

MATERIAL SAFETY DATA SHEET

CADH and DCADH Hybrid Driver Inflators

SECTION 1: CHEMICAL PRODUCT AND COMPANY INFORMATION

Material Identification

TRADE NAMES: CADH Single Stage Hybrid Driver Inflator
DCADH Dual Stage Hybrid Driver Inflator

Company Identification

MANUFACTURER:

Delphi Corporation
250 Northwoods Boulevard
Vandalia, Ohio 45377

TELEPHONE NUMBERS:

Product Information: 937.356.2225
Transport Emergency: INFOTRAC 800.535.5053
Medical Emergency: INFOTRAC 800.535.5053
International: 1.352.323.3500

SECTION 2: HAZARDS IDENTIFICATION

Note - This inflator is a manufactured article.

EMERGENCY OVERVIEW

Physical Appearance:

Steel toroid, approximately 70 mm diameter and 35 to 40 mm tall, with mounting flanges and manifold affixed. Device contains inert gas under high pressure and chemical gas generant materials that burn rapidly when ignited.

Immediate Concerns:

These devices are not flammable or reactive under typical emergency response conditions; however, accidental deployment or discharge due to damage or mishandling may pose a physical safety hazard. The compressed gas mixture within the device is inert, but can cause a potentially dangerous overpressure if released instantly into a small confined space. At temperatures greater than 107°C (225°F) or under fire conditions, the inflator can auto-ignite (auto-deploy) releasing stored and generated gases suddenly, which can cause the article to move up to 2 to 3 meters. Emergency responders must wear proper personal protective equipment for the situation to which they are responding.

Potential Health Effects

As manufactured and shipped, the inflators are sealed units, and there is no potential for exposure to their contents unless they are deployed or physically damaged.

Multiple deployments in testing situations may release effluents that may cause skin, eye, or mucous membrane irritation. In these situations, effluents must be effectively controlled through engineering systems designed to remove potential air contaminants. Use approved personal protective equipment (PPE) when engineering controls are not adequate or have not been implemented

Carcinogenicity

The components present in this material at concentrations equal to or greater than 0.1% are not listed as carcinogens by IARC, NTP, OSHA or ACGIH.

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SECTION 3: HAZARDS IDENTIFICATION

The inflator assembly is a steel vessel containing one or two igniter assemblies, up to 30 grams of energetic materials and up to 27 grams of a compressed gas mixture (94 – 98% argon and 2 – 6% helium).

<u>Substance</u>	<u>CAS Number</u>	<u>Percent by Weight</u>
<i>COMPRESSED GASES</i>		
ARGON	7440-37-1	< 5
HELIUM	7440-59-7	< 5
<i>ENERGETIC MATERIAL</i>		
GAS GENERANT	NA	< 5
<i>IGNITER(S)</i>		
PERCHLORATE MIXTURES WITH FINELY DIVIDED METALS	NA	< 1

NOTE: The compressed gases, energetic materials, and igniters listed above are contained within the gas generator assembly, which is a sealed unit.

SECTION 4: FIRST AID MEASURES

Inhalation, ingestion, and skin or eye contact are not expected when installed as intended. Sufficient engineering controls and PPE are to be utilized in multiple deployment testing to minimize potential for exposure. If exposure does occur in this situation, remove the victim to fresh air and flush contaminated skin and eyes. Seek medical attention, if irritation, redness, or breathing difficulty develops

SECTION 5: FIRE FIGHTING MEASURES

Flammable Properties

Igniter

Flash Point: Not applicable

Flammable Limits in Air: Not applicable

Hazardous Combustion Products

Expected to be similar to decomposition products listed in Section 10 of this MSDS.

Fire and Explosion Hazards

The inflator assembly contains compressed gas at up to 3,800 psig (maximum pressure at typical room temperatures). When the device reaches a temperature greater than approximately 107°C, the inflator will auto-ignite (i.e. auto-deploy) causing the device to release the stored compressed gas (due to internal overpressure); and in some cases causing the device to release generated gas (due to combustion of the energetic materials). This pressure release may cause the device to move suddenly, however, the device is designed to move no more than 2 to 3 meters if this occurs. Additional heating will cause burning of the energetic materials (igniter and gas generant). At temperatures exceeding 300°C, all energetic materials are consumed.

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Electrical currents (including currents from static electricity discharges) in excess of 0.4 ampere will cause the device to deploy, causing rapid combustion of the energetic materials and release of the compressed gas.

Extinguishing Media

None. Allow devices to burn out.

Fire Fighting Instructions

Cool the devices and surroundings with water from a suitable distance. Emergency responders should wear eye protection, self-contained breathing apparatus and full protective equipment. Evacuate personnel to a safe area. Keep personnel away and upwind of the fire. Contain firefighting water.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Spill and Leak Response

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. If a unit leaks gas, it will dissipate into the atmosphere. If the initiator disconnects itself from the unit and spills its contents, keep spilled material wet with water and use a soft bristle brush and a conductive rubber pan or conductive rubber shovel to clean up spill. Use non-sparking tools. Place spilled material in conductive containers. Ground all containers when transferring spilled material.

Environmental Precautions

Keep out of drains, sewers, ditches, and waterways. Contain contaminated water, including water from firefighting.

SECTION 7: HANDLING AND STORAGE

Handling

Take special precautions to prevent dropping devices. After deployment, the surface of the inflator airbag module or surfaces nearby may have particulate present on them. Use appropriate personal protective equipment (PPE) when handling deployed inflators or contacting dust-laden surfaces. Wash thoroughly if skin contacts deployed inflators or surfaces bearing dust from deployment.

These devices are provided with shorting clips to prevent accidental deployment due to electrical discharges. Handling practices and work procedures must be designed to prevent accidental removal or displacement of the shorting clips.

Storage

Undeployed devices should be stored in original shipping containers until use. Store containers in a cool; dry location, away from direct sunlight, or sources of intense heat. Store at temperatures not exceeding 90°C. Keep containers away from incompatible chemicals (See Section 10, Stability and Reactivity). Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Protect containers from physical damage during transport and storage.

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SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Multiple deployments, seen in testing conditions, may pose different risks of exposure to potentially elevated levels of effluent gases or particulates. In these situations, exposure to elevated concentrations of effluent gases or particulates may cause skin, eye, lung, or mucous membrane irritation. Implement appropriate engineering controls to minimize exposure to effluents from inflator deployments. Engage a qualified professional (e.g. industrial hygienist, industrial hygiene engineer) to evaluate the potential exposure scenario and possible needs for engineering controls or special personal protective equipment (PPE). Use approved personal protective equipment until effective engineering controls have been implemented and shown to provide adequate control of exposures. Seek assistance from an occupational health professional (e.g., industrial hygienist) regarding selection of appropriate PPE.

Engineering Controls

For ordinary handling, special ventilation is not required if the units are not damaged and remain sealed.

Personal Protective Equipment

EYE/FACE PROTECTION: For ordinary handling, wear approved industrial grade safety glasses as a minimal precaution.

RESPIRATORY PROTECTION: None needed for normal circumstances of use. See remarks in Exposure Guidelines above concerning multiple deployment scenarios.

PROTECTIVE CLOTHING: None required for ordinary handling if the units are not damaged and remain sealed.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Steel toroid, approximately 70 mm diameter and 35 to 40 mm tall.
FLASH POINT:	Not applicable
AUTOIGNITION TEMPERATURE:	Not applicable
PHYSICAL STATE:	Solid (pressurized vessel, igniter, energetics package)
ODOR:	No noticeable odor

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability

Stable at normal temperatures and storage conditions. See Section 7 for storage conditions.

Conditions to Avoid

Exposure to heat, flame, or static electricity discharges.

Incompatibility with Other Materials

Strong acids, strong bases, and materials that induce static electric potentials.

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Decomposition

Igniter and energetics package deployment/thermal decomposition products may include carbon dioxide, carbon monoxide, and unspecified gaseous and particulate nitrogen, halide, and metal compounds.

Hazardous Polymerization

Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

General Toxicity Information

Considered non-toxic based on criteria of the Hazardous Substances Labeling Act.

Carcinogenicity

The components present in this material at concentrations equal to or greater than 0.1% are not listed as carcinogens by IARC, NTP, OSHA or ACGIH.

SECTION 12: ECOLOGICAL INFORMATION

Environmental Fate & Ecotoxicity Data

No data available for this product. The ecotoxicological hazard of the sealed assembly is expected to be low, with regard to potential persistence, bioconcentration, and toxicity. Due caution should be exercised to prevent the release of initiator mixtures to aquatic or terrestrial environments (e.g., due to runoff from fire control or from deployed inflators).

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal

The Environmental Protection Agency has made a determination that undeployed airbag inflators and modules do not fall under the RCRA hazardous waste regulations when recycled. Please consult state or local environmental regulatory agencies to determine whether they have made a more restrictive determination.

USEPA (RCRA) Hazardous Waste Code: Reactive Characteristic - D003 (unadulterated ignition material as a waste).

Explosives or related dangerous material should be destroyed by open burning/open detonation, in an approved incinerator, or by another approved method such as chemical treatment/destruction. Waste disposal must be in accordance with appropriate Federal, State, and local regulations.

SECTION 14: TRANSPORT INFORMATION

Shipping Information

This material is hazardous as defined by 49 CFR 172.101 by the U.S. Department of Transportation.

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Proper Shipping Name:	Airbag inflators
Hazard Class Number and Description	9, "Class 9"
UN Identification Number	UN3268
Packing Group	III
DOT Label(s) Required	Class 9

SECTION 15: REGULATORY INFORMATION

US Federal Regulations

This product is an article per OSHA 29 CFR 1910.1200(c)

A: Federal Bureau of Alcohol, Tobacco, Firearms and Explosives (BATFE)

This product, as manufactured, is exempt per 27 CFR 55.32 (special explosive devices).

US State Regulations

A: California Code of Regulations, Title 22, Perchlorate BMP Regulations R-2005-03

Perchlorate Material – special handling may apply. See

www.dtsc.ca.gov/hazardouswaste/perchlorate

European Regulations

A: Labeling according to EC Directives

Symbols

None

Risk phrases

None

Safety phrases

None

B: German Regulations:

Subject to the Regulations for Dangerous Substances (GefStoffV), edition of November 15.1999, except parts 2 and 3.

Attention:

Subject to the German Explosive Law (in Germany: SprengG) concerning the admission (§ 5) for external application except for samples for testing purpose.

Usage only under supervision of a person with "Befähigungsscheininhaber gem. § 20 SprengG".

Further comments see § 4, item 2 and § 14 of the 1st Regulations to Explosive Law (in Germany: 1st SprengV):

Expectations to storage rooms and vessels according to the German Explosive Law according to 2nd SprengV in connection with the Explosive Regulations of National Authorities (in Germany: SprengLR):

SprengLR 220, 230 and appendix of 2nd SprengV

Storage of small quantities outside a storage room: see SprengRL 410

Subject to the Employers' Liability Insurance Association concerning the handling

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Additional Substance Related Information:

These gas generators are approved by the German establishment for admittance of explosives (BAM) as pyrotechnical articles for technical purposes of division T₁. According to § 4 1st Spreng V, § 7 (permission) and § 20 (certified statement of blaster's qualification), Spreng G are not applicable for the dealing with articles of division T₁.

The import, the distribution, the transfer and the dealing is only allowed in the scope of an occupation according to § 14 Spreng G.

Airbag-Hybridgasgenerator ADH-C Single BA01613-003: BAM-PT₁-1078

Airbag-Hybridgasgenerator ADH-C Dual BA01090-003: BAM-PT₁-1066

Additional Regulatory Information

A: Component Analysis – Inventory

All chemical constituents of this product have been checked against the non-confidential TSCA inventory and EINECS inventory by CAS Registry Number. All chemical constituents are listed on the TSCA section 8(b) inventory and EINECS inventory.

SECTION 16: OTHER INFORMATION

NFPA Hazard Ratings

Health:	0
Flammability	0
Instability	3

HMIS Hazard Ratings

Health	0
Flammability	0
Physical hazard	3

The information and recommendations set forth herein are taken from sources believed to be accurate as of the date of preparation; however, Delphi Corporation makes no warranty with respect to the accuracy or suitability of the recommendations, and assumes no liability to any use thereof.

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Revision: 4.000

Key/Legend

OSHA = Occupational Safety and Health Administration; ACGIH® = American Conference of Governmental Industrial Hygienists; US EPA = United States Environmental Protection Agency; IARC = International Agency for Research on Cancer; NTP = National Toxicology Program; NFPA = National Fire Protection Association; HMIS® = Hazardous Materials Identification System; RCRA = Resource Conservation and Recovery Act; DOT = Department of Transportation; BATFE = Bureau of Alcohol, Tobacco, Firearms, and Explosives; CFR = Code of Federal Regulations; TSCA = Toxic Substances Control Act; EINECS = European Inventory of Existing Commercial Chemical Substances; BMP = Best Management Practices; NA = Not Available

END OF DATA SHEET

FSG-ETS File MS222