



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

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

**COMPETENT AUTHORITY CERTIFICATION  
FOR A SPECIAL ARRANGEMENT SHIPMENT OF A TYPE B  
RADIOACTIVE MATERIALS PACKAGE DESIGN  
CERTIFICATE USA/0734/X, REVISION 0**

This certifies that the radioactive materials package design described below has been certified by the Competent Authority of the United States as meeting the regulatory requirements for Special Arrangement transportation of packaging for radioactive materials as prescribed in the regulations of the International Atomic Energy Agency<sup>1</sup> and the United States of America<sup>2</sup>.

1. Package Identification - MDS Nordion Gammabeam 650 Irradiator, Serial Number 17R.
2. Packaging Description - The Gammabeam 650 irradiator consists of a lead-shielded, steel-encased body, further contained within a sheet metal cabinet which is completely wrapped in thermal insulation. The unit is contained in a plywood shipping crate with overall dimensions 1423 mm high by 991 mm wide by 1372 mm long, and the gross weight is approximately 5443 kg. Package is shown in Nordion Drawing No. DS-0287, Rev. D (attached).

Special arrangement is required because the package design has not been demonstrated to meet all the Type B(U) package requirements.

3. Authorized Radioactive Contents - The irradiator may contain up to 272 TBq (7350 Ci) of cobalt-60 encapsulated within 24 MDS Nordion C-252 Capsule Assemblies (MDS Nordion Drawing No. C-252, no revision number, attached), each loaded with cylindrical nickel plated solid metal cobalt-60 pellets contained in an inner C-133 single seal capsule (MDS Nordion Drawing No. C-133, Rev. H, attached).
4. General Conditions -
  - a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation
  - b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Hazardous Materials Technology, (PHH-23), Pipeline and Hazardous Materials Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.
  - c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

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<sup>1</sup> "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.

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

**CERTIFICATE USA/0734/X, REVISION 0**

5. Special Conditions -

- a. The unit shall be prepared for shipment under the direction of MDS Nordion personnel in accordance with MDS Nordion specification IN/PP 0772 GB650 (Revision 5), "Preparation for Shipment of the Gammabeam-650 Irradiator".
- b. Transport shall be by exclusive use road vehicle.
- c. To the maximum extent possible, transport shall be on interstate highways and during periods of low road usage.
- d. Written notification of the shipment shall be provided to affected state radiation control officials, and to the U. S. Competent Authority, Washington, DC [telephone 202-366-4498, facsimile (202)366-3753], not less than four business days prior to the departure of the shipment.
- e. The advance notification to the U. S. Competent Authority shall include verification of the routing and estimated times for departure from point of origin, arrival and departure from the U. S./Canada border, arrival at the destination, and any road vehicle stop longer than 2 hours, as well as the information required by paragraph 559 of the IAEA regulations<sup>1</sup>.
- f. The U. S. Competent Authority shall be notified within 24 hours of any incidents.
- g. The package shall be adequately braced so as to prevent movement during normal conditions of transport. For heat fluxes exceeding 15 W/m<sup>2</sup> supplementary arrangements shall be made with the carrier to assure adequate heat dissipation.
- h. The shipment shall be escorted by a radiological control technician in a separate vehicle. Only personnel involved in the shipment shall be in the transport conveyance and the escort vehicle.
- i. The transport driver and escort radiological control technician shall be provided with mobile communication devices for communicating with each other. The radiological control technician shall be provided with radiation survey instruments, supplies to establish an emergency exclusion area, and written guidance to be followed in an emergency situation.

6. Marking and Labeling - The package shall bear the marking USA/0734/X, in addition to other required markings and labeling.

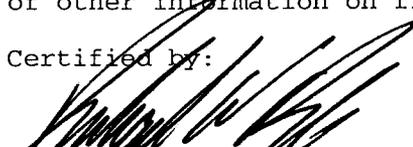
7. Expiration Date - This certificate expires on March 31, 2007.

**CERTIFICATE USA/0734/X, REVISION 0**

This certificate is issued in accordance with paragraph 825 of the IAEA Regulations, in response to the petition and information dated March 24, 2006 submitted by MDS Nordion, Inc., Kanata, Ontario, Canada, and in consideration of other information on file in this Office.

Certified by:

**SEP 29 2006**

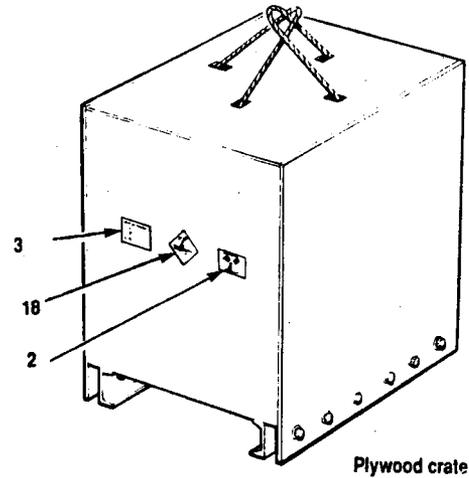
  
\_\_\_\_\_  
Robert A. McGuire  
Associate Administrator for Hazardous Materials Safety

\_\_\_\_\_  
(DATE)

Revision 0 - Issued to authorize a one-time shipment by highway from Tyco Electronics, Menlo Park, CA to MDS Nordion, Ottawa, Ontario, Canada.

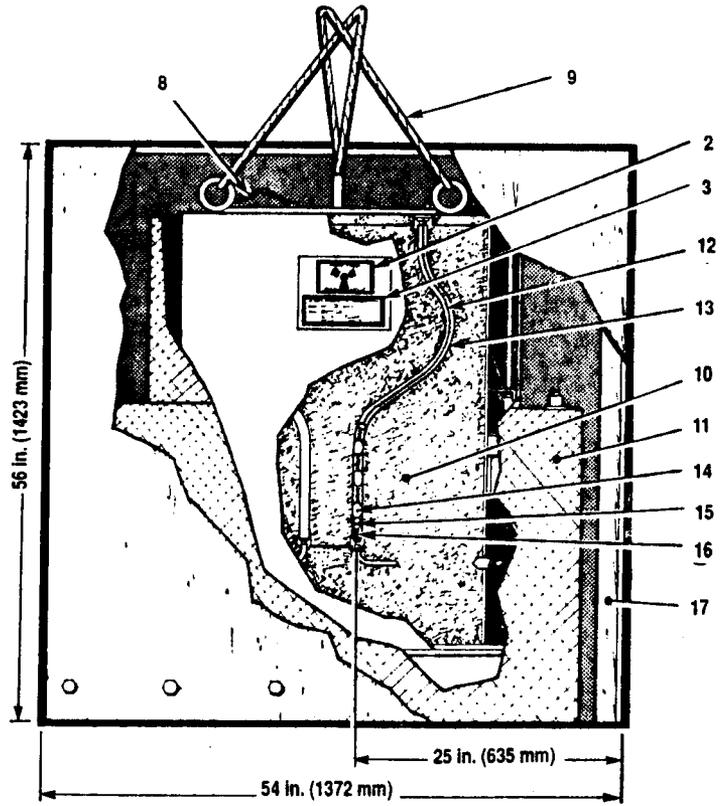
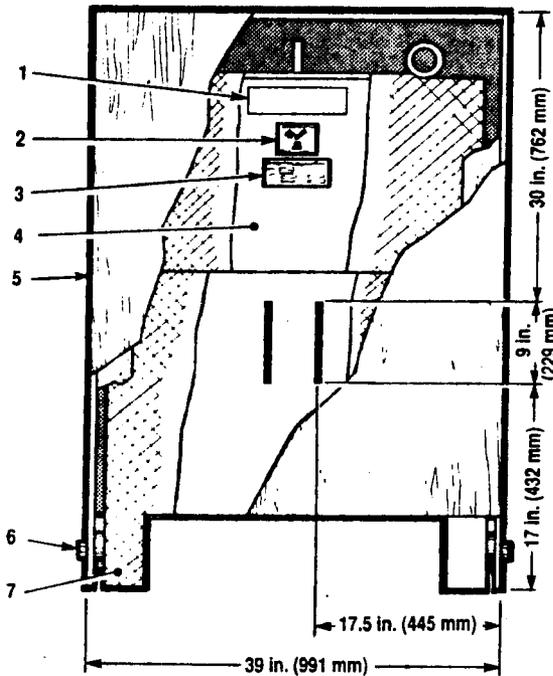
**Parts List**

1. Nameplate
2. "Caution Radioactive" Plate (2)
3. Identification Plate (2)
4. Sheet Metal Cabinet
5. Plywood Crate
6. 3/8 in - 8 UNC HEX Head Bolts (6)
7. Skid
8. Shipping Plate - Gasket - Secured by 3/8 in. - 16 UNC Socket Head Bolts (6)  
Torqued to 48 ft lb (6.6 m kg) Wire Seal Through Two Bolt Heads
9. Wire Rope Lifting Sling
10. Steel Encased Lead Shielding - 11.25 in. (286 mm)
11. Thermal Protection: 0.5 in. (12.7 mm) Kaowool, polyethylene (4 mil), steel wire mesh, steel packing straps
12. Cable Stop Assembly
13. Source Tube Assembly (12 Tubes in Circle)
14. Source Capsule
15. Pusher
16. Spring
17. 2 x 4 Wooden Support
18. Radioactive (Category I or II or III Label) (2)



**Notes**

1. Conforms to I.A.E.A. Type B(U) Transport Regulations S.S. 6 1973 Edition (as amended)
2. AECB Certification CDN/2014/B(U)
3. Capacity - 50,000 Ci (1850 TBq) <sup>60</sup>Co
4. Gross Weight - 12,000 lbs (5,443 kg)
5. Projected Floor Loading - 821 lb/sq ft (4008 kg/sq m)

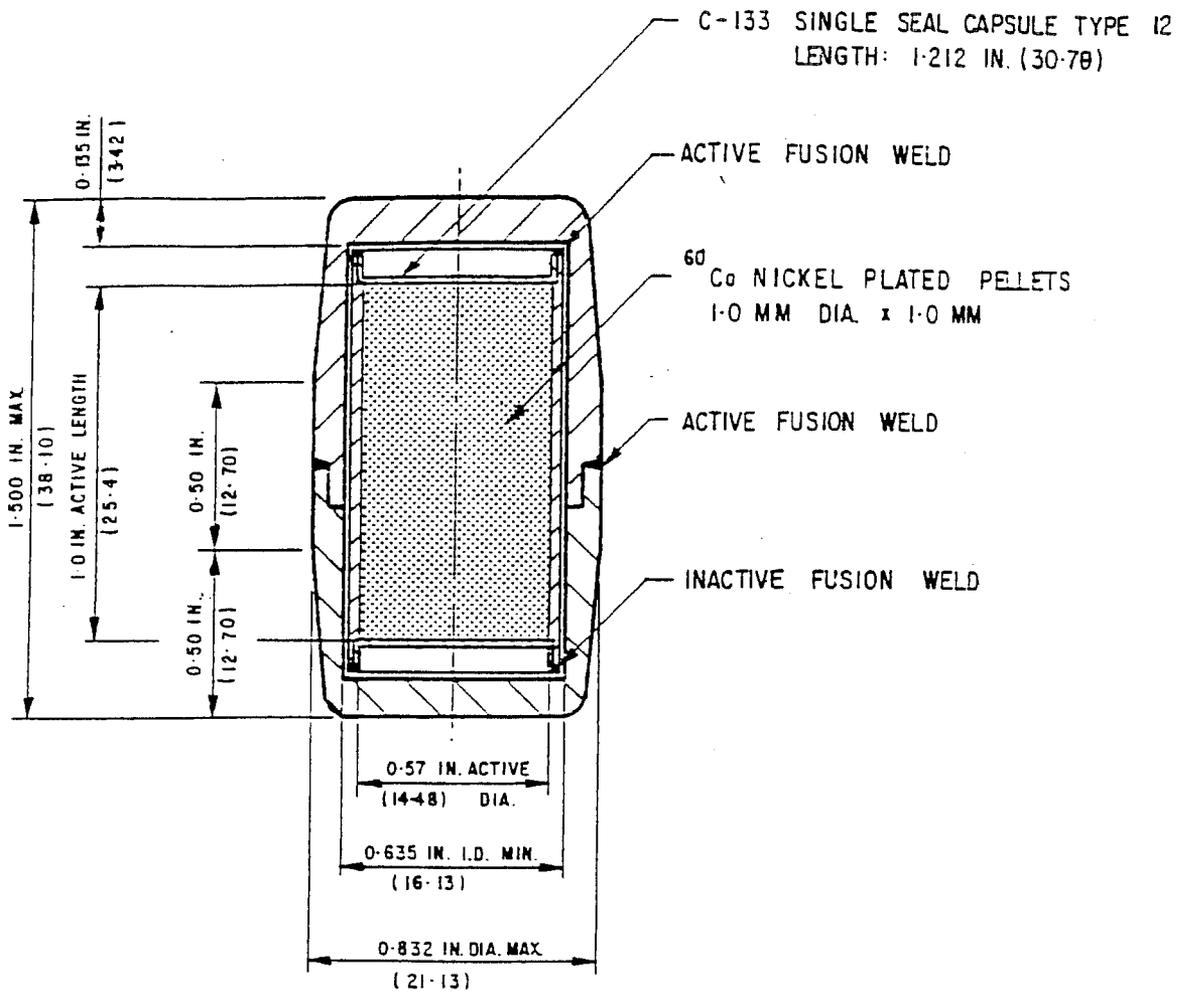


447 March Road, P.O. Box 13500  
 Kanata, Ontario, Canada, K2K 1X8  
 Tel: (613) 592-2790 • Fax: (613) 592-6937 • Telex: 053-4162

TITLE				Gammabeam 650 Live Sourcehead Crating for Shipment	
REF. DWG. A03410		REVISED August 1990			
DATE		No.		REV.	
DRAWN		CHECKED		APPROVED	
K.B		H. Murphy			
SHEET				1 of 1	

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FEB 10 1995



**NOTES -**

1. BRACKETED DIMENSIONS REPRESENT MILLIMETRES.
2. CAPSULE MATERIAL - 316L STAINLESS STEEL.
3. ENGRAVED ON CAPSULE BODY - C 252 & SERIAL NO.
4. DIMENSION SHOWN ARE AT 68°F (20°C).

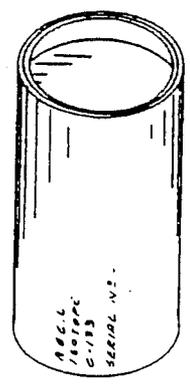
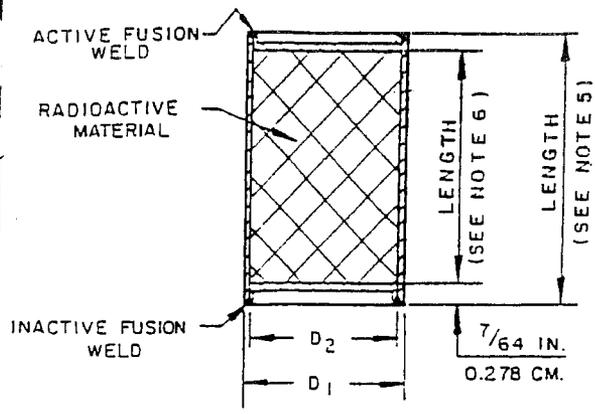
**MDS Nordion**

447 March Road, P.O. Box 13500  
 Kanata, Ontario, Canada, K2K 1X8  
 Tel: (613) 592-2790 · Fax: (613) 592-6937

TITLE  
**G.B. 650 PNEUMATIC  
 CAPSULE ASSEMBLY**

REF. DWG.	A10031	REVISED	
DATE	MAY 11, 1970	No.	C-252
DRAWN	CHECKED	APPROVED	REV.
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
SHEET 1		OF 1	

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(VARIABLE LENGTH)

TYPE	STANDARD SIZES			
	D1		D2	
	OUTSIDE DIAMETER	RADIOACTIVE MTL DIA.	IN.	CM.
1	0.180	0.457	0.130	0.330
2	0.215	0.546	0.165	0.419
3	0.250	0.635	0.200	0.508
4	0.280	0.711	0.230	0.584
5	0.315	0.800	0.265	0.673
6	0.350	0.889	0.300	0.762
7	0.380	0.966	0.330	0.838
8	0.420	1.067	0.370	0.940
9	0.445	1.130	0.395	1.003
10	0.515	1.308	0.465	1.181
11	0.550	1.397	0.500	1.270
12	0.620	1.575	0.570	1.448
13	0.650	1.651	0.600	1.524
14	0.720	1.829	0.670	1.702
15	0.850	2.159	0.800	2.032
16	0.920	2.337	0.870	2.210
17	1.034	2.626	0.984	2.500
18	1.104	2.804	1.054	2.677
19	1.154	2.931	1.104	2.804
20	1.224	3.109	1.174	2.982
21	1.294	3.287	1.224	3.109
22	0.332	0.843	0.282	0.716
23	0.430	1.092	0.380	0.965
24	0.437	1.110	0.387	0.983
25	0.529	1.344	0.479	1.217
26	0.627	1.593	0.577	1.466
27	0.790	2.007	0.740	1.880
28	0.809	2.055	0.759	1.928
29	1.006	2.555	0.956	2.428
30	1.174	2.982	1.124	2.855
31	1.254	3.185	1.204	3.058

- NOTES: - 1. MATERIAL - STAINLESS STEEL TYPE 316L.  
 2. CAPSULE WALLS - 0.025 IN. (0.064 CM.) THICK AND END CAPS  
 3. DIMENSIONS SHOWN ARE AT 68°F (20°C)  
 4. ENGRAVING ON CAPSULE - A.E.C.L. (WHEN USED AS AN OUTER CAPSULE) ISOTOPE C-133 SERIAL NO. - AS SPECIFIED  
 5. LENGTH AS REQUIRED - MAX. 13 IN. (33.02 CM) (SPECIAL AGREEMENT REQUIRED WITH ISOTOPE PRODUCTION FOR LONGER MAXIMUM LENGTHS)  
 6. MAX. INSIDE LENGTH = O/L MINUS 0.230 IN. (0.584 CM.)  
 7. ALLOW + 0.005 IN. (0.012 CM.) TOLERANCE ON OUTSIDE DIAMETER IN WELD AREAS.

**MDS Nordion**  
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 Kanata, Ontario, Canada, K2K 1X8  
 Tel: (613) 592-2790 · Fax: (613) 592-6937

TITLE				SINGLE SEAL CAPSULE	
REF. DWG. A02404		REVISED		3 JAN. 1972	
DATE MARCH 19, 1968		No.		REV.	
DRAWN	CHECKED	APPROVED	C-133		H
DB	H	AB	SHEET 1 OF 1		

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