



U.S. Department
of Transportation

East Building, PHH – 32
1200 New Jersey Avenue, Southeast
Washington, D.C. 20590

**Pipeline and Hazardous
Materials Safety Administration**

**The US Department of Transportation
Competent Authority for the United States**

CLASSIFICATION OF EXPLOSIVES
FIRST REVISION

Based upon a request by Cartridge Actuated Devices, Inc., 51 Dwight Place, Fairfield, NJ 07004, United States the following items are classed in accordance with Section 173.56, Title 49, Code of Federal Regulations (49 CFR). A copy of your application, all supporting documentation and a copy of this approval must be retained and made available to DOT upon request.

U.N. PROPER SHIPPING NAME AND NUMBER:

Cartridges, power device, UN0323

U.N. CLASSIFICATION CODE: 1.4S

REFERENCE NUMBER

EX2009070008

PRODUCT DESIGNATION/PART NUMBER

Drawing # 072120-1 Rev. A (Assembly Hi-Temp,
Initiator (HTI))

NOTES: The following packaging method is assigned: Inner Packaging - Bags, heat-sealed static-resistant plastic, each containing one device overpacked in a heavy-wall fiberboard tube sleeve. Intermediate Packaging - Box, compressed flame-retardant pulpboard (e.g. Homasote), each containing not more than twelve (12) inner packagings arranged in two layers of up to six units with opposed output ends segregated with foamed plastic inserts with six die-cut holes and with a Homasote pad not less than 1/2 inch in thickness between layers closed with two steel packing straps. Outer Packaging - UN 4G fiberboard box, each containing one intermediate packaging. The device in this packaging has been tested by and passed the UN Series 6(d) test requirement in the 5th Revision of the UN Manual of Tests and Criteria.

DATED: 03/07/2011

For Dr. Magdy El-Sibaie
Associate Administrator for Hazardous Materials Safety

PERCUSSION INITIATOR

DESCRIPTION

The Fike Percussion Initiators are percussion fired initiators for use in downhole oil and gas completion operations. They are typically used in Tubing Conveyed Perforating (TCP) operations to initiate the detonation chain of perforating guns for the completion of oil and gas wells.

The Percussion Initiator is available in multiple configurations for direct replacement of existing Percussion Initiators (See Ordering Information Table). It is intended for use in existing tools that meet the firing pin travel limits, “all-fire” characteristics and other specifications listed in the data sheet. The Fike Percussion Initiator is hermetically sealed to resist corrosion and manufactured to meet the following specifications.



SPECIFICATIONS

Material of Construction:	Body – Stainless Steel
Time and Temperature Exposure:	See Ordering Information Chart
Gap:	Initiates boosters at 1.25” max gap
Firing Characteristics: <i>(refer to 2nd page)</i>	All-Fire: Configuration A Firing Pin – 10 ft-lbs applied at 9.7 ft/s Configuration B: Firing Pin – 12.4 ft-lbs applied at 13.4 ft/s No-Fire: 5.0 foot-pounds maximum Note: Limit firing pin travel to a maximum of .157 (3.99mm) to .165 (4.19mm) from back surface <i>(refer to 2nd page)</i> .05 inch spherical radius
Recommended Firing Pin:	20,000 psi before and after function
Pressure Rating:	DOT Hazard Class: 1.4 S (all P/N’s)
Shipping Classification	UN Number: UN 0323 (all P/N’s) Ref Number: EX2009070008 (P/N 072120-1) EX2009070009 (P/N 072120-3) EX2009080482 (P/N 072140-1) EX2010101404 (P/N 072140-3) EC Cert Number: ENB/B/158/10 (all P/N’s)
Shelf Life:	5 years

Note: All information and ratings are subject to change without notice. The user must be satisfied with the products suitability for all applications.

APPLICATIONS

- Explosive Trains
- Perforating Guns
- Tubing Conveyed Perforating
- Specialized Applications

Form No. O.1.10.01-1

ILLUSTRATION 1

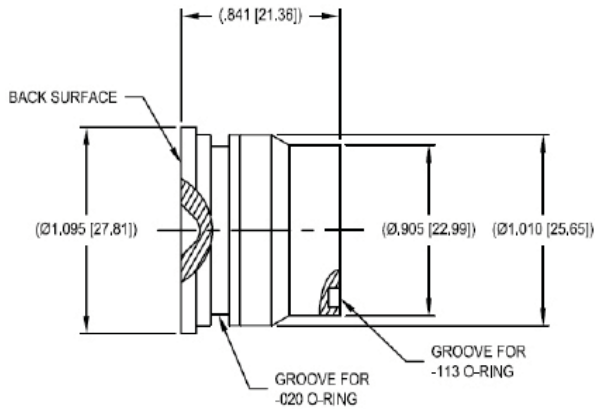
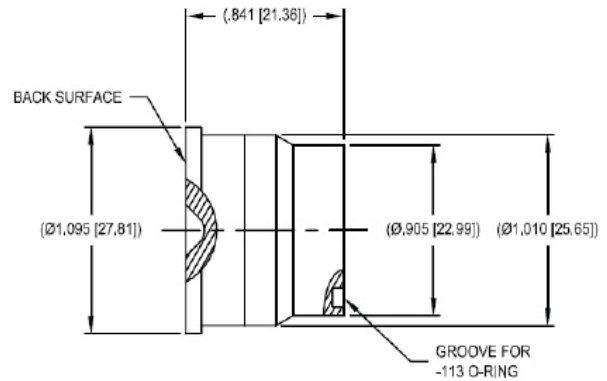


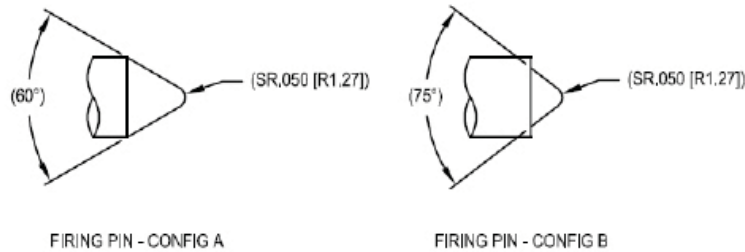
ILLUSTRATION 2



ORDERING INFORMATION

Fike P/N	Description	Reference	Temperature Rating
072120-1	Initiator, Hi-Temp (320°F) with -020 O-Ring Groove	Illustration 1	320°F for 200 Hours 340°F for 100 Hours
072120-3	Initiator, Hi-Temp (320°F) without -020 O-Ring Groove	Illustration 2	320°F for 200 Hours 340°F for 100 Hours
072140-1	Initiator, Hi-Temp (425°F) without -020 O-Ring Groove	Illustration 2	425°F for 200 Hours
072140-3	Initiator, Hi-Temp (425°F) with -020 O-Ring Groove	Illustration 1	425°F for 200 Hours

Note: Consult Fike for applications beyond the standard specifications.



FIRING PIN CONFIGURATIONS FOR INFORMATIONAL PURPOSES ONLY

FIKE SERVICES

Fike’s oilfield expertise creates a service and support structure that you can trust for your specific pyrotechnic applications

- Engineers and application specialists can assist in product applications and technical support.
- Rapid Response – lower costs and shorter lead times with Fike Oilfield products.
- Qualification testing of components under simulated applications and field testing.
- Manufactured by Cartridge Actuated Devices, Inc., a Fike Corporation company and industry leader in pyrotechnic products.





CONTAINER TESTING LABORATORY, INC.
 PACKAGE ENGINEERING • RESEARCH • CONSULTATION • TESTING

607 FAYETTE AVENUE • MAMARONECK, NEW YORK 10543
 PHONE: (914) 381-2600 • FAX: (914) 381-0143
 contestlab@hotmail.com • www.containertechnologylabs.com

**PACKAGING PERFORMANCE UN/ICAO/IMDG CERTIFICATE
 INCLUDING AIR TRANSPORT**

CONTAINER TESTING LABORATORY ID #+AQ

Certification Report #0600
 CTL P. #44496-C

REQUESTING PARTY:

Mr. Michael Bowen
 DG Supplies, Inc.
 4 Corporate Drive, Suite D, Bldg 4
 Cranbury, NJ 08512

1. Product tested: combination packaging, comprising two (2) 32 Oz. narrow mouth amber glass round bottles with black phenolic screw cap closures with poly-cone liners, each sealed with adhesive plastic tape, inner packaging inserted diagonally into a plastic lined center special slotted fibreboard box (International Box Code 0204) outer packaging backfilled with absorbent dunnage void space filler. The use of other packaging methods or components may render this report invalid.
2. Designated packaging code type: 4GV
 Packaging nomenclature: Combination packaging
3. Tests performed:

TEST	SPEC	INTENSITY	RESULTS
Cobb	Para 6.1.4.12.1	123.3 g/m ²	Pass
Drop	Para 6.1.5.3	1.8 meter	Pass
Internal Pressure (Hydraulic)	Para 6.1.5.5	250 kPa	Pass
Stacking	Para 6.1.5.6	204.3 kg	Pass
Vibration	49CFR 178.608	1 hour	Pass

4. Authentication: USA/+AQ0600

5. I certify that the samples of packaging prepared as for transport, described herein and tested in February 2010, in the manner summarized in paragraph (3) above, successfully passed the tests according to the criteria described in paragraphs 6.1.4.12.1, 6.1.5.3, 6.1.5.5 and 6.1.5.6 as set forth in the UN Recommendations of the Committee of Experts on the Transportation of Dangerous Goods, Chapter 6, 15th Revision and US 49CFR Section 178.608, and that the packages may continue to bear the existing marking authorized under the competent authority ruling 49CFR Section 178.601(g)(2):

U
n 4GV / X 13 / S / **
 USA / +AQ0600
 ** year of manufacture

By: 
 CONTAINER TESTING LABORATORY, INC.
 CERTIFICATION OFFICER

Date: February 11, 2010



GB Explosives Notified Body, Health & Safety Laboratory, Harpur Hill, Buxton, Derbyshire, SK17 9JN, United Kingdom
Tel: +44 (0)1298 218150 Fax: +44 (0)1298 218180 Email: enb@hsl.gov.uk www.hsl.gov.uk

EC TYPE EXAMINATION CERTIFICATE

NOTIFIED BODY NO: 0519

CERTIFICATE NO: ENB/B/158/11 Issue 2

- 1. Product Type:** High (Blasting) Explosive
- 2. Product Name:** HIGH TEMPERATURE INITIATOR as listed in Annex 1 to this certificate.
- 3. Manufacturer's Name and Address:** Cartridge Actuated Devices, 51 Dwight Place, Fairfield, New Jersey 07004, USA.
- 4. Applicant's Name and Address:** Fike Corporation, 704 S.W. 10th Street, Blue Springs, Missouri, 64015, USA.
- 5. Attachments to this Certificate:** Annex 1: products covered by this certificate; Annex 2: list of technical documents examined.

Being a notified body in accordance with the GB Statutory Instrument No 2714 (1993) and Directive 93/15/EEC of 5 April 1993 on the harmonization of the provisions relating to the placing on the market and supervision of explosives for civil uses, the Explosives Notified Body certifies that the above type of product has been examined using Module B of the system for attesting conformity and has been found to conform with the manufacturer's specifications for the type and with the relevant requirements of the Statutory Instrument and the Directive.

A handwritten signature in blue ink, appearing to read "SG Myatt".

Mr SG Myatt
Director, GB Explosives Notified Body

14 April 2011

ANNEX 1 TO EC TYPE EXAMINATION CERTIFICATE ENB/B/158/11 Issue 2

072120-1 Initiator, Hi-Temperature (HTI).
072120-3 Initiator, Hi-Temperature (HTI)
072140-1 Initiator, Hi-Temperature (HTI)
072140-3 Initiator, Hi-Temperature (HTI)

ANNEX 2 TO EC TYPE EXAMINATION CERTIFICATE ENB/B/158/11 Issue 2

LIST OF TECHNICAL DOCUMENTS EXAMINED

1. Cartridge Actuated Devices (CAD): Sales Drawing of Hi Temp Initiator 072120-1 (REV A).
2. Cartridge Actuated Devices (CAD): Sales Drawing of Hi Temp Initiator 072120-3 (REV A).
3. Cartridge Actuated Devices (CAD): Sales Drawing of Hi Temp Initiator 072140-1 (REV A).
4. Cartridge Actuated Devices (CAD): Assembly Drawing of Hi Temp Initiator 072120-1 (REV B).
5. Cartridge Actuated Devices (CAD): Assembly Drawing of Hi Temp Initiator 072120-3 (REV A).
6. Cartridge Actuated Devices (CAD): Assembly Drawing of Hi Temp Initiator 072140-1 (no REV).
7. Cartridge Actuated Devices (CAD): Packaging Drawing of HTI, 001033 (no REV).
8. Cartridge Actuated Devices (CAD): Assembly Packaging Drawing of HTI, 001033-1 (no REV).
9. Cartridge Actuated Devices (CAD): Standard DOT HAZMAT Package Markings & Labels, 001034 (no REV).
10. Cartridge Actuated Devices (CAD): Hi Temp Initiator 072120-1 product and Packaging Bill of Materials (Date 07/09/09).
11. Cartridge Actuated Devices (CAD): Hi Temp Initiator 072120-3 product and Packaging Bill of Materials (Dated 09/22/09).
12. Cartridge Actuated Devices (CAD): Hi Temp Initiator 072140-1 product and Packaging Bill of Materials (Dated 09/22/09).
13. Cartridge Actuated Devices (CAD): Test Data Sheets for All Fire, No Fire (Dated 12/17/08).
14. Cartridge Actuated Devices (CAD): Test Data Sheets for 072120-1 and 072140-1 Qualification (Dated 05/18/09, 05/26/09).

15. Cartridge Actuated Devices (CAD): Test Data Sheets for Drop Test (Dated 07/16/09).
16. Cartridge Actuated Devices (CAD): Production test Procedure for HTI PN 072120-1, 072120-3 & 072140-1, TP-397 (Dated 12/1/09).
17. US Department of Transportation: Classification of Explosives for each item (EX2009070008, EX2009070009, EX2009080482).
18. Explosives Bureau, New Jersey, USA: Classification advice for each item (Dated 05/31/09 and 08/20/09).
19. Cartridge Actuated Devices (CAD): Material Safety Data Sheet for Cartridge, Power Device, P/N 072120-1 (REV B).
20. Cartridge Actuated Devices (CAD): Material Safety Data Sheet for Cartridge, Power Device, P/N 072140-1 (REV A).
21. Certificates of Conformity of Raw Materials (Annex 3 Items 9-12).
22. Fike: Technical Data Sheet, High Temperature Initiator (HTI).
23. Bureau Veritas: Certificate ISO 9001:2000 Cartridge Actuated Devices (Dated 01/14/09).
24. TVU: Certificate ISO 9001:2000 Fike Corporation (Report No. 70717179).
25. Certificates of Conformity of Raw Materials (E10 d,-e).
26. Cartridge Actuated Devices (CAD): Test Procedure for P/N 072140 6ft Drop Test (E10f).
27. Cartridge Actuated Devices (CAD): Standard DOT HAZMAT Package Markings & Labels, 001034 (REV A).
28. Titan specialties Ltd: FHPA-1375-000 Firing Head Assembly Direct Pressure Actuated 1.375" OD Assembly (Preliminary July 2008).
29. Fike Corporation, e-mail to Explosive Notified Body dated 27 August 2010.
30. Cartridge Actuated Devices (CAD): Test Data Sheets (Dated 06/22/10, 06/24/10, 06/28/10, 06/29/10, 07/09/10, 07/13/10).
31. Cartridge Actuated Devices (CAD): Test Data Sheets for Drop Test (Dated 08/16/10).

32. Cartridge Actuated Devices (CAD): Material Safety Data Sheet for Cartridge, Power Device, P/N 072120-1 (REV C).
33. Cartridge Actuated Devices (CAD): Material Safety Data Sheet for Cartridge, Power Device, P/N 072140-1 (REV B).
34. Fike Corporation, e-mails to Explosive Notified Body dated 8 and 13 September 2010.
35. Fike Corporation, e-mails to Explosive Notified Body dated 14 February 2011.
36. Fike: Technical Data Sheet, Percussion Initiator.
37. US Department of Transportation: Classification of Explosive, EX2010101404.
38. Cartridge Actuated Devices (CAD): Assembly Drawing of Hi Temp Initiator 072140-3 (REV B).
39. Cartridge Actuated Devices (CAD): Sales Drawing of Hi Temp Initiator 072140 (REV A1).
40. Cartridge Actuated Devices (CAD): Hi Temp Initiator 072140-3 product and Packaging Bill of Materials.
41. Cartridge Actuated Devices (CAD): Material Safety Data Sheet for Cartridge, Power Device, P/N 072140-3 (REV D).
42. Cartridge Actuated Devices (CAD): Production test Procedure for HTI PN 072120-1, 072120-3 & 072140-1, 072140-3 TP-397 (Revision D).



CARTRIDGE ACTUATED DEVICES, INC.
51 DWIGHT PLACE FAIRFIELD, NJ 07004

REVISION: C DATE: 071510

HAZARDOUS CHEMICAL MATERIAL SAFETY DATA SHEET
(Conforms to the requirements of 29 CFR 1910.1200)

I. PRODUCT IDENTITY: Cartridges, Power Device
1.4S, UN0323 EX-2009070008
(Initiator, P/N 072120-1 Rev. A)

CARTRIDGE ACTUATED DEVICES, INC. 51 Dwight Place. Fairfield, N.J. 07004 Prepared by CAD Engineering Telephone Number: 973-575-1312 Material(s) described is/are:	<u>24 HOUR EMERGENCY PHONE #</u> <u>IN U.S.A.: 800-424-9300</u> <u>OUTSIDE U.S.A.: 202-483-7616 CALL COLLECT</u> <u>FIRE, SPILL, EMERGENCY ONLY</u> Electro-Pyrotechnic device and by-products of initiation.
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II. HAZARDOUS INGREDIENTS AND EXPOSURE LIMITS: N/A
Chemical and common name of Hazardous chemical ingredients:

	CAS. No.
Titanium	007440-32-0
Potassium Perchlorate	007778-74-7
Potassium Chlorate	3811-04-9
Calcium Silicide	12013-56-8
Antimony Sulfide	1345-04-6
Lead Azide	13424-46-9
Hexanitrostilbene	20062-22-0

III. PHYSICAL AND CHEMICAL CHARACTERISTICS

Boiling point: N/A	Solubility in water: N/A
Specific gravity: N/A	
Vapor Pressure @ 20°C negligible	pH: N/A
% Volatile: negligible	Evaporation rate: NONE

IV. FIRE, EXPLOSION AND REACTIVITY HAZARD DATA

DANGER Extremely Flammable --EXPLOSIVE--
Keep away from heat and keep shunted.

Flash point:	N/A
Flammable Limits:	N/A
Auto-ignition temperature:	350° F
Extinguishing media:	Water, Dry Chemical
Special Fire-Fighting procedures:	Do not fight fires directly involving explosives.
Grounding Procedure:	Insure that the device is shunted and handlers are grounded
Stability Considerations:	NONE
Incompatibility:	shock, flame, friction and static sources.
Hazardous decomposition products:	None
Hazardous products of combustion:	High temperature flame, carbon monoxide, carbon dioxide, nitrogen oxides, hydrogen chloride, and oxides of titanium.
Hazardous Polymerization:	None

V. HEALTH HAZARD DATA:
Emergency and First Aid Procedure:



CARTRIDGE ACTUATED DEVICES, INC.
51 DWIGHT PLACE FAIRFIELD, NJ 07004

REVISION: C DATE: 071510

Treat burns and any laceration by cleaning and applying sterile bandages.
Transport individual for further medical treatment.

Primary Route of Entry	Inhalation of gas after initiation.
Cancer Information	None
Reported effects on Humans	Respiratory irritant
Other	None

VI. SPILL AND LEAK PROCEDURES

Steps to be taken if material is spilled: (applies only if cartridge is ruptured)

Clean spill after liberally wetting down the material with solvent (Acetone, Butyl Acetate, Alcohol or Water) by wiping material up with paper towels or with a cotton rag. Keep a fire extinguisher present. Remove all sources of ignition.

Waste Disposal Method:

Disposal must be in accordance with local, state, and Federal regulations. Call Cartridge Actuated Devices for assistance, if needed.

VII. APPLICABLE CONTROL MEASURES:

Appropriate Hygienic Practices:	N/A
Personal Protective Equipment:	Safety glasses & grounding devices(ground straps and/or conductive footwear). When firefighting, wear NIOSH approved gas respirator.
Work Practices:	Avoid high temperatures. Keep the Cartridge shunted & wear protective equipment.
Handling and Storage precaution:	Recommended storage, 70° F., keep shunted.
Engineering Controls:	Work with unit in a shielded area, keep shunted until installed.
Protective Measures during Repair and Maintenance:	Eliminate static discharge sources. Avoid flame or high heat. Shield device when working with it.

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CARTRIDGE ACTUATED DEVICES, INC.
51 DWIGHT PLACE FAIRFIELD, NJ 07004

REVISION: C DATE: 071510

Net Reactive Material Content: 0.445 grams per unit