SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Permanent pressure fire extinguisher Mod. P3APP003010

1.2. Relevant identified uses of the substance or mixture and uses advised against
Identified uses: extinguisher for fire of class B and “class H”.
Uses advised against: uses not listed in the “identified uses” section above.

1.3. Details of the supplier of the safety data sheet
P3 engineering GmbH (FSCM CE579)
Blohmstr. 12
21079 Hamburg, Germany
E-Mail: hafex@p3-group.com
Internet: www.p3-group.com

1.4. Emergency telephone number
GiZ Giftinformationszentrum-Nord (24hours) +49 (0) 551-19240
Languages of the phone service: german, english

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008 (CLP)
Specific target organ toxicity – single exposure 3, H335, H336
Gas under pressure, Compressed gas, H280

2.2. Label elements
Labelling according to UN Mode Regulations

2.3. Item description and other hazards
The product described by this Safety Data Sheet consists of a fire extinguisher for fire of class B and fire of "class H", containing Halotron® BRX (BTP) as fire extinguishing agent and a propellant gas at pressure of 9 bar (at T = 21 ° C), composed of nitrogen (97% vol.) and helium (3% vol.).
The fire extinguisher is composed of a metal cylinder filled with the extinguishing agent and by of a manual valve for dispensing.

**SECTION 3: Composition/information on ingredients**

3.1. Substances

N/A

3.2. Mixtures

This product has been identified as “article” in accordance with the Reg. (CE) 1907/2006 “REACH” and Reg. (CE) 1272/2008 “CLP”.

Fire extinguisher contents

<table>
<thead>
<tr>
<th>Substance</th>
<th>Identification number</th>
<th>Quantity</th>
<th>Classification (Reg. CE 1272/2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-bromo-3,3,3-trifluoro-1-propene (BTP)</td>
<td>CAS n. 1514-82-5 EC n. 627-872-0</td>
<td>100% of extinguishing agent</td>
<td>H335 STOT SE 3 H336 STOT SE 3</td>
</tr>
<tr>
<td>nitrogen, pressurized</td>
<td>CAS n. 7727-37-9 EC n. 231-783-9</td>
<td>97% vol. of propellant</td>
<td>H280 Press. Gas</td>
</tr>
<tr>
<td>helium, pressurized</td>
<td>CAS n. 7440-98-7 EC n. 231-168-5</td>
<td>3% vol. of propellant</td>
<td>H280 Press. Gas</td>
</tr>
</tbody>
</table>

**SECTION 4: First aid measures**

4.1. Description of first aid measures

**Inhalation**: in case of inhalation of the extinguishing agent, move the person to fresh air, facilitating breathing. Call a physician if breathing difficulties occur.

**Skin contact**: In case of contact with the extinguishing agent, remove contaminated clothing and footwear. Consult a physician if irritation occurs.

**Eyes contact**: in case of contact with the extinguishing agent, flush eyes with cool water and move the person to an uncontaminated area. Contact a physician if irritation occurs.

**Swallowing**: in case of swallowing of the extinguishing agent, do not induce vomiting. Seek immediately medical attention.

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

**Inhalation**: overexposure to the extinguishing agent can cause effects on the central nervous system such as dizziness, confusion, lack of physical coordination, drowsiness, anesthesia or loss of consciousness. At concentrations of 1.0% (v/v) or higher overexposure can lead to increased sensitivity of the heart to adrenaline, which can cause irregular beats and possibly ventricular fibrillation or death.

**Skin contact**: in case of contact with the extinguishing agent, effects of skin irritation or skin corrosion are not known.

**Eyes contact**: in case of contact with the extinguishing agent, eye irritation effects are not known.

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

In the event of the appearance of symptoms in the patient, contact a doctor urgently.
SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: chemical properties of the extinguishing agent make it a suitable extinguishing media for fire of class B and fire of “class H”. In case of fire or heat sources in proximity, the metal cylinder of the fire extinguisher can be chilled with water.

Non-suitable extinguishing media: N/A

5.2. Special hazards arising from the substance or mixture

The chemical properties of the extinguishing agent make it a suitable extinguishing media for fire of class B and fire of “class H”. Overheating of the metal cylinder of the extinguisher can cause a sudden increase of the propellant gas pressure and the evaporation of the extinguishing agent. The extinguishing agent vapors are heavier than air and are potentially dangerous if large volumes are enclosed in closed or lower areas.

5.3. Advice for firefighters

The use of water can be useful for lowering the temperature of the metal cylinder of the fire extinguisher in case of intense heat source in proximity.

SECTION 6: Accidental release measure

6.1. Personal precautions, protective equipment and emergency procedures

In case of loss or use of extinguishing agent, don’t accede to the area as long as proper ventilation was applied.

6.2. Environmental precautions

Despite the extinguishing agent is volatile and evaporates quickly, prevent the spillage and contamination of surface water, ground water and sewerage. Do not dispose of empty or damaged fire extinguisher in the environment.

6.3. Methods and material for containment and cleaning up

The extinguishing agent is a volatile material and evaporates quickly. In case of spillage, avoid contact with the surface water, ground water and sewerage.

6.4. Reference to other sections

See sections 8, 13 and 15.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Fire extinguishers, bearing seal and in compliance with current regulations do not allow the unintentional release of the extinguishing agent. Expel the extinguishing agent only in case of emergency, for extinguishing fire of class B and fire of “class H”. Handling the fire extinguishers with care: danger of falling and impact. Avoid contact with skin and eyes of the extinguishing agent.
Wash after using and follow good personal hygiene practices.

**7.2. Conditions for safe storage, including any incompatibilities**

Store fire extinguishers away from excessive heat.
Always place the fire extinguisher properly to avoid injury (e.g. wall anchoring, cages, chains).

**7.3. Specific end use(s)**

N/A

**SECTION 8: Exposure controls/personal protection**

**8.1. Control parameters**

<table>
<thead>
<tr>
<th>EXTINGUISHING AGENT (2-bromo-3,3,3-trifluoro-1-propene)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNEL (8 h)</td>
</tr>
<tr>
<td>US EPA TSCA (8 h)</td>
</tr>
</tbody>
</table>

**8.2. Exposure controls**

**Eyes/face protection:** if possible due to emergency conditions, while using the fire extinguisher, protect your eyes with safety glasses.

**Skin protection:** if possible due to emergency conditions, while using the fire extinguisher, protect your hands with gloves.

**Body protection:** if possible due to emergency conditions, while using the fire extinguisher, protect your body with appropriate clothing.

**Respiratory protection:** if possible due to emergency conditions, while using the fire extinguisher, wear a mask with breathing apparatus.

**Thermal danger:** exposure to intense heat sources for extended periods, can cause a sudden increase in pressure of the extinguisher interior components.

**SECTION 9: Physical and chemical properties**

**9.1. Information on basic physical and chemical properties**

<table>
<thead>
<tr>
<th>a. appearance</th>
<th>metal cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. odour</td>
<td>EXTINGUISHING AGENT solvent, comparable to ether odour (if not stabilized), acid fruit (if stabilized)</td>
</tr>
<tr>
<td>c. olfactory threshold</td>
<td>N/A</td>
</tr>
<tr>
<td>d. pH</td>
<td>N/A</td>
</tr>
<tr>
<td>e. melting point/freezing point</td>
<td>EXTINGUISHING AGENT less than -50 °C NITROGEN -210 °C HELIUM -272 °C</td>
</tr>
<tr>
<td>f. initial boiling point and boiling range</td>
<td>EXTINGUISHING AGENT less than 34 °C NITROGEN -195 °C</td>
</tr>
</tbody>
</table>
g. flash point
h. evaporation rate
i. flammability (solids, gases)
j. upper/lower flammability or explosive limits
k. vapour pressure
l. vapour density
m. relative density
n. solubility
o. partition coefficient noctanol/water (Kow)
p. auto-ignition temperature
q. decomposition temperature
r. viscosity
s. explosive properties
t. oxidizing properties

SECTION 10: Stability and reactivity

10.1. Reactivity
The product is stable under the conditions described in Section 7.

10.2. Chemical stability
The product is stable under the conditions described in Section 7.

10.3. Possibility of hazardous reactions
The product is stable under the conditions described in Section 7.

10.4. Conditions to avoid
Direct contact with intense heat sources.

10.5. Incompatible materials
N/A

10.6. Hazardous decomposition products
From the decomposition of the extinguishing agent may derive hydrogen fluoride (HF), hydrogen bromide (HBr) and carbonyl aldehyde.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

a. acute toxicity:
EXTINGUISHING AGENT (2-bromo-3,3,3-trifluoro-1-propene)
Acute toxicity inhalation test, 5% vol., for 30 minutes (rats): no death and no positive necropsy screening. Inhalation test of 14 days, 6 hours/day, 5 days/week, 2 weeks (rats): no death after six
doses between 5,000 and 20,000 ppm. The effects associated with the treatment were slowdown and difficulty breathing, which returned to normal at the end of exposure, in addition to a decrease in body weight. The disease has shown irritant effects in the upper respiratory tract. Inhalation test of 90 days, 6 hours/day, 5 days/week, with a 4-week recovery period (rat): no death after six doses of 200 to 3,000 ppm. The effects associated with the treatment were slowdown and difficulty breathing, which returned to normal at the end of exposure, in addition to a decrease in body weight and food consumption. The disease has shown irritant effects in the upper respiratory tract. Changes in blood chemistry and hematology have been noticed, which appear to be reversible in the recovery phase. Some treated animals showed yellowed teeth.

b. skin corrosion/skin irritation:
EXTINGUISHING AGENT (2-bromo-3,3,3-trifluoro-1-propene)
No dermatological reaction or skin irritation was observed in laboratory on rabbits.

c. serious eye damage/eye irritation:
EXTINGUISHING AGENT (2-bromo-3,3,3-trifluoro-1-propene)
No eye irritation or reactions in laboratory on rabbits have been noticed.

d. respiratory or skin sensitization:
no available data

e. germ cell mutagenicity:
EXTINGUISHING AGENT (2-bromo-3,3,3-trifluoro-1-propene)
AMES, chromosomal aberration in human lymphocytes, of lymphoma in mice in vitro tests: the tests do not indicate mutagenic response.

f. cancerogenicity:
no available data

g. reproductive toxicity:
EXTINGUISHING AGENT (2-bromo-3,3,3-trifluoro-1-propene)
Reproductive toxicity, inhalation test, 6 h/day, 7 days/week, for up to 8 weeks (rats): in two of reproductive screening test, male and female rats were exposed daily for two weeks before mating, during mating, during gestation and lactation until the tenth day. They were administered six doses of 50 to 3,000 ppm. The offspring showed no obvious defects. The effects of repeated exposure on the reproductive performance and growth were tested in male and female rats at concentrations of 175 ppm and higher.

h. specific target organ toxicity (STOT) – single exposure:
EXTINGUISHING AGENT (2-bromo-3,3,3-trifluoro-1-propene)
Dose no observable adverse effect level (NOAEL) cardiotoxic, based on inhalation testing dogs with epinephrine: 0.5% vol.
Minimum dose with observable adverse effect level (LOAEL) cardiotoxic, based on inhalation testing dogs with epinephrine: 1.0% vol.

i. specific target organ toxicity (STOT) – repeated exposure:
EXTINGUISHING AGENT (2-bromo-3,3,3-trifluoro-1-propene)
No available data

j. danger in case of aspiration:
No available data.
SECTION 12: Ecological information

12.1. Toxicity
LC50 (Oncorhynchus mykiss/rainbow trout) 96 h: 31,6 mg/L (nominal)
ErI50 (Pseudokirchneriella subcapitata/green alga) 96 h: >800 mg/L (nominal)
EbI50 (Pseudokirchneriella subcapitata/green alga) 96 h: >800 mg/L (nominal)
EC50 (Daphnia magna/pulse d’acqua) 48h: 83,0 mg/L (nominal)
NOTE: The nominal concentrations are added to the amount of test samples. The material is volatile and disappears rapidly in the samples.

12.2. Persistence and degradability
EXTINGUISHING AGENT (2-bromo-3,3,3-trifluoro-1-propene)
Not readily biodegradable in water. It reacts rapidly with the OH radicals in the gas phase of the atmosphere and has a short atmospheric lifetime (7,0 days at latitudes from 30 ° N to 60 ° N). It expects a rapid shift in the atmosphere followed by decomposition.

12.3. Bioaccumulative potential
EXTINGUISHING AGENT (2-bromo-3,3,3-trifluoro-1-propene)
Given the chemical and physical characteristics of the substance, bioaccumulation is unlikely.

12.4. Mobility in soil
No available data

12.5. Results of PBT and vPvB assessment
No available data

12.6. Other adverse effects
The extinguishing agent content is a volatile organic compound and must not be mixed with the ground or with the drinking water.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
The waste management measures shall be assessed case by case, depending on the quantity of extinguishing agent may be present in the cylinder and the residual pressure of the propellant gas, in the light of the provisions of European and/or national legislation in force.
For manipulation and measures in case of accidental extinguishing agent dispersion, generally apply the guidance provided in paragraphs 6 and 7.
Resorting to waste disposal after evaluating the possibilities for re-use or re-filling or recovery at authorized companies under current regulations.
It is not allowed for disposal by unauthorized parties from the local requirements.
SECTION 14: Transport information

14.1. UN number
UN 1044

14.2. UN proper shipping name
FIRE EXTINGUISHERS

14.3. Transport hazard class(es)
2.2

14.4. Packing group
N/A

14.5. Environmental hazards
ADR/RID/ADN: not applicable
IMO: not applicable
ICAO: not applicable

14.6. Special precautions for user
The transport of dangerous goods, including loading and unloading must be carried out by persons who have received the necessary training required by the modal regulations.

For the application of any exemptions to the transport of dangerous goods, refer to the appropriate modal regulations.

Exemption for road transport (ADR 2015): SP 594 - Fire extinguishers manufactured and filled according to the provisions applied in the country of manufacture, are not subject to the requirements of ADR:
- provided with protection against inadvertent discharge; and
- if they are contained in strong outer packagings or in the case of large fire extinguishers which meet the requirements of special packing provision PP91 of packing instruction P003 in 4.1.4.1.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
No available data

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
The fire extinguisher is a good classified as hazardous for transportation
Applicable modal regulations: ADR, ADN, RID, IMDG, ICAO.

15.2. Chemical safety assessment
N/A
SECTION 16: Other information

This information has been compiled from sources considered to be dependable and is, to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty (either expressed or implied) or guarantee is made to the accuracy, reliability or completeness of the information contained herein.

This information relates to the specific materials designated and may not be valid for such material used in combination with any other materials or in any process. It is the user’s responsibility to satisfy himself as to the suitability and completeness of this information for his particular use.

P3 engineering GmbH does not accept liability for any loss or damage that may occur, whether direct, indirect, incidental or consequential, from the use of this information.

Note: this MSDS is not to be considered as a MSDS compiled in accordance with the art. 31 of Regulation (CE) 1907/2006 since the product is defined as “article”.

Previous MSDS version

Issue: A – First publication

Abbreviations and acronyms

ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
CAS [Number]: Chemical American Society [Number].
CLP: Regulation CE No. 1272/2008 on classification, labeling and packaging of substances and mixtures.
°C: degree centigrade.
DNEL: Derived No Effect Level.
EbI 50: Extended Biotic Index.
EC [Number]: also EINECS. European Inventory of Existing Commercial Chemical Substances [Number].
EC50: Half maximal effective concentration.
ErL50: Effect Range Low.
fire of class B: fires whose fuel is flammable or combustible liquid.
fire of “class H”: “Hidden Fires”. Fires that are “hidden” are not readily accessible, may be difficult to locate, and are more challenging to extinguish. Some examples of hidden fires would be fires behind sidewall paneling or in overhead areas (source: Federal Aviation – U.S.)
g/cm3: grams/cubecentimetre.
g/L: grams/litre.
h: hours.
ICAO: International Civil Aviation Organization.
IMO: International Maritime Organization.
LC50: Median lethal dose.
LOAEL: Lowest Observed Adverse Effect Level.
kPa: kilopascal.
mg/L: milligrams/litre.
N/A: not applicable.
NOAEL: No Observable Adverse Effect Level.
PBT: Persistent, Bioaccumulative, Toxic.
ppm: part per million.
RID: European Agreement concerning the International Carriage of Dangerous Goods by Railways.
SP: special provision.
STOT: Specific Target Organ Toxicity.
v/v, vol.: volume (concentration).
vPvB: Very persistent, very bioaccumulative.

H statements mentioned in the SDS
H280 Press. Gas – Contains gas under pressure: may explode if heated.
H335 STOT SE 3 (specific target organ toxicity, single exposure Category 3) – May cause respiratory irritation.
H336 STOT SE 3 (specific target organ toxicity, single exposure Category 3) – May cause drowsiness or dizziness.