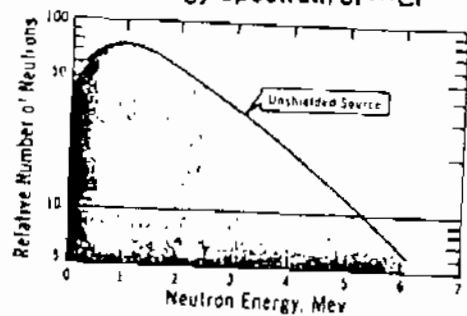


NOMINAL VALUES FOR NUCLEAR PROPERTIES OF ^{252}Cf

Effective half-life	2.646 years
Alpha decay half-life	2.731 years
Spontaneous fission half-life	85.5 years
Average neutron energy	2.35 MeV
Average alpha particle energy	6.12 MeV
Gamma emission rate	1.3×10^{13} photons per sec per gram
Decay heat (51.1% from fission, 48.9% from alpha decay)	38.5 watts per gram
Neutrons per spontaneous fission	3.76 neutrons
Neutron emission rate	4.31×10^9 neutrons per sec per curie 2.311×10^{12} neutrons per sec per gram
Specific Activity	536 curies per gram 1866 μgrams per curie

Neutron Energy Spectrum of ^{252}Cf



Gamma Energy Spectrum of ^{252}Cf

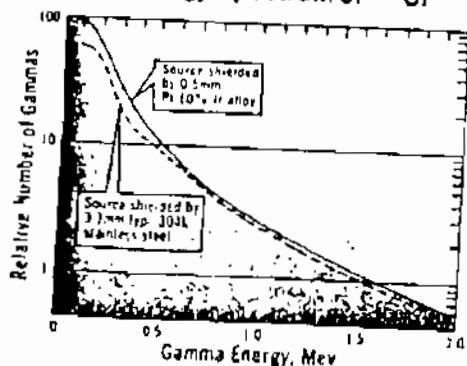


Table 3.5

Typical Analysis - Cf

Isotope	Atom %
249	4
250	11
251	2
252	82.5
253	0.5
254	<0.025



U.S. Department
of Transportation
Pipeline and
Hazardous Materials
Safety Administration

IAEA CERTIFICATE OF COMPETENT AUTHORITY
SPECIAL FORM RADIOACTIVE MATERIALS
CERTIFICATE USA/0367/S-96, REVISION 7

400 Seventh Street, S.W.
Washington, D.C. 20590

This certifies that the sources described have been demonstrated to meet the regulatory requirements for special form radioactive material as prescribed in the regulations of the International Atomic Energy Agency¹ and the United States of America² for the transport of radioactive material.

1. Source Identification - Frontier Technology Corporation Model 10 Series and Model 100 Series.
2. Source Description - The Model 10 Series source capsules are cylindrical single encapsulations made of Type 304L stainless steel or Zircalloy-2 and tungsten inert gas fusion welded. Approximate outer dimensions are 5.5 mm (0.22 in.) in diameter and either 11.9 mm (0.47 in.) or 24.6 mm (0.97 in.) in length. The Model 100 Series source capsules are cylindrical double encapsulations made of Type 304L stainless steel or Zircalloy-2 and tungsten inert gas fusion welded. The inner capsule is a Model 10 Series source capsule. Approximate outer dimensions are either 7.7 mm (0.3 in.) or 9.4 mm (0.37 in.) in diameter and either 19.6 mm (0.77 in.) or 32.5 mm (1.28 in.) in length. The overall length may be extended by attachment devices. Construction shall be in accordance with attached drawings entitled FTC Model 10 Series Standard Neutron Source or FTC Model 100 Series Standard Neutron Source.
3. Radioactive Contents - No more than 192.0 GBq (5.2 Ci) of Californium-252. The Cf-252 is in the form of a Cf-Pd cermet or Cf-Pd alloy.
4. Quality Assurance - Records of Quality Assurance activities required by Paragraph 310 of the IAEA regulations¹ shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Signors and consignees in the United States exporting or importing shipments under this certificate shall satisfy the requirements of Subpart H of 10 CFR 71.
5. Expiration Date - This certificate expires on January 31, 2011.

This certificate is issued in accordance with paragraph 804 of the IAEA Regulations and Section 173.476 of Title 49 of the Code of Federal Regulations, in response to the October 03, 2005 petition by Frontier Technology Corporation, Xenia, OH and in consideration of other information on file in this Office.

Certified By:

Robert A. McGuire
Associate Administrator for Hazardous Materials Safety

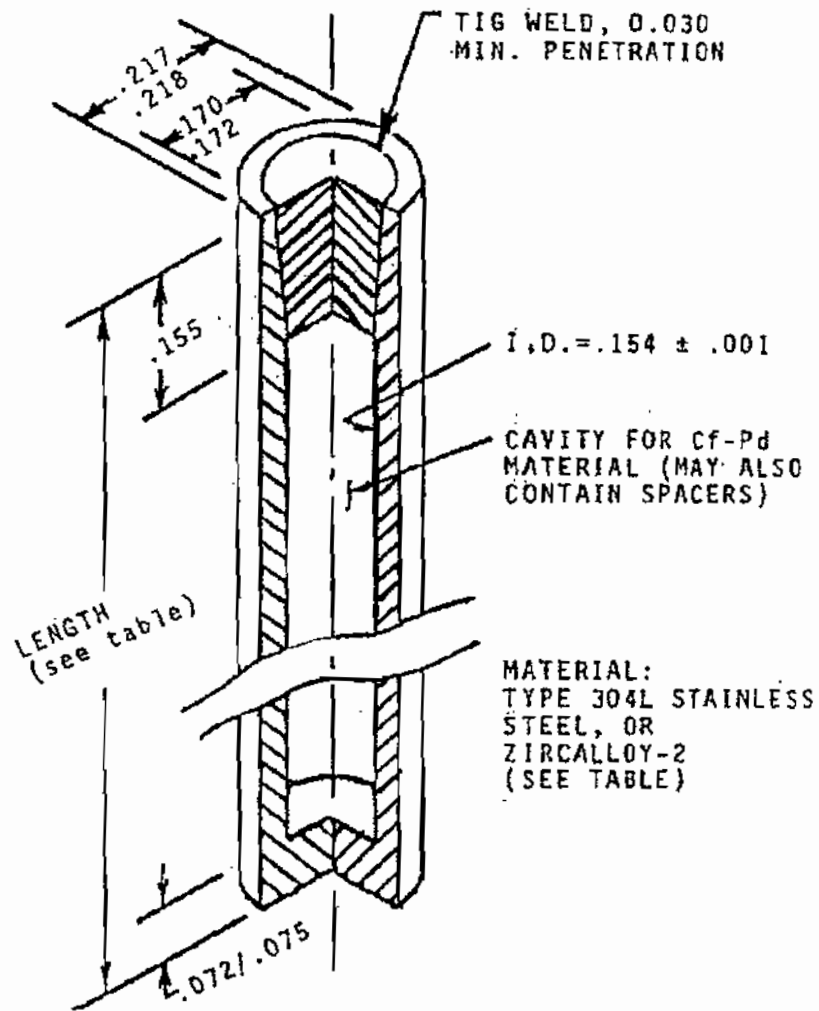
Jan 18 2006
(DATE)

¹ "Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised), No. TS-R-1 (ST-1, Revised)," published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

² Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

Revision 7 - Issued to add new outer dimension for Model 100 Series and update drawings.

FTC MODEL 10 SERIES - Standard Neutron Source

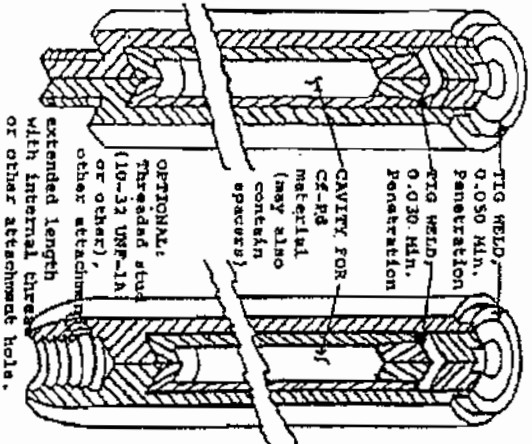


DIMENSIONS IN INCHES
(FOR REFERENCE)

MODEL DESCRIPTION CHART

MODEL	LENGTH(inches)	MATERIAL	Cf LIMIT
10	0.970/0.980	304L Stainless Steel	10 mg.
10S	0.465/0.475	304L Stainless Steel	4 mg.
Z10	0.970/0.980	Zircalloy-2	10 mg.
Z10S	0.465/0.475	Zircalloy-2	4 mg.

PTC Model 100-Series
Standard Neutron Source
MODEL DESCRIPTION CHART



LABELING: Each source is marked on the outside surface with the letters "PTC" to denote the manufacturer, "CF" to denote the contents as CF-251, and a unique serial number. The letter "Z" precedes the serial number when either or both capsules are zirconium-2.

Model	Inner capsule	Outer capsule	Threaded stud	CF Limit
100 & 100R	304L Stainless	304L Stainless	Yes	10 mg
2100 & 2100R	Zircalloy-2	Zircalloy-2	Yes	10 mg
100S & 100SR	304L Stainless	304L Stainless	Yes	4 mg
2100 & 2100R	Zircalloy-2	Zircalloy-2	Yes	4 mg
25100 & 25100R	Zircalloy-2	304L Stainless	Yes	10 mg
25100S & 25100SR	304L Stainless	Zircalloy-2	Yes	10 mg
2100S & 2100SR	304L Stainless	Zircalloy-2	Yes	4 mg
100NS & 100NSR	Stainless	304L Stainless	No	10 mg
2100NS & 2100NSR	Zircalloy-2	Zircalloy-2	No	10 mg
100SN & 100SNR	304L Stainless	304L Stainless	No	4 mg
2100SN & 2100SNR	Zircalloy-2	Zircalloy-2	No	4 mg
25100SN & 25100SNR	Zircalloy-2	304L Stainless	No	4 mg
25100SN & 25100SNR	304L Stainless	Zircalloy-2	No	4 mg
Any above with "ML" in suffix	As for model designation without "ML"	Special stud or attachment	Extended length with or without attachment hole	As w/o "ML"
Any above with "MX" in suffix	As for model designation without "MX"	Special stud or attachment	Extended length with or without attachment hole	As w/o "MX"
100ST & 100STR	304L Stainless	304L Stainless	No	4 mg

"ST" and "STR" indicate stainless steel short versions with thin wall with a 7.7 to 7.8 mm (0.303 to 0.307") outside diameter. All others have 0.370 to 0.371" outside diameter.