East Building, PHH-23
1200 New Jersey Ave, SE
Washington, D.C. 20590

U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

IAEA CERTIFICATE OF COMPETENT AUTHORITY
SPECIAL FORM RADIOACTIVE MATERIALS

CERTIFICATE USA/0852/S, REVISION 0

This certifies that the source described has been demonstrated to meet the regulatory requirements for special form radioactive material as prescribed in the regulations of the International Atomic Energy Agency[1] and the United States of America[2] for the transport of radioactive material.

1. Source Identification - Isotek-SFC-W-2.

2. Source Description - The Model Isotek-SFC-W-2 special form source capsule is a cylindrical single encapsulation, fabricated from 304/304L stainless steel and inert-gas seal-welded. The assembled and closed capsule has outer dimensions of 74.93 mm (2.95 in.) in diameter and 298.45 mm (11.75 in.) in length. The internal void has approximate dimensions of 52.33 mm (2.06 in.) in diameter and 254.26 mm (10.01 in.) in length. The approximate maximum weight with contents is 6.81 kg (15 lbs). Construction shall be in accordance with attached Isotek Drawing THO-60028-M, Revision 2.

3. Radioactive Contents - The radioactive contents will be dry solid thorium tetrachloride hydrate. The maximum net mass of the radioactive material is 5 grams. The 5 gram maximum will be comprised of up to 3 grams (2.37E-2 TBq) of Th-229, up to 16.7 milligrams (0.5 TBq) of Th-228, with the remainder consisting of Th-230, Th-232, and a variety of isotopes that may be present in small quantities. The radioactive contents are not to exceed the above total mass limits or the individual isotopic maximum mass and activities as follows:

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[1] "Regulations for the Safe Transport of Radioactive Material, 2018 Edition, No. SSR-6 (Rev. 1)" published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

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

Isotope	Maximum Mass [g]	Maximum Activity [Ci]	Maximum Activity [TBq]
Th-228	1.67E-02	1.35E+01	5.00E-01
Th-229	3.0	6.41E-01	2.37E-02
Th-230	3.00E-02	6.16E-04	2.28E-05
Th-232	5.0	5.41E-07	2.00E-08
U-232	5.00E-05	1.12E-03	4.15E-05
U-233	5.00E-03	4.86E-05	1.80E-06
U-234	5.00E-05	3.11E-07	1.15E-08
U-235	5.00E-06	1.08E-11	4.00E-13
U-236	5.00E-06	3.24E-10	1.20E-11
U-238	5.00E-04	1.62E-10	6.00E-12
Am-241	5.00E-06	1.76E-05	6.50E-07
Np-237	2.50E-02	1.76E-05	6.50E-07
Pu-238	5.00E-06	8.51E-05	3.15E-06
Pu-239	5.00E-05	3.11E-06	1.15E-07
Pu-240	5.00E-06	1.14E-06	4.20E-08
Pu-241	5.00E-06	5.14E-04	1.90E-05
Pu-242	5.00E-06	2.03E-08	7.50E-10
Cm-246	5.00E-03	1.49E-03	5.50E-05
Ra-224	8.47E-05	1.35E+01	5.00E-01
Ra-225	1.58E-05	6.41E-01	2.37E-02
Ra-226	6.16E-04	6.16E-04	2.28E-05
Ra-228	2.00E-09	5.41E-07	2.00E-08
Ac-225	1.13E-05	6.41E-01	2.37E-02
Pa-233	8.44E-10	1.76E-05	6.50E-07

4. Management System Activities - Records of Management System activities required by Paragraph 306 of the IAEA regulations shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the requirements of Subpart H of 10 CFR 71.

CERTIFICATE USA/0852/S, REVISION 0

5. Expiration Date - This certificate expires on July 31, 2029. Previous editions which have not reached their expiration date may continue to be used.

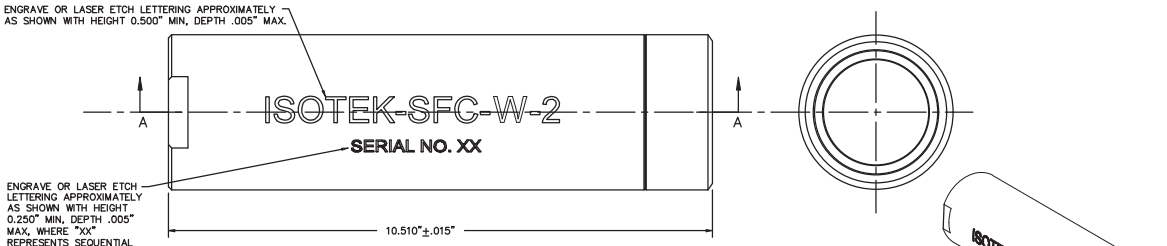
This certificate is issued in accordance with paragraph(s) 804 of the IAEA Regulations and Section 173.476 of Title 49 of the Code of Federal Regulations, in response to the May 20, 2024 petition by Terrapower Isotopes, Bellevue, WA, and in consideration of other information on file in this Office.

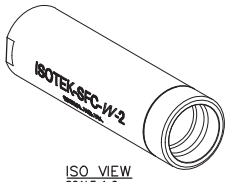
Certified By:

William Schoonover
Associate Administrator for Hazardous Materials Safety

July 18, 2024
(DATE)

Revision 0 – Original Issue.





ISO VIEW
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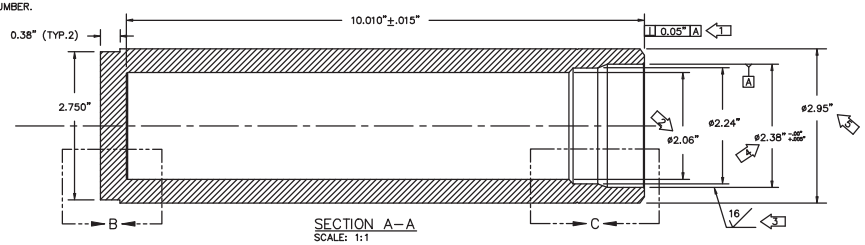
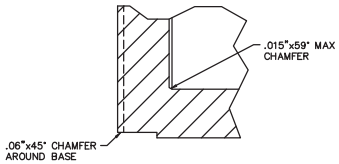


SECTION A–A
SCALE: 1:1



DETAIL B
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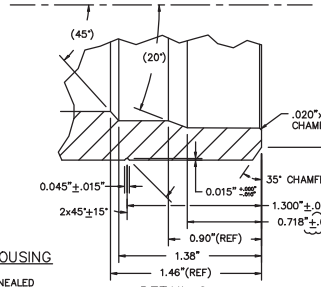
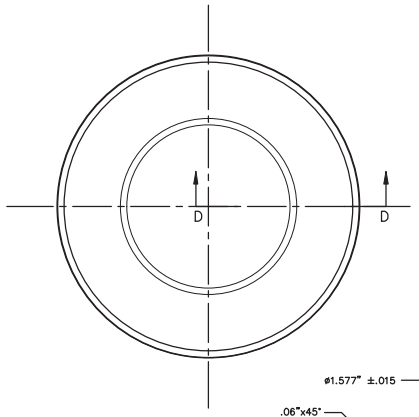
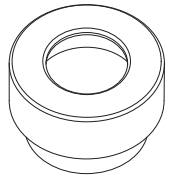


DETAIL C
SCALE: 2:1

ISOTEK–SFC–W–2 HOUSING
SCALE: 1:1
MATERIAL: SST 304/304L, ANNEALED

NOTES (CONTINUED):
6. NO VOIDS OR CRACKS IN THE HOUSING AND CAP MATERIALS OF CONSTRUCTION.
7. ⇨ INDICATES INSPECTION DIMENSION.
8. FIELD WELD TO BE COMPLETED IN ACCORDANCE WITH AWS STANDARD W.P.S. B2.1–8–212–01. A CWI TO VISUALLY INSPECT WELD IN ACCORDANCE WITH HICKS & INGLE PROCEDURE HI–VT–1.





ISO VIEW
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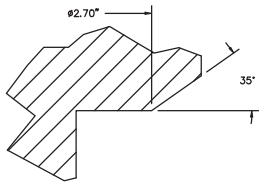

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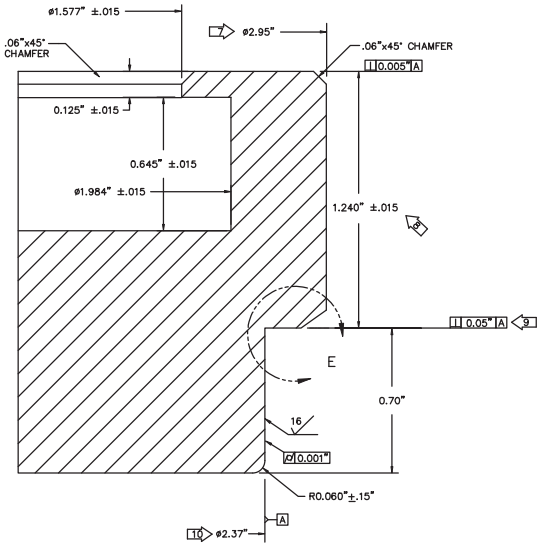
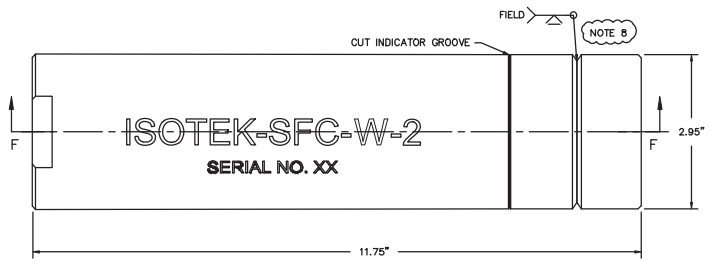
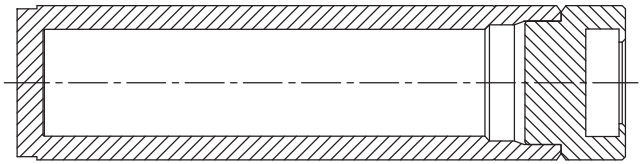
SCALE: 8:1



SECTION D–D
SCALE: 4:1

ISOTEK–SFC–W–2 CAP
SCALE: 2:1
MATERIAL: SST 304/304L, ANNEALED





SECTION F–F
SCALE: 1:1

ISOTEK–SFC–W–2 ASSEMBLY
SCALE: 1:1

NOTES:
1. UNITS ARE ENGLISH UNLESS OTHERWISE SPECIFIED.
2. ALL PARTS MUST BE DIMENSIONALLY INSPECTED PRIOR TO USE. PARTS THAT DO NOT MEET DRAWING REQUIREMENTS MUST NOT BE USED.
3. CAPSULE CONTENTS MUST BE PLACED INSIDE THE HOUSING PRIOR TO WELDING THE CAP INTO ITS FINAL POSITION.
4. CAPSULE CONTENTS SHOULD NOT EXTEND ABOVE THE MAX FILL LINE.
5. TO OPEN THE SEALED CAPSULE, CUT THROUGH THE CUT INDICATOR GROOVE WITH THE CAPSULE ORIENTED AS SHOWN.

TOLERANCES UNLESS OTHERWISE NOTED
XX DECIMALS ± 0.01
XXX DECIMALS ± 0.001
ANGLES ± 0.5°
BREAK SHARP EDGES 0.03 MAX.
FINISH = 3.2 RMS

REVISION NUMBER	DATE	DESCRIPTION	PREPARER	CHECKER	REVIEWER	OTHER	ENGINEER SUPERVISOR
2	04/15/24	REVISED AS NOTED	VMS 04/15/24	DAR 04/15/24	JAK 04/15/24	N/A	JER 04/15/24
1	05/11/22	REVISED AS NOTED	VMS 05/11/22	RSO 05/11/22	JAK 05/16/22	N/A	JER 05/16/22

ALL DIMENSIONS ARE INCHES UNLESS OTHERWISE STATED	COMPUTER GENERATED FILE, MANUAL CHANGES NOT PERMITTED
REFERENCE DWG	DWG NO

U.S. DEPARTMENT OF ENERGY
OAK RIDGE OFFICE OF ENVIRONMENTAL MANAGEMENT

ISOTEK SYSTEMS

DOE CONTRACT NO.
DE-AC05-04OR22860

PROJECT NAME
U-233 DISPOSITION PROJECT

TITLE
BLDG. 2026 - SPECIAL FORM CAPSULE
ISOTEK-SFC-W-2 COMPONENTS AND ASSEMBLY

DRAWING NUMBER
THO-60028-M

REV
2

CAD FILE THO-60028-M_R2.DWG | SCALE AS NOTED | SHEET 1 OF 1

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1200 New Jersey Ave, SE
Washington, D.C. 20590

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ORIGINAL REGISTRANT(S):

Terrapower Isotopes
15800 Northup Way
Bellevue, WA, 98008
USA