1. Identification of the substance / preparation and company / undertaking

Product name    HARP® Hydrocarbon Aerosol Propellant
REACH registration number    Exempt under REACH in accordance with Article 2(7)(b)
Company    Harp International Ltd
Gellihirion Industrial Estate
Pontypridd
Rhondda Cynon Taff
CF37 5SX
Tel: +44 (0) 1443 842255
Fax: +44 (0) 1443 841805
Email: harp@harpintl.com
Emergency phone number    +44 (0) 1270 502891 (24 hour)
Use    Aerosol propellant

2. Hazards identification

Classification of the substance or mixture

| Classification according to Regulation (EC) No 1272/2008/EC (CLP/GHS) |
|---------------------------|-------------------|
| Hazard classes / categories | Hazard statement |
| Flammable Gas, Category 1 | H220              |
| Gases under pressure      | H280              |

<table>
<thead>
<tr>
<th>Classification according to Directive 67/548/EEC &amp; 1999/45/EC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard characteristics</td>
</tr>
<tr>
<td>Extremely flammable</td>
</tr>
</tbody>
</table>

Label elements

Labelling according to Regulation (EC) No 1272/2008

Pictograms

Signal word    Danger

Hazard statements

H220    Extremely flammable gas
H280    Contains gas under pressure; may explode if heated

Not classified as a health hazard under GHS criteria.
Not classified as an environmental hazard under GHS criteria.
Precautionary statements

Precautionary statement prevention
P102     Keep out of reach of children
P210     Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P243     Take precautionary measures against static discharges

Precautionary statement response
P377     Leaking gas fire: Do not extinguish unless leak can be stopped safely
P381     Eliminate all ignition sources if safe to do so.

Precautionary statement storage
P410+P403     Protect from sunlight. Store in a well-ventilated place.

Labelling according to Directive 1999/45/EC

EC classification    Extremely flammable
EC risk phrases    R12    Extremely flammable
EC safety phrases    S2    Keep out of reach of children
S9    Keep container in a well-ventilated place
S16    Keep away from sources of ignition – No smoking
S23    Do not breathe vapour
S33    Take precautionary measures against static discharges
S51    Use only in well-ventilated areas

Other hazards
Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache and nausea. High gas concentrations will displace available oxygen from the air. Unconsciousness and death may occur suddenly from lack of oxygen. Exposure to rapid expanding gases may cause frost burns to eyes and/or skin.

Safety hazards
Vapours are heavier than air. Vapours may travel across the ground and reach remote ignition sources causing a flashback fire danger. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire.

3. Composition / information on ingredients

Substance
CAS number    68476-85-7

Mixtures
Complex mixtures of hydrocarbons consisting predominantly of butanes and butenes, propane and propenes plus some C5 and higher hydrocarbons. Low concentrations of sulphur, hydrogen sulphide and mercaptans may be present.

Synonyms
AP22, AP30, AP40, AP48, AP70, AP105

Hazardous components

Classification of components according to Regulation (EC) No 1272/2008

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS No.</th>
<th>EINECS</th>
<th>REACH Reg. No.</th>
<th>Conc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum gases, liquefied</td>
<td>68476-85-7</td>
<td>270-704-2</td>
<td>Exempt</td>
<td>&lt;=100.00%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Hazard class &amp; category</th>
<th>Hazard statement</th>
</tr>
</thead>
</table>
4. First aid measures

Description of first aid measures

Inhalation
Remove to fresh air. If breathing but unconscious, place in the recovery position. If breathing has stopped, apply artificial respiration. If heartbeat absent, give external cardiac compression. Monitor breathing and pulse. Seek urgent medical advice.

Skin contact
In the event of frostbite, slowly warm the exposed area by rinsing with warm water. Otherwise obtain medical treatment immediately. Contaminated clothing may be a fire hazard and therefore should be soaked with water before being removed. Loosen tight clothing. Keep warm and at rest.

Eye contact
DO NOT DELAY. Obtain medical treatment immediately. Remove contact lenses if present and easy to do so. Continue rinsing. Flush eye with copious quantities of water.

Ingestion
In the unlikely event of ingestion obtain medical attention immediately.

Most important symptoms and effects, both acute and delayed
High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea. Continued exposure may result in unconsciousness and/or death.

Indication of any immediate medical attention and special treatment needed
Treat symptomatically. Administer oxygen if necessary.

5. Fire-fighting measures

Clear fire area of all non-emergency personnel.

Extinguishing media
Shut off supply. If not possible and no risk to surroundings, let the fire burn itself out. Use foam, water fog for major fires. Use dry chemical powder, carbon dioxide, sand or earth for minor fires.

Unsuitable extinguishing media
Do not use direct water jets on the burning product as they could cause a steam explosion and spread of the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

Special hazards arising from the substance or mixture
Hazardous combustion products may include carbon monoxide, unidentified organic and inorganic compounds. Sustained fire attack on vessels may result in a Boiling Liquid Expanding Vapour Explosion (BLEVE). Contents are under pressure and can explode when exposed to heat or flames. The vapour is heavier than air, spreads along the ground and distant ignition is possible.

Advice for fire fighters
Wear full protective clothing and self-contained breathing apparatus.

Additional advice
Keep adjacent containers cool by spraying with water.
6. Accidental release measures

Evacuate the area of all non-essential personnel. Ventilate contaminated area thoroughly. Avoid contact with spilled or released material. Immediately remove all contaminated clothing. Do not attempt to do so if clothing is adhering to skin. For guidance on selection of personal protective equipment see chapter 8 of this safety data sheet. For guidance on disposal of spilled material see chapter 13 of this safety data sheet.

Personal precautions, protective equipment and emergency procedures
Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area and evacuate all personnel. Attempt to disperse the gas or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Monitor area with combustible gas meter. Use appropriate containment to avoid environmental contamination. Test atmosphere for flammable gas concentrations to ensure safe working conditions before personnel are allowed to ensure the area.

Environmental precautions
Use appropriate containment to avoid environmental contamination.

Methods and materials for containment and cleaning up
Allow to evaporate. Attempt to disperse the vapour or to direct its flow to a safe location, for example, by using fog sprays. Otherwise treat as for small spillage.

Additional advice
Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Vapour may form an explosive mixture with air. Risk of explosion. Inform the emergency services if product enters surface water drains.

7. Handling and storage

General precautions
Avoid breathing vapours or contact with material. Only use in well-ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see chapter 8 of this safety data sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Air-dry contaminated clothing in a well-ventilated area before laundering. Use local exhaust ventilation if there is a risk of inhalation of vapours, mists or aerosols.

Precautions for safe handling
This product can create a low temperature exposure hazard when released as a liquid. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Avoid prolonged or repeated contact with the skin. Electrostatic charges may be generated during handling. Electrostatic discharge may cause fire. Earth all equipment.

Conditions for safe storage, including any incompatibilities
Store only in purpose-designed, appropriately labelled pressure vessels or cylinders. Must be stored in a well-ventilated area, away from sunlight, ignition sources and other sources of heat. Do not store near cylinders containing compressed oxygen or other strong oxidisers.

Specific end uses
Not applicable.

Additional information
This product is intended for use in closed systems only. Ensure that all local regulations regarding handling and storage facilities are followed. Exposure to this product should be reduced as low as reasonably practicable. Reference should be made to the Health and Safety Executive’s publication “COSHH Essentials”.
Product transfer
Do not use compressed air for filling, discharging or handling. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Delivery lines may become cold enough to present a cold burns hazard.

Recommended materials
For containers and container linings, use materials specifically approved for use with this product. Examples of suitable materials are PA-11, PEEK, PVDF, PTFE, GRE (Epoxy), GRVE (vinyl ester), Vitron (FKM), type F and GB, Neoprene (CR).

Unsuitable materials
Some forms of cast iron. Examples of materials to avoid are ABS, polymethyl methacrylate (PMMA), polyethylene (PE / HDPE), propylene (PP), PVC, natural rubber (NR), Nitrile (NBR), ethyl propylene rubber (EPDM), Butyl (IIR), Hypalon (CSM), polystyrene, polyvinyl chloride (PVC), polyisobutylene. For containers and container linings, aluminium should not be used if there is a risk of caustic contamination of the product.

Container advice
Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.

8. Exposure controls / personal protection

If the American Conference of Governmental Industrial Hygienists (ACGIH) value is provided on this document, it is provided for information only.

Control parameters

Occupational exposure limits

<table>
<thead>
<tr>
<th>Material</th>
<th>Source</th>
<th>Type</th>
<th>ppm</th>
<th>mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum gases, liquefied</td>
<td>EH40 WEL</td>
<td>TWA</td>
<td>1,000</td>
<td>1,750</td>
</tr>
<tr>
<td></td>
<td>EH40 WEL</td>
<td>STEL</td>
<td>1,250</td>
<td>2,180</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>TWA</td>
<td>1,000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Material</th>
<th>Source</th>
<th>Hazard designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum gases, liquefied</td>
<td>EH40 (UK)</td>
<td>Carc (only applies if LPG contains more than 0.1% of buta-1, 3-diene) R12</td>
</tr>
</tbody>
</table>

Biological Exposure Index (BEI)  No biological limit allocated.
Derived No Effect Levels (DNEL)  Not applicable
PNEC related information  Exposure assessments have not been presented for the environment therefore PNEC values not required

Exposure controls

General information  The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Use sealed systems as far as possible. Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits. Local exhaust ventilation is recommended.

Occupational Exposure Controls

Personal protective equipment  Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
Eye protection

Chemical splash goggles (gas-tight monogoggles) and face shield with chin guard. Approved to EU Standard EN166.

Hand protection

Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended. Suitability and durability of a glove is dependent on usage e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Where hand contact with the product may occur the use of gloves approved to relevant standard (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: Neoprene rubber. Nitrile rubber. If contact with liquefied product is possible or anticipated, gloves should be thermally insulated to prevent cold burns.

Body protection

Chemical and cold resistant gloves/gauntlets, boots and apron.

Respiratory protection

If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where air-filtering apparatus are suitable, select an appropriate combination of mask and filter. Select a filter suitable for organic gases and vapours (boiling point <65°C (149°F))

Thermal hazards

When handling cold material that can cause frost burns, wear heat resistant gloves, safety hat and visor, cold resistant overalls (with cuffs over gloves and legs over boots) and heavy duty boots e.g. leather for cold resistance.

Monitoring methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with and OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.

Environmental Exposure Controls

Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance/colour</td>
<td>Colourless, Liquid under pressure</td>
</tr>
<tr>
<td>Odour</td>
<td>Odourless if unstencched</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Initial boiling point &amp; boiling range</td>
<td>Typical -40°C to -2°C / -40°F to 28°F 1,013hPa</td>
</tr>
<tr>
<td>Flash point</td>
<td>Typical &lt;-60°C / -76°F</td>
</tr>
<tr>
<td>Upper/lower Flammability or explosion limits</td>
<td>Typical 1.4 – 10.9 % (V)</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Typical 365°C / 689°F</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>ca. 590 to 1,760 kPa at 45°C / 113°F</td>
</tr>
<tr>
<td>Density</td>
<td>Typical 300-510 kg/m³ at 15°C / 59°F</td>
</tr>
<tr>
<td>Water solubility</td>
<td>Negligible</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>Data not available</td>
</tr>
<tr>
<td>n-octanol/water partition coefficient (log Pow)</td>
<td>ca. 2.3 to 2.8</td>
</tr>
</tbody>
</table>
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Dynamic viscosity          Not applicable
Kinematic viscosity        Not applicable
Vapour density (air=1)     ca. 1.5 at 15°C / 59°F
Evaporation rate (nBuAc=1) Data not available
Flammability               Extremely flammable

10. Stability and reactivity
Reactivity                  No, product will not become self-reactive
Chemical stability          Stable
Possibility of hazardous reactions No, hazardous, exothermic polymerisation cannot occur
Conditions to avoid         Heat, open flames, sparks and flammable atmospheres
Incompatible materials      Strong oxidising agents
Hazardous decomposition products Hazardous decomposition products are not expected to form during normal storage

11. Toxicological information
Information on toxicological effects
Basis for assessment        Information given is based on product data, a knowledge of the components and the toxicology of similar products.
Likely routes of exposure   Inhalation is the primary route of exposure although exposure may occur through skin or eye contact
Acute oral toxicity         Not applicable
Acute dermal toxicity       Not applicable
Acute inhalation toxicity   Low toxicity: LC50 >20 mg/l / 4.00 h, Rat
Skin corrosion / irritation Not irritating to skin
Serious eye damage / irritation Essentially non-irritating to eyes
Respiratory irritation      Inhalation of vapours or mists may cause irritation to the respiratory system
Respiratory or skin sensitisation Not expected to be a sensitizer.
Aspiration hazard          Not considered an aspiration hazard
Germ cell mutagenicity      There is no evidence of mutagenic activity
Carcinogenicity            Not expected to be carcinogenic
Reproductive & developmental toxicity Not expected to impair fertility. Not a developmental toxicant
Specific target organ toxicity – single Exposure High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.
Specific target organ toxicity – repeated Exposure Low systemic toxicity on repeated exposure
Additional information

Rapid release of gases which are liquids under pressure may cause frost burns of exposed tissues (skin, eye) due to evaporative cooling. High gas concentrations will displace available oxygen from the air; unconsciousness and death may occur suddenly from lack of oxygen. Exposure to very high concentrations of similar materials has been associated with irregular heart rhythms and cardiac arrest.

12. Ecological information

Basis for assessment

Information given is based on product testing, and/or similar products, and/or components.

Acute toxicity

Physical properties indicate that petroleum gases will rapidly volatilise from the aquatic environment and that acute and chronic effects would not be observed in practice.

Persistence and degradability

Expected to be readily biodegradable. Oxidises rapidly by photochemical reactions in air.

Bioaccumulative potential

Not expected to bioaccumulate significantly.

Mobility

Because of their extreme volatility, air is the only environmental compartment that hydrocarbon gases will be found.

Results of PBT and vPvB assessment

The substance does not fulfil all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB.

Other adverse effects

In view of the high rate of loss from solution, the product is unlikely to pose a significant hazard to aquatic life.

13. Disposal considerations

Waste treatment methods

Material disposal

It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferable to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand. Do not dispose into the environment, in drains or in water courses. Given the nature and uses of this product, the need for disposal seldom arises. If necessary, dispose by controlled combustion in purpose-designed equipment. If this is not possible, contact the supplier.

Container disposal

Return part-used or empty cylinders to the supplier. For tanks, seek specialist advice from suppliers. Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.

Local legislation

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with.

EU Waste Disposal Code (EWC): 16 05 04 Gases in pressure containers (including halons) containing dangerous substances.
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14. Transport information

ADR
UN No. 1965
UN Proper Shipping Name HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. (Propane/Butane)
Transport Hazard Class 2
Danger label (primary risk) 2.1
Environmental hazard No
Special precautions for user Refer to chapter 7, handling and storage, for special precautions which a user needs to comply with in connection with transport.

RID
UN No. 1965
UN Proper Shipping Name HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. (Propane/Butane)
Transport Hazard Class 2
Danger label (primary risk) 2.1
Environmental hazard No
Special precautions for user Refer to chapter 7, handling and storage, for special precautions which a user needs to comply with in connection with transport.

Inland waterways transport (ADN)
UN No. 1965
UN Proper Shipping Name HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. (Propane/Butane)
Transport Hazard Class 2
Danger label (primary risk) 2.1
Environmental hazard No
Special precautions for user Refer to chapter 7, handling and storage, for special precautions which a user needs to comply with in connection with transport.

Sea transport (IMDG Code)
UN No. UN 1965
UN Proper Shipping Name HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. (Propane/Butane)
Technical name (Propane/Butane)
Transport Hazard Class 2.1
Marine pollutant No
Special precautions for user Refer to chapter 7, handling and storage, for special precautions which a user needs to comply with in connection with transport.

Air transport (IATA)
UN No. 1965
UN Proper Shipping Name HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. (Propane/Butane)
Technical name (Propane/Butane)
Transport Hazard Class 2.1
Environmental hazard No
Special precautions for user Refer to chapter 7, handling and storage, for special precautions which a user needs to comply with in connection with transport.

Sea (annex II of MARPOL 73/78 and the IBC code)
Pollution category Not applicable
Ship type Not applicable
Product name Not applicable
Special precaution Not applicable

Additional information
Local regulations: UN1965 classification is used for petroleum gases, liquefied
Hazchem code: 2YE
IATA – Forbidden for transport on passenger aircraft
15. Regulatory information

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

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

Other regulatory information

Chemical Safety Assessment
No Chemical Safety Assessment has been performed for this substance.

16. Other information

R-phrase(s)   R12 Extremely flammable

CLP Hazard statements  H220 Extremely flammable gas
                      H280 Contains gas under pressure; may explode if heated

Identified uses according to the Use Descriptor System

Recommended Restrictions on Use (Advice Against)
This product must not be used in applications other than those recommended in section 1, without first seeking the advice of the supplier.

Additional information
This document contains important information to ensure the safe storage, handling and use of this product. The information in this document should be brought to the attention of the person in your organisation responsible for advising on safety matters.

Other information
The information in this document should be made available to all who may handle the product.