	unlikely
Y-87	2.48E+11	unlikely
Y-87M	1.61E+11	unlikely
Y-88	2.16E+10	unlikely
Y-88M	4.58E+10	unlikely
Y-90	8.52E+11	unlikely
Y-90M	1.58E+11	unlikely
Y-91	5.08E+11	unlikely
Y-91M	4.32E+12	unlikely
Y-92	7.58E+12	unlikely
Y-93	7.82E+12	unlikely
Y-93M	8.86E+11	unlikely
Y-94	7.30E+12	unlikely
Y-95	7.10E+12	unlikely
ZR-84	4.01E+07	no
ZR-85	3.08E+08	no
ZR-86	5.64E+09	no
ZR-87	2.35E+10	no
ZR-88	6.48E+09	no
ZR-88M	7.37E+00	no
ZR-89	2.04E+11	no
ZR-89M	9.69E+10	no
ZR-90M	3.09E+11	no
ZR-91M	8.13E+02	no
ZR-93	6.16E+04	no
ZR-95	5.53E+11	no
ZR-96	2.65E-09	no
ZR-97	7.86E+12	no
NB-87	4.90E+07	no
NB-87M	7.58E+07	no
NB-88	2.32E+08	no
NB-88M	1.25E+09	no
NB-89	6.79E+09	no

NB-90	4.19E+09	no
NB-91	2.09E+04	no
NB-91M	7.40E+07	no
NB-92	1.47E-01	no
NB-92M	4.79E+08	no
NB-93M	5.35E+05	no
NB-94	6.93E+02	no
NB-94M	9.98E+09	no
NB-95	7.88E+07	no
NB-95M	3.71E+08	no
NB-96	1.78E+09	no
NB-97	3.42E+09	no
NB-98M	7.58E+08	no
NB-99M	1.72E+08	no
MO-88	6.24E+07	no
MO-89	2.81E+08	no
MO-90	1.75E+09	no
MO-91	4.44E+09	no
MO-91M	1.64E+09	no
MO-92	9.80E-14	no
MO-93	5.07E+03	no
MO-93M	1.19E+08	no
MO-98	8.90E-08	no
MO-99	4.51E+08	no
MO-100	1.96E-13	no
MO-101	5.66E+08	no
MO-102	2.45E+08	no
MO-103	7.58E+07	no
TC-91	8.92E+06	no
TC-91M	8.92E+06	no
TC-92	1.96E+08	no
TC-93	1.96E+09	no
TC-93M	9.01E+08	no
TC-94	8.61E+08	no
TC-94M	5.65E+09	no
TC-95	3.12E+09	no
TC-95M	2.86E+07	no
TC-96	8.00E+08	no
TC-96M	8.70E+09	no
TC-97	3.21E+00	no
TC-97M	2.56E+07	no
TC-98	2.42E+00	no
TC-99	3.20E+01	no
TC-99M	3.99E+09	no
TC-101	4.22E+09	no
TC-102	1.32E+09	no
TC-104	3.25E+08	no
TC-105	8.03E+07	no
RU-92	2.23E+07	no

NB-89M	1.06E+10	no
NB-90	6.88E+10	no
NB-91	2.80E+06	no
NB-91M	9.83E+09	no
NB-92	4.01E+01	no
NB-92M	9.45E+10	no
NB-93M	2.39E+08	no
NB-94	5.19E+05	no
NB-94M	5.83E+11	no
NB-95	1.70E+11	no
NB-95M	4.08E+11	no
NB-96	1.53E+12	no
NB-97	1.02E+13	no
NB-98M	1.16E+12	no
NB-99M	3.01E+12	no
MO-89	1.16E+08	no
MO-89M	3.57E+07	no
MO-90	2.84E+09	no
MO-91	1.34E+10	no
MO-91M	4.86E+09	no
MO-93	5.36E+05	no
MO-93M	1.15E+09	no
MO-99	8.43E+12	no
MO-100	1.45E-08	no
MO-101	9.20E+12	no
MO-102	7.71E+12	no
MO-103	6.28E+12	no
MO-104	5.18E+12	no
TC-91	4.90E+07	no
TC-91M	3.57E+07	no
TC-92	9.41E+08	no
TC-93	1.80E+10	no
TC-93M	8.07E+09	no
TC-94	1.61E+10	no
TC-94M	3.58E+10	no
TC-95	9.87E+10	no
TC-95M	4.42E+09	no
TC-96	1.47E+11	no
TC-96M	1.76E+11	no
TC-97	1.69E+03	no
TC-97M	1.18E+10	no
TC-98	1.96E+03	no
TC-99	3.31E+05	no
TC-99M	7.89E+12	no
TC-100	1.42E+12	no
TC-101	1.15E+13	no
TC-101M	2.96E+04	no
TC-102M	4.29E+11	no
TC-104	7.33E+12	no

RU-94	2.15E+09	no
RU-95	4.92E+09	no
RU-96	1.83E-10	no
RU-97	1.82E+09	no
RU-103	3.08E+07	no
RU-105	6.41E+08	no
RU-106	4.39E+05	no
RU-107	1.16E+08	no
RU-108	8.47E+07	no
RH-95	3.07E+07	no
RH-95M	4.46E+06	no
RH-96	2.42E+08	no
RH-96M	1.87E+08	no
RH-97	1.49E+09	no
RH-97M	7.40E+08	no
RH-98	3.32E+09	no
RH-98M	1.49E+09	no
RH-99	9.44E+07	no
RH-99M	4.94E+09	no
RH-100	3.94E+09	no
RH-100M	4.15E+09	no
RH-101	2.72E+06	no
RH-101M	7.44E+08	no
RH-102	3.06E+06	no
RH-102M	5.23E+06	no
RH-103M	5.20E+09	no
RH-104M	2.40E+09	no
RH-105	1.17E+09	no
RH-106M	7.71E+08	no
RH-107	1.57E+09	no
RH-108	2.94E+08	no
RH-109	1.61E+08	no
PD-96	4.46E+06	no
PD-97	8.92E+06	no
PD-98	2.67E+08	no
PD-99	7.80E+08	no
PD-100	2.64E+08	no
PD-101	3.03E+09	no
PD-103	2.52E+08	no
PD-107	7.14E-01	no
PD-109	4.38E+08	no
PD-109M	2.50E+08	no
PD-110	1.07E-12	no
PD-111	1.47E+08	no
PD-111M	3.13E+07	no
PD-112	1.20E+07	no
PD-113	3.12E+07	no
PD-113M	3.12E+07	no
PD-114	4.46E+06	no

TC-105	6.02E+12	no
RU-94	4.07E+09	no
RU-95	1.16E+10	no
RU-97	7.36E+10	no
RU-101M	2.18E+03	no
RU-103	1.08E+12	no
RU-103M	2.29E+11	no
RU-105	8.08E+12	no
RU-106	7.69E+10	no
RU-107	4.99E+12	no
RU-108	4.12E+12	no
RH-95	1.71E+08	no
RH-95M	5.80E+07	no
RH-96	9.76E+08	no
RH-96M	6.81E+08	no
RH-97	6.05E+09	no
RH-97M	2.47E+09	no
RH-98	1.71E+10	no
RH-98M	6.67E+09	no
RH-99	7.85E+09	no
RH-99M	4.72E+10	no
RH-100	1.55E+11	no
RH-100M	5.10E+10	no
RH-101	6.77E+08	no
RH-101M	1.28E+11	no
RH-102	7.56E+09	no
RH-102M	4.67E+08	no
RH-103M	1.53E+12	no
RH-104	1.12E+12	no
RH-104M	3.57E+11	no
RH-105	9.29E+12	no
RH-106M	6.78E+11	no
RH-107	7.51E+12	no
RH-108	5.06E+12	no
RH-109	5.21E+12	no
RH-109M	2.20E+09	no
PD-96	4.46E+06	no
PD-97	9.81E+07	no
PD-98	1.15E+09	no
PD-99	4.04E+09	no
PD-100	1.44E+10	no
PD-101	4.72E+10	no
PD-103	5.50E+10	no
PD-105M	5.57E+05	no
PD-107	1.54E+04	no
PD-109	7.08E+12	no
PD-109M	5.52E+11	no
PD-111	5.47E+12	no
PD-111M	4.70E+11	no

AG-100	8.92E+06	yes
AG-100M	4.46E+06	yes
AG-101	1.78E+08	yes
AG-101M	7.13E+07	yes
AG-102	5.74E+08	yes
AG-102M	6.50E+08	yes
AG-103M	1.23E+09	yes
AG-104	5.28E+09	yes
AG-104M	1.89E+09	yes
AG-105	7.65E+07	yes
AG-105M	2.73E+09	yes
AG-106	3.50E+09	yes
AG-106M	6.21E+07	yes
AG-107M	8.39E+09	yes
AG-108	6.46E+08	yes
AG-108M	2.93E+03	yes
AG-109M	2.03E+09	yes
AG-110M	1.07E+06	yes
AG-111	5.96E+07	yes
AG-111M	7.67E+08	yes
AG-112	4.19E+08	yes
AG-113	1.85E+08	yes
AG-113M	1.41E+08	yes
AG-115	1.17E+07	yes
AG-116	4.46E+06	yes
CD-102	3.25E+08	yes
CD-103	8.47E+08	yes
CD-104	2.80E+09	yes
CD-105	4.34E+09	yes
CD-106	1.27E-12	yes
CD-107	6.06E+09	yes
CD-108	3.00E-11	yes
CD-109	6.86E+06	yes
CD-111M	1.12E+09	yes
CD-113	1.14E-10	yes
CD-113M	2.82E+04	yes
CD-114	1.38E-12	yes
CD-115	2.29E+07	yes
CD-115M	6.65E+05	yes
CD-116	3.61E-15	yes
CD-117	3.01E+07	yes
CD-117M	2.45E+07	yes
CD-118	4.46E+06	yes
CD-119	7.98E+06	yes
CD-119M	9.36E+05	yes
IN-106	4.90E+07	yes
IN-106M	4.46E+07	yes
IN-107	6.33E+08	yes
IN-108	3.16E+08	yes

PD-112	5.22E+12	no
PD-113	3.81E+12	no
PD-113M	1.47E+12	no
PD-114	3.13E+12	no
AG-99	7.13E+07	yes
AG-100	1.46E+08	yes
AG-100M	2.46E+08	yes
AG-101M	9.48E+08	yes
AG-102	7.43E+09	yes
AG-102M	5.47E+09	yes
AG-103	3.59E+10	yes
AG-103M	1.46E+10	yes
AG-104	4.47E+10	yes
AG-104M	3.55E+10	yes
AG-105	2.06E+10	yes
AG-105M	1.02E+11	yes
AG-106	2.04E+11	yes
AG-106M	3.72E+10	yes
AG-108	1.56E+11	yes
AG-108M	1.67E+07	yes
AG-110	2.38E+11	yes
AG-110M	1.88E+10	yes
AG-111	3.27E+12	yes
AG-111M	6.47E+12	yes
AG-112	6.99E+12	yes
AG-113	4.65E+12	yes
AG-113M	4.81E+12	yes
AG-114M	1.40E+04	yes
AG-115	3.02E+12	yes
AG-116	2.47E+12	yes
AG-117	1.30E+12	yes
CD-101	3.12E+07	yes
CD-102	4.15E+08	yes
CD-103	1.52E+09	yes
CD-104	7.17E+09	yes
CD-105	1.81E+10	yes
CD-107	1.23E+11	yes
CD-109	4.17E+09	yes
CD-109M	7.08E+05	yes
CD-111M	2.57E+11	yes
CD-113	1.03E-05	yes
CD-113M	4.36E+08	yes
CD-114	1.39E-07	yes
CD-115	4.48E+12	yes
CD-115M	7.95E+10	yes
CD-116	2.03E-09	yes
CD-117	2.46E+12	yes
CD-117M	1.77E+12	yes
CD-118	3.87E+12	yes

IN-108M	1.11E+09	yes
IN-109	3.04E+09	yes
IN-109M	9.90E+08	yes
IN-109N	7.58E+07	yes
IN-110	8.96E+08	yes
IN-110M	3.86E+09	yes
IN-111	7.50E+08	yes
IN-111M	1.16E+09	yes
IN-112	2.75E+09	yes
IN-112M	1.42E+09	yes
IN-113M	1.09E+09	yes
IN-114	5.88E+08	yes
IN-114M	3.97E+06	yes
IN-115	1.89E-09	yes
IN-115M	4.15E+08	yes
IN-116	1.52E+08	yes
IN-116M	2.94E+08	yes
IN-117	2.60E+08	yes
IN-117M	1.00E+08	yes
IN-118	4.46E+07	yes
IN-118M	8.47E+07	yes
IN-119	2.89E+07	yes
IN-119M	1.61E+07	yes
IN-120	1.34E+07	yes
IN-121M	4.46E+06	yes
SN-107	4.01E+07	yes
SN-108	3.39E+08	yes
SN-109	7.71E+08	yes
SN-110	1.96E+09	yes
SN-111	2.93E+09	yes
SN-113	1.61E+07	yes
SN-113M	1.65E+09	yes
SN-117M	5.74E+06	yes
SN-119M	9.52E+04	yes
SN-121	9.32E+06	yes
SN-121M	4.93E+02	yes
SN-123	1.19E+04	yes
SN-123M	4.46E+06	yes
SN-124	4.23E-14	yes
SN-125	2.09E-04	yes
SN-125M	3.36E-02	yes
SB-112	1.03E+09	yes
SB-113	2.31E+09	yes
SB-114	3.25E+09	yes
SB-115	4.48E+09	yes
SB-116	4.11E+09	yes
SB-116M	4.72E+08	yes
SB-117	4.45E+09	yes
SB-118	1.39E+09	yes

CD-119	2.02E+12	yes
CD-119M	5.64E+11	yes
IN-104	1.65E+08	yes
IN-105	1.11E+09	yes
IN-106	2.07E+09	yes
IN-106M	2.42E+09	yes
IN-107	1.56E+10	yes
IN-107M	4.56E+09	yes
IN-108	1.01E+10	yes
IN-108M	2.37E+10	yes
IN-109	9.35E+10	yes
IN-109M	2.97E+10	yes
IN-110	5.10E+10	yes
IN-110M	1.13E+11	yes
IN-111	2.83E+11	yes
IN-111M	1.02E+11	yes
IN-112	4.28E+11	yes
IN-112M	2.18E+11	yes
IN-113M	3.45E+11	yes
IN-114	4.34E+11	yes
IN-114M	2.88E+11	yes
IN-115	1.04E-04	yes
IN-115M	5.04E+12	yes
IN-116M	1.30E+12	yes
IN-117	4.79E+12	yes
IN-117M	2.71E+12	yes
IN-118M	1.10E+12	yes
IN-119	2.61E+12	yes
IN-119M	2.16E+12	yes
IN-121M	1.41E+12	yes
SN-106	6.24E+07	yes
SN-107	2.23E+08	yes
SN-108	2.52E+09	yes
SN-109	7.85E+09	yes
SN-110	2.91E+10	yes
SN-111	5.14E+10	yes
SN-111M	3.76E+04	yes
SN-113	7.41E+09	yes
SN-113M	9.48E+10	yes
SN-115M	1.28E+11	yes
SN-117M	7.60E+10	yes
SN-119M	6.17E+09	yes
SN-120M	5.42E+04	yes
SN-121	4.06E+12	yes
SN-121M	1.35E+08	yes
SN-123	1.95E+10	yes
SN-123M	2.73E+12	yes
SN-125	2.30E+11	yes
SN-125M	1.65E+12	yes

SB-118M	8.31E+07	yes
SB-119	3.42E+08	yes
SB-119M	3.31E-01	yes
SB-120	3.48E+08	yes
SB-120M	7.55E+06	yes
SB-122	1.88E+07	yes
SB-122M	8.92E+06	yes
SB-124	1.41E+05	yes
SB-124M	8.92E+06	yes
SB-124N	6.04E+00	yes
SB-125	4.60E+03	yes
SB-126	2.26E-03	yes
SB-126M	8.20E-01	yes
SB-126N	4.30E-01	yes
SB-127	2.22E-04	yes
SB-128	2.28E-04	yes
TE-113	1.20E+08	yes
TE-114	4.73E+08	yes
TE-115	1.07E+09	yes
TE-115M	3.52E+08	yes
TE-116	2.52E+09	yes
TE-117	2.45E+09	yes
TE-117M	6.60E+08	yes
TE-118	2.12E+08	yes
TE-119	1.08E+09	yes
TE-119M	5.24E+07	yes
TE-121	4.19E+07	yes
TE-121M	4.12E+05	yes
TE-123	7.21E-12	yes
TE-123M	2.32E+05	yes
TE-125M	1.88E+05	yes
TE-127	1.05E+07	yes
TE-127M	2.03E-02	yes
TE-128	1.39E-21	yes
TE-129	3.58E-02	yes
TE-129M	4.81E-05	yes
TE-130	2.75E-30	yes
TE-131	6.30E-04	yes
TE-131M	7.00E-05	yes
I-117	5.75E+08	yes
I-118	8.96E+08	yes
I-118M	7.13E+07	yes
I-119	1.69E+09	yes
I-120	1.71E+09	yes
I-120M	6.69E+07	yes
I-121	2.36E+09	yes
I-122	1.64E+09	yes
I-123	1.10E+09	yes
I-124	5.54E+07	yes

SN-126	1.06E+05	yes
SN-127	1.11E+12	yes
SN-127M	5.96E+11	yes
SN-128	1.86E+12	yes
SN-129	1.20E+12	yes
SN-129M	2.60E+11	yes
SN-130	9.43E+11	yes
SN-130M	6.96E+11	yes
SB-113	2.78E+10	yes
SB-114	7.27E+10	yes
SB-115	1.70E+11	yes
SB-115M	1.60E+08	yes
SB-116	2.24E+11	yes
SB-116M	5.61E+10	yes
SB-117	5.23E+11	yes
SB-118	6.01E+11	yes
SB-118M	4.33E+10	yes
SB-119	1.06E+12	yes
SB-119M	2.16E+03	yes
SB-120	6.63E+11	yes
SB-120M	1.17E+11	yes
SB-121M	7.95E+04	yes
SB-122	9.08E+11	yes
SB-122M	1.61E+11	yes
SB-124	7.35E+10	yes
SB-124M	7.33E+11	yes
SB-125	1.37E+10	yes
SB-126	9.41E+10	yes
SB-126M	1.42E+12	yes
SB-127	2.03E+12	yes
SB-128	2.65E+12	yes
SB-128M	2.40E+11	yes
SB-129	2.76E+12	yes
SB-129M	1.83E+11	yes
SB-130	1.28E+12	yes
SB-130M	2.01E+12	yes
SB-131	3.82E+12	yes
SB-131M	2.96E+02	yes
SB-132	1.71E+12	yes
SB-132M	1.30E+12	yes
SB-133	2.26E+12	yes
TE-112	4.86E+08	yes
TE-113	2.10E+09	yes
TE-114	7.71E+09	yes
TE-115	1.60E+10	yes
TE-115M	4.26E+09	yes
TE-116	5.99E+10	yes
TE-117	8.87E+10	yes
TE-117M	2.96E+10	yes

I-125	4.56E+06	yes
I-126	6.81E+06	yes
I-128	4.90E+07	yes
I-129	1.05E-03	yes
I-130	4.37E+06	yes
I-130M	4.89E+00	yes
I-131	1.89E+05	yes
I-132	1.25E-01	yes
I-132M	1.99E-02	yes
XE-117	8.92E+06	yes
XE-118	2.23E+07	yes
XE-119	5.80E+07	yes
XE-120	2.05E+08	yes
XE-121	3.39E+08	yes
XE-122	2.83E+08	yes
XE-123	1.22E+09	yes
XE-124	8.10E-09	yes
XE-125	5.85E+08	yes
XE-127	6.82E+06	yes
XE-127M	1.16E+08	yes
XE-129M	3.41E+05	yes
XE-131M	6.38E+05	yes
XE-133	1.43E-03	yes
XE-133M	1.82E-03	yes
XE-134	3.99E-22	yes
CS-122M	9.36E+07	yes
CS-122N	8.92E+06	yes
CS-123	6.78E+08	yes
CS-124	1.23E+09	yes
CS-124M	7.13E+07	yes
CS-125	1.32E+09	yes
CS-125M	8.99E-03	yes
CS-126	1.61E+09	yes
CS-127	8.91E+08	yes
CS-128	4.89E+08	yes
CS-129	5.47E+08	yes
CS-130	1.02E+08	yes
CS-130M	4.46E+07	yes
CS-131	4.50E+06	yes
CS-132	2.30E+06	yes
CS-134	2.05E+03	yes
CS-134M	3.08E+00	yes
CS-135	1.55E-10	yes
CS-135M	3.51E-02	yes
CS-136	5.79E-04	yes
CS-136M	6.40E-03	yes
BA-123	3.03E+08	yes
BA-124	6.38E+08	yes
BA-125	7.94E+08	yes

TE-118	1.03E+11	yes
TE-119	2.36E+11	yes
TE-119M	7.24E+10	yes
TE-121	1.27E+11	yes
TE-121M	4.64E+09	yes
TE-123	1.36E-07	yes
TE-123M	8.60E+09	yes
TE-125M	2.56E+10	yes
TE-127	2.43E+12	yes
TE-127M	1.68E+10	yes
TE-128	5.25E-09	yes
TE-128M	1.47E+03	yes
TE-129	3.12E+12	yes
TE-129M	9.76E+10	yes
TE-130	6.70E-14	yes
TE-131	4.73E+12	yes
TE-131M	3.09E+11	yes
TE-132	4.02E+12	yes
TE-133	3.84E+12	yes
TE-133M	2.15E+12	yes
TE-134	4.86E+12	yes
I-115	2.41E+08	yes
I-117	1.07E+10	yes
I-118	2.46E+10	yes
I-118M	2.43E+09	yes
I-119	7.28E+10	yes
I-120	1.34E+11	yes
I-120M	4.60E+09	yes
I-121	2.65E+11	yes
I-122	4.03E+11	yes
I-123	6.62E+11	yes
I-124	3.44E+11	yes
I-125	7.81E+10	yes
I-126	2.21E+11	yes
I-128	8.56E+11	yes
I-129	2.98E+03	yes
I-130	8.37E+11	yes
I-130M	3.53E+11	yes
I-131	2.47E+12	yes
I-132	5.09E+12	yes
I-132M	2.21E+11	yes
I-133	7.42E+12	yes
I-134	7.22E+12	yes
I-134M	8.54E+11	yes
I-135	5.98E+12	yes
XE-117	3.57E+07	yes
XE-118	5.44E+08	yes
XE-119	2.88E+09	yes
XE-120	1.30E+10	yes

BA-126	1.24E+09	yes
BA-127	7.98E+08	yes
BA-128	2.53E+08	yes
BA-129	2.39E+09	yes
BA-129M	5.17E+08	yes
BA-131	9.60E+07	yes
BA-131M	5.35E+07	yes
BA-133	9.77E+04	yes
BA-133M	8.72E+06	yes
BA-135M	1.12E+06	yes
BA-136M	2.06E+01	yes
BA-137M	1.31E+01	yes
BA-139	2.99E-02	yes
LA-128	7.18E+08	yes
LA-129	2.32E+09	yes
LA-130	3.20E+09	yes
LA-131	3.48E+09	yes
LA-132	2.47E+09	yes
LA-132M	3.43E+08	yes
LA-133	1.95E+09	yes
LA-134	7.40E+08	yes
LA-135	2.81E+09	yes
LA-136	7.13E+07	yes
LA-136M	4.46E+06	yes
LA-137	3.12E+02	yes
LA-138	1.66E-07	yes
LA-140	7.41E-01	yes
LA-141	1.69E-03	yes
CE-129	1.27E+09	yes
CE-130	2.13E+09	yes
CE-131	1.41E+09	yes
CE-131M	1.10E+09	yes
CE-132	2.95E+09	yes
CE-133	7.93E+08	yes
CE-133M	1.31E+09	yes
CE-134	4.78E+08	yes
CE-135M	4.55E+08	yes
CE-136	9.11E-07	yes
CE-137	4.37E+10	yes
CE-137M	7.66E+06	yes
CE-139	2.13E+08	yes
CE-141	4.73E+04	yes
CE-142	1.28E-17	yes
CE-143	1.09E-03	yes
CE-144	1.04E-06	yes
PR-135	4.04E+10	yes
PR-136	7.62E+10	yes
PR-137	8.64E+10	yes
PR-138	7.90E+10	yes

XE-121	3.39E+10	yes
XE-122	8.65E+10	yes
XE-123	1.55E+11	yes
XE-125	4.22E+11	yes
XE-127	9.18E+10	yes
XE-127M	2.73E+11	yes
XE-129M	6.95E+10	yes
XE-131M	8.21E+10	yes
XE-132M	2.61E+05	yes
XE-133	3.83E+12	yes
XE-133M	2.77E+11	yes
XE-134	8.76E-06	yes
XE-134M	1.94E+11	yes
XE-135	7.36E+12	yes
XE-135M	9.82E+11	yes
XE-136	3.61E-10	yes
XE-137	4.78E+12	yes
XE-138	4.23E+12	yes
CS-120	1.96E+08	yes
CS-121	6.68E+08	yes
CS-121M	5.48E+08	yes
CS-122M	2.26E+09	yes
CS-123	2.01E+10	yes
CS-124	4.83E+10	yes
CS-124M	1.17E+10	yes
CS-125	1.07E+11	yes
CS-125M	8.52E+00	yes
CS-126	1.86E+11	yes
CS-127	3.18E+11	yes
CS-127M	2.74E-01	yes
CS-128	4.13E+11	yes
CS-129	6.21E+11	yes
CS-130	5.15E+11	yes
CS-130M	2.36E+11	yes
CS-131	2.52E+11	yes
CS-132	2.92E+11	yes
CS-134	3.80E+09	yes
CS-134M	1.20E+11	yes
CS-135	3.61E+04	yes
CS-135M	7.04E+10	yes
CS-136	2.15E+11	yes
CS-137	2.43E+09	yes
CS-138	5.27E+12	yes
CS-138M	2.48E+11	yes
CS-139	4.75E+12	yes
CS-140	4.02E+12	yes
BA-122	9.36E+07	yes
BA-123	6.20E+08	yes
BA-124	3.32E+09	yes

PR-138M	2.67E+08	yes
PR-139	1.41E+11	yes
PR-140	2.28E+10	yes
PR-142	7.79E+06	yes
PR-142M	8.92E+06	yes
PR-143	2.25E+05	yes
PR-144	1.48E+00	yes
PR-144M	1.04E+00	yes
PR-145	3.35E+06	yes
PR-146	1.41E-02	yes
PR-147	5.00E-03	yes
ND-135	2.37E+10	yes
ND-135M	1.43E+10	yes
ND-136	7.47E+10	yes
ND-137	8.53E+10	yes
ND-138	7.87E+10	yes
ND-139	1.67E+11	yes
ND-139M	4.57E+09	yes
ND-140	2.27E+10	yes
ND-141	2.61E+11	yes
ND-141M	2.14E+09	yes
ND-144	7.31E-11	yes
ND-147	4.16E+05	yes
ND-148	3.92E-22	yes
ND-149	2.88E-02	yes
ND-150	4.11E-26	yes
ND-151	1.79E-03	yes
PM-136	2.48E+10	yes
PM-137	3.36E+10	yes
PM-137M	1.09E+10	yes
PM-138	1.25E+10	yes
PM-138M	5.34E+10	yes
PM-139	1.55E+11	yes
PM-139M	2.36E+10	yes
PM-140M	2.68E+10	yes
PM-141	2.67E+11	yes
PM-143	6.82E+08	yes
PM-144	5.32E+06	yes
PM-145	1.49E+05	yes
PM-146	1.23E+05	yes
PM-147	1.02E+05	yes
PM-148	1.95E+06	yes
PM-148M	3.00E+05	yes
PM-149	5.17E+06	yes

BA-125	1.06E+10	yes
BA-126	3.05E+10	yes
BA-127M	1.74E+04	yes
BA-128	1.00E+11	yes
BA-129	1.03E+11	yes
BA-129M	8.79E+10	yes
BA-130M	5.81E+09	yes
BA-131	1.36E+11	yes
BA-131M	1.07E+11	yes
BA-133	7.80E+08	yes
BA-133M	1.20E+11	yes
BA-135M	1.25E+11	yes
BA-136M	1.26E+11	yes
BA-137M	2.05E+11	yes
BA-139	5.61E+12	yes
BA-140	1.40E+12	yes
BA-141	4.32E+12	yes
BA-142	4.01E+12	yes
LA-124	4.46E+07	unlikely
LA-125	2.32E+08	unlikely
LA-127	6.13E+09	unlikely
LA-128	1.69E+10	unlikely
LA-129	4.06E+10	unlikely
LA-129M	1.42E+10	unlikely
LA-130	7.73E+10	unlikely
LA-131	1.39E+11	unlikely
LA-132	1.89E+11	unlikely
LA-132M	7.84E+10	unlikely
LA-133	3.48E+11	unlikely
LA-134	3.90E+11	unlikely
LA-135	6.11E+11	unlikely
LA-136	4.12E+11	unlikely
LA-136M	2.27E+10	unlikely
LA-137	1.80E+05	unlikely
LA-138	5.55E-02	unlikely
LA-140	1.31E+12	unlikely
LA-141	4.95E+12	unlikely
LA-142	4.47E+12	unlikely
LA-143	4.24E+12	unlikely
CE-128	9.50E+08	yes
CE-129	3.21E+09	yes
CE-130	1.08E+10	yes
CE-131	1.65E+10	yes
CE-131M	6.18E+09	yes

PM-150	8.52E+06	yes
PM-151	3.74E-01	yes
PM-152	8.92E+06	yes
PM-152M	4.00E-02	yes
PM-152N	2.95E-03	yes
PM-153	9.21E-03	yes
PM-154	5.63E-03	yes
PM-154M	1.44E-03	yes
SM-138	3.34E+10	yes
SM-139	7.48E+10	yes
SM-140	1.53E+11	yes
SM-141	1.53E+11	yes
SM-141M	5.60E+10	yes
SM-142	3.97E+11	yes
SM-143	5.10E+11	yes
SM-143M	3.48E+10	yes
SM-145	5.62E+07	yes
SM-146	1.71E-01	yes
SM-147	3.78E-05	yes
SM-148	2.34E-10	yes
SM-149	2.89E-10	yes
SM-151	1.03E+03	yes
SM-153	7.33E+05	yes
SM-155	1.20E+00	yes
SM-156	7.86E-03	yes
SM-157	6.29E-03	yes
EU-142M	7.13E+10	yes
EU-143	3.95E+11	yes
EU-145	6.53E+10	yes
EU-146	1.06E+10	yes
EU-147	2.61E+09	yes
EU-148	1.36E+08	yes
EU-149	1.39E+08	yes
EU-150	7.26E+04	yes
EU-150M	9.01E+08	yes
EU-152	5.38E+04	yes
EU-152M	1.72E+08	yes
EU-152N	4.43E+07	yes
EU-154	2.38E+04	yes
EU-154M	3.57E+07	yes
EU-155	2.49E+04	yes
EU-156	9.05E+05	yes
EU-157	3.76E+06	yes
EU-158	8.92E+06	yes
EU-159	2.09E-02	yes
GD-142	3.95E+10	yes
GD-143M	8.59E+10	yes

CE-132	5.26E+10	yes
CE-133	4.56E+10	yes
CE-133M	4.23E+10	yes
CE-134	1.22E+11	yes
CE-135	2.03E+11	yes
CE-136M	7.58E+02	yes
CE-137	4.19E+11	yes
CE-137M	8.40E+10	yes
CE-138M	1.39E+11	yes
CE-139	2.07E+10	yes
CE-141	6.05E+11	yes
CE-142	1.09E-06	yes
CE-143	4.30E+12	yes
CE-144	6.10E+10	yes
CE-145	3.35E+12	yes
CE-146	2.67E+12	yes
PR-131	2.14E+09	yes
PR-132	6.18E+09	yes
PR-133	1.64E+10	yes
PR-134	3.13E+10	yes
PR-134M	1.29E+09	yes
PR-135	6.22E+10	yes
PR-136	1.03E+11	yes
PR-137	1.65E+11	yes
PR-138	1.61E+11	yes
PR-138M	6.40E+10	yes
PR-139	3.60E+11	yes
PR-140	3.90E+11	yes
PR-142	2.14E+11	yes
PR-142M	6.09E+10	yes
PR-143	9.11E+11	yes
PR-144	2.37E+11	yes
PR-144M	1.06E+11	yes
PR-145	3.68E+12	yes
PR-146	2.96E+12	yes
PR-147	2.41E+12	yes
PR-148	1.91E+12	yes
PR-148M	3.72E+10	yes
PR-149	1.56E+12	yes
ND-133	8.96E+08	yes
ND-134	3.45E+09	yes
ND-135	5.89E+09	yes
ND-135M	2.87E+09	yes
ND-136	2.05E+10	yes
ND-137	4.06E+10	yes
ND-138	6.46E+10	yes
ND-139	7.55E+10	yes

GD-144	3.62E+11	yes
GD-145	6.84E+11	yes
GD-145M	2.16E+11	yes
GD-146	1.26E+10	yes
GD-147	2.50E+11	yes
GD-148	2.39E+07	yes
GD-149	6.20E+10	yes
GD-150	5.07E+02	yes
GD-151	8.36E+08	yes
GD-152	2.63E-06	yes
GD-153	1.12E+08	yes
GD-159	2.75E+07	yes
GD-160	1.95E-13	yes
GD-161	8.92E+06	yes
GD-162	4.46E+06	yes
TB-147	6.87E+11	yes
TB-147M	2.26E+11	yes
TB-148	1.60E+12	yes
TB-148M	1.35E+11	yes
TB-149	2.39E+12	yes
TB-149M	2.44E+11	yes
TB-150	1.20E+12	yes
TB-150M	1.40E+11	yes
TB-151	5.08E+11	yes
TB-151M	1.04E+11	yes
TB-152	6.25E+11	yes
TB-152M	3.78E+10	yes
TB-153	1.89E+11	yes
TB-154	7.57E+08	yes
TB-154M	6.10E+09	yes
TB-154N	9.64E+09	yes
TB-155	6.73E+10	yes
TB-156	7.26E+08	yes
TB-156M	3.93E+08	yes
TB-156N	7.28E+08	yes
TB-157	6.98E+06	yes
TB-158	1.68E+04	yes
TB-158M	4.82E+08	yes
TB-160	3.54E+06	yes
TB-161	1.84E+07	yes
TB-162	1.11E+08	yes
TB-163	6.24E+07	yes
TB-164	1.78E+07	yes
TB-165	8.92E+06	yes
DY-148	1.04E+12	yes
DY-149	2.37E+12	yes
DY-150	1.69E+12	yes
DY-151	1.33E+12	yes
DY-152	1.98E+12	yes

ND-139M	3.10E+10	yes
ND-140	1.27E+11	yes
ND-140M	5.10E+01	yes
ND-141	2.39E+11	yes
ND-144	1.98E-06	yes
ND-147	8.13E+11	yes
ND-149	1.77E+12	yes
ND-150	1.92E-09	yes
ND-151	9.14E+11	yes
ND-152	6.37E+11	yes
PM-136	1.53E+09	yes
PM-137	4.83E+09	yes
PM-138	2.79E+09	yes
PM-138M	9.30E+09	yes
PM-139	2.32E+10	yes
PM-139M	6.84E+09	yes
PM-140	2.71E+10	yes
PM-140M	1.43E+10	yes
PM-141	8.15E+10	yes
PM-142M	1.88E+10	yes
PM-143	3.05E+09	yes
PM-144	1.27E+09	yes
PM-145	8.14E+07	yes
PM-146	2.29E+08	yes
PM-147	2.49E+09	yes
PM-148	3.77E+10	yes
PM-148M	5.10E+09	yes
PM-149	1.61E+12	yes
PM-149M	8.35E+01	yes
PM-150	1.18E+11	yes
PM-151	1.04E+12	yes
PM-152	7.28E+11	yes
PM-152M	4.36E+10	yes
PM-153	5.12E+11	yes
PM-154	2.57E+11	yes
PM-154M	5.17E+10	yes
SM-138	9.85E+08	yes
SM-139	3.23E+09	yes
SM-140	6.17E+09	yes
SM-141	6.11E+09	yes
SM-141M	6.03E+09	yes
SM-142	2.63E+10	yes
SM-143	4.40E+10	yes
SM-143M	1.53E+10	yes
SM-145	8.91E+08	yes
SM-146	1.09E+01	yes
SM-147	6.77E-03	yes
SM-148	2.29E-07	yes
SM-151	1.08E+08	yes

DY-153	2.08E+12	yes
DY-154	1.50E+03	yes
DY-155	2.00E+12	yes
DY-156	3.45E-09	yes
DY-157	1.31E+12	yes
DY-159	1.48E+10	yes
DY-165	3.65E+08	yes
DY-165M	1.43E+08	yes
DY-166	1.68E+07	yes
DY-167	5.80E+07	yes
DY-168	8.92E+06	yes
HO-152	1.00E+12	yes
HO-153	1.92E+12	yes
HO-153M	4.78E+11	yes
HO-154	4.20E+12	yes
HO-154M	2.65E+11	yes
HO-155	3.61E+12	yes
HO-156M	3.13E+12	yes
HO-157	2.06E+12	yes
HO-158	4.18E+12	yes
HO-158M	1.19E+11	yes
HO-158N	1.83E+10	yes
HO-159	7.25E+12	yes
HO-160	7.18E+11	yes
HO-160M	1.07E+12	yes
HO-161	4.88E+12	yes
HO-162	3.38E+10	yes
HO-162M	1.35E+10	yes
HO-163	1.56E+06	yes
HO-164	1.28E+10	yes
HO-164M	6.17E+09	yes
HO-166	6.94E+08	yes
HO-166M	6.27E+02	yes
HO-167	2.01E+09	yes
HO-168	8.11E+08	yes
HO-168M	7.47E+00	yes
HO-169	3.48E+08	yes
HO-170	4.46E+07	yes
ER-154	3.48E+12	yes
ER-155	2.66E+12	yes
ER-156	3.28E+12	yes
ER-157	1.63E+12	yes
ER-158	3.94E+12	yes
ER-159	7.03E+12	yes
ER-160	1.97E+12	yes
ER-161	5.80E+12	yes
ER-162	6.81E-05	yes
ER-163	1.16E+13	yes
ER-165	9.77E+11	yes

SM-153	5.22E+11	yes
SM-153M	2.12E+10	yes
SM-155	2.49E+11	yes
SM-156	1.69E+11	yes
SM-157	9.67E+10	yes
SM-158	5.05E+10	yes
EU-142M	1.81E+09	yes
EU-143	9.10E+09	yes
EU-145	2.24E+10	yes
EU-146	2.21E+10	yes
EU-147	9.17E+09	yes
EU-148	3.96E+09	yes
EU-148M	7.41E+00	yes
EU-149	3.27E+09	yes
EU-150	1.25E+07	yes
EU-150M	2.49E+10	yes
EU-152	4.36E+07	yes
EU-152M	1.81E+10	yes
EU-154	7.34E+07	yes
EU-154M	1.12E+10	yes
EU-155	7.34E+08	yes
EU-156	4.83E+10	yes
EU-157	1.43E+11	yes
EU-158	8.13E+10	yes
EU-159	4.78E+10	yes
GD-143M	5.04E+08	yes
GD-144	1.61E+09	yes
GD-145	4.05E+09	yes
GD-145M	1.91E+09	yes
GD-146	1.25E+09	yes
GD-147	1.77E+10	yes
GD-148	5.19E+06	yes
GD-149	1.20E+10	yes
GD-150	5.07E+02	yes
GD-151	2.20E+09	yes
GD-152	9.93E-06	yes
GD-153	1.26E+09	yes
GD-153M	1.40E+09	yes
GD-155M	1.85E+09	yes
GD-159	7.27E+10	yes
GD-160	4.15E-09	yes
GD-161	2.46E+10	yes
GD-162	1.50E+10	yes
GD-163	6.53E+09	yes
TB-147	2.59E+09	yes
TB-147M	2.00E+09	yes
TB-148	5.51E+09	yes
TB-148M	1.31E+09	yes
TB-149	7.20E+09	yes

ER-169	3.81E+08	yes
ER-171	1.54E+09	yes
ER-172	1.40E+08	yes
ER-173	2.76E+08	yes
ER-174	5.35E+07	yes
ER-175	8.92E+06	yes
TM-158	2.25E+12	yes
TM-159	6.08E+12	yes
TM-160	6.80E+12	yes
TM-161	5.87E+12	yes
TM-162	1.03E+13	yes
TM-162M	7.35E+11	yes
TM-163	1.17E+13	yes
TM-164	1.32E+13	yes
TM-164M	3.29E+11	yes
TM-165	2.93E+12	yes
TM-166	9.60E+11	yes
TM-167	3.98E+11	yes
TM-168	6.86E+08	yes
TM-170	2.04E+08	yes
TM-171	2.56E+07	yes
TM-172	2.86E+09	yes
TM-173	7.59E+09	yes
TM-174	3.94E+09	yes
TM-175	1.28E+09	yes
TM-176	2.27E+08	yes
YB-159	3.77E+12	yes
YB-160	5.54E+12	yes
YB-161	4.00E+12	yes
YB-162	9.15E+12	yes
YB-163	1.06E+13	yes
YB-164	1.25E+13	yes
YB-165	1.19E+13	yes
YB-166	1.78E+12	yes
YB-167	1.20E+13	yes
YB-168	8.91E-05	yes
YB-169	2.18E+10	yes
YB-169M	3.96E+11	yes
YB-175	4.51E+09	yes
YB-176M	2.18E+09	yes
YB-177	7.30E+09	yes
YB-178	1.35E+09	yes
YB-179	2.23E+07	yes
LU-162	6.32E+11	yes
LU-162M	9.84E+11	yes
LU-162N	2.70E+12	yes
LU-163	7.38E+12	yes

TB-149M	5.27E+09	yes
TB-150	1.04E+10	yes
TB-150M	4.94E+09	yes
TB-151	2.75E+10	yes
TB-151M	2.13E+10	yes
TB-152	3.65E+10	yes
TB-152M	8.08E+09	yes
TB-153	4.30E+10	yes
TB-153M	8.06E+09	yes
TB-154	3.23E+09	yes
TB-154M	3.23E+10	yes
TB-155	3.88E+10	yes
TB-156	1.84E+10	yes
TB-156M	5.64E+09	yes
TB-157	9.38E+06	yes
TB-158	1.82E+06	yes
TB-158M	5.94E+09	yes
TB-160	1.14E+09	yes
TB-161	2.02E+10	yes
TB-162	2.82E+10	yes
TB-163	1.74E+10	yes
TB-164	8.80E+09	yes
TB-165	5.07E+09	yes
DY-147	1.12E+08	yes
DY-148	1.20E+09	yes
DY-149	2.14E+09	yes
DY-150	4.43E+09	yes
DY-151	5.24E+09	yes
DY-152	1.30E+10	yes
DY-153	1.85E+10	yes
DY-154	1.05E+02	yes
DY-155	3.34E+10	yes
DY-155M	8.19E+03	yes
DY-157	4.86E+10	yes
DY-157M	2.41E+09	yes
DY-159	1.66E+09	yes
DY-159M	2.37E+09	yes
DY-165	1.16E+10	yes
DY-165M	6.19E+09	yes
DY-166	5.33E+09	yes
HO-150	3.27E+08	yes
HO-152	1.36E+09	yes
HO-153	3.59E+09	yes
HO-153M	1.52E+09	yes
HO-154	5.74E+09	yes
HO-154M	1.88E+09	yes
HO-155	1.29E+10	yes

LU-164	8.88E+12	yes
LU-165	9.68E+12	yes
LU-166	8.61E+12	yes
LU-166M	1.66E+12	yes
LU-166N	1.06E+12	yes
LU-167	1.05E+13	yes
LU-167M	2.42E+03	yes
LU-168	2.76E+12	yes
LU-168M	8.46E+12	yes
LU-169	2.14E+12	yes
LU-169M	2.90E+12	yes
LU-170	9.15E+11	yes
LU-170M	7.58E+11	yes
LU-171	2.76E+11	yes
LU-171M	5.93E+11	yes
LU-172	1.15E+11	yes
LU-172M	6.48E+11	yes
LU-173	2.92E+09	yes
LU-174	3.27E+08	yes
LU-174M	1.08E+09	yes
LU-176	6.68E-03	yes
LU-176M	4.69E+11	yes
LU-177	1.99E+10	yes
LU-177M	4.96E+07	yes
LU-177N	3.39E+05	yes
LU-178	8.65E+10	yes
LU-178M	6.28E+10	yes
LU-179	4.14E+10	yes
LU-180	1.19E+09	yes
LU-180M	3.29E+03	yes
LU-181	5.73E+01	yes
HF-164	3.45E+12	no
HF-165	3.85E+12	no
HF-166	5.76E+12	no
HF-167	5.14E+12	no
HF-168	7.11E+12	no
HF-169	5.52E+12	no
HF-170	4.73E+12	no
HF-171	6.49E+12	no
HF-171M	1.73E+06	no
HF-172	6.95E+09	no
HF-173	3.83E+12	no
HF-174	7.03E-06	no
HF-175	4.79E+10	no
HF-177N	3.56E+09	no
HF-178N	8.85E+05	no
HF-179N	4.04E+09	no
HF-180M	7.44E+10	no
HF-181	2.07E+09	no

HO-156	1.44E+10	yes
HO-156M	5.21E+09	yes
HO-157	2.38E+10	yes
HO-158	2.77E+10	yes
HO-158M	8.80E+09	yes
HO-159	3.56E+10	yes
HO-160	2.88E+10	yes
HO-160M	2.83E+10	yes
HO-161	4.25E+10	yes
HO-162	1.32E+10	yes
HO-162M	5.60E+09	yes
HO-163	1.09E+05	yes
HO-164	1.12E+10	yes
HO-164M	5.55E+09	yes
HO-166	9.25E+09	yes
HO-166M	1.83E+04	yes
HO-167	9.72E+09	yes
HO-168	5.61E+09	yes
HO-168M	5.28E+00	yes
HO-169	3.12E+09	yes
HO-170	9.88E+08	yes
ER-154	1.10E+09	yes
ER-155	2.90E+09	yes
ER-156	5.46E+09	yes
ER-157	7.82E+09	yes
ER-158	1.17E+10	yes
ER-159	1.58E+10	yes
ER-160	1.94E+10	yes
ER-161	2.32E+10	yes
ER-163	2.88E+10	yes
ER-165	3.03E+10	yes
ER-169	2.47E+09	yes
ER-171	2.40E+09	yes
ER-172	1.29E+09	yes
ER-173	5.71E+08	yes
ER-174	3.08E+08	yes
ER-175	1.34E+08	yes
TM-156	9.43E+08	yes
TM-157	1.88E+09	yes
TM-158	2.98E+09	yes
TM-159	5.41E+09	yes
TM-160	6.54E+09	yes
TM-160M	4.06E+09	yes
TM-161	1.08E+10	yes
TM-162	1.24E+10	yes
TM-163	1.63E+10	yes
TM-164	1.86E+10	yes
TM-164M	4.36E+09	yes
TM-165	2.08E+10	yes

HF-182	1.64E-06	no
HF-182M	1.74E+03	no
HF-183	1.48E-03	no
TA-170	4.41E+12	no
TA-171	7.67E+12	no
TA-172	7.88E+12	no
TA-173	9.57E+12	no
TA-174	1.01E+13	no
TA-175	7.45E+12	no
TA-176	8.16E+12	no
TA-177	2.76E+12	no
TA-178	1.50E+13	no
TA-178M	6.44E+12	no
TA-179	2.49E+10	no
TA-180	3.15E+13	no
TA-180M	1.80E-02	no
TA-182	1.67E+11	no
TA-182M	1.34E+12	no
TA-182N	5.84E+10	no
TA-183	4.98E+05	no
TA-184	3.30E-01	no
W-171	1.66E+12	no
W-172	2.46E+12	no
W-173	2.30E+12	no
W-174	3.21E+12	no
W-175	2.86E+12	no
W-176	3.72E+12	no
W-177	3.26E+12	no
W-178	6.22E+10	no
W-179	3.50E+12	no
W-179M	1.21E+12	no
W-181	6.05E+09	no
W-183	1.48E-15	no
W-184	2.21E-22	no

TM-166	1.94E+10	yes
TM-167	8.30E+09	yes
TM-168	2.60E+08	yes
TM-170	1.29E+08	yes
TM-171	3.19E+07	yes
TM-172	2.29E+09	yes
TM-173	2.19E+09	yes
TM-174	1.13E+09	yes
TM-175	7.58E+08	yes
TM-176	2.81E+08	yes
TM-177	1.03E+08	yes
YB-158	5.21E+08	yes
YB-159	1.01E+09	yes
YB-160	1.91E+09	yes
YB-161	3.00E+09	yes
YB-162	5.34E+09	yes
YB-163	6.83E+09	yes
YB-164	1.00E+10	yes
YB-165	1.13E+10	yes
YB-166	1.14E+10	yes
YB-167	1.50E+10	yes
YB-169	1.58E+09	yes
YB-171M	9.74E+03	yes
YB-172M	3.75E-02	yes
YB-175	1.21E+09	yes
YB-175M	1.56E+08	yes
YB-176M	6.24E+07	yes
YB-177	5.08E+08	yes
YB-177M	1.34E+08	yes
YB-178	2.63E+08	yes
YB-179	9.81E+07	yes
YB-180	7.13E+07	yes
LU-161	6.38E+08	yes
LU-161M	4.28E+08	yes
LU-162	3.30E+08	yes
LU-162M	1.02E+09	yes
LU-163	2.09E+09	yes
LU-164	3.39E+09	yes
LU-165	5.02E+09	yes
LU-166	4.89E+09	yes
LU-166M	2.16E+09	yes
LU-167	8.60E+09	yes
LU-167M	8.29E+00	yes
LU-168	8.19E+09	yes
LU-168M	1.54E+09	yes
LU-169	1.03E+10	yes
LU-169M	3.17E+09	yes
LU-170	9.58E+09	yes
LU-170M	1.01E+09	yes

LU-171	4.56E+09	yes
LU-171M	6.15E+08	yes
LU-172	1.63E+09	yes
LU-172M	1.01E+09	yes
LU-173	8.14E+07	yes
LU-174	4.93E+06	yes
LU-174M	1.83E+07	yes
LU-176	1.35E-04	yes
LU-176M	8.69E+08	yes
LU-177	5.84E+08	yes
LU-177M	9.14E+05	yes
LU-178	6.24E+08	yes
LU-178M	2.50E+08	yes
LU-179	4.86E+08	yes
LU-179M	2.27E-01	yes
LU-180	2.05E+08	yes
LU-180M	1.25E-01	yes
LU-181	9.81E+07	yes
LU-182	4.01E+07	yes
HF-164	7.53E+08	no
HF-165	1.28E+09	no
HF-166	2.32E+09	no
HF-167	3.52E+09	no
HF-168	5.03E+09	no
HF-169	5.85E+09	no
HF-170	7.17E+09	no
HF-171	7.85E+09	no
HF-171M	2.20E+03	no
HF-172	5.60E+07	no
HF-173	9.20E+09	no
HF-174	5.59E-08	no
HF-175	5.08E+08	no
HF-180M	3.12E+07	no
HF-181	2.83E+07	no
HF-182	2.08E-01	no
HF-182M	3.12E+07	no
HF-183	1.38E+08	no
HF-184	6.24E+07	no
HF-185	2.23E+07	no
HF-186	8.92E+06	no
TA-167	1.03E+09	no
TA-168	1.65E+09	no
TA-169	2.52E+09	no
TA-170	3.44E+09	no
TA-171	4.37E+09	no
TA-172	5.54E+09	no
TA-173	6.53E+09	no
TA-174	7.17E+09	no
TA-175	7.51E+09	no

TA-176	7.37E+09	no
TA-177	6.50E+09	no
TA-178	1.88E+09	no
TA-178M	4.41E+08	no
TA-179	5.30E+07	no
TA-180	3.43E+08	no
TA-180M	1.30E-09	no
TA-182	1.19E+07	no
TA-182M	2.01E+08	no
TA-183	2.16E+08	no
TA-184	1.92E+08	no
TA-185	8.92E+07	no
TA-186	4.90E+07	no
TA-187	1.78E+07	no
W-169	6.92E+08	no
W-170	1.17E+09	no
W-171	1.76E+09	no
W-172	2.72E+09	no
W-173	3.53E+09	no
W-174	4.36E+09	no
W-175	5.10E+09	no
W-176	5.40E+09	no
W-177	6.23E+09	no
W-178	1.15E+09	no
W-179	6.67E+09	no
W-179M	3.88E+08	no
W-180	4.43E-11	no
W-180M	1.21E+03	no
W-181	1.89E+08	no
W-183	6.23E-11	no
W-184	1.39E-11	no
W-185	1.41E+07	no
W-185M	8.47E+07	no
W-186	3.44E-12	no
W-187	8.78E+07	no
W-188	2.06E+06	no
W-189	4.46E+06	no
W-190	2.23E+07	no
RE-173	1.31E+09	no
RE-174	2.13E+09	no
RE-175	2.92E+09	no
RE-176	3.33E+09	no
RE-177	4.28E+09	no
RE-178	4.97E+09	no
RE-179	5.48E+09	no
RE-180	5.96E+09	no
RE-181	6.03E+09	no
RE-182	4.01E+09	no
RE-182M	4.41E+08	no

RE-183	3.41E+08	no
RE-183M	8.92E+06	no
RE-184	2.65E+07	no
RE-184M	2.29E+06	no
RE-186	9.60E+07	no
RE-186M	2.67E+00	no
RE-187	6.81E-05	no
RE-188	7.73E+07	no
RE-188M	8.92E+06	no
RE-189	8.77E+07	no
RE-190	3.49E+07	no
RE-190M	1.78E+07	no
RE-191	1.78E+07	no
OS-175	1.03E+09	no
OS-176	1.52E+09	no
OS-177	2.23E+09	no
OS-178	3.15E+09	no
OS-179	3.77E+09	no
OS-180	4.57E+09	no
OS-181	4.19E+09	no
OS-181M	8.52E+08	no
OS-182	5.41E+09	no
OS-183	2.81E+09	no
OS-183M	3.99E+09	no
OS-184	1.37E-06	no
OS-185	2.67E+08	no
OS-186	3.65E-08	no
OS-189M	3.06E+08	no
OS-190M	4.46E+06	no
OS-191	1.64E+07	no
OS-191M	1.78E+07	no
OS-193	2.15E+07	no
OS-195	4.46E+06	no
OS-196	4.46E+06	no
OS-198	4.46E+06	no
IR-179	2.01E+09	no
IR-180	2.54E+09	no
IR-181	3.65E+09	no
IR-182	4.16E+09	no
IR-183	5.33E+09	no
IR-184	6.17E+09	no
IR-185	6.62E+09	no
IR-186	7.03E+09	no
IR-186M	3.17E+08	no
IR-187	8.89E+09	no
IR-187M	1.56E+08	no
IR-188	2.44E+09	no
IR-189	3.37E+09	no
IR-189M	1.12E+09	no

IR-190	2.90E+07	no
IR-190M	4.91E+07	no
IR-192	3.98E+06	no
IR-192M	3.12E+07	no
IR-193M	4.38E+06	no
IR-194	2.22E+07	no
IR-194M	4.02E-01	no
IR-195	8.92E+06	no
IR-195M	1.47E-02	no
IR-197	1.11E+04	no
IR-197M	4.46E+06	no
PT-182	2.44E+09	no
PT-183	1.72E+09	no
PT-183M	1.62E+09	no
PT-184	4.62E+09	no
PT-184M	1.60E+08	no
PT-185	4.74E+09	no
PT-185M	6.64E+08	no
PT-186	6.65E+09	no
PT-187	8.41E+09	no
PT-188	3.26E+09	no
PT-189	1.36E+10	no
PT-190	2.96E-04	no
PT-191	1.84E+10	no
PT-193	9.71E+06	no
PT-193M	1.92E+07	no
PT-195M	8.53E+06	no
PT-197	8.71E+06	no
PT-197M	4.45E+06	no
PT-199	1.70E-02	no
PT-200	4.41E-03	no
PT-201	1.24E-04	no
AU-186	4.50E+09	no
AU-187	6.71E+09	no
AU-188	8.67E+09	no
AU-189	1.21E+10	no
AU-189M	7.89E+08	no
AU-190	1.65E+10	no
AU-191	2.40E+10	no
AU-192	4.11E+10	no
AU-192M	2.90E+08	no
AU-193	5.43E+10	no
AU-194	2.33E+08	no
AU-194M	1.52E+08	no
AU-195	1.43E+09	no
AU-196	2.84E+07	no
AU-198	3.87E+07	no
AU-198M	2.32E+00	no
AU-199	6.55E+06	no

AU-199M	2.03E-02	no
AU-200	4.37E+02	no
AU-201	8.92E+06	no
AU-202	9.57E-02	no
HG-186	2.03E+09	yes
HG-186M	2.72E+08	yes
HG-187	2.62E+09	yes
HG-187M	1.29E+09	yes
HG-188	6.59E+09	yes
HG-189	1.02E+10	yes
HG-189M	1.02E+09	yes
HG-190	1.50E+10	yes
HG-191	2.21E+10	yes
HG-191M	8.43E+08	yes
HG-192	4.04E+10	yes
HG-193	5.34E+10	yes
HG-193M	7.58E+08	yes
HG-194	2.12E+06	yes
HG-195	7.25E+10	yes
HG-195M	1.86E+08	yes
HG-197	9.94E+10	yes
HG-197M	9.23E+07	yes
HG-199M	3.57E+07	yes
HG-201M	1.87E+01	yes
HG-203	3.81E+05	yes
HG-205	5.47E+02	yes
HG-205M	2.22E-02	yes
HG-206	8.95E+01	yes
HG-207	5.59E+02	yes
HG-208	1.58E+01	yes
TL-188	2.13E+09	yes
TL-188M	1.64E+09	yes
TL-189	5.43E+09	yes
TL-189M	2.67E+09	yes
TL-190	9.08E+09	yes
TL-190M	2.13E+09	yes
TL-191	1.52E+10	yes
TL-191M	4.67E+09	yes
TL-192	3.48E+10	yes
TL-192M	2.56E+09	yes
TL-193	5.05E+10	yes
TL-193M	5.36E+09	yes
TL-194	8.14E+10	yes
TL-194M	2.41E+08	yes
TL-195	7.17E+10	yes
TL-196	9.45E+10	yes
TL-196M	1.61E+09	yes
TL-197	1.28E+11	yes
TL-197M	1.31E+09	yes

TL-198	1.04E+11	yes
TL-198M	5.48E+08	yes
TL-199	1.93E+11	yes
TL-199M	2.54E+08	yes
TL-200	1.85E+11	yes
TL-200M	1.25E+08	yes
TL-201	1.35E+11	yes
TL-201M	6.69E+07	yes
TL-202	4.18E+07	yes
TL-204	5.36E+04	yes
TL-204M	9.40E-01	yes
TL-206	4.73E+05	yes
TL-206M	1.02E+01	yes
TL-207	6.71E+11	yes
TL-208	1.76E+11	yes
TL-209	4.44E+09	yes
TL-210	1.19E+06	yes
PB-190	5.04E+09	yes
PB-191	8.20E+09	yes
PB-191M	2.35E+09	yes
PB-192	2.95E+10	yes
PB-193	3.33E+10	yes
PB-193M	6.90E+09	yes
PB-194	7.49E+10	yes
PB-195	6.05E+10	yes
PB-195M	5.25E+09	yes
PB-196	9.20E+10	yes
PB-197	1.21E+11	yes
PB-197M	4.62E+09	yes
PB-198	1.02E+11	yes
PB-199	1.92E+11	yes
PB-199M	2.32E+09	yes
PB-200	1.99E+11	yes
PB-201	1.93E+11	yes
PB-201M	6.69E+08	yes
PB-202	7.59E+04	yes
PB-202M	1.25E+08	yes
PB-203	2.72E+11	yes
PB-204M	5.35E+10	yes
PB-205	4.85E+01	yes
PB-205M	1.73E+10	yes
PB-207M	2.96E+08	yes
PB-209	1.04E+12	yes
PB-210	4.57E+08	yes
PB-211	9.24E+10	yes
PB-212	3.88E+11	yes
PB-213	1.85E+09	yes
PB-214	3.99E+09	yes
PB-215	4.46E+07	yes

BI-193	7.90E+09	yes
BI-194	1.55E+10	yes
BI-194M	4.97E+09	yes
BI-195	3.63E+10	yes
BI-195M	3.53E+09	yes
BI-196	4.91E+10	yes
BI-196M	6.58E+09	yes
BI-197	1.07E+11	yes
BI-197M	5.12E+09	yes
BI-198	7.93E+10	yes
BI-198M	1.17E+10	yes
BI-199	1.81E+11	yes
BI-199M	3.88E+09	yes
BI-200	1.83E+11	yes
BI-200M	1.02E+10	yes
BI-201	1.87E+11	yes
BI-201M	2.80E+09	yes
BI-202	3.49E+11	yes
BI-203	3.35E+11	yes
BI-203M	7.12E+10	yes
BI-204	5.77E+11	yes
BI-204M	4.15E+08	yes
BI-205	1.27E+11	yes
BI-206	1.08E+11	yes
BI-206M	1.95E+01	yes
BI-207	3.35E+08	yes
BI-207M	4.46E+07	yes
BI-208	2.19E+04	yes
BI-208M	3.51E+05	yes
BI-210	3.53E+11	yes
BI-210M	6.69E-02	yes
BI-211	6.73E+11	yes
BI-212	4.89E+11	yes
BI-212M	3.00E+08	yes
BI-213	2.13E+11	yes
BI-214	5.64E+09	yes
BI-215	1.33E+09	yes
BI-216	7.49E+07	yes
PO-198	6.02E+10	yes
PO-199	7.47E+10	yes
PO-199M	1.92E+10	yes
PO-200	1.76E+11	yes
PO-201	1.17E+11	yes
PO-201M	2.16E+10	yes
PO-202	3.38E+11	yes
PO-203	2.67E+11	yes
PO-204	5.72E+11	yes
PO-205	5.05E+11	yes
PO-205M	3.52E+05	yes

PO-206	3.96E+11	yes
PO-207	7.50E+11	yes
PO-208	4.40E+09	yes
PO-209	1.54E+08	yes
PO-210	3.75E+10	yes
PO-211	1.28E+12	yes
PO-218	3.98E+09	yes
PO-221	4.01E+07	yes
AT-201	8.61E+10	yes
AT-202	1.26E+11	yes
AT-202M	2.07E+10	yes
AT-203	2.19E+11	yes
AT-204	2.72E+11	yes
AT-204M	1.13E+10	yes
AT-205	4.50E+11	yes
AT-206	3.73E+11	yes
AT-207	6.67E+11	yes
AT-208	3.96E+11	yes
AT-209	9.02E+11	yes
AT-210	4.31E+11	yes
AT-211	8.04E+11	yes
AT-220	7.13E+08	yes
AT-221	5.75E+08	yes
RN-204	1.21E+11	yes
RN-205	1.80E+11	yes
RN-206	2.67E+11	yes
RN-207	3.41E+11	yes
RN-207M	3.28E+10	yes
RN-208	4.38E+11	yes
RN-209	4.32E+11	yes
RN-210	7.04E+11	yes
RN-211	4.94E+11	yes
RN-212	7.30E+11	yes
RN-221	7.53E+09	yes
RN-222	3.86E+09	yes
RN-223	3.65E+09	yes
RN-224	3.23E+09	yes
RN-225	1.70E+09	yes
RN-226	1.19E+09	yes
RN-228	5.04E+08	yes
FR-210	3.20E+11	yes
FR-211	4.16E+11	yes
FR-212	4.24E+11	yes
FR-221	2.09E+11	yes
FR-222	3.36E+10	yes
FR-223	3.18E+10	yes
FR-224	2.46E+10	yes
FR-225	1.88E+10	yes
FR-227	9.61E+09	yes

RA-223	7.80E+10	yes
RA-224	4.03E+11	yes
RA-225	3.03E+10	yes
RA-226	1.08E+06	yes
RA-227	7.16E+10	yes
RA-228	1.21E+08	yes
RA-229	3.96E+10	yes
RA-230	3.26E+10	yes
RA-231	1.84E+10	yes
RA-232	1.37E+10	yes
AC-222M	1.03E+11	unlikely
AC-223	4.95E+11	unlikely
AC-224	4.68E+11	unlikely
AC-225	1.50E+11	unlikely
AC-226	3.47E+11	unlikely
AC-227	2.12E+08	unlikely
AC-228	2.77E+11	unlikely
AC-229	2.94E+11	unlikely
AC-230	2.39E+11	unlikely
AC-231	1.97E+11	unlikely
AC-232	1.31E+11	unlikely
AC-233	9.74E+10	unlikely
AC-234	5.37E+10	unlikely
TH-225	5.67E+11	no
TH-226	6.87E+11	no
TH-227	1.16E+11	no
TH-228	6.89E+09	no
TH-229	2.10E+06	no
TH-230	1.89E+05	no
TH-231	1.03E+12	no
TH-232	8.64E-01	no
TH-233	8.03E+11	no
TH-234	1.21E+11	no
TH-235	4.75E+11	no
TH-236	3.95E+11	no
TH-237	5.27E+10	no
PA-226	4.39E+10	no
PA-227	8.65E+10	no
PA-228	2.82E+11	no
PA-229	3.83E+11	no
PA-230	1.90E+11	no
PA-231	7.23E+05	no
PA-232	1.81E+12	no
PA-233	4.70E+11	no
PA-234	2.97E+12	no
PA-234M	3.09E+11	no
PA-235	4.56E+12	no
PA-236	5.06E+12	no
PA-237	9.75E+12	no

PA-238	8.89E+11	no
U-227	1.03E+09	no
U-228	3.57E+09	no
U-229	2.26E+10	no
U-230	1.19E+10	no
U-231	1.61E+11	no
U-232	3.22E+08	no
U-233	1.51E+05	no
U-234	3.22E+05	no
U-235	1.91E+02	no
U-235M	1.01E+13	no
U-236	8.93E+03	no
U-237	2.21E+13	no
U-238	3.05E+07	no
U-239	1.97E+13	no
U-240	4.55E+08	no
U-241	2.23E+02	no
NP-228	1.34E+07	no
NP-229	2.23E+07	no
NP-230	4.41E+08	no
NP-231	1.17E+09	no
NP-232	1.18E+10	no
NP-233	3.41E+10	no
NP-234	1.05E+11	no
NP-235	4.14E+09	no
NP-236	6.15E+04	no
NP-236M	2.02E+11	no
NP-237	6.97E+04	no
NP-238	4.95E+11	no
NP-239	1.63E+13	no
NP-240	1.45E+09	no
NP-240M	8.47E+07	no
NP-241	8.02E+07	no