

August 12, 2015

Mr. Richard Struckmeyer
 Licensing Branch
 Division of Materials Safety and State Agreements
 Office of Federal and State Materials and Environmental Management Programs
 U.S. Nuclear Regulatory Commission
 Washington, DC 20555-0001

RE: NRC Licenses No. 32-23858-01E

Richard,

We would like to amend our NRC license 32-23858-01E. The following provides highly confidential information and documents pursuant to that request; therefore, we request that it be exempt from disclosure under 10 CFR 2.390.

Our current license authorizes distribution of smoke detectors pursuant to 10 CFR 32.26. This amendment requests our license No. 32-23858-01E be pursuant to 10 CFR 32.14.

Should this amendment be approved, the SSD certificate associated with our device(s) would no longer be necessary and should be inactivated with issuance of the amended license.

Under our license we have made the following transfers without changes since the initial registration:

Year	Models						TBq
	0905	0906	0908	1225	1255	Series 200	
1999	-	-	-	-	-	8,892,118	0.296108
2000	-	-	-	-	-	10,134,556	0.337481
2001	-	-	-	-	-	7,081,478	0.235813
2002	-	-	-	-	-	7,863,068	0.261840
2003	-	-	-	-	-	10,143,404	0.337775
2004	-	-	-	-	-	10,609,888	0.353309
2005	-	-	-	-	-	12,198,754	0.406219
2006	-	-	-	-	-	12,001,159	0.399639
2007	-	-	-	-	-	11,947,835	0.397863
2008	-	-	-	-	-	13,688,666	0.455833
2009	-	-	-	-	-	15,396,331	0.512698
2010	-	-	-	-	-	13,367,670	0.445143
2011	-	-	-	-	-	13,328,515	0.443840
2012	-	-	-	-	-	14,599,336	0.486158
2013	-	-	-	-	-	16,986,676	0.565656
2014	-	-	-	-	-	22,468,075	0.748187

Per your request, we are submitting an up-to-date application addressing the applicable regulatory criteria specified in 10 CFR 32.14 and 32.15.

Only two models of Smoke Detectors will be distributed:

Series 200 chamber - Each unit contains 1.0 microcuries (37.0 kBq) of AM 241 per device
235 Series chamber - Each unit contains 0.14 microcuries (5.18 kBq) of AM 241 per device

Smoke Detectors are to be distributed from the following facilities:

- 1016 Corporate Park Drive, Mebane, North Carolina
- 1027 Corporate Park Drive, Mebane, North Carolina
- 1394 South Third Street, Mebane, North Carolina
- 3825 S. Willow Avenue, Fresno California

The following supports the application requirements of 32.14 and is divided by those requirements.

(a). The applicant satisfies the general requirements specified in § 30.33 of this chapter;

Kidde satisfies the requirements of 30.33 as supported by the documentation in our current licenses. That documentation can be found below.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

July 30, 2013

Patrick Keough
Manager, Global Transportation and Logistics
Walter Kidde Portable Equipment, Inc.
1016 Corporate Park Drive
Mebane, NC 27302

SUBJECT: WALTER KIDDE PORTABLE EQUIPMENT, INC. LICENSE AMENDMENT

Dear Mr. Keough:

Enclosed find U.S. Nuclear Regulatory Commission (NRC) exempt distribution License No. 32-23858-01E, Amendment No. 12, which removes a distribution location from your license as requested in your letter dated June 18, 2013.

Please review the enclosed documents carefully and be sure that you understand all the conditions. If there are any errors or questions, please contact me so that appropriate corrections and answers can be provided.

Please be advised that you must conduct your program involving radioactive materials in accordance with the conditions specified in your NRC license, representations made in your license application, and other rules, regulations, and orders of the U.S. Nuclear Regulatory Commission, now or hereafter in effect, to include the following:

1. Comply with applicable NRC regulations in 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," 10 CFR Part 32, "Specific Domestic Licenses to Manufacture or Transfer Certain Items Containing Byproduct Material," and other applicable regulations.
2. Distribute only those products containing radioactive material which are specifically authorized in your license.
3. Notify NRC in writing within 30 days of any change in mailing address.
4. Request and obtain appropriate amendments if you plan to change control or ownership of your organization, change locations of distribution of products containing radioactive material, or make any other changes in your program which are contrary to the license conditions or representations made in your license application and any supplemental correspondence with NRC.
5. Submit a complete renewal application or termination request at least 30 days before the expiration date on your license. You should receive a reminder notice approximately 90 days before the expiration date. Continued distribution of products containing radioactive material after your license expires is a violation of NRC regulations.

P. Keough

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6. In accordance with 10 CFR 30.36, request termination of your license if you plan to permanently discontinue activities involving distribution of products containing radioactive material.

You will be periodically inspected by NRC. Failure to conduct your program in compliance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC may result in enforcement action(s) against you. This could include issuance of a notice of violation; proposed imposition of a civil penalty; or an order suspending, modifying, or revoking your license as specified in the "General Statement of Policy and Procedures for NRC Enforcement Actions," (NUREG-1600).

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in NRC's Public Document Room, or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC web site at <http://www.nrc.gov/NRC/ADAMS/ADAMS.html> (the Public Electronic Reading Room).

If you have any questions, please contact me at (301) 415-5477 or by electronic mail at richard.stuckmeyer@nrc.gov.


Sincerely,



Richard K. Stuckmeyer
Licensing Branch
Division of Materials, Safety and
State Agreements
Office of Federal and State Materials and
Environmental Management Programs

Docket No. 030-34526
License No. 32-23858-01E
Enclosure License No. 32-23858-01E

NRC FORM 374	U.S. NUCLEAR REGULATORY COMMISSION		PAGE 1 OF 2 PAGES Amendment No. 12														
MATERIALS LICENSE																	
<p>Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438) and Title 10, Code of Federal Regulations (Chapter 1 Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70) and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below, to use such material for the purposes and at the place(s) designated below, to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 163 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.</p>																	
Licensee 1. Walter Kidde Portable Equipment, Inc. 2. 1394 South Third Street Mebane, North Carolina 27302		In accordance with letter dated June 18, 2013 3. License number 32-23858-01E is amended in its entirety to read as follows: 4. Expiration date: December 31, 2018 5. Docket No. 030-34526 Reference No.															
6. Byproduct, source, and/or special nuclear material: A. Americium-241	7. Chemical and/or physical form: A. Foil Sources (NRC Model A-001, QSA Global Models AMM-1001 & AMM-1001H)	8. Maximum amount that licensee may possess of any one type under this license: A. Not applicable. (See Condition 11.)															
9. Authorized use: Pursuant to 10 CFR 32.26, the licensee is authorized to distribute smoke detector devices specified in Condition 10 to persons exempt from the requirements for a license pursuant to 10 CFR 30.20, or equivalent provisions of the regulations of any Agreement State.																	
CONDITIONS																	
10. The following smoke detector devices may be distributed pursuant to the license provided the amount of americium-241 contained in each device does not exceed the amounts specified in the following table:																	
<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: left;">Device Model</th> <th style="text-align: left;">Maximum Quantity Per Device</th> </tr> </thead> <tbody> <tr> <td>0905</td> <td>1.0 microcurie</td> </tr> <tr> <td>0906</td> <td>1.0 microcurie</td> </tr> <tr> <td>0908</td> <td>1.0 microcurie</td> </tr> <tr> <td>1225</td> <td>1.0 microcurie</td> </tr> <tr> <td>1255</td> <td>1.0 microcurie</td> </tr> <tr> <td>Series 200</td> <td>1.0 microcurie</td> </tr> </tbody> </table>				Device Model	Maximum Quantity Per Device	0905	1.0 microcurie	0906	1.0 microcurie	0908	1.0 microcurie	1225	1.0 microcurie	1255	1.0 microcurie	Series 200	1.0 microcurie
Device Model	Maximum Quantity Per Device																
0905	1.0 microcurie																
0906	1.0 microcurie																
0908	1.0 microcurie																
1225	1.0 microcurie																
1255	1.0 microcurie																
Series 200	1.0 microcurie																
11. This license does not authorize possession or use of licensed material.																	

NRC FORM 314A	PAGE 6 OF 7 PAGES
MATERIALS LICENSE SUPPLEMENTARY SHEET	License Number 32-23858-01E
	Docket or Reference Number 030-34526
	Amendment No. 12
<p>12. The licensee may distribute only from its facilities located at:</p> <ul style="list-style-type: none">• 1016 Corporate Park Drive, Mebane, North Carolina• 1394 South Third Street, Mebane, North Carolina• 1027 Corporate Park Drive, Mebane, North Carolina• 3825 S. Willow Avenue, Fresno, California <p>13. The licensee shall file periodic reports as specified in 10 CFR 32.29.</p> <p>14. Except as specifically provided otherwise by this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.</p> <p>A. Application dated November 27, 2007 [ML073529390] B. Letter dated October 20, 2008 [ML083360274] C. Letter dated November 23, 2009 [ML0933507200] D. Letter dated July 16, 2012 [ML12222A366] E. Letter dated June 18, 2013 [ML13176A079] and F. Email dated July 15, 2013 [ML13199A336]</p>	
Date: July 30, 2013	By:  Richard K. Struckmeyer Licensing Branch Division of Materials Safety and State Agreements Office of Federal and State Materials and Environmental Management Programs Washington, DC 20545



RADIOACTIVE MATERIALS BRANCH
 RADIATION PROTECTION SECTION
 N. C. DEPARTMENT OF HEALTH AND HUMAN SERVICES

RADIOACTIVE MATERIALS LICENSE

Pursuant to North Carolina Regulations for Protection Against Radiation and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer, and import radioactive materials listed below, and use such radioactive material for the purpose(s) and at the place(s) designated below. This License is subject to all applicable rules and regulations of the North Carolina Radiation Protection Section now and hereafter in effect and to any condition specified below.

1. Licensee Name:	Walter Kidde Portable Equipment, Inc.	3. License No.:	001-1069-1	License Type	0500
2a. Mailing Address:	1016 Corporate Park Drive Mebane, NC 27302	4. Expiration Date:	May 31, 2017		
b. Physical Address:	1016 Corporate Park Drive Mebane, NC 27302		New License	<input checked="" type="checkbox"/>	Routine Administrative
c. Radiation Safety Officer:	Patrick Keough		Renewal	<input type="checkbox"/>	Corrected Copy Termination
		5a. Amendment No.:	21		
		b. Issuance Date:	May 30, 2014		
6. Radioactive Material (element and mass no.)	7. Chemical and or Physical Form	8. Maximum Amount of Radioactivity and or Quantity of Radioactive Material which Licensee May Possess at Any One Time			
A. Americium-241	A. Foil Source	A. Total possession not to exceed 16 curies. No single foil source to exceed 1.0 microcuries.			
B. Plutonium 239	B. Sealed Source	B. 9 µCi			
9. Authorized Use:					
A.	To be used in Kidde Safety Models: SM01, 239, 305, 311, 0805, 0905, 0906, 0908, 0914, 0919, 0916, 0918, 1235, 1239, 1255, 1275 Series 200 and Invenys Climate Control America Model 9.0V Series and 120V AC Series smoke detectors.				
B.	To be used for instrument testing and calibration.				

CONDITIONS

10. A. The authorized place of use in the licensee address noted in Item 2b above.
- B. Radioactive materials listed in Item 6 A above may be stored at the following locations:
 1027 Corporate Park Drive, Mebane, NC 27302-9711
 1394 South Third Street, Mebane, NC 27302-9711
11. The licensee shall comply with the provisions of 15A NCAC 11-1600 (Standards for Protection Against Radiation) and 15A NCAC 11-1000 (Licenses, Instruments, Reports and Inspections) (The North Carolina Regulations for Protection Against Radiation are contained in 15A NCAC 11-).
12. A. Radioactive material shall be used by or under the supervision of Patrick Keough.
- B. Training of workers associated with radioactive materials shall be in accordance with details specified in licensee renewal application dated April 12, 2007, signed by Ann Farver-Dolan, General Manager.
- C. The Radiation Safety Officer shall maintain complete documentation of training specified in condition 12 B.
- D. The Radiation Safety Officer for the activities authorized by this license shall be Patrick Keough.

WITHHOLD FROM PUBLIC DISCLOSURE UNDER N.C.G.S. 104E-9(A)(4) EXCEPT TO INDIVIDUALS WITH A NEED TO KNOW



RADIOACTIVE MATERIALS BRANCH
 RADIATION PROTECTION SECTION
 N. C. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Page 2 of 3
 License No.: 001-1069-1

RADIOACTIVE MATERIALS LICENSE

CONDITIONS (Continued):

- 13 A The licensee shall perform Quality Control and Leak Testing procedures as specified in license renewal application dated April 12, 2007 signed by Amir Farwardhan, General Manager
- B The Radiation Safety Officer shall maintain complete documentation of testing specified in condition 13.A
- 14 The licensee shall maintain documentation require to show compliance with 15A NCAC 11 0116 Records
- 15 The licensee does not authorize distribution to persons exempted or licensed pursuant to United States Nuclear Regulatory Commission and/or Agreement State regulation
- 16 In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material to quantities below the maximum limit specified in 15A NCAC 11 0153 for establishing decommissioning financial assurance
- 17 The licensee shall annually review its Radiation Protection Program for content and implementation [Ref 15A NCAC 11 1603(a)] Documentation of the Radiation Protection program review shall be returned for inspection by the agency [Ref 15A NCAC 11 1636]
- 18 The licensee shall institute the provisions of 15A NCAC 11 1610 when an occupationally exposed woman voluntarily informs her supervisor in writing of her pregnancy and the estimated date of conception
- 19 The licensee shall ensure that no individual "member of the public" [Reference 15A NCAC 11 0104(81)] receives a radiation dose in excess of the limit specified in 15A NCAC 11 1611(a) while conducting licensed operations
- 20 Sealed radioactive sources contained in smoke detectors shall not be opened and or removed from the smoke detector by the licensee
- 21 This license may be subject to amendment, revision, modification, suspension, or revocation in accordance with the provisions of 15A NCAC 11 0344
- 22 In addition to the possession limits referenced in Item 8 above, the licensee shall further restrict possession of radionuclides listed in the table below to the quantities noted within the table. Sum of fractions for the radionuclides listed below shall not exceed unity:

Radionuclide	Quantity (curie)	Radionuclide	Quantity (curie)
Am-241	16	Pm-147	10,800
Am-241/Be	16	Pu-238	16
Cf-252	5.4	Pu-239/Be	16
Cm-244	13.5	Ra-226	10.8
Co-60	51	Sr-75	54
Cs-137	27	Sr-90/Y-90	270
Cd-153	270	Tm-170	5,400
H-192	21.6	Yb-169	51

WITHHOLD FROM PUBLIC DISCLOSURE UNDER N.C.G.S. 104E-9(A)(4) EXCEPT TO INDIVIDUALS WITH A NEED TO KNOW



RADIOACTIVE MATERIALS BRANCH
RADIATION PROTECTION SECTION
N. C. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Page 3 of 3
License No.: 001-1069-1

RADIOACTIVE MATERIALS LICENSE

CONDITIONS (Continued):

- 23 Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Items 6, 7, and 8 of this license in accordance with statements, representations and procedures and attachments listed below. The North Carolina Regulations for Protection Against Radiation shall govern, unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.
- A Application with attachment, dated March 15, 2012, signed by James P. Ward, President and General Manager with electronic mail with attachment, received April 17, 2012.
- B Application for amendment with attachment, dated October 24, 2013, signed by Patrick Keough, Logistics Manager and RSO.

For: W. Lee Cox, III
Chief, Radiation Protection Section

WITHHOLD FROM PUBLIC DISCLOSURE UNDER N.C.G.S. 104E-9(A)(4) EXCEPT TO INDIVIDUALS WITH A NEED TO KNOW

State of California-Health and Human Services Agency

California Department of Public Health

Page 1 of 3 pages

RADIOACTIVE MATERIAL LICENSE

Pursuant to the California Code of Regulations, Division 1, Title 17, Chapter 5, Subchapter 4, Group 2, Licensing of Radioactive Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, use, possess, transfer, or dispose of radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations, and orders of the California Department of Public Health now or hereafter in effect and to any standard or specific condition specified in this license.

1. Licensee	Kidde Safety, Inc.	2. License Number	6394-10	Amendment Number	10
2. Address	3825 S. Willow Avenue Suite 104 Fresno, CA 93725	4. Expiration Date	June 3, 2017	(5)	
Attention	Cesar Grande Radiation Safety Officer	5. Inspection Agency	Radiologic Health Branch North		

License number 6394-10 is hereby amended as follows:

6. Nuclide	7. Form	8. Possession Limit
A. Americium-241	A. Metal foils (NRD Model A-801, Amersham Model Amm-1001, and EAD Metallurgical Model AMX 1100, Pyrotech Model 200 Series)	A. Each single foil not to exceed 1 microcurie. Total not to exceed 1000 millicuries.
B. Plutonium-239	B. Sealed source (Eberline Model DNS-16)	B. 1 source not to exceed 0.01 microcuries.

9. Authorized Use

- A. Possession only. Distribution authorized by NRC exempt distribution license number 32-23858-01E.
- B. To be used for calibration of an Eberline Alpha Counter.

LICENSE CONDITIONS

- 10. Radioactive material shall be used only at the following locations:
 - (a) 3825 S. Willow Avenue Suite 104, Fresno, CA.
- 11. This license is subject to an annual fee for sources of radioactive material authorized to be possessed at any one time as specified in Items 6, 7, 8 and 9 of this license. The annual fee for this license is required by and computed in accordance with Title 17, California Code of Regulations, Sections 30250-30252 and is also subject to an annual cost-of-living adjustment pursuant to Section 109425 of the California Health and Safety Code.
- 12. Radioactive material shall be used by the following individuals:
 - (a) Cesar Grande
 - (b) Paul Mendez
 - (c) Mike Arroyave
 - (d) Daniel Soriano
 - (e) Hope Morales

State of California-Health and Human Services Agency

California Department of Public Health

Page 2 of 3 pages

RADIOACTIVE MATERIAL LICENSE

License Number: 6394-10

Amendment Number: 19

13. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Items 6, 7, 8 and 9 of this license in accordance with the statements, representations, and procedures contained in the documents listed below. The Department's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
- (a) The renewal application with attachments dated May 25, 2007, signed by LeMar Thomas, Radiation Safety Officer. The attachments include radiation safety plan and supporting documents for renewal.
 - (b) The letter dated March 10, 2009, with attachments thereto, signed by Ron Hill, Radiation Safety Officer, in regards to the Duties and Responsibilities of the RSO and Delegation of Authority and updated personnel training procedure.
 - (c) The letter with attachments dated December 19, 2011, signed by Ron Hill, Radiation Safety Officer, and letters dated January 30, 2012 and August 9, 2012, both signed by Patrick Keough, Global Transportation and Logistics Manager, regarding the removal of old use location in Long Beach, CA.
 - (d) The letters with attachments dated May 22, 2012, August 10, 2012, and September 28, 2012, all signed by Patrick Keough, Global Transportation and Logistics Manager, regarding addition of new location at 3825 S. Willow Avenue Suite 104, Fresno, CA, release for unrestricted use of old location at 3596 East Central Avenue, Fresno, CA, and updated emergency phone list.
 - (e) The letters with attachments dated October 24, 2013, and December 5, 2013, both signed by Patrick Keough, Global Transportation and Logistics Manager, regarding the updated facility map.
14. The Radiation Safety Officer in this program shall be Cesar Granda.
15. The licensee is authorized to perform tests for leakage and/or contamination of sealed sources. The following tests may be performed for sources possessed under this license.
- (a) Collection of wipe test samples from sealed sources and devices containing sealed sources.
 - (b) Analysis of materials collected by the licensee as stated in (a) above for the amount of radioactivity.
16. The licensee will provide the Low Level Radioactive Waste (LLRW) reports specified in the California Health and Safety Code section 115005.1(h) to the California Department of Public Health (CDPH) on an annual basis for both shipped and stored LLRW. Alternatively, LLRW shipment information may be provided on a per-shipment basis. LLRW shipment information and annual reports shall be mailed to:
- Anti-LLRW Tracking Program
California Department of Public Health
Radiologic Health Branch MS 7610
P.O. Box 997416
Sacramento, CA 95899-7416
17. At least 30 days prior to vacating any address of use listed on Condition 10 of this license, the licensee shall provide written notification thereof to the California Department of Public Health, in accordance with Title 17, California Code of Regulations, Section 30156.1(a).

(b) The applicant submits sufficient information regarding the product pertinent to evaluation of the potential radiation exposure, including:

(1) Chemical and physical form and maximum quantity of byproduct material in each product;

Smoke Detectors contain Americium-241 the chemical and physical form of Foil Sources (NRD Model A-001, QSA Global Models AMM-1001, and AMM-1001H).

Series 200 chamber - Each unit contains 1.0 microcuries (37.0 kBq) of AM 241 per device.

235 Series chamber - Each unit contains 0.14 microcuries (5.18 kBq) of AM 241 per device.

(2) Details of construction and design of each product;

Foil Source

The foil source is a laminated structure with the radioactive layer over plated with gold. See document below.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20542

AMENDMENT NO. 1
CERTIFICATE OF REGISTRATION
AND SAFETY ANALYSIS SUMMARY
SEALED SOURCE

<u>Manufacturer and Distributor</u>	<u>Sealed Source Model Designation</u>
Amersham Corporation 2976 S. Clearbrook Drive Arlington Heights, IL 60005	(Fuel) AMM 1001 (Mounted Foil) AMM 1001H
<u>Isotope</u>	<u>Maximum Activity</u>
Americium-241	Up to 5 microcuries in 5 mm dia. disc, and up to 60 microcuries/cm ² of foil

In accordance with request dated September 20, 1973 this certificate is amended as follows:

Description of Foil Source

The general construction of foil, identified as model AMM 1001 is typically as shown in the sketch below. The radioactive americium oxide is uniformly distributed and contained in a matrix of fine gold at temperatures in excess of 800°C. It is further contained between a backing of gold or gold/palladium alloy or palladium and gold by hot forging. The metal system now continuously welded and extended in area by means of a power pulling mill to give required active and overall areas.

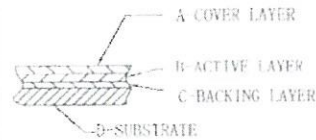


- A - (i) Palladium - 0.002 mm
- (ii) Gold - 0.002 mm
- B - Americium Oxide plus Gold - 0.002 mm
- C - Gold - 0.001 mm
- D - 0.20 - 0.25 mm
- E - Gold - 0.001 mm

Date: October 26, 1973 Reviewed by: Joseph A. [Signature]
Date: October 26, 1973 Concurrence: Paul [Signature]

INDISPERSIBLE SOLID RADIOACTIVE MATERIAL

REFER TO MANUFACTURING PROCEDURE'S - SOP-MF-015



SECTION OF ACTIVE AREA


- A- GOLD OR GOLD PALLADIUM ALLOY OR GOLD
 PALLADIUM LAMINATE (Pd ON SURFACE) 0.002 OR 0.003mm
- B- AMERICIUM OXIDE PLUS GOLD 0.002mm
 OR RADIUM SULPHATE PLUS GOLD 0.002mm
- C- GOLD 0.001mm
- D- SILVER 0.15-0.25mm

CONSTRUCTION

THE RADIONUCLIDE AS AMERICIUM OXIDE OR RADIUM SULPHATE IS CONTAINED UNIFORMLY DISTRIBUTED & SINTERED IN A MATRIX OF FINE GOLD AT TEMPERATURES OF 750°C±20°C IT IS FURTHER CONTAINED BETWEEN A GOLD COATED SUBSTRATE OF PURE FINE SILVER & A FRONT COVERING OF NOBLE METAL (SEE 'A' ABOVE) BY HOT FORGING THE METAL LAYERS NOW CONTINUOUSLY WELDED ARE EXTENDED IN AREA BY A POWER ROLLING MILL TO GIVE REQUIRED ACTIVE & OVERALL FOIL AREAS.

TESTING FOR LEAKAGE & CONTAMINATION

EACH ROLLED LENGTH OF FOIL IS WIPE TESTED OVER THE ENTIRE AREA - ACCEPTANCE LIMIT 0.005uCi(185 Bq)

ISSUE	MOD DATE			Title	ALPHA Foil	Material	Au-241
F	05/12/11			Scope		Weight (g)	
						Scale	10:1
						SHT 1 OF SHTS 1	
Design	Amer sham	Approve	宋S	IRG No	E-FS-030001		
Check	陈海	QA approve	陈海	Company			
				SHENZHEN CIC-AEA TECHNOLOGY MANUFACTURING CO., LTD.			

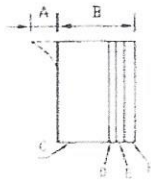


FIG. 1

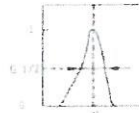


FIG. 2

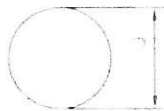



FIG. 3



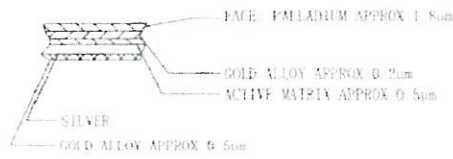
FIG. 4

Note:
 This drawing must be used in conjunction with
 the appropriate source product specification (SPS)

ISSUE	MOD DATE			Title	ALPHA SOURCE SINGLE STRIP GENERAL SPECIFICATION	Material	90-241
1	05/12/14					Weight(s)	
				Scope		Scale	10:1
				DES. NO.	E-FS-030002	SHEET 1 OF SHEETS 1	
Design	Amershan	Approve	张	Company		SHENZHEN CIC-AEA TECHNOLOGY MANUFACTURING CO., LTD.	
Check	张	WT approve	张				



FOIL DISC BLANKED
 FROM ROLLED SHEET



ENLARGED SECTION 1/8X OF FOIL

Notes:

1. Active material: Americium 241
2. Activity 29.6KBq (0.8uCi) $\pm 20\%$
3. Peak energy level: 4.5MeV $\pm 10\%$

DATE	MOD DATE			Title	Fig.	Material	Am-241
1	05.12.14					Weight	
				Scope	AMMR5-030	Scale	10:1
						SHT 1 OF SHTS 1	
DESIGNER	APPROVE		REV. NO	E-ES-030003			
DESIGNER	APPROVE		Company				
DESIGNER	APPROVE		SHENZHEN CIC AEA TECHNOLOGY MANUFACTURING CO., LTD.				

SPS No. 001

Issue 2

Page 1 of 4

QSA GLOBAL LIMITED

RADIATION SOURCES MANUFACTURING – QSA GLOBAL LIMITED

SOURCE PRODUCT SPECIFICATION (SPS)

Title: Americium-241 Foil Disc AMMK5630 Date:

Approved by:

Scope

This is the specification for Am-241 alpha foil 2.38mm diameter discs. This document consists of 4 pages and 3 drawings listed in Section 2.

PRODUCT CODE : AMMK5630

I. Details of Active Material

Radionuclide	Americium 241
Half life	433 years
Major Radiations	Alpha plus Gamma
Alpha Particle Energy	5.338 MeV 1.4% 5.445 MeV 12.8% 5.486 MeV 85.2% others low
Electromagnetic Radiations	~59.5 KeV 35.9% Np L Xray 40.6% (12-22KeV) others low

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 Issue 2
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Radionuclidic Purity Am 243 activity <0.5% Am241
 Activity
 Gamma imps> 60KeV <0.0001%
 Am241 activity

2. Details of Foil Construction

Drawings	E-FS-030001	Issue 1
	E-FS-030002	Issue 1
	E-FS-030003	Issue 1

E-FS-030001 and E-FS-030003 indicate the general construction of the foil discs.

2.1 Material Specification (Figure 1)

C)	Backing Material	Silver 0.2mm +/- 0.05mm Cover of approx. 0.5mm Gold To distinguish from active face
D)	Interface Layer	Gold Palladium Alloy – Approx. 0.5um
E)	Active Matrix	Americium oxide gold – approx. 0.5um
F)	Face Material	Palladium PdAu laminate – approx. 2um

2.2 External Dimensions

B)	Thickness (Fig 1)	0.2mm +/- 0.05mm
J)	Diameter (Fig 3)	2.33mm – 2.43mm
A)	Burr (Fig 1)	0.05mm
K)	Flatness (Fig 4)	0.05mm

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Issue 2

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2.3 Surface finish

M) - L) (Fig 4) free from blemishes

2.4 Radioactivity

Activity - content 29.6Kbq (0.8uCi) \pm 20%

Activity - measurement Gamma content measured against Lab standard

H) Peak Energy (Fig 2) 4.5MeV \pm 10%

G) Peak Width (FWHM) (Fig 2) \leq 0.8 MeV maximum

3. Special Requirements

The foil discs are washed in organic solvent to remove any traces of oil and small fines produced in the blanking operation.

4. Manufacturing Quality Assurance

The sources are manufactured within the scope of a Quality Assurance Management System which complies with ISO 9001 and is approved by Floyds Register Quality Assurance. The system is described in the Radiation Sources QA Manual and its associated manufacturing and testing procedures.

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Issue 2

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5. **Documentation**

A Test Report and Handling Instructions are supplied with the despatch instructions on all consignments to the customer.

6. **Safety and Performance Testing**

BS/ISO/ANSI 77 Classification	C64444	QCS 601
Recommended Working Life (RWL)	10 years	

7. **QC Inspection**

Foils sources are visually inspected for scratches, discolouration and surface defects according to mutually agreed acceptance standard.

Sources are subjected to a final leak test - wipe test to BS 5288 App D.2.1.
The results are reported on a Radioactive Test Report.

8. **Application**

Foil discs are loaded into stainless steel holders by the customer for use in smoke detection systems.

9. **Conditions of Use**

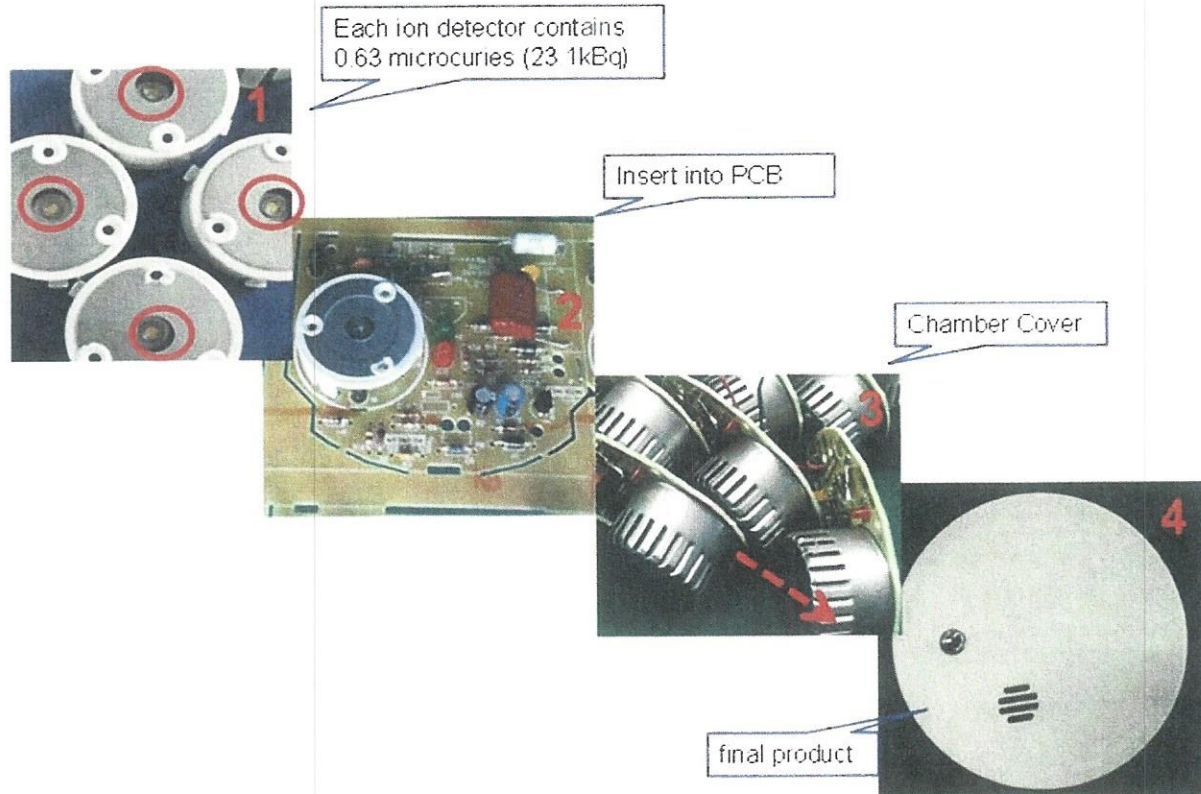
Normal industrial and laboratory environment.

10. **Additional Information**

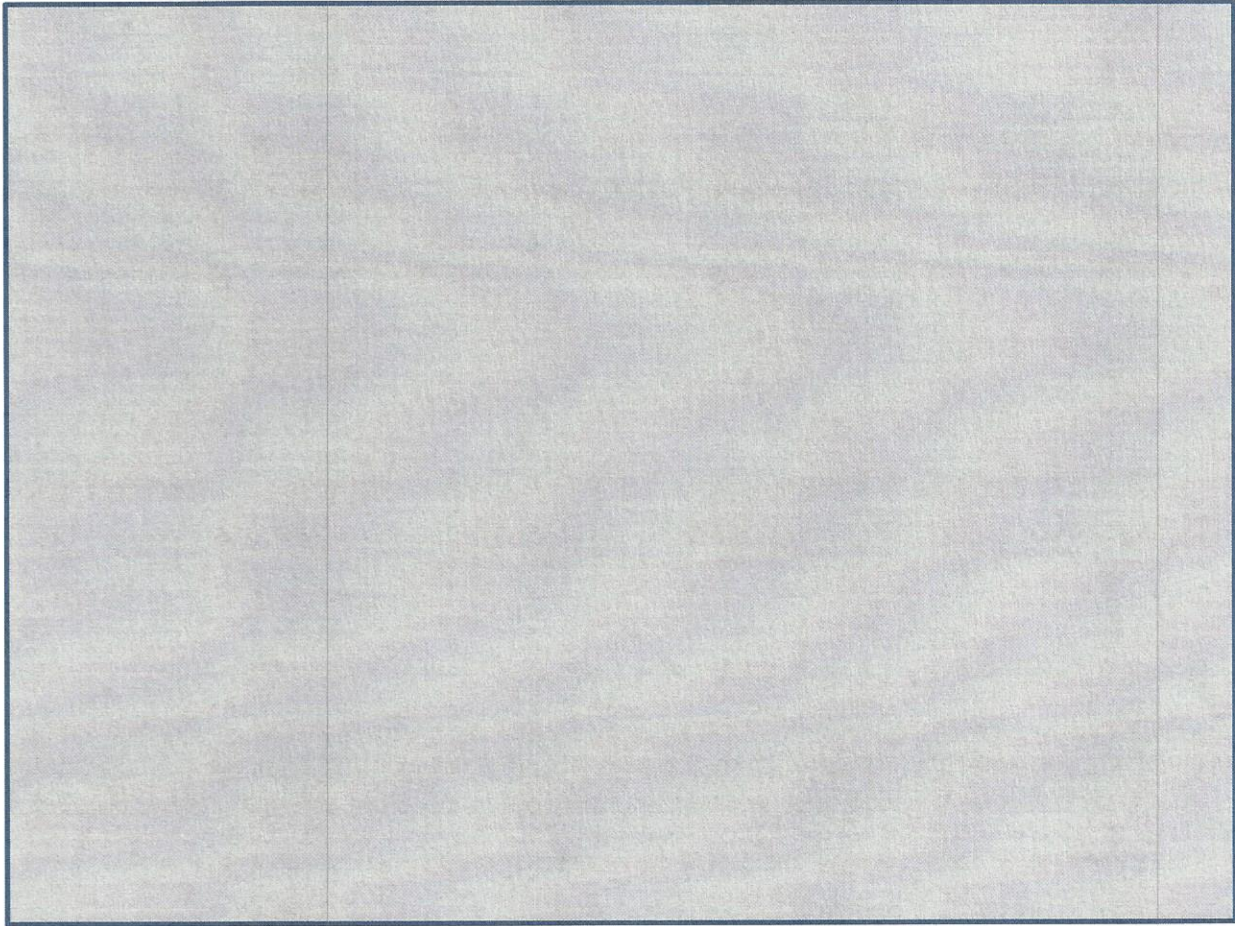
Series 200

The source is riveted into the source holder which is also riveted into the chamber insulator assembly. The same source and source holder are used in all Kidde Series 200 ionization smoke alarms.

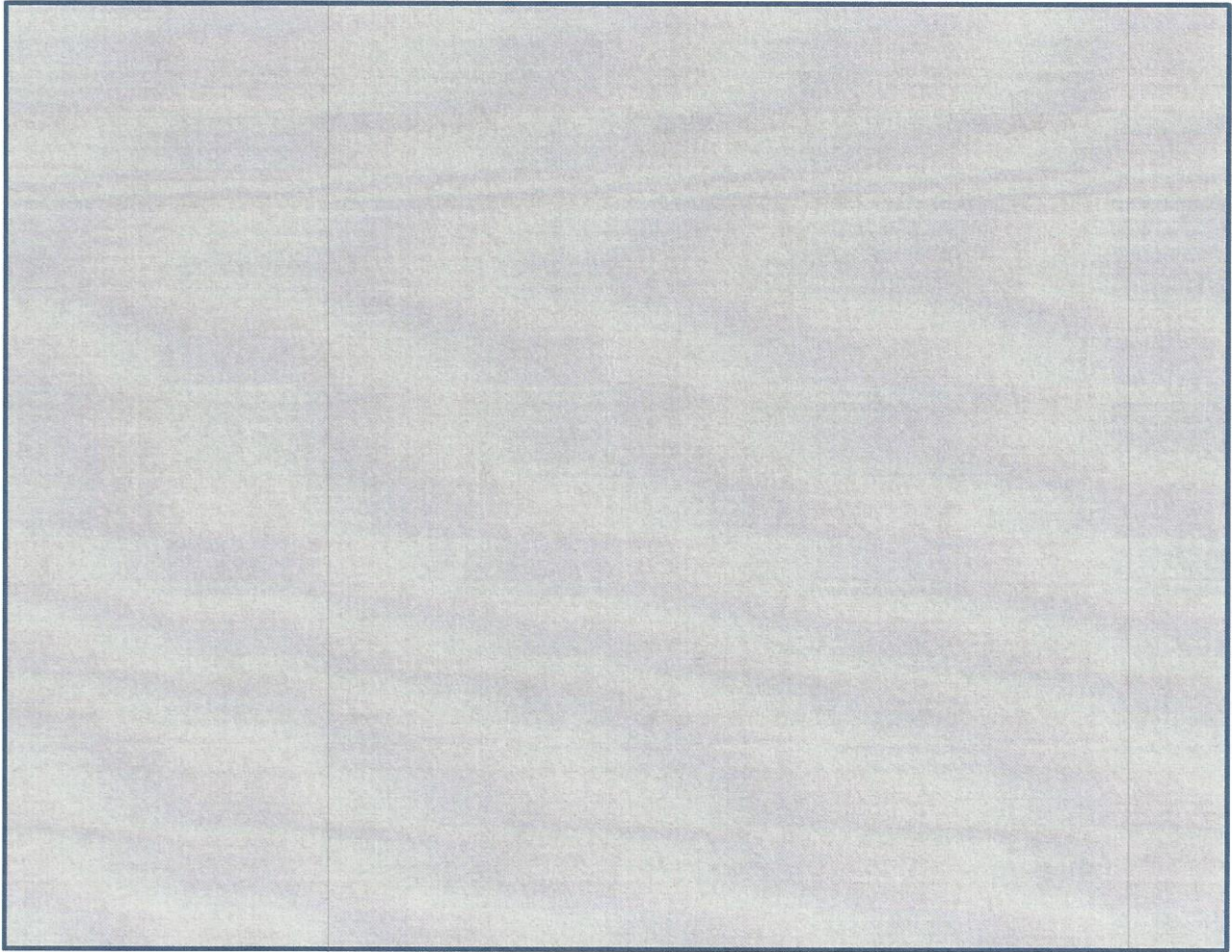
Series 200 chamber - Each unit contains 1.0 microcuries (37.0 kBq) of AM 241 per device. See picture and documents below.



Series 200 Chamber – See documents below.



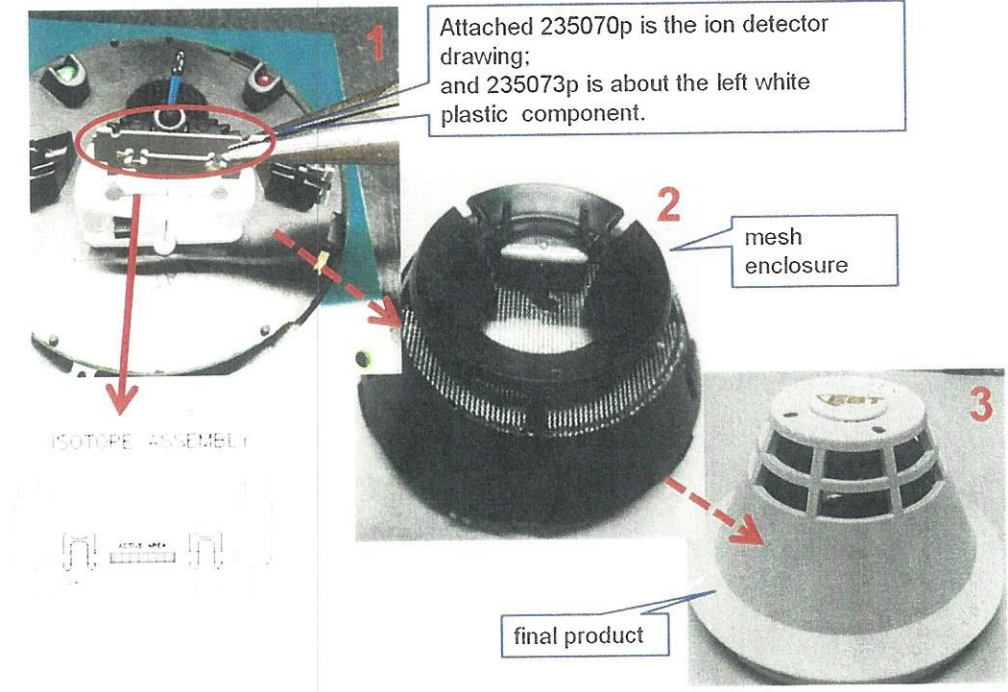
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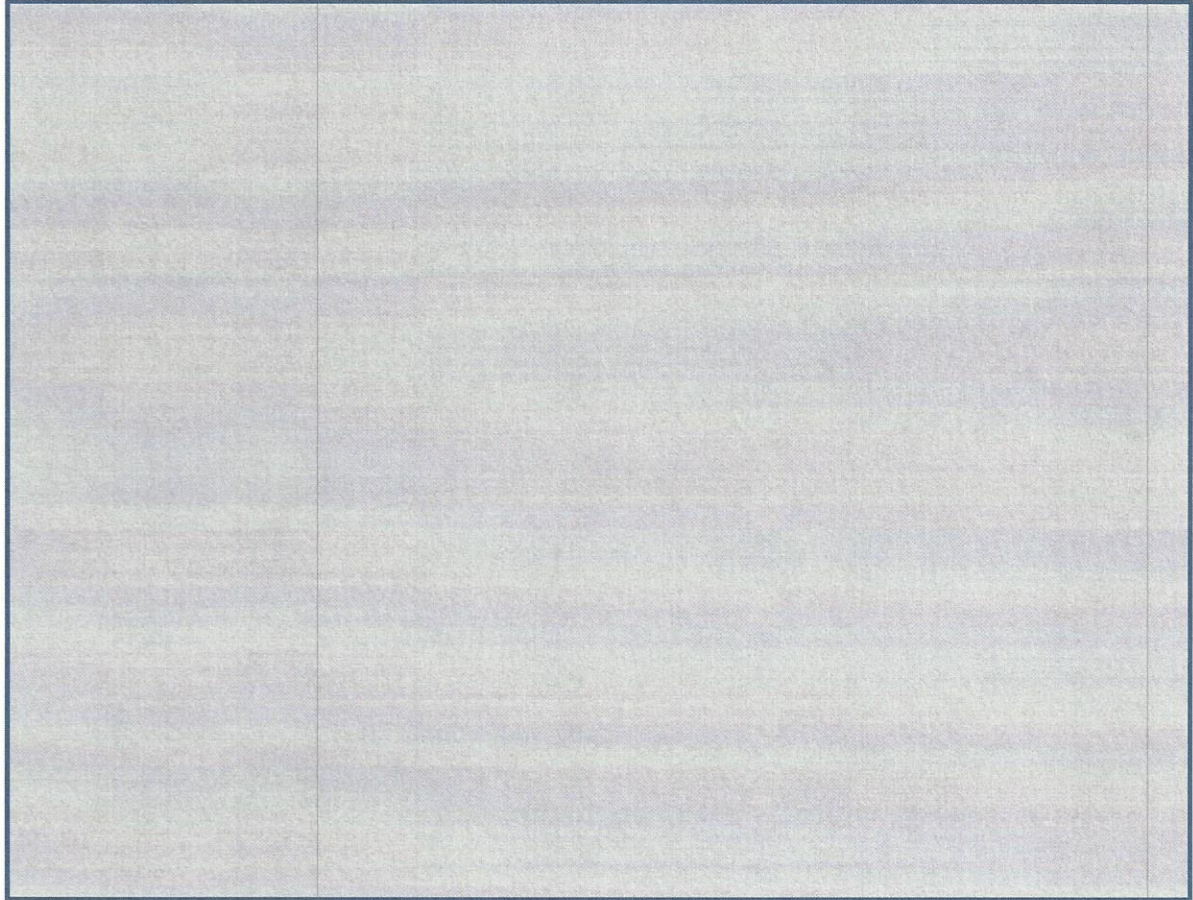


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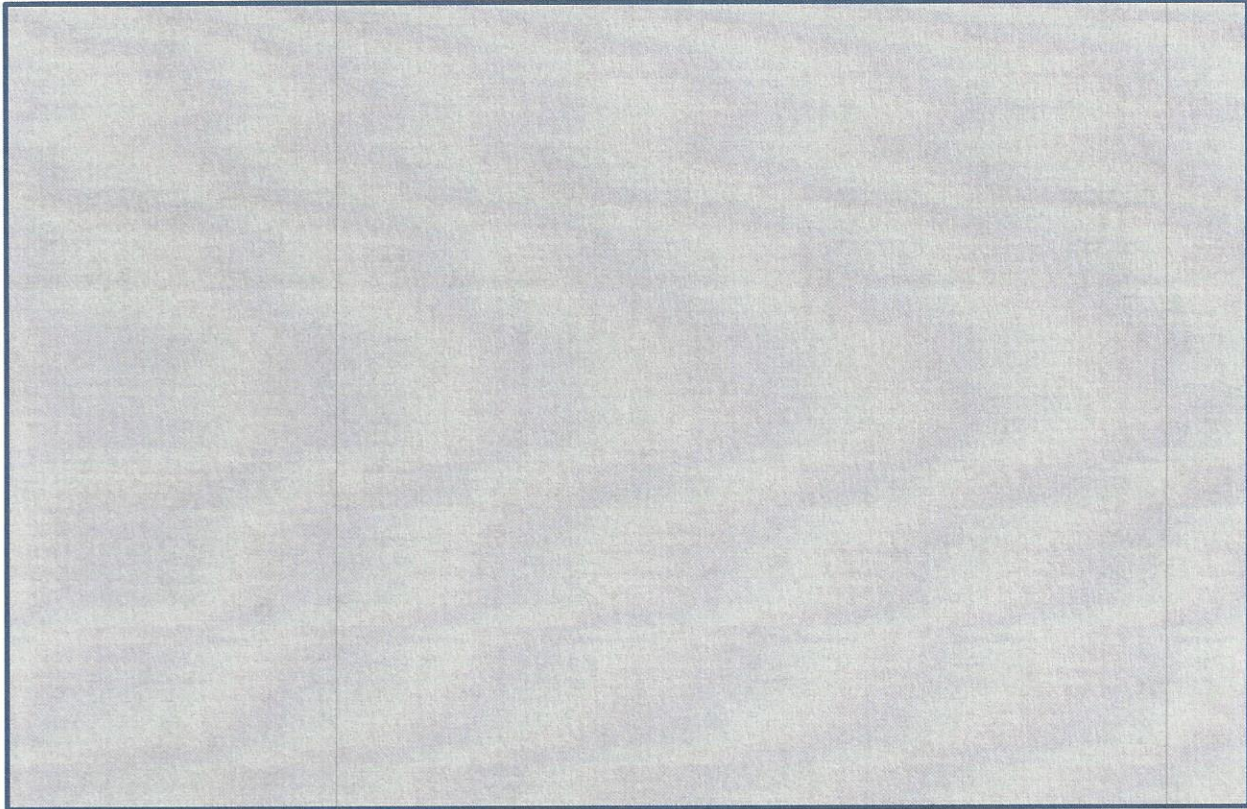
235 Series

Source is crimped into the holder
The same source and source holder are use on all Edwards 235 Series ionization smoke alarms.
See picture and documents below.





Redacted



(3) The method of containment or binding of the byproduct material in the product;

Alarms that use the Series 200 or 235 Series chamber are all constructed with plastic housings. The plastics used are chosen to meet the flammability, temperature, stability and impact resistance criteria outlined in the UL standard for that category of smoke alarm (AC or battery powered). The housings consist of a plastic base and cover the size of the alarms range from 4 inches across to 7 inches across. The plastic for all models has a minimum thickness of 0.062 inches thick. All models are agency tested. This testing included 5 drop tests from 7 feet, jarring tests and vibration tests.

(4) Except for electron tubes and ionization chamber smoke detectors and timepieces containing promethium-147 or tritium in the form of gaseous tritium light sources, procedures for and results of prototype testing to demonstrate that the byproduct material will not become detached from the product and that the byproduct material will not be released to the environment under the most severe conditions likely to be encountered in normal use of the product;

Not Applicable

Redacted

(5) In the case of ionizing radiation measuring instruments and timepieces containing tritium in the form of paint, quality control procedures to be followed in the fabrication of production lots of the product and the quality control standards the product will be required to meet;

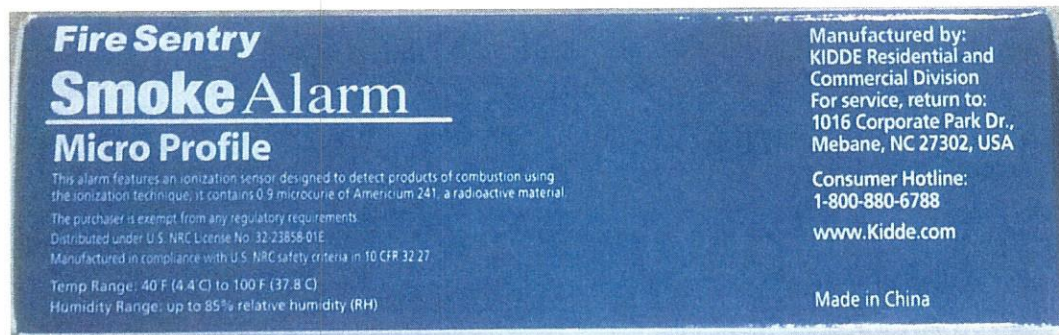
Not Applicable

(6) The proposed method of labeling or marking each unit, except timepieces or hands or dials containing tritium or promethium-147, and its container with the identification of the manufacturer or initial transferor of the product and the byproduct material in the product;

The alarm and packaging contains the following text which is readable prior to sale of the product.

Series 200

Point of Sale Packaging Label



Fire Sentry
Smoke Alarm
Micro Profile

This alarm features an ionization sensor designed to detect products of combustion using the ionization technique; it contains 0.9 microcurie of Americium 241, a radioactive material.
The purchaser is exempt from any regulatory requirements.
Distributed under U.S. NRC License No. 32-23858-01E.
Manufactured in compliance with U.S. NRC safety criteria in 10 CFR 32.27.
Temp Range: 40 F (4.4 C) to 100 F (37.8 C)
Humidity Range: up to 85% relative humidity (RH)

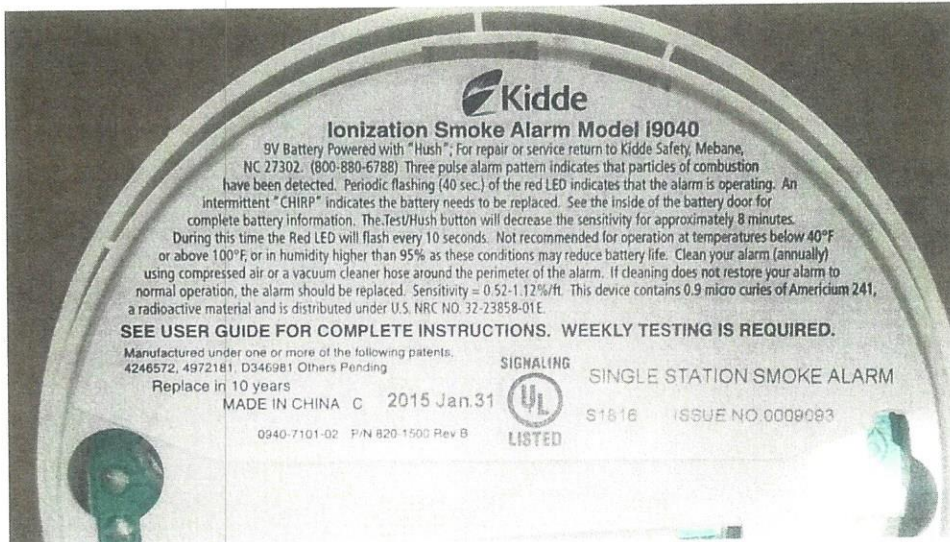
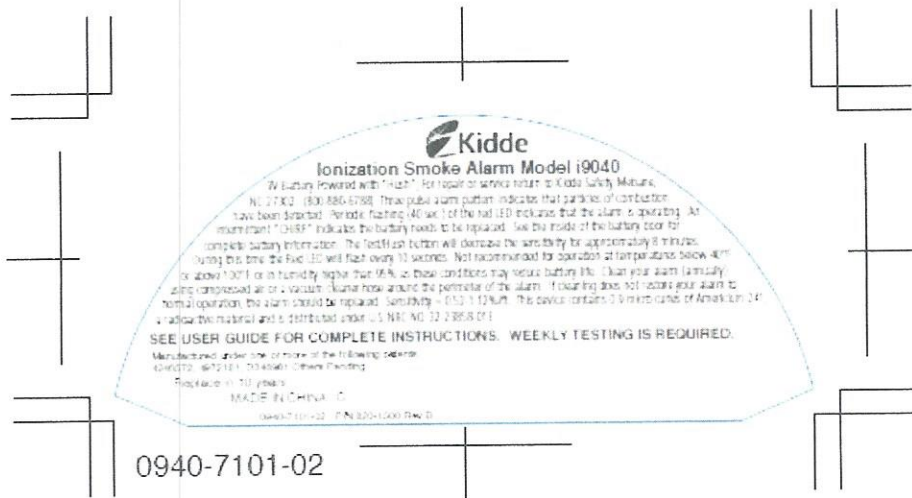
Manufactured by:
KIDDE Residential and
Commercial Division
For service, return to:
1016 Corporate Park Dr.,
Mebane, NC 27302, USA

Consumer Hotline:
1-800-880-6788
www.Kidde.com

Made in China

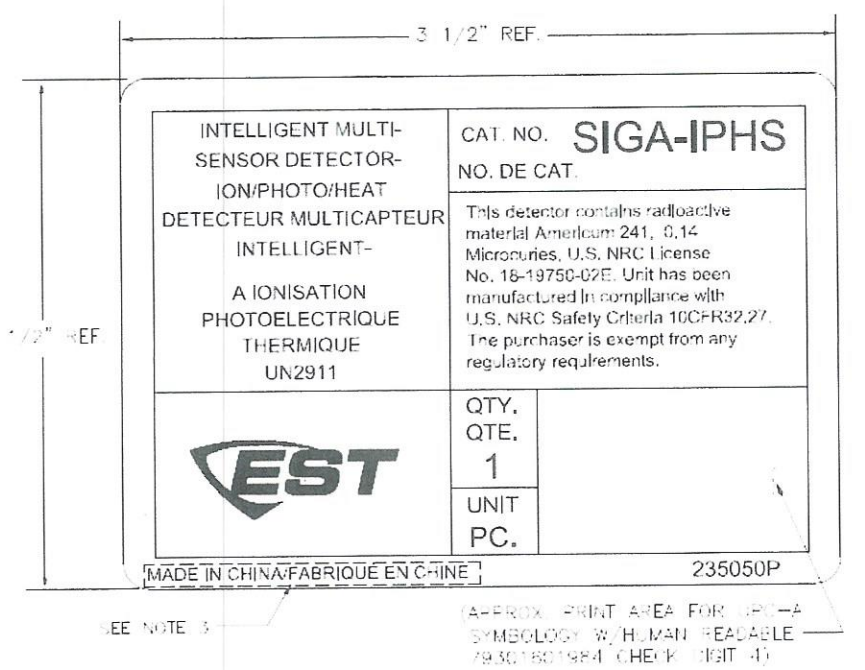


Product Label

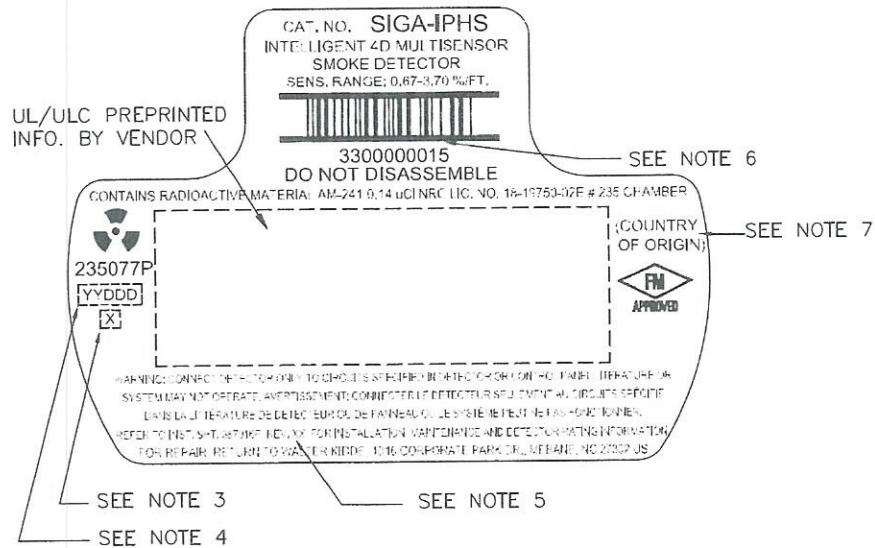


235 Series

Point of Sale Packaging Label



Product Label



(7) For products for which limits on levels of radiation are specified in § 30.15 of this chapter, the radiation level and the method of measurement;

Radiation monitoring is performed using Ludlum 2000 Scaler

Ludlum Model	Serial No#
2000/43-10	247352/PR261467
2000/43-10	282000/PR310116
2000/43-10	282014/PR310114

(8) Any additional information, including experimental studies and tests, required by the Commission to facilitate a determination of the safety of the product.

(c) Each product will contain no more than the quantity of byproduct material specified for that product in § 30.15 of this chapter. The levels of radiation from each product containing byproduct material will not exceed the limits specified for that product in § 30.15 of this chapter.

Series 200 chamber - Each unit contains 1.0 microcuries (37.0 kBq) of AM 241 per device
235 Series chamber - Each unit contains 0.14 microcuries (5.18 kBq) of AM 241 per device

(d) The Commission determines that the byproduct material is properly contained in the product under the most severe conditions that are likely to be encountered in normal use and handling.

Alarms that use the Series 200 or 235 Series chamber are all constructed with plastic housings. The plastics used are chosen to meet the flammability, temperature, stability and impact resistance criteria outlined in the UL standard for that category of smoke alarm (AC or battery powered). The housings consist of a plastic base and cover the size of the alarms range from 4 inches across to 7 inches across. The plastic for all models has a minimum thickness of 0.062 inches thick. All models are agency tested. This testing included 5 drop tests from 7 feet, jarring tests and vibration tests.

(a) Each person licensed under § 32.14 for products for which quality control procedures are required shall:

(1) Maintain quality assurance systems in the manufacture of the part or product, or the installation of the part into the product, in a manner sufficient to provide reasonable assurance that the safety-related components of the distributed products are capable of performing their intended functions;

(2) Subject inspection lots to acceptance sampling procedures, by procedures specified in the license issued under § 32.14, to provide at least 95 percent confidence that the Lot Tolerance Percent Defective of 5.0 percent will not be exceeded; and

Smoke detectors are subject to incoming wipe test inspections



QA.WI220.10

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Revision#	Description of Change	Date	Author
5	Add storing of source verbage Add Survey of work area	4/13/12	Stuart Jones
7	Changed name of Alpha Counter and minor editorials	2/28/12	Stuart Jones
8	1) test samples Collected and transferred By receiving personnel	4/10/06	Carolyn Lawson
	2) Add receiving WI as Associated document - Change some wording - Examples: smoke alarm To smoke alarm, lot to Container.	8/20/06	Carolyn Lawson

Approvals

Approvals			
RSO Signature	Date	Quality Manager Signature	Date

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QA WI220 10

Title: Smoke Alarm Inspection & Testing	Rev: 3	Date: 4/13/2012	Page: 2 of 7
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1.0 PURPOSE

The purpose of this work instruction is to establish a system for the inspection & testing of ionization type smoke alarm product.

2.0 SCOPE

This work instruction applies to ionization type smoke alarm products that are to become part of finished goods.

3.0 DEFINITIONS

- LTPD Lot Tolerance Percent Defective
- Lot The total quantity of individual smoke alarms containing ionization chamber model 200 received within a 24 hour period at the distribution site
- Container A standard dimension shipping container used for the transportation of goods from one location to another
- ROO Radiation Safety Officer

4.0 ASSOCIATED DOCUMENTS

Document Number	Document Description
QA F220 070 001	Incoming Smoke Alarm QA Inspection Form
QA F220 033	Failure & Rejection Report
QPS 3.4	Control of Nonconforming Material- External
QA F220 31	Defective Material Report
QHP WI420 3	Smoke Alarm Receiving & Unloading

5.0 RESPONSIBILITY

Quality is responsible for the work elements in this procedure.

6.0 PROCEDURE

- 6.1 Confirm smoke alarm models and quantities on the incoming container(s) are per packing list models and quantities. Responsibility: receiving personnel.
- 6.2 If a package containing a smoke alarm is to be opened to determine damage:
 - a. Wear disposable gloves.

Note: If paperwork showing that the material was not tested/certified by the manufacturer is available for the materials being received, contact the ROO immediately.

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NOTIFICATIONS (For information, questions and reporting contacts)

NC Division of Radiation Protection – Raleigh (919) 571-4141

6.3 Sample size for testing is based upon the size of the lot. Establish sample size for testing by referring to regulatory guide C-6 under LTPD for 5% or 7% sampling quantity. (Use LTPD 5% sampling size if manufacture (China) has provided paperwork for design conformity and certificate of testing. Use LTPD 7% sampling size if proof of testing is not available. LTPD charts are shown at the end of this procedure.

6.3.1 If more than one container makes up a lot, the selection of individual units for the test should be equally gathered from each container.

(Example): 3 containers of smoke alarms are received within 24 hours and each container has a quantity of 20,000 smoke alarms and each smoke alarm contains the "type 200 ionization chamber" and there is no paperwork provided for design conformity from the manufacturer. In this case LTPD chart 7% is used (not LTPD chart 5% because no paperwork evidencing test from the manufacturer was found), to select a total quantity of 75 pieces based on 60,000 piece lot size. The total sample needs to be made up of 25 pieces (75 pieces/3 containers =25 pieces) from each container.

(Note: Do not place lots in inventory until testing results have been verified.)

6.4 An inspection and wipe test will be performed on the sample. The alarms will be checked for the following items:

6.4.1 Mechanical integrity of the alarm (Confirmation that the alarm is properly assembled.) if a defect is found, follow instructions in section 6.4.3 paragraph 4b under WIPE TESTING PROCEDURE below.

6.4.2 Labeling: The point of sale package labeling and the alarm labeling will be checked to insure compliance with State and NRC requirements.

6.4.3 Wipe testing to insure no radioactive contamination is present on the case of the smoke alarm will be performed using the following Wipe Testing Procedure:

1. Moisten Q-tip with alcohol.
2. The selected random sample is wiped with the same moistened Q-tip (maximum of 75 units per Q-tip).
3. Allow the Q-tip to evaporate to dryness.

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4. Place the Q-10 in the Ludlum Alpha Counter and count for 1 minute.
 - a. If the count for each unit in the selected sample size is less than the acceptable limit (0.005 uCi), the entire lot is accepted and released for shipment. Submit container release notice to receiving supervisor.
 - b. If the count is greater than the acceptable limit for a single unit (0.005 uCi), the entire lot is rejected. Contact the RSO immediately. Also, if mechanical integrity defects are found, the following procedures apply:
 1. The rejected lot is segregated from other units in-house. Defective Material Report will be filled out and signed.
 2. All rejected units will be returned to the manufacturer.
 - c. Record wipe test results on the Incoming Smoke Alarm QA Inspection form. Enter date tested, container number of sampled units, supplier name and test results.
 - d. Have signature authorities sign-off on inspection form.

6.5 CALIBRATION AND USE OF LUDLUM ALPHA COUNTER

- 6.5.1 a. Turn on power to counter and allow a 5-minute warm-up.
- b. Set counting time for 1.0 minute.
- c. Clean the movable drawer with a paper wipe and then close the drawer.
- d. Push the START/RESET button to start the count.
- e. After the counting time has elapsed, note the total counts registered. This is the background count and should be less than one (1).
- f. If any number greater than 1¹ is recorded, repeat the count.
- g. If instrument continues to show a reading greater than 1¹, notify the RSO.

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- h. Remove the source from its secure designated area
- i. Insert the calibrated Pu-239 source into the sample drawer and count for 1 minute. Make sure the source is flush with the sample drawer. Adjust the round plate accordingly. When performing calibration it must be flush. After calibration, you will need to adjust it to fit the Q-tips.
- j. Compare the source reading with the values given in section below.
- k. If the count is acceptable, the counter is operating properly. Remove the source from the counter and return to the secure designated area.

6.5.2. Survey of the Work Area

An inspection and testing of the work area will be performed before and after the wipe testing of the sample.

- a. Insure that the counter has been calibrated.
- b. Moisten Q-tip with alcohol.
- c. Wipe the entire length of the work surface from left to right one time.
- d. Place the Q-tip in the counter and count for 1 minute. (Press the count button)
 - 1. If the count is greater than the acceptable limit, repeat the count.
 - 2. If reading continues to show a reading greater than the acceptable limit, notify the RDO.
 - 3. If the count is less than the acceptable limit, record the results on the Incoming Smoke Alarm QA Inspection form and proceed with procedure.
 - 4. After the wipe testing of the sample. Repeat steps 6.5.2. a thru d.

6.5.3. WIPE TESTING

- a. Place Q-tip(s) used to perform Wipe test into the sample drawer and count for 1 minute. (Press count button.)
- b. If count exceeds 2300 CPM, reject lot and contact RDO. If not, accept lot.



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5.5.4 Proper Operation of Counter

- a. The 1-minute count of the Pu-239 source must be between: 10,336 and 12,632 CPM.
- b. If the count does not agree with these numbers, repeat the count.
- c. If, after repeated counting, the sample is not within the limits of 10336 and 12632 CPM, notify the Radiation Safety Officer.

5.5.5 Analysis of Wipe Sample Results

- a. If the wipe sample shows a reading greater than 9,068 CPM, contamination is present.
- b. Notify the Radiation Safety Officer.

Calculations:

Counter efficiency for Pu-239 is 90%. Pu-239 source output is 11,484 cpm (factory Calibrated).
 $11,484 \times 0.9 = 10336$ cpm. $\pm 1\sigma = \pm 124$; 95% C.L. = ± 248 dpm. Therefore counter reading should be between 10336 and 12632.
 Maximum allowable contamination = $0.005 \mu\text{Ci}$ (1.11×10^4 cpm); or 9.96×10^3 cpm including 0.8 efficiency. $\pm 1\sigma = \pm 94$ cpm; 95% C.L. = ± 188 . Therefore a counter reading in excess of 9,068 cpm would indicate contamination.

~~a. (Smoke Alarms) materials and should be kept in the inspection area.~~
 LTPD acceptance sampling is based on the following chart.

The following are the modified 5% LTPD and 7% LTPD tables (Guide 6-6)

LTPD = 5%

LOT SIZE	n	c
1 - 25	All	0
26 - 50	24	0
51 - 100	28	0
101 - 200	30	0
201 - 300	31	0
301 - 800	32	0

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501 - 1,000	33	0
1,001 - 100,000	66	0

LTPD = 7%

LOT SIZE	n	c
1 - 30	All	0
31 - 50	30	0
51 - 100	37	0
101 - 200	40	0
201 - 300	43	0
301 - 400	44	0
401 - 2,000	46	0
2,001 - 100,000	76	0

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(3) Visually inspect each unit in inspection lots. Any unit which has an observable physical defect that could adversely affect containment of the byproduct material must be considered a defective unit.

Kidde receives all detection products from FHK in China which is part of Kidde through the same reporting structure. All detection products are physically inspected and tested according to the Smoke Alarm Inspection and Testing (QA WI220.10) procedure before being received. Defective ionization smoke alarms are accumulated and disposed of through a Kidde's approved radioactive waste vendor.

(b) No person licensed under § 32.14 shall transfer to other persons for use under § 30.15 of this chapter or equivalent regulations of an Agreement State:

(1) Any part or product tested and found defective under the criteria and procedures specified in the license issued under § 32.14, unless the defective part or product has been repaired or reworked, retested, and found by an independent inspector to meet the applicable acceptance criteria; or

(2) Any part or product contained within any lot that has been sampled and rejected as a result of the procedures in paragraph (a)(2) of this section, unless:

(i) A procedure for defining sub-lot size, independence, and additional testing procedures is contained in the license issued under § 32.14; and

(ii) Each individual sub-lot is sampled, tested, and accepted in accordance with the procedures specified in paragraphs (a)(2) and (b)(2)(i) of this section and any other criteria that may be required as a condition of the license issued under § 32.14.

c) [Reserved]

(d)(1) Label or mark each unit, except timepieces or hands or dials containing tritium or promethium-147, and its container so that the manufacturer or initial transferor of the product and the byproduct material in the product can be identified.

(2) For ionization chamber smoke detectors, label or mark each detector and its point-of-sale package so that:

(i) Each detector has a durable, legible, readily visible label or marking on the external surface of the detector containing:

(A) The following statement: "CONTAINS RADIOACTIVE MATERIAL";

(B) The name of the radionuclide ("americium-241" or "Am-241") and the quantity of activity; and

(C) An identification of the person licensed under § 32.14 to transfer the detector for use under § 30.15(a)(7) of this chapter or equivalent regulations of an Agreement State.

(ii) The labeling or marking specified in paragraph (d)(2)(i) of this section is located where it will be readily visible when the detector is removed from its mounting.

(iii) The external surface of the point-of-sale package has a legible, readily visible label or marking containing:

(A) The name of the radionuclide and quantity of activity;

(B) An identification of the person licensed under § 32.14 to transfer the detector for use under § 30.15(a)(7) or equivalent regulations of an Agreement State; and

(C) The following or a substantially similar statement: "THIS DETECTOR CONTAINS RADIOACTIVE MATERIAL. THE PURCHASER IS EXEMPT FROM ANY REGULATORY REQUIREMENTS."

(iv) Each detector and point-of-sale package is provided with such other information as may be required by the Commission

The alarm and packaging contains the following text which is readable prior to sale of the product.

Series 200

Point of Sale Packaging Label:



Fire Sentry
Smoke Alarm
Micro Profile

This alarm features an ionization sensor designed to detect products of combustion using the ionization technique. It contains 0.9 microcurie of Americium 241, a radioactive material. The purchaser is exempt from any regulatory requirements. Distributed under U.S. NRC License No. 32-23858-01E. Manufactured in compliance with U.S. NRC safety criteria in 10 CFR 32.27.

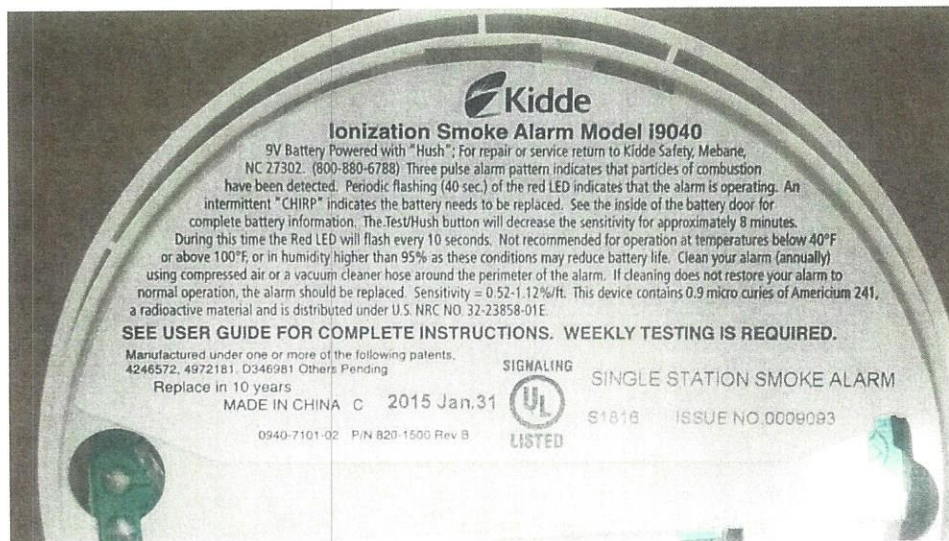
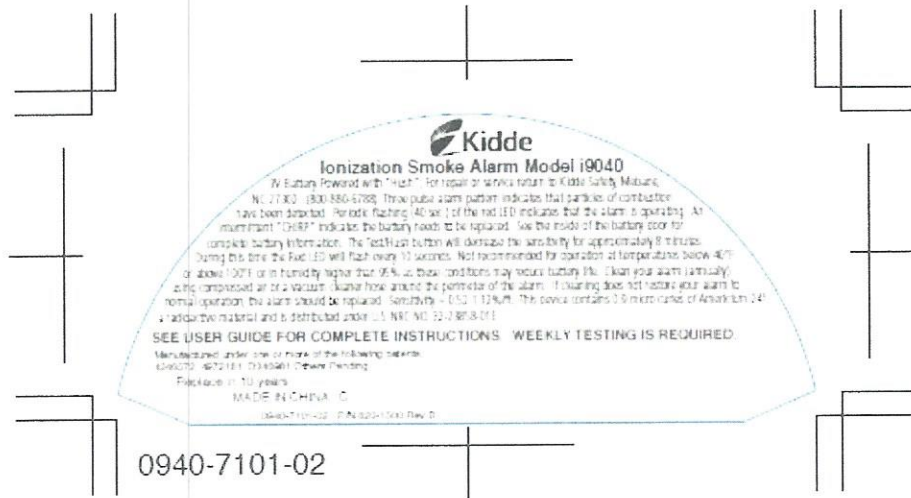
Temp Range: 40 F (4.4 C) to 100 F (37.8 C)
Humidity Range: up to 85% relative humidity (RH)

Manufactured by:
KIDDE Residential and
Commercial Division
For service, return to:
1016 Corporate Park Dr.,
Mebane, NC 27302, USA

Consumer Hotline:
1-800-880-6788
www.Kidde.com

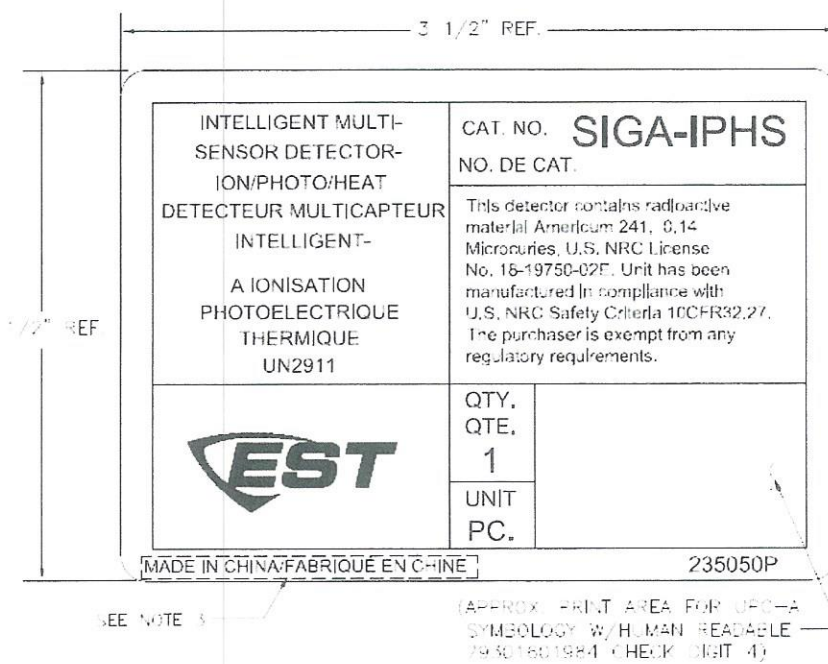
Made in China

Product Label:

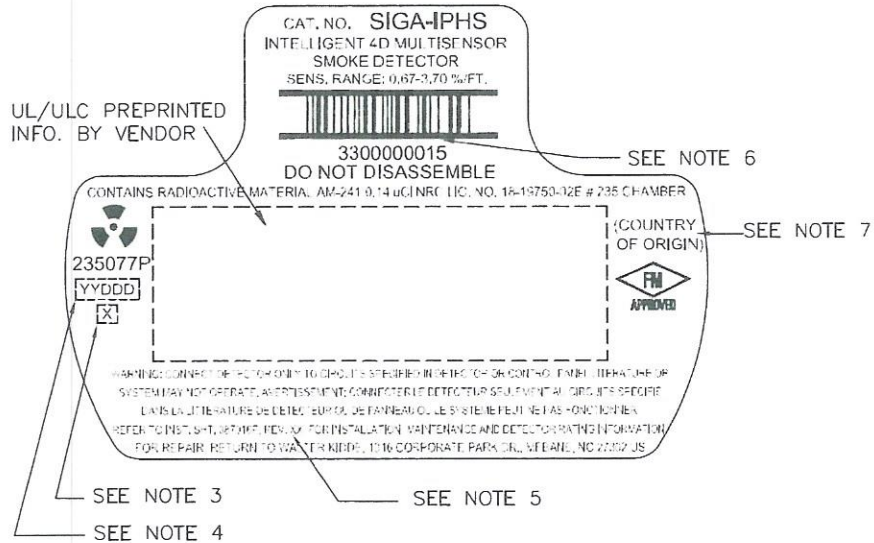


235 Series

Point of Sale Packaging Label

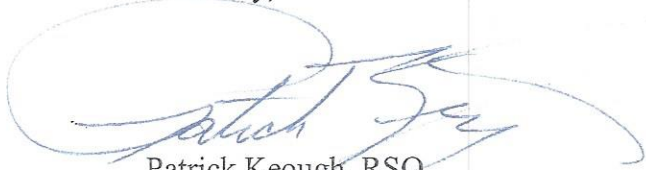


Product Label



Thank you. Please contact me if you have any questions or wish to discuss this matter.

Sincerely,

A handwritten signature in blue ink, appearing to read "Patrick Keough", with a large, sweeping flourish extending to the right.

Patrick Keough, RSO
Logistics Manager