HOCHIKI
america corporation

7051 Village Drive, Suite 100
Buena Park, CA 90621-2268
Phone (714) 522-2246
Fax (714) 522-2268

May 5, 2011

Shirley Xu
License Branch
Division of Materials Safety and State Agreements
Office of Federal and State Materials and
Environmental Management Programs

Subject: Hochiki America Corporation Application for License Renewal

Dear Ms. Xu:

Attached you will find our application for renewal of our license. We have discussed with your office, and have decided that we would like to take advantage of the option to be authorized for distribution under 10 CFR 32.14. The information that is being submitted is to support the renewal of our license, no changes to the SS&DR certificates are required. When we are issued our revised license we would also like to inactivate our SS&DR certificates NR-355-D-105-E and NR-355-D-106-E.

Also attached is the actual sales quantity for our ionization smoke detectors for years 2007-2010.

If you have any questions regarding this renewal submission package please let us know.

Best regards,

Loren Leimer

Loren Leimer
Engineering Manager / RSO
Hochiki America Corporation
lleimer@hochiki.com

H.HARA

Hisham Harake
President/ CEO/ Alt RSO
Hochiki America Corporation
Hharake@hochiki.com

C: Ravi Hem

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 places(s) designated below. This license is subject to all applicable rules, regulations, and orders of the Department of Health Services now or hereafter in effect and to any standard or specific condition specified in this license.

1. Licensee	Hochiki America Corporation	*3. License Number*	2090-30 *Amendment Number*: 22
2. Address	7051 Village Drive, Suite 100 Buena Park, CA 90621-2268	*4. Expiration date*	**December 17, 2014** (5)
Attention:	Loren L. Leimer Radiation Safety Officer	*5. Inspection agency*	Radiologic Health Branch **South**

License Number 2090-30 is hereby amended in its entirety to extend the license expiration date from December 17, 2004 to December 17, 2014.

6. Nuclide	7. Form	8. Possession Limit
A. Americium 241	A. Foil sources (Nuclear Radiation Developments Model A-001)	A. **Not to exceed 1.0 microcurie per foil. Total not to exceed 75 millicuries.**

9. Authorized Use

A.- C. To be used in the manufacture of smoke detectors and for storage only.

LICENSE CONDITIONS

10. Radioactive material shall be used only at the following locations:

    (a) 7051 Village Drive, Buena Park, 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 30230-30232 and is also subject to an annual cost-of-living adjustment pursuant to Section 100425 of the California Health and Safety Code.

12. Radioactive material shall be used by, or under the supervision of, the following individuals:

    (a) Loren Leimer

    (b) Hisham Harake

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 letter of renewal request, dated November 5, 2004, and the renewal application with attachments, dated November 1, 2004, signed by Loren L. Leimer, Radiation Safety Officer. The attachments include supporting documents for the license renewal.**

RADIOACTIVE MATERIAL LICENSE

License Number: 2090-30

Amendment Number: 22

14. (a) The Radiation Safety Officer in this program shall be Loren L. Leimer.

    (b) The Alternate Radiation Safety Officer in this program shall be Hisham Harake.

15. This license does not authorize distribution of radioactive material pursuant to Title 17, California Code of Regulations, Sections 30180 and 30192 through 30192.6 or equivalent provisions of the U.S. Nuclear Regulatory Commission or Agreement States.

For the State Department of Health Services

Date: September 8, 2006

By: John G Fassell

Radiologic Health Branch
P.O. Box 997414-MS 7610, Sacramento, CA 95899-7414

LPCB

Certificate of Quality System Registration

HOCHIKI AMERICA CORPORATION
7051 Village Drive, Suite 100, Buena Park, California 90621, USA

has complied with the requirements of the following:

ISO 9001:2008

and is authorised to use the LPCB mark on stationery and publications related to the following products and/or services

Manufacture of fire detection and alarm system components.
Procurement, distribution and repair of control indicating equipment for fire protection.

Tracie Hunter

T. A. HUNTER

for and on behalf of LPCB

Certificate No: 358

Issue Number: 08

Date of Issue: 11 November 2010

Date of Expiry: 31 July 2013

LOSS PREVENTION CERTIFICATION BOARD
LPCB

UKAS
MANAGEMENT SYSTEMS
007

breglobal

LPCB is part of BRE Global Limited, Watford, WD25 9XX T: +44 (0)1923 664100 F: +44 (0)1923 664910 W: www.redbooklive.com

This certificate remains the property of BRE Global Ltd and is issued subject to terms and conditions. It is maintained and held in force through at least annual review and verification. To check the validity of this certificate, please visit www.redbooklive.com or contact us.

QUALITY PROCEDURE		TITLE	QP NUMBER: 7.16	
WRITTEN BY:	APPROVED BY:	Receiving Inspection Procedure	ISSUE NO.: 17	ISSUE DATE: 3/30/09
B. Misiuk	Hisham Harake		Page 1 of 2	

Introduction

1. To prescribe a system for inspection and movement of materials received from vendors, suppliers and subcontractors.

Scope

2. Applies to all materials received by Hochiki America Corporation

Procedure

3.1 All items used for manufacturing of Hochiki America products shall be inspected by the QC Inspector. The QC Inspector will inspect for visual, drawing/specification and purchase order requirements. Electronic components will be verified against the "Engineering Approved Manufacturing List". Inspections will be based on an AQL (Acceptable Quality Level) of 2.5 based on the table below:

LOT SIZE	SAMPLE SIZE (SS)	ACCEPT	REJECT	Criteria for Continuing Inspection
1 – 8	ALL	*	*	N/A
9 – 150	8	0	2	If 1 defective identified, go to SS of 20**
(Cumulative SS)	20	1	2	
151 – 280	20	1	3	If 2 defective identified, go to SS of 32
(Cumulative SS)	32	2	3	
281 – 500	20	1	4	If 2-3 defective identified, go to SS of 50
(Cumulative SS)	50	3	4	
501 – 1200	32	1	6	If 2-5 defective identified, go to SS of 80
(Cumulative SS)	80	5	6	
1201 – 3200	50	2	8	If 3-7 defective identified, go to SS of 125
(Cumulative SS)	125	7	8	
3201 – 10,000	80	3	11	If 4-10 defective identified, go to SS of 200
(Cumulative SS)	200	10	11	
10,001 – 35,000	125	5	15	If 6-14 defective identified, go to SS of 315
(Cumulative SS)	315	14	15	
Over 35,000	200	8	22	If 9-21 defective identified, go to SS of 500
(Cumulative SS)	500	21	22	

*Reject only the defectives found.

**If the LOT size is 20 or less, inspect all and reject only the defectives found.

3.2 All incoming material should have a receipt or packing slip with it. Some material (plastics, metals) require certifications to verify conformance in addition to the packing slip and will be required on the purchase order. These documents will be filed in the Receiving Inspection area. If any required document is missing the inspector will reject the lot.

3.3 The Receiving Inspector will enter a record in the Receiving Inspection database located on the Hochiki intranet at: Engineering\Server-2\Quality\Database\Receiving Inspection.mdb. The Receiving Inspector will then forward acceptable material to the Receiving Clerk.

Non-Conforming Materials

3.4 If the material does not conform to specifications, the Receiving Inspector will create a record in the Non-Conforming Document database located on the Hochiki intranet located at: Engineering\Server-2\Quality\Database\NCD Database.mdb. From the database, reports section, the Receiving Inspector will then print an NDC FORM (FQAD-105). The software will ask for the specific NCD number. The Receiving Inspector will enter the NCD number and the software will display the NCD form on the screen. The Receiving Inspector will then print the NCD form and attach it to the non-conforming material. The material is then placed in a designated area in the Receiving or Quality area and notifies the QA Supervisor. The material is reviewed by the Quality Supervisor or Quality Engineer who will decide if the material should be rejected or sent to the Material Review Board (MRB) for disposition (see Material Review Board Procedure, QP 7.33).

3.5 If the material is sent to the MRB for disposition, the material is held in the Receiving area or QA-MRB area depending on the physical size of the material until a disposition is reached. The NCD form will remain attached to the material. The material cannot be removed from the Receiving area or MRB area until approval has been given in writing per a Material Review Report, Form No. FMFG-407, issued by the Material Review Board (see Material Review Board Procedure, QP 7.33).

3.6 If the material is rejected and the QA Engineer determines that the MRB is not required, then a copy of the NCD is provided to the Purchasing Agent to forward to the responsible supplier. The supplier is then required to complete the NCD form to identify what "CORRECTION" will be provided, what the "ROOT CAUSE" of the defect was and what "CORRECTIVE ACTION" will be implemented to prevent reoccurrence. This completed NCD form should be returned to HA's Quality Engineer, via the HA Purchasing Agent, within 30 days of receipt by the supplier. The supplier may contact the QE by phone, FAX or email to explain the correction, root cause and/or corrective action. The QE may enter the information into the NCD database to complete the NCD record.

3.7 If the Quality Engineer determines that the MRB evaluation is required then the MRB will evaluate the issue and determine if the items are to be "used as is", "reworked by HA", "returned to the supplier" for rework or replacement or scrapped. In any case, the NCD requirements of section 3.7 of this procedure will be implemented.

Records

3.8 Receiving records will be kept for a minimum of three years and are located in the QA Records area in the supplier history files.

Responsibilities

3.9 The Quality Assurance Manager is responsible to ensure that these procedures are followed.

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Quality Assurance Sampling Plans

AAFES sampling plans are derived from MIL-STD-105E or ANSI/ASQ Z 1.4, Sampling Procedures and Tables for Inspection by Attributes. This standard is also known as ISO 2859-1, Sampling procedures for inspection by attributes - part 1: Sampling schemes indexed by acceptance limit (AQL) for loy-by-lot inspection.

AAFES sampling plans are designed to provide maximum inspection productivity while maintaining a high degree of random sampling reliability. Plans are provided for Acceptance Quality Levels (AQLs) of 2.5, 4.0, and 6.5 percent defective and are extracted from Inspection Levels I and II of the above standards. The acceptance criteria for the smaller (of the two) sample sizes in AAFES sampling plans are based on Level I, tightened inspection, while acceptance criteria of the larger sample sizes are based on Level II, normal inspection. The rejection criteria in all sample sizes of AAFES sampling plans are the same as that of Level II, normal inspection.

An AQL of 2.5 Normal, 2.5 Tightened is used for all hardlines merchandise.

AQLs of 4.0 Normal, 4.0 Tightened and 6.5 Normal, 6.5 Tightened are used for jewelry, shoes, clothing, softside luggage and any cut & sewn item.

An AQL of 6.5 Normal, 6.5 Tightened is used for extra value, budget, or entry price point type of merchandise.

What an AQL means is that as long as a supplier maintains his/her process average (% defective) at the assigned AQL or lower, there is a very high probability that shipments from that supplier, when inspected using AAFES sampling plans, will be accepted. By the same token, there is a very high probability that shipments, when inspected using AAFES sampling plans, will be rejected if a supplier's process average (% defective) remains higher than the assigned AQL.

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2.5 AQL - NORMAL INSPECTION

Lot Size	Sample Size	Acc	Rej	Criteria for Continuing Inspection
1 - 8	All	*	*	N/A
9 - 150 (Cumulative S/S)	8 20	0 1	2 2	If 1 defective found, go to S/S of 20. **
151 - 280 (Cumulative S/S)	20 32	1 2	3 3	If 2 defectives found, go to S/S of 32.
281 - 500 (Cumulative S/S)	20 50	1 3	4 4	If 2 - 3 defectives found, go to S/S of 50.
501 - 1200 (Cumulative S/S)	32 80	1 5	6 6	If 2 - 5 defectives found, go to S/S of 80
1201 - 3200 (Cumulative S/S)	50 125	2 7	8 8	If 3 - 7 defectives found, go to S/S of 125
3201 - 10,000 (Cumulative S/S)	80 200	3 10	11 11	If 4 - 10 defectives found, go to S/S of 200
10,001 - 35,000 (Cumulative S/S)	125 315	5 14	15 15	If 6 - 14 defectives found. go to S/S of 315
Over 35,000 (Cumulative S/S)	200 500	8 21	22 22	If 9 - 21 defectives found. go to S/S of 500

* Reject only defectives found.

** If lot size is 20 units or less, inspect all and reject only defectives found.

Here is how the random sampling works:

Let us say that the shipment or lot size is 2,000 items or pieces.
Then,
(1) Take a sample of 50 pieces at random from this shipment.
(2) Inspect all 50 pieces.
(3) If 2 or less defective pieces are found, accept the shipment.
(4) If 8 or more defective pieces are found, reject the shipment.
(5) If 3 to 7 defective pieces are found, then take additional 75 samples at random.
(6) Inspect all 75 samples.
(7) If a total of 7 or less defective pieces are found, accept the shipment.
(8) If a total of 8 or more defective pieces are found, reject the shipment.

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Lot Size	Sample Size	Acc	Rej	Criteria for Continuing Inspection
1 - 8	All	*	*	N/A
91 - 150 (Cumulative S/S)	8 20	0 1	2 2	If 1 defective found, go to S/S of 20. **
151 - 280 (Cumulative S/S)	20 32	0 1	2 2	If 1 defective found, go to S/S of 32.
281 - 500 (Cumulative S/S)	20 50	1 2	3 3	If 2 defectives found, go to S/S of 50.
501 - 1200 (Cumulative S/S)	32 80	1 3	4 4	If 2 - 3 defectives found, go to S/S of 80
1201 - 3200 (Cumulative S/S)	50 125	2 5	6 6	If 3 - 5 defectives found, go to S/S of 125
3201 - 10,000 (Cumulative S/S)	80 200	3 8	9 9	If 4 - 8 defectives found, go to S/S of 200
10,001 - 35,000 (Cumulative S/S)	125 315	5 12	13 13	If 6 - 12 defectives found. go to S/S of 315
Over 35,000 (Cumulative S/S)	200 500	8 18	19 19	If 9 - 18 defectives found. go to S/S of 500

* Reject only defectives found.

** If lot size is 20 units or less, inspect all and reject only defectives found.

NOTE: Tightened sampling plans are used by AAFES for reinspection of a previously failed lot and when a supplier's quality history indicates a higher than normal risk of sub-standard quality being shipped. We recommend suppliers always use the tightened sampling plans.

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4.0 AQL - NORMAL INSPECTION

Lot Size	Sample Size	Acc	Rej	Criteria for Continuing Inspection
1 - 8	All	*	*	N/A
9 - 90 (Cumulative S/S)	5 13	0 1	2 2	If 1 defective found, go to S/S of 13. **
91 - 150 (Cumulative S/S)	13 20	1 2	3 3	If 2 defectives found, go to S/S of 20.
151 - 280 (Cumulative S/S)	13 32	1 3	4 4	If 2 - 3 defectives found, go to S/S of 32.
281 - 500 (Cumulative S/S)	20 50	1 5	6 6	If 2 - 5 defectives found, go to S/S of 50.
501 - 1200 (Cumulative S/S)	32 80	2 7	8 8	If 3 - 7 defectives found, go to S/S of 80
1201 - 3200 (Cumulative S/S)	50 125	3 10	11 11	If 4 - 10 defectives found, go to S/S of 125
3201 - 10,000 (Cumulative S/S)	80 200	5 14	15 15	If 6 - 14 defectives found, go to S/S of 200
10,001 - 35,000 (Cumulative S/S)	125 315	8 21	22 22	If 9 - 21 defectives found. go to S/S of 315
Over 35,000 (Cumulative S/S)	200 315	12 21	22 22	If 13 - 21 defectives found. go to S/S of 312

* Reject only defectives found.

** If lot size is 13 units or less, inspect all and reject only defectives found.

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4.0 AQL - TIGHTENED INSPECTION

Lot Size	Sample Size	Acc	Rej	Criteria for Continuing Inspection
1 - 8	All	*	*	N/A
9 - 90 (Cumulative S/S)	5 13	0 1	2 2	If 1 defective found, go to S/S of 13. *
91 - 150 (Cumulative S/S)	13 20	0 1	2 2	If 1 defective found, go to S/S of 20.
151 - 280 (Cumulative S/S)	13 32	1 2	3 3	If 2 defectives found, go to S/S of 32.
281 - 500 (Cumulative S/S)	20 50	1 3	4 4	If 2 - 3 defectives found, go to S/S of 50.
501 - 1200 (Cumulative S/S)	32 80	2 5	6 6	If 3 - 5 defectives found, go to S/S of 80
1201 - 3200 (Cumulative S/S)	50 125	3 8	9 9	If 4 - 8 defectives found, go to S/S of 125
3201 - 10,000 (Cumulative S/S)	80 200	5 12	13 13	If 6 - 12 defectives found, go to S/S of 200
10,001 - 35,000 (Cumulative S/S)	125 315	8 18	19 19	If 9 - 18 defectives found. go to S/S of 315
Over 35,000 (Cumulative S/S)	200 315	12 18	19 19	If 13 - 18 defectives found. go to S/S of 312

* Reject only defectives found.

** If lot size is 13 units or less, inspect all and reject only defectives found.

NOTE: Tightened sampling plans are used by AAFES for reinspection of a previously failed lot and when a supplier's quality history indicates a higher than normal risk of sub-standard quality being shipped. We recommend suppliers always use the tightened sampling plans.

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6.5 AQL - NORMAL INSPECTION

Lot Size	Sample Size	Acc	Rej	Criteria for Continuing Inspection
1 - 8	All	*	*	N/A
9 - 25 (Cumulative S/S)	3 8	0 1	2 2	If 1 defective found, go to S/S of 8.
26 - 90	13	2	3	N/A
91 - 150 (Cumulative S/S)	13 20	1 3	4 4	If 2 - 3 defective found, go to S/S of 20.
151 - 280 (Cumulative S/S)	13 32	1 5	6 6	If 2 - 5 defectives found, go to S/S of 32.
281 - 500 (Cumulative S/S)	20 50	2 7	8 8	If 3 - 7 defectives found, go to S/S of 50.
501 - 1200 (Cumulative S/S)	32 80	3 10	11 11	If 4 - 10 defectives found, go to S/S of 80
1201 - 3200 (Cumulative S/S)	50 125	5 14	15 15	If 6 - 14 defectives found, go to S/S of 125
3201 - 10,000 (Cumulative S/S)	80 200	8 21	22 22	If 9 - 21 defectives found, go to S/S of 200
10,001 - 35,000 (Cumulative S/S)	125 200	12 21	22 22	If 13 - 21 defectives found. go to S/S of 200
Over 35,000	200	21	22	N/A

* Reject only defectives found.

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Lot Size	Sample Size	Acc	Rej	Criteria for Continuing Inspection
1 - 8	All	*	*	N/A
9 - 25 (Cumulative S/S)	3 8	0 1	2 2	If 1 defective found, go to S/S of 8.
26 - 90	13	1	2	N/A.
91 - 150 (Cumulative S/S)	13 20	1 2	3 3	If 2 defective found, go to S/S of 20.
151 - 280 (Cumulative S/S)	13 32	1 3	4 4	If 2 - 3 defectives found, go to S/S of 32.
281 - 500 (Cumulative S/S)	20 50	2 5	6 6	If 3 - 5 defectives found, go to S/S of 50.
501 - 1200 (Cumulative S/S)	32 80	3 8	9 9	If 4 - 8 defectives found, go to S/S of 80
1201 - 3200 (Cumulative S/S)	50 125	5 12	13 13	If 6 - 12 defectives found, go to S/S of 125
3201 - 10,000 (Cumulative S/S)	80 200	8 18	19 19	If 9 - 18 defectives found, go to S/S of 200
10,001 - 35,000 (Cumulative S/S)	125 200	12 18	19 19	If 13- 18 defectives found. go to S/S of 200
Over 35,000	200	18	19	N/A

* Reject only defectives found.

NOTE: Tightened sampling plans are used by AAFES for reinspection of a previously failed lot and when a supplier's quality history indicates a higher than normal risk of sub-standard quality being shipped. We recommend suppliers always use the tightened sampling plans.

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RENEWAL APPLICATION TO THE U.S. NUCLEAR REGULATORY COMMISSION FOR RADIATION SAFETY EVALUATION AND REGISTRATION OF DEVICES

November 19, 2010

HOCHIKI AMERICA COPROATION
7051 VILLAGE DRIVE, SUITE 100
BUENA PARK, CA 90621-2268
TEL: (714) 522-2246
FAX: (714) 522-2268

CONTACT: LOREN L. LEIMER – RSO
HISHAM HARAKE – ALT. RSO

IONIZATION TYPE SMOKE DETECTORS
HOCHIKI MODEL SI_SERIES

This series of detector is manufactured for both Hochiki customers as well as private labeled for specific customers.

RADIOACTIVE SOURCE Am-241 0.5 µCi

Manufactured by:

NRD, LLC.
2937 Alt Blvd.
Grand Island, NY 14072
Model A-001

Radioactive material possessed under conditions of California License 2090-30 (agreement state). Sources will be leak tested at the time of manufacture and distribution in compliance with 10 CFR Part 32.29 and as described within this document.

This detector is Principal Use Code "P" devices proposed for use under a license exemption per 10 CFR Part 30.20.

Summary Description

The SI_ series smoke detectors are industrial ionization type. They are intended to be used for the protection of life and property from fires by the detection of airborne particulates. These detectors will normally be mounted on the ceiling or below the floor. A complete system will generally be comprised of a number of detector heads which are connected to and operate from a central control unit. The SI_ series detectors are designed in such a way that the radioactive material is not readily accessible in its location within the assembly. The outside cover protects the chamber and prevents most objects from reaching the source. During installation there is no need to remove any mechanical or electrical parts which would also preclude anyone from inadvertently coming in contact with the radioactive source.

Description, Intended Use and Operation

The SI_ series ionization smoke detectors are designed with a radioactive source of (Am-241), .0.5 μCi to ionize the air. The detectors are designed to detect an abnormal decrease in Ionization current due to the combustion products created by a fire. It is installed in a fixed location. The source housing does not move during operation.

The SI_ series smoke detectors have two sampling chambers, an outer and an inner ionization chamber. Smoke or invisible gasses can freely penetrate the outer chamber, but the inner chamber is virtually closed to prevent easy entry. With both chambers ionized by radioactive source Am-241, a very small amount of current flows in the circuit. The presence of smoke or gases will influence the current flow in the outer chamber, and will cause a change in the voltage ratio between chambers. This difference is then amplified inside the detector and transmitted to the fire alarm control unit to which it is connected. (See enclosure A1).

1. Details of Construction and Use

A list of mechanical parts for SI_ series are shown in Enclsoure A2. Enclosure A3 shows the major mechanical parts uded in the SI_ series assemblies. Enclosures A4 through A25 are drawings of those part and their respective materials.

Mounting the Inner Electroce and Holder

The method of attaching the foil to the inner electrode is shown in Enclosure A16. The Foil is captured onto the inner electrode with a retaining disc which is staked in place by a hydraulically controlled welding machine. The inner electrode is placed into the insulation plate and the intermediate electrode is then snapped over the inner electrode and into insulation plate.

Securing the PCB

One leg of the intermediate electrode snaps into the insulation plate and the other leg protrudes through the insulation plate and is soldered onto one lead of the FET. This assembly process electrode is then placed over this assembly. The outer electrode has two tabs, 180^0 apart that are placed through openings in both the insulation plate and PCB. These tabs are then soldered. The outer cover protects the unit and prevents objects from approaching the source. The closest approach is approximately 2 cm. During operation the over cover, outer electrode and the intermediate electrode prevent someone or something from contacting the source.

The detector has been designed so that once the radioactive material has been assembled into the unit at the factory, it is inaccessible without someone removing the printed circuit board from the detector and de-solders the two legs of the outer electrode. After the detector has been assembled by the factory there would be no need for disassembly, by either the installers or other field service technicians.

SIJ Type Outer Cover Tamperproof Mechanism

The SIJ type detector Outer Cover (see enclosure A4) is designed such that upon locking into the Enclosure (see enclosure A6) via 4 tabs located on it's underside, cannot be removed without great difficulty or the use of a tool. This prevents any tampering by the consumer. The Outer Cover cannot be removed without the use of a tool or by destroying the unit.

The SI_ series detectors do not require removal of the Outer Cover in order to attach it to a ceiling. This is achieved through the use of a separate base in which the detector is attached. The base unit is mechanically attached to the ceiling. There is both a mechanical connection and electrical continuity via the use of metal fittings. These base units will vary dependent upon the application in which it is used (see enclosure A43).

The I_ series detectors are tested and listed to the ANSI/ UL 268 6th Edition August 14, 2009 standard. This standard requires that the detectors be subjected to variable ambient temperatures, humidity plunges, corrosive environments and vibration testing. After such testing, the detectors shall function normally. During normal use, detector is not expected to be subjected to ambient conditions outside of the listed parameters.

Total Expected Annual Distribution

It is estimated that a total of up to 5,000 detectors will be distributed in the United States by Hochiki annually. Each detector contains 0.5 µCi making the maximum distribution of Am-241 in the United States 10 millicuries. The useful life of the detector is assumed to be 10 years. This is the same useful life value commonly used in other similar fire protection devices already in service in the field.

2. Labeling and Marking

Each detector is manufactured with a permanent type, self adhesive backed label which is affixed to the bottom of the detector. (See Enclosure A26 through A29). The label contains the model name, type of detector, serial number, amount and type of radioactive material used, distribution license number, installation instruction drawing number, where to send for service, where unit was produced and other pertinent information regarding its use. The labels are expected to last the useful life of the detector. The SI_ series detectors are placed into a shock absorbing dust cover and then into a shipping carton. Each carton is printed with the name of the radio nuclide and the quantity of activity: Americium 241, 0.5 µCi. (See enclosure A31 through A38)

3. Prototype Testing and Evaluation

Tests were performed on the source after it was mounted onto the inner electrode. The tests were done by the Japan Radioisotope Association. The certification of approval under the classification C 32222 of IS-Z4821 of the above mentioned part is included in Enclosure A39. IS-Z4821 is equivalent to ANSI N542 or ISO2919 and ISO1677. The following table describes the tests and their criteria (See enclosure A40 and A41).

Test Item	Test Method	Criteria	Results
Temperature	63 min.@ 185º ±5° C 25 min.@ 45° ±50° C	Perform wipe test and soak test after subjecting samples to stress. Leak measurement for both tests to be less than 185 bg.	Less than 185 bg.
Pressure	25 kPa abs. Atmospheric pressure	Perform wipe test and soak test after subjecting samples to stress. Leak measurement for both tests to be less than 185 bg.	Less than 185 bg
Impact	50g. hammer 1m from sample	Perform wipe test and soak test after subjecting samples to stress. Leak measurement for both tests to be less than 185 bg.	Less than 185 bg
Vibration	10 min. x 3 @ 25 – 500 Hz Maximum Acceleration Vibration: 49 m/s^2	Perform wipe test and soak test after subjecting samples to stress. Leak measurement for both tests to be less than 185 bg.	Less than 185 bg
Puncture	1g hammer and pin 1m from sample	Perform wipe test and soak test after subjecting samples to stress. Leak measurement for both tests to be less than 185 bg.	Less than 185 bg

Please note that the testing conducted by Japan in Enclosures A40 and A41 and the results in the table above were performed on the SIH-24 detector. This device is as approved in a previous NRC submission for the SI_ series. The SIJ_ series detector utilizes the same RI foil and chamber assembly as the SIH detector.

An impact test was also performed by America Corporation. The results showed that the there was no leakage from the detector source. Two each of the SIJ_ series detectors were dropped from a height of 12 feet. A total of 25 drops were performed on each detector, and there were some signs of physical damage. Further investigation revealed that the inner electrode that holds the RI material was not damaged and appeared to be unaffected. The outer and inner electrodes remained very solid within the insulation plate and showed no other signs of physical damage.

Even though there signs of external physical damage, the internal components remained unaffected so as to protect the radioactive source and keeping it isolated from direct contact with the outside. (See Enclosure A42).

SOLUBILITY OF WATER AND BODY FLUIDS

The following tests were performed by Amersham International Corporation Radio-chemical Center in England to determine solubility of the foils in water and body fluids:

Test - 1 Sample foils containing 100 uCi Am-241 in an area of 1 square cm were immersed in distilled water at 98 degrees Fahrenheit for four (4) hours. In all tests, less than 0.003 uCi Am-241 were transferred to the water.

Test - 2 Sample foils containing 1 uCi in an area of 9 square mm were immersed in distilled water for three (3) weeks. In all tests, less than .001 uCi Am-241 were transferred to the water.

Test - 3 Sample foils containing 1 uCi in an area of 9 square mm were immersed in distilled water for twelve (12) weeks. Wipe out tests and immersion tests carried out on the foils indicated less than .001 uCi Am-241 were removed from the sample.

Test - 4 Sample foils containing 1 uCi in an area of 9 square mm were immersed in a 0.1m HC1 solution for four (4) hours at 98 degrees Fahrenheit. In all tests, less than .004 uCi Am-241 were removed from the sample. HC1 was chosen for this test to more closely simulate body fluids.

The following were performed by New York State University at Buffalo to determine solubility of the foils in water and body fluids for NRD Inc.

Test 1 - Sample foils containing 2 uCi Am-241 in an area of $20mm^2$ were immersed in city water at 98 degrees Fahrenheit for four (4) hours. In all tests, less than 0.0001 uCi Am-241 was transferred to the water.

Test 2 - Sample foils containing 2 uCi in an area of $20mm^2$ were immersed in city water for twelve (12) days. In all tests, less than .001 uCi were transferred to the water.

Test 3 - Sample foils containing 2 uCi in an area of $20mm^2$ were immersed in a solution simulating digestive juices with a pH of 1.96 for seven and one half (71/2) hours - Total activity released was less than .005 uCi.

Based on Test Report May 1976 David Dooley etal.

4. Quality Control

Hochiki America Incoming Inspection Sampling Plan

Hochiki America uses ANSI/ASQC Z1.4 “Sampling Procedures and Tables for Inspection” to calculate our sampling plans at incoming inspection. We are currently using AAFES General Inspection level II unless otherwise specified.

The following procedures are followed at Hochiki America Corporation for the SI_ series detector. Data will be made available through Hochiki America Corporation ‘s Quality Control Department.

Receipt of Foils

Incoming inspections are performed when containers of radioactive material are received. The outside of the shipping container is smear tested and the results recorded. The inside of the inner container is smear tested and the results recorded.

If any contamination is detected, the foils are isolated and returned to the manufacturer for disposal. If there is no contamination detected the foils are placed in the safe and the information recorded. Before the foils are dispersed to the assembly area the inside of the container is smear tested and the results recorded and initialed. If any contamination is detected the foils are isolated and returned to the manufacturer of the foils for disposal. These tests are conducted by using a cotton tip swab wetted with alcohol. Wipes are inserted into the chamber of the Radiation Monitoring Device and counted. The results are recorded on the appropriate forms. The background of the Radiation Monitoring Device will be determined by counting with the chamber empty and the results recorded in the appropriate space on the applicable form. Any wipe showing greater than 10 cpm above background will be recounted to verify results. If results continue to show more than 10 cpm above background, item(s) will be cleaned until no activity is detectable.

There are two survey meters that can be used to make these tests. Each will be calibrated by the manufacturer against known radioactive materials including americium annually. The testers are incorporated into Hochiki's equipment calibration program.

Foil Integrity from Manufacturer

Certificates of Conformance are submitted by NRD with each shipment received. These certificates insure that our vendor has checked 100% of the material for removable contamination. The certificate also insures that a minimum of LTPD 5% are checked for design conformity.

Raw Materials

Incoming inspections are done on all raw materials. Materials that make up the ionization chamber assembly are checked for dimensional conformity to controlled drawings for the individual parts. By checking for design conformity at the raw materials level design Conformity of the ionization chamber can be assured. All results are recorded on appropriate forms.

Assembled Ionization Chambers

A Minimum random sample of 45 PCs. Of daily production of ionization chambers will be wiped and recorded. The quantity represents LTPD 5% of daily production. 100% of assembled chambers are also visually inspected for design conformity.

Finish Goods Prior To Shipment

All (100%) of the daily quantity of units ready for final packaging will be wiped, counted, recorded and initialed. The following are the procedures routinely performed:

1. Indicate on the form provided the lot number, date, serial numbers and the sample size of the lot checked.

2. Background of the Radiation Monitoring Device currently being used will be determined by counting with the chamber empty and the results recorded on the appropriate form.

3. A cotton tip swab, wetted with alcohol, will be used to wipe the detectors. The area wiped will not exceed 100 cm per wipe.

4. Wipes will be taken through the slats in the outer enclosure until the swab touches the bug screen.

5. A maximum total of 100 detectors are to be wiped before the swab is placed in the meter and the findings recorded and initialed.

6. Any wipes showing a reading greater than 10 cpm above background will be recounted to verify results. If the wipe shows more than 10 cpm above background, the detectors will be re-wiped and the date recorded. If the detectors show the presence of contamination, they will be checked and cleaned until no activity is detectable, or the contaminated detector(s) will be disposed of by a NRC approved procedure.

Point of Sale Package Conformity

A random sample of Minimum of LTPD 5% will be visually checked for conformity to Hochiki America's packaging and labeling specifications

Actions Taken When Non Conforming Materials Are Found

Any physical non conformity or contamination detected will result in an investigation until the cause if found. The conclusions of this investigation will in most every case be one of the following:

1) Rejection of the entire daily productions.

2) Wipe test of 100% of the days production and disposal of contaminated units only.

3) Re-measure the sample and re-valuate.

4) In cases of physical non conformity, disposal of non conforming unit.

All investigations will follow Hochiki America Quality Procedure 7.33 which requires proper documentation of all conclusions.

Contaminated units will be properly disposed of according to applicable regulatory procedures.

5. Radiation Profiles

BY-PRODUCT MATERIAL

The radioactive isotope used in the SI_ series detector is Americium-241, manufactured by NRD Inc. The activity is 0.5 uCi, the physical size is 2.5 X 2.5 mm (see enclosure A14). The NRD model number is A001 and the NRC listed model number is A001. Each detector contains a single foil. Each detector is defined by a unique serial number. The source is mounted onto the inner electrode and crimped into place.

BY-PRODUCT, CHEMICAL & PHYSICAL FORM

The radio nuclide, in the form of Americium oxide (AmO_2), is uniformly distributed and sintered in a matrix of pure fine gold at temperatures in excess of 800 degrees C.
It is contained between a backing of pure silver and a front covering of gold-palladium alloy (94% gold, 6% palladium) by hot forging. **The metal layers, continuously welded, are extended by means of a power rolling mill to give required foil strips which contain 8 uCi per cm^2 and from which elements of foil are cut into sections containing 0.5 uCi each.** Encapsulating in this manner insures that there will be no physical or chemical changes in the radioactive material over the life of the detector.

RADIATION FROM SMOKE DETECTOR HEADS

Radiation dose from 2 SIJ_ series detectors were measured in Buena Park, CA by Hochiki America. A hologram G-M tube attached to an Eberline SRM-100 Survey Meter was used in measurements. Four positions on the detector were measured, top, bottom, left and right sides. These measurements were taken at the surface of the detector, at 5 cm and at 25 cm to the center of the tube. The tube was calibrated against a CO_{60} source. The dose rates are an average of the measurements from the two detectors (see Enclosure A44 and A45). ***To show that the SIJ_ series detector is quite safe, we have chosen to utilize the same calculations that were used in the approval of the SIH series detector (the SIH detector is now obsolete and will no longer be sold). As you can see by the data following below, the SIJ detector has much lower radiation levels than that of the SIH.***

SIJ Series	*SIH Series*
At 5 cm: .22 uR/hr	At 5 cm: 1 .6 uR/hr
At 25cm: .018 uR/hr	At 25cm: 0.3 uR/hr

RADIATION DOSE AND DOSE COMMITMENTS BASE ON ACTUAL VALUE OF SIH TYPE

To determine the external exposure dose rate it was assumed that the dose rate 5 cm from a 0.5 uCi of Am-241 is 1.6 uR/hr. This was based on the average value measured as previously outlined in Enclosure A44. From this dose rate, other distances were calculated. Such as, the dose rate 25 cm from the detector:

$$\frac{(1.6)\,(5.0)^2}{(25)^2} = .06 \text{ uR/hr}$$

The following were also calculated:

At	2cm	from the source 11 uR/hr.
At	5cm	from the source 1.6 uR/hr
At	25cm	from the source 0.06 uR/hr
At	1m	from the source 0.004 uR/hr
At	2m	from the source 0.001 uR/hr
At	3m	from the source 0.0004 uR/hr

A number of potential exposure conditions are summarized below using the values calculated previously. It was assumed in the evaluations that the detectors were mounted on the ceiling as in a normal field installation.

Example 1

A person who works in a facility protected by one or more detectors and lives in a residence with 1 detector in the bedroom and 1 or more in the hallway. The estimated dose is:

8 hrs/day work at I in 0.004 X 8 X 5 X 50 = 8 urems/y

8 hrs/day work at 2m 0.001 X 8 X 365 = 3urems/y

8 hrs/day transient at I in 0.0004 X 4 X 365 = 0.58 urems/y

Total annual dose = 11.58 microrems or 0.0116 mrems per year. If this same person were to be involved in cleaning or relocating 5 detectors, and if this operation was performed 6 times a year, and it took 1 hour per operation, the estimated dose would be: Body at 25 cm, 30 hours. X 0.06 = 1.8 urems/y or 0.002 mrems/y. Hands at surface, 30 hrs. X 4 = 120 urems/y or 0.12 mrems/y.

The total annual dose estimate for this person would be:

Body, 0.0116 + 0.002 = 0.0136 mrems/y

Hands 0.0116 + 0.12 = 0.132 mrems/y

Example 2

A person who is working at a station I in from a lot of 100 detectors that are stacked in such a way that they would be in a cube approximately 60 cm on a side. The calculated dose rate at I in from this lot is 0.12 urads/hr. The estimated dose is: 0.12 X 40 X 50 = 240 urems/y or 0.24 mrems/y.

The same person might also handle an individual detector 1 hour per day and this additional dose would be:

Body at 25 cm 0.06 X 5 X 50 = 15 urems/y or 0.02 mrems/y

Hands at 5 cm 1.6 X 5 X 50 = 400 urems/y or 0.40 mrems/y

Assuming the same person was also exposed as the person in example 1, this dose would be: Body, 0.24 + 0.02 + 0.0136 = 0.274 mrems/y. Hands, 0.24 + 0.40 + 1.32 = 0.772 mrems/y.

Example 3

A person working in a warehouse who is stationed 3m from a lot of 1000 detectors. It is calculated that the dose rate 3m from such an array would be 0.16 urads/h. The estimated dose is: 0.16 X 50 X 40 = 320 urems/y or 0.32 mrems/y. Assuming the 1000 were in 10 cartons of 100 detectors each, the same person might handle each of the 10 cartons an additional 4 times a year, 1 hour per handling. It is calculated that the dose rate from a carton containing 100 detectors is 1.6 urads/h at the surface and 0.55 urads/h at 25 cm. The estimated handling dose would be: Body at 25 cm, 0.55 X 10 X 4 = 22 urems/y or 0.02 mrems/y. Hands at surface, 1.6 X 10 X 4 = 64 mrems/y or 0.064 mrems/y. Assuming the same person were also exposed as in example 1, the estimated dose would be: Body, 0.32 + 0.02 + 0.0136 = 0.354 mrems/y. Hands, 0.32 + 0.064 + 0.132 = 0.516 mrems/y.

Example 4

A person who installs detectors 40 hours per week might have his hands at the surface of a detector 1/4 of the time, and at 5 cm 3/4 of the time. The body average would be 25 cm from a detector.

The estimated dose would be: Body, 0.06 X 40 X 50 = 120 urems/y. Hands, 25%, 4 X 40 X 50 X 1/4 = 2000 urems/y. Hands, 75%, 1.6 X 40 X 50 X 3/4 = 2400 urems/y. Total estimate dose to hands = 4400 urems/y or 4.4 mrems/y. Assuming the same person were also exposed as in Example 1, his estimated dose would be: Body, 0.12 + 0.0136 = 0.134 mrems/y. Hands, 4.4 + 0.132 = 4.53 mrems/y.

Example 5

A person working 40 hours per week, repairing, cleaning detectors with his hands at 2 cm from the source 1/2 of his time and 5 cm from the detectors the other 1/2 of his time, the body averages 25 cm from the detector. His estimated dose would be: Body, 0.6 X 50 X 40 = 120 urems/y or 0.12 mrems/y. Hands 50% of the time 2 cm, 11 X 50 X 40 X 1/2 = 11,000 urems/y. Hands 50 % of the time 5 cm, 1.6 X 50 X 40 X 1/2 = 1,600 urems/y. Total estimated dose to hands = 12,600 urems/y or 12.6 mrems/y.

Assuming the same person was also exposed as in example 1, the estimated dose would be: Body 0.12 + 0.0136 = 0.134 mrems/y. Hands, 12.6 + 0.132 = 12.73 mrems/y.

Example 6

A person who transports 10 cartons containing 100 detectors each, totaling 1000 detectors across country traveling 4000 miles. The trip took 80 hours traveling at 50 mph. The estimated dose would be: 0.16 X 80 = 12.8 urems/y or .013 mrems/y. The same person making the trip 10 more times during the year would have an estimated dose of 0.13 mrems/y. If the same person were exposed as in example 1 in addition to the 10 trips made yearly, the estimated dose would be: 1 - trip, 0.013 + 0.01 = 0.023 mrems. 10 - trips, 0.135 + 0.01 = 0.14 mrems.

EXTERNAL EXPOSURE, SUMMARY

All of the examples used are very conservative in scope, such as distances, proximity to the source, and exposure times. Examples given do not take into consideration the shielding effect provided by packaging or other materials. All the preceding estimates are less than the limits in 10 CFR 32.28, Column 1 (5 mrems/y body and 75 mrems/y hands), so it is very unlikely that these limits will be exceeded.

DOSE COMMITMENT

In the following section on Dose Commitment, several unusual examples, such as fires, are considered. While the Dose Commitments may be higher in these cases, the external exposure to such personnel as described will be negligible because of the short exposure times.

Calculations of the annual intake of AM-241 to produce a 50 year dose commitment of 0.005 rems, based on the report of ICRP Committee II on Permissible Dose for Internal Radiation follow:

$$R = \frac{EF\ (RBE)\ n\ (q)\ (3.7 \times 10^{4} \times 3600 \times 24 \times 365 \times 1.6 \times 10^{-6})}{100\ m}$$

Where EF (RBE) n = effective absorbed energy per dis, MeV
q = uCi of Am-241 deposited in organ of reference, grams
m = mass of organ of reference, grams
3.7×10^{4} = dis/sec per uCi
3600 X 24 X 365 = sec/year
1.6×10^{-6} = ergs per MeV
100 = ergs/grams per rad
and R is in units of rems/year

$$R = \frac{EF\ (RBE)\ n\ q}{m} = (1.867 \text{ X } 10^{4})$$

If bone is the organ of reference, EF (RBE) n = 280, and m = 7 X 10^3, and $R = \frac{280\ q}{7000}$

$= (1.867 \text{ X } 10^{4}) = 747\ q$ rems/year.

The integrated dose over 50 years is:

$$D = \frac{R}{\lambda}\,(1 - e\ \lambda^{-1})$$

Where R = rems/year

λ= the elimination constant = 0.693/T years^{-1}

T= the effective half-life, years

t = the time of consideration, years = 50 and D is in rems

For Bone, T is 5.1 X 10^4 days or 140 years, and

$$D = \frac{(747\ q)\ (140)}{0.693}\,(1 - e^{-0.2475}) = 3.30 \text{ X } 10^{4}\ q \text{ rems}$$

For the limiting dose of 0.005 rems,

$$q = \frac{0.005}{3.3 \text{ X } 10^{4}} = 1.5 \text{ X } 10^{-7} \text{ uCi}$$

The fraction of Am-241 inhaled which reaches the bone, Fa is 0.063, so the amount of AM-241 inhaled per year to produce a 50 year dose of 0.005 rems, Qa is:

$$\frac{1.5 \text{ X } 10^{7}}{0.063} = 2.4 \text{ X } 10^{4} \text{ uCi}$$

Similarly, the fraction reaching the bone through ingestion, f is 2.5 X 10^{-5} and Qw is

$$\frac{1.5 \text{ X } 10^{-7}}{2.5 \text{ X } 10^{-5}} = 6.1 \text{ X } 10^{-3} \text{ by ingestion.}$$

Another set of calculations using “Whole Body” as the organ of reference was made: EF (RBE)n = 57; m = 7 X 10^4 grams

T = 1.8 X 10^4 days or 49.3 years; fa = 0.25; f = 10^{-4}

This resulted in annual intake of Am-241 to produce a dose of 0.0005 rems in 50 years as follows:

Qa = 3.7 X 10^{-5} uCi by inhalation

Qw = 9.1 X 10^{-2} uCi by ingestion

Comparing these values with similar ones for bone, it is obvious that bone is the more critical organ. Similar calculations for other organs (limiting dose is 0.015 rems) also showed that bone is the most critical organ. Therefore, all of the estimated dose commitments that follow are based on bone as the critical organ. There is no evidence that Am-241 becomes airborne from sources previously described. Placing an upper limit on zero is difficult but will be done in order to estimate an upper limit on dose commitment. ORNL Report TM-2684 summarizes a number of tests performed on 12 smoke detectors which had been in service at least 5 years. The detectors contained a total of 78 foils (some Ra-226, some Am-241) and contained 20 to 130 uCi per detector. Foil construction was similar to what has been previously described. Some pertinent results of these tests were:

1. Only one of the smear tests on the external surface of the 12 detectors showed detectable alpha activity, and this was 20 d/m.

2. The average removable contamination on the Am-241 foils, as measured by smear tests, was 694 d/m.

3. Following a "12-week Environmental Test" at 110 degrees F and 80% relative humidity, on 20 foils (12 Ra-226, 8 Am-241), half of which were intentionally damaged. There was no detectable contamination on the interior surfaces of the test chamber, as measured by a smear test.

4. During 1 hour "Fire Tests" (925 degrees C for 1 hour), the average loss from Am-241 foils was 31% and the loss which was deposited on filters or became airborne, was 0.002%. The ORNL Report indicates that there was no detectable contamination on the interior surfaces of the test chamber after the "12-Week Environmental Test." From the report, levels down to 6 d/m could be detected, so it would be reasonable to assume that at least 20 d/m would have been detected on a smear test of the chamber. Also, from the report, it is noted that a total of 0.12 uCi were available to become airborne, as measured by smear tests on the foils at the beginning of the test. This amount is approximately 25 times the permissible contamination (0.005 uCi) on the foils used in production of the detectors and as measured by smear tests. If it is assumed that the sample in the ORNL Tests represented at least 4% of the chamber area, and 20 d/m could be detected, the maximum that could be released from a foil in a year would be:

$$\frac{20 \times 52}{12} = 87 \text{ d/m or } 3.9 \text{ X } 10^{-5} \text{ uCi}$$

If this detector was in a room of 4 X 5 X 3 meters, and there was one air change per hour, the concentration average over a year would be:

$$\frac{3.9 \text{ X } 10^{-5}}{4 \text{ X } 5 \text{ X } 3 \text{ X } 10^{6} \text{ X } 24 \text{ X } 365} = 7.4 \text{ X } 10^{-17} \text{ uCi/cc}$$

The above represents a maximum concentration of a room in a residence. Similarly, if a work place had a volume of 8 X 10 X 6 cubic meters, the concentration average over a year would be:

$9.3 \text{ X } 10^{-18}$ uCi/cc

If a person were exposed as in Example 1 for 12 of the 16 hours per day at home and breathed 1 X 10^{7} cc in this 16 hour period, his annual intake of Am-241 would be:

$$(7.4 \text{ X } 10^{-17}) (1 \text{ X } 10^{7}) \text{ X } 12/16 \text{ X } 365 = 2.0 \text{ X } 10^{-17} \text{ uCi/y}$$

Also, as in Example 1, if the same person were exposed at work to $9.3 \text{ X } 10^{-18}$ uCi/cc in this 8 hours per day and breathed 1 X 10 cc in this 8 hours his annual intake of Am-241 would be:

$$(9.3 \text{ X } 10^{-18})\,(1 \text{ X } 10^{7}) \text{ X } 5 \text{ X } 50 = 2.3 \text{ X } 10^{-8} \text{ uCi/y}$$

The total intakes would be $2.2 \text{ X } 10^{-7}$ uCi/y. As calculated previously, inhalation of $2.4 \text{ X } 10^{-6}$ uCi/y would result in a 50 year dose commitment of 0.005 rems. The dose commitment from an intake of $2.2 \text{ X } 10^{-7}$ uCi/y would therefore be:

$$\frac{2.2 \text{ X } 10^{-7}}{2.4 \text{ X } 10^{-6}}\,(0.005) = 0.00046 \text{ rems}$$

The above is intended to be an upper limit on zero, since there is no evidence to show that Am-241 becomes airborne under normal conditions. It can also be said that in Examples 2 - 6 previously described, that there is a negligible release of Am-241 to be respirable, even though quantities of 100 or 1000 detectors are involved.

Estimated Dose Commitments under abnormal conditions are calculated in the following examples:

Example 7

If a fire should occur in a 4 X 5 X 3 meter room, and 0.31% of the 0.5 uCi Am-241 source should become airborne, the average concentration might be:

$$\frac{0.0031 \text{ X } 1.0}{4 \text{ X } 5 \text{ X } 3 \text{ X } 10^{6}} = 2.6 \text{ X } 10^{-11} \text{ uCi/cc}$$

If a person were to remain in this room for 5 minutes, he might inhale:

$$2.6 \text{ X } 10^{-11} \text{ X } 2 \text{ X } 10^{7} \text{ X } \frac{5}{60 \text{ X } 24} = 1.8 \text{ X } 10^{-6} \text{ uCi}$$

If as previously calculated, inhalation of $2.4 \text{ X } 10^{-6}$ uCi/y would result in a 50 year dose commitment of 0.005 rems, inhalation of $1.8 \text{ X } 10^{-6}$ uCi would result in a 50 year dose commitment of approximately 0.00375 rems.

Example 8

If a fire occurred in an area having a volume of 8 X 10 X 6 cubic meters and containing 10 detectors, and 0.31% of the 50 uCi became airborne, the average concentration might be:

$$\frac{0.0032 \text{ X } 50}{8 \text{ X } 10 \text{ X } 6 \text{ X } 10^{6}} = 3.2 \text{ X } 10^{-10} \text{ uCi/m3}$$

However, it would take some period of time for the airborne contamination to become evenly distributed in a room of this size. The heat from such a fire would preclude any person from being in close proximity of the fire. There would be at least a dilution factor of 10 to where a person might be during the first few minutes of the fire. Assuming a person might take 5 minutes to evacuate, he might inhale:

$$3.2 X 10^{-11} X 2 X 10^{7} X \frac{5}{60 X 24} = 2.2 X 10^{-6} uCi$$

This corresponds to a 50 year dose commitment of:

$$\frac{2.2 X 10^{-6}}{2.4 X 10^{-6}} (0.005) = 0.010 rems$$

If a person fighting the fire would enter the room after the airborne contamination had been distributed throughout the volume, and the person was not wearing a respirator and he remained 1/2 an hour, he might inhale:

$$\frac{3.2 X 10^{-10} X 2 X 10^{7}}{2 X 24} = 1.3 X 10^{-4} uCi$$

Note: Water or other fire-fighting materials would tend to reduce the airborne contamination. This corresponds to a 50 year dose commitment of:

$$\frac{1.3 X 10^{-4}}{2.4 X 10^{-6}} (0.005) = 0.27 rems$$

Example 9

If a fire should occur in an area having a volume of 30 X 50 X 6 cubic meters and there were 1000 detectors present and 0.31% of the 500 uCi became airborne, the average concentration would be:

$$\frac{0.0031 X 500}{30 X 50 X 6 X 10^{6}} = 1.7 X 10^{-10} uCi/cc$$

Again assuming there would be a dilution factor of at 10 where a person might be during the first few minutes of the fire, and delayed his exit for 5 minutes, the person might inhale:

$$1.7 X 10^{-11} X 2 X 10^{7} X \frac{5}{60 X 24} = 1.2 X 10^{-6} uCi$$

This corresponds to a 50 year dose commitment of:

$$\frac{1.2 X 10^{-6}}{2.4 X 10^{-6}} 0.005) = 0.005 rems$$

If a fire fighter entered the area after the airborne contamination had distributed throughout the volume, and was not wearing respiratory protection, and he remained for 1/2 hour, he might inhale:

$$\frac{1.7 \mathrm{X} 10^{-10} \mathrm{X} 2 \mathrm{X} 10^{7}}{2 \mathrm{X} 24} = 7 \mathrm{X} 10^{-4} \text{ uCi}$$

This corresponds to a 50 year dose commitment of:

$$\frac{7.0 \mathrm{X} 10^{-5}}{2.4 \mathrm{X} 10^{-6}} (0.005) = 0.15 \text{ rems}$$

Example 10

A person who would be cleaning up after the fire described in Example 9 might be exposed to 0.0031 X 500 = 1.6 uCi of contamination which might have become airborne. Dunster Health Physics (Vol. 8, No. 4, Aug. "62") indicates a re-suspension factor when rummaging through dusty building rubble in an enclosed and unventilated space would be:

$$2 \mathrm{X} 10^{-6} \text{ m}^{-1}$$

Assuming the 1.6 uCi were in an area of 6 X 6 square meters, the concentration in the room would be:

$$\frac{1.6 \mathrm{X} 2 \mathrm{X} 10^{-6}}{6 \mathrm{X} 6} = 8. \mathrm{X} 10^{-8} \text{ uCi/m}^{3} \text{ or } 8.9 \mathrm{X} 10^{-14} \text{ uCi/cc}$$

If a person were to work 8 hours under these conditions, he might inhale:

$$8.9 \mathrm{X} 10^{-14} \mathrm{X} 2 \mathrm{X} 10^{7} \mathrm{X} \frac{8}{24} = 6.0 \mathrm{X} 10^{-7} \text{ uCi}$$

This corresponds to a 50 year dose commitment of:

$$\frac{6.0 \mathrm{X} 10^{-7}}{2.4 \mathrm{X} 10^{-6}} (0.005) = 0.001 \text{ rems}$$

Example 11

In the unlikely event that a person should swallow a foil and the total activity (0.5 uCi) were ingested as previously calculated, and the quantity ingested in a year is 6.1 X 10^{-3} uCi to produce a 50 year dose commitment of 0.005 rems, the dose commitment would be:

$$\frac{0.5}{6.1 \mathrm{X} 10^{-3}} (0.005) = 0.40 \text{ rems}$$

An actual case history (Health Physics, Vol. 33 No. 5, Dec. 1977) indicate the scenario in the above assumption to be extremely conservative. The reference indicated that the foils passed in a reasonable time and that there was no detectable residual body burden.

DOSE COMMITMENT SUMMARY

All of the preceding examples are considered conservative. The "ORNL Fire Test" indicated that the average loss from the Am-241 foils was 0.31%, but most of this was deposited on the tubes containing the foils, and only 0.002% became airborne and was deposited on filters. All dose commitments are less than 10 CFR 32.28; Column I limits, under normal operating conditions. In abnormal situations, the estimates indicate that Column II may be exceeded slightly, but they are all less than the Column III limits. Tests have shown that it is unlikely that there will be significant reduction of containment from wear and abuse likely to occur in normal handling and use during the lifetime of the SI_ series detector.

6. Installation

SI_ series detectors are intended for commercial and industrial use. They are one part of an entire fire safety system. Detectors are recommended for installation in either the ceiling or under floor applications. They must be connected properly to a fire and/ or smoke detection circuit as part of a fire safety system. There is no risk to persons responsible for installing the detectors. All installations are required to be done by qualified persons.

7. Radiological Safety Instructions

As stated above, unless detectors are subjected to extraordinary damages there is no potential for leakage of hazardous materials.

PRODUCT DISPOSAL

All SI_ series detectors that are returned to the factory for surveying will be disposed of through facilities that are authorized to handle radioactive materials. In addition, the following is an estimate dose commitment from concentrating forty thousand smoke detectors, each containing 0.5 uCi in a public landfill. The internationally recognized dose of Am-241 is 0.0129 R/hr/Ci/m. Thus the exposure rate at 1 meter from a 20 mCi Am-241 source is less than 0.26 mr/hr. However, it is unlikely due to the bulk of 40,000 detectors, anyone could get closer than approximately 5 meters from the effective center of the pile. The effective exposure rate is, therefore, 10nR/hr to anyone at the pile. This rate is without consideration of shielding by the detectors non-radioactive components. A landfill operator would reside less than an hour while burying the pile. His total dose would be less than 10nR. No significant internal dose from inhalation would be expected to result from disposal of the detectors to the workers of the landfill. Assuming an unlikely 1% airborne release of activity (Am-241), doses to critical organs would be: Lungs - 0.15 rem; Liver - 4.4 rem; Bones - 2.1 rem. These dosages are less than 10 CFR 32: 28 Column III. Long term effects to local populations would be expected to be negligible. The solubility of $Am0_2$ in a gold matrix such as the foil, is extremely low and negligible activity would be expected to reach from the burial site even under the worst conditions. Radium watch dial faces and smoke detectors over many years of burial have not been found to have contaminated public landfill operation. In addition, radium is in a far more soluble chemical physical form than $AM0_2$. In our opinion, random disposal of AM-241 containing smoke detectors from accidental or normal conditions will not contribute to a measurable cumulative environmental hazard.

8. Accompanying Documents

There are no accompanying documents provided with the products. All information pertaining to radiological safety are printed on the individual product labels as well as packaging.

9. Servicing

Any ionization detectors that are returned to Hochiki America for servicing undergo the following:

1. Indicate on form provided date, model type, serial number and operator name.
2. Perform a wipe test as indicated on steps 24 of the finished goods prior to shipment section above.
3. Record the results on the form.
4. Perform servicing.
5. The detector is tested to insure functionality.
6. The outer cover is removed and cleaned.
7. The cover is reassembled to the unit.
8. Repeat steps 2, 3 again after re-assembling unit.
9. The unit is re-calibrated.
10. If any of the above cannot be completed satisfactorily the unit is disassembled and the radioactive source is disposed of properly.
11. The service technician has been trained in the proper handling of radioactive materials.

10. Leak Test

The **NRC** does not require periodic testing of devices that contain less than 10 microcuries of alpha emitting material. However units are wipe tested prior to and on completion of manufacture, prior to distribution as well as before and after servicing as described above.

11. Additional Information

The SI_ series detectors are manufactured under very strict quality control procedures and distributed in accordance with the requirements of Underwriters Laboratories UL 268 specifications, the laws of the state of California and the State Fire Marshall, the Nuclear Regulatory Commission, Factory Mutual Research, and other industrial governing bodies.

12. Product Warranty

Hochiki America warrants the equipment manufactured by it to be free from defects in material and workmanship (does not apply to batteries). Hochiki America will repair or replace, at its option, any equipment which it determines to contain defective material or workmanship. Said equipment will be returned to purchaser F.O.B., Hochiki America, California. Hochiki America shall not be obligated to repair or replace equipment which has been repaired by others, abused, improperly installed, altered, or otherwise misused or damaged in any way. **HOCHIKI AMERICA WILL NOT BE RESPONSIBLE FOR ANY DISMANTLING, RE-ASSEMBLY OR RE-INSTALLATION CHARGES**. We warrant our devices to DIRECT PURCHASERS ONLY for one (1) year from date of shipment, with the exception of the smoke detectors, which have a three (3) year warranty. We will replace defective goods or credit them at invoice price per our option. Merchandise that is returned for defective reasons, and found not to be defective will be returned to the sender with charges commensurate with the extent of inspection and services performed, plus freight charges. After the warranty period expires, a service charge will be made for material and labor. This warranty is in lieu of all other warranties expressed or implied. Hochiki America shall not be liable for special, indirect, incidental or consequential damages claimed in connection with any revision of this agreement by others.

13. Safety Analysis

As noted above it is highly unlikely that materials will accumulate to a point in which it would pose a safety hazard. The table in part 32.28 was used as a guideline to insure that accumulations do not exceed these amounts. Thus exposure dosages will be held to acceptable levels. Due to the low level nature of the radioactive source it would require an accumulation that would be unacceptable to the company to continue conducting day to day business activities.
Such an accumulation would be bad business economics in terms of inventory levels. Due to the conditions of use it is highly unlikely that any damages would occur when considering the effectiveness of shielding.

Hochiki America fully intends to distribute materials to persons exempt from licensing.

Application Enclosure Index

SIJ Enclosure Number	Description
A1	Ionization Principle
A2	Mechanical Components List
A3	Exploded View
A4	Outer Cover
A5	Outer Cover Assembly
A6	Enclosure
A7	Insulation Plate
A8	Shield Case
A9	Shield Plate
A10	FET Contact
A11	Intermediate Electrode
A12	Outer Electrode
A13	Outer Electrode Assembly
A14	AM-241 Foil Source
A15	Inner Electrode
A16	Inner Electrode Assembly
A17	RI Cover
A18	Locking Screw
A19	Insect Screen
A20	Contact Blade
A21	Contact Clip
A22	Insert Metal
A23	Enclosure Assembly
A24	Potted JFET
A25	PCB Assembly
A26	Nameplate SIJ-24
A27	Nameplate SIJ-24DH
A28	Nameplate D281A
A29	Nameplate 67-1033
A29-1	Nameplate IS-24
A30	Dust Cover
A31	Warning Label
A32	Retail Labels (Various)
A33	1 Piece Box
A34	5 Piece Box
A35	50 Piece Master Carton
A36	100 Piece Master Carton
A37	1 Piece Box Assembly
A38	5 Piece Box Assembly
A39	Japan Radioisotope Association Certificate
A40	Japan Radioisotope Association Test Report
A41	Reliability Test Report
A42	Shock Test
A43	Detector Base
A44	SIH Radiation Measurement Profile
A45	SIJ Radiation Measurement Profile

Hochiki America Corporation

Ionization Principle

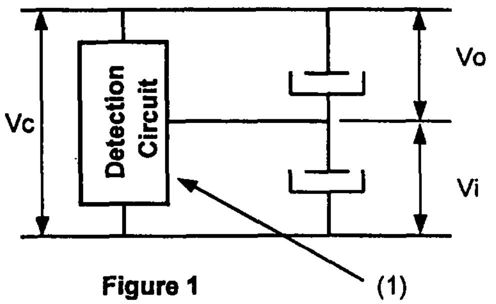


Figure 1

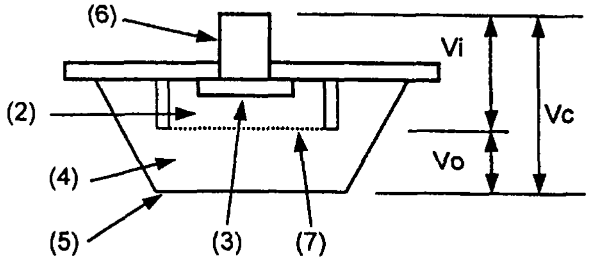


Figure 2

(1) Detection Circuit
(2) Inner Ion Chamber
(3) Radiation Source (AM-241)
(4) Outer Ion Chamber
(5) Outer Electrode
(6) Inner Electrode
(7) Intermediate Electrode

Vo: Outer Ion Chamber Voltage

Vi: Inner Ion Chamber Voltage

The inner ion chamber compensates for environmental conditions, such as temperature and atmospheric pressure. The outer ion chamber is designed to have an unsaturated characteristic while the inner ion chamber has a saturated characteristic.

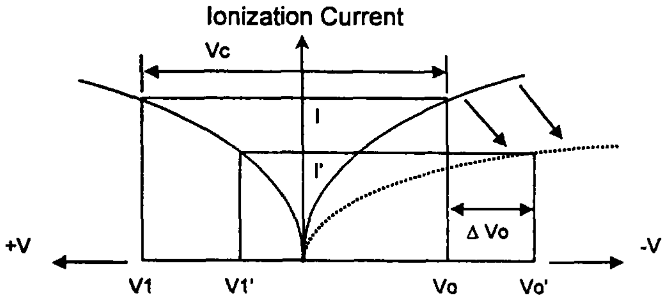


Figure 3

The outer ion chamber and the inner ion chamber are at Vo and Vi value respectively, while sharing Vc, the voltage applied to both ion chambers. The outer ion chamber is shown with a solid line in Figure 3. With the outbreak of a fire, smoke particles enter the outer chamber and attach themselves to the ions flowing in the chamber, resulting in a decreased ionization current to flow in the ion chamber. The ionization current Vs. voltage curves in the outer ion chamber as shown by the dotted line in Figure 3, with the current decreased to I', and the outer ion chamber voltage variation ΔVo will be: ΔVo = Vo'-Vo. Therefore, the voltage shows an increase by ΔVo as compared with that of when no smoke exists in the chamber. A further increase in the amount of smoke will allow the curves to move toward the right thus reducing the ionization current. Consequently the outer ion voltage V'o will be larger, resulting in a further increase in ΔVo.

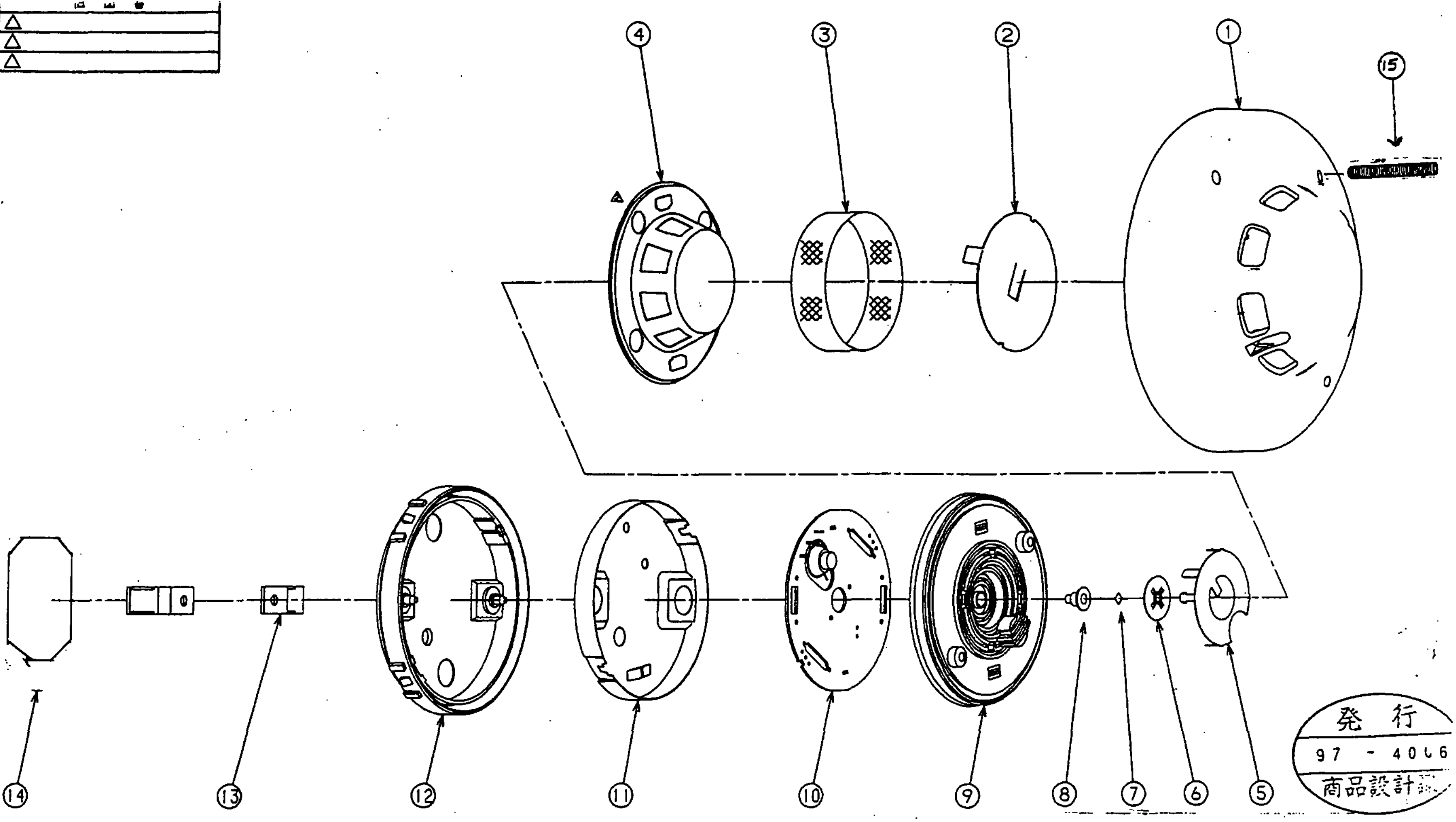
Enclosure A1

Loren L. Leimer 6/2000

SIJ-24 MECHANICAL COMPONENTS LIST

ITEM	MATERIAL	DIMENSION (mm)	MOUNTING	MANUFACTURER	REMARKS
Enclosure	ABS or Equivalent	ϕ67 x 10.5		Hochiki	Yellow Card No. E47016 (R)
Outer Cover	ABS or Equivalent	ϕ100 x 38	Fitting	Hochiki	Yellow Card No. E47016 (R)
Inner Electrode	Stainless Steel	ϕ13 x 6	Fitting	Hochiki	
Intermediate Electrode	Stainless Steel	ϕ28 x 8.2	Soldering	Hochiki	
Outer Electrode	Stainless Steel	ϕ62.2 x 16.1	Soldering	Hochiki	
Radioactive Source	Am241 0.5uCi	2.5 x 2.5 t=0.2	Staked	NRD INC.	A-001
RI Holder	Stainless Steel	ϕ13	Staked	Hochiki	
Shield Case	Steel	ϕ58.6 x 6.8	Fitting	Hochiki	Solder Plating
Shield Plate	Stainless Steel	ϕ40	Fitting	Hochiki	
Insect Screen	Stainless Steel	127 x 12.5	Spot Welding	Hochiki	
Insulation Plate	Polypropylene	ϕ62 x 13	Fitting	Hochiki	
Contact Blade	Brass	8 x 30 x 5.5	Staked	Hochiki	Solder Plating
P.C. Board	Composite	ϕ53.8 x 0.8	Screwed	Stay Electronic Co., LTD., or Sogo Circuit Co., LTD., or Japan Auto-tech Industries Co., LTD or Equivalent level of manufacture	MC4.MC3 or SCC32, SCC32A or Auto-6 or Equivalent
Name Label	Polyethylene Terephtalate Film	40 x 30	Adhesive	Hochiki	

ENCLOSURE A2



発行
97 - 4066
商品設計

CONTROLLED
DATE: 9/5/2000
ENGINEERING

番号	品 名	個数	図 番	番号	品 名	個数	図 番
1	外カバー SIJ	1	2-3-275-0460	9	絶縁板 SIJ	1	2-3-275-0462
2	シールド板 0293	1	2-3-295-0293	10	プリント基板 SIJ-24	1	2-1-803-3611
3	防虫網 0294	1	2-3-295-0294	11	シールドケース 0292	1	2-3-295-0292
4	外部電極加工 SIJ	1	2-1-490-0363	12	端子盤 SIJ	1	2-3-275-0461
5	中間電極加工 0301	1	2-1-490-0301	13	嵌合金具 0459	2	2-3-295-0459
6	RIカバー 0297	1	2-3-295-0297	14	総合銘板 SIJ-24	1	2-3-015-1621
7	放射線源 0303	1	2-3-295-0303	15			
8	内部電極 0091	1	2-3-315-0091	16			

REV	DATE	BY	CHANGE
B	9-5-00	RN	CHANGED TITLE
A	[illegible]	JA	Added Screw Locking #15
—	[illegible]	HC	Initial Release

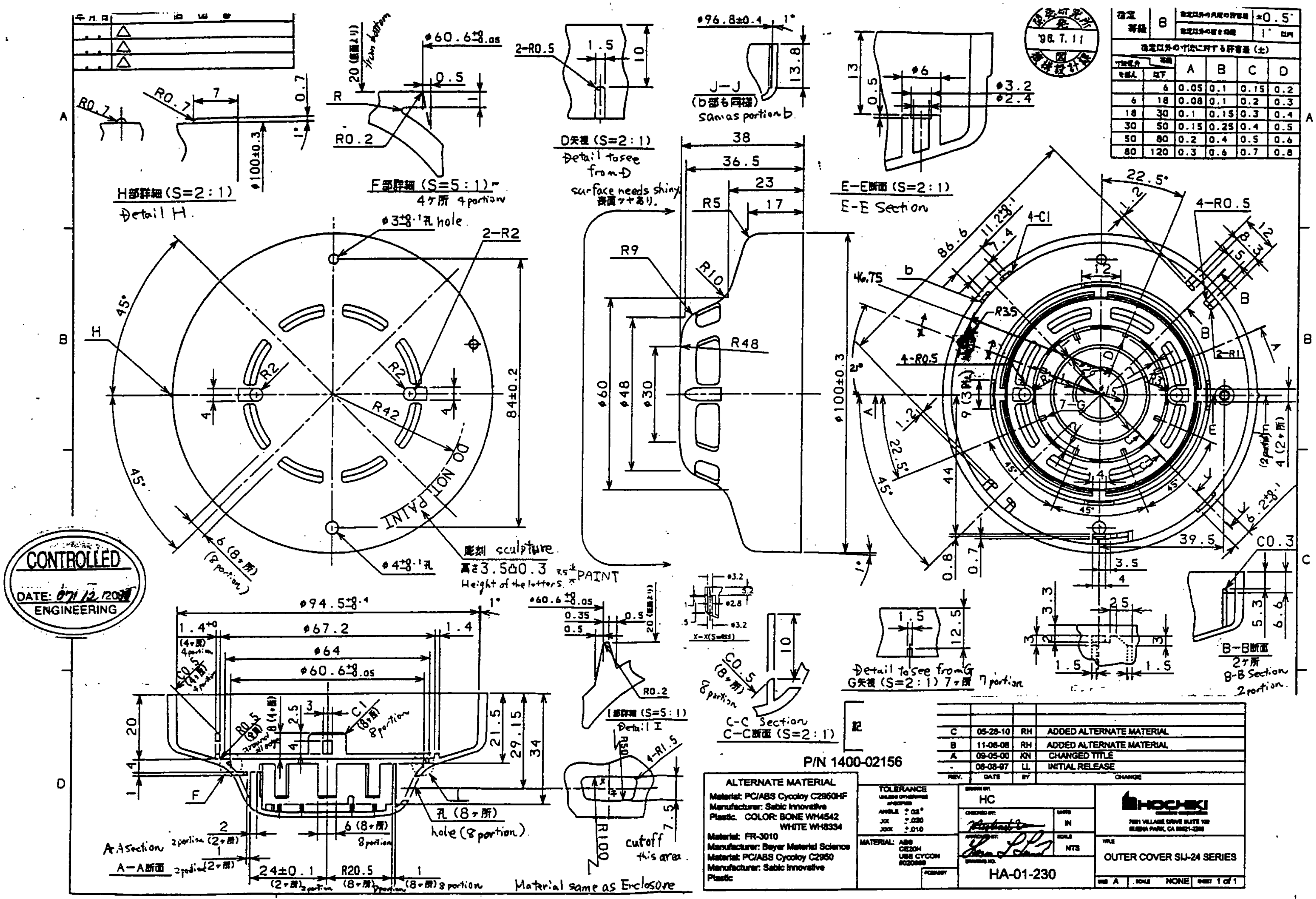
DRAWN BY HC DATE 10/21/98

HOCHIKI AMERICA CORP.
[illegible] INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

DRAWING NO: HA-01-213
TITLE: ASSEMBLY, SIJ-24 SERIES

記事	—				
材質	—				
承認	調査	設計	製図	図名	ME SIJ-24 展開図
		川端	川端		
縮尺		設計年月日		図番	2-1-603-0938-163-2/2
1:1		96.10.22			
単位	mm	第3角法		ホーチキ株式会社	

ENCL. A3



CONTROLLED
DATE: 07/12/2010
ENGINEERING

'98. 7. 11

指定等級	B	指定以外の角度の許容差	±0.5°
		指定以外の抜き勾配	1° 以内

指定以外の寸法に対する許容差 (±)

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8

記

P/N 1400-02156

REV.	DATE	BY	CHANGE
C	05-28-10	RH	ADDED ALTERNATE MATERIAL
B	11-06-06	RH	ADDED ALTERNATE MATERIAL
A	09-05-00	KN	CHANGED TITLE
-	08-08-97	LL	INITIAL RELEASE

ALTERNATE MATERIAL
Material: PC/ABS Cycoloy C2950HF
Manufacturer: Sabic Innovative Plastic.
COLOR: BONE WH4542
WHITE WH8334
Material: FR-3010
Manufacturer: Bayer Material Science
Material: PC/ABS Cycoloy C2950
Manufacturer: Sabic Innovative Plastic

TOLERANCE UNLESS OTHERWISE SPECIFIED
ANGLE ±.02°
.XX ±.020
.XXX ±.010

MATERIAL: ABS CE20H UBS CYCON #020900

DRAWN BY: HC
UNITS: IN
SCALE: NTS
DRAWING NO. HA-01-230

HOCHIKI
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE
OUTER COVER SIJ-24 SERIES

SIZE A SCALE NONE SHEET 1 of 1

ENCL. A4

月日	旧図番
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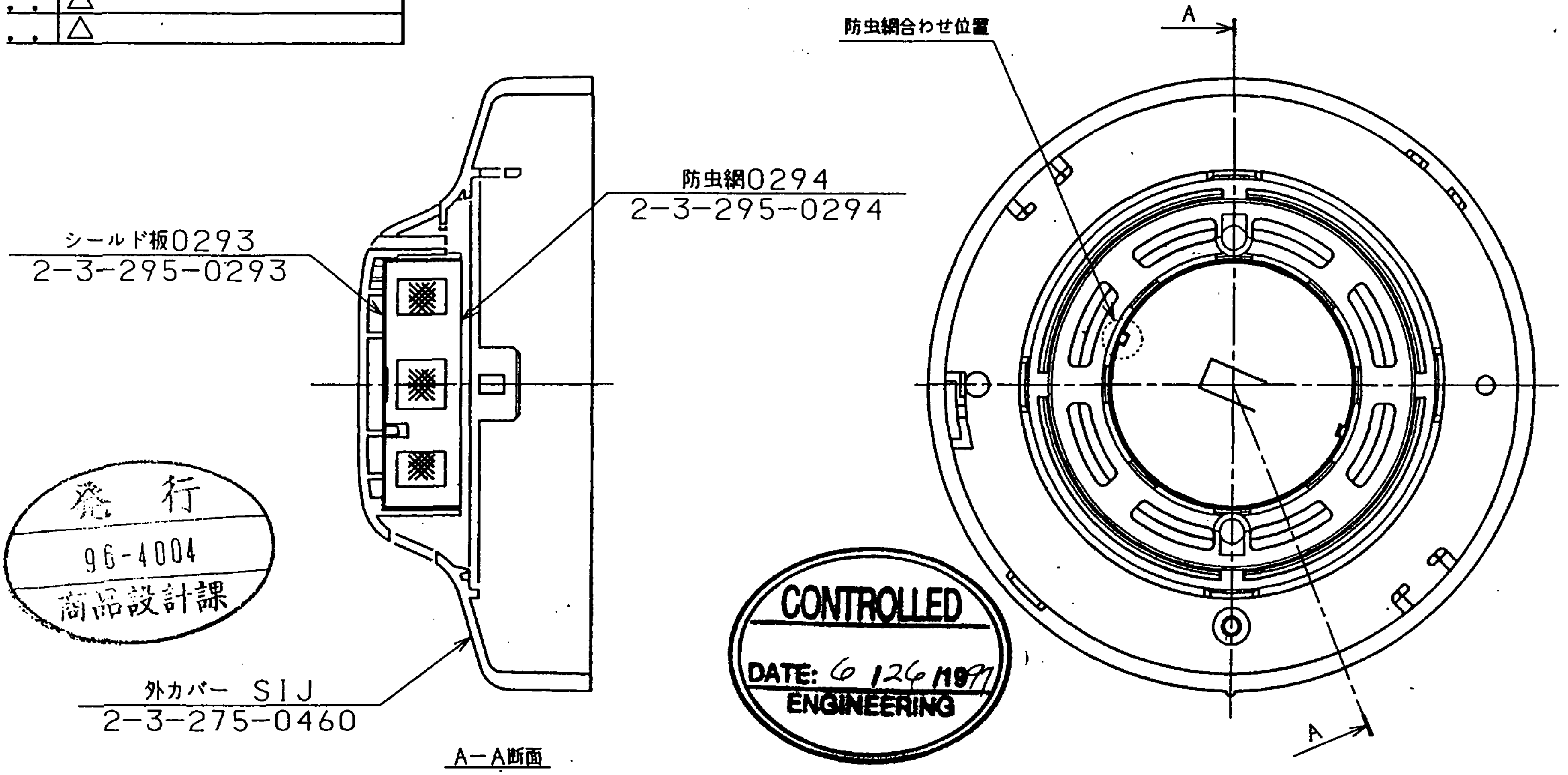


A－A断面

発行
96-4004
商品設計課

CONTROLLED
DATE: 6/26/1997
ENGINEERING

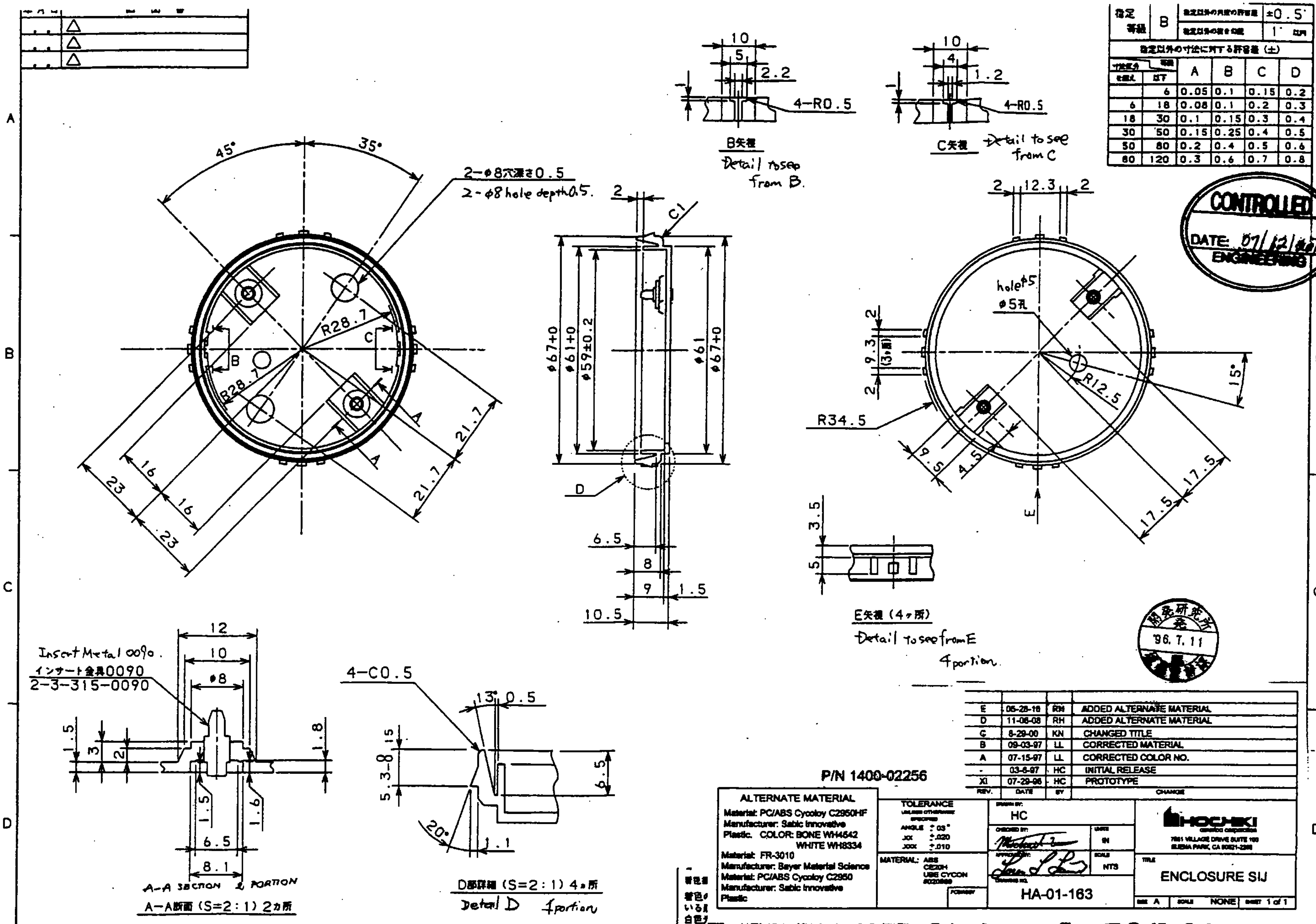
. .	⚠2		
. .	⚠		
月日	訂正事項	設計	承認
記事	---		

材質	---
仕上	---

承認	調査	設計	製図
三輪	小沢	川端	川端
縮尺	1:1	単位	mm

REV.	DATE	BY	CHANGE
–	6-26-97	HC	Initial Release

DRAWN BY: HC	DATE 6/28/98	HOCHIKI AMERICA CORP. 5415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY:	SCALE	
DRAWING NO: HA-01-208		TITLE: ASSEMBLY OUTER COVER SIJ



指定等級	B	[illegible]	±0.5°
		[illegible]	1° 以内

指定以外の寸法に対する許容差 (±)

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	'50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8

CONTROLLED
DATE: 07/12/2010
ENGINEERING

開発研究所
'96. 7. 11

REV.	DATE	BY	CHANGE
E	05-28-16	RH	ADDED ALTERNATE MATERIAL
D	11-06-08	RH	ADDED ALTERNATE MATERIAL
C	8-29-00	KN	CHANGED TITLE
B	09-03-97	LL	CORRECTED MATERIAL
A	07-15-97	LL	CORRECTED COLOR NO.
-	03-6-97	HC	INITIAL RELEASE
XI	07-29-96	HC	PROTOTYPE

P/N 1400-02256

ALTERNATE MATERIAL

Material: PC/ABS Cycoloy C2950HF
Manufacturer: Sabic Innovative
Plastic. COLOR: BONE WH4542
WHITE WH8334
Material: FR-3010
Manufacturer: Bayer Material Science
Material: PC/ABS Cycoloy C2950
Manufacturer: Sabic Innovative
Plastic

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.020
.XXX ±.010

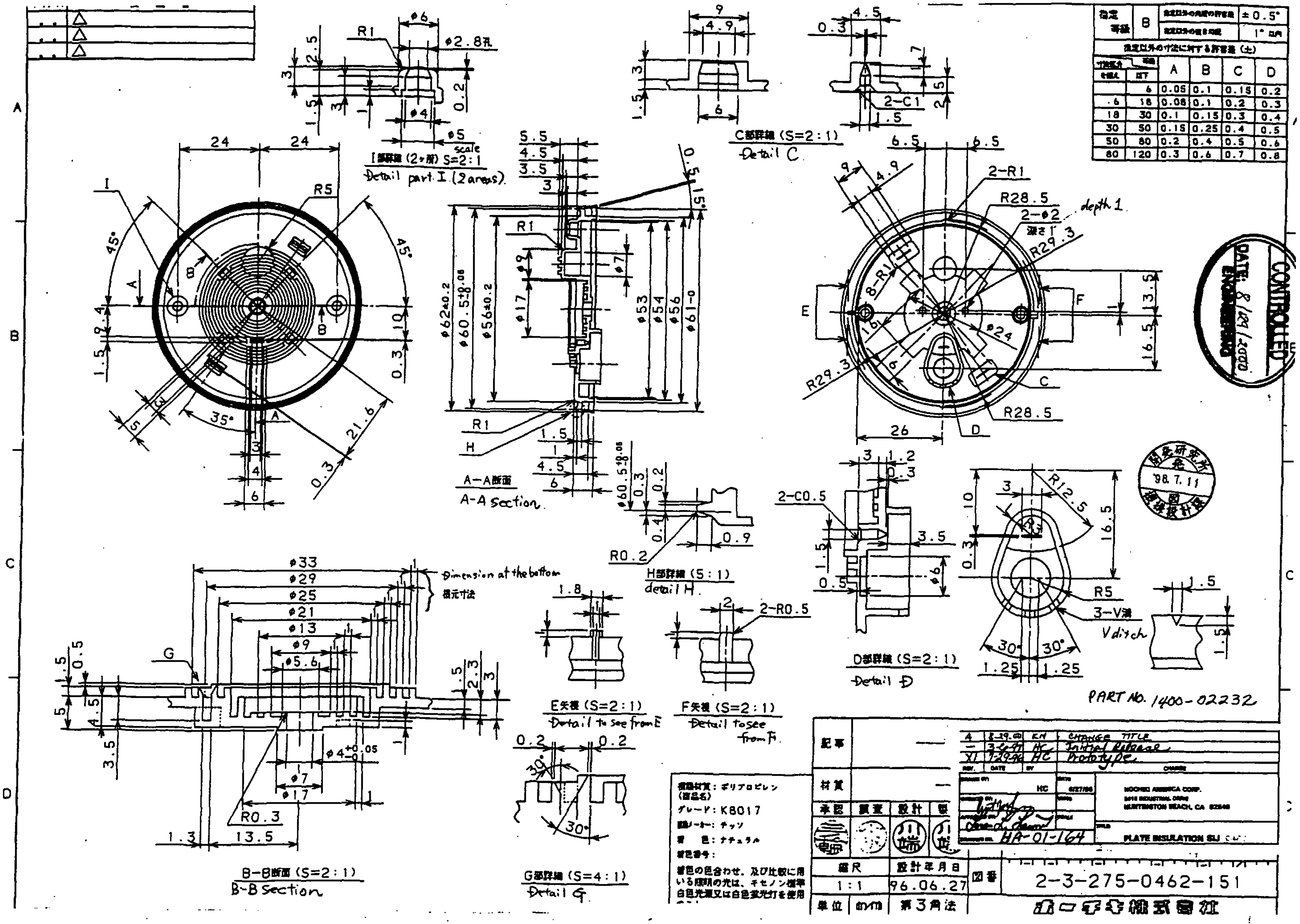
MATERIAL: ABS
C220H
UBE CYCON
#020889

DRAWN BY: HC
CHECKED BY:
UNITS: IN
APPROVED BY:
SCALE: NTS
DRAWING NO. HA-01-163

HOCHIKI america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE: ENCLOSURE SIJ
SIZE A
SCALE NONE
SHEET 1 of 1

ENCL. A6



PART No. 1400-02232

指定等級	B	指定以外の角度の許容差	±0.5°
		指定以外の直角度	1° 以内

指定以外の寸法に対する許容差（±）

寸法区分 を越え	以下	A	B	C	D
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6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8

CONTROLLED
DATE: 8/29/2000
ENGINEERING

開発研究所
'98.7.11
設計課

REV.	DATE	BY	CHANGE
A	8-29-00	KN	CHANGE TITLE
—	3-6-97	HC	Initial Release
XI	7-29-96	HC	Prototype

DRAWN BY: HC DATE: 6/27/96
CHECKED BY:
APPROVED BY:
DRAWING NO.: HA-01-164

NOCHEK AMERICA CORP.
5418 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

TITLE: PLATE INSULATION SU

樹脂材質：ポリプロピレン
（商品名）
グレード：K8017
樹脂メーカー：チッソ
着　色：ナチュラル
着色番号：
着色の色合わせ、及び比較に用いる照明の光は、キセノン標準白色光源又は白色蛍光灯を使用

記事	—
材質	—

承認	調査	設計	製

縮尺	設計年月日
1:1	96.06.27
単位 m/m	第3角法

図番 2-3-275-0462-151

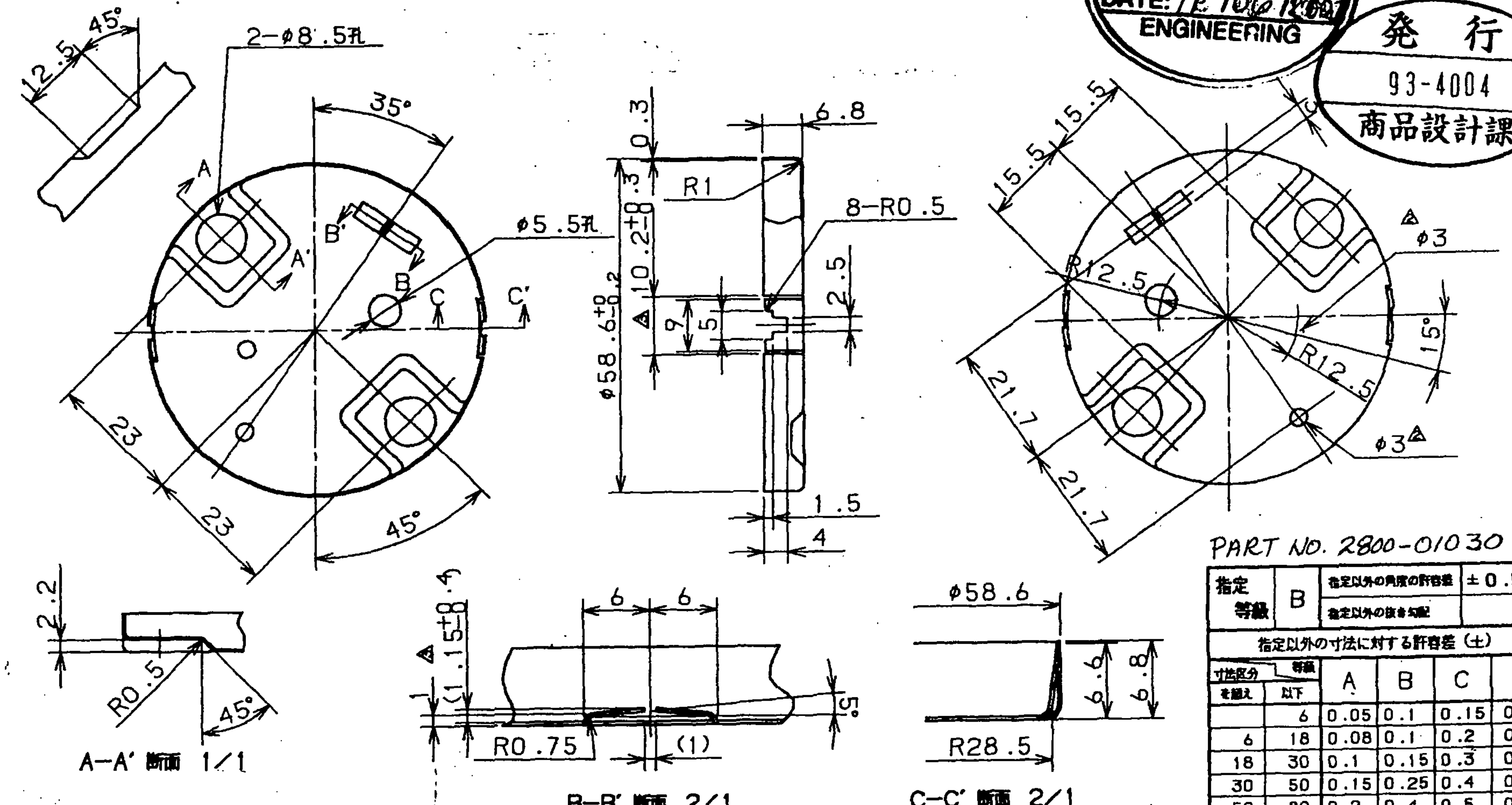
[illegible]株式会社

ENCL. A7

ENCL. A8

CONTROLLED
DATE: 12/10/2001
ENGINEERING

発　行
93-4004
商品設計課



PART NO. 2800-01030

指定 等級	B	指定以外の角度の許容差	±0.5°
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6

MATERIAL:
PRE-SOLDER PLATED STEEL
(90/10 –60/40 Sn/Pb RATIO @ > 5μm PLATING THICKNESS)

ALTERNATE MATERIAL:
STAINLESS STEEL (SUS304)

t=0.3

REV.	DATE	BY	CHANGE
C	11/08/01	RH	ADDED ALTERNATE MATERIAL
B	10/18/01	RH	ADDED PLATING THICKNESS >7.5μm
A	01/12/96	LL	ADDED 60%Sn 40%Pb
–	04/22/94	HC	INITIAL RELEASE

2-3-295-0292-155

DRAWN BY: HC
UNITS: mm
SCALE
DRAWING NO. HA-01-058

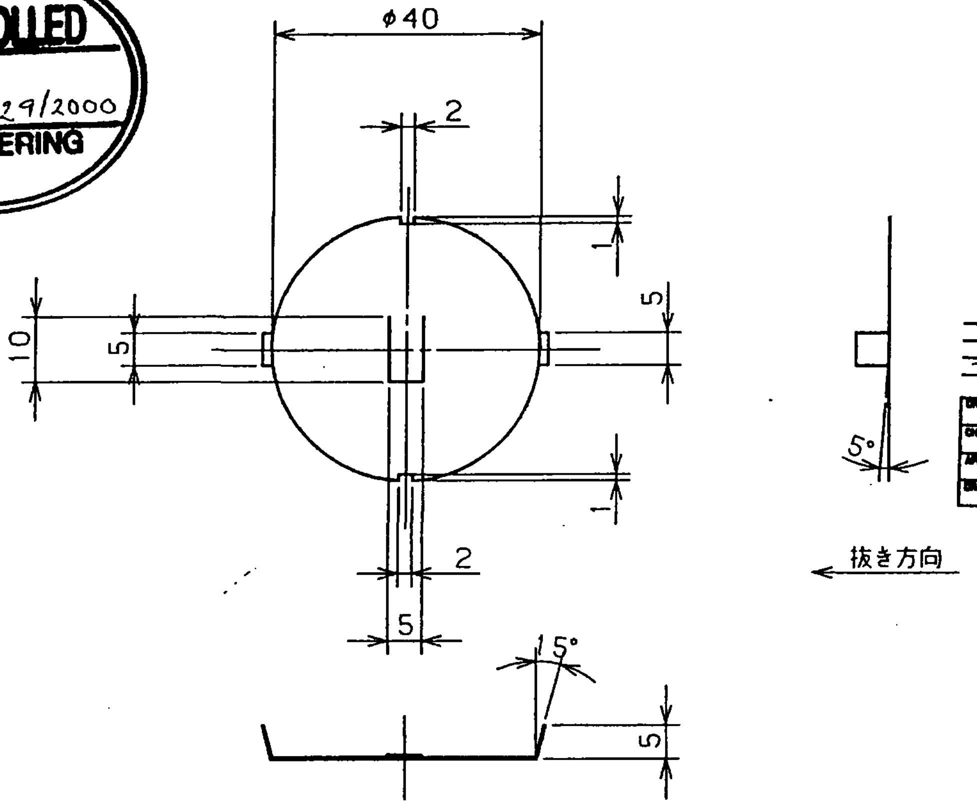
HOCHIKI

TITLE: SHIELD CASE SIJ

2

ENCL. A9

CONTROLLED
DATE: 8/29/2000
ENGINEERING



PART NO. 2800-01130

t=0 .3

指定等級	B	指定以外の角度の許容差	± 1°
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分 を超え	以下	A	B	C	D
	6	0 .05	0 .1	0 .15	0 .2
6	18	0 .08	0 .1	0 .2	0 .3
18	30	0 .1	0 .15	0 .3	0 .4
30	50	0 .15	0 .25	0 .4	0 .5
50	80	0 .2	0 .4	0 .5	0 .6
80	120	0 .3	0 .6	0 .7	0 .8
120	180	0 .4	0 .9	1 .0	1 .1
180	250	0 .6	1 .2	1 .3	1 .4
250	500	0 .8	1 .5	1 .7	1 .9

REV.	DATE	BY	CHANGE
A	8/29/00	LA	CHANGE TITLE
	4-22-'94	HC	Initial Release

DRAWN BY: HC
CHECKED BY:
APPROVED BY:
DRAWING NO. HA-01-074

HOCHIKI
HOCHIKI AMERICA CORP.
5415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649
TITLE Shield Plate

発 行
93-4004
商品設計課

			材質	SUS304	承認	調査	設計	製図	設計年月日	枚数	図名	シールド板0293
. .	②				早川	[illegible]	八島	八島	63 .8 .10	／	図番	2-3-295-0293-151
. .	①											
年月日	訂正事項	設計	仕上		縮尺	1／1	単位	mm	第3角法		ホーチキ株式会社	
記事												

ENCL. A10

REV.	DATE	BY	CHANGE
A	8/29/00	EN	CHANGE TITLE
–	4-22-96	HC	Initial Release.

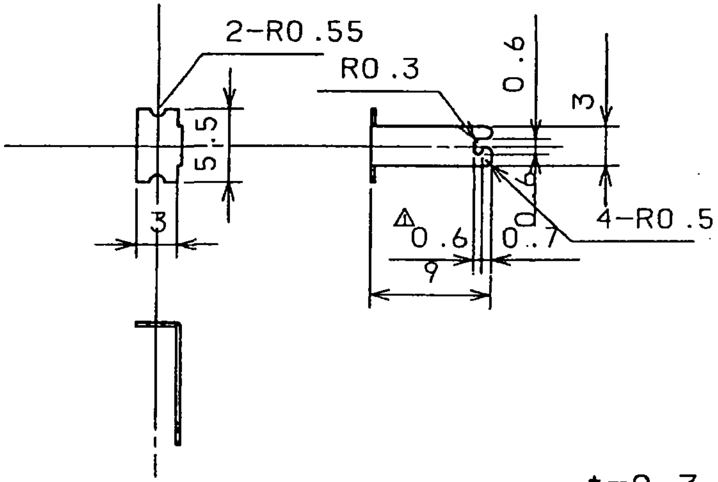
DRAWN BY: HC	**HOCHIKI** HOCHIKI AMERICA CORP. 5415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	
APPROVED BY:	
DRAWING NO. HA-01-068	TITLE Contact FET SIJ

CONTROLLED
DATE: 8/29/2000
ENGINEERING

指定 等級	B	指定以外の角度の許容差	±0.5°
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1
180	250	0.6	1.2	1.3	1.4
250	500	0.8	1.5	1.7	1.9



t=0.3

発行
93-4004
商品設計課

PART NO. 2800-01090

. .	②		材質	⚠ハンダメッキ鋼板	承認	調査	設計	製図	設計年月日	枚数	図名	FETリード0300
1.46	⚠ FETハンダ部，材質変更	長島			早川	中	八島	八島	63.8.10	／	図番	2-3-295-0300-152
年月日	訂 正 事 項	設計	仕上		縮尺	2/1	単位	mm	第3角法		ホーチキ株式会社	
記事												

ENCL. A11

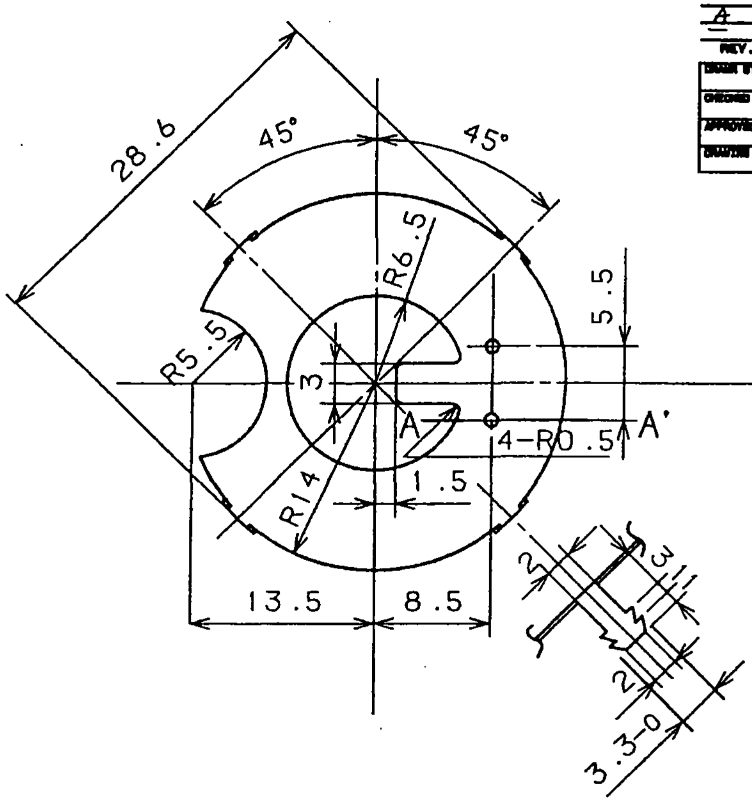
A	8/29/00	KN	CHANGED TITLE
—	4-22-94	HC	Initial Release
REV.	DATE	BY	CHANGE

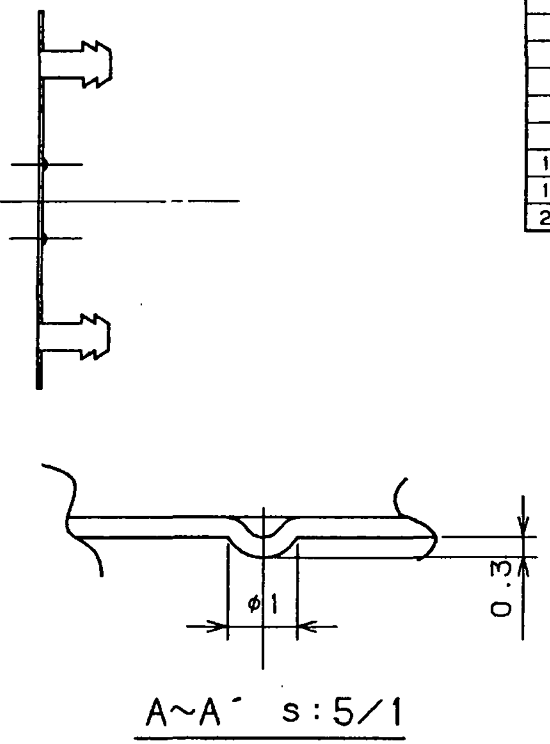
DRAWN BY: HC	**HOCHIKI** HOCHIKI AMERICA CORP. 5415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY: Kenji Kimura	
APPROVED BY:	
DRAWING NO. HA-01-067	TITLE: Middle Electrode SIJ

指定 等級	B	指定以外の角度の許容差	±0.5°
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分 を超え	等級 以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1
180	250	0.6	1.2	1.3	1.4
250	500	0.8	1.5	1.7	1.9





A~A´ s:5/1

CONTROLLED
DATE: 8/29/2000
ENGINEERING

発 行
93-4004
商品設計課

PART NO. 2800-01070

t=0.3

. .	⚠2		材質	SUS304	承認	調査	設計	製図	設計年月日	枚数	図名 中間電極0296
. .	⚠1				早川	中	八島	八島	63.8.10	/	図番 2-3-295-0296-151
年月日	訂 正 事 項	設計	仕上		縮尺	2/1	単位	mm	第3角法		ホーチキ株式会社
記事											

REV.	DATE	BY	CHANGE
B	8/29/00	KN	CHANGE TITLE
A	5-15-97	LL	Added 3rd 6.5mm hole
–	3-6-97	HC	Initial Release
X1	7-26-96	HC	Prototype.

DRAWN BY: HC	DATE 6/27/96	HOCHIKI AMERICA CORP. 5415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649	
CHECKED BY:	UNITS		
APPROVED BY:	SCALE	TITLE:	
DRAWING NO: HA-01-165		ELECTRODE OUTER SIJ	

CONTROLLED
DATE: 8/29/2000

ENCL. A12

指定 等級	B	指定以外の角度の許容差	± 0.5°
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6

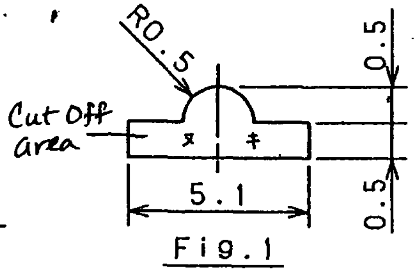
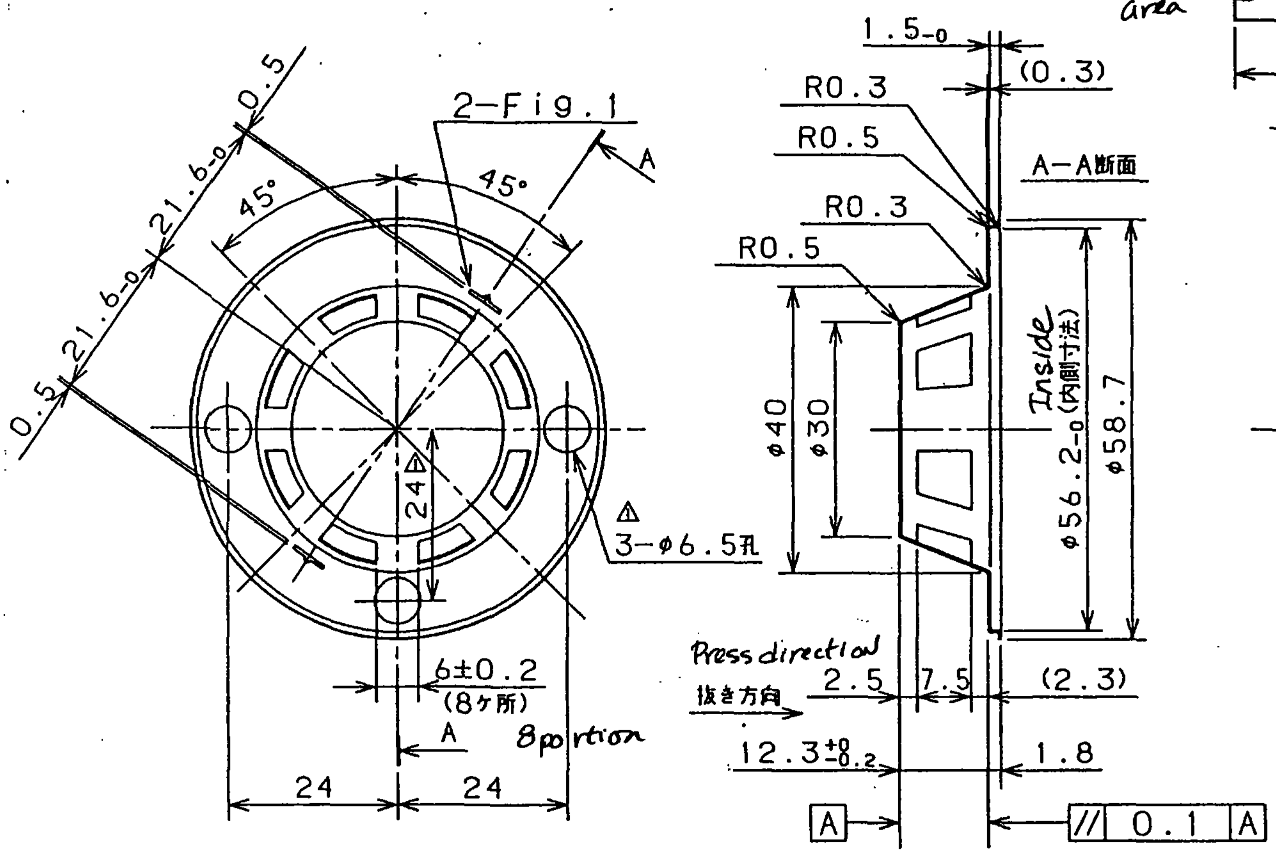
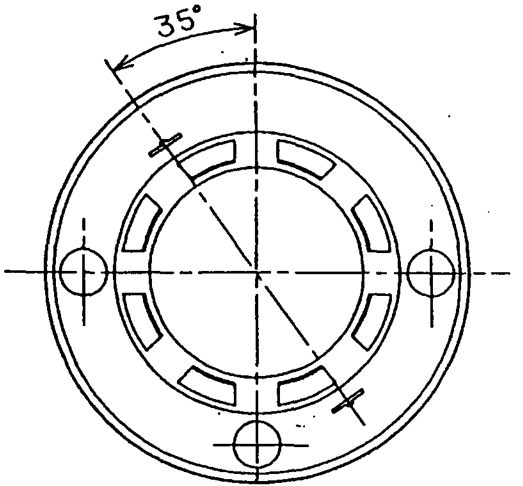


Fig.1





発行
97 - 4006
商品設計課

Part No. 2800-01102

Material

年月日	訂正事項	設計	承認	材質	SUS304 t=0.3
	△2				
97.02.17	△1 φ6.5孔の追加	川端	三ノ輪		
記事	–––			仕上	Finish 脱脂 Remove Grease

承認	調査	設計	製図	設計年月日	図名	外部電極 SIJ
		川端	川端	96.06.27	図番	2-3-295-0489-152
縮尺	1:1	単位	mm	第3角法		ホーチキ株式会社

1 2 3

原図保管

ENCL. A13

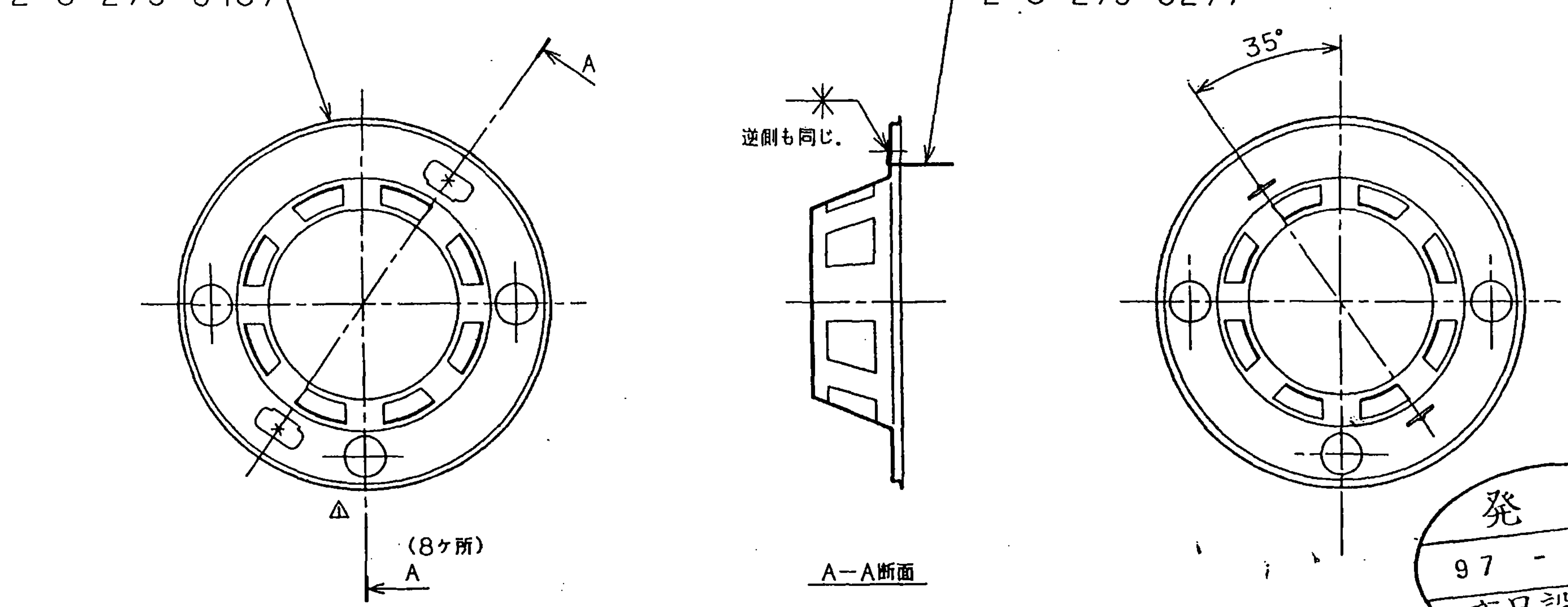
月 日	旧 図 番
. .	△
. .	△
. .	△

CONTROLLED
DATE: 6 /26 /1997
ENGINEERING

指定等級	B	指定以外の角度の許容差	± 0.5°
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6



発 行
97 - 4006
商品設計課

REV.	DATE	BY	CHANGE
—	6-26-97	HC	Initial Release

DRAWN BY: HC
DATE 6/28/96
CHECKED BY:
UNITS
APPROVED BY:
SCALE

HOCHIKI AMERICA CORP.
5415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

DRAWING NO: HA-01-220

TITLE: ASSEMBLY OUTER ELECTRODE SIJ

ENCL. A14

FOIL DIMENSIONS		DECIMAL EQUIVALENT		AMERICIUM CONTENT
X	Y	X	Y	
2.5mm	2.5mm	0.098"	0.098"	0.5 μCi
3.6mm	3.6mm	0.142"	0.142"	0.98 μCi

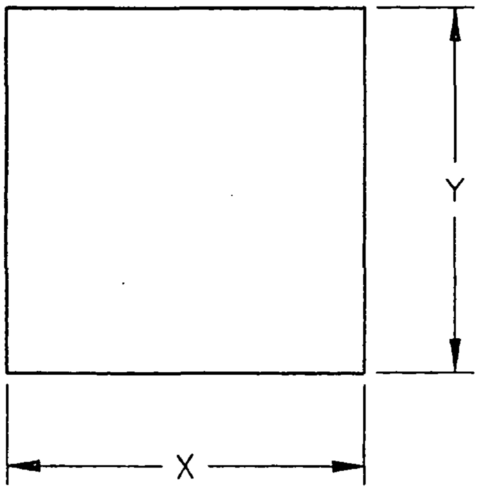
REV.	DATE	BY	CHANGE
B	5/6/98	JA	ADDED 0.98 FOIL
A	1/31/95	AJG	ADDED COMPUTER NO.
–	8/23/90	LLL	INITIAL RELEASE

DRAWN BY: NRD INC.
DATE 3/3/98
CHECKED BY:
UNITS
APPROVED BY:
SCALE

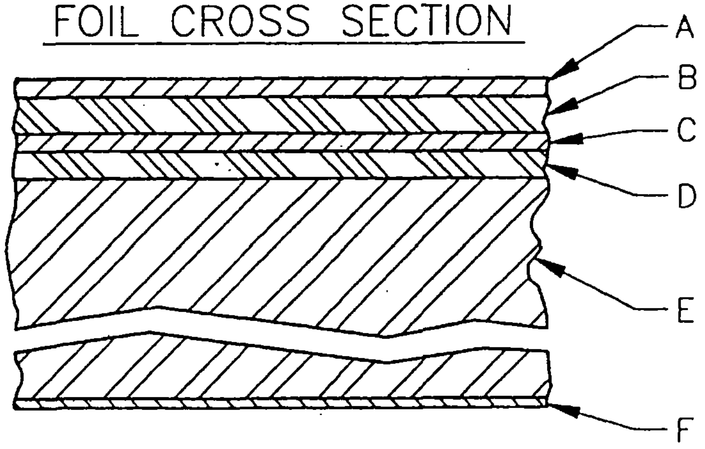
HOCHIKI AMERICA CORP.
5415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

DRAWING NO: HA-01-026

TITLE: FOIL, Americium 241 (NRD)



FOIL CROSS SECTION



A. WHITE GOLD PLATE 0.00002"
B. GOLD 0.00004"
C. AMERICIUM 241 & GOLD 0.00002"
D. GOLD 0.00003"
E. SILVER 0.005" TO 0.009"
F. YELLOW GOLD FLASH PLATE FOR IDENTIFICATION

NOTES:

1. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

PART NO. 2500-00010

CONTROLLED
DATE: 5/6/1998
ENGINEERING

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:
1 PL DECIMALS ±0.03mm
3 PL DECIMALS ±0.001"
ANGLES ±
FRACTIONS ±

DO NOT SCALE PRINT

SIGNATURES		DATE
DRAWN	C. DUNN	03MR98
CHECKED		3/3/98
APPROVED		3/3/98
APPROVED	T. Caffarelli	3/3/98

THIRD ANGLE PROJECTION

NRD INC.
A SUBSIDIARY OF MARK IV INDUSTRIES, INC.
2937 ALT BOULEVARD GRAND ISLAND, NEW YORK 14072

A-001 SINGLE FACE FOIL

MATERIAL & FINISH AMERICIUM 241, GOLD, SILVER

	DATE	SCALE	DWG NO	REVISION
A	03MR98	NA	98A020	

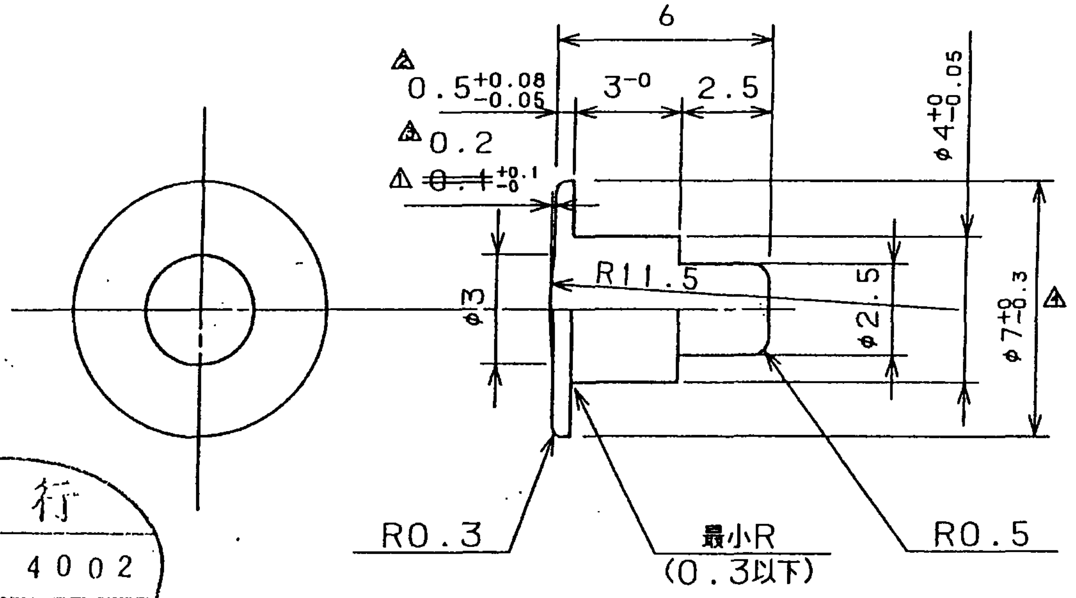
ENCL. A15

日	旧図番
	△
	△
	△

指定等級	B	指定以外の角度の許容差	±
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分 を越え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1
180	250	0.6	1.2	1.3	1.4
250	500	0.8	1.5	1.7	1.9



CONTROLLED
DATE: 7/27/1999
ENGINEERING

発行
99 − 4002
[illegible]設計課

[redacted]

COMPUTER NO. 2800-01050

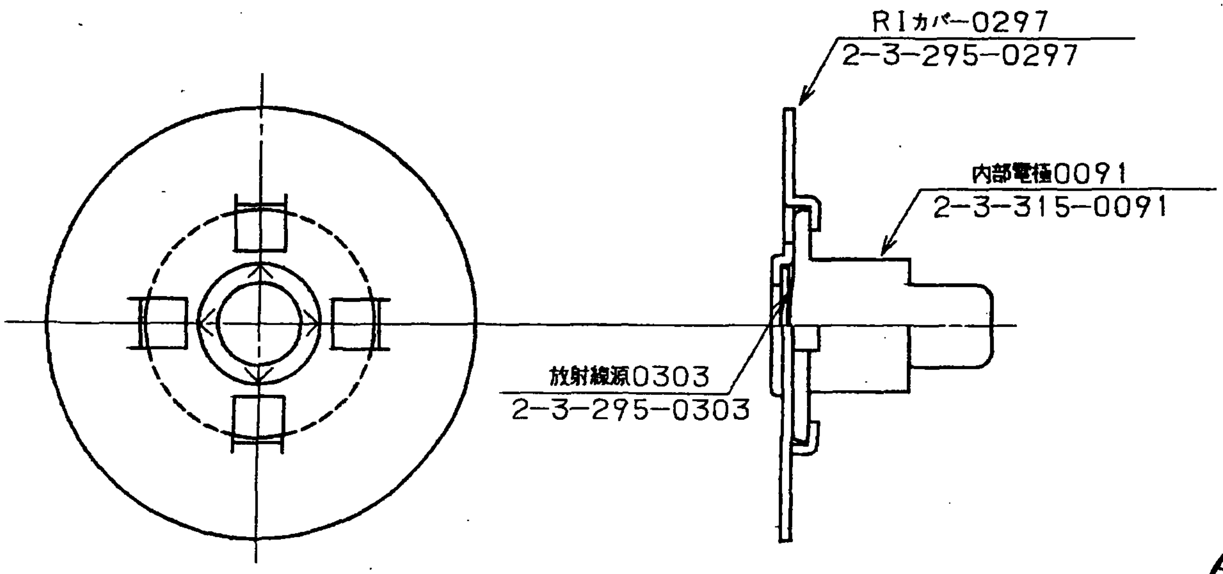
0	△4 公差変更（マイナス公差追加）	森田	市川
9	△3 寸法変更	サワ	
1	△2 公差変更	小泉	
2	△1 凸追加		
3	訂正事項	設計	承認

		承認	調査	設計	製図	設計年月日	図名	内部電極0091
材質	SUS304	市川	鳥越	森田	森田	63.12.2	図番	2-3-315-0091-155
仕上		縮尺	5:1	単位	mm	第3角法	ホロテキ株式会社	

ENCL. A16

CONTROLLED

DATE: 4/26/1994



発行
93-4004
商品設計課

[illegible] CA CORP.

HA-01-063

ASSY INNER ELECTRODE SIT

	△2		材質	
63.12.2	△1 内電凸追加			
年月日	訂正事項	設計	仕上	
記事				

承認	調査	設計	製図	設計年月日	枚数	図名	内部電極加工0217
早川	中	八島	八島	63.12.19	/	図番	2-1-490-0217-152
縮尺	5/1	単位	mm	第3角法		ホーチキ株式会社	

ENCL. A17

REV.	DATE	BY	CHANGE
A	8-29-00	KN	CHANGE TITLE
–	4-22-94	HC	Initial Release

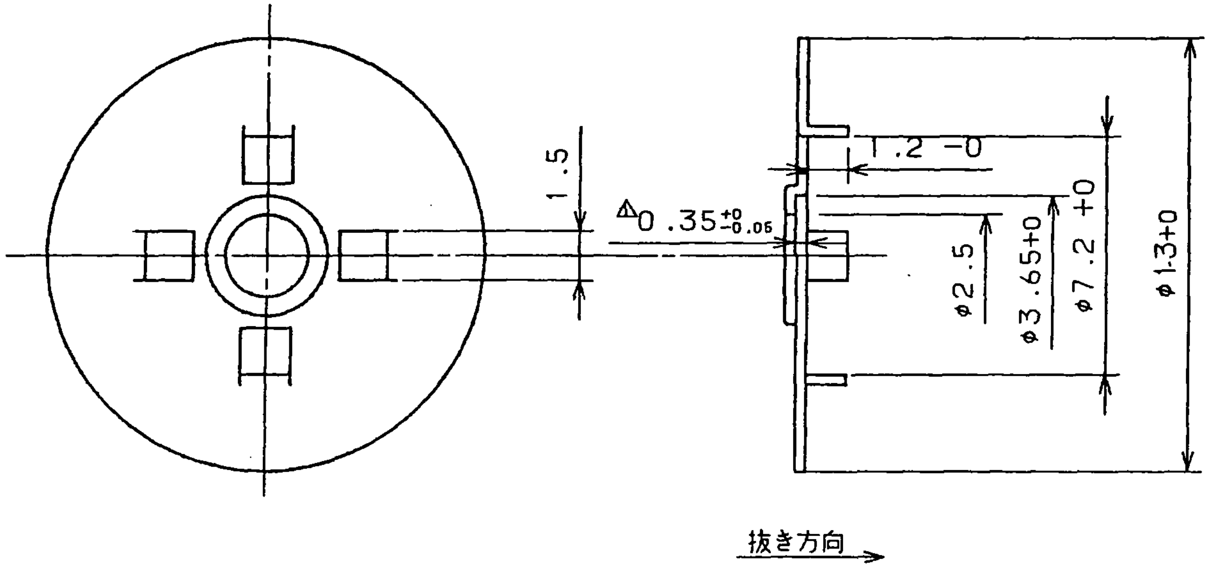
DRAWN BY: HC
CHECKED BY:
APPROVED BY:
DRAWING NO. HA-01-065

HOCHIKI
HOCHIKI AMERICA CORP.
5415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649
TITLE Cover RI (SIJ)

指定等級	B	指定以外の角度の許容差	±
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1
180	250	0.6	1.2	1.3	1.4
250	500	0.8	1.5	1.7	1.9



CONTROLLED
DATE: 8/29/2000
ENGINEERING

発行
93-4004
商品設計課

t=0.3

PART NO. 2800-01060

年月日	訂正事項	設計
	△2	
63.12.14	△1 深さ 変更	
記事		

材質	SUS304
仕上	

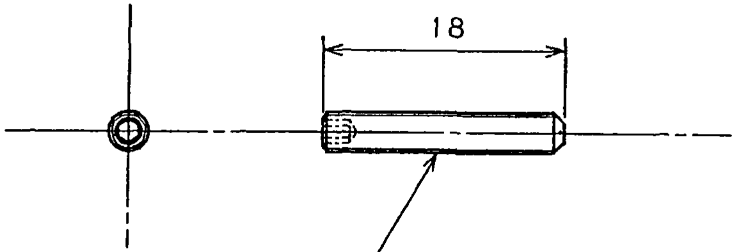
承認	調査	設計	製図	設計年月日	枚数
早川	[illegible]	八島	八島	63.12.1	／
縮尺	5/1	単位	mm	第3角法	

図名	RIカバー0297
図番	2-3-295-0297-152

ホーチキ株式会社

ENCL. A18

CONTROLLED
DATE: 8/29/2000
ENGINEERING



JIS B 1177 六角穴付き止めねじ くぼみ先 M3X18 SUS305

発行
93-4012
商品設計課

PART NO. 2825-00165

REV.	DATE	BY	CHANGE
A	8/29/00	KN	CHANGE TITLE
—	4-22-94	HC	Initial Release

DRAWN BY: HC	**HOCHIKI** HOCHIKI AMERICA CORP. 5415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	
APPROVED BY:	
DRAWING NO. HA-01-082	TITLE: Locking Screw

. .	⚠2		材質	SUS305
. .	⚠1			
年月日	訂正事項	設計	仕上	——
記事				

承認	調査	設計	製図	設計年月日	枚数
				63.9.19	／
縮尺	2/1	単位	mm	第3角法	

図名	ロッキングスクリュウ M3X18
図番	2-5-232-3180-151
ホーチキ株式会社	

ENCL. A19

REV.	DATE	BY	CHANGE
A	8-29-00	KN	CHANGE TITLE
—	4-22-94	K	Initial Release

DRAWN BY: HS	**HOCHIKI** HOCHIKI AMERICA CORP. 9415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	
APPROVED BY:	
DRAWING NO. HA-01-073	TITLE Insect screen SIJ

CONTROLLED
DATE: 8/29/2000
ENGINEERING

指定等級	A	指定以外の角度の許容差	± 0.5°
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1
180	250	0.6	1.2	1.3	1.4
250	500	0.8	1.5	1.7	1.9

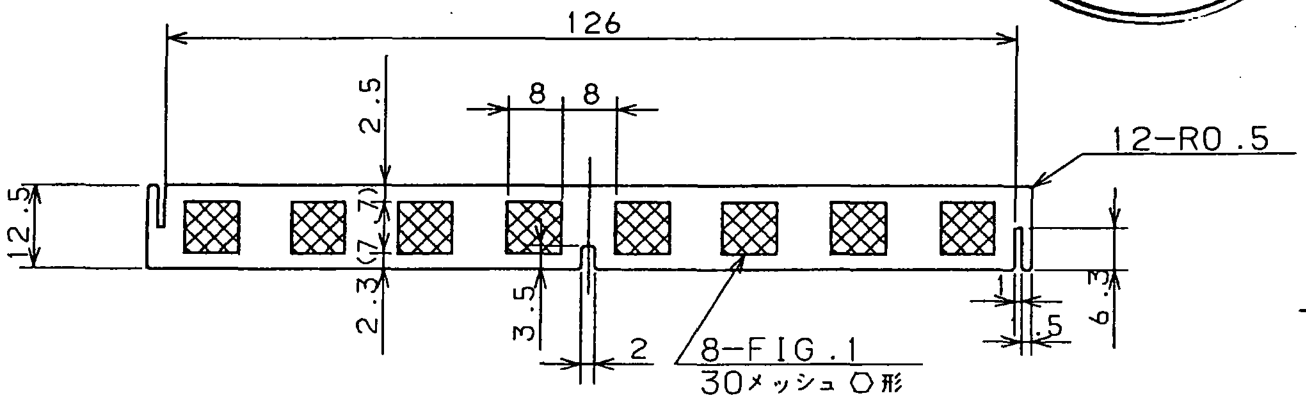
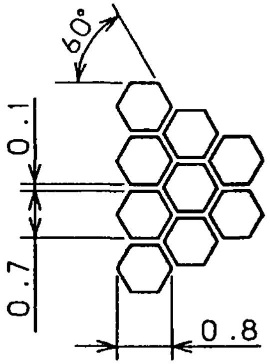


FIG.1 (メッシュパターン)S:10/1



発行
93-4004
商品設計課

t=0.1

part No. 2800-01120

. .	⚠2	
. .	⚠1	
年月日	訂 正 事 項	設計
記事		

材質	SUS304
仕上	

承認	調査	設計	製図	設計年月日	枚数
早川	[illegible]	八島	八島	63.8.10	/
縮尺	1/1	単位	mm	第3角法	

図名	防虫網0294
図番	2-3-295-0294-151

ホーチキ株式会社

ENCL. A20

月日	旧図番
. .	△
. .	△
. .	△

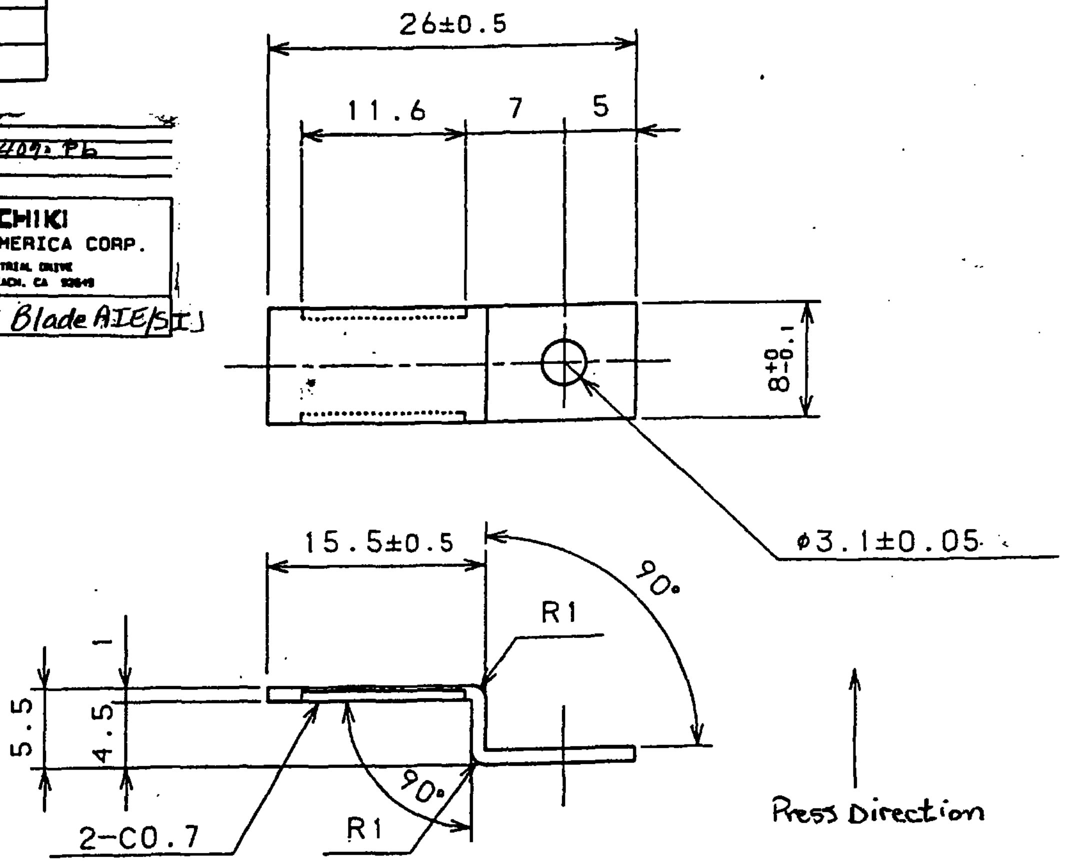
REV.	DATE	BY	CHANGE
A	1-12-98	EL	Added 60% Sn 40% Pb
–	4-9-96	HC	Initial Release

DRAWN BY: HS	DATE 12-19-94	**HOCHIKI** HOCHIKI AMERICA CORP. 3413 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY:	SCALE	
DRAWING NO. HA-01-157		TITLE Contact Blade AIE/SIJ

指定等級	B	指定以外の角度の許容差	± 1°
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1
180	250	0.6	1.2	1.3	1.4
250	500	0.8	1.5	1.7	1.9



CONTROLLED
DATE: 14/1/1998
ENGINEERING

N.C.C
商品設計課

t=1.0

'98.1.31

part No. 2800-01021

. .	△		
. .	△		
年月日	訂正事項	設計	承認
記事			

材質	Copper or Copper alloy C2680P t=1.0	承認	調査	設計	製図	設計年月日	図名 Contact Blade AI 04
			渋谷	富沢	富沢	94.12.19	図番 2-3-295-0459-151
仕上	Finish: Solder Plated 90% [illegible] 10% Pb or 60% Sn. 40% Pb	縮尺	2:1	単位	mm	第3角法	ホーチキ株式会社

指定等級	B	指定以外の角度の許容差	±
		指定以外の抜き勾配	以内

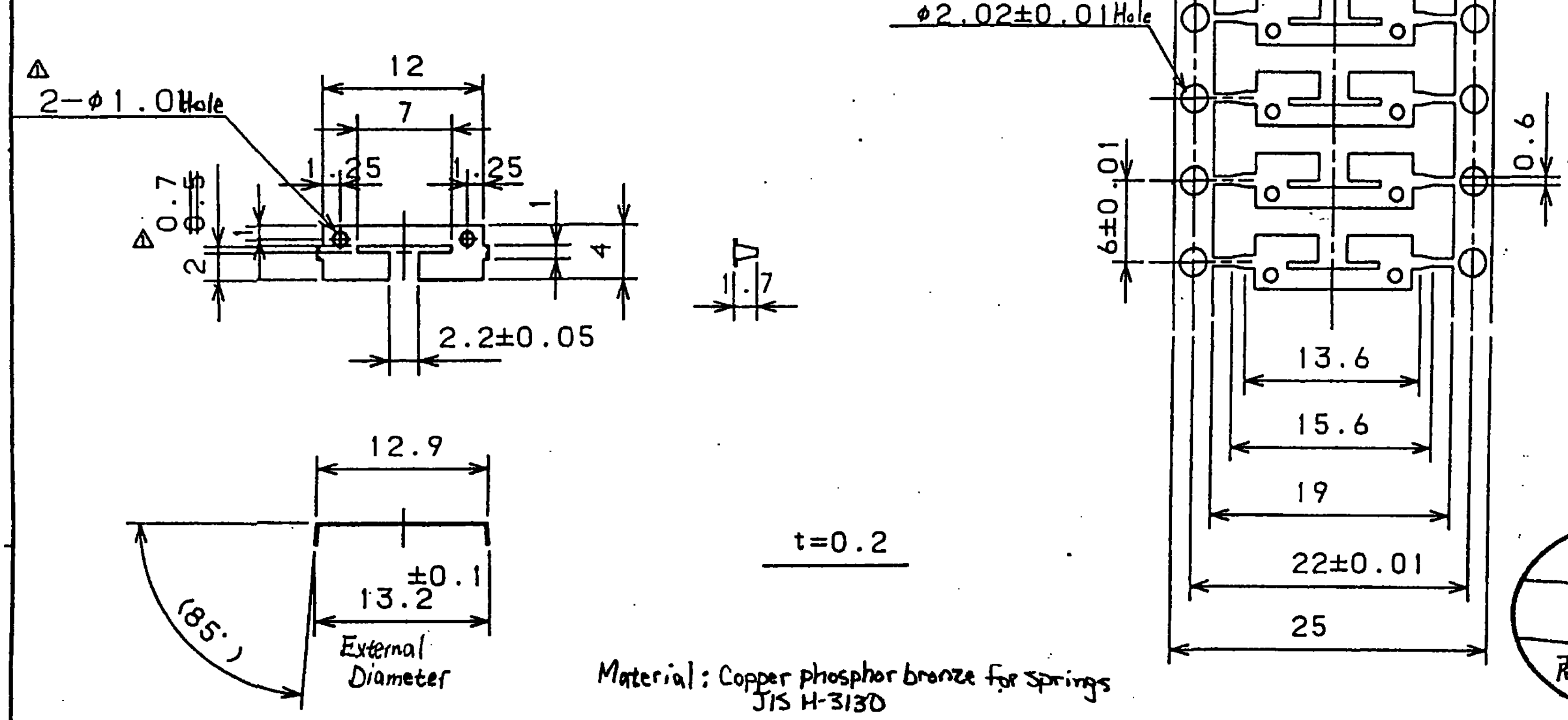
指定以外の寸法に対する許容差（±）

寸法区分 を越え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4

REV.	DATE	BY	CHANGE
—	4-9-96	HC	Initial Release

DRAWN BY: HC	DATE 9-21-63	**HOCHIKI** HOCHIKI AMERICA CORP. 3413 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY: 4/4/96	SCALE	
DRAWING NO. HA-01-140		TITLE Contact Clip

CONTROLLED
ENGINEERING
DATE: 4/10/1996



発行
91-2079
商品設計課

Material: Copper phosphor bronze for springs
JIS H-3130

Plating: Solder Plate 90%Sn 10% Pb

Computer No. 2800-02000

	⚠	
91.1.13	⚠φ1.0孔2ヶ所追加、及び寸法変更	森田
年月日	訂　正　事　項	設計
記事		

材質	
仕上	

承認	調査	設計	製図	設計年月日	枚数
早川	中	八島	八島	63.9.21	／
縮尺	2/1	単位	mm	第3角法	

図名	Contact Clip
図番	2-3-295-0298-152

ホーチキ株式会社

'90.1.8

ENCL. A21

ENCL. A22

REV.	DATE	BY	CHANGE
B	8/29/00	KN	CHANGE TITLE
A	2-28-97	LL	Added part NO. To dwg.
–	4-22-94	HC	Initial Release

DRAWN BY: HC
CHECKED BY: Kazuya Kawamura
APPROVED BY:
DRAWING NO. HA-01-056

HOCHIKI
HOCHIKI AMERICA CORP.
5415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

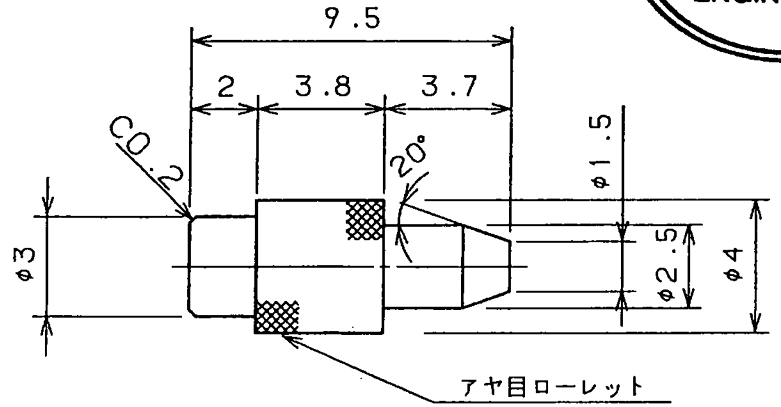
TITLE Insert Metal SIJ Enclsr

CONTROLLED
DATE: 8/29/2000
ENGINEERING

指定 等級	B	指定以外の角度の許容差	±
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分		等級 A	B	C	D
を超え	以下				
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1
180	250	0.6	1.2	1.3	1.4
250	500	0.8	1.5	1.7	1.9



⚠ メッキ仕様（JIS H0404）：MBSnPb3-C3

発行
93-4004
商品設計課

part NO. 2800-01010

. .	⚠2	
89.10.5	⚠ メッキ仕様追加	小泉
年月日	訂正事項	設計
記事		

材質	C1100W-1/2H
仕上	半田メッキ

承認	調査	設計	製図	設計年月日	枚数
早川		八島	八島	63.10.14	／
縮尺	5/1	単位	mm	第3角法	

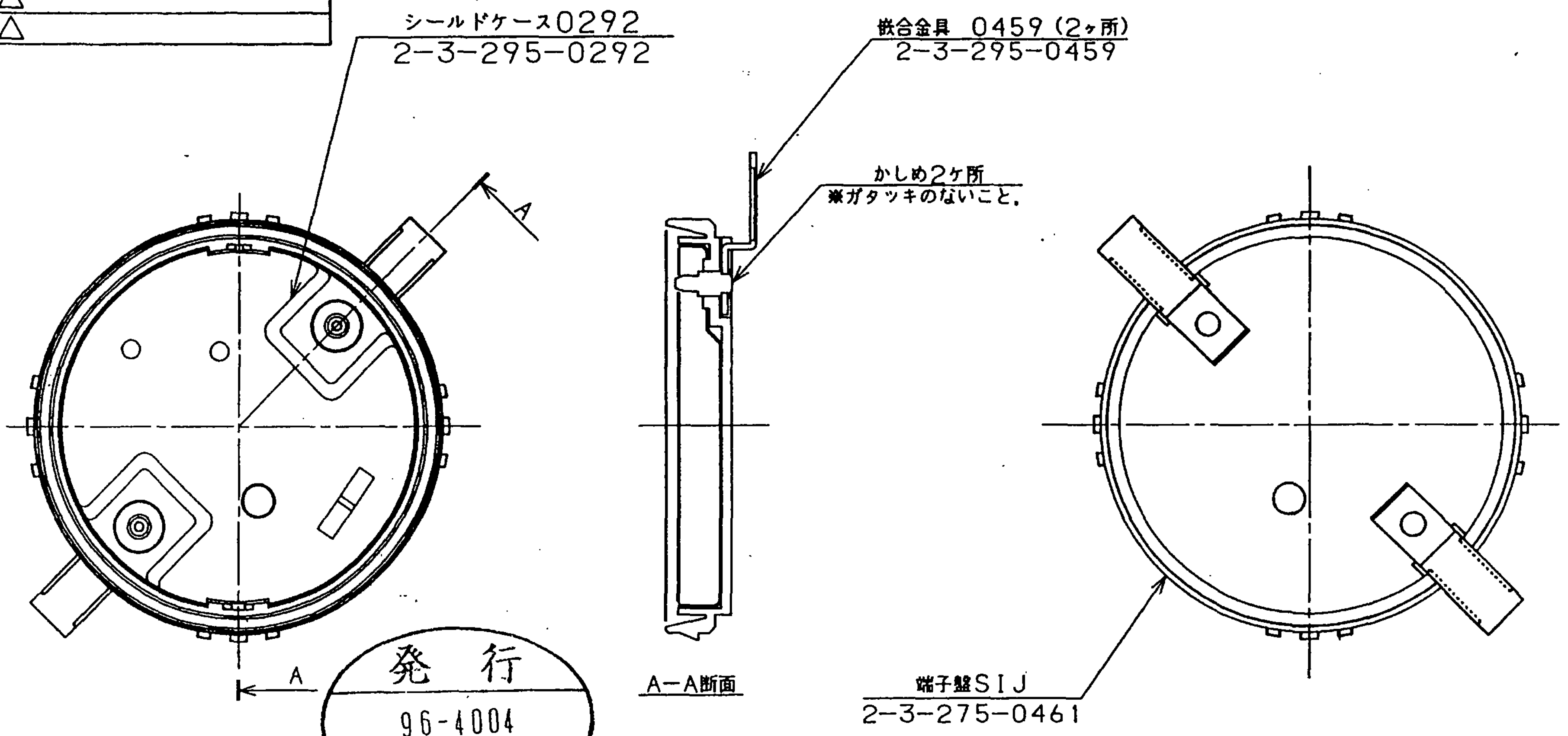
図名	インサート金具
図番	2-3-315-0090-152

ホーチキ株式会社

CONTROLLED
DATE: 6/26/1997
ENGINEERING

ENCL. A23

月日	旧図番
. .	△
. .	△
. .	△



発行
96-4004
商品設計課

. .	⚠2			材質		
. .	⚠1					
年月日	訂正事項	設計	承認	仕上		
記事						

承認	調査	設計	製図
三輪	小沢	川端	川端
縮尺	1：1	単位	mm

1 2

REV.	DATE	BY	CHANGE
–	6-26-97	HC	Initial Release.

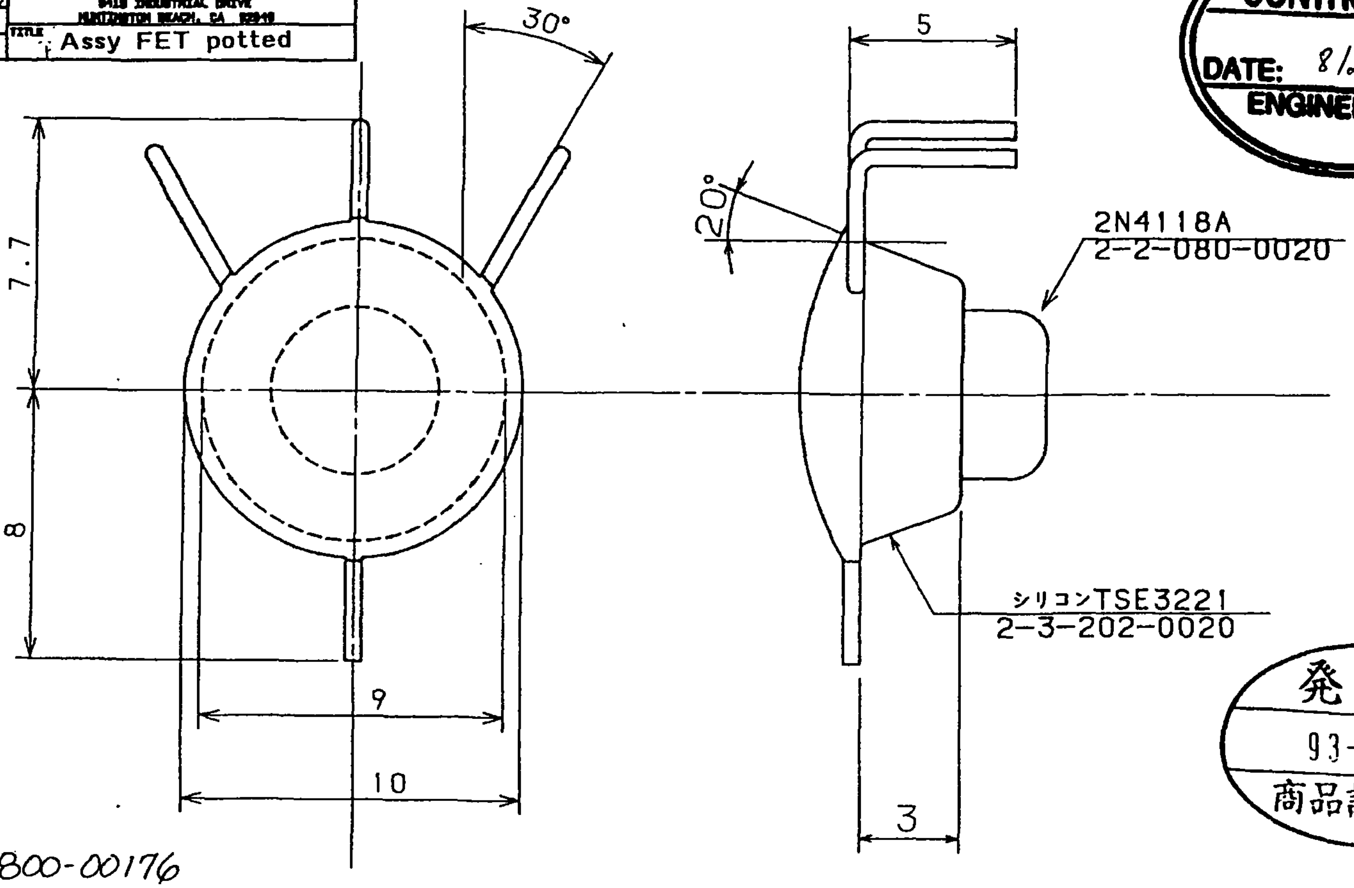
DRAWN BY: HC	DATE 6/28/96	HOCHIKI AMERICA CORP. 8415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY:	SCALE	TITLE:
DRAWING NO: HA-01-207		ASSEMBLY ENCLOSURE SIJ

ENCL. A24

REV.	DATE	BY	CHANGE
B	3-29.00	KY	CHANGE TITLE
A	2-9.98	JA	ADDED PART NO.
—	4-22-94	HC	Initial Release

DRAWN BY: HC	**HOCHIKI** HOCHIKI AMERICA CORP. 5415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	
APPROVED BY:	
DRAWING NO. HA-01-062	TITLE Assy FET potted

CONTROLLED
DATE: 8/29/2000
ENGINEERING

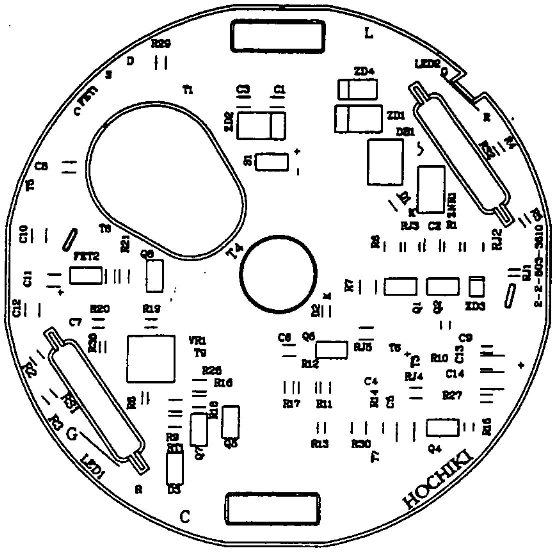


発 行
93-4004
商品設計課

PART NO. 4800-00176

. .	⚠2		材質		承認	調査	設計	製図	設計年月日	枚数	図名 FET加工2N4118A
. .	⚠1				[illegible]	小泉	河野	川端	'91. 9. 20	/	図番 2-1-100-0010-151
年月日	訂 正 事 項	設計	仕上		縮尺	5/1	単位	mm	第3角法		ホーチキ株式会社
記事											

ITEM #	HA PART #	HC PART #	DESIGNATOR	DESCRIPTION	PRIMARY MFG.	MFG PART #	QTY.
1	4800-00500	2-2-182-0020	DB1	DIODE BRIDGE	SHINDENGEN	SZB20-4052 TAPPING	1
2	4800-00712	2-2-080-0025	ZNR1	TRANZORB ZNR	ORIGIN	FIC560BTP	1
3	4800-00520	2-2-086-0010	S1	THYRISTOR	NEC	03P2J-T1 TAPPING	1
4	4800-00715	2-2-174-0440	ZD1	ZENER DIODE	NEC	RD47FM-T1-B	1
5	4800-00860	2-2-175-0180	ZD2	ZENER DIODE	ROHM	PTZ TE-25 2.7B	1
6	4800-00720	2-2-174-0250	ZD3	ZENER DIODE	TOSHIBA	02DZ10-Z(TPH3)	1
7	4800-00810	2-2-162-0180	D1, D2	DIODE	ROHM	1SS355 (TE-17)	2
8	4800-00880	2-2-163-0040	D3	DIODE	TOSHIBA	1SS184(TE85L TED)	1
9	2450-00060	2-2-105-0011	LED1, LED2	LED BI-COLOR INDICATION	STANLEY	VEPY5312X	2
10	4800-00175	2-2-080-0020	FET1	TRANS JFET N-CHNL LOW CURR	NATIONAL/FAIRCHILD	2N4118A	1
11	4800-00570	2-2-086-0010	FET2	FET	NEC	2SK160-T1B-E4/E5	1
12	4800-00790	2-2-125-0110	Q4, Q6	TRANSISTOR	ROHM	2SA1037AK T146R	2
13	4800-00800	2-2-145-0150	Q1, Q2, Q5, Q7, Q8	TRANSISTOR	ROHM	2SC2412K T146R	5
14	1500-02240	2-2-750-3312	C1	CAP CERAMIC .033uF 0805 10%	MURATA	GRM40B333K50PT10	1
15	1500-02210	2-2-750-0410	C2, C3	CAP CERAMIC 0.1uF 0805	MURATA	GRM40F104Z25PT176	2
16	1500-02360	2-2-705-0542	C4	CAP 16V 100uF THRU-HOLE	ELNA	RC2-16V-101MB	1
17	1500-02200	2-2-752-2410	C5	CAP CERAMIC .22uF 1206 10%	MURATA	GRM42-6B224K25PT86	1
18	1500-02310	2-2-750-0430	C6	CAP CERAMIC 0.1uF 0805 10%	MURATA	GRM40B104K25PT176	1
19	1500-02150	2-2-752-0420	C7	CAP CERAMIC .1uF 1206 10%	MURATA	GRM42-6B104K50PT10	1
20	1500-02320	2-2-750-0210	C8, C9, C10	CAP CERAMIC .001UF 50V 0805 10%	MURATA	GRM40B102K50PT10	3
21	1500-02330	2-2-752-2320	C11, C12, C13, C14	CAP CERAMIC .022UF 1206	MURATA	GRM42-6F223Z50PT10	4
22	4700-14020	2-2-650-3700	R1, R13, R15	RES SMT 1K OHM 0805 5%	KOA	RK73B2ATTD102J	3
23	4700-14160	2-2-650-2300	R2, R4	RES SMT 68 OHM 0805 5%	KOA	RK73B2ATTD680J	2
24	4700-14180	2-2-650-3306	R3, R5	RES SMT 470 OHM 0805 5%	KOA	RK73B2ATTD471J	2
25	4700-14800	2-2-650-4300	R6	RES SMT 3.3K OHM 0805 5%	KOA	RK73B2ATTD332J	1
26	4700-14100	2-2-650-7300	R7, R27	RES SMT 1M OHM 0805 5%	KOA	RK73B2ATTD105J	2
27	4700-14010	2-2-650-0000	R8,RJ1,RJ2,RJ3,RJ4,RJ5	RES SMT 0 OHM 0805 5%	KOA	RK73Z2ATTD	6
28	4700-14470	5-2-650-0028	R9	RES SMT 240K OHM 0805 5%	KOA	RK73B2ATTD244J	1
29	4700-14040	5-2-650-0017	R10	RES SMT 4.3K OHM 0805 5%	KOA	RK73B2ATTD432J	1
30	4700-14790	2-2-650-6540	R11, R29, R30	RES SMT 10M OHM 0805 5%	KOA	RK73B2ATTD106J	3
31	4700-14060	2-2-650-6100	R12, R16, R17, R26	RES SMT 100K OHM 0805 5%	KOA	RK73B2ATTD104J	4
32	4700-14600	5-2-650-0129	R14	RES SMT 300 OHM 0805 5%	KOA	RK73B2ATTD301J	1
33	4700-14050	2-2-650-5800	R18	RES SMT 56K OHM 0805 5%	KOA	RK73B2ATTD563J	1
34	4700-14450	5-2-650-0027	R19	RES SMT 820K OHM 0805 5%	KOA	RK73B2ATTD824J	1
35	4700-14080	2-2-650-6300	R20, R21	RES SMT 150K OHM 0805 5%	KOA	RK73B2ATTD154J	2
36	4700-15030		R28	RES SMT 2.87M OHM 0805 1%	KOA	RK73H2ATE2874F	1
37	4700-14000	2-2-695-0150	VR1	RESISTOR VARIABLE	MURATA	PVM4A304C01B00	1
38	5100-00100	2-2-333-0013	RS1, RS2	REED SWITCH	TOKIN	RD-17BS-2040C210	2
39	4800-00580	2-2-091-0008	RT1	THERMISTOR	MITSUBISHI	DTN-20-4D154LT TAPPING	1
40	2800-02000	2-3-296-0298		CONTACT BLADE 0298	SHANSHU	CONTACT BLADE 0298	3
41	1600-01460	2-2-603-3610	PCB SIJ-24	PA SIJ-24	KCC	PA SIJ-24 (BARE BOARD)	1
				ALTERNATES			
1	4800-00500	2-2-182-0020	DB1	DIODE BRIDGE	TOSHIBA	U05C4B48 or U05D4B48	1
3	4800-00520	2-2-086-0010	S1	THYRISTOR	MITSUBISHI	CR06AS or CR08AS	1
3	4800-00520	2-2-086-0010	S1	THYRISTOR	TOSHIBA	URSF06C49 or USF06C49	1
6	4800-00720	2-2-174-0250	ZD3	ZENER DIODE	TOSHIBA	02DZ11	1
6	4800-00720	2-2-174-0250	ZD3	ZENER DIODE	NEC	RD10S OR RD11S	1
6	4800-00720	2-2-174-0250	ZD3	ZENER DIODE	ROHM	UDZ10B OR UDZ11B	1
7	4800-00810	2-2-162-0180	D1, D2	DIODE	TOSHIBA	1SS362	2
8	4800-00890	2-2-163-0040	D3	DIODE	TOSHIBA	1SS362	1
8	4800-00890	2-2-163-0040	D3	DIODE	ROHM	DAP202K	1
9	2450-00060	2-2-105-0011	LED1, LED2	LED	ROHM	SPR-39MVW	2
12	4800-00790	2-2-125-0110	Q4, Q6	TRANSISTOR	TOSHIBA	2SA1162	2
12	4800-00790	2-2-125-0110	Q4, Q6	TRANSISTOR	NEC	2SA812	2
12	4800-00790	2-2-125-0110	Q4, Q6	TRANSISTOR	MITSUBISHI	2SA1236	2
13	4800-00800	2-2-145-0150	Q1, Q2, Q5, Q7, Q8	TRANSISTOR	TOSHIBA	2SC2712	5
13	4800-00800	2-2-145-0150	Q1, Q2, Q5, Q7, Q8	TRANSISTOR	NEC	2SC1623	5
13	4800-00800	2-2-145-0150	Q1, Q2, Q5, Q7, Q8	TRANSISTOR	MITSUBISHI	2SC3052	5
38	5100-00100	2-2-333-0013	RS1, RS2	REED SWITCH	CP CLARE	PR2	2
38	5100-00100	2-2-333-0013	RS1, RS2	REED SWITCH	OKI	ORD221	2
38	5100-00100	2-2-333-0013	RS1, RS2	REED SWITCH	NIPPON ALEPH	HYR1502 OR HRY1552	2



CONTROLLED

DATE: 07/03/2006

ENGINEERING

P/N 8000-00520

REV.	DATE	BY	CHANGE
D	06-15-06	RH	REDRAWN PCB ARTWORK BY BEN M./UPDATED PART LIST
C	10-16-00	RM	CHANGED R28 TO 2.87M OHM
B	9-05-00	KN	CHANGED TITLE
A	9-28-99	KN	CHANGED R29 TO 10M OHM & R26 TO 3.3M OHM & ADDED TOP LEVEL DOCUMENT ITEM NO.
-	4-15-97	HC	INITIAL RELEASE

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.015
.XXX ±.005

MATERIAL:

PCB/ASSY

DRAWN BY: Ben M./HC

CHECKED BY:

APPROVED BY:

UNITS: IN.

SCALE: NTS

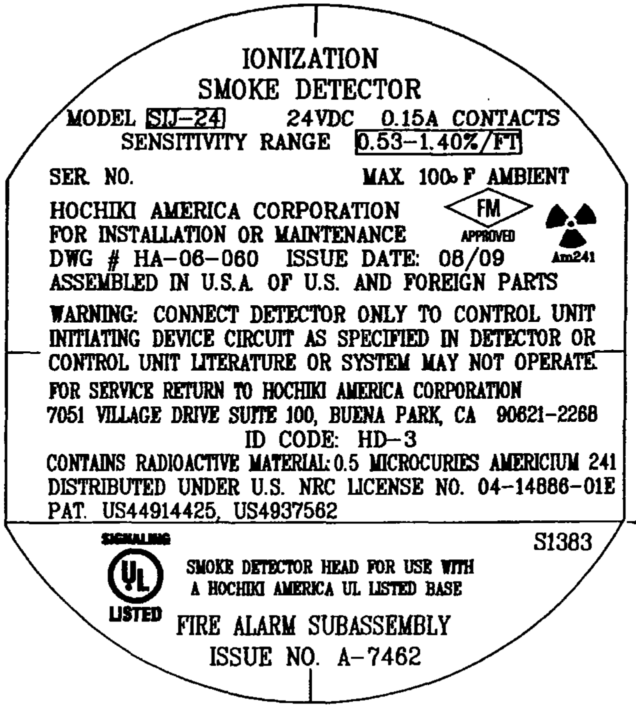
DRAWING NO. HA-01-206

HOCHIKI america corporation
7051 VILLAGE DRIVE, SUITE 100
BUENA PARK, CA 90621-2268

TITLE: ASSEMBLY PCB
SIJ-24 SERIES

NOTES:

ENCL. A25



IONIZATION
SMOKE DETECTOR
MODEL SIJ-24 24VDC 0.15A CONTACTS
SENSITIVITY RANGE 0.53-1.40%/FT
SER. NO. MAX. 100° F AMBIENT
HOCHIKI AMERICA CORPORATION
FOR INSTALLATION OR MAINTENANCE
DWG # HA-06-060 ISSUE DATE: 08/09
ASSEMBLED IN U.S.A. OF U.S. AND FOREIGN PARTS

WARNING: CONNECT DETECTOR ONLY TO CONTROL UNIT INITIATING DEVICE CIRCUIT AS SPECIFIED IN DETECTOR OR CONTROL UNIT LITERATURE OR SYSTEM MAY NOT OPERATE.

FOR SERVICE RETURN TO HOCHIKI AMERICA CORPORATION
7051 VILLAGE DRIVE SUITE 100, BUENA PARK, CA 90621-2268
ID CODE: HD-3
CONTAINS RADIOACTIVE MATERIAL: 0.5 MICROCURIES AMERICIUM 241
DISTRIBUTED UNDER U.S. NRC LICENSE NO. 04-14886-01E
PAT. US44914425, US4937562

S1383

SMOKE DETECTOR HEAD FOR USE WITH
A HOCHIKI AMERICA UL LISTED BASE
FIRE ALARM SUBASSEMBLY
ISSUE NO. A-7462

ALL TEXT ABOVE THIS LINE MUST HAVE A MIN. TEXT HEIGHT OF .047

CONTROLLED
DATE 01/12/2010
ENGINEERING

REV.	DATE	BY	CHANGE
K	11-04-09	RH	REVISED UL TEXT FROM EQUIPMENT TO SUBASSEMBLY
J	08-13-09	RH	CHANGED ISSUE DATE FROM 02/08 TO 08/09
IH	10-13-08	RH	REVISED UL MARKING/TEXT PER UL COMPLIANCE
HA	06-07-06	RH	CHANGED ISSUE DATE FROM 7-03 TO 11-04
H	09-25-03	RH	REVISED FM AND UL LOGO/CHANGED ISSUE DATE FROM 2/00 TO 7/03
G	2-25-00	BM	CHANGED ISSUE DATE
F	11-19-99	GFC	CHANGED ISSUE DATE
E	8-5-99	GFC	ADDED FM LBL, ADD., & ID CODE/CHANGED SENSITIVITY
D	11-3-98	DJH	CHANGED LABEL FORMAT
C	6-30-98	BM	ADDED PATENT NUMBERS.
B	4-6-98	BM	REVISED TEXT.
A	6-10-97	BM	ADDED MIN. TEXT HEIGHT AND ISSUE NO.
–	4-3-97	AJG	INITIAL RELEASE

NOTES:

1. USE LABEL STOCK PART # 1700-03280
2. LABEL TO BE WHITE WITH ADHESIVE BACKING
3. THE PRINT WILL BE PRODUCED BY THE WEBER MARKING SYSTEMS ULTRAPLATE, ULTRAPLATE B, OR ULTRAPLATE C THERMAL TRANSFER INK FOR PRODUCING FINISHED PRINTED LABELS WITH UL LISTED WEBER THERMAL TRANSFER PRINTERS
4. MINIMUM TEXT SIZE IS .047 IN.
5. THE IMTRAN GS-200 PAD PRINTING SYSTEM MAY BE USED INSTEAD OF THE WEBER MARKING SYSTEM

P/N 1700-03320

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±015
.XXX ±005

MATERIAL:
SEE NOTE 1
PCB/ASSY

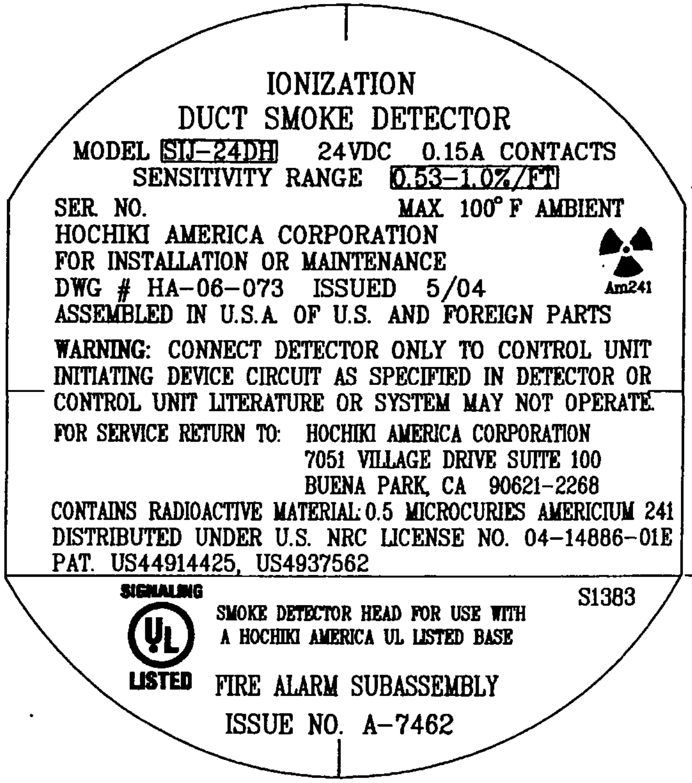
DRAWN BY: ANTHONY J GARCIA
CHECKED BY:
APPROVED BY:
UNITS: IN
SCALE: NTS
DRAWING NO. HA-01-197

HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE
LABEL NAMEPLATE SIJ-24

ENCL. A27

CONTROLLED
DATE: 6/12/2010
ENGINEERING



IONIZATION
DUCT SMOKE DETECTOR
MODEL SIJ-24DH 24VDC 0.15A CONTACTS
SENSITIVITY RANGE 0.53-1.0%/FT
SER. NO. MAX. 100° F AMBIENT
HOCHIKI AMERICA CORPORATION
FOR INSTALLATION OR MAINTENANCE
DWG # HA-06-073 ISSUED 5/04
Am241
ASSEMBLED IN U.S.A. OF U.S. AND FOREIGN PARTS

WARNING: CONNECT DETECTOR ONLY TO CONTROL UNIT INITIATING DEVICE CIRCUIT AS SPECIFIED IN DETECTOR OR CONTROL UNIT LITERATURE OR SYSTEM MAY NOT OPERATE.

FOR SERVICE RETURN TO: HOCHIKI AMERICA CORPORATION
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

CONTAINS RADIOACTIVE MATERIAL: 0.5 MICROCURIES AMERICIUM 241
DISTRIBUTED UNDER U.S. NRC LICENSE NO. 04-14886-01E
PAT. US44914425, US4937562

SIGNALING
UL
LISTED
SMOKE DETECTOR HEAD FOR USE WITH A HOCHIKI AMERICA UL LISTED BASE
S1383
FIRE ALARM SUBASSEMBLY
ISSUE NO. A-7462

ALL TEXT ABOVE THIS LINE MUST HAVE A MIN. TEXT HEIGHT OF .047

NOTES:

1. USE LABEL STOCK PART # 1700-03280
2. LABEL TO BE WHITE WITH ADHESIVE BACKING
3. THE PRINT WILL BE PRODUCED BY THE WEBER MARKING SYSTEMS ULTRAPLATE, ULTRAPLATE B, OR ULTRAPLATE C THERMAL TRANSFER INK FOR PRODUCING FINISHED PRINTED LABELS WITH UL LISTED WEBER THERMAL TRANSFER PRINTERS
4. MINIMUM TEXT SIZE IS .047 IN.

P/N 1700-03380

REV.	DATE	BY	CHANGE
E	11/04/09	RH	REVISED UL TEXT FROM EQUIPMENT TO SUBASSEMBLY
D	10/13/08	RH	REVISED UL MARKING/TEXT PER UL COMPLIANCE. CHANGED ISSUE # FROM A-11,948 TO A-7462 TO BE USED FOR ONE PERMANENT ISSUE #
C	11/11/05	RH	REVISED UL LOGO/CHANGED ISSUE DATE FROM 04/00 TO 05/04
B	4/20/00	KN	CHANGED ISSUE DATE
A	7/27/99	GFC	CHANGED ADDRESS & LOGO
–	11/03/98	DJH	INITIAL RELEASE

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.015
.XXX ±.005

MATERIAL:
SEE NOTE 1

PCB/ASSY

DRAWN BY:
DAVID HALL

CHECKED BY:

UNITS
IN

APPROVED BY:

SCALE
NTS

DRAWING NO.
HA-01-270

HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE
LABEL NAMEPLATE SIJ-24DH

IONIZATION
SMOKE DETECTOR
MODEL D281A 24VDC 0.15A CONTACTS
SENSITIVITY RANGE 0.53-1.40%/FT
SER. NO.
BOSCH SECURITY SYSTEMS INC.
130 PERINTON PARKWAY
FAIRPORT, NY 14450
MAXIMUM 100°F AMBIENT
FOR INSTALLATION OR MAINTENANCE
DWG. F01U035643-06 ISSUE DATE: 12/07
FOR SERVICE RETURN TO: BOSCH SECURITY SYSTEMS INC.

WARNING: THIS DETECTOR MAY ONLY BE CONNECTED TO AN APPROVED BOSCH CONTROL PANEL INITIATING CIRCUIT AS SPECIFIED IN THE INSTALLATION AND OPERATION MANUAL OR SYSTEM MAY NOT OPERATE.

ID CODE: HD-3
CONTAINS RADIOACTIVE MATERIAL: 0.5 MICROCURIES AMERICIUM 241
DISTRIBUTED UNDER U.S. NRC LICENSE NO. 04-14886-01E
PAT. US44914425, US4937562

SMOKE DETECTOR HEAD FOR USE WITH A BOSCH UL LISTED BASE
FIRE ALARM SUBASSEMBLY
ISSUE NO. A-7462

ALL TEXT ABOVE THIS LINE MUST HAVE A MIN. TEXT HEIGHT OF .047

CONTROLLED
DATE: 01/12/2010
ENGINEERING

REV.	DATE	BY	CHANGE
E	11/06/09	RH	REVISED UL TEXT FROM EQUIPMENT TO SUBASSEMBLY
D	10/13/08	RH	REVISED UL MARKING/TEXT PER UL COMPLIANCE. CHANGED ISSUE # FROM A-45,852 TO A-7462 TO BE USED FOR ONE PERMANENT ISSUE #
C	9/10/03	BM	CHANGED FROM RADIONICS TO BOSCH/ADDED P/N 1700-03151
B	5/2/00	BM	CHANGED ISSUE DATE
A	2/18/00	BM	REMOVED DUPLICATE MAX 100°F.
–	9/29/99	DH	INITIAL RELEASE

NOTES:

1. USE LABEL STOCK PART # 1700-03280
2. LABEL TO BE WHITE WITH ADHESIVE BACKING
3. THE PRINT WILL BE PRODUCED BY THE WEBER MARKING SYSTEMS ULTRAPLATE, ULTRAPLATE B, OR ULTRAPLATE C THERMAL TRANSFER INK FOR PRODUCING FINISHED PRINTED LABELS WITH UL LISTED WEBER THERMAL TRANSFER PRINTERS
4. MINIMUM TEXT SIZE IS .047 IN.
5. THE IMTRAN GS-200 PAD PRINTING SYSTEM MAY BE USED INSTEAD OF THE WEBER MARKING SYSTEM

P/N 1700-03151

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.015
.XXX ±.005

MATERIAL:
SEE NOTE 1
PCB/ASSY

DRAWN BY:
DAVID HALL
CHECKED BY:
APPROVED BY:
UNITS
IN
SCALE
NTS
DRAWING NO.
HA-01-307

HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE
LABEL NAMEPLATE SIJ-24
(D281A-BOSCH)

IONIZATION
SMOKE DETECTOR
MODEL 67-1033
CONTACTS 0.15A @ 24V DC
SENSITIVITY RANGE 0.53-1.40%/FT
SER. NO.

FIKE PROTECTION SYSTEMS
704 S. 10TH STREET, BLUE SPRINGS, MO 64013
MAXIMUM 100° F AMBIENT
FOR INSTALLATION OR MAINTENANCE
DWG. HA-06-077 ISSUE DATE: 6/00
FOR SERVICE RETURN TO: FIKE PROTECTION SYSTEMS

WARNING: CONNECT DETECTOR ONLY TO CONTROL UNIT INITIATING DEVICE CIRCUIT AS SPECIFIED IN DETECTOR OR CONTROL UNIT LITERATURE OR SYSTEM MAY NOT OPERATE.
ASSEMBLED IN U.S.A. OF U.S. AND FOREIGN PARTS
CONTAINS RADIOACTIVE MATERIAL: 0.5 MICROCURIES AMERICIUM 241
DISTRIBUTED UNDER U.S. NRC LICENSE NO. 04-14886-01E
PAT. US44914425, US4937562

SMOKE DETECTOR HEAD FOR
USE WITH A FIKE UL LISTED BASE
FIRE ALARM SUBASSEMBLY
ISSUE NO. A-7462

ALL TEXT ABOVE THIS LINE MUST HAVE A MIN. TEXT HEIGHT OF .047

CONTROLLED
DATE: 01/12/2010
ENGINEERING

NOTES:

1. USE LABEL STOCK PART # 1700-03280
2. LABEL TO BE WHITE WITH ADHESIVE BACKING
3. THE PRINT WILL BE PRODUCED BY THE WEBER MARKING SYSTEMS ULTRAPLATE, ULTRAPLATE B, OR ULTRAPLATE C THERMAL TRANSFER INK FOR PRODUCING FINISHED PRINTED LABELS WITH UL LISTED WEBER THERMAL TRANSFER PRINTERS
4. MINIMUM TEXT SIZE IS .047 IN.
5. THE IMTRAN GS-200 PAD PRINTING SYSTEM MAY BE USED INSTEAD OF THE WEBER MARKING SYSTEM

P/N 1700-03312

REV.	DATE	BY	CHANGE
F	11/04/09	RH	REVISED UL TEXT FROM EQUIPMENT TO SUBASSEMBLY
E	10/13/08	RH	REVISED UL MARKING/TEXT PER UL COMPLIANCE. CHANGED ISSUE # FROM A-45,848 TO A-7462 TO BE USED FOR ONE PERMANENT ISSUE #
D	12-15-05	RH	CHANGED FROM HOCHIKI AMERICA TO FIKE
C	10-03-03	RH	REVISED FM LOGO
B	11-06-00	RM	ADDED FM LOGO
A	10-27-99	BM	CHANGED FIKE ZIP CODE
–	8-13-99	GFC	INITIAL RELEASE

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.015
.XXX ±.005

MATERIAL:
SEE NOTE 1

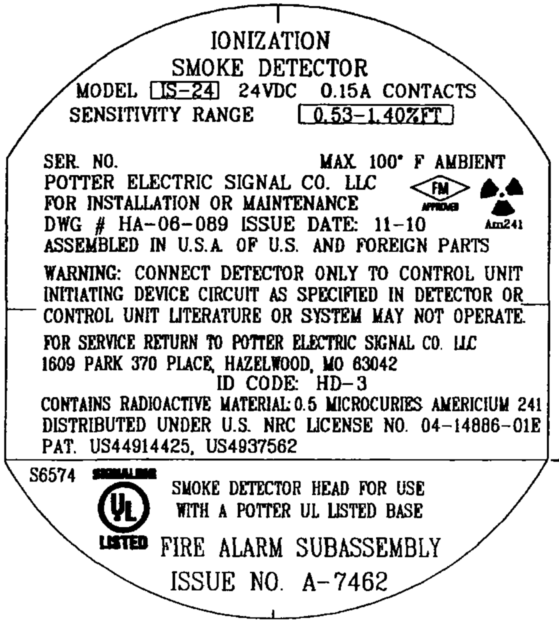
PCS/ASSY

DRAWN BY: GREG F. CORTI
CHECKED BY:
UNITS: IN
APPROVED BY:
SCALE: NTS
DRAWING NO. HA-01-300

HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE: LABEL NAMEPLATE SIJ-24
(FIKE MODEL- 67-1033)

ENCL. A29-1



IONIZATION
SMOKE DETECTOR
MODEL IS-24 24VDC 0.15A CONTACTS
SENSITIVITY RANGE 0.53-1.40%FT

SER. NO. MAX 100° F AMBIENT
POTTER ELECTRIC SIGNAL CO. LLC
FOR INSTALLATION OR MAINTENANCE
DWG # HA-06-089 ISSUE DATE: 11-10
ASSEMBLED IN U.S.A. OF U.S. AND FOREIGN PARTS

WARNING: CONNECT DETECTOR ONLY TO CONTROL UNIT INITIATING DEVICE CIRCUIT AS SPECIFIED IN DETECTOR OR CONTROL UNIT LITERATURE OR SYSTEM MAY NOT OPERATE.

FOR SERVICE RETURN TO POTTER ELECTRIC SIGNAL CO. LLC
1609 PARK 370 PLACE, HAZELWOOD, MO 63042
ID CODE: HD-3
CONTAINS RADIOACTIVE MATERIAL: 0.5 MICROCURIES AMERICIUM 241
DISTRIBUTED UNDER U.S. NRC LICENSE NO. 04-14886-01E
PAT. US44914425, US4937562

S6574

SMOKE DETECTOR HEAD FOR USE
WITH A POTTER UL LISTED BASE
FIRE ALARM SUBASSEMBLY
ISSUE NO. A-7462

ALL TEXT ABOVE THIS LINE MUST HAVE A MIN. TEXT HEIGHT OF .047

CONTROLLED
DATE: 01/20/2011
ENGINEERING

NOTES:

1. USE LABEL STOCK PART # 1700-03280
2. LABEL TO BE WHITE WITH ADHESIVE BACKING
3. THE PRINT WILL BE PRODUCED BY THE WEBER MARKING SYSTEMS ULTRAPLATE, ULTRAPLATE B, OR ULTRAPLATE C THERMAL TRANSFER INK FOR PRODUCING FINISHED PRINTED LABELS WITH UL LISTED WEBER THERMAL TRANSFER PRINTERS
4. MINIMUM TEXT SIZE IS .047 IN.
5. THE IMTRAN GS-200 PAD PRINTING SYSTEM MAY BE USED INSTEAD OF THE WEBER MARKING SYSTEM

P/N 1700-03514

REV.	DATE	BY	CHANGE
E	10-07-10	RH	REMOVED ULC LOGO/TEXT/CHANGED ADDRESS
D	11-06-09	RH	REVISED UL TEXT FROM EQUIPMENT TO SUBASSEMBLY
C	10-13-08	RH	REVISED UL MARKING/TEXT PER UL COMPLIANCE
B	10-03-03	RH	REVISED FM LOGO
A	6-7-02	RH	INCORPORATE ULC
–	3-14-01	BM	INITIAL RELEASE

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.015
.XXX ±.005

MATERIAL: SEE NOTE 1
PCS/ASSY

DRAWN BY: BEN MAGARIN
CHECKED BY:
APPROVED BY:
UNITS: IN
SCALE: NTS
DRAWING NO. HA-01-356

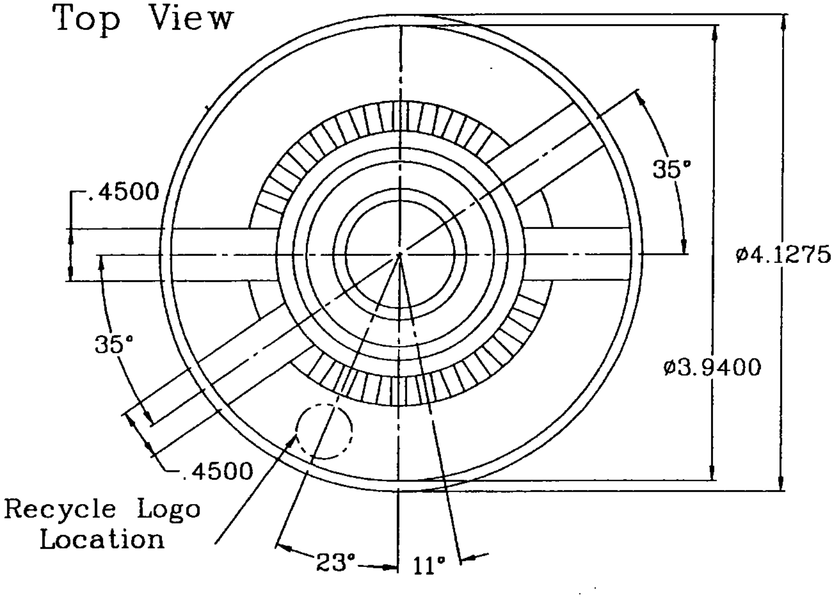
HOCHIKI america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE: LABEL NAMEPLATE SIJ-24/-24C (IS-24 AND IS-24 CANADA POTTER)

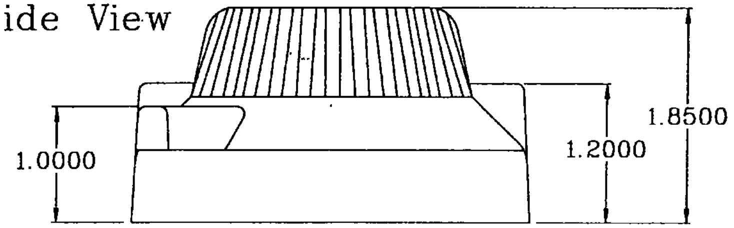
ENCL. A30

CONTROLLED
DATE: 5 /31 /2000
ENGINEERING

Top View



Side View



COMPUTER # 3800-00679

REV.	DATE	BY	CHANGE
–	5-15-00	AVC	INITIAL RELEASE

Notes:

1. Material 15 Mil PVC
   Color: Red 106

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.020
.XXX ±.010

MATERIAL: SEE NOTE 1

PCS/ASSY

DRAWN BY: AVC CORPORATION

CHECKED BY:

UNITS: IN

APPROVED BY:

SCALE: NTS

DRAWING NO. HA-10-372

HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE: COVER DUST DETECTORS (HA)

ENCL. A31

THIS DETECTOR CONTAINS RADIOACTIVE MATERIAL: 0.5 MICROCURIES OF AMERICIUM-241 AND HAS BEEN MANUFACTURED IN COMPLIANCE WITH U.S. NRC SAFETY CRITERIA IN 10 CFR 32.27 AND HAS BEEN DISTRIBUTED IN COMPLIANCE WITH U.S. NRC LICENSE NO. 04-14886-01E. THE PURCHASER IS EXEMPT FROM ANY REGULATORY REQUIREMENT. THIS PACKAGE CONFORMS TO THE CONDITIONS AND LIMITATIONS SPECIFIED IN 49 CFR 173.422 FOR RADIOACTIVE MATERIAL. EXCEPTED PACKAGE - INSTRUMENTS OR ARTICLES UN2910.

CONTROLLED
DATE: 8/21/1997
ENGINEERING

REV.	DATE	BY	CHANGE
A	8-20-97	BM	CORRECTED LABEL STOCK NO.
-	3-13-97	AJG	INITIAL RELEASE

PART # 1700-09742

NOTES:
1. ALL PRINT TO BE BLACK
2. BACKGROUND TO BE WHITE
3. USE LABEL STOCK PART #1700-01001

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.015
.XXX ±.005

MATERIAL:

PCS/ASSY

DRAWN BY: ANTHONY J GARCIA
DATE: 3-13-97
CHECKED BY:
UNITS: NA
APPROVED BY:
SCALE: NA
DRAWING NO. HA-10-239

HOCHIKI AMERICA CORP.
5415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

TITLE
LABEL NRC WARNING
5/10 PC BOX

SLR-835B-2

DIRECT-WIRE PHOTOELECTRIC SMOKE
DETECTOR - 2 WIRE
8-35VDC 0.15A CONTACTS
MAX 100°F AMBIENT

BAR CODE 39

SLR-835B-2W

DIRECT-WIRE PHOTOELECTRIC SMOKE
DETECTOR - 2 WIRE WHITE
8-35VDC 0.15A CONTACTS
MAX 100°F AMBIENT

BAR CODE 39

SIJ-24

IONIZATION SMOKE DETECTOR
24VDC 0.15A CONTACTS
MAX 100°F AMBIENT

THIS DETECTOR CONTAINS RADIOACTIVE MATERIAL: 0.5 MICROCURIES OF AMERICIUM-241 AND HAS BEEN MANUFACTURED IN COMPLIANCE WITH U.S. NRC SAFETY CRITERIA IN 10 CFR 32.27 AND HAS BEEN DISTRIBUTED IN COMPLIANCE WITH U.S. NRC LICENSE NO. 04-14886-01E. THE PURCHASER IS EXEMPT FROM ANY REGULATORY REQUIREMENT. THIS PACKAGE CONFORMS TO THE CONDITIONS AND LIMITATIONS SPECIFIED IN 49 CFR 173.422 FOR RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - INSTRUMENTS OR ARTICLES UN2910

BAR CODE 39

Am241

SLR-24H

PHOTOELECTRIC SMOKE DETECTOR W/HEAT
24VDC 0.15A CONTACTS
MAX 100°F AMBIENT
ELEMENT TEMP. RATING 135°F (57.2 °C)

BAR CODE 39

SLR-835BH-2W

DIRECT-WIRE PHOTOELECTRIC SMOKE
DETECTOR W/HEAT - 2 WIRE WHITE
8-35VDC 0.15A CONTACTS
MAX 100°F AMBIENT
ELEMENT TEMP. RATING 135°F (57.2 °C)

BAR CODE 39

SLR-835B-2-DDC

DIRECT-WIRE PHOTOELECTRIC SMOKE
DETECTOR - 2 WIRE
8-35VDC 0.15A CONTACTS
MAX 100°F AMBIENT

BAR CODE 39

SLR-835B-4

DIRECT-WIRE PHOTOELECTRIC SMOKE
DETECTOR - 4 WIRE
8-35VDC 0.5A CONTACTS
MAX 100°F AMBIENT

BAR CODE 39

SLR-835B-4W

DIRECT-WIRE PHOTOELECTRIC SMOKE
DETECTOR - 4 WIRE WHITE
8-35VDC 0.5A CONTACTS
MAX 100°F AMBIENT

BAR CODE 39

SLR-24

PHOTOELECTRIC SMOKE DETECTOR
24VDC 0.15A CONTACTS
MAX 100°F AMBIENT

BAR CODE 39

SLR-24V

PHOTOELECTRIC SMOKE DETECTOR
24VDC 0.15A CONTACTS
MAX 100°F AMBIENT
AIR VELOCITY 0-4000 FPM

BAR CODE 39

SLR-835BH-2

DIRECT-WIRE PHOTOELECTRIC SMOKE
DETECTOR W/HEAT - 2 WIRE
8-35VDC 0.15A CONTACTS
MAX 100°F AMBIENT
ELEMENT TEMP RATING 135°F (57.2 °C)

BAR CODE 39

SLR-835BH-2-DDC

DIRECT-WIRE PHOTOELECTRIC SMOKE
DETECTOR W/HEAT - 2 WIRE
8-35VDC 0.15A CONTACTS
MAX 100°F AMBIENT
ELEMENT TEMP. RATING 135°F (57.2 °C)

BAR CODE 39

SLR-835

PHOTOELECTRIC SMOKE DETECTOR
8-35VDC 0.15A CONTACTS
MAX 100°F AMBIENT

BAR CODE 39

SLR-835W

PHOTOELECTRIC SMOKE DETECTOR
8-35VDC 0.15A CONTACTS
MAX 100°F AMBIENT
COLOR: WHITE

BAR CODE 39

SIJ-24+NS6-220

IONIZATION SMOKE DETECTOR WITH BASE

24VDC 0.15A CONTACTS
MAX 100°F AMBIENT

BASE ALARM CURRENT
93mA (136mA@33.0V MAX)
BASE ID: HB-3

THIS DETECTOR CONTAINS RADIOACTIVE MATERIAL 0.5 MICROCURIES OF AMERICIUM-241 AND HAS BEEN MANUFACTURED IN COMPLIANCE WITH U.S. NRC SAFETY CRITERIA IN 10 CFR 32.27 AND HAS BEEN DISTRIBUTED IN COMPLIANCE WITH U.S. NRC LICENSE NO. 04-14886-01E. THE PURCHASER IS EXEMPT FROM ANY REGULATORY REQUIREMENT. THIS PACKAGE CONFORMS TO THE CONDITIONS AND LIMITATIONS SPECIFIED IN 49 CFR 173.422 FOR RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - INSTRUMENTS OR ARTICLES UN2910

BAR CODE 39

Am241

SLR-24H+NS6-220

PHOTOELECTRIC SMOKE DETECTOR W/HEAT & W/BASE
24VDC 0.15A CONTACTS
MAX 100°F AMBIENT
ELEMENT TEMP. RATING 135°F (57.2 °C)

BASE ALARM CURRENT
93mA(136mA@ 33.0V MAX)
BASE ID: HB-3

BAR CODE 39

SLR-835H

PHOTOELECTRIC SMOKE DETECTOR W/HEAT
8-35VDC 0.15A CONTACTS
MAX 100°F AMBIENT
ELEMENT TEMP. RATING 135°F (57.2 °C)

BAR CODE 39

SLR-835H+SBC-2

PHOTOELECTRIC SMOKE DETECTOR W/HEAT & W/BASE
8-35VDC 0.15A CONTACTS
MAX 100°F AMBIENT
ELEMENT TEMP. RATING 135°F (57.2 °C)

		GROUP/ GLOBAL MODE
BASE Max. Alarm Current	31mA @ 8.7 VDC 47mA @ 12 VDC 69mA @ 24 VDC	17mA @ 8.7 VDC 23mA @ 12 VDC 45mA @ 24 VDC

BAR CODE 39

SLR-835W+HSC-4R12

PHOTOELECTRIC SMOKE DETECTOR WITH RELAY BASE
8-35VDC 0.15A CONTACTS
MAX 100°F AMBIENT
COLOR: WHITE

BASE ALARM CURRENT
47mA(75mA@ 18.0V MAX)
COLOR: WHITE
CAUTION: FOR 12 VOLT APPLICATION ONLY.

BAR CODE 39

SLR-835HW

PHOTOELECTRIC SMOKE DETECTOR W/HEAT
8-35VDC 0.15A CONTACTS
MAX 100°F AMBIENT
ELEMENT TEMP. RATING 135°F (57.2 °C)
COLOR: WHITE

BAR CODE 39

SLR-835BH-4W

DIRECT-WIRE PHOTOELECTRIC SMOKE
DETECTOR W/HEAT - 4 WIRE WHITE
8-35VDC 0.5A CONTACTS
MAX 100°F AMBIENT
ELEMENT TEMP. RATING 135°F (57.2 °C)

BAR CODE 39

SLR-835BH-4

DIRECT-WIRE PHOTOELECTRIC SMOKE
DETECTOR W/HEAT - 4 WIRE
8-35VDC 0.5A CONTACTS
MAX 100°F AMBIENT
ELEMENT TEMP. RATING 135°F (57.2 °C)

BAR CODE 39

SLR-24V+NS6-220

PHOTOELECTRIC SMOKE DETECTOR W/BASE
24VDC 0.15A CONTACTS
MAX 100°F AMBIENT
AIR VELOCITY: 0-4000 FPM

BASE ALARM CURRENT
93mA(136mA@ 33.0V MAX)
BASE ID: HB-3

BAR CODE 39

SLR-835HW+SBC-2W

PHOTOELECTRIC SMOKE DETECTOR W/HEAT & W/BASE
8-35VDC 0.15A CONTACTS
MAX 100°F AMBIENT
ELEMENT TEMP. RATING 135°F (57.2 °C)

		GROUP/ GLOBAL MODE
BASE Max. Alarm Current	31mA @ 8.7 VDC 47mA @ 12 VDC 69mA @ 24 VDC	17mA @ 8.7 VDC 23mA @ 12 VDC 45mA @ 24 VDC

BAR CODE 39

CONTROLLED
DATE: 01/11/2008
ENGINEERING

NOTES:

1. USE LABEL STOCK PART # 1700-01009
2. LABEL TO BE WHITE WITH ADHESIVE BACKING
   USE WEBER 620257 BLACK RIBBON .
3. THE PRINT WILL BE PRODUCED BY THE WEBER MARKING SYSTEMS ULTRAPLATE, ULTRAPLATE B, OR ULTRAPLATE C THERMAL TRANSFER INK FOR PRODUCING FINISHED PRINTED LABELS WITH UL LISTED WEBER THERMAL TRANSFER PRINTERS
4. ALL BAR CODES MUST INCLUDE PART NUMBER INFORMATION (REFER TO TOP LEVEL DOCUMENT FOR THE CORRECT PART NUMBER).

REV.	DATE	BY	CHANGE
E	11-12-07	RH	ADDED SLR-835H+SBC-2, SLR-835B-2-DDC/-BH-2-DDC
D	05-04-06	RH	ADDED SLR-24V+NS6-220
C	12-10-01	RH	ADDED SLR-835H, SLR-835HW, SLR-835BH-2, SLR-835BH-2W, SLR-835BH-4 & SLR-835BH-4W
B	10-26-01	RH	ADDED SIJ-24+NS6-220, SLR-24H+NS6-220 & SLR-835W+HSC-4R12W
A	4-07-00	KN	ADDED SLR-835, SLR-835W, & SLR-24V
-	11-19-99	GFC	INITIAL RELEASE

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.015
.XXX ±.005

MATERIAL:
SEE NOTE 1

PCS/ASSY

DRAWN BY: GREG F. CORTI

CHECKED BY:

APPROVED BY:

UNITS: IN

SCALE: NTS

DRAWING NO. HA-01-323

HOCHIKI america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE: LABEL INDIVIDUAL BOX SMOKE DETECTOR RETAIL

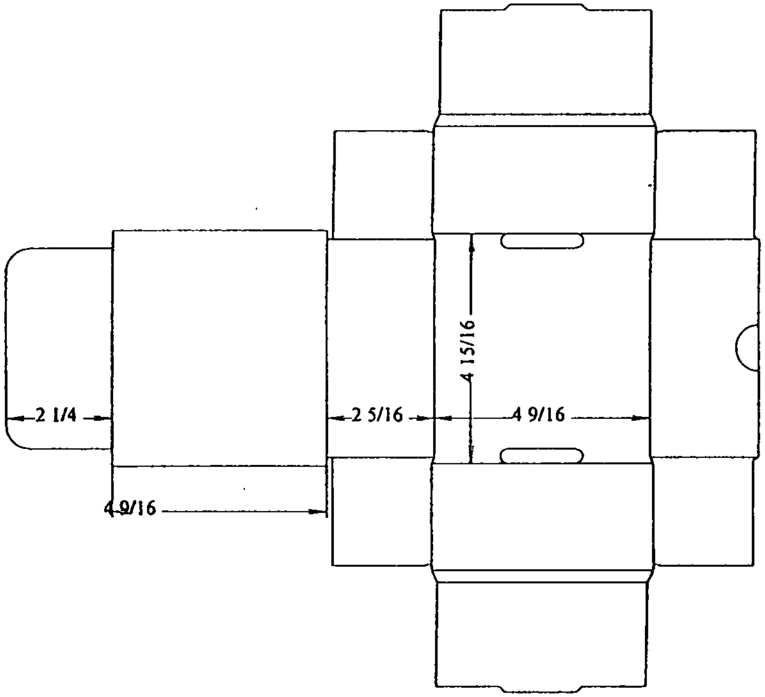
ENCL. A33

Customer: **HOCHIKI AMERCA**	67	I.D. Size: 4 5/16 X 4 5/16 X 2 1/8		Project #:
Requested By: **BILL**		Finished Size: 14 9/16 X 16		Design #: 999900400
Designed By: **TONY GARCIA**		Test: 200	Flute: B Color: #3 WHITE	Style: RETT
Area (Square Feet): 1.62		Inches of Rule: 131 3/4		

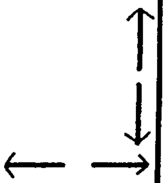
Corrugation Direction: Vertical

VIEW

PART NO. 3800-00525



CONTROLLED
DATE: 10/ 8 /1998
ENGINEERING



REV.	DATE	BY	CHANGE
-	10-7-98	JA	INITIAL RELEASE

DRAWN BY: HERITAGE
DATE 10/5/98
CHECKED BY:
UNITS
APPROVED BY:
SCALE
DRAWING NO: HA-10-304

HOCHIKI AMERICA CORP.
5415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

TITLE: BOX 1 PC 4 5/16 X 4 5/16 X 2 1/8

CK'D BY:
Date: 10/05/98
Time: 03:36 PM

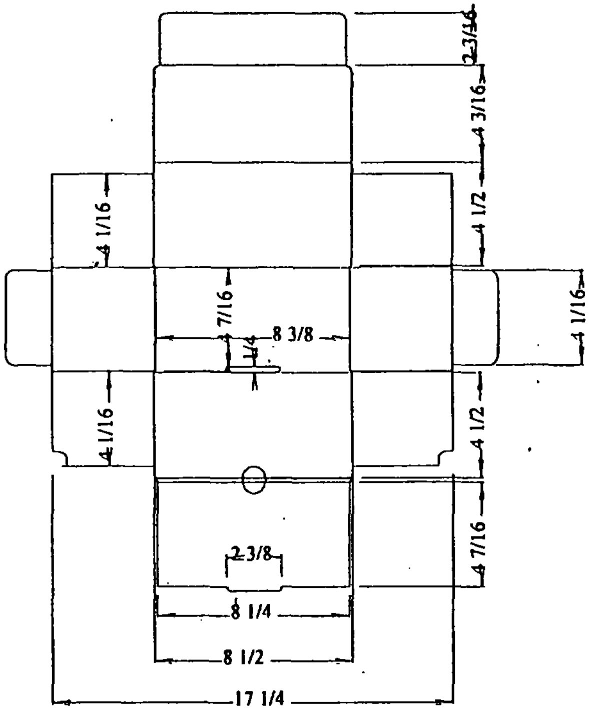
ENCL. A34

Customer: **HOCHIKI AMERCA**	67	I.D. Size: 8 1/4 X 4 1/8 X 4 1/2			Project #:
Requested By: **BILL**		Finished Size: 24 3/4 X 21 1/4			Design #: **1004**
Designed By: **SAUL CONTRERAS**		Test: 200lb.	Flute: E	Color: K	Style: **TOWARDS 90**
Area (Square Feet): 3.6512		Inches of Rule: 197 41/64			

Corrugation Direction: **Vertical**

VIEW

PART NO: 3800-00625



CONTROLLED
DATE: 5/14/1998
ENGINEERING

REV.	DATE	BY	CHANGE
B	5-14-98	JA	Changed PART No. & Description
A	6-26-97	LL	Changed Vendor & DIM.
—	3-17-97	HC	Initial Release

DRAWN BY: HC	DATE 7/10/96	HOCHIKI AMERICA CORP. 5415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY:	SCALE	TITLE:
DRAWING NO: HA-10-235		BOX 5 PC ALG, SIJ, SLR

ENCL. A35

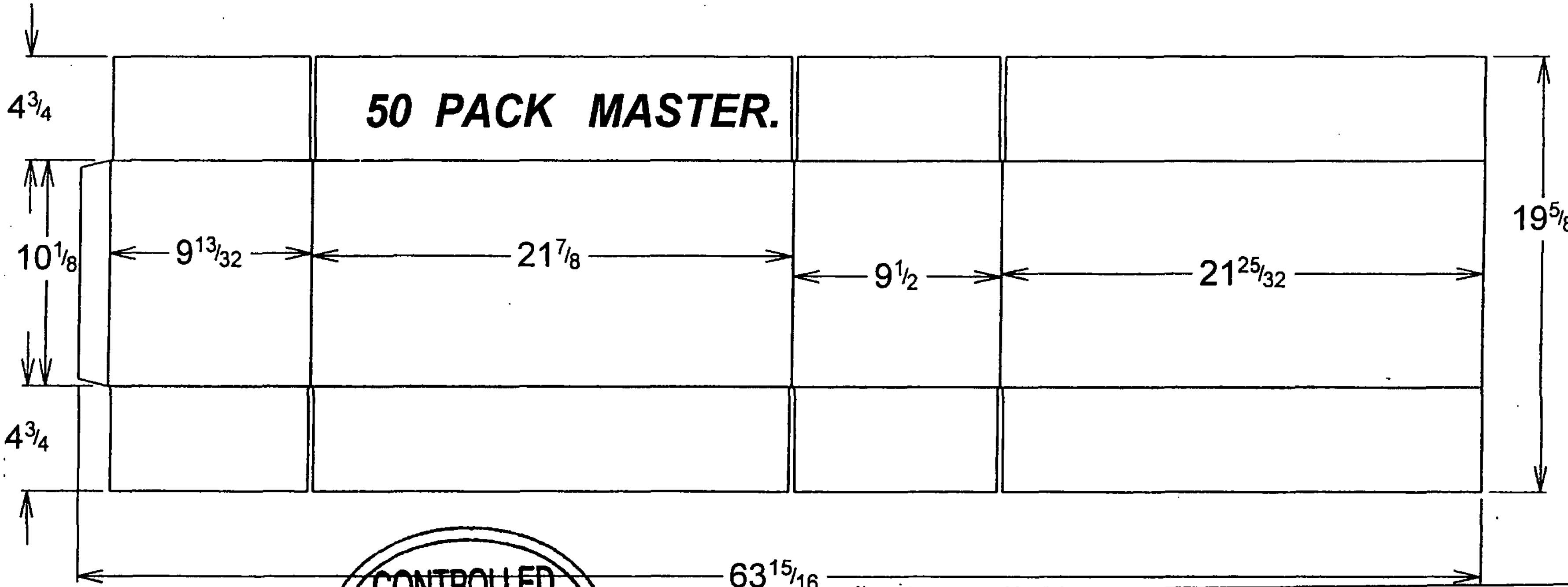
Heritage Paper Company

2400 South Grand, Santa Ana, CA 92705 (714) 540-9737 / (800) 894-7273 / FAX (714) 428-0266

Customer: : HOCHIKI
Requested By:
Date: 12/22/1999
Design: DESIGN4.ARD
Description: RSC.
Board: 200lb. C-FLUTE

I.D. Size: 21+11/16 x9+5/16 x9+3/4
Finished Size: 19+5/8 X 63.937
Inches of Rule : 388.442
Area (SQ. Feet): 8+9/16
Corrugation Direction: Vertical

3800-00626



CONTROLLED
DATE: 1/12/2000
ENGINEERING

COMPUTER# 3800-00626

REV.	DATE	BY	CHANGE
--	1/18/00	KN	INITIAL RELEASE

DRAWN BY: HERITAGE PAPER
CHECKED BY:
UNITS INCH
APPROVED BY:
SCALE NA

HOCHIKI america corporation
7051 VILLAGE DRIVE, SUITE 100
BUENA PARK, CA 90621-2268

DRAWING NO: HA-10-352
TITLE: BOX MASTER 21 11/16 X 9 5/16 X 9 3/4

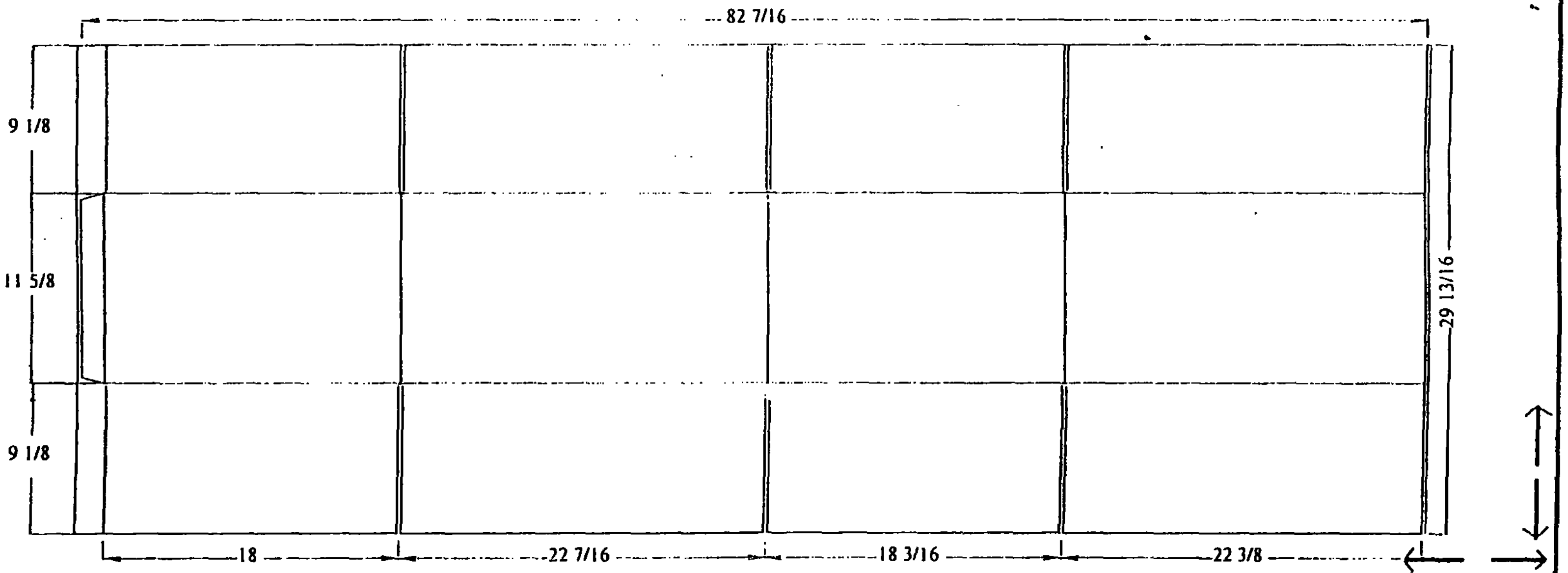
ENCL. A36

Customer: :	66	I.D. Size: 22 1/4 X 18 X 11 1/4		Project #:
Requested By: BILL		Finished Size: 29 13/16 X 82 7/16		Design #: 14
Designed By: TONY GARCIA		Test: 200lb.	Flute: C	Color: KRAFT Style: RSC
Area (Square Feet): 17.17		Inches of Rule: 540 7/8		

Corrugation Direction: Vertical

VIEW

P/N 3800-00596



A	9/23/99	JA	CHANGED DIMENSION
–	10/7/98	JA	INITIAL RELEASE
REV.	DATE	BY	CHANGE

CK'D BY:

Date: 10/27/98

Time: 07:31 AM

DRAWN BY: HERITAGE

DATE 10/5/98

CHECKED BY:

UNITS

APPROVED BY:

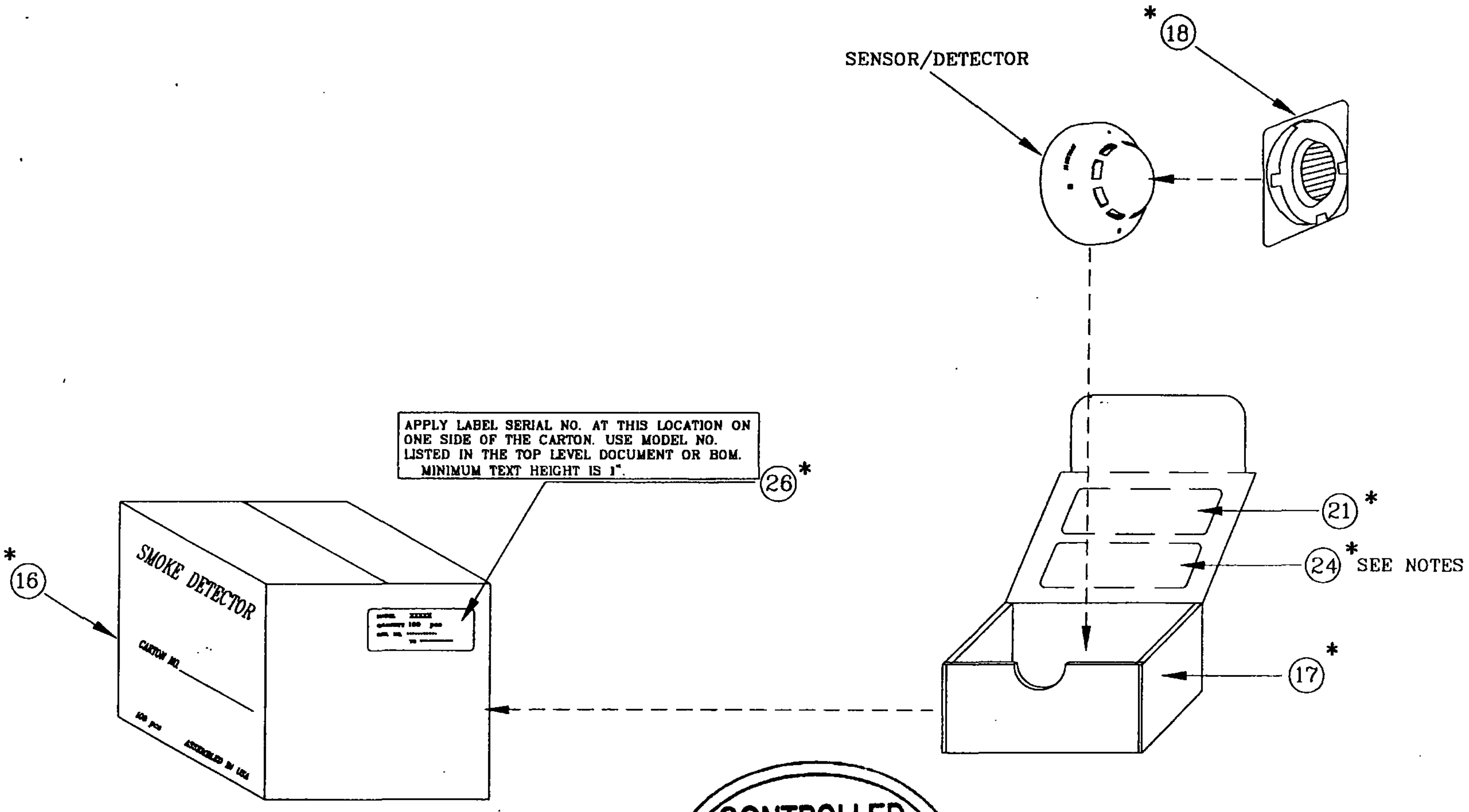
SCALE

HOCHIKI america corporation
7051 VILLAGE DRIVE
BUENA PARK, CA 90621-2268

DRAWING NO. HA-10-309

TITLE: BOX MASTER 22 1/4 X 18 X 11 1/4

CONTROLLED
DATE: 9 /23/1999
ENGINEERING



CONTROLLED

DATE: 6/1/2000

ENGINEERING

NOTES:

1. PLACE DUST COVER (18) ON SENSOR/DETECTOR AS SHOWN.
2. PLACE THE SENSOR/ DETECTOR INTO THE INDIVIDUAL BOX (17).
3. APPLY NRC WARNING LABEL (21) ONTO THE OUTSIDE ON TOP OF 1 PC BOX (17).
4. APPLY BARCODE LABEL (24) OR STAMP MODEL NUMBER ON THE OUTSIDE ON TOP OF THE 1PC BOX (17).
5. PLACE 100 INDIVIDUAL BOXES INTO THE MASTER BOX (16).
6. APPLY 100PC SERIAL NO. LABEL (26) TO THE MASTER BOX (16) AS SHOWN.
7. STAMP MODEL NO. ON BOTH SIDES OF THE MASTER BOX (16).

B	5-11-00	KN	CHANGED ITEM NO.
A	10-4-99	BM	REVISED DRAWING
–	10-6-98	BM	INITIAL RELEASE
REV.	DATE	BY	CHANGE

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.015
.XXX ±.005

MATERIAL:

PCB/ASSY

DRAWN BY: BEN MAGARIN

CHECKED BY:

APPROVED BY:

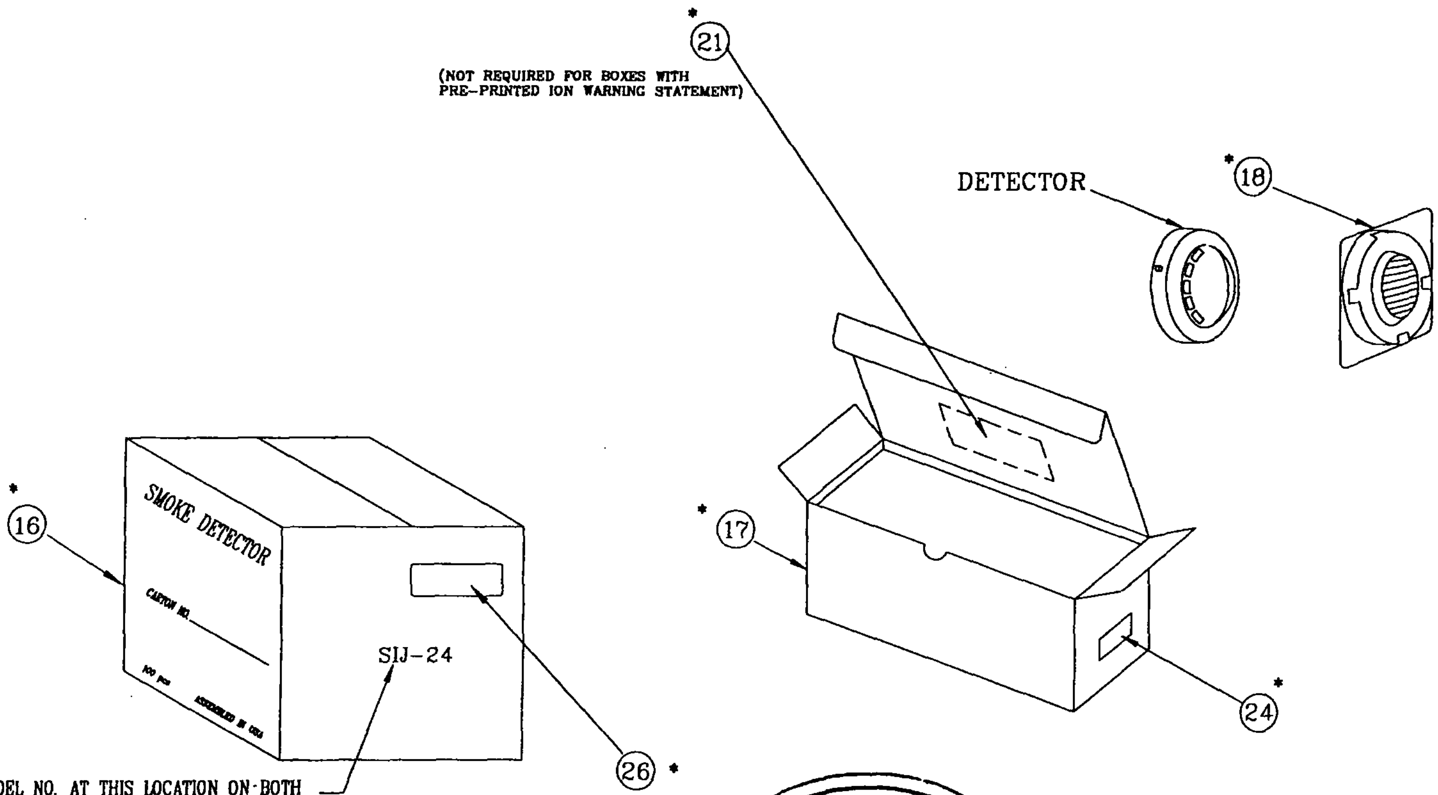
UNITS NA

SCALE NA

DRAWING NO. HA-10-307

HOCHIKI america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE ASSEMBLY PACKAGING INDIVIDUAL BOX ION SENSOR/DETECTOR



STAMP MODEL NO. AT THIS LOCATION ON BOTH SIDES OF THE CARTON. USE MODEL NUMBER LISTED IN THE TOP LEVEL DOCUMENT OR BOM. MINIMUM TEXT HEIGHT IS 1".
MODEL NUMBER IS AN EXAMPLE ONLY!!!!

CONTROLLED
DATE: 6/1/2000
ENGINEERING

REV.	DATE	BY	CHANGE
C	5-11-00	KN	CHANGED ITEM NO. & CHANGED THE TITLE OF THE DWG
B	8-4-99	GFC	CHANGED LOGO & ADDRESS, ADDED SERIES & MODEL NO. INFO.
A	12-15-97	BM	REMOVED DESCRIPTION AND PART NO.
-	9-23-97	BM	INITIAL RELEASE

NOTES:

1. PLACE DUST COVER (18) ON THE DETECTOR
2. PLACE 5 DETECTORS IN 5 PC BOX (17) (SIDEWAYS)
3. APPLY NRC WARNING LABEL (21) ON THE OUTSIDE OF THE TOP OF 5 PC BOX (17)
4. APPLY 5 PC SERIAL NO. LABEL (24) TO 5 PC BOX
5. PLACE 20 OF THE 5 PC BOXES IN 100 PC BOX (16)
6. APPLY 100 PC SERIAL NO. LABEL (26) TO 100 PC BOX
7. STAMP 100 PC BOX AS SHOWN BOTTOM LEFT

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.015
.XXX ±.005

MATERIAL:

PCS/ASSY

DRAWN BY: BEN MAGARIN

CHECKED BY:

APPROVED BY:

UNITS NA

SCALE NA

DRAWING NO. HA-10-263

HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2265

TITLE
ASSEMBLY PACKAGING 5PC BOX
ION DETECTORS USA SERIES

TO:HOCHIKI CORPORATION

FROM:JAPAN RADIOISOTOPE ASSOSIATION

CERTIFICATE OF UNDERMENTIONED FOIL SOURCE

APPROVEED THE CLASSIFICATION C32222 OF JIS-Z4821

NUCLIDE : AM-241
(Manufacturer : Amersham International plc, Amersham UK)

CODE NUMVER : AMMK-2812 pd face
2.5mm x 2.5mm

RADIOACTIVITY : 18.5kbq (0.5uci)

TEST REQUIREMENT
: The test was performed after the source was mounted in stainless steel holder.
(Holder No. SIH-type XM-11781 and XM-11782)

ENCL. A40

TEST REPORT

TO: HOCHIKI CORPORATION

FROM: JAPAN RADIOISOTOPE ASSOSIATION

REPORT IS AS FOLLOWS:

<table>
<tr><td>1</td><td>MATTER OF REQUEST</td><td colspan="3">CLASSIFICATION TEST OF UNDERMENTIONED FOIL SOURCE ACCORDING TO THE JIS Z-4821 1981.</td></tr>
<tr><td>2</td><td>TEST MATERIAL</td><td colspan="3">ALPHA FOIL SOURCE FOR SMOKE DETECTOR WITH HOLDER (XM-11781, 11782)</td></tr>
<tr><td>3</td><td>TEST METHOD</td><td colspan="3">ACCORDING TO THE JIS Z-4821 1981</td></tr>
<tr><td>4</td><td>TEST PLACE</td><td colspan="3">JAPAN RADIOISOTOPE ASSOCIATION & HOCHIKI CORPORATION</td></tr>
<tr><td>5</td><td>TEST DATE</td><td colspan="3">JAN. 18. 1988- FEB. 2. 1988</td></tr>
<tr><td rowspan="6">6</td><td rowspan="6">TEST RESULT</td><td>TEST ITEM</td><td>CLASSIFICATION</td><td>JUDGMENT</td></tr>
<tr><td>TEMPERATURE</td><td>3</td><td>GOOD</td></tr>
<tr><td>PRESSURE</td><td>2</td><td>GOOD</td></tr>
<tr><td>SHOCK</td><td>2</td><td>GOOD</td></tr>
<tr><td>VIBRATION</td><td>2</td><td>GOOD</td></tr>
<tr><td>BANG</td><td>2</td><td>GOOD</td></tr>
</table>

ENCL. A41

RELIABILITY TEST REPORT

TEST	Vibration Test (Sine Wave)		
SAMPLE	Ionization Smoke Detector	Model	SIH-24F

Test Method	1. Under supplying the power to the detector, it will be forced to the vibration of 1000 cycles per minutes and amplitude of 4mm for 60 minutes. 2. Mounting Each 3 detectors shall be mounted in up side and down side (which means total 6 pcs. of detectors are mounted and tested). The detectors shall be tested for both of vertical and horizontal vibration.
Test apparatus	1. Matsudaira type vibration machine model:UBC-4A, Manufactured by Ito seiki Co., 2. Fire Alarm Control Panel
Test Result	1. There was no false alarm during the test. 2. There was no trouble on the function and the structure of the detector.
Standard for judgement	1. The detector should not generate a false alarm. 2. The detector should not have a trouble on the structure and the function.
Judgement	OK
Comment	In consideration of this test, under normal environmental vibration (possibly the detectors may be faced. the vibration in normal environment), there are no influence on the detectors of the structure and the function.

HOCHIKI CORPORATION

ENCL. A42

Date: 12/9/96 CK

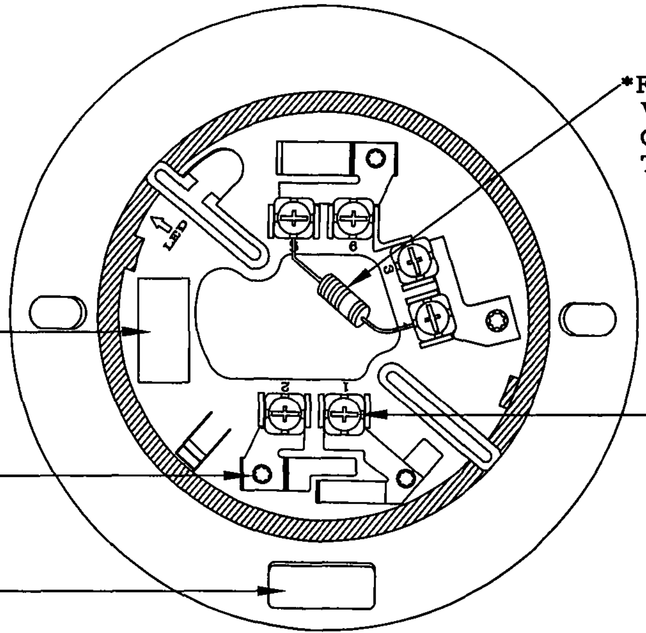
SIJ SERIES SHOCK TEST

# OF SAMPLE	2 SIJ IONIZATION SMOKE DETECTORS		
TEST METHOD	1. HAND HELD VERTICLE DROP FROM 12' 2. 2 DETECTORS CYCLED 25 TIMES EACH 3. DETECTORS WERE DROPPED FACE DOWN AS THEY WOULD BE INSTALLED IN THE FIELD. AFTER 8 DROPS OF EACH DETECTOR THEY WERE INSPECTED FOR DAMAGE AND MEASUREMENTS TAKEN.		
TEST RESULTS	MEASUREMENTS TAKEN WERE AS FOLLOWS:		
	PRIOR TO DROP	DETECTOR (A)	DETECTOR (B)
	BACKGROUND	32	32
	GROSS COUNT	31	35
	NET COUNTS	-1	3
	AFTER 8 DROPS THERE WAS THERE WAS SLIGHT PHYSICAL DAMAGE		
	AFTER 8 CYCLES	DETECTOR (A)	DETECTOR (B)
	BACKGROUND	39	47
	GROSS COUNT	29	42
	NET COUNTS	-10	-5
	AFTER 16 DROPS THERE WAS THERE WAS SLIGHT PHYSICAL DAMAGE		
	AFTER 16 CYCLES	DETECTOR (A)	DETECTOR (B)
	BACKGROUND	38	37
	GROSS COUNT	40	34
	NET COUNTS	2	-4
	AFTER 25 DROPS THERE WAS MODERATE DAMAGE TO THE COVER		
	AFTER 25 CYCLES	DETECTOR (A)	DETECTOR (B)
	BACKGROUND	37	33
	GROSS COUNT	29	29
	NET COUNTS	-8	-4
JUDGEMENT STANDARD	AFTER TEST, DETECTOR SHOULD NOT SHOW ANY SIGNS OF MAJOR DAMAGE TO THE SMOKE DETECTOR CHAMBER AND SPECIFICALLY TO THE RADIOACTIVE SOURCE.		
JUDGEMENT	MEET ALL CRITERIA		
COMMENTS	ALTHOUGH THE DETECTOR OUTER COVER SHOWED MODERATE DAMAGE THE SMOKE CHAMBER AND RADIOACTIVE SOURCE SHOWED NO SIGNS OF MAJOR DAMAGE. WE FEEL THIS TEST IS MUCH MORE SEVERE THAN WOULD EVER ARISE IN THE FIELD, AND UNDER NORMAL CONDITIONS THE SIJ SERIES DETECTOR WOULD IN NO ADVERS WAY AFFECT THE HEALTH AND SAFETY OF PUBLIC DOMAIN FROM A LEAK DUE TO THE DETECTOR INADVERTENTLY BEING DROPPED OR OTHERWISE BEING ABUSED SUCH AS DAMAGED IN TRANSIT		

ENCL. A43

*TABLE 1

MODEL	ID NO	RESISTOR VALUE
NS6-2, 2W	HB-1	2K OHM 2W
NS6-21, 21W	HB-2	750 OHM 2W
NS6-224, 224W	HB-5	430 OHM 3W
NS6-221, 221W	HB-4	390 OHM 2W
NS6-220, 220W	HB-3	220 OHM 5W



*FOR PROPER RESISTOR VALUE BY BASE MODEL OR IDENTIFIER REFER TO TABLE 1

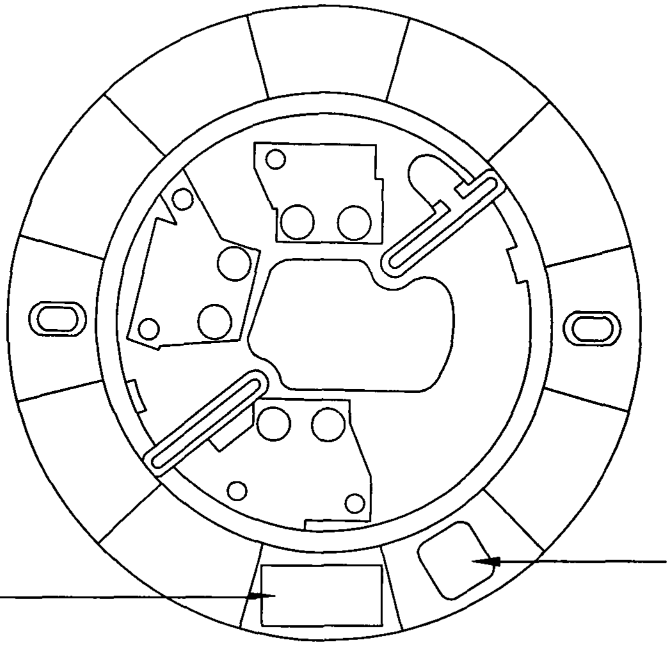
MODEL NUMBER LABEL
(SEE DWG.HA-02-138)

3.5 X 8
SCREW PHIL W/CLAMP
(6 PLCS)

3 X 7
LINEHEAD SCREW
(4 PLCS)

LABEL LOGO
(SEE TOP LEVEL DOCUMENT OR BOM)

FRONT



UL LABEL

FM LABEL
(SEE TOP LEVEL DOCUMENT OR BOM)

BACK

試験内容	Radiation data sheet	測定日	自 H1. 9. 6 至 . .
		承認 / 調査 / 測定	HIRAIZ

distance

DPM

	0cm		5		25	
	[cpm]	[mR/h]	[cpm]	[mR/h]	[cpm]	[mR/h]
A ①	120	4.14×10^{-3}	80	1.38×10^{-3}	75	1.04×10^{-3}
②	120	4.14×10^{-3}	80	1.38×10^{-3}	75	1.04×10^{-3}
B ①	75	1.04×10^{-3}	90	2.07 "	60	0
②	100	2.76 "	100	2.76 "	70	0.69×10^{-3}
C ①	120	4.14 "	80	1.38 "	50	0
②	100	2.76 "	90	2.07 "	60	0
D ①	70	0.69 "	65	0.35 "	50	0
②	80	1.38 "	80	1.38 "	60	0
	→ 60.					

備考

① : sample No. 1

② : sample No. 2

一般条件	室温	湿度	気圧	風速	炉内温度			
	℃	%	mmHg	m/s	℃			

CK 12/9/1996

Radiation Measurement Sheet
SIJ-24

	0cm		5cm		25cm	
	CPM	uR/hr.	CPM	uR/hr.	CPM	uR/hr.
Top						
1	67	2.14	50	0.97	38	0.14
2	65	2	45	0.62	35	0.00
Bottom						
1	43	0.48	34	0.00	33	0.00
2	44	0.55	33	0.00	33	0.00
Right						
1	37	0.35	27	0.00	36	0.00
2	26	0.00	38	0.14	29	0.00
Left						
1	37	0.07	27	0.00	28	0.00
2	42	0.41	31	0.00	31	0.00

1= Sample #1
2= Sample#2

Background Count = 36CPM

Conditions:
21.0 °C 53% R.H.

Eberline Survey Meter
Model SRM-100
Ser. No. 289

ACTUAL SALES QTY OF IONIZATION SMOKE DETECTORS

MODEL	2007	2008	2009	2010
SIJ-24+NS6-100		2		
SIJ-24+NS6-220	130	197	123	169
SIJ-24DH	7	2		2
SIJ-24 HA	9740	7755	5416	3616
SIJ-24 RETAIL	331	420	367	122
IS-24 (SIJ-24) SB-93 POTTER	400	400	400	500
SIJ-24 BOSCH	10	66	19	32
SIJ-E		438		
SIJ-24 ASN	2250	2258	1700	400
CONVENTIONAL TOTAL QTY	12,868	11,530	8,025	4,841
MODEL				
AIE-EAC AIS CN POTTER	100			
AIE-EA AIS POTTER	240	200	200	
AIE-EA HA	1165	1112	2700	640
AIE-EA SK	6546	2843	2673	1000
AIE-EA BOSCH			206	
AIE-EA AS		600	129	400
AIE-E	1844	1350	609	1100
AIE-EA VES	597	249		
ANALOG TOTAL QTY	10,492	6,354	6,517	3,140
OVERALL QTY (CONV+ANALOG)	23,360	17,884	14,542	7,981

HOCHIKI
america corporation

7051 Village Drive, Suite 100
Buena Park, CA 90621-2268
Phone Main: 714-522-2246

RENEWAL APPLICATION TO THE U.S. NUCLEAR REGULATORY COMMISSION FOR RADIATION SAFETY EVALUATION AND REGISTRATION OF DEVICES

November 19, 2010

HOCHIKI AMERICA COPROATION
7051 VILLAGE DRIVE, SUITE 100
BUENA PARK, CA 90621-2268
TEL: (714) 522-2246
FAX: (714) 522-2268

CONTACT: LOREN L. LEIMER – RSO
HISHAM HARAKE – ALT. RSO

IONIZATION TYPE SMOKE DETECTORS
HOCHIKI MODEL AI_SERIES

This series of detector is manufactured for both Hochiki customers as well as private labeled for specific customers.

RADIOACTIVE SOURCE Am-241 0.98 μCi

Manufactured by:

NRD, LLC.
2937 Alt Blvd.
Grand Island, NY 14072
Model A-001

Radioactive material possessed under conditions of California License 2090-30 (agreement state). Sources will be leak tested at the time of manufacture and distribution in compliance with 10 CFR Part 32.29 and as described within this document.

This detector is Principal Use Code "P" devices proposed for use under a license exemption per 10 CFR Part 30.20.

Summary Description

The AI_ series smoke detector is industrial ionization type. It is intended to be used for the protection of life and property from fires by the detection of airborne particulates. This detector will normally be mounted on the ceiling or below the floor. A complete system will generally be comprised of a number of detector heads, which are connected to and operate from a central control unit. The AI_ series detector is designed in such a way that the radioactive material is not readily accessible in its location within the assembly. The outside cover protects the chamber and prevents most objects from reaching the source. During installation there is no need to remove any mechanical or electrical parts which would also preclude anyone from inadvertently coming in contact with the radioactive source.

Description, Intended Use and Operation

The AI_ series ionization smoke detector is provided with a radioactive source of (Am-241), .0.98 uCi to ionize the air. The detector is designed to detect an abnormal decrease in ionization current due to the combustion products created by a fire. It is installed in a fixed location. The source housing does not move during operation.

The AI_ series smoke detector has two sampling chambers, an outer and an inner ionization chamber. Smoke or invisible gasses can freely penetrate the outer chamber, but the inner chamber is virtually closed to prevent easy entry. With both chambers ionized by radioactive source Am-241, a very small amount of current flows in the circuit. The presence of smoke or gases will influence the current flow in the outer chamber, and will cause a change in the voltage ratio between chambers. This difference is then amplified inside the detector and transmitted to the fire alarm control unit to which it is connected. (See enclosure A2).

Details of Construction and Use

The basic chamber design for the AIE type of detectors has been carefully researched. Maximum ionization of air between the electrodes is achieved with a minimum amount of AM-241. As mentioned earlier, the AIE type ionization detector utilizes 0.98 uCi of AM-241.

AIE Type

A list of mechanical parts and an expand view of the AIE Type are shown on Enclosure A1 and A2. Enclosures A3 through A24 are drawings of those parts and respective materials.

The following is the process in which the AIE type of chamber assembly is constructed:

1) Spot weld insect screen to outer electrode
2) Assemble inner electrode with RI./RI holder to the insulation plate
3) Assemble intermediate electrode to the insulation plate
4) Secure PCB, insulation plate assembly and sealing gasket with a nut and the inner electrode
5) Solder intermediate electrode to FET which has been previously soldered to the PCB
6) Insert entire assembly into enclosure. Place outer cover atop assembly and secure with 2 screws

Chamber Assembly for AI Series

The above assembly process assures that the source is protected from damage and makes it otherwise tamper proof. The outer cover protects the unit and prevents objects from approaching the source. The closest approach is approximately 2 cm. During operation the outer cover, outer electrode and the intermediate electrode prevent someone or something from contacting the source.

The detector has been designed so that once the radioactive material has been assembled into the unit at the factory, it is inaccessible without someone removes the printed circuit board from the detector and de-solders the one leg of the intermediate electrode. After the detector has been assembled by the factory, there would be no need for disassembly by either the installers or other field service technicians.

The AI_ series detector is tested and listed to the ANSI/ UL 268 6th Edition August 14, 2009 standard. This standard requires that the detectors be subjected to variable ambient temperatures, humidity plunges, corrosive environments and vibration testing. After such testing, the detectors shall function normally. During normal use, detector is not expected to be subjected to ambient conditions outside of the listed parameters.

Total Expected Annual Distribution

It is estimated that a total of up to 4,000 detectors will be distributed in the United States by Hochiki annually. Each detector contains 0.98 uCi making the maximum distribution of Am-241 in the United States 200 millicuries. The useful life of the detector is assumed to be 10 years. This is the same useful life value commonly used in other similar fire protection devices already in service in the field.

Labeling and Marking

Each detector is manufactured with a permanent type, self adhesive backed label which is affixed to the bottom of the detector. The label contains the model name, type of detector, serial number, amount and type of radioactive material used, distribution license number, installation instruction drawing number, where to send for service, where unit was produced and other pertinent information regarding its use. The labels are expected to last the useful life of the detector. The AIE type detectors are placed into a five piece shipping carton. Each carton is printed with the name of the radio-nuclide and the quantity of activity: Americium 241, 0.98 uCi.

Prototype Testing and Evaluation

Tests were performed on the source after it was mounted onto the inner electrode. The tests were done by the Japan Radioisotope Association. The certification of approval under the classification C 32222 of IS-Z4821 of the above mentioned part is included in Enclosure A35. Hochiki Corporation in Japan performed vibration tests on 6 completed detectors. The test consisted on 1000 cycles per minute at an amplitude of 4 mm for 60 minutes. The test results showed no leakage of the source. The results also showed there was no damage to the integrity of the operation of the detector (see Enclosure A36). Hochiki Corporation also performed shock and impact tests with acceptable results (see Enclosure A37).

An impact test was also performed by America Corporation. The results showed that the there was no leakage from the detector source. The AIE type detector was dropped from a height of 12 feet. A total of 25 drops were performed and there were some signs of physical damage. Further investigation revealed that the inner electrode that holds the RI material was not damaged and appeared to be unaffected. The outer and inner electrodes remained very solid within the insulation plate and showed no other signs of physical damage. The internal components remained unaffected and therefore protected the radioactive source, keeping it isolated from direct contact with the outside environment (see Enclosure A38).

SOLUBILITY OF WATER AND BODY FLUIDS

The following tests were performed by Amersham International Corporation Radio-chemical Center in England to determine solubility of the foils in water and body fluids:

Test - 1 Sample foils containing 100 uCi Am-241 in an area of 1 square cm were immersed in distilled water at 98 degrees Fahrenheit for four (4) hours. In all tests, less than 0.003 uCi Am-241 were transferred to the water.

Test - 2 Sample foils containing 1 uCi in an area of 9 square mm were immersed in distilled water for three (3) weeks. In all tests, less than .001 uCi Am-241 were transferred to the water.

Test - 3 Sample foils containing 1 uCi in an area of 9 square mm were immersed in distilled water for twelve (12) weeks. Wipe out tests and immersion tests carried out on the foils indicated less than .001 Am-241 were removed from the sample.

Test - 4 Sample foils containing 1 uCi in an area of 9 square mm were immersed in a 0.1n HC1 solution for four (4) hours at 98 degrees Fahrenheit. In all tests, less than .004 uCi Am-241 were removed from the sample. HC1 was chosen for this test to more closely simulate body fluids.

The following were performed by New York State University at Buffalo to determine solubility of the foils in water and body fluids for NRD Inc.

Test 1 - Sample foils containing 2 uCi Am-241 in an area of $20mm^2$ were immersed in city water at 98 degrees Fahrenheit for four (4) hours. In all tests, less than 0.0001 uCi Am-241 was transferred to the water.

Test 2 - Sample foils containing 2 uCi in an area of $20mm^2$ were immersed in city water for twelve (12) days. In all tests, less than .001 uCi were transferred to the water.

Test 3 - Sample foils containing 2 uCi in an area of $20mm^2$ were immersed in a solution simulating digestive juices with a ph of 1.96 for seven and one half (71/2) hours - Total activity released was less than .005 uCi.

Based on Test Report May 1976 David Dooley etal.

Quality Control

The following procedures are followed both at Hochiki Corporation as well as Hochiki America Corporation. (Data will be made available through Hochiki America Corporation 's Quality Control Department)

Design Conformity

Incoming inspections are done on all raw materials. Materials that make up the ionization chamber assembly are checked for dimensional conformity to controlled drawings for the individual parts. By checking for design conformity at the raw materials level design Conformity of the ionization chamber can be assured. All results are recorded on appropriate forms. Enclosures A5, A7, A9, A12 and A13 indicate the minimal areas that are measure for dimensional conformity to specification. Over an extended period of time the Hochiki America Quality Control Department may decide to eliminate dimensional checks dependent upon the level of confidence given to the particular vendor. Upon elimination of dimensional checks, visual inspections will be performed.

Receipt of Foils

Incoming inspections are performed when containers of radioactive material are received. The outside of the shipping container is smear tested and the results recorded. The inside of the inner container is smear tested and the results recorded. If any contamination is detected, the foils are isolated and returned to the manufacturer for disposal. If there is no contamination detected the foils are placed in the safe and the information recorded. Before the foils are dispersed to the assembly area the inside of the container is smear tested and the results recorded and initialed. If any contamination is detected the foils are isolated and returned to the manufacturer of the foils for disposal. These tests are conducted by using a cotton tip swab wetted with alcohol. Wipes are inserted into the chamber of the Radiation Monitoring Device and counted. The results are recorded on the appropriate forms. The background of the Radiation Monitoring Device will be determined by counting with the chamber empty and the results recorded in the appropriate space on the applicable form. Any wipe showing greater than 10 cpm above background will be recounted to verify results. If results continue to show more than 10 cpm above background, item(s) will be cleaned until no activity is detectable.

There are two survey meters that can be used to make these tests. Each will be calibrated by the manufacturer against known radioactive materials including americium annually. The testers are incorporated into Hochiki's equipment calibration program.

A Minimum of 1% of the daily production of ionization chambers, randomly selected, will be wiped. The results will be recorded. Any contamination detected will result in an investigation until the cause is found. Contaminated units will be properly disposed of according to applicable regulatory procedures.

FINISH GOODS PRIOR TO SHIPMENT

All (100%) of the daily quantity of units ready for final packaging will be wiped, counted, recorded and initialed. The following are the procedures routinely performed:

1. Indicate on the form provided the lot number, date, serial numbers and the sample size of the lot checked.

2. Background of the Radiation Monitoring Device currently being used will be determined by counting with the chamber empty and the results recorded on the appropriate form.

3. A cotton tip swab, wetted with alcohol, will be used to wipe the detectors. The area wiped will not exceed 100 cm per wipe.

4. Wipes will be taken through the slats in the outer enclosure until the swab touches the bug screen.

5. A maximum total of 100 detectors are to be wiped before the swab is placed in the meter and the findings recorded and initialed.

6. Any wipes showing a reading greater than 10 cpm above background will be recounted to verify results. If the wipe shows more than 10 cpm above background, the detectors will be re-wiped and the date recorded. If the detectors show the presence of contamination, they will be checked and cleaned until no activity is detectable, or the contaminated detector(s) will be disposed of by a NRC approved procedure.

Product Manufactured at Hochiki Corporation and Received By Hochiki America

1) Incoming inspections will be performed using LTPD 5% Sampling for removable contamination. The table below will be sued to determine sample size. The Radiation Monitor Device and Wipe Test method describe above will be used.

LOT SIZE	SAMPLE SIZE
1 - 400	44
401 - 2000	45
2001 – 100,000	75

2) Results will be recorded on appropriate forms and filed by the Hochiki America Quality Control Department.

3) A visual inspection of the units will be done at the same time to insure proper design conformance. Units can not be disassembled to inspect the chamber because this may affect product settings.

Radiation Profiles

BY-PRODUCT MATERIAL

The radioactive isotope used in the AI_ series detector is Americium-241, manufactured by NRD Inc. The activity is 0.98 uCi, the physical size is 3.6 X 3.6 mm. The NRD model number is A001 and the NRC listed model number is A001.

Each detector contains a single foil. Each detector is defined by a unique serial number. The source is mounted onto the inner electrode and crimped into place.

BY-PRODUCT, CHEMICAL & PHYSICAL FORM

The radionuclide, in the form of Americium oxide (AmO_2), is uniformly distributed and sintered in a matrix of pure fine gold at temperatures in excess of 800 degrees C. It is contained between a backing of pure silver and a front covering of gold-palladium alloy (94% gold, 6% palladium) by hot forging. **The metal layers, continuously welded, are extended by means of a power rolling mill to give required foil strips which contain 8 uCi per cm^2. The strips of foil are cut into sections containing .98 uCi each.** Encapsulating in this manner insures that there will be no physical or chemical changes in the radioactive material over the life of the detector.

RADIATION FROM SMOKE DETECTOR HEADS

Radiation dose from the detector head was measured in Tokyo, Japan by Hochiki Corporation on 2 AI_ series detectors. A hologram G-M tube attached to a TGS 111 Survey Meter was used in measurements. Four positions on the detector were measured, top, bottom, left and right sides.

These measurements were taken at the surface of the detector, at 5 cm and at 25 cm to the center of the tube. The tube was calibrated against a CO_{60} source. The dose rates are an average of the measurements from the two AI_ series detectors (see Enclosure A34).

For the AIE Type
At Surface 11.43 uR/hr
At 5 cm: 4.46 uR/hr
At 25cm: 1.24 uR/hr

CALCULATED DOSE RATES

A theoretical dose rate may be calculated, based on a gamma emission of 60 KeV (35%) and a specific gamma ray constant of 0.036 R/h at 1 meter from 1 Ci (Radiological Health Book, HEW, 1970.)

The calculated dose rate at 5 cm from a 1.0 uCi source, for comparison:

$$\frac{(0.036)\,(0.35)\,(1.0 \text{ X } 10^{-6})\,(100^2)}{(5.0)^2} = 4.8 \text{ uR/hr}$$

Similarly, the dose rate, 25 cm from a 1.0 microcurie source is calculated to be:

$$\frac{4.8\,(5.0)^2}{(25)^2} = 0.19 \text{ uR/hr}$$

ORNL Report TM-2864 reports an exposure rate of 0.01 mR/h 14 cm from a 13.5 uCi foil. This would translate into a dose rate of 5.0 uR/hr at 5.0 cm from a 1.0 uCi source.

RADIATION DOSE AND DOSE COMMITMENTS

To determine the external exposure dose rate it was assumed that the dose rate 5 cm from a 1.0 uCi of Am-241 is 5.7 uR/hr. From this dose rate, other distances were calculated. Such as, the dose rate 25 cm from the detector:

$$\frac{(5.7).(5.0)^2}{(25)^2} = .22 \text{ uR/hr}$$

The following were also calculated:

At **2cm** from the source **36 uR/hr.**
At **5cm** from the source **5.7 uR/hr**
At **25cm** from the source **0.22 uR/hr**
At **1m** from the source **0.014 uR/hr**
At **2m** from the source **0.004 uR/hr**
At **3m** from the source **0.002 uR/hr**

A number of potential exposure conditions are summarized below using the values calculated previously. It was assumed in the evaluations that the detectors were mounted on the ceiling as in a normal field installation. For purpose of these calculations the calculated rates for all distances will be used except for the 25cm distance. The actual measured dose rate was found to be higher for the AIE type detectors. Thus the AIE value of 1.24 uR/hr, has been used for all calculations involving the 25cm distance. The remaining distances were calculated using the derived values because they were found to be higher than the actual measured dose rate. This will insure that worst case scenarios are presented.

Example 1

A person who works in a facility protected by one or more detectors and lives in a residence with 1 detector in the bedroom and 1 or more in the hallway. The estimated dose is:

8 hrs/day work at 1m 0.014 X 8 X 5 X 50 = 28.0 urems/y

8 hrs/day work at 2m 0.004 X 8 X 365 = 11.7 urems/y

8 hrs/day transient at 1m 0.014 X 4 X 365 = 20.4 urems/y

Total annual dose = 60 microrems or 0.060 mrems per year. If this same person were to be involved in cleaning or relocating 5 detectors, and if this operation was performed 6 times a year, and it took 1 hour per operation, the estimated dose would be: Body at 25 cm, 30 hours. X 1.24 = 37.2 urems/y or 0.037 mrems/y. Hands at surface, 30 hrs. X 21 = 630 urems/y or 0.63 mrems/y.

The total annual dose estimate for this person would be:

Body, 0.060 + 0.037 = 0.097 mrems/y

Hands 0.060 + 0.63 = 0.69 mrems/y

Example 2

A person who is working at a station I in from a lot of 100 detectors that are stacked in such a way that they would be in a cube approximately 60 cm on a side. The calculated dose rate at I in from this lot is 0.24 urads/hr. The estimated dose is: 0.24 X 40 X 50 = 480 urems/y or 0.48 mrems/y.

The same person might also handle an individual detector 1 hour per day and this additional dose would be:

Body at 25 cm 1.24 X 5 X 50 = 310 urems/y or 0.31 mrems/y

Hands at 5 cm 5.7 X 5 X 50 = 1,425 urems/y or 1.425 mrems/y

Assuming the same person was also exposed as the person in example 1, this dose would be: Body, 0.48 + 0.31 + 0.10 = 0.89 mrems/y. Hands, 0.48 + 1.425 + 0.69 = 2.6 mrems/y.

Example 3

A person working in a warehouse who is stationed 3 m from a lot of 1000 detectors. It is calculated that the dose rate 3m from such an array would be 3.1 urads/h. The estimated dose is: 3.1 X 50 X 40 = 620 urems/y or 0.62 mrems/y. Assuming the 1000 were in 10 cartons of 100 detectors each, the same person might handle each of the 10 cartons an additional 4 times a year, 1 hour per handling. It is calculated that the dose rate from a carton containing 100 detectors is 3.1 urads/h at the surface and 1.1 urads/h at 25 cm. The estimated handling dose would be: Body at 25 cm, 1.1 X 10 X 4 = 44 urems/y or 0.044 mrems/y. Hands at surface, 3.1 X 10 X 4 = 124 mrems/y or 0.124 mrems/y. Assuming the same person were also exposed as in example 1, the estimated dose would be: Body, 0.097 + 0.044 + 0.62 = 0.76 mrems/y. Hands, 0.69 + 0.124 + 0.044 = 0.86 mrems/y.

Example 4

A person who installs detectors 40 hours per week might have his hands at the surface of a detector 1/4 of the time, and at 5 cm 3/4 of the time. The body average would be 25 cm from a detector. The estimated dose would be: Body, 1.24 X 40 X 50 = 2480 urems/y. Hands, 25%, 21 X 40 X 50 X 1/4 = 10500 urems/y. Hands, 75%, 5.7 X 40 X 50 X 3/4 = 8550 urems/y. Total estimate dose to hands = 19050 urems/y or 19.1 mrems/y. Assuming the same person were also exposed as in Example 1, his estimated dose would be: Body, 2.48 + 0.067 = 2.547 mrems/y. Hands, 19.1 + 0.69 = 19.8 mrems/y.

Example 5

A person working 40 hours per week, repairing, cleaning detectors with his hands at 2 cm from the source 1/2 of his time and 5 cm from the detectors the other 1/2 of his time, the body averages 25 cm from the detector. His estimated dose would be: Body, 1.24 X 50 X 40 = 2480 urems/y or 2.48 mrems/y. Hands 50% of the time 2 cm, 36X 50 X 40 X 1/2 = 36000 urems/y. Hands 50 % of the time 5 cm, 5.7 X 50 X 40 X 1/2 = 5700 urems/y. Total estimated dose to hands = 41700 urems/y or 41.7 mrems/y.

Assuming the same person was also exposed as in example 1, the estimated dose would be: Body 2.48 + 0.067 = 2.547 mrems/y. Hands, 41.7 + 0.69 = 42.4 mrems/y.

Example 6

A person who transports 10 cartons containing 100 detectors each, totaling 1000 detectors across country traveling 4000 miles. The trip took 80 hours traveling at 50 mph. The estimated dose would be: 0.31 X 80 = 24.8 urems/y or .025 mrems/y. The same person making the trip 10 more times during the year would have an estimated dose of 0.25 mrems/y.

If the same person were exposed as in example I in addition to the 10 trips made yearly, the estimated dose would be: 1 - trip, 0.025 + 0.01 = 0.035 mrems. 10 - trips, 0.25 + 0.01 = 0.26 mrems.

EXTERNAL EXPOSURE, SUMMARY

All of the examples used are very conservative in scope, such as distances, proximity to the source, and exposure times. Examples given do not take into consideration the shielding effect provided by packaging or other materials. All the preceding estimates are less than the limits in 10 CFR 32.28, Column 1 (5 mrems/y body and 75 mrems/y hands), so it is very unlikely that these limits will be exceeded.

DOSE COMMITMENT

In the following section on Dose Commitment, several unusual examples, such as fires, are considered. While the Dose Commitments may be higher in these cases, the external exposure to such personnel as described will be negligible because of the short exposure times.

Calculations of the annual intake of AM-241 to produce a 50 year dose commitment of 0.005 rems, based on the report of ICRP Committee II on Permissible Dose for Internal Radiation follow:

$$R = \frac{EF\ (RBE)\ n\ (q)\ (3.7 \times 10^4 \times 3600 \times 24 \times 365 \times 1.6 \times 10^{-6})}{100\ m}$$

Where EF (RBE) n = effective absorbed energy per dis, MeV

q = uCi of Am-241 deposited in organ of reference in mass of organ of reference

m = mass of organ of reference, grams

3.7×10^4 = dis/sec per uCi

3600 X 24 X 365 = sec/year

1.6×10^{-6} = ergs per MeV

100 = ergs/grams per rad

and R is in units of rems/year

$$R = \frac{EF\ (RBE)\ n\ q}{m} = (1.867 \times 10^4)$$

If bone is the organ of reference, EF (RBE) n = 280, and m = 7×10^3, and $R = \frac{280\ q}{7000}$

$= (1.867 \times 10^4) = 747$ q rems/year.

The integrated dose over 50 years is:

$$D = \frac{R}{\lambda} (1 - e\ \lambda^{-1})$$

Where R = rems/year

λ= the elimination constant = 0.693/T years^{-1}

T= the effective half-life, years

t = the time of consideration, years = 50 and D is in rems

For Bone, T is $5.1 \text{ X } 10^4$ days or 140 years, and

$$D = \frac{(747\ q)\ (140)}{0.693} (1 - e^{-0.2475}) = 3.30 \text{ X } 10^4 \text{ q rems}$$

For the limiting dose of 0.005 rems,

$$q = \frac{0.005}{3.3 \text{ X } 10^4} = 1.5 \text{ X } 10^7 \text{ uCi}$$

The fraction of Am-241 inhaled which reaches the bone, Fa is 0.063, so the amount of AM-241 inhaled per year to produce a 50 year dose of 0.005 rems, Qa is:

$$\frac{1.5 \text{ X } 10^7}{0.063} = 2.4 \text{ X } 10^4 \text{ uCi}$$

Similarly, the fraction reaching the bone through ingestion, f is 2.5 X 10 and Qw is

$$\frac{1.5 \text{ X } 10^{-7}}{2.5 \text{ X } 10^{-5}} = 6.1 \text{ X } 10^{-3} \text{ by ingestion.}$$

Another set of calculations using "Whole Body" as the organ of reference was made: EF (RBE)n = 57; $m = 7 \text{ X } 10^4$ grams

$T = 1.8 \text{ X } 10^4$ days or 49.3 years; fa = 0.25; $f = 10^{-4}$

This resulted in annual intake of Am-241 to produce a dose of 0.0005 rems in 50 years as follows:

$Qa = 3.7 \text{ X } 10^{-5}$ uCi by inhalation
$Qw = 9.1 \text{ X } 10^{-2}$ uCi by ingestion

Comparing these values with similar ones for bone, it is obvious that bone is the more critical organ. Similar calculations for other organs (limiting dose is 0.015 rems) also showed that bone is the most critical organ. Therefore, all of the estimated dose commitments that follow are based on bone as the critical organ. There is no evidence that Am-241 becomes airborne and respirable from sources previously described. Placing an upper limit on zero is difficult but will be done in order to estimate an upper limit on dose commitment. ORNL Report TM-2684 summarizes a number of tests performed on 12 smoke detectors which had been in service at least 5 years. The detectors contained a total of 78 foils (some Ra-226, some Am-241) and contained 20 to 130 uCi per detector. Foil construction was similar to what has been previously described. Some pertinent results of these tests were:

1. Only one of the smear tests on the external surface of the 12 detectors showed detectable alpha activity, and this was 20 d/m.

2. The average removable contamination on the Am-241 foils, as measured by smear tests, was 694 d/m.

3. Following a "12-week Environmental Test" at 110 degrees F and 80% relative humidity, on 20 foils (12 Ra-226, 8 Am-241), half of which were intentionally damaged. There was no detectable contamination on the interior surfaces of the test chamber, as measured by a smear test.

4. During 1 hour "Fire Tests" (925 degrees C for 1 hour), the average loss from Am-241 foils was 31% and the loss which was deposited on filters or became airborne, was 0.002%. The ORNL Report indicates that there was no detectable contamination on the interior surfaces of the test chamber after the "12-Week Environmental Test." From the report, levels down to 6 d/m could be detected, so it would be reasonable to assume that at least 20 d/m would have been detected on a smear test of the chamber.
Also, from the report, it is noted that a total of 0.12 uCi were available to become airborne, as measured by smear tests on the foils at the beginning of the test. This amount is approximately 25 times the permissible contamination (0.005 uCi) on the foils used in production of the detectors and as measured by smear tests. If it is assumed that the sample in the ORNL Tests represented at least 4% of the chamber area, and 20 d/m could be detected, the maximum that could be released from a foil in a year would be:

$$\frac{20 \text{ x } 52}{12} = 87 \text{ d/m or } 3.9 \text{ X } 10^{-5} \text{ uCi}$$

If this detector was in a room of 4 X 5 X 3 meters, and there was one air change per hour, the concentration average over a year would be:

$$\frac{3.9 \text{ X } 10^{-5}}{4 \text{ X } 5 \text{ X } 3 \text{ X } 10^{6} \text{ X } 24 \text{ X } 365} = 7.4 \text{ X } 10^{-17} \text{ uCi/cc}$$

The above represents a maximum concentration of a room in a residence. Similarly, if a work place had a volume of 8 X 10 X 6 cubic meters, the concentration average over a year would be:

$9.3 \text{ X } 10^{-18}$ uCi/cc

If a person were exposed as in Example 1 for 12 of the 16 hours per day at home and breathed 1 X 10^{7} cc in this 16 hour period, his annual intake of Am-241 would be:

$$(7.4 \text{ X } 10^{-17}) (1 \text{ X } 10^{7}) \text{ X } 12/16 \text{ X } 365 = 2.0 \text{ X } 10^{-17} \text{ uCi/y}$$

Also, as in Example 1, if the same person were exposed at work to 9.3 X 10^{-18} uCi/cc in this 8 hours per day and breathed 1 X 10^{7} cc in this 8 hours his annual intake of Am-241 would be:

$$(9.3 \text{ X } 10^{-18}) (1 \text{ X } 10^{7}) \text{ X } 5 \text{ X } 50 = 2.3 \text{ X } 10^{-8} \text{ uCi/y}$$

The total intakes would be 2.2 X 10^{-7} uCi/y. As calculated previously, inhalation of 2.4 X 10^{-6} uCi/y would result in a 50 year dose commitment of 0.005 rems. The dose commitment from an intake of 2.2 X 10^{7} uCi/y would therefore be:

$$\frac{2.2 \text{ X } 10^{-7}}{2.4 \text{ X } 10^{-6}} (0.005) = 0.00046 \text{ rems}$$

The above is intended to be an upper limit on zero, since there is no evidence to show that Am-241 becomes airborne under normal conditions. It can also be said that in Examples 2- 6 previously described, that there is a negligible release of Am-241 to be respirable, even though quantities of 100 or 1000 detectors are involved.

Estimated Dose Commitments under abnormal conditions are calculated in the following examples:

Example 7

If a fire should occur in a 4 X 5 X 3 meter room, and 0.31% of the 1.0 uCi Am-241 source should become airborne, the average concentration might be:

$$\frac{0.0031 \text{ X } 1.0}{4 \text{ X } 5 \text{ X } 3 \text{ X } 10^{6}} = 5.2 \text{ X } 10^{-11} \text{ uCi/cc}$$

If a person were to remain in this room for 5 minutes, he might inhale:

$$5.2 \text{ X } 10^{-11} \text{ X } 2 \text{ X } 10^{7} \text{ X } \frac{5}{60 \text{ X } 24} = 3.6 \text{ X } 10^{-6} \text{ uCi}$$

If as previously calculated, inhalation of 2.4 X 10^{-6} uCi/y would result in a 50 year dose commitment of 0.005 rems, inhalation of 3.6 X 10^{-6} uCi would result in a 50 year dose commitment of approximately 0.0075 rems.

Example 8

If a fire occurred in an area having a volume of 8 X 10 X 6 cubic meters and containing 10 detectors, and 0.31% of the 100 uCi became airborne, the average concentration might be:

$$\frac{0.0032 \text{ X } 100}{8 \text{ X } 10 \text{ X } 6 \text{ X } 10^{6}} = 6.7 \text{ X } 10^{-10} \text{ uCi/m3}$$

However, it would take some period of time for the airborne contamination to become evenly distributed in a room of this size. The heat from such a fire would preclude any person from being in close proximity of the fire. There would be at least a dilution factor of 10 to where a person might be during the first few minutes of the fire. Assuming a person might take 5 minutes to evacuate, he might inhale:

$$6.7 \text{ X } 10^{-11} \text{ X } 2 \text{ X } 10^{7} \text{ X } \frac{5}{60 \text{ X } 24} = 4.7 \text{ X } 10^{-6} \text{ uCi}$$

This corresponds to a 50 year dose commitment of:

$$\frac{4.7 \text{ X } 10^{-6}}{2.4 \text{ X } 10^{-6}} (0.005) = 0.010 \text{ rems}$$

If a person fighting the fire would enter the room after the airborne contamination had been distributed throughout the volume, and the person was not wearing a respirator and he remained 1/2 an hour, he might inhale:

$$\frac{6.7 \text{ X } 10^{-10} \text{ X } 2 \text{ X } 10^{7}}{2 \text{ X } 24} = 2.8 \text{ X } 10^{-4} \text{ uCi}$$

Note: Water or other fire-fighting materials would tend to reduce the airborne contamination. This corresponds to a 50 year dose commitment of:

$$\frac{2.8 \text{ X } 10^{-4}}{2.4 \text{ X } 10^{-6}} (0.005) = 0.58 \text{ rems}$$

Example 9

If a fire should occur in an area having a volume of 30 X 50 X 6 cubic meters and there were 1000 detectors present and 0.31% of the 1000 uCi became airborne, the average concentration would be:

$$\frac{0.0031 \text{ X } 1000}{30 \text{ X } 50 \text{ X } 6 \text{ X } 10^{6}} = 3.4 \text{ X } 10^{-10} \text{ uCi/cc}$$

Again assuming there would be a dilution factor of at 10 where a person might be during the first few minutes of the fire, and delayed his exit for 5 minutes, the person might inhale:

$$3.4 \text{ X } 10^{-11} \text{ X } 2 \text{ X } 10^{7} \text{ X } \frac{5}{60 \text{ X } 24} = 2.4 \text{ X } 10^{-6} \text{ uCi}$$

This corresponds to a 50 year dose commitment of:

$$\frac{2.4 \text{ X } 10^{-6}}{2.4 \text{ X } 10^{-6}} \; 0.005) = 0.005 \text{ rems}$$

If a fire fighter entered the area after the airborne contamination had distributed throughout the volume, and was not wearing respiratory protection, and he remained for 1/2 hour, he might inhale:

$$\frac{3.4 \text{ X } 10^{-10} \text{ X } 2 \text{ X } 10^{7}}{2 \text{ X } 24} = 1.4 \text{ X } 10^{-4} \text{ uCi}$$

This corresponds to a 50 year dose commitment of:

$$\frac{1.4 \text{ X } 10^{-4}}{2.4 \text{ X } 10^{-6}} (0.005) = 0.29 \text{ rems}$$

Example 10

A person who would be cleaning up after the fire described in Example 9 might be exposed to 0.0031 X 1000 = 3.1 uCi of contamination which might have become airborne. Dunster Health Physics (Vol. 8, No. 4, Aug. "62") indicates a re-suspension factor when rummaging through dusty building rubble in an enclosed and unventilated space would be:

$$2 \text{ X } 10^{-6} \text{ m}^{-1}$$

Assuming the 3.1 uCi were in an area of 6 X 6 square meters, the concentration in the room would be:

$$\frac{3.1 \text{ X } 2 \text{ X } 10^{-6}}{6 \text{ X } 6} = 1.7 \text{ X } 10^{-7} \text{ uCi/m}^{3} \text{ or } 1.7 \text{ X } 10^{-13} \text{ uCi/cc}$$

If a person were to work 8 hours under these conditions, he might inhale:

$$1.7 \text{ X } 10^{-13} \text{ X } 2 \text{ X } 10^{7} \text{ X } \frac{8}{24} = 1.1 \text{ X } 10^{-6} \text{ uCi}$$

This corresponds to a 50 year dose commitment of:

$$\frac{1.1 \text{ X } 10^{-6}}{2.4 \text{ X } 10^{-6}} (0.005) = 0.0023 \text{ rems}$$

Example 11

In the unlikely event that a person should swallow a foil and the total activity (1.0 uCi) were ingested as previously calculated, and the quantity ingested in a year is 6.1 X 10^{-3} uCi to produce a 50 year dose commitment of 0.005 rems, the dose commitment would be:

$$\frac{1.0}{6.1 \text{ X } 10^{-3}} (0.005) = 0.82 \text{ rems}$$

An actual case history (Health Physics, Vol. 33 No. 5, Dec. 1977) indicate the scenario in the above assumption to be extremely conservative. The reference indicated that the foils passed in a reasonable time and that there was no detectable residual body burden.

DOSE COMMITMENT SUMMARY

All of the preceding examples are considered conservative. The "ORNL Fire Test" indicated that the average loss from the Am-241 foils was 0.31%, but most of this was deposited on the tubes containing the foils, and only 0.002% became airborne and was deposited on filters. Dose commitments may be over estimated by a factor of 150. All dose commitments are less than 10 CFR 32.28; Column I limits, under normal operating conditions. In abnormal situations, the estimates indicate that Column II may be exceeded slightly, but they are all less than the Column III limits.

Tests have shown that it is unlikely that there will be significant reduction of containment from wear and abuse likely to occur in normal handling and use during the lifetime of the AI_ series detector.

Installation

AI_ series detector is intended for commercial and industrial use. It is one part of an entire fire safety system. Detector is recommended for installation in either the ceiling or under floor applications. It must be connected properly to a fire and/ or smoke detection circuit as part of a fire safety system. There is no risk to persons responsible for installing the detectors. All installations are required to be done by qualified persons.

Radiological Safety Instructions

As stated above, unless detectors are subjected to extraordinary damages there is no potential for leakage of hazardous materials.

<u>PRODUCT DISPOSAL</u>

All AI_ series detectors that are returned to the factory for surveying will be disposed of through facilities that are authorized to handle radioactive materials. In addition, the following is an estimate dose commitment from concentrating 20,000 smoke detectors, each containing 1.0 uCi (this value was used for ease of calculation) in a public landfill. The internationally recognized dose of Am-241 is 0.0129 R/hr/Ci/m. Thus the exposure rate at 1 meter from a 20 mCi Am-241 source is less than 0.26 mr/hr.
However, it is unlikely due to the bulk of 20,000 detectors, anyone could get closer than approximately 5 meters from the effective center of the pile. The effective exposure rate is, therefore, 10nR/hr to anyone at the pile. This rate is without consideration of shielding by the detectors non-radioactive components. A landfill operator would reside less than an hour while burying the pile. His total dose would be less than 10nR. No significant internal dose from inhalation would be expected to result from disposal of the detectors to the workers of the landfill. Assuming an unlikely 1% airborne release of activity (Am-241), doses to critical organs would be: Lungs - 0.15 rem; Liver - 4.4 rem; Bones - 2.1 rem. These dosages are less than <u>10</u> <u>CFR</u> 32: <u>28</u> <u>Column</u> III. Long term effects to local populations would be expected to be negligible. The solubility of $Am0_2$ in a gold matrix such as the foil, is extremely low and negligible activity would be expected to reach from the burial site even under the worst conditions. Radium watch dial faces and smoke detectors over many years of burial have not been found to have contaminated public landfill operation. In addition, radium is in a far more soluble chemical physical form than $AM0_2$. In our opinion, random disposal of AM-241 containing smoke detectors from accidental or normal conditions will not contribute to a measurable cumulative environmental hazard.

Accompanying Documents

There are no accompanying documents provided with the products. All information pertaining to radiological safety are printed on the individual product labels as well as packaging.

Servicing

Any ionization detectors that are returned to Hochiki America for servicing undergo the following:

1. Indicate on form provided date, model type, serial number and operator name.
2. Perform a wipe test as indicated on steps 2-4 of the finished goods prior to shipment section above.
3. Record the results on the form.
4. Perform servicing.
5. The detector is tested to insure functionality.
6. The outer cover is removed and cleaned.

7. The cover is reassembled to the unit.

8. Repeat steps 2, 3 again after re-assembling unit.

9. The unit is re-calibrated.

10. If any of the above cannot be completed satisfactorily the unit is disassembled and the radioactive source is disposed of properly.

11. The service technician has been trained in the proper handling of radioactive materials.

Leak Test

The NRC does not require periodic testing of devices that contain less than 10 microcuries of alpha emitting material. However units are wipe tested prior to and on completion of manufacture, prior to distribution as well as before and after servicing as described above.

Additional Information

The AI_ series detectors are manufactured under very strict quality control procedures and distributed in accordance with the requirements of Underwriters Laboratories UL 268 specifications, the laws of the state of California and the State Fire Marshall, the Nuclear Regulatory Commission, Factory Mutual Research, and other industrial governing bodies.

Product Warranty

Hochiki America warrants the equipment manufactured by it to be free from defects in material and workmanship (does not apply to batteries). Hochiki America will repair or replace, at its option, any equipment which it determines to contain defective material or workmanship. Said equipment will be returned to purchaser F.O.B., Hochiki America, California. Hochiki America shall not be obligated to repair or replace equipment which has been repaired by others, abused, improperly installed, altered, or otherwise misused or damaged in any way. **HOCHIKI AMERICA WILL NOT BE RESPONSIBLE FOR ANY DISMANTLING, RE-ASSEMBLY OR RE-INSTALLATION CHARGES**. We warrant our devices to DIRECT PURCHASERS ONLY for one (1) year from date of shipment, with the exception of the smoke detectors, which have a three (3) year warranty. We will replace defective goods or credit them at invoice price per our option. Merchandise that is returned for defective reasons, and found not to be defective will be returned to the sender with charges commensurate with the extent of inspection and services performed, plus freight charges. After the warranty period expires, a service charge will be made for material and labor. This warranty is in lieu of all other warranties expressed or implied. Hochiki America shall not be liable for special, indirect, incidental or consequential damages claimed in connection with any revision of this agreement by others.

Safety Analysis

As noted above it is highly unlikely that materials will accumulate to a point in which it would pose a safety hazard. The table in part 32.28 was used as a guideline to insure that accumulations do not exceed these amounts. Thus exposure dosages will be held to acceptable levels.

Due to the low level nature of the radioactive source, high exposure dosages would require an accumulation that would be unacceptable to the company to continue conducting day to day business activities. Such an accumulation would be bad business economics in terms of inventory levels. Due to the conditions of use it is highly unlikely that any damages would occur when considering the effectiveness of shielding.

Hochiki America fully intends to distribute materials to persons exempt from licensing.

Application Enclosure Index

AIE Enclosure Number	Description
A1	Mechanical Components List
A2	Exploded View
A3	Outer Cover
A4	Enclosure
A5	Insulation Plate
A6	Light Guide
A7	Intermediate Electrode
A8	Intermediate Electrode Assembly
A9	Outer Electrode
A10	Outer Electrode Assembly
A11	FET Terminal
A12	AM-241 Foil Source
A13	Inner Electrode
A14	Holding Plate
A15	Inner Electrode Assembly
A16	Machine Screw M3 x 6
A17	Insect Screen
A18	Contact Blade
A19	Contact Clip
A20	Insert Metal
A21	Hex Nut M3
A22	Gasket
A23	Potted JFET
A24	PCB Assembly
A25	Nameplate AI-EA
A26	Nameplate D325A
A27	Nameplate 67-1032
A28	Nameplate SD505-AIS
A28-1	Nameplate AIS
A28-2	Nameplate VF2001
A28-3	Nameplate FAI-325
A29	Dust Cover
A30	Warning Label
A31	Assembly Packaging (Individual)
A32	Assembly Packaging (5 Piece)
A33	Box 5 Piece
A34	AIE Radiation Measurement Profile
A35	Japan Radioisotope Association Test Report
A36	Vibration Test Report
A37	Shock Test Report
A38	Hochiki America Drop/Shock Test

AIE Mechanical Component List

Description	Material
Outer Cover	ACS
Enclosure	ACS
Insulation Plate	Polypropylene
Gasket	Chloroprene Sponge Rubber
Outer Electrode	SUS 302
Intermediate Electrode	SUS 302
Inner Electrode	SUS 305, SUS 316
Shield Case	Steel w/Solder Plating
M3 x 6 Screw	Steel w/Chromate Coating
M3 Nut	Steel w/Chromate Coating
Radioactive Foil	Americum-241 0.98 uCi
Insert Metal	Copper/Copper Alloy w/Solder Plating
Light Guide	Acrylic Plastic
Contact Blade	Copper w/Solder Plating
FET Terminal	Steel w/Solder Plating
Contact Clip	Copper-Phospher Bronze w/Solder Plating
Insect Screen	SUS 304

Enclosure A1

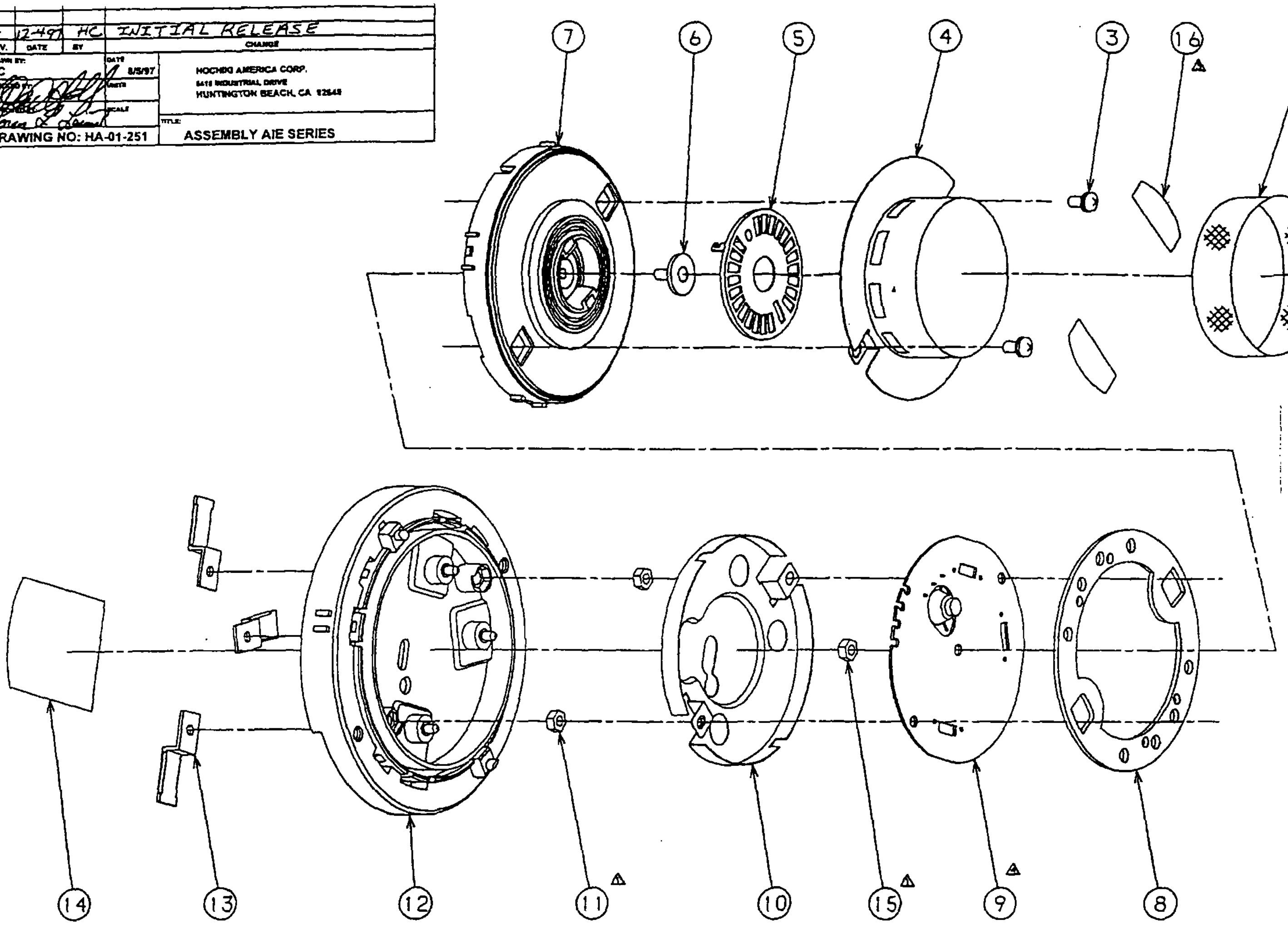
REV.	DATE	BY	CHANGE
–	12-4-97	HC	INITIAL RELEASE

DRAWN BY: HC
DATE: 8/5/97
CHECKED BY:
DATE:
APPROVED BY:
SCALE:

HOCHIKI AMERICA CORP.
5415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

DRAWING NO: HA-01-251
TITLE: ASSEMBLY AIE SERIES

ENCL. A2



CONTROLLED
DATE: 12/10/1997
ENGINEERING

発行
97 - 5004
商品設計課

年月日		訂正事項	設計	承認
97.08.05	△4	P板の変更	川端	三ノ輪
96.12.16	△3	外電用シールAIE追加	端山	宮部
96.08.22	△2	1／3ページ改版のため	川端	三ノ輪
96.06.21	△1	鉄ナット数変更、真鍮ナット追加	川端	三ノ輪

番号	品名	個数	図番	番号	品名	個数	図番	
1	外カバー AIE	1	2-3-275-0418	9	プリント基板 AIE-EA	1	2-1-803-3833	△
2	防虫網 ALG 0449	1	2-3-295-0449	10	シールドケースAIE	1	2-3-295-0468	
3	ナベセムスネジM3X6	2	2-5-002-3061	11	六角ナットM3	2	2-5-705-0302	△
4	外部電極 AIE	1	2-3-295-0469	12	端子盤 AIE	1	2-3-275-0419	
5	中間電極組立 AIE	1	2-1-490-0349	13	鉄合金具0459	3	2-3-295-0459	
6	内部電極組立 AIE	1	2-1-490-0350	14	総合銘板AIE-EA	1	2-3-015-1492	
7	絶縁板 AIE	1	2-3-275-0420	15	六角ナットM3 Bs 半田	1	2-5-706-0304	△
8	パッキン AIE	1	2-3-184-0146	16	外電用シール AIE	2	2-3-015-1678	△

記事	—		
材質	—	仕上	—

承認	調査	設計	製図
三ノ輪		川端	川端

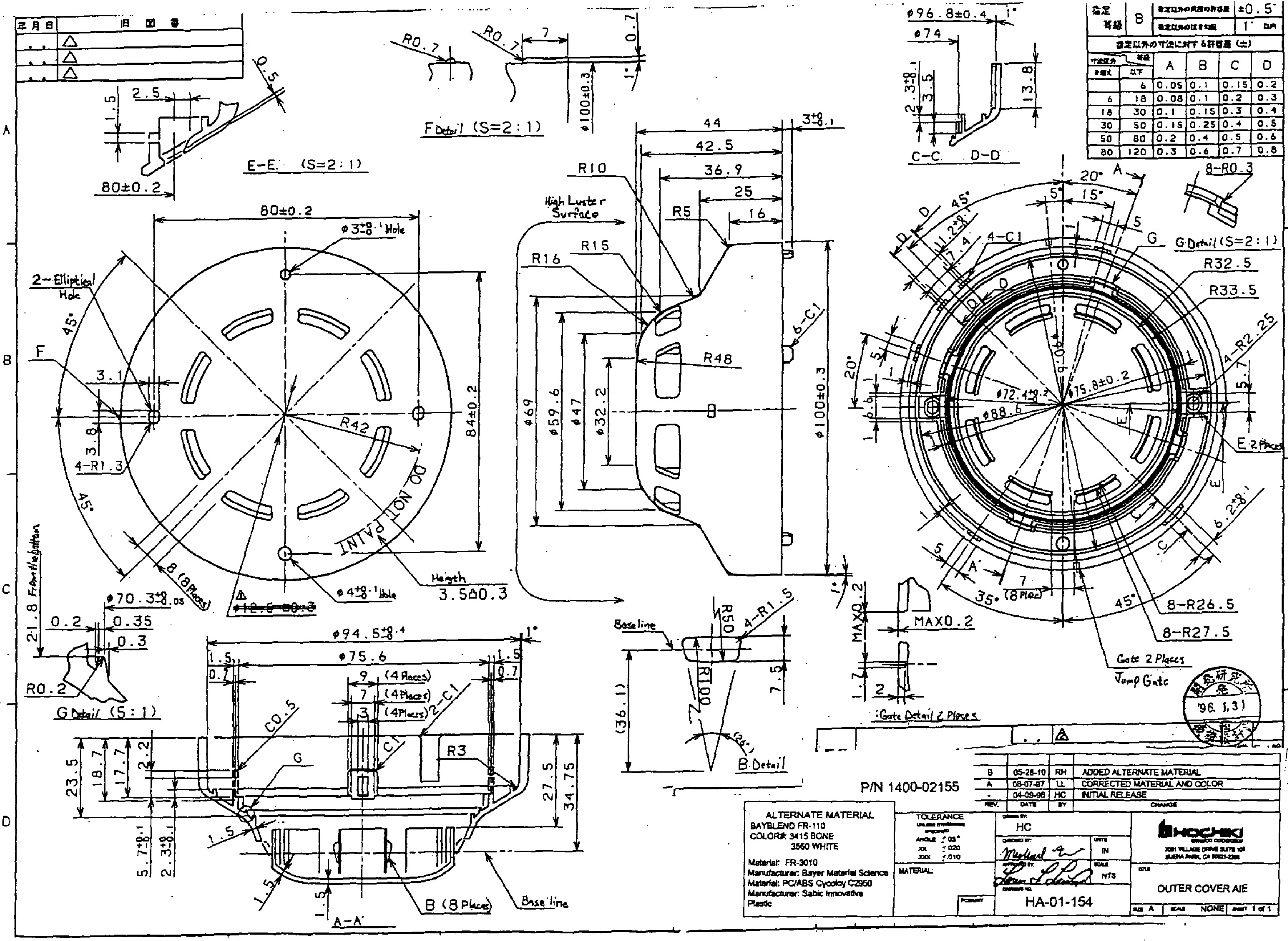
縮尺	設計年月日
1:1	96.03.11

単位 mm 第3角法

図名 ME AIE-EA 展開図

図番 2-1-603-0888-165-2/3

ホーチキ株式会社



指定等級	B	指定以外の角度の許容差	±0.5°
		指定以外の抜き勾配	1° 以内

指定以外の寸法に対する許容差 (±)

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8

P/N 1400-02155

REV.	DATE	BY	CHANGE
B	05-28-10	RH	ADDED ALTERNATE MATERIAL
A	08-07-87	LL	CORRECTED MATERIAL AND COLOR
-	04-09-96	HC	INITIAL RELEASE

ALTERNATE MATERIAL
BAYBLEND FR-110
COLOR#: 3415 BONE
3560 WHITE

Material: FR-3010
Manufacturer: Bayer Material Science
Material: PC/ABS Cycoloy C2950
Manufacturer: Sabic Innovative Plastic

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ±.03°
.XX ±.020
.XXX ±.010

MATERIAL:

DRAWN BY: HC
CHECKED BY: Michael
UNITS: IN
APPROVED BY:
SCALE: NTS
DRAWING NO. HA-01-154

HOCHIKI
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE: OUTER COVER AIE

SIZE A | SCALE NONE | SHEET 1 of 1

CONTROLLED
DATE: 07/12/2012
ENGINEERING

ENCL. A3

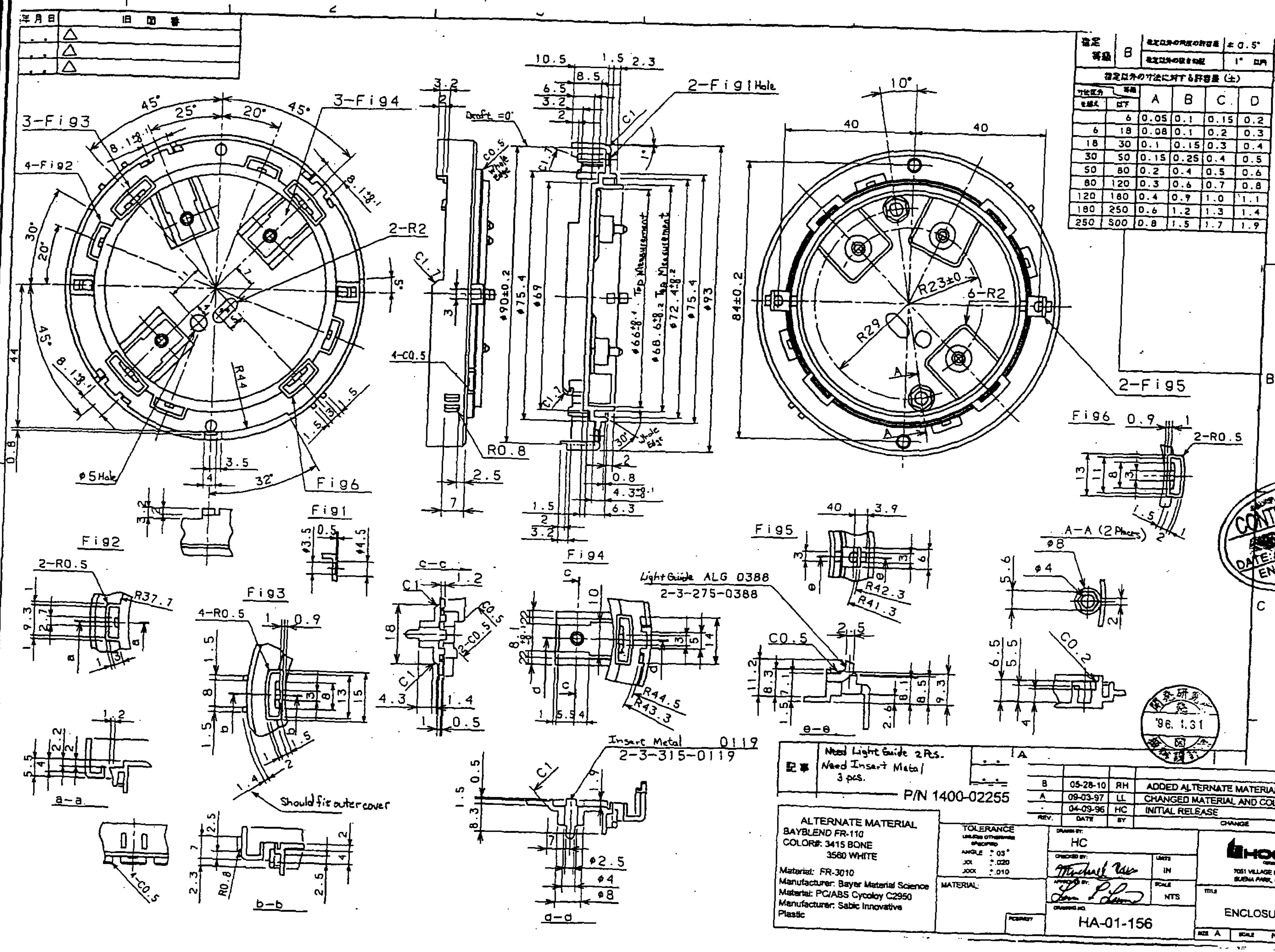
ENCL. A4

年月日	旧図番
. .	△
. .	△
. .	△

指定等級	B	指定以外の角度の許容差	± 0.5°
		指定以外の抜き勾配	1° 以内

指定以外の寸法に対する許容差（±）

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1
180	250	0.6	1.2	1.3	1.4
250	500	0.8	1.5	1.7	1.9



CONTROLLED
DATE: 2012
ENGINEERING

'96. 1.31

記事 Need Light Guide 2 Pcs.
Need Insert Metal
3 pcs.

A

P/N 1400-02255

REV.	DATE	BY	CHANGE
B	05-28-10	RH	ADDED ALTERNATE MATERIAL
A	09-03-97	LL	CHANGED MATERIAL AND COLOR
-	04-09-96	HC	INITIAL RELEASE

ALTERNATE MATERIAL
BAYBLEND FR-110
COLOR#: 3415 BONE
3560 WHITE
Material: FR-3010
Manufacturer: Bayer Material Science
Material: PC/ABS Cycoloy C2950
Manufacturer: Sabic Innovative Plastic

TOLERANCE UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ± .020
.XXX ± .010

MATERIAL:

DRAWN BY: HC
CHECKED BY: Michael Vas
APPROVED BY:
UNITS: IN
SCALE: NTS
DRAWING NO. HA-01-156

HOCHIKI america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE: ENCLOSURE AIE

SIZE A | SCALE NONE | SHEET 1 of 1

年月日	旧図番
. .	△
. .	△
. .	△

Do not use rust preventative on tooling.
Do not use mold release on tooling.

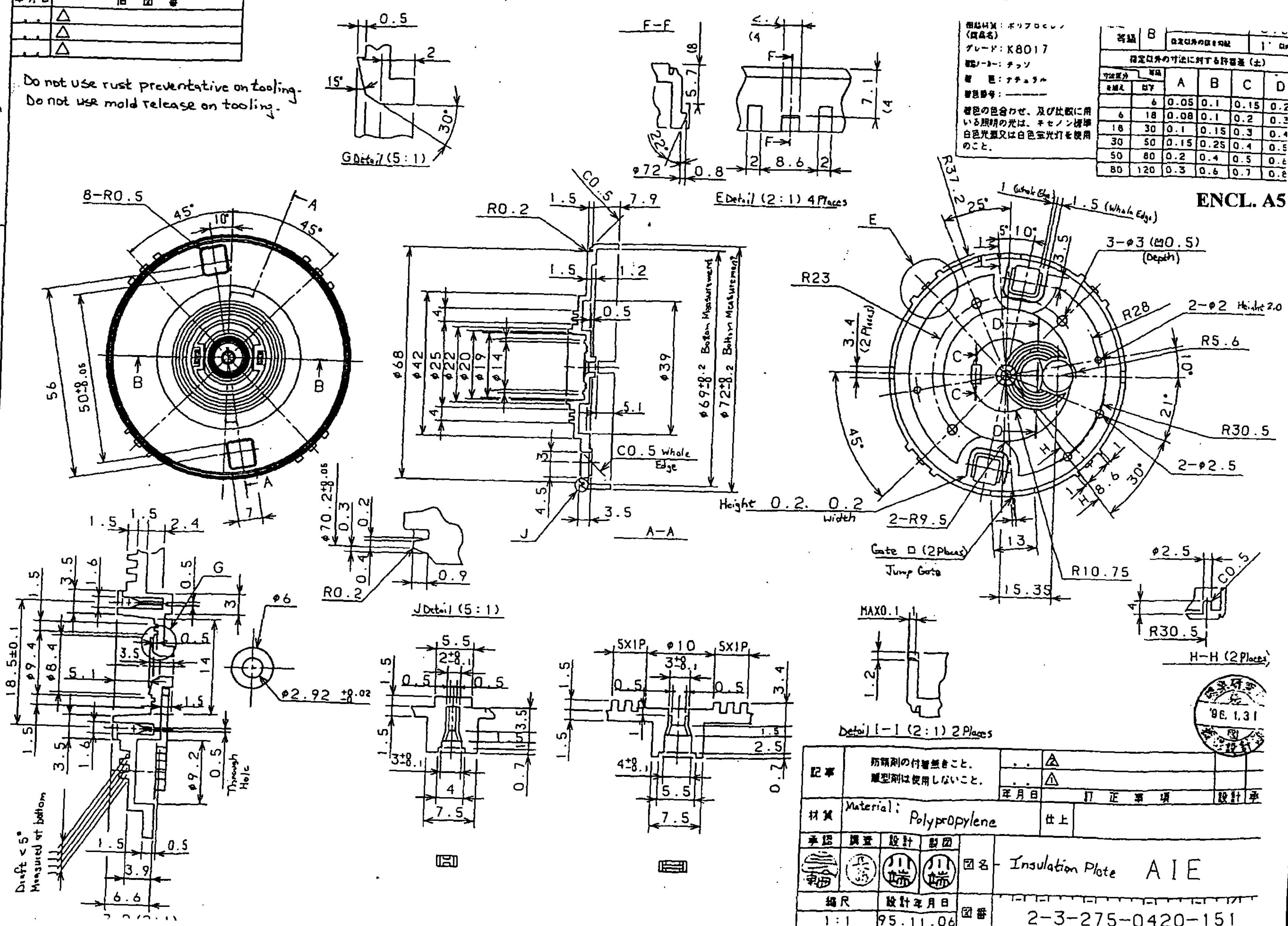
CONTROLLED
DATE: 4/10/96
ENGINEERING

REV.	DATE	BY	CHANGE
–	4-12-96	HC	Initial Release

HOCHIKI
HOCHIKI AMERICA CORP.
[illegible]

DRAWN BY: HC
DATE: 11-6-95
ITEM: Insulation Plate AIE
DRAWING NO: HA-01-153

Computer No 1400-02235



樹脂材質：ポリプロピレン
（商品名）
グレード：K8017
樹脂メーカー：チッソ
着　色：ナチュラル
着色番号：——————
着色の色合わせ、及び比較に用いる照明の光は、キセノン標準白色光源又は白色蛍光灯を使用のこと。

等級	B	指定以外の角度の公差	1°

指定以外の寸法に対する許容差（±）

寸法区分 を越え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.
80	120	0.3	0.6	0.7	0.

ENCL. A5

'96.1.31

記事	防錆剤の付着無きこと。 離型剤は使用しないこと。	. .	△2		
		. .	△1		
		年月日	訂正事項	設計	承
材質	Material: Polypropylene	仕上			

承認	調査	設計	製図
三輪		川端	川端

図名 Insulation Plate AIE

縮尺	設計年月日	図番
1:1	95.11.06	2-3-275-0420-151
単位 mm	第3角法	

ホーチキ株式会社

ENCL.A6

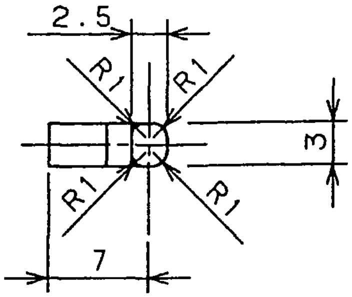
年月日	旧図番
. .	△
. .	△
. .	△

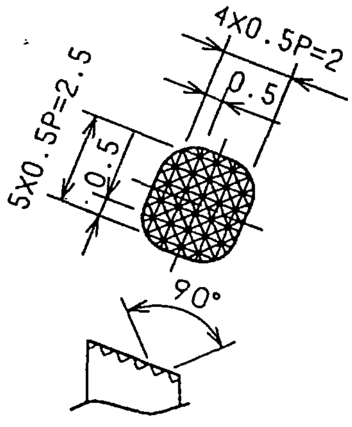
CONTROLLED
DATE: 8/29/2000
ENGINEERING

指定等級	B	指定以外の角度の許容差	±0.5°
		指定以外の抜き勾配	1° 以内

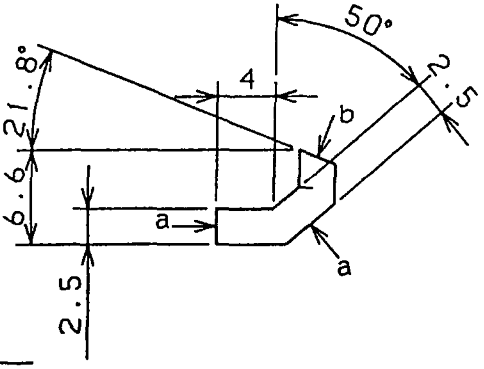
指定以外の寸法に対する許容差（±）

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1
180	250	0.6	1.2	1.3	1.4
250	500	0.8	1.5	1.7	1.9





b Detail (5:1)



Material: Acrylic
Grade: VH
Manufacturer: Mitsubishi Rayon
Color: Clear

N.C.C
商品設計課

Finish:
注) a) Mirror Surface
b) Diamond Cut Surface

'96. 1. 31

REV.	DATE	BY	CHANGE
A	8/29/00	KN	CHANGE TITLE
—	4-9-96	HC	Initial Release

DRAWN BY: HC	DATE 11-9-94	**HOCHIKI** HOCHIKI AMERICA CORP. 5415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY: 11-4-96	SCALE	
DRAWING NO. HA-01-141		TITLE Plastic Light Guide ALG/AIE

Computer No. 1400-02400

Light Guide

年月日	訂正事項	設計	承認
. .	②△		
. .	①△		
記事			

材質

仕上

承認	調査	設計	製図	設計年月日
		小沢	小沢	'94-11-09
縮尺	2:1	単位	mm	第3角法

図名 ライトガイド ALG 0388

図番 2-3-275-0388-151

ホーチキ株式会社

原図保管

ENCL. A7

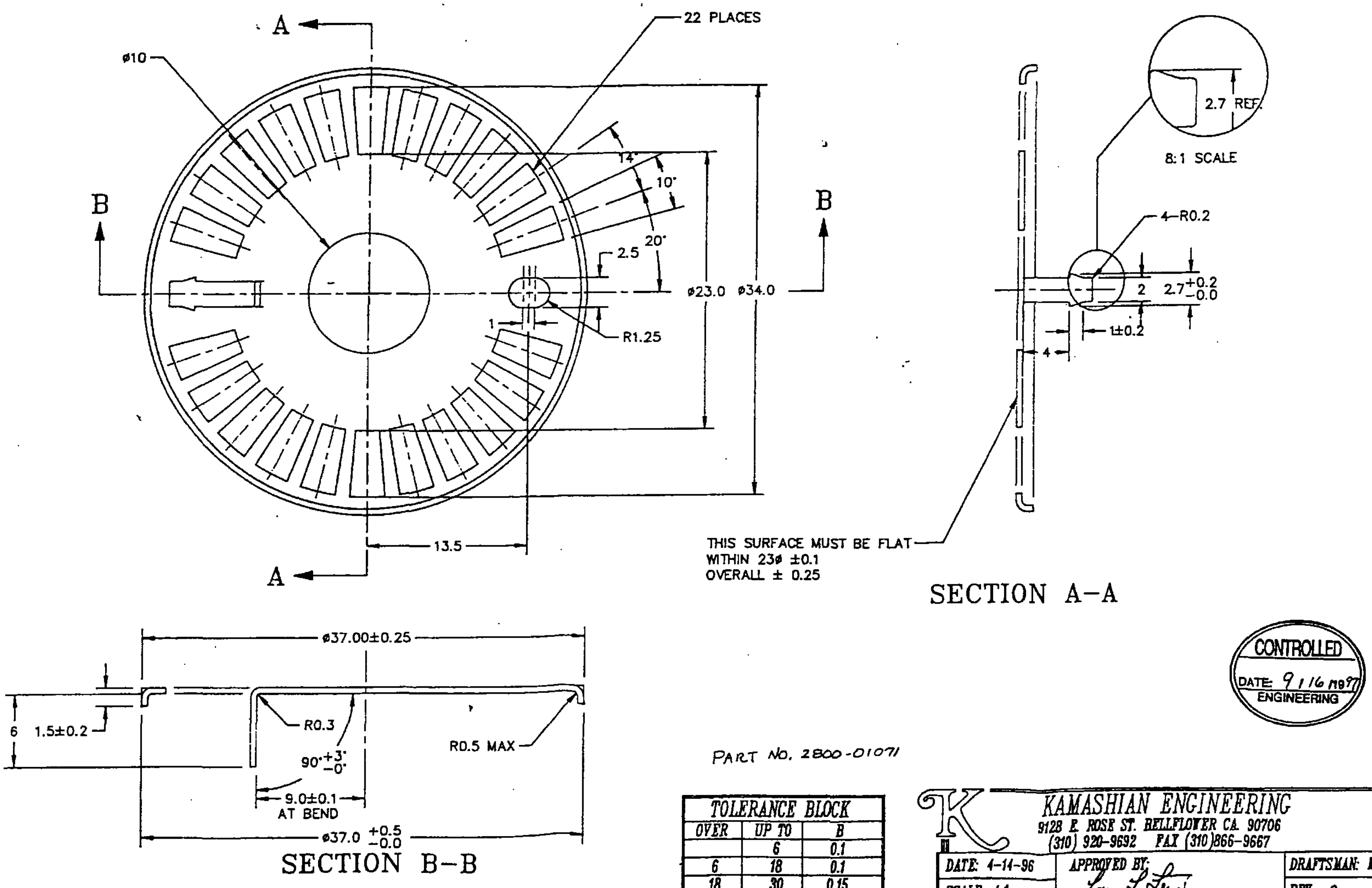
HC Initial Release

HOCHIKI
HOCHIKI AMERICA CORP.

HC

HA-01-146

Intermediate Electrode AIE



CONTROLLED
DATE: 9/16/1997
ENGINEERING

PART No. 2800-01071

TOLERANCE BLOCK		
OVER	UP TO	B
	6	0.1
6	18	0.1
18	30	0.15
30	50	0.25
ANGLES		±1°

DRAWING SIZE: A2

KAMASHIAN ENGINEERING
9128 E. ROSE ST. BELLFLOWER CA. 90706
(310) 920-9692 FAX (310)866-9667

DATE: 4-14-96
APPROVED BY: Loren S. Lewis
DRAFTSMAN: MM
SCALE: 4:1
REV. A
PART NAME: AIE - INTERMEDIATE ELECTRODE
PART NO.: 2-3-295-0466-152
TOOL NO.: K2947
MATERIAL: SUS304 - 0.5 THICK
DRWG NO. 466 C

FINISH: Remove GREASE

指定等級	B	指定以外の角度の許容差	±0.5
		指定以外の抜き勾配	以内

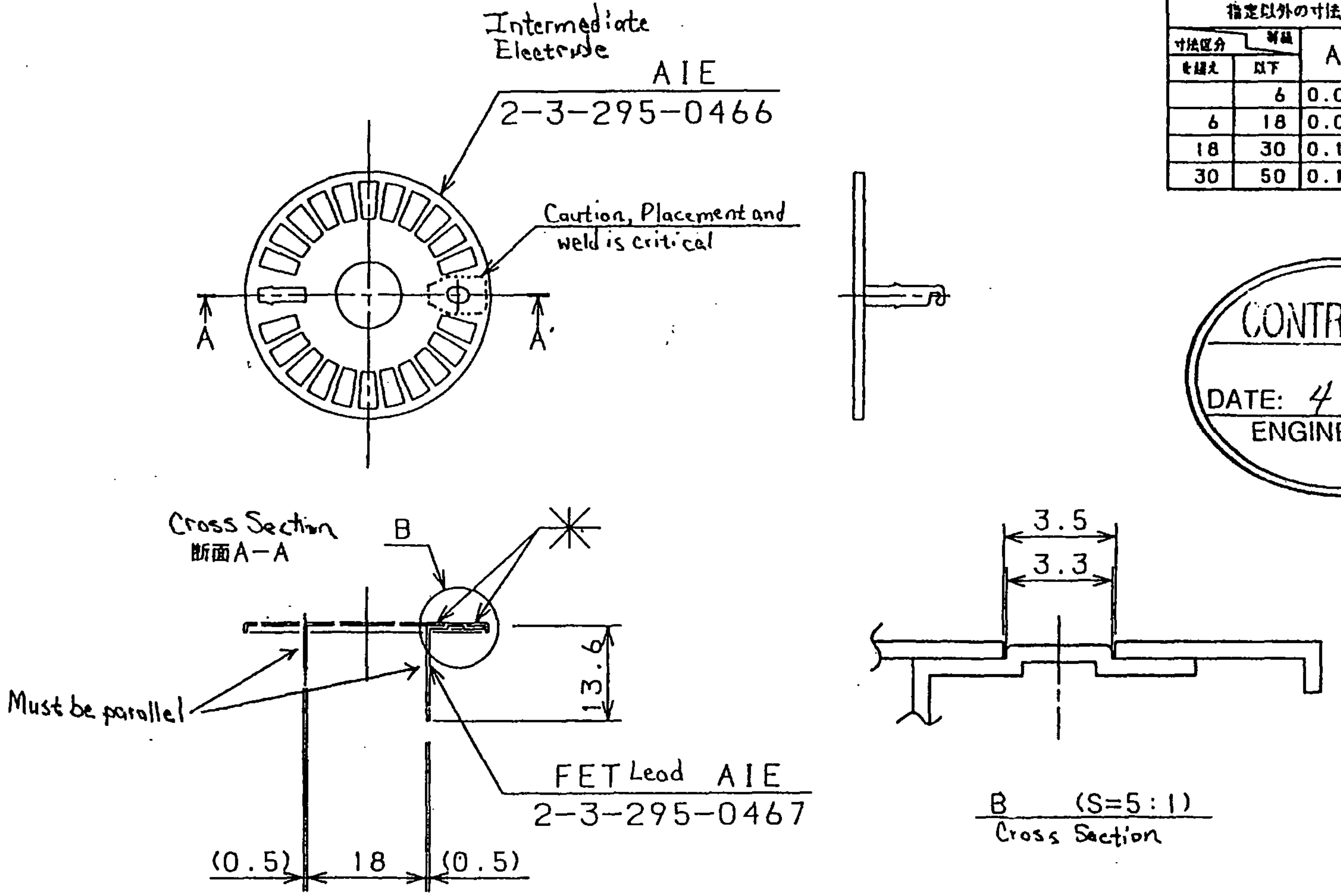
指定以外の寸法に対する許容差（±）

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5

REV.	DATE	BY	CHANGE
1	4-9-96	HC	Initial Release

HOCHIKI
HOCHIKI AMERICA CORP.
3415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

DRAWN BY: HC
DATE: 7-8-95
CHECKED BY:
UNITS:
APPROVED BY: 4/1/96
SCALE:
TITLE: Assembly Intermediate Electrode AIE
DRAWING NO.: HA-01-144



CONTROL
DATE: 4/10/1996
ENGINEERING

'96. 1.31

月日	訂正事項	設計	承認
. .	⚠2		
. .	⚠1		

記事 ---

材質 ---

仕上 ---

承認	調査	設計	製図	設計年月日
	長島	川端	川端	95.11.08
縮尺	1:1	単位	mm	第3角法

図名 Intermediate Electrode Assembly AIE

図番 2-1-490-0349-161

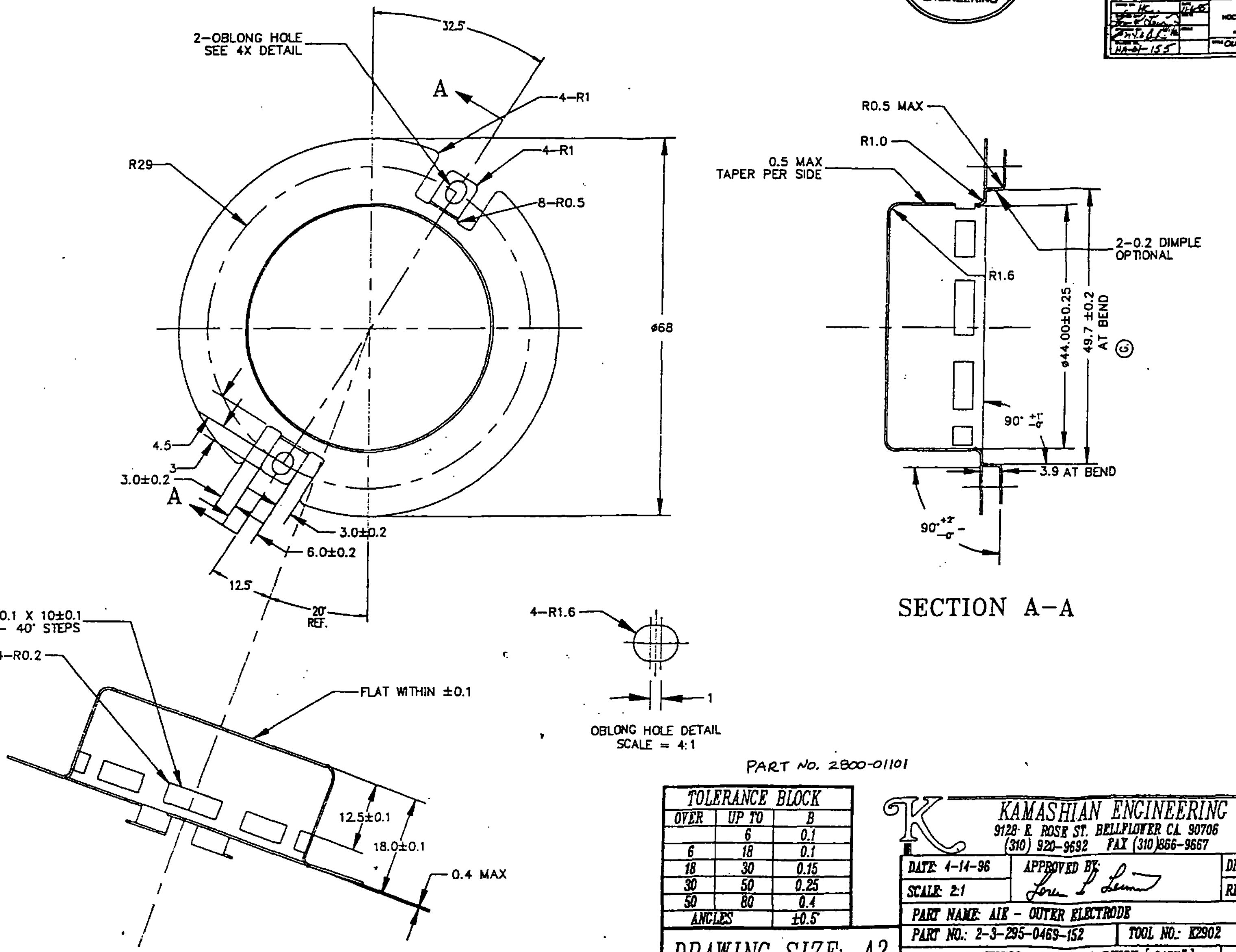
ホーチキ株式会社

ENCL. A9

CONTROLLED
DATE: 9/16/1997
ENGINEERING

A [illegible] Changed per [illegible]
— [illegible] Initial Release

HOCHIKI
HOCHIKI AMERICA CORP.
HA-01-155
Outer Electrode AIE



PART NO. 2800-01101

TOLERANCE BLOCK		
OVER	UP TO	B
	6	0.1
6	18	0.1
18	30	0.15
30	50	0.25
50	80	0.4
ANGLES		±0.5°

DRAWING SIZE: A2

KAMASHIAN ENGINEERING
9128 E. ROSE ST. BELLFLOWER CA. 90706
(310) 920-9692 FAX (310)866-9667

DATE: 4-14-96	APPROVED BY: Loren L Leeman	DRAFTSMAN: MM
SCALE: 2:1		REV. A
PART NAME: AIE - OUTER ELECTRODE		
PART NO.: 2-3-295-0469-152	TOOL NO.: K2902	
MATERIAL: SUS304-CP - 0.4 THICK [.0157"]	DRWG NO. 469	G

FINISH: Remove Grease

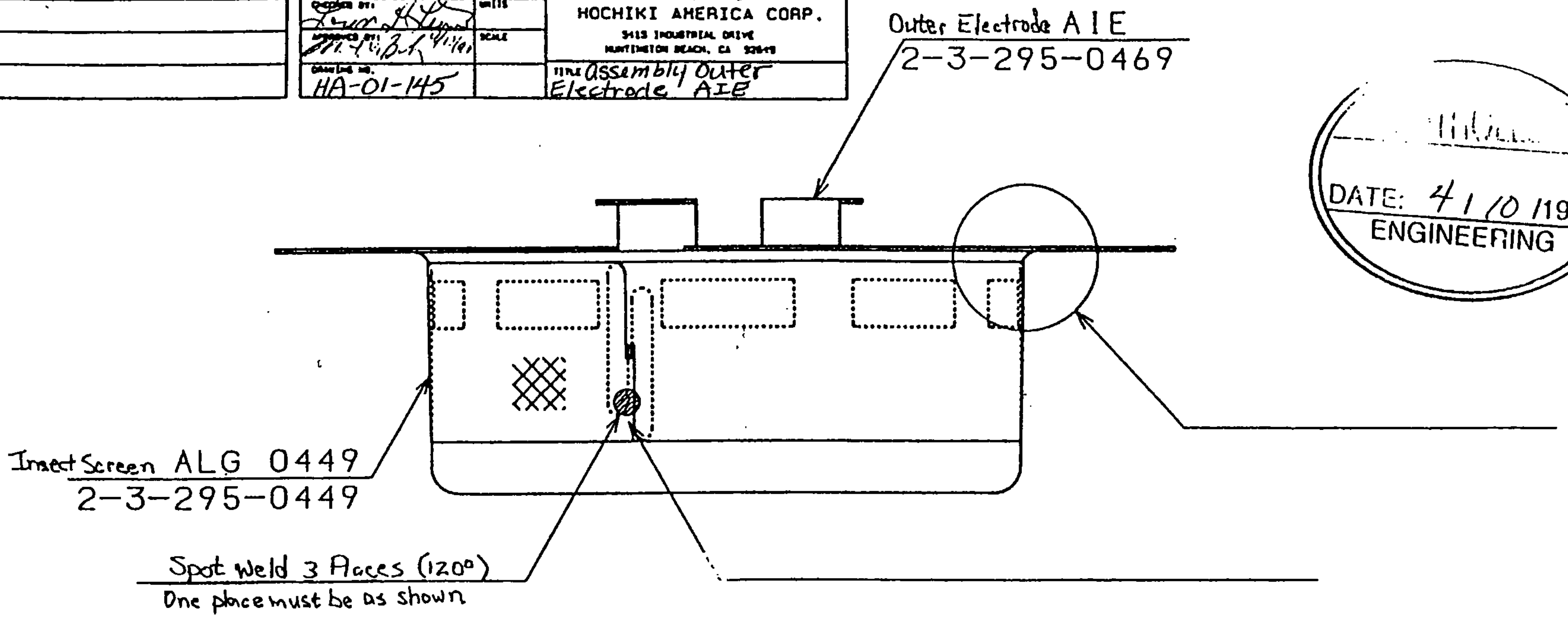
ENCL. A10

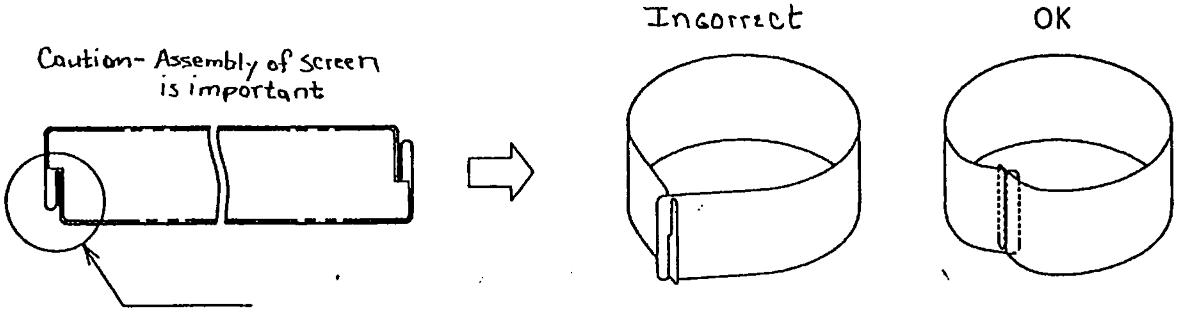
年月日	旧図番
. .	△
. .	△
. .	△

REV.	DATE	BY	CHANGE
—	4-9-96	HC	Initial Release

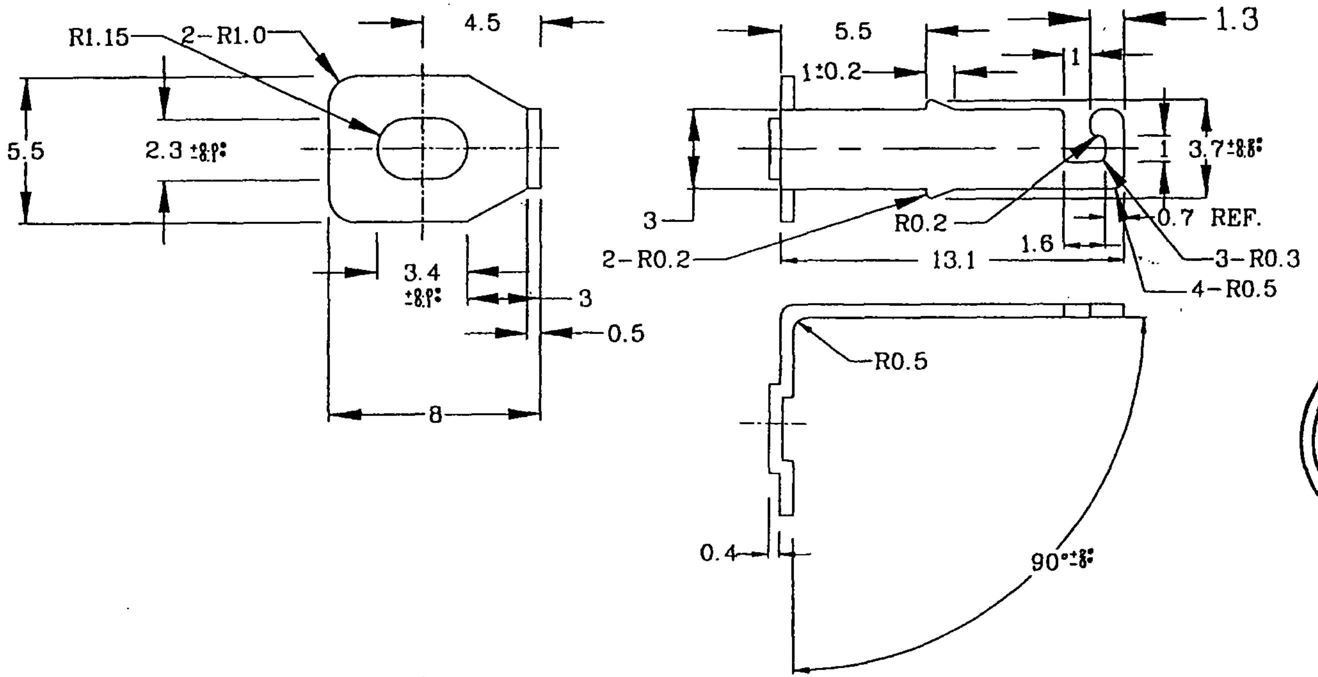
DRAWN BY: HC	DATE 11-6-95	**HOCHIKI** HOCHIKI AMERICA CORP. 5415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY: 4/11/96	SCALE	
DRAWING NO. HA-01-145		TITLE Assembly Outer Electrode AIE

DATE: 4/10/1996
ENGINEERING





				材質	———	承認	調査	設計	製図	設計年月日	図名	Outer Electrode Assembly A I E
. .	②△							川端	川端	95.11.06	図番	2-1-490-0351-16
95.2.1	①△ 防虫網の合わせ方法追加	川端	三ノ輪									
年月日	訂正事項	設計	承認	仕上	———	縮尺	———	単位	mm	第3角法	ホーチキ株式会社	
記事	———											



CONTROLLED
DATE: 4/7/1999
ENGINEERING

REV.	DATE	BY	CHANGE
C	11/17/98	GFC	REDREW, CORRECTED DIMENSION 3.4, CHANGED TEMPLATE
B	1/12/98	LL	ADDED 60% Sn 40% Pb
A	9/16/97	LL	CHANGED DWG FORMAT
–	4/9/96	HC	INITIAL RELEASE

PART # 2800-01095

NOTES:

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.015
.XXX ±.005

MATERIAL:
Preplated Steel 0.5 thick
90% Sn 10%Pb or
60% Sn 40%Pb

PCS/ASSY

DRAWN BY: HC
DATE 11/8/95

CHECKED BY: Ben Magan
UNITS MM

APPROVED BY: Loren L Lein
SCALE NTS

DRAWING NO. HA-01-147

HOCHIKI
HOCHIKI AMERICA CORP.
5415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

TITLE
FET TERMINAL AIE

ENCL. A12

FOIL DIMENSIONS		DECIMAL EQUIVALENT		AMERICIUM CONTENT
X	Y	X	Y	
2.5mm	2.5mm	0.098"	0.098"	0.5 μCi
3.6mm	3.6mm	0.142"	0.142"	0.98 μCi

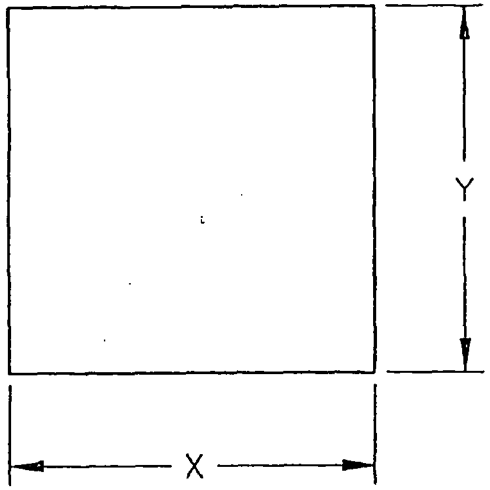
REV.	DATE	BY	CHANGE
B	5/6/98	JA	ADDED 0.98 FOIL
A	1/31/96	AJG	ADDED COMPUTER NO.
–	8/23/90	LLL	INITIAL RELEASE

DRAWN BY: NRD INC.
DATE 3/3/98
CHECKED BY:
UNITS
APPROVED BY:
SCALE

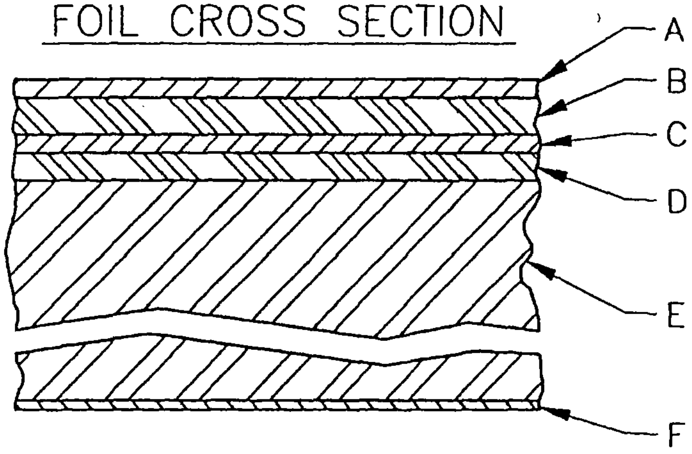
HOCHIKI AMERICA CORP.
6415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

DRAWING NO: HA-01-026

TITLE: FOIL, Americium 241 (NRD)



FOIL CROSS SECTION



A. WHITE GOLD PLATE 0.00002"
B. GOLD 0.00004"
C. AMERICIUM 241 & GOLD 0.00002"
D. GOLD 0.00003"
E. SILVER 0.005" TO 0.009"
F. YELLOW GOLD FLASH PLATE FOR IDENTIFICATION

NOTES:

1. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

PART NO. 2500-00010

CONTROLLED
DATE: 5/6/1998
ENGINEERING

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:
1 PL DECIMALS ±0.03mm
3 PL DECIMALS ±0.001"
ANGLES ±
FRACTIONS ±

DO NOT SCALE PRINT

SIGNATURES		DATE
DRAWN	C. DUNN	03MR98
CHECKED		3/3/98
APPROVED		3/3/98
APPROVED	T. Caffarella	3/3/98

THIRD ANGLE PROJECTION

NRD INC.
A SUBSIDIARY OF MARK IV INDUSTRIES, INC.
2937 ALT BOULEVARD GRAND ISLAND, NEW YORK 14072

A-001 SINGLE FACE FOIL

MATERIAL & FINISH AMERICIUM 241, GOLD, SILVER

	DATE	SCALE	DWG NO	REVISION
A	03MR98	NA	98A020	

ENCL. A13

	旧　図　番
	△
	△
	△

CONTROLL

DATE: 4/10/1996

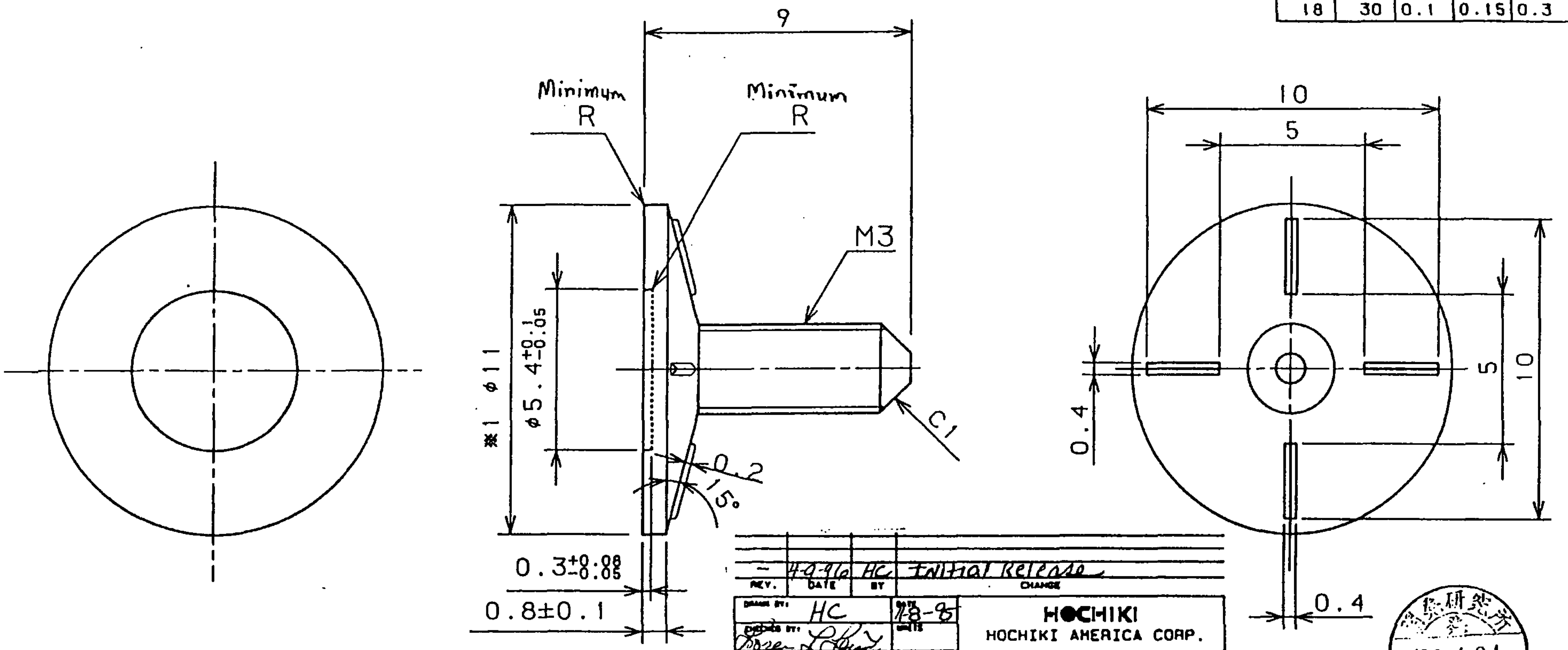
ENGINEERING

指定 等級	B	指定以外の角度の許容差	±0.5°
		指定以外の仕上り記	以

指定以外の寸法に対する許容差（±）

寸法区分 を越え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4

※1. RI Holder (2-3-295-0077)
The space between the RI and RI holder should be less than 0.2mm.



REV.	DATE	BY	CHANGE
–	4-9-96	HC	Initial Release

DRAWN BY: HC	DATE 7-8-95	**HOCHIKI** HOCHIKI AMERICA CORP. 3415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY:	SCALE	
DRAWING NO. HA-01-143		TITLE INNER Electrode AIE

'96. 1.31

Computer No. 2800-01055

	②		
	①		
年月日	訂　正　事　項	設計	承認
記事			

材質	Material SUS305
仕上	Finish 脱脂 Remove Grease

承認	調査	設計	製図	設計年月日
東	長島	川端	川端	95.11.08
縮尺	5:1	単位	mm	第3角法

図名	Inner Electrode AIE
図番	2-3-315-0121-151

ホーチキ株式会社

原図保管

ENCL. A14

Computer No 2800-00131

REV.	DATE	BY	CHANGE
—	4-9-96	HC	Initial Release

DRAWN BY: HC
CHECKED BY: Don L Lem
APPROVED BY: 4/4/96
DATE: 7-3-59
UNITS
SCALE
DRAWING NO. HA-01-152

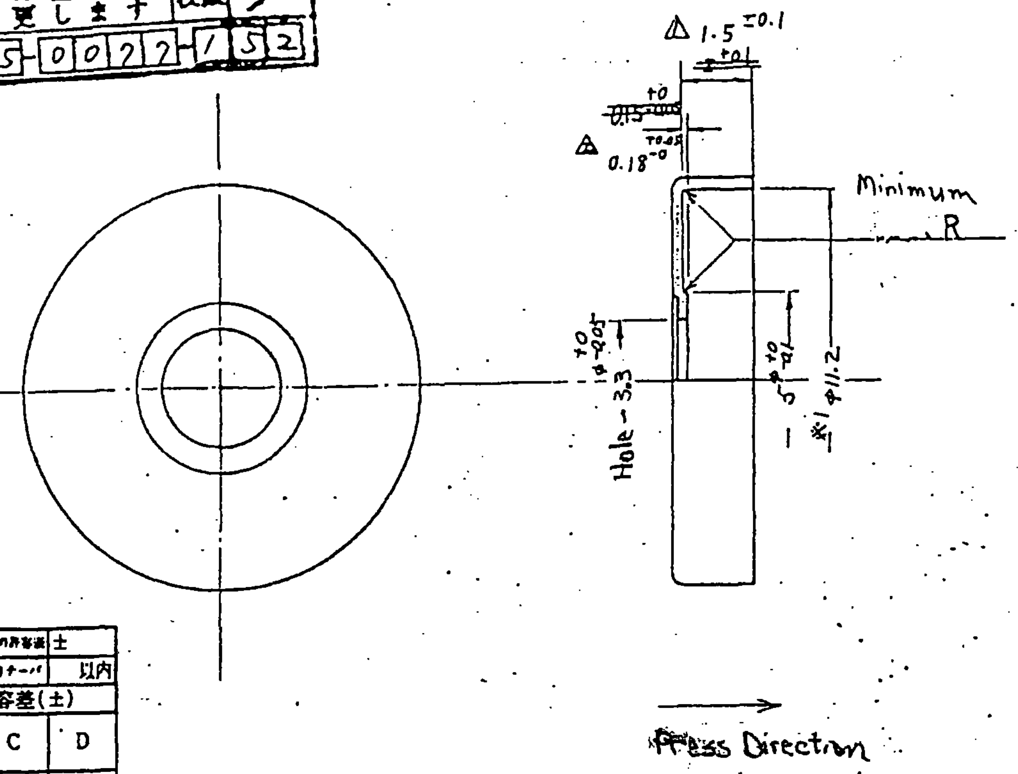
HOCHIKI
HOCHIKI AMERICA CORP.
3415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

TITLE Holding Plate AIE

関係仕様書及図面	名　称	番　号
記事		

年月日	訂 正 事 項	設計	承認
58.11.18	①寸法変更	柴田	
59.7.3	②寸法変更	〃	

一新コードー	この図書に変更します	改版	/
図面	2-3-295-0072-152		



※1. Distance between inner electrode and RI holder should be less than 0.2mm

2. Barrel Finish Polishing
~~(全周面とする)~~

CONTROLLED
DATE: 4/10/1996
ENGINEERING

91-2043

指定等級	B	指定以外の角度の許容差	±
		指定以外の抜きテーパ	以内

指定以外の寸法に対する許容差(±)

寸法区分 を超え	等級 以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1
180	250	0.6	1.2	1.3	1.4
250	500	0.8	1.5	1.7	1.9

t : 0.3

Material : SUS 316
Finish : Remove Grease

'96.1.31

				2	
	/	SUS316	脱脂	1	
G-	G-	材質	仕様	部番	名　称

承認	調査	設計	製図	縮尺	5/1
		柴田	柴田	単位	—
				第3角法	
57.8.27		S57-8-24			

図名 RI Holding Plate AIE

図番 ~~DAA-0002~~

ホーチキ株式会社

SIZE-A4

原図保管 商品設計部

ENCL. A15

旧 図 番
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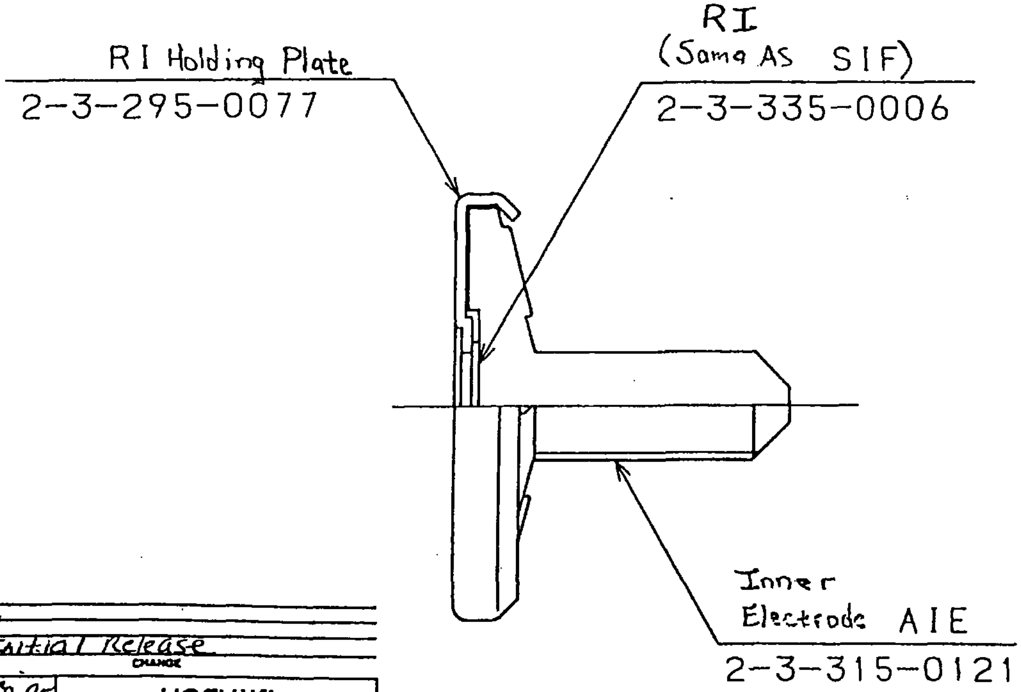
△
△

Notes:

1. Press force should be 2~3 Kg·cm
   Holding plate should not be loose
2. No dust should be on the surface of the RI.



CONTROLL...
DATE: 4/10/1996
ENGINEERING

'96. 1.31

REV.	DATE	BY	CHANGE
—	4-9-96	HC	Initial Release

DRAWN BY: HC	DATE 11-8-95	**HOCHIKI** HOCHIKI AMERICA CORP. 5415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	SIZE	
APPROVED BY:	SCALE	
DRAWING NO. HA-01-148		TITLE Assembly Inner Electrode AIE

	⚠2			材質	―――
	⚠1				
月日	訂 正 事 項	設計	承認	仕上	―――
記事	―――				

承認	調査	設計	製図	設計年月日	図名	Inner Electrode Assembly AIE
	長島	川端	川端	95.11.08	図番	2-1-490-0350-161
縮尺	5:1	単位	mm	第3角法	ホーチキ株式会社	

原図保管

ENCL. A16

旧 図 番
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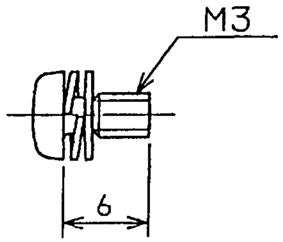
△

REV.	DATE	BY	CHANGE
—	4-9-96	HC	Initial Release

DRAWN BY: HC	DATE 11-9-95	**HOCHIKI** HOCHIKI AMERICA CORP. 3415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY: 4/4/96	SCALE	
DRAWING NO. HA-01-150		TITLE Screw MachinE M3X6 AIE



CONTROLL

DATE: 4/10/1996

ENGINEERING

Cross Recessed Head Machine Screw
with Flat Washer and Spring Washer M3X6

(JIS B 1188)

Plating: Chromate coating on electroplated
Zinc (JIS) H8625

Computer No. 2825-00135

'96. 1.31

. .	②△			材質	Material Steel	
. .	①△					
年 月 日	訂 正 事 項	設計	承認			
記号	———			仕上		

承認	調査	設計	製図	設計年月日	図名	AIE Machine Screw M3X6
	長島	川端	川端	95.11.09	図番	2-5-002-3061-15
縮尺	———	単位	mm	第3角法	ホーチキ株式会社	

原図保管

ENCL.A17

旧 図 番
△
△
△

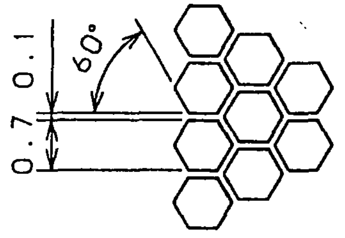
CONTROLL
DATE: 8/29/00
ENGINEERING

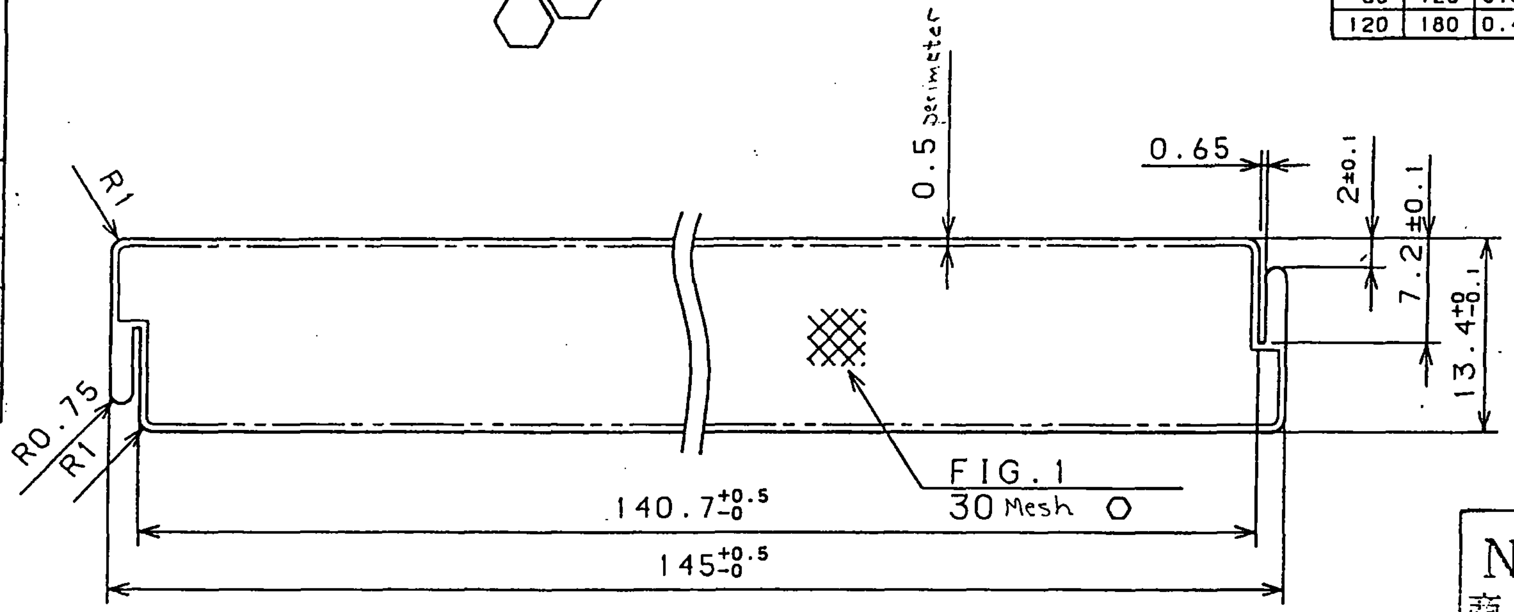
指定等級	A	指定以外の角度の許容差	±0.5°
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1

FIG.1 Mesh Pattern S=5:1





REV.	DATE	BY	CHANGE
A	8/29/00	KN	CHANGE TITLE
—	4/4/96	HC	Initial Release

HOCHIKI
HOCHIKI AMERICA CORP.
5415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

DRAWN BY: HC	DATE: 9-30-94
CHECKED BY:	UNITS
APPROVED BY:	SCALE
DRAWING NO. HA-01-142	TITLE Insect screen

N.C.C
商品設計課

'96. 1.31

Computer No. 2800-01121

		Material							
△2	材質	SUS304 t=0.1	承認	調査	設計	製図	設計年月日	図名	防虫網 ALG 0449
△1					小沢	小沢	94.09.30	図番	2-3-295-0449-151
	処理	脱脂 Remove Grease	縮尺	2:1	単位	mm	第3角法	ホーチキ株式会社	

原図保管

ENCL. A18

旧図番

△
△
△

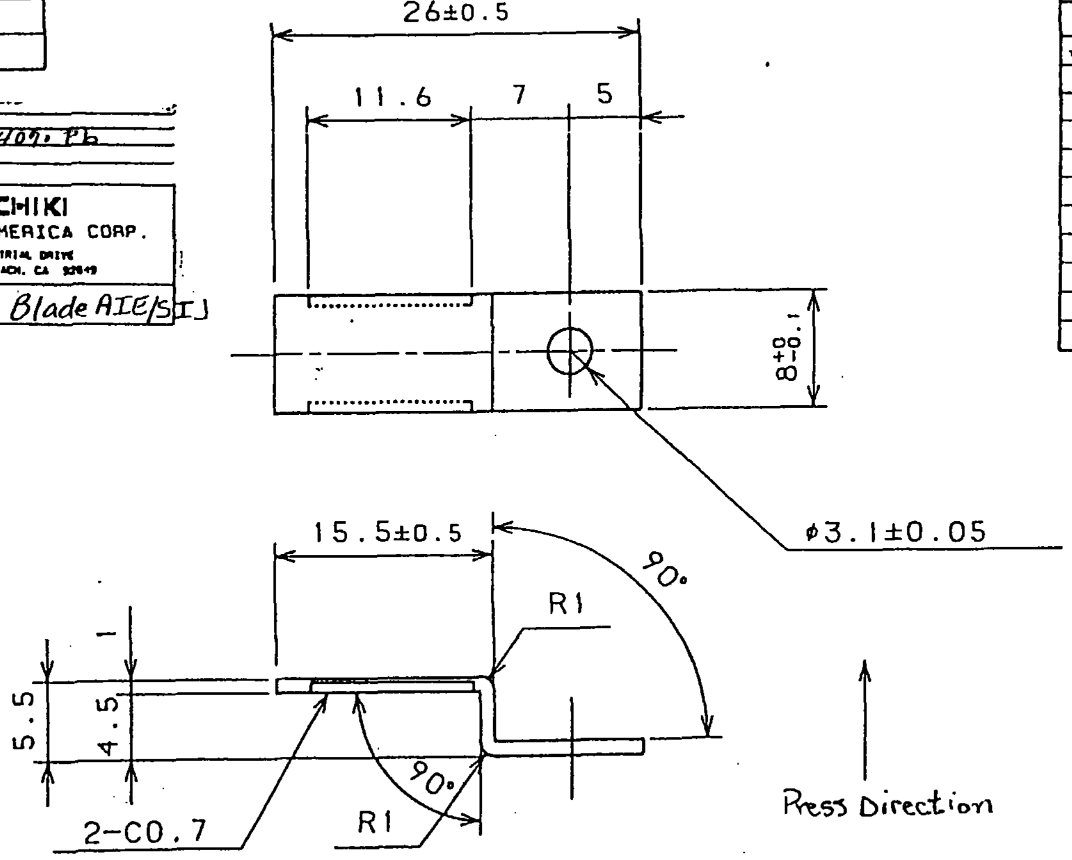
REV.	DATE	BY	CHANGE
A	1-12-98	LL	Added 60% Sn 40% Pb
–	4-9-96	HC	Initial Release

DRAWN BY: HS	DATE 12-19-94	**HOCHIKI** HOCHIKI AMERICA CORP. 3415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY:	SCALE	
DRAWING NO. HA-01-157		TITLE Contact Blade AIE/SIJ

指定等級	B	指定以外の角度の許容差	± 1°
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分 を越え	等級 以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1
180	250	0.6	1.2	1.3	1.4
250	500	0.8	1.5	1.7	1.9



CONTROLLED
DATE: 1/12/1998
ENGINEERING

N.C.C
商品設計課

t=1.0

'90.1.31

part No. 2800-01021

. .	△2		
. .	△1		
年月日	訂正事項	設計	承認
記事			

		承認	調査	設計	製図	設計年月日
材質	Copper or Copper alloy C2680P t=1.0	三輪	渋谷	富沢	富沢	94.12.19
仕上	Finish: Solder Plated 90% Sn 10% Pb or 60% Sn 40% Pb	縮尺	2:1	単位	mm	第3角法

図名	Contact Blade A: 04
図番	2-3-295-0459-15

ホーチキ株式会社

ENCL. A19

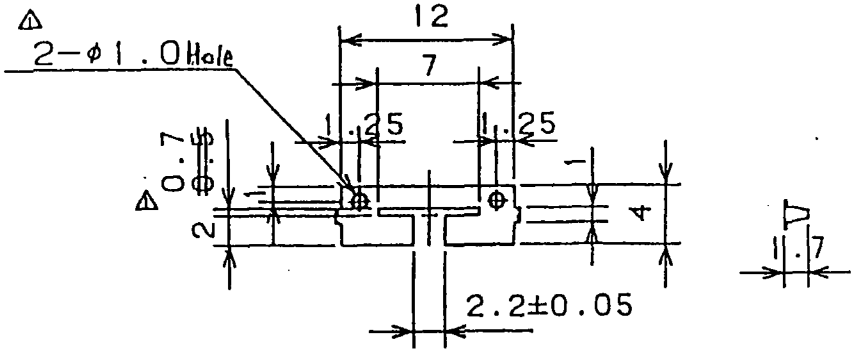
B	指定以外の角度の許容差	±
	指定以外の抜き勾配	以内

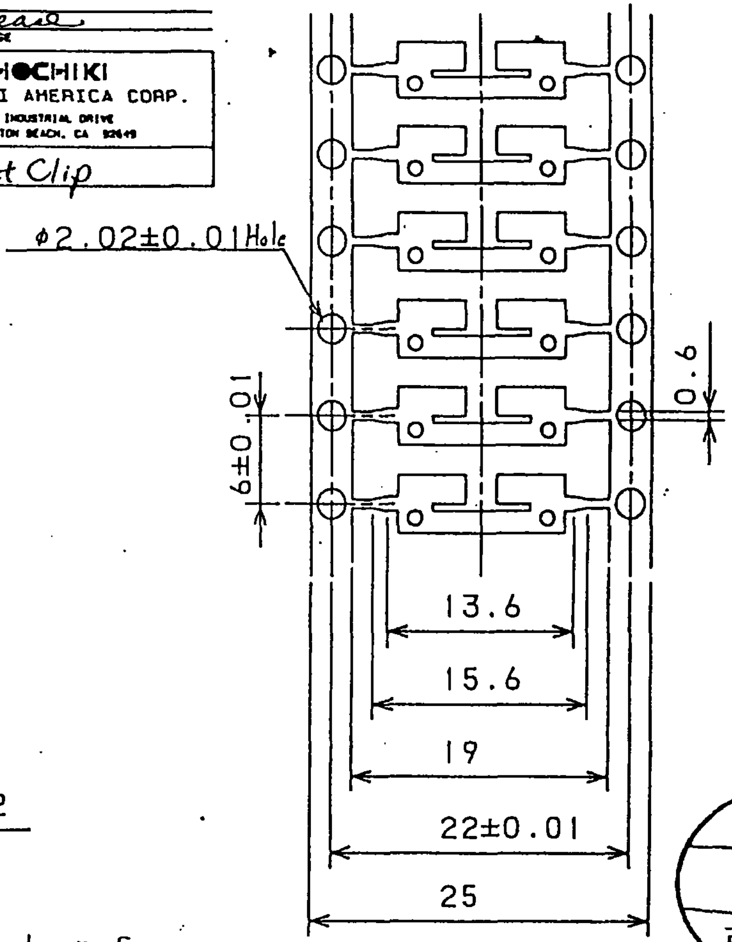
定以外の寸法に対する許容差（±）				
等級 / 以下	A	B	C	D
6	0.05	0.1	0.15	0.2
18	0.08	0.1	0.2	0.3
30	0.1	0.15	0.3	0.4

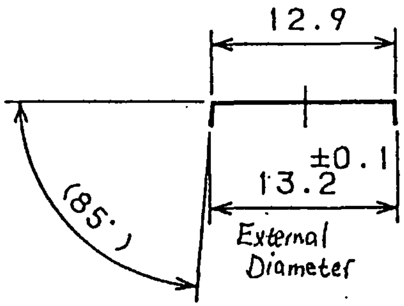
REV.	DATE	BY	CHANGE
–	4-9-96	HC	Initial Release

DRAWN BY: HC	DATE 9-21-63	HOCHIKI HOCHIKI AMERICA CORP. 5415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY:	SCALE	
DRAWING NO. HA-01-140		TITLE Contact Clip

DATE: 4/10/1996
ENGINEERING







t=0.2

発　行
91-2079
商品設計課

Material: Copper phosphor bronze for springs JIS H-3130

Plating:, Solder Plate 90%Sn 10% Pb

Computer No. 2800-00066

	⚠2		材質	
91.1.13	⚠1 φ1.0孔2ヶ所追加、及び寸法変更	森田		
年月日	訂正事項	設計	仕上	
記事				

承認	調査	設計	製図	設計年月日	枚数
早川		八島	八島	63.9.21	／
縮尺	2/1	単位	mm	第3角法	

図名	Contact Clip
図番	2-3-295-0298-152

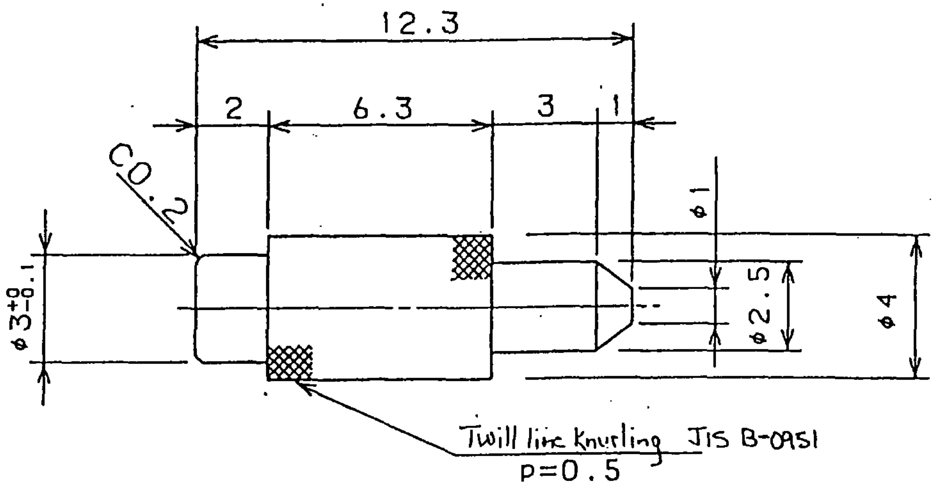
ホーチキ株式会社

ENCL. A20

指定等級	B	指定以外の角度の許容差	±
		指定以外の面取り丸R	以内

指定以外の寸法に対する許容差（±）

寸法区分 をこえ	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1
180	250	0.6	1.2	1.3	1.
250	500	0.8	1.5	1.7	1.



CONTROLLED
DATE: 1 / 12 /1998
ENGINEERING

REV.	DATE	BY	CHANGE
A	1-12-98	LL	Added 60%Sn 40%Pb
—	4-9-96	HC	Initial Release

N.C.C
商品設計課

DRAWN BY: HC	DATE 12-19-94	**HOCHIKI** HOCHIKI AMERICA CORP. 3415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY:	SCALE	
DRAWING NO. HA-01-139		TITLE Insert Metal AIE

'96. 1.31

Computer No. 2800-01017

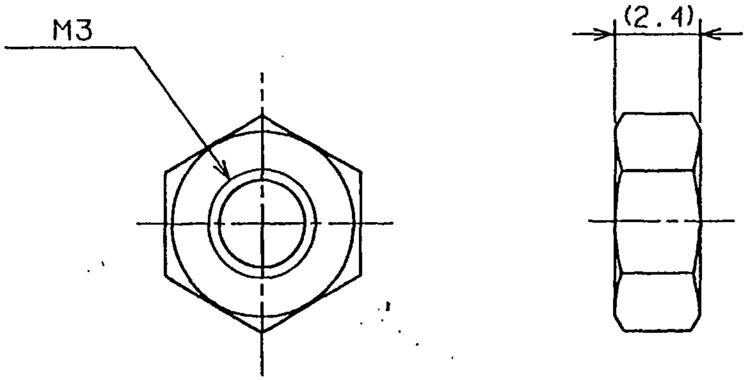
. .	②			材質	Copper or Copper alloy C1100W-1/2H	承認	調査	設計	製図	設計年月日	図名	Insert Metal
. .	①						淡	富沢	富沢	94.12.19	図番	2-3-315-0119-151
年月日	訂正事項	設計	承認	仕上	Finish: Solder Plating 90%Sn 10%Pb or 60%Sn 40%Pb	縮尺	5:1	単位	mm	第3角法	ホーチキ株式会社	
記事												

ENCL. A21

—	4-9-96	HC	Initial Release
REV.	DATE	BY	CHANGE

DRAWN BY: HC	DATE 11-8-95	**HOCHIKI** HOCHIKI AMERICA CORP. 3415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY: 4/1/4	SCALE	
DRAWING NO. HA-01-136		TITLE Nut, Hex M3

Hex Nut M3 Style 1 (Grade A) Both Sides)
(JIS B 1181)



CONTROL
DATE: 4/10/1996
ENGINEERING

'96. 1.31

Computer No. 2825-00185

. .	⚠2			材質	Material Steel	承認	調査	設計	製図	設計年月日	図名	Hex Nut M3
. .	⚠1							川端	川端	95.11..08	図番	2-5-705-0302-151
年月日	訂正事項	設計	承認	仕上	Finish Chromate	縮尺	5:1	単位	mm	第3角法	ホーチキ株式会社	
記事	---											

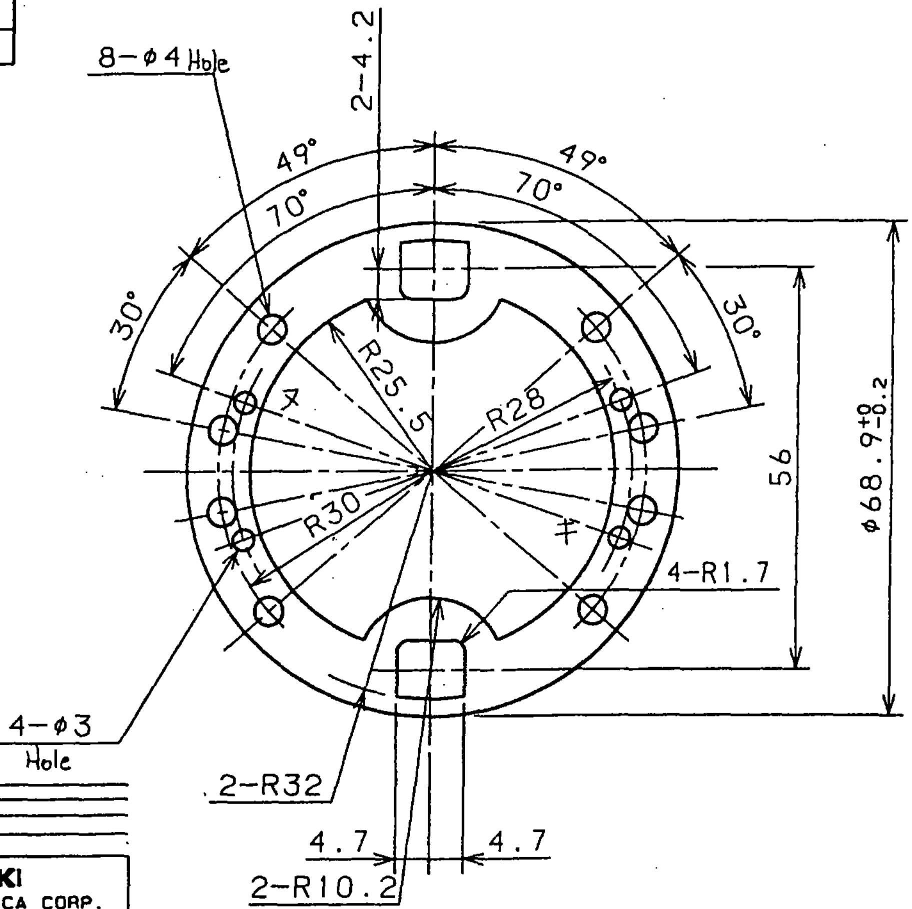
ENCL. A22

月日	旧　図　番
. .	△
. .	△
. .	△

指定等級	B	指定以外の角度の許容差	±
		指定以外の抜き勾配	以内

指定以外の寸法に対する許容差（±）

寸法区分 を超え	以下	A	B	C	D
	6	0.05	0.1	0.15	0.2
6	18	0.08	0.1	0.2	0.3
18	30	0.1	0.15	0.3	0.4
30	50	0.15	0.25	0.4	0.5
50	80	0.2	0.4	0.5	0.6
80	120	0.3	0.6	0.7	0.8
120	180	0.4	0.9	1.0	1.1
180	250	0.6	1.2	1.3	1.4
250	500	0.8	1.5	1.7	1.9



CONTROLLED
DATE: 4/10/1996
ENGINEERING

t=1.5

REV.	DATE	BY	CHANGE
—	4-9-96	HC	Initial Release

DRAWN BY: HC	DATE 11-6-95	**HOCHIKI** HOCHIKI AMERICA CORP. 5415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY:	SCALE	
DRAWING NO. HA-01-137		TITLE Gasket AIE

Computer No. 2500-00030

'95.1.31

年月日	訂正事項	設計	承認
. .	△2		
. .	△1		
記事			

材質	Chiloro.prene Sponge Rubber Closed cell	承認	調査	設計	製図	設計年月日	図名	Gasket AIE
			長島	川端	川端	95.11.06	図番	2-3-184-0146-151
仕上		縮尺	1:1	単位	mm	第3角法	ホーチキ株式会社	

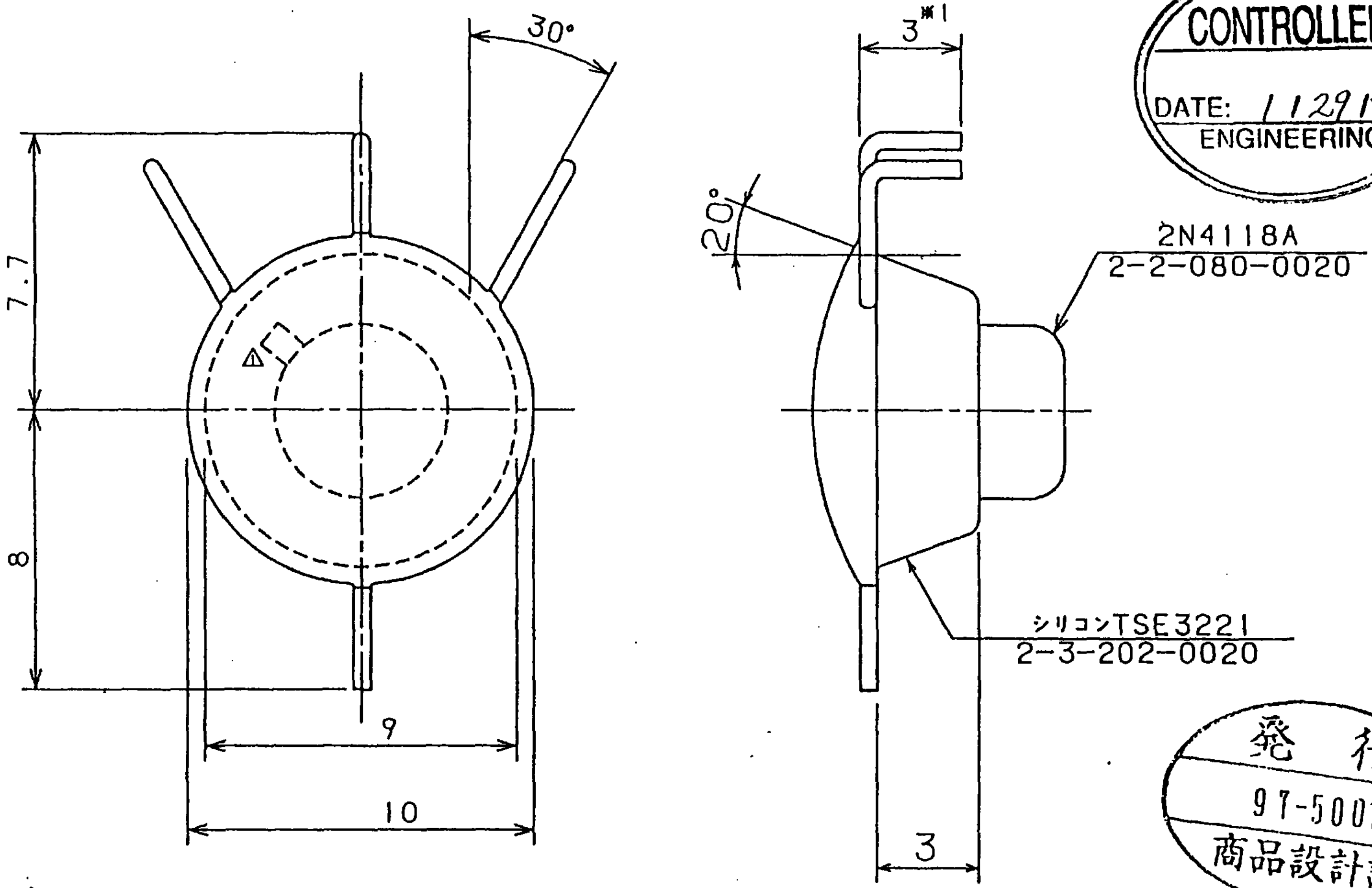
原図保管

ENCL. A23

CONTROLLED

DATE: 1/29/1998

ENGINEERING



発行

97-5001

商品設計課

PART NO. 4800-00177

. .	△2			材質	---
770702	△FETケースの突起形状の追加	森田	宮部		
年月日	訂正事項	設計	承認		
記事	※1 フォーミング長さ3mm以外は、2-1-100-0010と同形状。			仕上	---

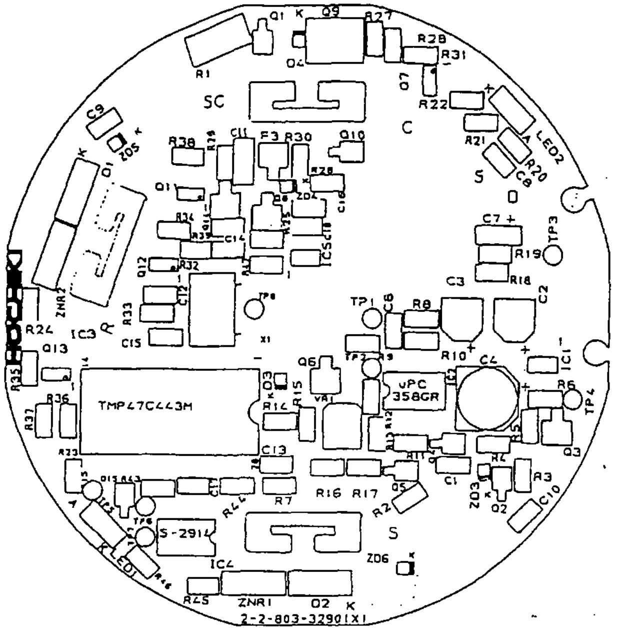
承認	調査	設計	製図
宮[illegible]	鳥越	森田	森田
縮尺	5:1	単位	mm

REV.	DATE	BY	CHANGE
A	1-29-98	JA	Added PART NO.
–	12-15-97	HC	Initial Release.

DRAWN BY: HC	DATE 3/25/96	HOCHIKI AMERICA CORP. 5415 INDUSTRIAL DRIVE HUNTINGTON BEACH, CA 92649
CHECKED BY:	UNITS	
APPROVED BY:	SCALE	TITLE:
DRAWING NO: HA-01-247		ASSEMBLY JFE, POTTED AIE

ENCL. A24

部品配置番号	部品名	捺印	名称	品目コード	数量
IC1	S-81230SG-QB-T1	QB	定電圧IC	2-2-045-0048	1
△ IC2	UPC358GR-T2	358	オペアンプ	2-2-214-0011	1
IC3	MC020FP(443M-JU84)		CPU(SOP28)	2-2-030-0053	1
△ IC4	S-29130AFJ-TB	S130	EEPROM(SOP8)	2-2-020-0015	1
IC5	PST8128NR	28DL	電圧検出IC	2-2-046-0041	1
D1,2	U1GC44-TE12L	GC	ダイオード	2-2-162-0100	2
D3,4	1SS352(TPH3)	C1	ダイオード	2-2-162-0070	2
ZNR1,2	F1CS600TP	560	サージアブソーバ	2-2-090-0025	2
ZD3	02DZ10-Z(TPH3)	10Z	ツェナーダイオード	2-2-174-0250	1
ZD4	02DZ7.5-Y(TPH3)	7Y5	ツェナーダイオード	2-2-174-0260	1
ZD5,6	02DZ15-X	15X	ツェナーダイオード	2-2-174-0240	2
Q1,5	DTC124XU-T106	AS	デジタルトランジスタ	2-2-148-0080	2
Q2	2SC4131-T1B-L17/L18	L18	トランジスタ	2-2-145-0100	1
Q3,8,14	2SC1623-T1B-L6/L7	L7	トランジスタ	2-2-145-0010	3
Q4,10,15	DTA115EU-T106	19	デジタルトランジスタ(R1N)	2-2-148-0070	3
Q6	2SA812-T1B-M5/M6	M6	トランジスタ	2-2-125-0010	1
Q7,12	IMT2-HSE-T108	T2	デジタルトランジスタ(2P)	2-2-212-0005	2
Q9	2SC2873-Y-TE12L	NY	トランジスタ	2-2-115-0020	1
Q11,13	IMB2-T110	B2	デジタルトランジスタ(R2P)	2-2-212-0005	2
F1	2N4118A		J-FET	2-2-080-0020	1
F3	2SK520-T1B-K43	K43	FET	2-2-095-0050	1
LED1,2	BR1101F-TR		LED	2-2-200-0090	2
X1	DCRKC600-M1	600	セラミック発振子	2-2-431-0057	1
C1	GRM40B103K50PT		セラミックコンデンサ(0.01u)	2-2-750-0310	1
C2,3	NSE16VC10-05S	10	電解コンデンサ(10u)	2-2-767-0640	2
C4	EEVHA1C470P	47	電解コンデンサ(47u)	2-2-767-4650	1
C6,8,9,10,13,16,17,18	GRM40F104Z25PT		セラミックコンデンサ(0.1u)	2-2-750-0410	8
C7	TESVA1C105M1-8R	C105	タンタルコンデンサ(1u)	2-2-763-0510	1
C11	GRM42-6B104K50PT	-	セラミックコンデンサ(0.1u,50V)	2-2-752-0420	1
C12	GRM40CH221J50PT		セラミックコンデンサ(220p)	2-2-750-2130	1
C14,15	GRM40CH101J50PT		セラミックコンデンサ(100p)	2-2-750-0130	2
R1	RK73K2BTE 4.7KΩ-KJ	472	抵抗	2-2-653-4500	1
R2,18	RK73K2ATD 1MΩ-KJ	105	抵抗	2-2-650-7300	2
R3	RK73K2ATD 470Ω-KJ	471	抵抗	2-2-650-3300	1
R4	RK73K2ATD 820KΩ-KJ	824	抵抗	2-2-650-7200	1
R5	RK73K2ATD 220KΩ-KJ	224	抵抗	2-2-650-6500	1
R6,14,16,29,36,39,46	RK73K2ATD 10KΩ-KJ	103	抵抗	2-2-650-1900	7
R7,21,25,27,30,34,37	RK73K2ATD 47KΩ-KJ	473	抵抗	2-2-650-5700	7
R8,47	RK73K2ATD 5.6KΩ-KJ	562	抵抗	2-2-650-4600	2
R9	RK73K2ATD 1KΩ-KJ	102	抵抗	2-2-650-3700	1
△ R10	RK73K2ATD 39KΩ-KJ	393	抵抗	2-2-650-5600	1
R11,12,13,20,32	RK73K2ATD 100KΩ-KJ	104	抵抗	2-2-650-6100	5
R15,38	RK73K2ATD 27KΩ-KJ	273	抵抗	2-2-650-5400	2
R17	RK73K2ATD 18KΩ-KJ	183	抵抗	2-2-650-5200	1
R19	RK73K2ATD 470KΩ-KJ	474	抵抗	2-2-650-6900	1
R22	RK73K2ATD 4.7MΩ-KJ	475	抵抗	2-2-650-8140	1
R23,35	RK73K2ATD 4.7KΩ-KJ	472	抵抗	2-2-650-4500	2
R24	RK73K2ATD 270Ω-KJ	271	抵抗	2-2-650-3000	1
R26	RK73K2ATD 100Ω-KJ	101	抵抗	2-2-650-2500	1
R28	RK73K2ATD 330Ω-KJ	331	抵抗	2-2-650-3100	1
R31,33,43,44	RK73K2ATD 180KΩ-KJ	184	抵抗	2-2-650-6400	4
R45	RK73K2ATD 270KΩ-KJ	274	抵抗	2-2-650-6600	1
VR1	RVG4X08-103YY-TG		ボリューム	2-2-695-0460	1
△			接触金具 図番	2-3-295-0290	



CONTROLLED
DATE: 03/16/11
ENGINEERING

N.C.C
商品設計課

Part No. 8000 - 00540

ITEM	PART #	DESIGNATOR	ALTERNATE DESCRIPTION	PRIMARY MFG	MFG PART #	QTY
	4800-00696	IC4	EEPROM	SEIKO	S-93L46A	1
	4800-00695	IC3	CPU	TOSHIBA	TMP47C443MG-JU84	1
	4800-00251	X1		TOKO	DCRJ600A	1

REV.	DATE	BY	CHANGE
D	01-11-11	RH	ADDED ALTERNATE X1 DCRJ600A, DCRKC600-M1 END OF LIFE
C	02-18-09	RH	ADDED ALTERNATE IC3 LEAD FREE
B	03-30-06	RH	ADDED ALTERNATE IC4 LEAD FREE
A	06-18-97	LL	CORRECTED PART NO.
-	05-14-97	HC	INITIAL RELEASE

APPROVALS	
MKTG/DATE	1/18/01
QA/DATE	2/18/09
MFG/DATE	2/11/09
ENG/DATE	
R&D/DATE	

TOLERANCE UNLESS OTHERWISE SPECIFIED
ANGLE ± .03°
.XX ± .015
.XXX ± .005

MATERIAL: C4305
ADHENSIVE: T4720

RDR | CCM/DATE

DRAWN BY: HC | DATE 5/20/96
CHECKED BY: | DATE 2/18/09
APPROVED BY: | DATE 2/18/09

DRAWING NO. HA-01-203

HOCHIKI america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE: ASSEMBLY PCB AIE-EA | REV. D
SIZE B | SCALE NONE | SHEET 1 of 1

年月日	訂正事項	設計
96.6.20	△ R10 定数，品目コード変更	桑名
96.6.20	△ 接触金具品目コード変更，実装図追加	桑名
96.4.23	△ IC2 品目コード変更	桑名
96.4.3	△ IC4 変更	桑名

仕上

承認	調査	設計	製図
兼田	馬越	桑名	桑名

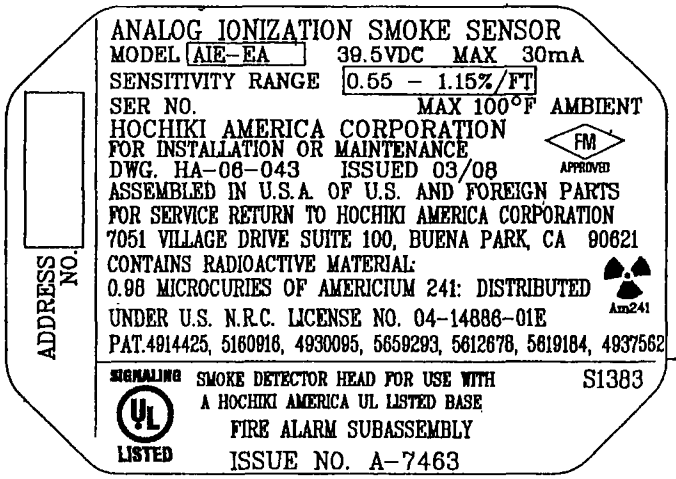
設計年月日 96.5.20
尺度 ／
単位 mm
第3角法

図名: 実装図B
AIE-EA プリント板実装図B

図番: 2-1-803-3293-365

ホーチキ株式会社

ENCL. A25



ANALOG IONIZATION SMOKE SENSOR
MODEL AIE-EA 39.5VDC MAX 30mA
SENSITIVITY RANGE 0.55 – 1.15%/FT
SER NO. MAX 100°F AMBIENT
HOCHIKI AMERICA CORPORATION
FOR INSTALLATION OR MAINTENANCE
DWG. HA-06-043 ISSUED 03/08
ASSEMBLED IN U.S.A. OF U.S. AND FOREIGN PARTS
FOR SERVICE RETURN TO HOCHIKI AMERICA CORPORATION
7051 VILLAGE DRIVE SUITE 100, BUENA PARK, CA 90621
CONTAINS RADIOACTIVE MATERIAL:
0.98 MICROCURIES OF AMERICIUM 241: DISTRIBUTED
UNDER U.S. N.R.C. LICENSE NO. 04-14886-01E
PAT.4914425, 5160916, 4930095, 5659293, 5612678, 5619184, 4937562
SIGNALING SMOKE DETECTOR HEAD FOR USE WITH
A HOCHIKI AMERICA UL LISTED BASE S1383
FIRE ALARM SUBASSEMBLY
ISSUE NO. A-7463

ALL TEXT ABOVE THIS LINE MUST
HAVE A MIN. TEXT HEIGHT OF .047

CONTROLLED
DATE: 01/12/2010
ENGINEERING

REV.	DATE	BY	CHANGE
F	11-10-09	RH	REVISED UL TEXT FROM EQUIPMENT TO SUBASSEMBLY
ED	10-09-08	RH	REVISED UL MARKING/TEXT PER UL COMPLIANCE CHANGED ISSUE # FROM A-7784 TO A-7463 TO BE USED FOR ONE PERMANENT ISSUE #
D	11-24-04	RH	REVISED UL LOGO AND ADDED FM LOGO
C	2-18-00	BM	CHANGED ADDRESS & ISSUE DATE
B	1-5-99	BM	REMOVED FM SYMBOL
A	6-12-98	BM	ADDED FM SYMBOL, ISSUE NUMBER, AND PATENT NO.
–	8-6-97	DJH	INITIAL RELEASE

P/N 1700-03335

NOTES:
1. USE LABEL STOCK PART # 1700-03275

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.020
.XXX ±.010

MATERIAL:
SEE NOTE 1

PCS/ASSY

DRAWN BY:
DAVID J. HALL

CHECKED BY:

UNITS
IN

APPROVED BY:

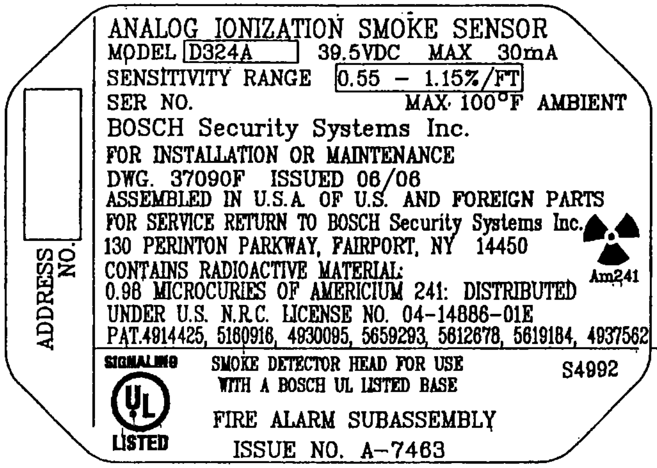
SCALE
NTS

DRAWING NO.
HA-01-225

HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE
LABEL NAMEPLATE AIE-EA
(HA)

ENCL. A26



ANALOG IONIZATION SMOKE SENSOR
MODEL D324A 39.5VDC MAX 30mA
SENSITIVITY RANGE 0.55 – 1.15%/FT
SER NO. MAX 100°F AMBIENT
BOSCH Security Systems Inc.
FOR INSTALLATION OR MAINTENANCE
DWG. 37090F ISSUED 06/06
ASSEMBLED IN U.S.A. OF U.S. AND FOREIGN PARTS
FOR SERVICE RETURN TO BOSCH Security Systems Inc.
130 PERINTON PARKWAY, FAIRPORT, NY 14450
CONTAINS RADIOACTIVE MATERIAL:
0.98 MICROCURIES OF AMERICIUM 241: DISTRIBUTED
UNDER U.S. N.R.C. LICENSE NO. 04-14886-01E
PAT.4914425, 5160916, 4930095, 5659293, 5612678, 5619184, 4937562

SMOKE DETECTOR HEAD FOR USE
WITH A BOSCH UL LISTED BASE
S4992
FIRE ALARM SUBASSEMBLY
ISSUE NO. A-7463

ALL TEXT ABOVE THIS LINE MUST HAVE A MIN. TEXT HEIGHT OF .047

CONTROLLED
DATE: 01/12/2010
ENGINEERING

P/N 1700-03188

E	11-12-09	RH	REVISED UL TEXT FROM EQUIPMENT TO SUBASSEMBLY
D	10-09-08	RH	REVISED UL MARKING/TEXT PER UL COMPLIANCE CHANGED ISSUE # FROM A-11761 TO A-7463 TO BE USED FOR ONE PERMANENT ISSUE #
C	06-28-06	RH	CHANGED DWG# FROM 37090D TO 37090F/ISSUED FROM 3/01 TO 06/06
B	9-10-03	RH	CHANGED FROM RADIONICS TO BOSCH
A	2-3-99	BM	CHANGED ADDRESS, ISSUE DATE AND DWG NO.
–	9-28-98	GFC	INITIAL RELEASE
REV.	DATE	BY	CHANGE

NOTES:
1. USE LABEL STOCK PART # 1700-03275

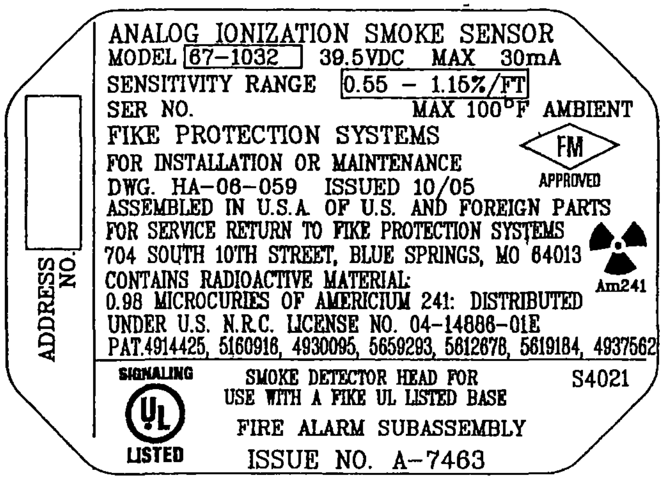
TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.020
.XXX ±.010

MATERIAL: SEE NOTE 1
PCS/ASSY

DRAWN BY: GREG F. CORTI
DATE: 9-28-98
CHECKED BY:
UNITS: IN
APPROVED BY:
SCALE: NTS
DRAWING NO. HA-01-271

HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE
LABEL NAMEPLATE AIE-EA
(D324A BOSCH)



ANALOG IONIZATION SMOKE SENSOR
MODEL 67-1032 39.5VDC MAX 30mA
SENSITIVITY RANGE 0.55 – 1.15%/FT
SER NO. MAX 100°F AMBIENT
FIKE PROTECTION SYSTEMS
FOR INSTALLATION OR MAINTENANCE
DWG. HA-06-059 ISSUED 10/05
ASSEMBLED IN U.S.A. OF U.S. AND FOREIGN PARTS
FOR SERVICE RETURN TO FIKE PROTECTION SYSTEMS
704 SOUTH 10TH STREET, BLUE SPRINGS, MO 64013
CONTAINS RADIOACTIVE MATERIAL:
0.98 MICROCURIES OF AMERICIUM 241: DISTRIBUTED
UNDER U.S. N.R.C. LICENSE NO. 04-14886-01E
PAT.4914425, 5160916, 4930095, 5659293, 5612678, 5619184, 4937562
SMOKE DETECTOR HEAD FOR
USE WITH A FIKE UL LISTED BASE
S4021
FIRE ALARM SUBASSEMBLY
ISSUE NO. A-7463

ALL TEXT ABOVE THIS LINE MUST HAVE A MIN. TEXT HEIGHT OF .047

CONTROLLED
DATE: 01/12/2010
ENGINEERING

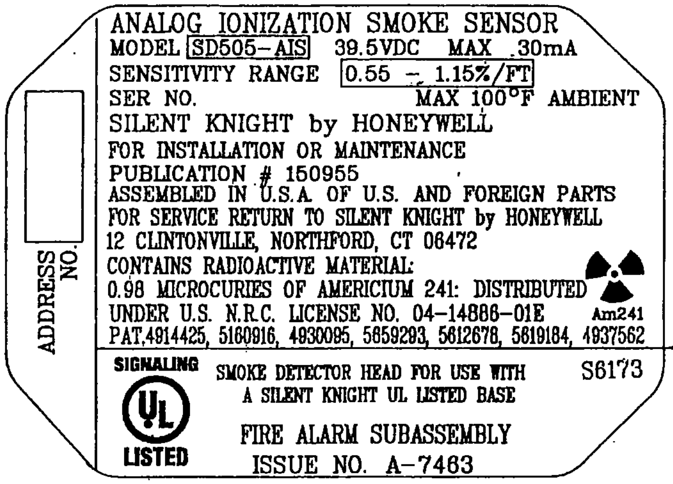
REV.	DATE	BY	CHANGE
D	11-11-09	RH	REVISED UL TEXT FROM EQUIPMENT TO SUBASSEMBLY
C	10-10-08	RH	REVISED UL MARKING/TEXT PER UL COMPLIANCE CHANGED ISSUE # FROM A-7783 TO A-7463 TO BE USED FOR ONE PERMANENT ISSUE #
B	10-3-03	RH	REVISED FM,UL LOGO AND CHANGED FROM HOCHIKI TO FIKE
A	6-12-98	BM	ADDED FM SYMBOL, ISSUE NUMBER, AND PATENT NO.
–	6-6-97	DJH	INITIAL RELEASE

P/N 1700-03186

NOTES:
1. USE LABEL STOCK PART # 1700-03275

TOLERANCE UNLESS OTHERWISE SPECIFIED ANGLE ± 03° .XX ±.020 .XXX ±.010	DRAWN BY: DAVID J. HALL	DATE 6-6-97	HOCHIKI america corporation 7051 VILLAGE DRIVE SUITE 100 BUENA PARK, CA 90621-2268
	CHECKED BY:	UNITS IN	
MATERIAL: SEE NOTE 1	APPROVED BY:	SCALE NTS	TITLE LABEL NAMEPLATE AIE-EA (FIKE PROTECTION SYSTEMS)
PCS/ASSY	DRAWING NO. HA-01-226		

ENCL. A28



ANALOG IONIZATION SMOKE SENSOR
MODEL SD505-AIS 39.5VDC MAX .30mA
SENSITIVITY RANGE 0.55 - 1.15%/FT
SER NO. MAX 100°F AMBIENT
SILENT KNIGHT by HONEYWELL
FOR INSTALLATION OR MAINTENANCE
PUBLICATION # 150955
ASSEMBLED IN U.S.A. OF U.S. AND FOREIGN PARTS
FOR SERVICE RETURN TO SILENT KNIGHT by HONEYWELL
12 CLINTONVILLE, NORTHFORD, CT 06472
CONTAINS RADIOACTIVE MATERIAL:
0.98 MICROCURIES OF AMERICIUM 241: DISTRIBUTED
UNDER U.S. N.R.C. LICENSE NO. 04-14886-01E Am241
PAT.4914425, 5160916, 4930095, 5659293, 5612678, 5619184, 4937562

SMOKE DETECTOR HEAD FOR USE WITH
A SILENT KNIGHT UL LISTED BASE
S6173

FIRE ALARM SUBASSEMBLY
ISSUE NO. A-7463

ALL TEXT ABOVE THIS LINE MUST HAVE A MIN. TEXT HEIGHT OF .047

CONTROLLED
DATE: 01/12/200
ENGINEERING

G	11-11-09	RH	REVISED UL TEXT FROM EQUIPMENT TO SUBASSEMBLY
F	06-08-09	RH	CHANGED ADDRESS FROM 7550 MERIDIAN CIRCLE MAPLE GROVE, MN 55369-4927 TO 12 Clintonville Road, Northford, CT 06472
E	10-08-08	RH	REVISED UL MARKING/TEXT PER UL COMPLIANCE
D	11-11-05	RH	REVISED UL LOGO & REMOVED HOCHIKI AMERICA REPLACED SILENT KNIGHT
C	02-01-01	RM	REMOVED SECURITY SYSTEMS FROM LABEL
B	6-30-98	BM	ADDED PATENT NUMBERS
A	6-10-97	BM	ADDED MIN. TEXT HEIGHT AND ISSUE NO.
–	4-3-97	AJG	INITIAL RELEASE
REV.	DATE	BY	CHANGE

P/N 1700-03185

NOTES:
1. USE LABEL STOCK PART # 1700-03275

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.020
.XXX ±.010

MATERIAL:
SEE NOTE 1

PCS/ASSY

DRAWN BY:
ANTHONY J GARCIA

CHECKED BY:

UNITS
IN

APPROVED BY:

SCALE
NTS

DRAWING NO.
HA-01-158

HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE
LABEL NAMEPLATE AIE-EA
(SILENT KNIGHT)

ANALOG IONIZATION SMOKE SENSOR
MODEL AIS 39.5VDC MAX 30mA
SENSITIVITY RANGE 0.55 - 1.15%/FT U.S.A
SENSITIVITY RANGE 0.25 - 0.32 MIC CANADA
SER NO. MAX 100°F AMBIENT
POTTER ELECTRIC SIGNAL COMPANY
FOR INSTALLATION OR MAINTENANCE
DWG. HA-06-090 ISSUED 10/05
ASSEMBLED IN U.S.A. OF U.S. AND FOREIGN PARTS
FOR SERVICE RETURN TO POTTER ELECTRIC SIGNAL COMPANY
2081 CRAIG ROAD ST.LOUIS, MO 63146-4161
CONTAINS RADIOACTIVE MATERIAL:
0.98 MICROCURIES OF AMERICIUM 241: DISTRIBUTED
UNDER U.S. N.R.C. LICENSE NO. 04-14886-01E
PAT.4914425, 5160916, 4930095, 5659293, 5612678, 5619184, 4937562

SIGNALING S6574
UL LISTED
SMOKE DETECTOR HEAD FOR USE WITH A POTTER ELECTRIC SIGNAL CO. UL LISTED BASE
FIRE ALARM SUBASSEMBLY
ISSUE NO.A-61,001

ULC LISTED S8630
SMOKE DETECTOR HEAD FOR USE WITH A ULC LABELLED POTTER ELECTRIC SIGNAL CO. COMPONENT FOR SMOKE DETECTOR BASE

ALL TEXT ABOVE THIS LINE MUST HAVE A MIN. TEXT HEIGHT OF .047

CONTROLLED
DATE: 01/12/2010
ENGINEERING

P/N 1700-03515

REV.	DATE	BY	CHANGE
D	11-11-09	RH	REVISED UL TEXT FROM EQUIPMENT TO SUBASSEMBLY
C	10-10-08	RH	REVISED UL MARKING/TEXT PER UL COMPLIANCE
B	4-13-06	RH	INCORPORATED ULC TO BE USED AS A COMBO LABEL
A	5-12-05	RH	REVISED UL LOGO/CHANGED ISSUE NO. FROM A-7784 TO A-50,962
–	3-14-01	BM	INITIAL RELEASE

NOTES:
1. USE LABEL STOCK PART # 1700-03275

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.020
.XXX ±.010

MATERIAL:
SEE NOTE 1

PCS/ASSY

DRAWN BY:
BEN MAGARIN

CHECKED BY:

APPROVED BY:

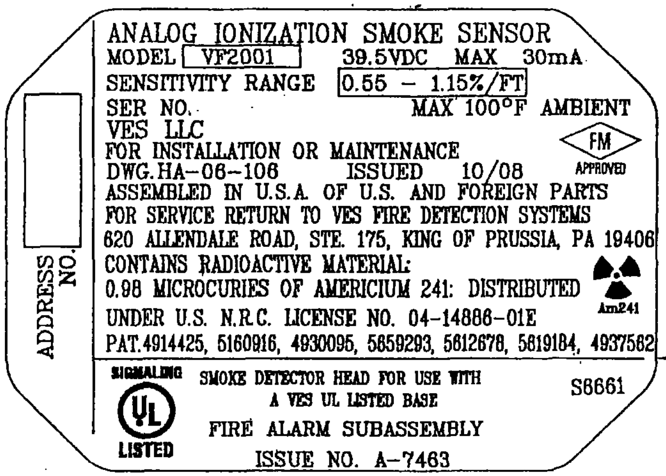
UNITS
IN

SCALE
NTS

DRAWING NO.
HA-01-355

HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE
LABEL NAMEPLATE AIE-EA/AIE-EAC
(AIS/AIS CN POTTER)



ANALOG IONIZATION SMOKE SENSOR
MODEL VF2001 39.5VDC MAX 30mA
SENSITIVITY RANGE 0.55 – 1.15%/FT
SER NO. MAX 100°F AMBIENT
VES LLC
FOR INSTALLATION OR MAINTENANCE
DWG. HA–06–106 ISSUED 10/08
ASSEMBLED IN U.S.A. OF U.S. AND FOREIGN PARTS
FOR SERVICE RETURN TO VES FIRE DETECTION SYSTEMS
620 ALLENDALE ROAD, STE. 175, KING OF PRUSSIA, PA 19406
CONTAINS RADIOACTIVE MATERIAL:
0.98 MICROCURIES OF AMERICIUM 241: DISTRIBUTED
UNDER U.S. N.R.C. LICENSE NO. 04–14886–01E
PAT. 4914425, 5160916, 4930095, 5659293, 5612678, 5619184, 4937562

SMOKE DETECTOR HEAD FOR USE WITH
A VES UL LISTED BASE
FIRE ALARM SUBASSEMBLY
ISSUE NO. A–7463

ALL TEXT ABOVE THIS LINE MUST HAVE A MIN. TEXT HEIGHT OF .047

CONTROLLED
DATE: 01/12/2010
ENGINEERING

P/N 1700–03343

D	11–12–09	RH	REVISED UL TEXT FROM EQUIPMENT TO SUBASSEMBLY
C	12–05–08	RH	CHANGED TO VES/VES FIRE DETECTION SYSTEMS
B	10–09–08	RH	REVISED UL MARKING/TEXT PER UL COMPLIANCE CHANGED ISSUE # FROM A–51,982 TO A–7463 TO BE USED FOR ONE PERMANENT ISSUE #
A	11–24–04	RH	ADDED FM LOGO
–	01–20–03	RH	INITIAL RELEASE
REV.	DATE	BY	CHANGE

NOTES:

1. USE LABEL STOCK PART # 1700–03275

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±020
.XXX ±010

MATERIAL:
SEE NOTE 1

PCS/ASSY

DRAWN BY:
RAVI M. HEM

CHECKED BY:

APPROVED BY:

UNITS
IN

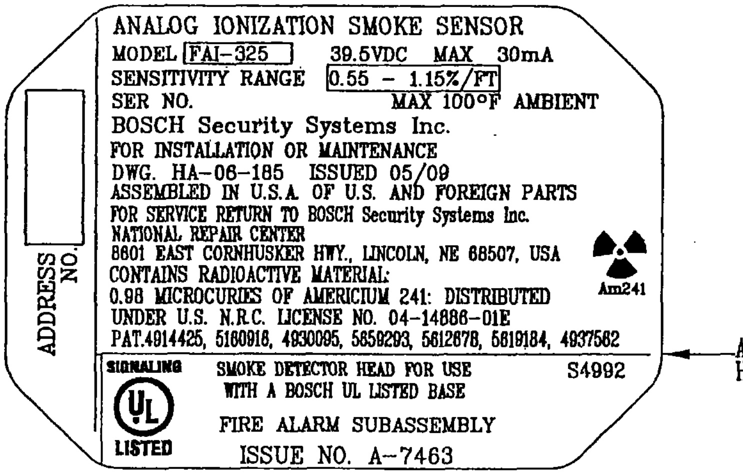
SCALE
NTS

DRAWING NO.
HA–01–414

HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621–2268

TITLE
LABEL NAMEPLATE AIE–EA
VF2001 VES

ENCL. A28-3


ADDRESS NO.

ANALOG IONIZATION SMOKE SENSOR
MODEL FAI-325 39.5VDC MAX 30mA
SENSITIVITY RANGE 0.55 - 1.15%/FT
SER NO. MAX 100°F AMBIENT
BOSCH Security Systems Inc.
FOR INSTALLATION OR MAINTENANCE
DWG. HA-06-185 ISSUED 05/09
ASSEMBLED IN U.S.A OF U.S. AND FOREIGN PARTS
FOR SERVICE RETURN TO BOSCH Security Systems Inc.
NATIONAL REPAIR CENTER
8601 EAST CORNHUSKER HWY., LINCOLN, NE 68507, USA
CONTAINS RADIOACTIVE MATERIAL:
0.98 MICROCURIES OF AMERICIUM 241: DISTRIBUTED
UNDER U.S. N.R.C. LICENSE NO. 04-14886-01E
PAT.4914425, 5160916, 4930095, 5659293, 5612678, 5619184, 4937562

Am241

SIGNALING
UL
LISTED

SMOKE DETECTOR HEAD FOR USE
WITH A BOSCH UL LISTED BASE
S4992

FIRE ALARM SUBASSEMBLY
ISSUE NO. A-7463

ALL TEXT ABOVE THIS LINE MUST HAVE A MIN. TEXT HEIGHT OF .047

CONTROLLED
DATE: 01/12/2010
ENGINEERING

NOTES:
1. USE LABEL STOCK PART # 1700-03275

P/N 1700-05040

REV.	DATE	BY	CHANGE
A	11-12-09	RH	REVISED UL TEXT FROM EQUIPMENT TO SUBASSEMBLY
–	05-06-09	RH	INITIAL RELEASE

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.020
.XXX ±.010

MATERIAL:
SEE NOTE 1

PCS/ASSY

DRAWN BY:
RAVI HEM

CHECKED BY:

UNITS
IN

APPROVED BY:

SCALE
NTS

DRAWING NO.
HA-01-524

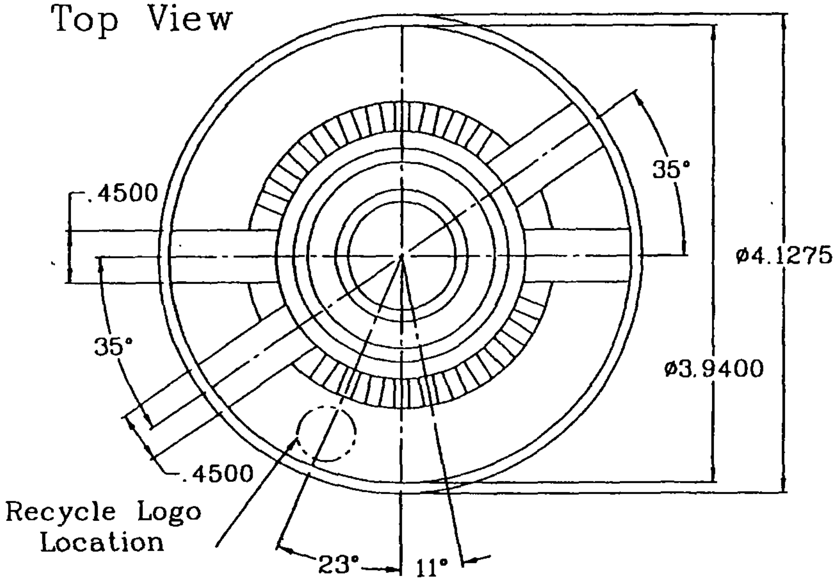
HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2266

TITLE
LABEL NAMEPLATE AIE-EA
(FAI-325 BOSCH)

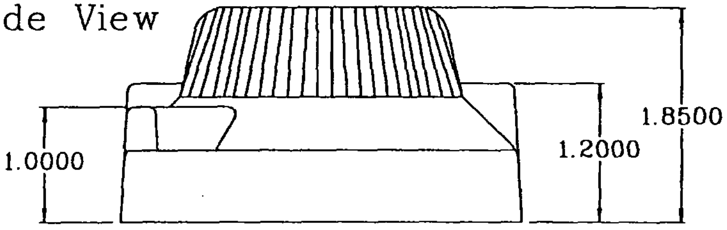
ENCL. A29

CONTROLLED
DATE: 5/31/2000
ENGINEERING

Top View



Side View



Notes:

1. Material 15 Mil PVC
   Color: Red 106

COMPUTER # 3800-00679

REV.	DATE	BY	CHANGE
–	5-15-00	AVC	INITIAL RELEASE

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.020
.XXX ±.010

MATERIAL: SEE NOTE 1

PCS/ASSY

DRAWN BY: AVC CORPORATION

CHECKED BY:

APPROVED BY:

UNITS: IN

SCALE: NTS

DRAWING NO. HA-10-372

HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE: COVER DUST DETECTORS
(HA)

THIS DETECTOR CONTAINS RADIOACTIVE MATERIAL: 0.98 MICROCURIES OF AMERICIUM-241 AND HAS BEEN MANUFACTURED IN COMPLIANCE WITH U.S. NRC SAFETY CRITERIA IN 10 CFR 32.27 AND HAS BEEN DISTRIBUTED IN COMPLIANCE WITH U.S. NRC LICENSE NO. 04-14886-01E. THE PURCHASER IS EXEMPT FROM ANY REGULATORY REQUIREMENT. THIS PACKAGE CONFORMS TO THE CONDITIONS AND LIMITATIONS SPECIFIED IN 49 CFR 173.422 FOR RADIOACTIVE MATERIAL. EXCEPTED PACKAGE - INSTRUMENTS OR ARTICLES UN2910.

CONTROLLED
DATE: 8 /21 /1997
ENGINEERING

NOTES:
1. ALL PRINT TO BE BLACK
2. BACKGROUND TO BE WHITE
3. USE LABEL STOCK PART #1700-01001

PART # 1700-09743

REV.	DATE	BY	CHANGE
-	8-19-97	BM	INITIAL RELEASE

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.015
.XXX ±.005

MATERIAL:

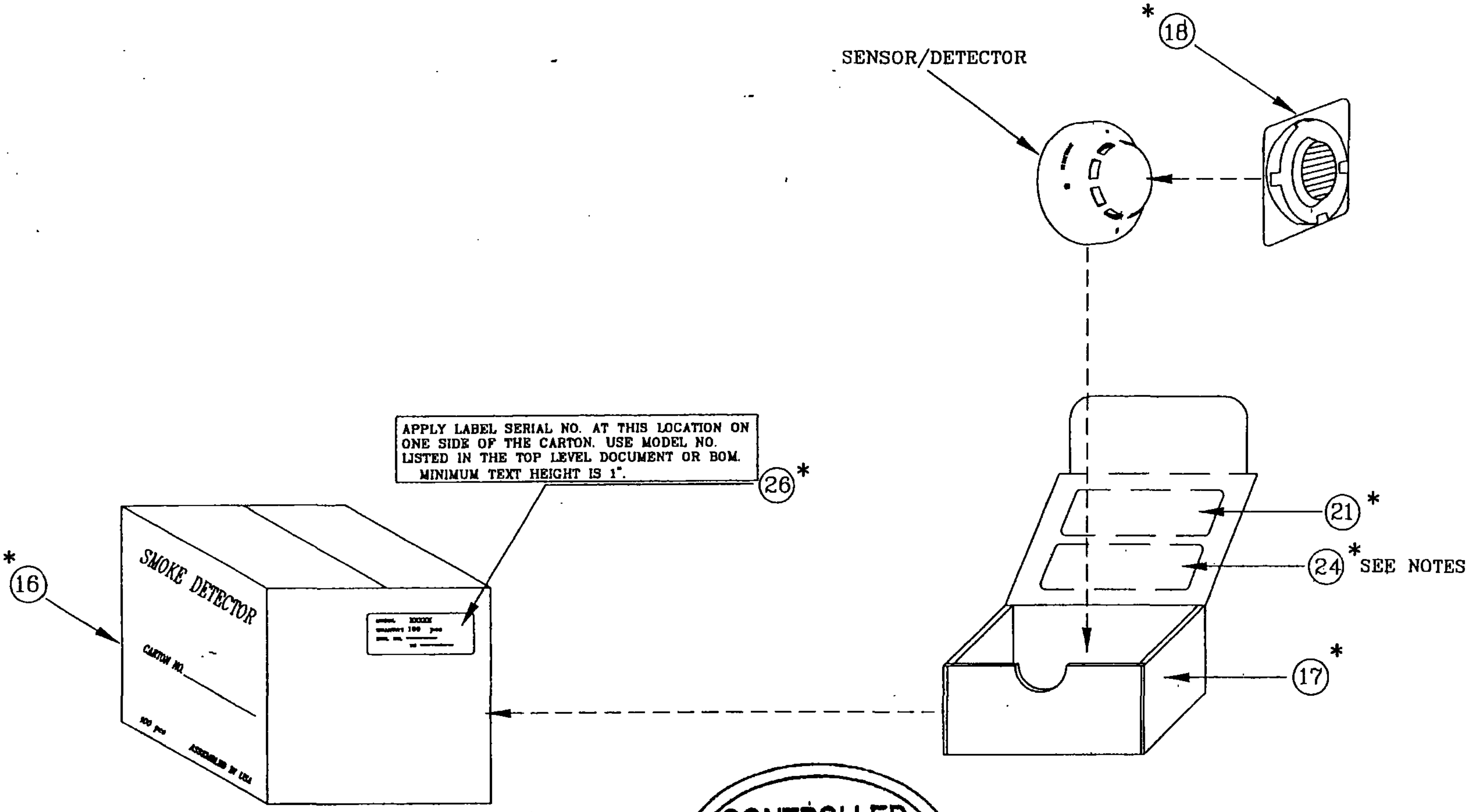
PCS/ASSY

DRAWN BY: BEN MAGARIN
DATE: 8-19-97
CHECKED BY:
UNITS: NA
APPROVED BY:
SCALE: NA
DRAWING NO. HA-10-259

HOCHIKI AMERICA CORP.
5415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

TITLE
LABEL NRC WARNING
FOR (0.98)
MICROCURIES

ENCL. A31



APPLY LABEL SERIAL NO. AT THIS LOCATION ON ONE SIDE OF THE CARTON. USE MODEL NO. LISTED IN THE TOP LEVEL DOCUMENT OR BOM. MINIMUM TEXT HEIGHT IS 1".

CONTROLLED
DATE: 6 / 1 /2000
ENGINEERING

NOTES:

1. PLACE DUST COVER (18) ON SENSOR/DETECTOR AS SHOWN.
2. PLACE THE SENSOR/ DETECTOR INTO THE INDIVIDUAL BOX (17).
3. APPLY NRC WARNING LABEL (21) ONTO THE OUTSIDE ON TOP OF 1 PC BOX (17).
4. APPLY BARCODE LABEL (24) OR STAMP MODEL NUMBER ON THE OUTSIDE ON TOP OF THE 1PC BOX (17).
5. PLACE 100 INDIVIDUAL BOXES INTO THE MASTER BOX (16).
6. APPLY 100PC SERIAL NO. LABEL (26) TO THE MASTER BOX (16) AS SHOWN.
7. STAMP MODEL NO. ON BOTH SIDES OF THE MASTER BOX (16).

REV.	DATE	BY	CHANGE
B	6-11-00	KN	CHANGED ITEM NO.
A	10-4-99	BM	REVISED DRAWING
–	10-6-98	BM	INITIAL RELEASE

TOLERANCE
UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.015
.XXX ±.005

MATERIAL:

PCS/ASSY

DRAWN BY: BEN MAGARIN

CHECKED BY:

APPROVED BY:

UNITS NA

SCALE NA

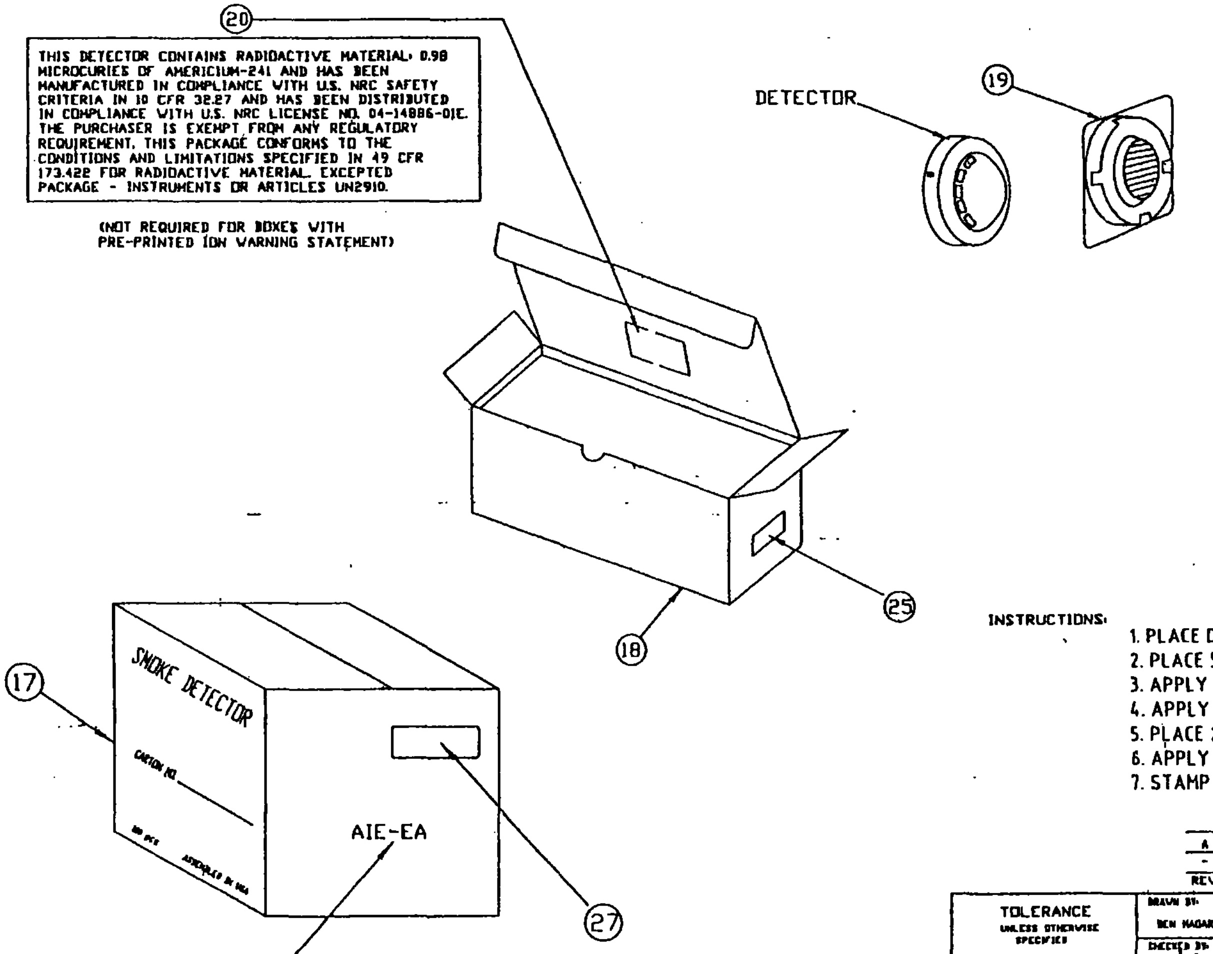
DRAWING NO. HA-10-307

HOCHIKI
america corporation
7051 VILLAGE DRIVE SUITE 100
BUENA PARK, CA 90621-2268

TITLE
ASSEMBLY PACKAGING
INDIVIDUAL BOX ION
SENSOR/DETECTOR

THIS DETECTOR CONTAINS RADIOACTIVE MATERIAL: 0.98 MICROCURIES OF AMERICIUM-241 AND HAS BEEN MANUFACTURED IN COMPLIANCE WITH U.S. NRC SAFETY CRITERIA IN 10 CFR 32.27 AND HAS BEEN DISTRIBUTED IN COMPLIANCE WITH U.S. NRC LICENSE NO. 04-14886-01E. THE PURCHASER IS EXEMPT FROM ANY REGULATORY REQUIREMENT. THIS PACKAGE CONFORMS TO THE CONDITIONS AND LIMITATIONS SPECIFIED IN 49 CFR 173.422 FOR RADIOACTIVE MATERIAL. EXCEPTED PACKAGE - INSTRUMENTS OR ARTICLES UN2910.

(NOT REQUIRED FOR BOXES WITH PRE-PRINTED ION WARNING STATEMENT)



STAMP MODEL NO. AT THIS LOCATION ON BOTH SIDES OF THE CARTON. USE MODEL NUMBER LISTED IN THE TOP LEVEL DOCUMENT OR BOM. MINIMUM TEXT HEIGHT IS 1".

MODEL NUMBER IS FOR EXAMPLE ONLY!!

CONTROLLED
DATE: 2/ 9 /1998
ENGINEERING

INSTRUCTIONS:

1. PLACE DUST COVER ON DETECTOR
2. PLACE 5 DETECTORS IN 5 PC BOX (SIDEWAYS)
3. APPLY NRC WARNING LABEL ON OUTSIDE OF TOP OF 5 PC BOX
4. APPLY 5 PC SERIAL NO. LABEL TO 5 PC BOX
5. PLACE 20 OF THE 5 PC BOXES ON 100 PC BOX
6. APPLY 100 PC SERIAL NO. LABEL TO 100 PC BOX
7. STAMP 100 PC BOX AS SHOWN BOTTOM LEFT

REV.	DATE	BY	CHANGE
A	1-8-98	BM	REMOVED REF. TABLE
-	9-25-97	BM	INITIAL RELEASE

TOLERANCE UNLESS OTHERWISE SPECIFIED
ANGLE ± 03°
.XX ±.015
.XXX ±.005

MATERIAL: SEE TABLE 1

PCS/ASSY

DRAWN BY: BEN MAGARIN

DATE: 9-25-97

CHECKED BY:

UNITS: NA

APPROVED BY:

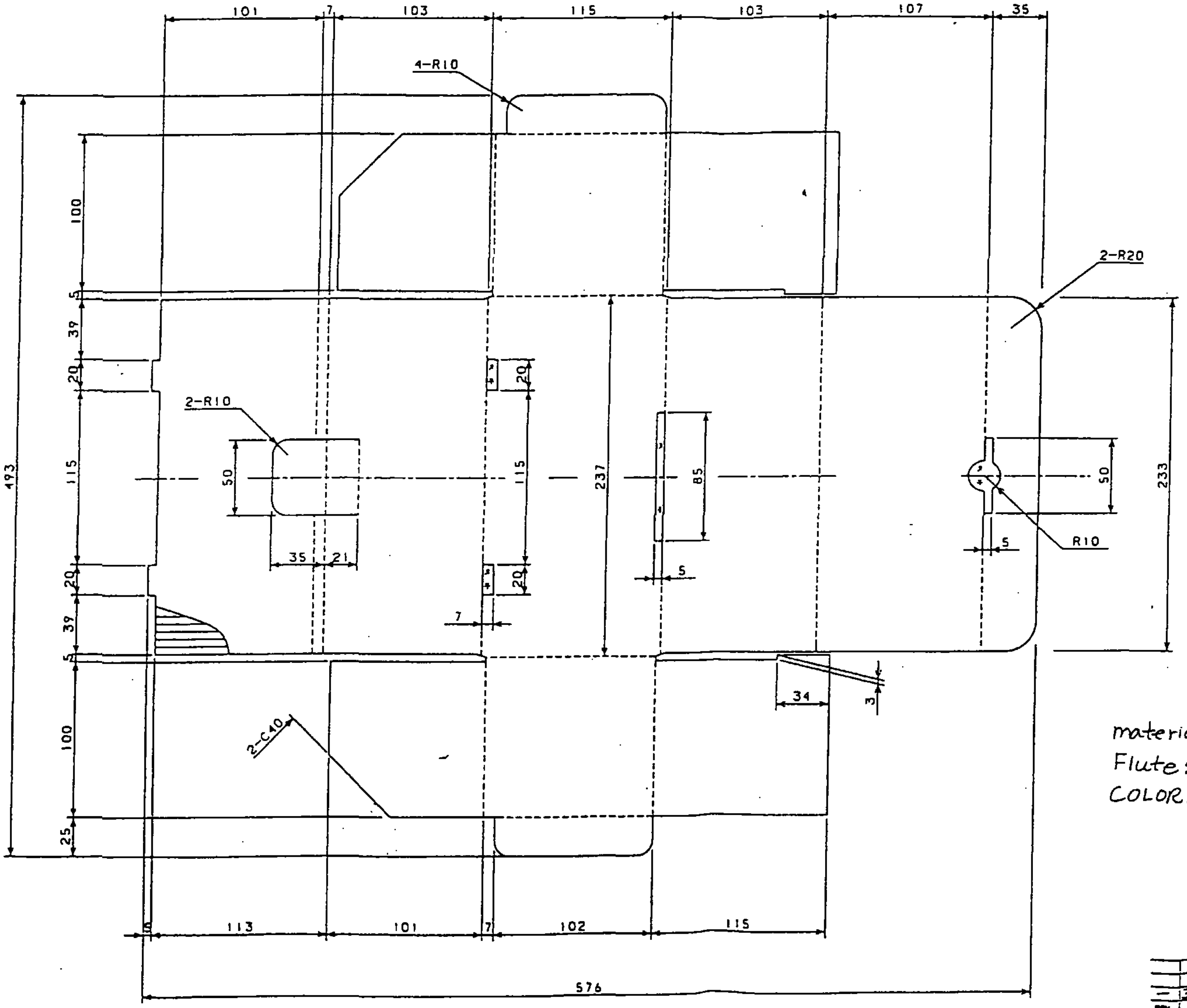
SCALE: NA

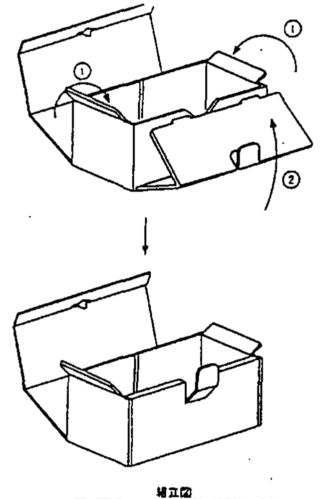
DRAWING NO.: HA-10-268

HOCHIKI AMERICA CORP.
5415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

TITLE: ASSEMBLY PACKAGING AIE SERIES USA

ENCL. A33





組立図

①、②の順に折り込んで下さい。

CONTROLLED
DATE: 3 / 13 / 1997
ENGINEERING

material: 200 LB
Flute: E
COLOR: Brown

'97. 2. 17

part no. 3800-00629

REV.	DATE	BY	CHANGE
—	3-12-97	HC	Initial Release

DRAWN BY: HC
DATE: 12/11/96
CHECKED BY: Kazu Kanazawa
UNITS
APPROVED BY:
SCALE

HOCHIKI AMERICA CORP.
5415 INDUSTRIAL DRIVE
HUNTINGTON BEACH, CA 92649

DRAWING NO: HA-10-238
TITLE: BOX 5 PC AIE

DATA SHEET

NO. 1

Test Item	Measurement of Radiation (AIE-EA)	Date	15th· 3· '96		
		Approved	Checked	Tested	
		M. Shibata	S. Narusaki	M. Kuwana	

	Distance	TOP C/M	TOP μR/hr	BOTTOM C/M	BOTTOM μR/hr	RIGHT C/M	RIGHT μR/hr	LEFT C/M	LEFT μR/hr		
No 1	0 cm	140	18.6	105	8.6	100	7.1	95	5.7		
	5 cm	110	10.0	85	2.9	80	1.4	80	1.4		
	25 cm	100	7.1	75	0	75	0	75	0		
No 2	0 cm	150	21.4	115	11.4	110	10.0	105	8.6		
	5 cm	100	7.1	90	4.3	90	4.3	90	4.3		
	25 cm	80	1.4	75	0	75	0	80	1.4		

Remarks

C/M of Back Ground = 75

GM SURVEY METER
MODEL : TGS-Ⅲ
SER. No. : 86R976

Test Condition	Room Temp.	Room Humid.	Pressure	Air Velocity	Box Temp.				
	24.0 °C	53 %RH	1007 hPa	—— cm/S	—— °C				

ホーチキ株式会社

ENCL. A34

JRIA

JAPAN RADIOISOTOPE ASSOCIATION
28-45, HON-KOMAGOME 2-CHOME, BUNNKYO-KU
TOKYO
Tel. 03-3946-7116, Fax. 03-3943-1860

TEST REPORT

TO:HOCHIKI CORPORATION

FROM:JAPAN RADIOISOTOPE ASSOCIATION

REPORT IS AS FOLLOWS:

<table>
<tr><td>1</td><td>MATTER OF REQUEST</td><td colspan="3">CLASSIFICATION TEST OF UNDERMENTIONED FOIL SOURCE</td></tr>
<tr><td>2</td><td>TEST MATERIAL</td><td colspan="3">ALPHA FOIL SOURCE FOR SMOKE DETECTOR WITH HOLDER
RI HOLDER CODE :A2-93-0172
INNER ELECTRODE CODE :A2-95-0250
RADIO ACTIVE SOURCE CODE :A2-95-0247</td></tr>
<tr><td>3</td><td>TEST METHOD</td><td colspan="3">ACCORDING TO THE JIS Z 4821-1993 "CLASSIFICATION AND TESTING OF SEALED RADIOACTIVE SOURCES"</td></tr>
<tr><td>4</td><td>TEST DATE</td><td colspan="3">APR. 17. 1996-APR. 24. 1996</td></tr>
<tr><td>5</td><td>TEST PLACE</td><td colspan="3">JAPAN RADIOISOTOPE ASSOCIATION & HOCHIKI CORPORATION</td></tr>
<tr><td rowspan="6">6</td><td rowspan="6">TEST RESULT</td><td>TEST ITEM</td><td>CLASSIFICATION</td><td>JUDGMENT</td></tr>
<tr><td>TEMPERATURE</td><td>3</td><td>GOOD</td></tr>
<tr><td>PRESSURE</td><td>2</td><td>GOOD</td></tr>
<tr><td>SHOCK</td><td>2</td><td>GOOD</td></tr>
<tr><td>VIBRATION</td><td>2</td><td>GOOD</td></tr>
<tr><td>BANG</td><td>2</td><td>GOOD</td></tr>
</table>

T. Hagiwara
T. HAGIWARA
DIVISION OF RADIOISOTOPES
TECHNICAL SECTION

Y. Nakamura
Y. NAKAMURA
MANAGER DIVISION OF RADIOISOTOPES
TECHNICAL SECTION

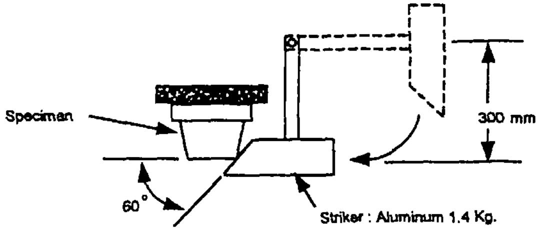
ENCL. A35

VIBRATION TEST REPORT

TEST ITEM	VIBRATION TEST (SINE WAVE, SYMPATHETIC POINT)
SPECIMEN	IONIZATION TYPE SMOKE SENSOR: MODEL AIE-EA
TEST METHOD	[Sine Wave] Under supplying the power to the sensor, it will be forced to the vibration of 1000 cycles per minute and amplitude of 4mm for 60 minutes. Seven sensors shall be mounted in up side. The sensors shall be tested for both vertical and horizontal vibration. [Sympathetic Point] Frequency of vibration: 0~150 Hz, vibration acceleration: 3G Sweep method: Logarithm Sweep Sweep time: (10~150~10 Hz / 15 minutes) X 2 cycles Seven sensors shall be mounted in up side. The sensors shall be tested for both vertical and horizontal vibration of 4 cycles each.
STANDARD FOR JUDGEMENT	The sensor should not generate a fault signal during the test. The sensor should not have a trouble on the structure and the function after test.
TEST RESULT	There was no fault signal generated during the test. There was no trouble on the function and structure of the sensor. There was not significant sensitivity (analog output) drift of the sensor.
JUDGEMENT	OK
COMMENT	In consideration of this test, the ionization smoke sensor model AIE-EA meet the requirement for vibration in normal environment to install and operate.

Date: 9-Nov.-1995

SHOCK TEST REPORT

TEST ITEM	SHOCK TEST & IMPACT TEST (CONFORMED TO EN54-PART 7)
SPECIMEN	IONIZATION TYPE SMOKE SENSOR: MODEL AIE-EA
TEST METHOD	[SHOCK TEST] The testing shall be performed using similar apparatus described in EN54-Part 7. The specimen should be mounted on proper position and energized. The steel block weighing 1 Kg shall be dropped six times on to the center of the upper horizontal face of the beam from a height of 700 mm. The sensitivity of the specimen (detector/sensor) shall be measured after testing. [IMPACT TEST] The testing shall be performed using the apparatus shown as follows. The specimen should be mounted on proper position and energized. The striker weighting 1.4 Kg is mounted on the shaft so that its long axis is at a radial distance of 300 mm from the axis of rotation of the asssembly. The striker shall be released three times from the horizontal position of the shaft. The sensitivity of the speciman (detector/sensor) shall be measured after testing. 
STANDARD FOR JUDGEMENT	The sensor should not generate a fault signal during the test. The sensor should not have a trouble on the structure and the function after test.
TEST RESULT	There was no fault signal generated during the test. There was no trouble on the function and structure of the sensor. There was not significant sensitivity (analog output) drift of the sensor.
JUDGEMENT	OK
COMMENT	In consideration of this test, the ionization smoke sensor model AIE-EA meet the requirement for vibration in normal environment to install and operate.

Date: 9-Nov.-1995

ENCL. A37

DATE: 6/3/1996TB

AIE SERIES SHOCK TEST

# OF SAMPLE	2 NS (AIE) IONIZATION SMOKE DETECTORS.		
TEST METHOD	1. HAND HELD VERTICAL DROP FROM 12' 2. 2 DETECTORS CYCLED 25 TIMES EACH. 3. DETECTORS WERE DROP FACE DOWN AS THEY WOULD BE WHEN INSTALLED IN THE FIELD. AFTER 8 TIME, EACH DETECTOR WERE INSPECTED FOR DAMAGE AND MEASUREMENTS WERE TAKEN. MEASUREMENTS TAKEN WERE AS FOLLOWS:		
TEST RESULTS	PRIOR TO DROP TEST	DETECTOR (A)	DETECTOR (B)
	BACKGROUND	45	52
	GROSS COUNT	54	54
	NET COUNTS	7	2
	AFTER 8 TIMES THERE WAS NO VISIBLE DAMAGE		
	AFTER 8 CYCLES	DETECTOR (A)	DETECTOR (B)
	BACKGROUND	50	50
	GROSS COUNT	49	52
	NET COUNTS	1	2
	AFTER 16 TIMES THERE WAS NO VISIBLE DAMAGE		
	AFTER 16 CYCLES	DETECTOR (A)	DETECTOR (B)
	BACKGROUND	47	56
	GROSS COUNT	52	50
	NET COUNTS	5	6
	AFTER 25 TIMES THERE WAS NO VISIBLE DAMAGE		
	AFTER 25 CYCLES	DETECTOR (A)	DETECTOR (B)
	BACKGROUND	50	52
	GROSS COUNT	54	56
	NET COUNTS	4	4
JUDGMENT STANDARD	AFTER TEST, DETECTOR SHOULD NOT SHOW ANY SIGNS OF MAJOR DAMAGE TO THE SMOKE DETECTOR CHAMBER AND SPECIALLY TO THE RADIOACTIVE SOURCE.		
JUDGMENT	MEET ALL CRITERIA		
COMMENTS	WE FEEL THIS TEST IS MUCH MORE SEVERE THAN WOULD EVER ARISE IN THE FIELD, AND UNDER NORMAL CONDITIONS THE AIE SERIES DETECTOR WOULD IN ADVERSE WAY AFFECT THE HEALTH AND SAFETY OF THE PUBLIC DOMAIN FROM A LEAK DUE TO THE DETECTOR INADVERTENTLY BEING DROPPED OR OTHERWISE BEING ABUSED SUCH AS DAMAGED IN TRANSIT.		

ACTUAL SALES QTY OF IONIZATION SMOKE DETECTORS

MODEL	2007	2008	2009	2010
SIJ-24+NS6-100		2		
SIJ-24+NS6-220	130	197	123	169
SIJ-24DH	7	2		2
SIJ-24 HA	9740	7755	5416	3616
SIJ-24 RETAIL	331	420	367	122
IS-24 (SIJ-24) SB-93 POTTER	400	400	400	500
SIJ-24 BOSCH	10	66	19	32
SIJ-E		438		
SIJ-24 ASN	2250	2258	1700	400
CONVENTIONAL TOTAL QTY	12,868	11,530	8,025	4,841
MODEL				
AIE-EAC AIS CN POTTER	100			
AIE-EA AIS POTTER	240	200	200	
AIE-EA HA	1165	1112	2700	640
AIE-EA SK	6546	2843	2673	1000
AIE-EA BOSCH			206	
AIE-EA AS		600	129	400
AIE-E	1844	1350	609	1100
AIE-EA VES	597	249		
ANALOG TOTAL QTY	10,492	6,354	6,517	3,140
OVERALL QTY (CONV+ANALOG)	23,360	17,884	14,542	7,981

HOCHIKI
america corporation

7051 Village Drive, Suite 100
Buena Park, CA 90621-2268
Phone Main: 714-522-2246