

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name Inflatable Life Preserver with Signal Kit, Aviation Type

Trade Names

Model	Part No.	Model	Part No.	Model	Part No.
KSD-35L8	P0723-()K	KSE-35L8	P0723E105PK	KSE-35L8	P0723E105P()K
KSD-35L8	P0723-()CK	KSE-35L8	P0723E105PCK	XF-35	P01074-151W
KSD-35L8	P0723-()WCK	KSE-35L8	P0723E105PWCK	XF-35	P01074-151WC
KSD-35L8	P0723-()WCKR	KSE-35L8	P0723E105PWCKR		

Company Eastern Aero Marine
5502 NW 37th Avenue
Miami, Florida 33142

Telephone (800) 255-3924

Fax (305) 637-8632

Emergency Phone Number (813) 248-0585

2. HAZARDS IDENTIFICATION

- Carbon Dioxide, Compressed
- Pyrotechnic Signaling Device (flares)

Symbol(s) or pictogram(s) Refer to supplier's Safety Data Sheets for specific information on components.

Hazard statement(s) Refer to supplier's Safety Data Sheets for specific information on components.

Precautionary statement(s) Refer to supplier's Safety Data Sheets for specific information on components.

Hazards not otherwise classified Refer to supplier's Safety Data Sheets for specific information on components.

3. COMPOSITION/INFORMATION ON INGREDIENTS

N/A. Refer to supplier's Safety Data Sheets for specific information on components.

4. FIRST AID MEASURES

Inhalation Provide patient with fresh air and seek medical advice.

Skin Contact Refer to supplier's Safety Data Sheets for specific information on components.

Eye Contact Irrigate thoroughly with water and seek medical advice.

Ingestion Get medical aid immediately.

5. FIREFIGHTING MEASURES

Suitable Extinguishing Media Large volumes of water.

Specific Hazards From Combustion Refer to supplier's Safety Data Sheets for specific information on components.

Personal Protection Use air-ventilated full mask and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Hazardous materials are contained in sealed units within the life vest. Spills should pose no threat if sealed units are not breached. If compressed gas cylinder may discharge or rupture, ventilate the area. Refer to supplier's Safety Data Sheets for specific information on components.

7. HANDLING AND STORAGE

Handle the life vest with care. These units should be stored in a cool and dry area away from danger of sparks, heat or flame. Do not pull the inflation tab on the vest. Opening the package and unpacking the vest may cause it to inflate. Life vest can cause injury if inflated close to people or in a confined area. Prolonged exposure to moisture may cause water activated lights on some vests to discharge and give off a non-hazardous “rotten egg” smell. Fully ventilate the area. Refer to supplier’s Safety Data Sheets for specific information on components.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

N/A. Refer to supplier’s Safety Data Sheets for specific information on components.

9. PHYSICAL AND CHEMICAL PROPERTIES

Refer to supplier’s Safety Data Sheets for specific information on components.

10. STABILITY AND REACTIVITY

The life vest is stable if stored in the original package in cool and dry conditions. Do not subject life vest to high temperatures or excessively humid conditions. Refer to supplier’s Safety Data Sheets for specific information on components.

11. TOXICOLOGICAL INFORMATION

N/A. Refer to supplier’s Safety Data Sheets for specific information on components.

12. ECOLOGICAL INFORMATION

N/A. Refer to supplier’s Safety Data Sheets for specific information on components.

13. DISPOSAL CONSIDERATIONS

Refer to supplier’s Safety Data Sheets for specific disposal information of components. Other solid contents may be disposed of as domestic waste in accordance with local laws and regulations.

14. TRANSPORT INFORMATION

UN Number	UN2990
UN Proper Shipping Name	Life Saving Appliance, Self-Inflating
Transport Hazard Class(es)	Class 9
Packing Group	N/A

15. REGULATORY INFORMATION

N/A. Refer to supplier’s Safety Data Sheets for specific information on components.

16. OTHER INFORMATION

Revision Level	Original
Other	Supplier’s Safety Data Sheets can be found on our website at www.eamworldwide.com/technical-data/

iSi Components Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Carbon dioxide (compressed)		Trade Name: Carbon dioxide
Chemical Name: Carbon dioxide		Synonyms: Carbonic anhydride, carbonic acid gas
Formula: CO ₂		Chemical Family: Acid anhydrides
Telephone:	Emergencies: 1-800-424-9300* Routine: 1-973-227-2426*	Company Name: <i>iSi North America, Inc.</i> 175 Route 46 West Fairfield, NJ 07004

* Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact *iSi Components* or call the number above.

2. Composition/Information on Ingredients

Carbon dioxide is supplied in cylinders as a liquid under its own vapor pressure, which varies depending on the temperature. It is non-toxic, non-flammable and heavier than air. Cylinders range in size from 10 ml. to 350 ml.

INGREDIENT	CAS NUMBER	CONCENTRATION	OSHA PEL	ACGIH TLV-TWA
Carbon Dioxide	124-38-9	>99%	5,000 ppm*	5,000 ppm**

* The symbol > means "greater than"; the symbol <, "less than."

** See following section.

3. Hazards Identification

EMERGENCY OVERVIEW

CAUTION! High-pressure liquid and gas.

Can cause rapid suffocation.

Can increase respiration and heart rate.

May cause nervous system damage.

May cause frostbite.

May cause dizziness and drowsiness.

Self-contained breathing apparatus may be required by rescue workers.

Odor: None to slightly pungent

THRESHOLD LIMIT VALUE: TLV-TWA, 5,000 ppm (ACGIH, 1998). TLV-TWA, 15 min STEL, 30,000 ppm.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION—Carbon dioxide gas is an asphyxiant with effects due to lack of oxygen. It is also physiologically active, affecting circulation and breathing. Moderate concentrations may cause headache, drowsiness, dizziness, stinging of the nose and throat, excitation, rapid breathing and heart rate, excess salivation, vomiting, and unconsciousness. Lack of oxygen can kill.

SKIN CONTACT—No harm expected from vapor. Cold gas, or liquid or solid carbon dioxide may cause severe frostbite.

SWALLOWING—An unlikely route of exposure. This product is a gas at normal temperature and pressure.

EYE CONTACT—No harm expected from vapor. Cold gas, or liquid or solid carbon dioxide may cause severe frostbite.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No harm expected.

OTHER EFFECTS OF OVEREXPOSURE: Damage to retinal or ganglion cells and central nervous system may occur.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: The toxicology and the physical and chemical properties of carbon dioxide suggest that overexposure is unlikely to aggravate existing medical conditions.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: A single study has shown an increase in heart defects in rats exposed to 6% carbon dioxide in air for 24 hours at different times during gestation. There is no evidence that carbon dioxide is teratogenic in humans.

CARCINOGENICITY: Carbon dioxide is not listed by NTP, OSHA, or IARC.

4. First Aid Measures

INHALATION: Immediately remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT: For exposure to cold vapor or solid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). In case of massive exposure, remove contaminated clothing while showering with warm water. Call a physician.

SWALLOWING: An unlikely route of exposure. This product is a gas at normal temperature and pressure.

EYE CONTACT: For exposure to cold vapor or solid, immediately flush eyes thoroughly with warm water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. See a physician, preferably an ophthalmologist, immediately.

NOTES TO PHYSICIAN: *There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.*

5. Fire Fighting Measures

FLASH POINT (test method)	Not applicable	AUTOIGNITION TEMPERATURE	Not applicable
FLAMMABLE LIMITS IN AIR, % by volume	LOWER	Not applicable	UPPER Not applicable

EXTINGUISHING MEDIA: Carbon dioxide cannot catch fire. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: CAUTION! High-pressure gas liquid and gas. Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool, then move them away from fire area if without risk. Self-contained breathing apparatus may be required by rescue workers. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Heat of fire can build pressure in cylinder and cause it to rupture. **Recommended storage temperature: -30 degrees C to +65 degrees C.**

HAZARDOUS COMBUSTION PRODUCTS: None known.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: CAUTION! High-pressure liquid and gas. Carbon dioxide is an asphyxiant. Lack of oxygen can kill. Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off leak if you can do so without risk. Ventilate area or move cylinder to a well-ventilated area. Test for sufficient oxygen, especially in confined spaces, before allowing reentry.

WASTE DISPOSAL METHOD: Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation. If applicable, secure cylinders upright to keep them from falling or being knocked over.

PRECAUTIONS TO BE TAKEN IN HANDLING: Protect cylinders from damage, refer to section 16.

For additional information on storage and handling, refer to Compressed Gas Association (CGA) pamphlet P-1, *Safe Handling of Compressed Gases in Containers*, available from the CGA.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST—Use a local exhaust system, if necessary, to control the concentration of carbon dioxide in the worker's breathing zone.

MECHANICAL (general)—Under certain conditions, general exhaust ventilation may be acceptable to keep carbon dioxide below the exposure limit.

SPECIAL—None

OTHER—None

RESPIRATORY PROTECTION: None required under normal use. An air-supplied respirator must be used in confined spaces. Respiratory protection must conform to OSHA rules as specified in 29 CFR 1910.134.

SKIN PROTECTION: Wear insulated neoprene gloves for cylinder handling

EYE PROTECTION: Select in accordance with OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133.

9. Physical and Chemical Properties

MOLECULAR WEIGHT:	44.01
SPECIFIC GRAVITY (Air = 1) at 70°F (21.1°C) and 1 atm:	1.522
GAS DENSITY at 70°F (21.1°C) and 1 atm:	0.1444 lb/ft ³ (1.833 kg/m ³)
LIQUID DENSITY (saturated) at 70°F (21.1°C) and 1 atm:	47.6 lb/ft ³ (762 kg/m ³)
VAPOR PRESSURE at 70°F (21.1°C):	838 psig (5778 kPa)
SOLUBILITY IN WATER , vol/vol at 68°F (20°C) and 1 atm:	0.90
PERCENT VOLATILES BY VOLUME:	100
EVAPORATION RATE (Butyl Acetate = 1):	High
pH:	3.7 (for carbonic acid)
SUBLIMATION POINT at 1 atm:	-109.3°F (-78.5°C)

APPEARANCE, ODOR, AND STATE: Colorless, odorless, slightly acid gas. It is felt by some to have a slight, pungent odor and biting taste.

10. Stability and Reactivity

STABILITY: Unstable Stable

INCOMPATIBILITY (materials to avoid): Alkali metals, alkaline earth metals, metal acetylides, chromium, titanium above 1022°F (550°C), uranium above 1382°F (750°C), magnesium above 1427°F (775°C)

HAZARDOUS DECOMPOSITION PRODUCTS: Electrical discharges and high temperatures decompose carbon dioxide into carbon monoxide and oxygen.

HAZARDOUS POLYMERIZATION: May Occur Will Not Occur

CONDITIONS TO AVOID: None known.

11. Toxicological Information

Carbon dioxide is an asphyxiant. It initially stimulates respiration and then causes respiratory depression. High concentrations result in narcosis. Symptoms in humans are as follows:

EFFECT:	CONCENTRATION:
Breathing rate increases slightly.	1%
Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness.	2%
Breathing increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate.	3%
Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt.	4 - 5%
Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness.	5 - 10%
Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.	50 - 100%

12. Ecological Information

No adverse ecological effects expected. Carbon dioxide does not contain any Class I or Class II ozone-depleting chemicals. Carbon dioxide is not listed as a marine pollutant by DOT.

13. Disposal Considerations

Empty cylinders prior to disposal. Cylinder shells are 100% recyclable steel.

14. Transport Information

DOT/IMO SHIPPING NAME: Carbon dioxide

HAZARD CLASS: 2.2	IDENTIFICATION NUMBER: UN 1013	PRODUCT RQ: Not applicable
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SHIPPING LABEL(s): NONFLAMMABLE GAS

PLACARD (when required): NONFLAMMABLE GAS

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(b)].

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of extremely hazardous substances (40 CFR Part 355):

Threshold Planning Quantity (TPQ): None

Extremely Hazardous Substances (40 CFR 355): None

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

IMMEDIATE: Yes

DELAYED: No

PRESSURE: Yes

REACTIVITY: No

FIRE: No

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Carbon dioxide does not require reporting under Section 313.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Carbon dioxide is not listed as a regulated substance.

TSCA: TOXIC SUBSTANCES CONTROL ACT: Carbon dioxide is listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Carbon dioxide is not listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: Carbon dioxide is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).).

WARNING: The combustion of this gas produces carbon monoxide—a chemical known to the State of California to cause birth defects or other reproductive harm.

(California Health and Safety Code §25249.5.)

PENNSYLVANIA: Carbon dioxide is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

HAZARD RATING SYSTEMS:

• **NFPA RATINGS:**

HMIS RATINGS:

HEALTH = 1
FLAMMABILITY = 0

HEALTH = 0
FLAMMABILITY = 0

REACTIVITY = 0
SPECIAL = SA

REACTIVITY = 0
(CGA recommends this to designate Simple Asphyxiant)

1. Identification

Product Identifier : Carbon Dioxide
Other means of identification : Carbonic, Carbon Dioxide, Carbonic Anhydride, CO₂, UN 1013
Product use : Synthetic, Analytical chemistry
Supplier : Leland Limited, Inc.
2614 South Clinton Ave.
South Plainfield, NJ 07080
1-908-668-1008 (9-5 EST)
Emergency calls (CHEMTREC) : 1-800-424-9300 (Domestic)
1-703-527-3887 (International)

2. Hazards Identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture : Gases under pressure – Liquefied gas
Simple asphyxiant
GHS label elements
Hazard pictograms :



Signal word : Warning
Hazards statements : Contains gas under pressure; may explode if heated
May cause frostbite
May displace oxygen and cause rapid suffocation
May increase respiration and heart rate

Precautionary statements

General : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position.
Prevention : Use and store outdoors or in a well ventilated place.
Response : IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
Storage : Protect from sunlight. Protect from sunlight when ambient temperature exceeds 52C/125F. Store in a well-ventilated place.
Disposal : Dispose in accordance with all applicable regulations.
Hazards not otherwise classified : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.
May cause frostbite.

3. Composition, Information on Ingredients

Substance/Mixture	: Substance
Chemical Name	: Carbon dioxide
Synonyms	: Carbonic, Carbon Dioxide, Carbon Anhydride, CO ₂
CAS Number	: 124-38-9
Content (vo%)	: 99.5 % or more

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

4. First Aid Measures

Description of necessary first aid measures

Inhalation	: Remove exposed person to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular, or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Skin Contact	: Carbon dioxide is harmless at atmospheric pressure. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Eye Contact	: Carbon dioxide is harmless at atmospheric pressure. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
Ingestion	: Since this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Inhalation	: No known significant effects or critical hazards.
Skin Contact	: No known significant effects or critical hazards.
Eye Contact	: No known significant effects or critical hazards.
Frostbite	: Try to warm up the frozen tissues and seek medical attention.
Ingestion	: As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Inhalation	: No specific data.
Skin Contact	: No specific data.
Eye Contact	: No specific data.
Ingestion	: No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments : No specific treatment.
- Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

5. Fire Fighting Measures

Extinguishing media

- Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media : None known.
- Specific hazards arising from the chemical : Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.
- Hazardous thermal decomposition products : Decomposition products may include the following materials:
Carbon dioxide
Carbon monoxide
- Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Special protective equipment for fire-fighters : Fire-fighters should wear appropriate equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
- Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

- Small spill : Immediately contact emergency personnel. Stop leak if without risk.
- Large spill : Immediately contact emergency personnel. Stop leak if without risk. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and Storage

Precautions for safe handling

- Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
- Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
- Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52C (125F).

8. Exposure Controls and Personal Protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Carbon Dioxide	ACGIH TLV (United States, 3/2012). Oxygen Depletion [Asphyxiant]. STEL: 54000 mg/m ³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m ³ 8 hours TWA: 5000 ppm 8 hours. NIOSH REL (United States, 1/2013). STEL: 54000 mg/m ³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m ³ 8 hours TWA: 5000 ppm 8 hours. OSHA PEL (United States, 6/2010). TWA: 9000 mg/m ³ 8 hours TWA: 5000 ppm 8 hours.

	OSHA PEL 1989 (United States, 3/1989). STEL: 54000 mg/m ³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m ³ 8 hours TWA: 5000 ppm 8 hours.
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- Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.
- Environmental exposure control : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.
- Individual protection measures
- Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking, using the lavatory and at the end of your shift.
Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/Face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.
- Skin protection
- Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

9. Physical and Chemical Properties

Appearance

Physical state	: Gas at normal temperature and pressure
Color	: Colorless
Molecular weight	: 44.01 g/mol
Molecular formula	: C-O ₂
Melting/freezing point	: Sublimation temperature: -79C (-110.2F)
Critical temperature	: 30.85C (87.5F)
Odor	: Odorless
Odor threshold	: Not available.
pH	: Not available.
Flash point	: [Product does not sustain combustion.]
Burning time	: Not applicable.
Burning rate	: Not applicable.
Evaporation rate	: Not available.
Flammability (solid, gas)	: Not available.
Lower and upper explosive (flammable) limits	: Not available.
Vapor pressure	: 830 psig
Vapor density	: 1.53 (Air = 1), Liquid Density@BP: Solid Density = 97.5 lb/ft ³ (1562 kg/m ³)
Specific Volume	: 8.7719 ft ³ /lb (m ³ /g)
Gas Density	: 0.114 lb/ft ³ (178.6 g/m ³)
Relative density	: Not applicable.
Solubility	: Not available.
Solubility in Water	: Not available.
Partition coefficient: n-octanol/water	: 0.83
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
SADT	: Not available.
Viscosity	: Not applicable.

10. Stability and Reactivity

Reactivity	: No specific test data related to reactivity is available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: No specific data.
Hazardous decomposition	: Under normal conditions of storage and use, hazardous decomposition

products : products should not be produced.
Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

11. Toxicological Information

Information on toxicological effects

Acute toxicity : Not available.
Irritation / Corrosion : Not available.
Sensitization : Not available.
Mutagenicity : Not available.
Carcinogenicity : Not available.
Reproductive toxicity : Not available.
Teratogenicity : Not available.
Specific target organ toxicity (single exposure) : Not available.
Specific target organ toxicity (repeated exposure) : Not available.
Aspiration hazard : Not available.
Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.
Inhalation : No known significant effects or critical hazards.
Skin contact : No known significant effects or critical hazards.
Ingestion : Since this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.
Inhalation : No specific data.
Skin contact : No specific data.
Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.
Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.
Potential delayed effects : Not available.

Potential chronic health effects – Not available.

General : No known significant effects or critical hazards.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates : Not available.

12. Ecological Information

Toxicity : Not available.

Persistence and degradability : Not available.

Bioaccumulative potential

Product/Ingredient name	Log P _{ow}	BCF	Potential
Carbon Dioxide	0.83	-	low

Mobility in soil

Soil/Water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

13. Disposal Considerations

Discharge of Carbon Dioxide : Gradually release in open air.

Disposal of Cylinders : If gas remains in cylinders, release gas with proper equipment and dispose of cylinders as incombustible waste.
For empty cylinders, check for a puncture hole and dispose of as incombustible waste.
Do not dispose of cylinders without first checking that all gas has been released.

14. Transport Information

DOT / IMDG : Carbon Dioxide

Shipping Name

UN Number : UN 1013

Hazard Class : 2.2

Placard (When required) : Nonflammable gas



Special Shipping Information : See CFR 49, 172.101, 173.306 for exceptions of labeling.

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. Federal Regulations	:	None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.
SARA 311/312	:	Fire hazard : No
Hazardous Categories	:	Sudden release of pressure : Yes
	:	Reactive : No
	:	Immediate (acute) health hazard : No
	:	Delayed (chronic) health hazard : No
State Regulations	:	Massachusetts : This material is listed.
	:	New York : This material is not listed.
	:	New Jersey : This material is listed.
	:	Pennsylvania : This material is listed.
	:	California : This material is listed. Not regulated under CA Proposition 65.
International Regulations	:	Canada inventory : This material is listed or exempted.
	:	Australia inventory (AICS) : This material is listed or exempted.
	:	China inventory (IECSC) : This material is listed or exempted.
	:	Japan inventory : This material is listed or exempted.
	:	Korea inventory : This material is listed or exempted.
	:	Malaysia inventory (EHS Register) : Not determined.
	:	New Zealand inventory of Chemicals (NZIoC) : This material is listed or exempted.
	:	Philippines inventory (PICCS) : This material is listed or exempted.
	:	Taiwan inventory (CSNN) : Not determined.

16. Other Information

Hazard Rating Systems	:	NFPA Ratings	HMIS Ratings
		Health = 2	Health = 1
		Flammability = 0	Flammability = 0
		Reactivity = 0	Physical hazards = 3
		Special = SA	

Key to abbreviations

ACGIH	:	American Conference of Governmental Industrial Hygienists
BCF	:	Bioconcentration Factor
CAS	:	Chemical Abstract Services
CERCLA	:	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	:	United States Code of Federal Regulations

DOT	: Department of Transportation
GHS	: Globally Harmonized System of Classification and Labeling of Chemicals
IATA	: International Air Transport Association
IMDG	: International Maritime Dangerous Goods
Log P _{ow}	: Logarithm of the octanol/water partition coefficient
NIOSH	: National Institute for Occupational Safety and Health
OSHA	: Occupational Safety and Health Administration
STEL	: Short-term Exposure Limit
SARA	: Superfund Amendments and Reauthorization Act
TLV	: Threshold Limit Value
TSCA	: Toxic Substances Control Act
TWA	: Time Weighted Average

Notice to reader:

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee they are the only hazards that exist.



Safety Data Sheet

Issued by Atp	Department R&D	Date 07 November 2014	Page no 1 (10)
Product denomination Ikaros Day & Night Signal		Document no. SDS Ikaros Day and Night Signal	Edition no. 9

Supersedes: Version 8 dated 24 October 2014

SECTION 1 IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product Name	Day & Night Signal (Original name: Day and Night Distress Signal, MK13, Smoke and Light N.2)
Article Nos.	343200
Chemical name	2 g of ignition composition, 32 g of red illuminating composition and 25 g of orange smoke composition.
Document number	SDS Ikaros Day and Night Signal – ed9

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use	Distress signal
Uses advised against	None specified

1.3. Details of the supplier of the safety data sheet

Company/Manufacturer	Hansson PyroTech AB / Nammo LIAB AB
Company address	P O Box 154, SE-711 23 Lindesberg, Sweden
E-mail, internet	info@hansson-pyrotech.com www.hansson-pyrotech.com
Telephone number	+46 581 871 00
Telefax number	+46 581 872 51

1.4. Emergency telephone number

Emergency telephone number	+46 581 87 111 (Available 24 hours)
Contact person	Ask for officer on duty at Nammo LIAB AB

SECTION 2 HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Main health hazard	Hazards refer to contents of signal
Inhalation	May be mildly irritating to respiratory system
Skin contact	May be mildly irritating to skin. Contact with flame or hot tube can cause severe burns
Eye contact	May be irritating to eyes
Ingestion	May be mildly irritating to gastro-intestinal tract. May cause nausea and vomiting
Fire and explosive hazards	Risk of explosion by shock, friction, fire or other sources of ignition
Environmental hazards	Toxic to aquatic life with long lasting effects



Safety Data Sheet

Issued by Atp	Department R&D	Date 07 November 2014	Page no 2 (10)
Product denomination Ikaros Day & Night Signal		Document no. SDS Ikaros Day and Night Signal	Edition no. 9

Supersedes: Version 8 dated 24 October 2014

CLP Classification Explosive Division 1.4 – H204 H319 – Irritant, Category 2 Aquatic Chronic Category 2 – H411 For full wording of Hazard statements see Section 16	DPD Classification Explosive – R2 Harmful –R22-R36 Hazardous for the Environment –R51/53 For full wording of Risk phrases see Section 16
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2.2. Label elements

DANGER

Contains: Potassium chlorate, strontium nitrate and 1-aminoanthraquinone

H204 – Fire or projection hazard.

H319 - Causes serious eye irritation.

H411 – Toxic to aquatic life with long lasting effects.



P102 - Keep out of reach of children.

P210 - Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

P273 – Avoid release to the environment.

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P501 – Dispose of contents / container to authorised waste disposal facility.

P370+P378 - In case of fire: Use water for extinction.

2.3. Other hazards

May be mildly irritating to skin, respiratory system and gastro-intestinal tract.

Contact with flame or hot tube can cause severe burns.

SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

Hazardous component(s)

Under CLP EC1272/2008

Substances	CAS No.	REACH Reg. No.	%	Gram	CLP Hazard Category & H Statements
1-aminoanthraquinone	82-45-1	Not yet available	8.0	4.7	Aquatic Chronic Cat 2 – H411
Strontium nitrate	10042-76-9	01-2120007501-75	7.2	4.2	Oxidising Solid Cat 3 – H272 Acute Toxic Cat 4 – H302 Eye Irritant Cat 2 – H319
Magnesium powder	7439-95-4	01-2119537203-49	4.0	2.4	Water Reactive Cat 1 – H260
Potassium Chlorate	3811-04-9	01-2119494917-18	3.6	1.1	Oxidising Solid Cat 1 – H271 Acute Toxic Cat 4 – H302, 332 Aquatic Chronic Cat 2 – H411



Safety Data Sheet

Issued by Atp	Department R&D	Date 07 November 2014	Page no 3 (10)
Product denomination Ikaros Day & Night Signal		Document no. SDS Ikaros Day and Night Signal	Edition no. 9

Supersedes: Version 8 dated 24 October 2014

Under DPD EC1999/45

Substances	CAS No.	EC No.	%	Gram	Symbol & Risk phrases
1-amino anthraquinone	82-45-1	201-423-5	8.0	4.7	N: R51/53
Strontium nitrate	10042-76-9	233-131-9	7.2	4.2	O, Xn: R8-22-36
Magnesium powder	7439-95-4	231-104-6	4.0	2.4	F: R15
Potassium Chlorate	3811-04-9	223-289-7	3.6	1.1	O, Xn, N: R9-20/22-51/53

For full wording of H-statements and R-phrases see Section 16.

SECTION 4 FIRST-AID MEASURES

4.1. Description of first aid measures

After inhalation	Move patient to fresh air.
After skin contact	If burned, wash with plenty of water for at least 20 min.
After eye contact	Keep eyelids apart. Wash with a lot of water for several minutes. If needed visit physician.
After ingestion	Contact a physician.

4.2. Most important symptoms and effects, both acute and delayed

Contact with flame or hot tube can cause severe burns. May be mildly irritating to skin, respiratory system and gastro-intestinal tract.

4.3. Indication of any immediate medical attention and special treatment needed

None other than above.

SECTION 5 FIRE-FIGHTING MEASURES

5.1. Extinguishing media

- Suitable extinguishing media	Use any fire extinguishing media at early stages of fire. Once the product has ignited it cannot be extinguished.
- Not to be used	No restriction.

5.2. Special hazards arising from the substance or mixture

Product is explosive, evolving large quantities of gases and emitting large quantities of heat radiation if involved in fire.

5.3. Advice for fire-fighters

Normal equipment.



Safety Data Sheet

Issued by Atp	Department R&D	Date 07 November 2014	Page no 4 (10)
Product denomination Ikaros Day & Night Signal		Document no. SDS Ikaros Day and Night Signal	Edition no. 9

Supersedes: Version 8 dated 24 October 2014

SECTION 6 ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Normal industrial hygiene, use protective gloves.

6.2. Environmental precautions

Do not let waste reach drains, sewers and bodies of water or leak into ground.

6.3. Methods and material for containment and cleaning up

Collect using non-sparking tools, reuse if undamaged. Otherwise, keep for disposal by experts.

6.4. Reference to other sections

See Sections 8 & 13.

SECTION 7 HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid dropping the signal on hard surfaces.

7.2. Conditions for safe storage, including any incompatibilities

Storage Temperature should not exceed +75° C

7.3. Specific end use(s)

Distress signal

SECTION 8 PERSONAL PROTECTION/EXPOSURE CONTROLS

8.1. Control parameters

None set

8.2. Exposure controls

Recommended engineering controls No fire, sparks or welding close to the items. If cleaning up spillage, use tools which can not strike sparks.

Personal protective equipment Normally none needed. But in case of spillage:

- Respiratory protection In case of dust use particle filter mask such as EN143 Type P or EN149 Type FFP-S.

- Hand protection Leather or similar protective gloves.

- Eye protection Shatter-proof glasses or goggles.

- Skin protection Normal industrial hygiene

Specific hygiene measures No smoking.

Further information Always check applicability with your supplier of protective equipment.



Safety Data Sheet

Issued by Atp	Department R&D	Date 07 November 2014	Page no 5 (10)
Product denomination Ikaros Day & Night Signal		Document no. SDS Ikaros Day and Night Signal	Edition no. 9

Supersedes: Version 8 dated 24 October 2014

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Hermetically sealed in a plastic container with red and yellow label. Green lid for smoke and red lid with tactile marking for flare
Odour	None
Odour threshold value	Not applicable
pH (concentrated product)	Not applicable
Melting point (°C)	Not determined
Boiling point/range (°C)	Not applicable
Flash point (°C)	Not applicable
Evaporation rate	Not applicable
Flammability	Contents are flammable
Explosive properties	Explosive device! Product will emit smoke and a very hot flame if ignited. Once ignited it can not be extinguished.
Vapour pressure (mbar at 25°C)	Not applicable
Vapour density	Not applicable
Density at 20°C (g/cm ³)	Not determined
Solubility in water (% by weight)	Insoluble
Solubility in solvents	Not determined
Partition coefficient (log Pow)	Not applicable
Autoignition temperature (°C)	> 150
Decomposition temperature (°C)	Not determined
Viscosity	Not applicable
Oxidising properties	Contents have oxidising properties

9.2. Other information

Note: These are typical values and do not constitute a specification

SECTION 10 STABILITY AND REACTIVITY

10.1. Reactivity

Stable product under recommended storage and handling conditions.

10.2. Chemical stability

Stable product under recommended storage and handling conditions.



Safety Data Sheet

Issued by Atp	Department R&D	Date 07 November 2014	Page no 6 (10)
Product denomination Ikaros Day & Night Signal		Document no. SDS Ikaros Day and Night Signal	Edition no. 9

Supersedes: Version 8 dated 24 October 2014

10.3. Possibility of hazardous reactions

Stable product under recommended storage and handling conditions.

10.4. Conditions to avoid

High temperatures, above 75 °C

10.5. Incompatible materials

Not applicable.

10.6. Hazardous decomposition products

Product is explosive, evolving large quantities of gases and emitting large quantities of heat radiation if involved in fire.

SECTION 11 TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

No data available on mixture. Data based on individual components shown below.

Hazardous ingredients	Potassium chlorate and Strontium nitrate.
(a) acute toxicity	Potassium chlorate: LD ₅₀ oral rat 1870 mg/kg - Harmful by ingestion Strontium nitrate: LD ₅₀ oral rat 1892 mg/kg - Harmful by ingestion Calculated product ATE = 17474 mg/kg – not harmful
(b) skin corrosion/irritation	Not classified as Skin Irritant Category 2 under CLP
(c) serious eye damage/irritation	Not classified as Eye Irritant Category 2 under CLP
(d) respiratory or skin sensitisation	No ingredients classified as sensitisers
(e) germ cell mutagenicity	No deleterious effects known.
(f) carcinogenicity	No deleterious effects known.
(g) reproductive toxicity	No deleterious effects known.
(h) STOT-single exposure	No deleterious effects known.
(i) STOT-repeated exposure	No deleterious effects known.
(j) aspiration hazard	No deleterious effects known.
Likely routes of exposure	Contact with skin
Symptoms related to the physical, chemical and toxicological characteristics	Powders may be mildly irritating to the skin, eyes and respiratory tract. May cause gastric irritation, nausea and vomiting.
Delayed and immediate effects as well as chronic effects from short and long-term exposure	No deleterious effects known.



Safety Data Sheet

Issued by Atp	Department R&D	Date 07 November 2014	Page no 7 (10)
Product denomination Ikaros Day & Night Signal		Document no. SDS Ikaros Day and Night Signal	Edition no. 9

Supersedes: Version 8 dated 24 October 2014

Other information None

SECTION 12 ECOLOGICAL INFORMATION

12.1. Toxicity

No data available on mixture. Data based on individual components shown below.

1-aminoanthraquinone EC₅₀ Algae 72h: 0.25mg/l harmful.

12.2. Persistence and degradability

Not applicable – contains inorganic materials and is in form of solid article.

12.3. Bioaccumulative potential

Mobility No test data on product.

12.4. Mobility in soil

None – product in form of solid article.

12.5. Results of PBT and vPvB assessment

Does not fulfil the criteria for classification as PBT or vPvB.

12.6. Other adverse effects

Not Marine pollutant (IMDG Code).

SECTION 13 DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Disposal of waste materials Waste should be kept in separate container.
NO SMOKING!
Destruction must only be done by experts. Used product may be disposed as ordinary plastic/metallic waste.
DO NOT TRY TO DISMANTLE THE PRODUCT!

Contaminated packing May burn rapidly.

SECTION 14 TRANSPORT INFORMATION

14.1. UN numbers	See table below
14.2. UN proper shipping name	See table below
14.3. Transport hazard class(es)	See table below
14.4. Packing group	Not applicable
14.5. Environmental hazards	None
14.6. Special precautions for user	See P Statements in Section 2.2
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable



Safety Data Sheet

Issued by Atp	Department R&D	Date 07 November 2014	Page no 8 (10)
Product denomination Ikaros Day & Night Signal		Document no. SDS Ikaros Day and Night Signal	Edition no. 9

Supersedes: Version 8 dated 24 October 2014

Transport Classification

Article Number (Order article No.)	343200
- UN No.	0191
- Proper shipping name	Signal devices, hand
- Transport Class	1.4G
- Packing Instruction	P135
Label	1.4

IMO-IMDG code

- EMS code	
EX number (DOT/USA)	2010101256
Swedish Rescue Service Agency Cert. No.	2009-4246

Comment Not classified as Marine Pollutant

SECTION 15 REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

None specified

15.2. Chemical Safety Assessment

A Chemical Safety Assessment has not been carried out on this mixture.

SECTION 16 OTHER INFORMATION

Inventories - All ingredients listed in EINECS.

Sources of data used in this SDS

In-house data files
Literature such as Sax's Dangerous Properties of Industrial Materials, the RSC Dictionary of Substances and their Effects, RTECS
CLP Annex VI Tables 3.1 & 3.2
Suppliers' Safety Data Sheets
EU ESIS web site



Safety Data Sheet

Issued by Atp	Department R&D	Date 07 November 2014	Page no 9 (10)
Product denomination Ikaros Day & Night Signal		Document no. SDS Ikaros Day and Night Signal	Edition no. 9

Supersedes: Version 8 dated 24 October 2014

Version number 8
Date prepared 207.11.14
Supersedes Version 8 dated 24.10.14
Nature of revision Correction of CAS numbers for the ingredients.

Mixture classified under CLP (EC1272/2008) by calculation based on ingredient information.

R-phrases used in document

R2	Risk of explosion by shock, friction, fire or other sources of ignition
R8	Contact with combustible material may cause fire
R9	Explosive when mixed with combustible material
R15	Contact with water liberates extremely flammable gases
R22	Harmful if swallowed
R20/22	Harmful by inhalation and if swallowed
R36	Irritating to eyes
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment

H-statements used in document

H204	Fire or projection hazard
H260	In contact with water releases flammable gases which may ignite spontaneously
H271	May cause fire or explosion; strong oxidiser
H272	May intensify fire; oxidiser
H302	Harmful if swallowed
H319	Causes serious eye irritation
H332	Harmful if inhaled
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

Based on EU Regulation 1907/2006 as amended by 453/2010

The current Material Safety Data Sheet was defined by Hansson PyroTech AB on the basis of knowledge of the product at the date of issue.

Therefore, data provided in this form can not be considered as exhaustive.

It is the duty of the operator

- to develop under his own responsibility, the safety dispositions regarding the operation of the product taking into account the data from this form



Safety Data Sheet

Issued by Atp	Department R&D	Date 07 November 2014	Page no 10 (10)
Product denomination Ikaros Day & Night Signal	Document no. SDS Ikaros Day and Night Signal		Edition no. 9

Supersedes: Version 8 dated 24 October 2014

- to pass to all users and operators the appropriate safety data and warning regarding the risks mentioned in the documentation relative to the utilisation of the product
- to be cautious of possible risks faced when the product is used for other utilisation than those for which it has been designed

SAFETY DATA SHEET

1. Product and Company Identification

Day and Night, Smoke and Light N. 2

Use: Distress Signal

CIL / Orion

Phone Number: 450-566-0655

533 Argenteuil

LACHUTE, Quebec Canada J8H3Y2

EMERGENCY 613-996-6666

2. Hazards Identification

Emergency Overview



Danger

GHS Classifications

Explosive	Division 1.4
Acute Toxicity	Category 4
Skin Corrosion / Irritation	Product- Category 1A Contents - Category 2
Serious Eye Damage / Irritation	Product-Category 1 Contents - Category 2B
Respiratory or Skin Sensitization	Contents - Category 1
STOT - Repeated Exposure	Contents - Category 2
Aquatic Hazard (Acute/Chronic)	Category 1

Hazard Statements:

Fire or projection hazard
Harmful if swallowed
Very toxic to aquatic life with long lasting effects
Burning flare causes severe skin burns and eye damage
Contents cause skin and eye irritation
May cause allergic reaction to individuals sensitive to milk proteins
May cause damage to thyroid through ingestion of contents after prolonged or repeated exposure

NFPA Rating

Flammability 2
Health 2
Reactivity 1

Precautionary Statements:

Keep out of reach of children.
Keep away from heat/sparks/open flames/hot surfaces. – no smoking.
Keep/Store away from combustible materials.
Use only non-sparking tools
Avoid breathing dust/smoke
Do not ignite inside a building, vehicle or boat cabin.
Do not dismantle.
Allow signal to burn to completion.
Avoid release to the environment.(contents)
Use personal protective equipment as required.
In case of fire: use water deluge. Do not use dry powder or foam extinguishers!

HMIS Rating

Flammability 1
Health 3
Physical Hazard 1

3. Composition / Information on Ingredients

Component	CAS #	EINCS #	%age
1-Amino-Anthraquinone	82-45-1	201-423-5	20-40%
Magnesium	7439-95-4	231-104-6	10-30%
Strontium Nitrate	10042-76-9	233-131-9	10-30%
Potassium Chlorate	3811-04-9	231-100-4	1-20%
Potassium Perchlorate	7778-74-7	231-912-9	1-20%
Lactose	63-42-3	238-691-8	1-20%
Polyvinyl Chloride	9002-86-2	200-831-0	1-20%

4. First Aid Measures

Inhalation	If fumes from ignition or contents are inhaled, remove to fresh air. If not breathing, give artificial respiration and get medical aid.
Skin	For burns, cool with water and bandage appropriately. If contents are contacted, wash with area with soap and water for 15 minutes. Remove contaminated clothing and wash before reuse. Get medical aid if burned or irritation occurs.
Eyes	If burned, cover eye and get medical help immediately. If contents get into eye, flush with plenty of water for at least 15 minutes, occasionally lifting the up and lower lids. Remove contact lenses if easily possible Get medical aid immediately.
Ingestion	Get medical aid immediately.

5. Firefighting Measures

Extinguishing Media	Water deluge	Unsuitable Extinguishing Media	Foam and dry chemical extinguishers and suffocation are ineffective.
Protective Equipment and Precautions for Firefighters	Use NIOSH/MSHA approved self-contained breathing apparatus when this material is involved in a fire. If a large number of signals are involved in a fire, explosion is possible.		
Specific Hazards Arising from the Chemical	Flame and sparks and dense smoke are ejected out the open ends of the flare when it functions. Use copious amounts of water to extinguish fire. Using small quantities of water on contents can cause auto / re-ignition as contents contain magnesium. Use of water on a magnesium fire will generate hydrogen gas that may cause an explosion		
Flashpoint	Not Applicable	Flammability Limits	Not Applicable
		Ignition Temperature	>400°F



Div: EVANinc

Explosives EXPERTS
Explosifs

533 Argentueil
LACHUTE, Québec
Canada J8H 3Y2

Tel.: (450) 566-0655
Fax: (450) 566-0677

6. Accidental Release Measures

Personal Precautions

Do not breathe contents and avoid contact with skin and eyes. If significant amounts of dust are present, wear chemical safety goggles, Viton or Norfoil gloves, clothing designed to prevent or minimize skin contact and a NIOSH/MSHA approved dust respirator. Keep away from ignition sources.

Environmental Precautions

Prevent dispersion of contents on soil and in water. Prevent contents from spreading or entering into drains, ditches, groundwater or rivers by using appropriate barriers.

Methods for Containment and Clean-up

Be sure all ignition sources are removed before beginning the cleaning operation. Use caution when cleaning up spilled product contents. Use non-static forming broom and dust pan to clean up dust. Undamaged signals may be picked up and put back into their original shipping containers or containers approved by local, state and federal authorities. Pick up spill for recovery or disposal and place in an approved container.

7. Handling and Storage

Handling

Keep out of reach of children. Do not dismantle. Do not allow contents to touch eyes, skin or clothing. Flush skin areas contacted with large amount of water. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not ingest contents. Avoid inhalation of smoke. Signals should be allowed to burn to completion. Unburned and partially burned signals contain potassium perchlorate which should not be allowed to come into contact with surface and ground water. Perchlorate Material – special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate.

Storage

Store in a cool, dry place away from all sources of ignition.

8. Exposure Controls / Personal Protection

Exposure Limits	OSHA PEL	ACGIH TLV
1-Amino-Anthraquinone	No data available	No data available
Magnesium	Not established	Not established
Strontium Nitrate	Not established	Not established
Potassium Perchlorate	Nuisance dust 15 mg/m ³	Nuisance dust 15 mg/m ³
Potassium Chlorate	Not established	Not established
Lactose	Nuisance particulate, 15 mg/m ³ of total dust	Nuisance particulate 10 mg/m ³ of total dust
Polyvinyl Chloride	5mg/ml for the respirable portion and 15mg/ml for total dust.	5 and 10mg/ml, respectively

**Engineering Controls
Eye / Face Protection**

Use product outdoors only! When cleaning up powder, use local and/or general exhaust.
No protective equipment is required unless signals have broken open. For cleanup, wear NIOSH approved goggles to protect from dust

**Skin Protection
Respiratory Protection
General Hygiene**

None under normal conditions when using product. For cleanup, wear NIOSH approved gloves to protect from dust.
None under normal conditions when using product. For cleanup, wear NIOSH approved respirator to protect from dust.
Use product outdoors away from combustible products.

9. Physical and Chemical Properties

Appearance (colour, physical form, shape):	Plastic tube with red plastic cap on one end and green plastic cap on other		
pH:	Not available	Melting Point:	Not available
Boiling Point	Not applicable	Freezing Point:	Not applicable
Vapour Pressure:	Not applicable	Specific Gravity	Not applicable
		Solubility:	Not available
		Evaporation Rate:	Not applicable
		Vapour Density:	Not applicable

10. Stability and Reactivity

Chemical Stability	Stable	Possibility of Hazardous Reactions	Hazardous polymerization will not occur.
Conditions to Avoid	Excessive temperatures, moisture, water, and ignition sources..	Incompatible Materials	Avoid exposure to oxidizers, strong acids and strong bases.
		Hazardous Decomposition Products	Carbon monoxide, Carbon dioxide, Sulfur oxide.

11. Toxicology Information

Toxicology	Oral LD50	skin LD50	LC50
1-Amino-Anthraquinone	Rat: 1500 mg/kg	No data available	Not stated
Magnesium	Rat: >2000 mg/kg	Not available	Not available
Strontium Nitrate	Rat: 2750 mg/kg	Not stated	Not stated
Potassium Perchlorate	Rat: 2100 mg/kg	Not stated	Not stated
Potassium Chlorate	Rat 1870 mg/kg	No information found	No information found
Lactose	Rat > 10000 mg/kg	No information found	No information found
Polyvinyl Chloride	The product is biologically inert.	Not available	Not available

Acute Dose Effects

Can cause skin, eye and mucous membrane irritation; dermatitis and nausea. Contains traces of milk protein: inhalation of dust may lead to sensitization in some allergic individuals. Contact of contents with skin may cause possible burns, especially if skin is wet or moist, due to the potassium chlorate.

Repeated Dose Effects

Potassium chlorate may cause methemoglobinemia, cyanosis, convulsions, tachycardia, dyspnoea, and death..



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533 Argentueil
LACHUTE, Québec
Canada J8H 3Y2

Tel.: (450) 566-0655
Fax: (450) 566-0677

Irritation	Contents can cause skin, eye and mucous membrane irritation or dermatitis. Inhalation will cause irritation to the lungs and mucus membrane.	Corrosivity	Contact with burning product will cause burns to eyes and skin. Contact with potassium chlorate in contents with skin may cause burns, especially if skin is wet or moist,
Carcinogenicity	None of the ingredients are suspect to be a carcinogen.	Reproductive Effects	No information found
Genetic Effects	No information found	Neurological Effects	No information found
Developmental Effects	Perchlorate exposure at certain levels can disrupt the function of the thyroid gland by interfering with the iodide uptake and thyroid hormone production. This interference may lead to developmental defects. Scientists consider pregnant women, children, infants, and individuals with thyroid disorders to be the populations most at risk of harm from being exposed to perchlorate.	Sensitization	Contains traces of milk protein: inhalation of dust may lead to sensitization in some allergic individuals

Target Organ Effects Eye, skin, liver, kidney, and thyroid.

12. Ecological Information

Aquatic Toxicity	Persistence / Degradability	Bioaccumulation / Accumulation	Mobility in Environmental Media
<u>1-Aminoanthraquinone</u> : Fish: 48h LC50:>30 mg/L (<i>Oryzias latipes</i>); EC50 - <i>Daphnia magna</i> (Water flea) - > 82.3 mg/l - 48 h - Toxic to aquatic life.	1-Aminoanthraquinone: 0 % (by BOD), 2 % (by HPLC)	1-Aminoanthraquinone: 50 - 150 (conc. 30 ug/L), 55 - 137 (conc. 3 ug/L)	Strontium Nitrate: Water:: considerable solubility and mobility; Soil/sediments non-significant adsorption
<u>Magnesium</u> : Fishes <i>Pimephales promelas</i> LC50(98hr) 541 mg/L; Fishes, <i>Daphnia magna</i> , LC50(48hr) 140 mg/L			
<u>Strontium Nitrate</u> : Acute toxicity - Fishes, <i>Carassius auratus</i> , LC100, 9,615 mg/l; Chronic toxicity - Fishes, <i>Gasterosteus aculeatus</i> , LC100, 2,912 mg/l			
<u>Potassium Chlorate</u> : fish: LC50 <i>oncorhynchus mykiss</i> (rainbow trout) 1750 mg/l - 96 hr, EC50 <i>daphnia magna</i> (water flea) 1093 mg/l 24 hr			

13. Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.. Refer to California Code of Regulations, Title 33, Sections 67384.1-67384.10 for additional information on handling and disposal of potassium perchlorate containing materials.

14. Transportation Information

Shipping Name	Hazard Class	ID Number	Packing Group	EX Number	Reportable Quantities	Net Explosive Quantity
Signal Devices, Hand	1.4G	UN0191	II	EX-2011021134	none	0.06 kg/unit

15. Regulatory Information

US Regulations	TSCA	CERCLA	CWA	CAA	SARA 313	SARA 302	Acute	Chronic	Fire	Reactivity	Pressure
1-Amino-Anthraquinone	yes	no	no	no	no	no	no	no	no	no	no
Magnesium	8(b)	no	no	no	no	no	no	yes	yes	no	no
Strontium Nitrate	yes	no	no	no	no	no	yes	no	no	yes	no
Potassium Perchlorate	yes	no	no	no	no	no	yes	yes	no	yes	no
Potassium Chlorate	yes	no	no	no	no	no	yes	yes	no	yes	no
Lactose	yes	no	no	no	no	no	no	no	no	no	no
Polyvinyl Chloride	yes	no	no	no	no	no	yes	no	no	no	no

US States	Prop 65	NJ	PA	Canada	WHMIS	DSL	Europe	wgk
1-Amino-Anthraquinone	no	no	no		D2B - toxic	yes		1
Magnesium	no	1136	yes		No results	yes		nwg
Strontium Nitrate	no	1743	no		No results	yes		2
Potassium Perchlorate	no	1577	no		C - Oxidizing material	yes		1
Potassium Chlorate	no	1560	no		No results	yes		2
Lactose	no	no	no		No results	yes		not listed
Polyvinyl Chloride	no	3622	no		No results	yes		not listed



Div: EVANinc

Explosives
EXPERTS
Explosifs

533 Argentueil
LACHUTE, Québec
Canada J8H 3Y2

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16. Other Information

Revision Information: May, 2014

Risk and Safety Phrases:

- R10 Flammable
- R38, Irritating to skin
- R20 Harmful by inhalation.
- R21 Harmful in contact with skin.
- R22 Harmful if swallowed.
- R34 Causes burns
- R36 Irritating to eyes.
- R37 Irritating to respiratory system.
- S17 Keep away from combustible material
- S16 Keep away from sources of ignition
- S2 Keep out of the reach of children.

- S8 Keep container dry.
- S13 Keep away from food, drink and animal foodstuffs.
- S24 Avoid contact with skin.
- S25 Avoid contact with eyes.
- S29 Do not empty into drains.
- S41, In case of fire and / or explosion do not breathe fumes
- S43 In case of fire use water
- S51 Use only in well ventilated areas

Key / Legend:

- HMIS: hazardous material identification system
- NFPA: national fire protection association
- CAS: Chemical Abstracts Service number
- EINECS: European inventory of existing chemical substances
- OSHA PEL: occupational safety and health administration permissible exposure limit
- NIOSH TLV: national institute of occupational safety and health Threshold Limit Value
- NTP: National Toxicology Program
- IARC: International Agency for Research on Cancer

- TSCA: toxic substance control act - US
- CERCLA: comprehensive environmental response, compensation and liability act - US
- CWA: clean water act - US
- CAA: clean air act - US
- SARA: superfund amendments and reauthorization act - US
- PROP 65: California's Proposition 65 list
- WHMIS: workplace hazardous materials information system - Canada
- DSL: Domestic Substances List - Canada
- WGK: water hazard classes - Germany

Legal Statement:

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