Johnson Matthey
Inspiring science, enhancing life

SAFETY DATA SHEET

Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by UK REACH Regulation SI 2019/758

EASY-FLO™ 100 Flux Paste

Version	:	1
Date of issue/ Date of revision	:	22/09/2022
Date of previous issue	:	No previous validation

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

1.1 Product identifier

Product name EASY-FLO™ 100 Flux Paste

Product type : Liquid.

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

Specific uses : Brazing. Flux agent.

1.3 Details of the supplier of the safety data sheet

Supplier : Johnson Matthey Plc,
Gate 11, Orchard Road,
Royston,
Herts SG8 5HE
United Kingdom
+44 (0) 1763 253000

e-mail address of person responsible for this SDS : mj@matthey.com

1.4 Emergency telephone number

Telephone number : +44 (0)1763 253000

Hours of operation : 24 hours

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to UK CLP/GHS

Acute Tox. 4, H302
Eye Irrit. 2, H319
Repr. 2, H361d (oral)
Aquatic Acute 1, H400
Aquatic Chronic 3, H412

The product is classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.

SECTION 2: Hazards identification

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : Harmful if swallowed.
Causes serious eye irritation.
Suspected of damaging the unborn child. (oral)
Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention : Obtain special instructions before use. Wear protective gloves. Wear protective clothing. Wear eye or face protection.

Response : IF exposed or concerned: Get medical attention. IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Special packaging requirements

Containers to be fitted with child-resistant fastenings : Not applicable.

Tactile warning of danger : Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII : This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

Other hazards which do not result in classification : None known.

SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

Product/ingredient name	Identifiers	%	Classification	Type
Reaction product of mixed inorganic base and acid resulting in dipotassium hydroxytetrafluoro triborontrioxide, potassium trihydroxy fluoroborate, dipotassium tetrahydroxy tetraboronpentaoxide dehydrate in powder form	REACH #: 01-2120790432-54 EC: 948-045-3	≥25 - ≤50	Acute Tox. 4, H302 Repr. 2, H361d (oral)	[1] [2]
potassium difluorodihydroxyborate (1-)	EC: 286-925-2 CAS: 85392-66-1	≥25 - ≤50	Acute Tox. 4, H302 Repr. 2, H361d (oral)	[1] [2]
Boron potassium oxide, tetrahydrate	REACH #: 01-2119970730-37 EC: 215-575-5 CAS: 12045-78-2	≥10 - ≤25	Repr. 2, H361d (oral)	[1]
cetrimonium bromide	REACH #: 01-2119989160-35 EC: 200-311-3 CAS: 57-09-0	<2.5	Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 STOT SE 3, H335 STOT RE 2, H373 (gastrointestinal tract) (oral) Aquatic Acute 1, H400 (M=100) Aquatic Chronic 1, H410 (M=1) **See Section 16 for the full text of the H statements declared above.**	[1]

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, are PBTs, vPvBs or Substances of equivalent concern, or have been assigned a workplace exposure limit and hence require reporting in this section.

Type

[1] Substance classified with a health or environmental hazard
[2] Substance with a workplace exposure limit

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact : 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.

SECTION 4: First aid measures

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Move affected person to fresh air. 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 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. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Flush contaminated skin with plenty of water. In case of burns, immediately cool affected skin with cold water and continue for as long as possible or apply wet cloths to the area until medical attention can be obtained. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. 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.

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.

4.2 Most important symptoms and effects, both acute and delayed

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
irritation
coughing

Skin contact : No specific data.

Ingestion : Adverse symptoms may include the following:
reduced foetal weight
increase in foetal deaths
skeletal malformations

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
halogenated compounds
metal oxide/oxides
hydrogen fluoride

5.3 Advice for firefighters

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.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Not explosive.
Non-flammable.

SECTION 6: Accidental release measures

6.1 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. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised 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".

6.2 Environmental precautions

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

6.3 Methods and material for containment and cleaning up

SECTION 6: Accidental release measures

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

6.4 Reference to other sections

See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe fumes or vapours released when the product is heated. Do not ingest. Avoid breathing vapour or mist. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

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.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Seveso Directive - Reporting thresholds

Danger criteria

SECTION 7: Handling and storage

Category	Notification and MAPP threshold	Safety report threshold
E1	100 tonne	200 tonne

7.3 Specific end use(s)

Recommendations : Not available.

Industrial sector specific solutions : Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
Reaction product of mixed inorganic base and acid resulting in dipotassium hydroxytetrafluoro triborontrioxide, potassium trihydroxy fluoroborate, dipotassium tetrahydroxy tetraboronpentaoxide dehydrate in powder form	**EH40/2005 WELs (United Kingdom (UK), 1/2020). [Fluorides (inorganic)]** TWA: 2.5 mg/m³, (as F) 8 hours.
potassium difluorodihydroxyborate (1-)	**EH40/2005 WELs (United Kingdom (UK), 1/2020). [Fluorides (inorganic)]** TWA: 2.5 mg/m³, (as F) 8 hours.

Biological exposure indices

No exposure indices known.

Recommended monitoring procedures : Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
Reaction product of mixed inorganic base and acid resulting in dipotassium hydroxytetrafluoro triborontrioxide, potassium trihydroxy fluoroborate, dipotassium tetrahydroxy tetraboronpentaoxide dehydrate in powder form	DNEL	Long term Inhalation	7.8 mg/m³	Workers	Systemic
	DNEL	Long term Inhalation	13.6 mg/m³	Workers	Local
	DNEL	Short term Inhalation	13.6 mg/m³	Workers	Local
	DNEL	Long term Dermal	367.7 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	3.9 mg/m³	General population	Systemic
	DNEL	Long term	13.6 mg/	General	Local

SECTION 8: Exposure controls/personal protection

		Inhalation	m^3	population	
	DNEL	Short term Inhalation	13.6 mg/m^3	General population	Local
	DNEL	Long term Dermal	185.6 mg/kg bw/day	General population	Systemic
	DNEL	Long term Oral	0.92 mg/kg bw/day	General population	Systemic
	DNEL	Short term Oral	0.92 mg/kg bw/day	General population	Systemic
potassium difluorodihydroxyborate (1-)	DNEL	Short term Oral	1.46 mg/kg bw/day	General population	Systemic
	DNEL	Long term Oral	1.46 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	5.11 mg/m^3	General population	Systemic
	DNEL	Long term Inhalation	10.95 mg/m^3	Workers	Systemic
	DNEL	Short term Inhalation	18.4 mg/m^3	General population	Local
	DNEL	Long term Inhalation	18.4 mg/m^3	General population	Local
	DNEL	Short term Inhalation	18.4 mg/m^3	Workers	Local
	DNEL	Long term Inhalation	18.4 mg/m^3	Workers	Local
	DNEL	Long term Dermal	250.39 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	500.1 mg/kg bw/day	Workers	Systemic
Boron potassium oxide, tetrahydrate	DNEL	Long term Inhalation	7.8 mg/m^3	Workers	Systemic
	DNEL	Short term Inhalation	7.8 mg/m^3	Workers	Systemic
	DNEL	Long term Inhalation	13.6 mg/m^3	Workers	Local
	DNEL	Short term Inhalation	13.6 mg/m^3	Workers	Local
	DNEL	Long term Dermal	367.7 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	3.9 mg/m^3	General population	Systemic
	DNEL	Short term Inhalation	3.9 mg/m^3	General population	Systemic
	DNEL	Long term Inhalation	13.6 mg/m^3	General population	Local
	DNEL	Short term Inhalation	13.6 mg/m^3	General population	Local
	DNEL	Long term Dermal	185.6 mg/kg	General population	Systemic

SECTION 8: Exposure controls/personal protection

			bw/day		
	DNEL	Long term Inhalation	10.2 mg/m³	Workers	Systemic
	DNEL	Short term Inhalation	10.2 mg/m³	Workers	Systemic
	DNEL	Long term Inhalation	17.8 mg/m³	Workers	Local
	DNEL	Short term Inhalation	17.8 mg/m³	Workers	Local
	DNEL	Long term Dermal	480.6 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Oral	1.2 mg/kg bw/day	General population	Systemic
	DNEL	Short term Oral	0.92 mg/kg bw/day	General population	Systemic
	DNEL	Long term Oral	0.92 mg/kg bw/day	General population	Systemic
cetrimonium bromide	DNEL	Long term Inhalation	0.0987 mg/m³	Workers	Systemic
	DNEL	Long term Inhalation	0.05 mg/m³	Workers	Local
	DNEL	Short term Inhalation	0.05 mg/m³	Workers	Local
	DNEL	Long term Dermal	0.467 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Dermal	0.05 mg/cm²	Workers	Local
	DNEL	Short term Dermal	0.25 mg/cm²	Workers	Local

PNECs

Product/ingredient name	Compartment Detail	Value	Method Detail
Reaction product of mixed inorganic base and acid resulting in dipotassium hydroxytetrafluoro triborontrioxide, potassium trihydroxy fluoroborate, dipotassium tetrahydroxy tetraboronpentaoxide dehydrate in powder form	Fresh water	2.02 mg/l	Sensitivity Distribution
	Sewage Treatment Plant	10 mg/l	Assessment Factors
	Soil	5.4 mg/kg dwt	Sensitivity Distribution
potassium difluorodihydroxyborate (1-)	Fresh water	2.02 mg/l	Sensitivity Distribution
	Sewage Treatment Plant	10 mg/l	Assessment Factors
	Soil	5.4 mg/l	Sensitivity Distribution
Boron potassium oxide, tetrahydrate	Fresh water	2.02 mg/l	Sensitivity

SECTION 8: Exposure controls/personal protection

	Sewage Treatment Plant	10 mg/l	Distribution Assessment Factors
	Soil	5.4 mg/kg dwt	Sensitivity Distribution
cetrimonium bromide	Fresh water	0.000022 mg/l	Assessment Factors
	Sewage Treatment Plant	0.19 mg/l	Assessment Factors
	Soil	0.21 mg/kg dwt	Assessment Factors

8.2 Exposure controls

Appropriate engineering controls : Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Fume extraction should take place as close as possible to the source of emission.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. 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: chemical splash goggles. Recommended: EN 166 or local equivalent. Wear eye protection with filtered lenses compliant with EN 169 (or local equivalent) when carrying out brazing work.

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. Recommended: EN 374 or local equivalent. 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 : In case of inadequate ventilation wear respiratory protection. Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Recommended: inorganic gases/vapours filter (Type B) or acid gas filter (Type E) (EN 14387 or local equivalent) and particulate filter (EN 143 or 149, Type P3 or

SECTION 8: Exposure controls/personal protection

FFP3, Associated Protection Factor (APF) = 20) or local equivalent as a minimum)

Thermal hazards : When handling hot material, wear heat-resistant protective gloves that are able to withstand the temperature of molten product (EN 407 or local equivalent).

Environmental exposure controls : 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.

SECTION 9: Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1 Information on basic physical and chemical properties

Appearance

Physical state : Liquid. [Paste.]

Colour : White.

Odour : Odourless.

Odour threshold : Not applicable.

Melting point/freezing point : Not available.

Initial boiling point and boiling range : 100°C (212°F)

Flammability (solid, gas) : Non-flammable.

Upper/lower flammability or explosive limits : Not available.

Flash point : Not applicable.

Auto-ignition temperature :

Ingredient name	°C	°F	Method
Reaction product of mixed inorganic base and acid resulting in dipotassium hydroxytetrafluoro triborontrioxide, potassium trihydroxy fluoroborate, dipotassium tetrahydroxy tetraboronpentaoxide dehydrate in powder form	>850	>1562	

Decomposition temperature : Not available.

pH : Not applicable.

Viscosity : Not available.

Solubility(ies) :

Media	Result
cold water	Not soluble

Solubility in water : Immiscible in water.

Miscible with water : No.

Partition coefficient: n-octanol/water : Not applicable.

SECTION 9: Physical and chemical properties

Vapour pressure	:	2.3 kPa (17.3 mm Hg) [room temperature] Not applicable. [50°C (122°F)]
Relative density	:	Not available.
Vapour density	:	Not available.
Explosive properties	:	Not explosive.
Oxidising properties	:	Not oxidising.
Particle characteristics		
Median particle size	:	Not applicable.

SECTION 10: Stability and reactivity

10.1 Reactivity

No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability

The product is stable.

10.3 Possibility of hazardous reactions

May react with reducing agents, evolving extremely flammable hydrogen gas.

10.4 Conditions to avoid

No specific data.

10.5 Incompatible materials

reducing agents

10.6 Hazardous decomposition products

Emits acrid smoke and fumes when heated to decomposition. metal oxide/oxides. hydrogen fluoride. halogenated compounds. May react with reducing agents, evolving extremely flammable hydrogen gas.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Reaction product of mixed inorganic base and acid resulting in dipotassium hydroxytetrafluoro triborontrioxide, potassium trihydroxy fluoroborate, dipotassium tetrahydroxy tetraboronpentaoxide dehydrate in powder form	LC50 Inhalation Dusts and mists	Rat - Male, Female	>2.04 mg/l	4 hours
	LD50 Dermal	Rabbit -	>2000 mg/kg	-

SECTION 11: Toxicological information

		Male, Female		
potassium difluorodihydroxyborate (1-)	LC50 Inhalation Dusts and mists	Rat - Male, Female	>2.04 mg/l	4 hours
	LD50 Dermal	Rabbit - Male, Female	>2000 mg/kg	-
	LD50 Oral	Rat - Female	608 mg/kg	-
Boron potassium oxide, tetrahydrate	LC50 Inhalation Dusts and mists	Rat - Male, Female	>2.04 mg/l	4 hours
	LD50 Dermal	Rabbit - Male, Female	>2000 mg/kg	-
	LD50 Oral	Rat - Male	3690 mg/kg	-
cetrimonium bromide	LD50 Dermal	Rabbit - Male, Female	2150 mg/kg	-
	LD50 Oral	Rat	465 mg/kg	-

Conclusion/Summary : Harmful if swallowed.

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
EASY-FLO™ 100 Flux Paste	834.5	N/A	N/A	N/A	N/A
Reaction product of mixed inorganic base and acid resulting in dipotassium hydroxytetrafluoro triborontrioxide, potassium trihydroxy fluoroborate, dipotassium tetrahydroxy tetraboronpentaoxide dehydrate in powder form	500	N/A	N/A	N/A	N/A
potassium difluorodihydroxyborate (1-)	608	N/A	N/A	N/A	N/A
Boron potassium oxide, tetrahydrate	3690	N/A	N/A	N/A	N/A
cetrimonium bromide	465	2150	N/A	N/A	N/A

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Reaction product of mixed inorganic base and acid resulting in dipotassium hydroxytetrafluoro triborontrioxide, potassium trihydroxy fluoroborate, dipotassium tetrahydroxy tetraboronpentaoxide dehydrate in powder form	Eyes - Not irritant	Rabbit	0 to 1	24 hours	72 hours
	Skin - Not irritant	Rabbit	0	4 hours	48 hours

SECTION 11: Toxicological information

cetrimonium bromide	Eyes - Severe irritant Skin - Moderate irritant	Rabbit Rabbit	- -	450 mg -	- -

Conclusion/Summary

Skin : Not classified.

Eyes : Causes serious eye irritation.

Respiratory : Not classified.

Sensitisation

Product/ingredient name	Route of exposure	Species	Result
Reaction product of mixed inorganic base and acid resulting in dipotassium hydroxytetrafluoro triborontrioxide, potassium trihydroxy fluoroborate, dipotassium tetrahydroxy tetraboronpentaoxide dehydrate in powder form	skin	Guinea pig	Not sensitizing
Boron potassium oxide, tetrahydrate	skin	Guinea pig	Not sensitizing

Conclusion/Summary

Skin : Not classified.

Respiratory : Not classified.

Mutagenicity

Product/ingredient name	Test	Experiment	Result
Reaction product of mixed inorganic base and acid resulting in dipotassium hydroxytetrafluoro triborontrioxide, potassium trihydroxy fluoroborate, dipotassium tetrahydroxy tetraboronpentaoxide dehydrate in powder form	OECD 471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative
	OECD 476 In vitro Mammalian Cell Gene Mutation Test	Experiment: In vitro Subject: Mammalian-Animal	Negative
	NTP	Experiment: In vitro Subject: Mammalian-Animal	Negative
	OECD 474 Mammalian Erythrocyte Micronucleus Test	Experiment: In vivo Subject: Mammalian-Animal Cell: Somatic	Negative
potassium difluorodihydroxyborate	OECD 471 Bacterial Reverse Mutation	Experiment: In vitro Subject: Bacteria	Negative

SECTION 11: Toxicological information

(1-)	Test		
	OECD 476 In vitro Mammalian Cell Gene Mutation Test	Experiment: In vitro Subject: Mammalian-Animal	Negative
	NTP	Experiment: In vitro Subject: Mammalian-Animal	Negative
Boron potassium oxide, tetrahydrate	OECD 471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative
	OECD 476 In vitro Mammalian Cell Gene Mutation Test	Experiment: In vitro Subject: Mammalian-Animal	Negative
	NTP	Experiment: In vitro Subject: Mammalian-Animal	Negative
	OECD 474 Mammalian Erythrocyte Micronucleus Test	Experiment: In vivo Subject: Mammalian-Animal	Negative

Conclusion/Summary : Not classified.

Carcinogenicity

Conclusion/Summary : Not classified.

Reproductive toxicity

Conclusion/Summary : Suspected of damaging the unborn child if swallowed.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
cetrimonium bromide	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
cetrimonium bromide	Category 2	oral	gastrointestinal tract

Aspiration hazard

Product/ingredient name	Result
Not available.	

Information on likely routes of exposure : Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

Potential acute health effects

Eye contact : Causes serious eye irritation.

SECTION 11: Toxicological information

Inhalation : Emits acrid smoke and fumes when heated to decomposition.

Skin contact : Contact with hot material causes thermal skin burns.

Ingestion : Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
irritation
coughing

Skin contact : No specific data.

Ingestion : Adverse symptoms may include the following:
reduced foetal weight
increase in foetal deaths
skeletal malformations

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Harmful if swallowed. Causes serious eye irritation.

Potential delayed effects : May damage the unborn child if swallowed.

Long term exposure

Potential immediate effects : May damage the unborn child if swallowed.

Potential delayed effects : May damage the unborn child if swallowed.

Potential chronic health effects

Conclusion/Summary : Not classified.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Reproductive toxicity : Suspected of damaging the unborn child. (oral)

Other information : Not available.

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

SECTION 12: Ecological information

12.1 Toxicity

SECTION 12: Ecological information

Product/ingredient name	Result	Species	Exposure
Reaction product of mixed inorganic base and acid resulting in dipotassium hydroxytetrafluoro triborontrioxide, potassium trihydroxy fluoroborate, dipotassium tetrahydroxy tetraboronpentaoxide dehydrate in powder form	Acute LC50 25.05 to 80.06 mg/l Marine water	Crustaceans - Litopenaeus vannamei	96 hours
	Acute LC50 133 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 74 mg/l Marine water	Fish - Limanda limanda	96 hours
potassium difluorodihydroxyborate (1-)	Acute EC10 1050 mg/l Fresh water	Micro-organism - Pseudomonas putida	17 hours
	Acute EC50 133 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 750 mg/l Fresh water	Fish - Danio rerio	96 hours
	Acute NOEC 10 mg/l Fresh water	Micro-organism - Opercularia bimarginata	72 hours
Boron potassium oxide, tetrahydrate	Acute LC50 133 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 280 mg/l	Fish - Gila elegans	96 hours
	Acute LC50 74 mg/l Marine water	Fish - Limanda limanda	96 hours

Conclusion/Summary : Very toxic to aquatic life. Harmful to aquatic life with long lasting effects.

12.2 Persistence and degradability

Conclusion/Summary : The methods for determining the biological degradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
cetrimonium bromide	3.18	444 to 677	high

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

12.6 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	UN3082	UN3082	UN3082	UN3082
14.2 UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (cetrimonium bromide)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (cetrimonium bromide)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (cetrimonium bromide)	Environmentally hazardous substance, liquid, n. o.s. (cetrimonium bromide)
14.3 Transport hazard class (es)	9 	9 	9 	9 
14.4 Packing group	III	III	III	III
14.5 Environmental hazards	Yes.	Yes.	Yes.	Yes.

Additional information

SECTION 14: Transport information

ADR/RID : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.
Hazard identification number 90
Limited quantity 5 L
Special provisions 274, 335, 601, 375
Tunnel code (-)

ADN : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.
Special provisions 274, 335, 375, 601

IMDG : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.
Emergency schedules F-A, S-F
Special provisions 274, 335, 969
IMDG Code Segregation group SGG2 - Ammonium compounds

IATA : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.
Quantity limitation Passenger and Cargo Aircraft: 450 L. Packaging instructions: 964. Cargo Aircraft Only: 450 L. Packaging instructions: 964. Limited Quantities - Passenger Aircraft: 30 kg. Packaging instructions: Y964.
Special provisions A97, A158, A197

14.6 Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Maritime transport in bulk according to IMO instruments : Not available.

SECTION 15: Regulatory information

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

UK (GB)/REACH

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Ozone depleting substances

Not listed.

Prior Informed Consent (PIC)

Not listed.

SECTION 15: Regulatory information

Persistent Organic Pollutants
Not listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Seveso Directive

This product is controlled under the Seveso Directive.

Danger criteria

Category
E1

EU regulations

Industrial emissions (integrated pollution prevention and control) - Air : Listed

Industrial emissions (integrated pollution prevention and control) - Water : Not listed

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals
Not listed.

Montreal Protocol
Not listed.

Stockholm Convention on Persistent Organic Pollutants
Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)
Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals
Not listed.

Inventory list

Australia : All components are listed or exempted.

Canada : At least one component is not listed.

China : At least one component is not listed.

Eurasian Economic Union : **Russian Federation inventory**: At least one component is not listed.

Japan : **Japan inventory (CSCL)**: At least one component is not listed.
Japan inventory (ISHL): At least one component is not listed.

New Zealand : At least one component is not listed.

Philippines : At least one component is not listed.

Republic of Korea : At least one component is not listed.

SECTION 15: Regulatory information

Taiwan	:	At least one component is not listed.
Thailand	:	At least one component is not listed.
Turkey	:	At least one component is not listed.
United States	:	At least one component is not listed.
Viet Nam	:	At least one component is not listed.

15.2 Chemical safety assessment : Not applicable.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
GB CLP = UK CLP (EC No 1272/2008) on the Classification, Labelling and Packaging of Substances and Mixtures as amended by (EU Exit) Regulations 2019 No. 720 and amendments
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = GB CLP-specific Hazard statement
N/A = Not available
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
SGG = Segregation Group
vPvB = Very Persistent and Very Bioaccumulative

Procedure used to derive the classification

Classification	Justification
Acute Tox. 4, H302	Calculation method
Eye Irrit. 2, H319	Calculation method
Repr. 2, H361d (oral)	Calculation method
Aquatic Acute 1, H400	Calculation method
Aquatic Chronic 3, H412	Calculation method

Full text of abbreviated H statements

H302	Harmful if swallowed.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H361d	Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Full text of classifications

SECTION 16: Other information

Acute Tox. 4	ACUTE TOXICITY - Category 4
Aquatic Acute 1	SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1
Aquatic Chronic 1	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1
Aquatic Chronic 3	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3
Eye Dam. 1	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
Eye Irrit. 2	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Repr. 2	REPRODUCTIVE TOXICITY - Category 2
Skin Irrit. 2	SKIN CORROSION/IRRITATION - Category 2
STOT RE 2	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2
STOT SE 3	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3

Date of issue/ Date of revision : 22/09/2022

Date of previous issue : No previous validation

Version : 1

Notice to reader

Information in this publication is believed to be accurate and is given in good faith, but it is for the Customer to satisfy itself of the suitability for its own particular purpose. Accordingly, Johnson Matthey gives no warranty as to the fitness of the Product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that such exclusion is prevented by law. Freedom under Patent, Copyright and Designs cannot be assumed.
It is the policy of Johnson Matthey to update this information regularly. You are therefore advised to check that this sheet is the most recent issue.