



Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by Commission Regulation (EU) 2015/830 - Ireland

SAFETY DATA SHEET

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

1.1 Product identifier

Product name MFP

Component name	Identifiers	Type
barium diboron tetraoxide	REACH #: 01-2119983530-36 EC: 237-222-4 CAS: 13701-59-2	[A]

[A] Constituent
[B] Impurity
[C] Stabilising additive

Physical state Solid.

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

Use of the substance/mixture

Industry: Paint. (Industrial, Professional, Consumer)

Product use: Corrosion inhibitor and flame retardant

Identified uses

GES 1 Industrial re-packaging of powder.
GES 2 Industrial formulation in paint.
GES 3 Industrial use in coating of PVC truck foil and coating of electric wires.
GES 4 Industrial use in coating/painting of articles.
GES 5 Professional use in paint
GES 6 Consumer use in paint.

Uses advised against

None.

Product name:

MFP

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

1.3 Details of the supplier of the safety data sheet

Manufacturer	n.v. Buckman Laboratories . Wondelgemkaai 157 9000 Gent - BELGIUM 0032 (0)9 257 92 11
Distributor	Buckman Laboratories Ltd. Lancashire Gate - 21 Tiviot Dale Stockport - Cheshire SK1 1TD - UK 0032 (0)9 257 92 11
e-mail address of person responsible for this SDS	sds@buckman.com

1.4 Emergency telephone number

Supplier	
Telephone number	0032 (0)9 257 93 00
Hours of operation	24/7

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition Mono-constituent substance

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Acute Tox. 4, H302

Repr. 1B, H360F (Fertility)

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 Danger

Hazard statements H302 - Harmful if swallowed.
H360F - May damage fertility.

Precautionary statements

Prevention	P201 - Obtain special instructions before use. P280 - Wear protective gloves. Wear eye or face protection. Wear protective clothing.
Response	P308 + P313 - IF exposed or concerned: Get medical attention. P301 + P312 - IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell.
Storage	P405 - Store locked up.
Disposal	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Product name:

MFP

SECTION 2: Hazards identification

Hazardous ingredients	barium diboron tetraoxide	REACH #: 01-2119983530-36 EC: 237-222-4 CAS: 13701-59-2
Supplemental label elements	Not applicable.	
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	Restricted to professional users.	

2.3 Other hazards

Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII	Not available.
Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII	No. vP: Not available. vB: Not available.
Other hazards which do not result in classification	None known.

SECTION 3: Composition/information on ingredients

3.1 Substances

Mono-constituent substance

Product/ingredient name	Identifiers	%	Classification	Type
			Regulation (EC) No. 1272/2008 [CLP]	
barium diboron tetraoxide	REACH #: 01-2119983530-36 EC: 237-222-4 CAS: 13701-59-2	100	Acute Tox. 4, H302 Repr. 1B, H360F (Fertility) (oral) See Section 16 for the full text of the H statements declared above.	[A]

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type

[A] Constituent

[B] Impurity

[C] Stabilising additive

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

Product name:

MFP

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 20 minutes. Get medical attention if irritation occurs.
Inhalation	Remove victim 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 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	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 20 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Ingestion	Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Over-exposure signs/symptoms

Eye contact	No specific data.
Inhalation	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
Skin contact	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
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	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	No specific treatment.

Product name:

MFP

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 No specific fire or explosion hazard.

Hazardous combustion products Decomposition products may include the following materials:
metal oxide/oxides

5.3 Advice for firefighters

Special precautions 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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

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. 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

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

6.3 Methods and material for containment and cleaning up

Spill Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

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.

Product name:

MFP

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

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 ingest. 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.

7.3 Specific end use(s)

Recommendations

Not available.

Industrial sector specific solutions

Not available.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
barium diboron tetraoxide	NAOSH (Ireland, 8/2018). OELV-8hr: 0.5 mg/m ³ , (as Ba) 8 hours.

Recommended monitoring procedures

: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

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: 06/06/2019

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Version : 4.1

6/55

Product name:

MFP

SECTION 8: Exposure controls/personal protection

Product/ingredient name	Type	Exposure	Value	Population	Effects
Barium diboron tetraoxide	DNEL	Long term Inhalation	2.5 mg/m ³	Workers	Systemic
	DNEL	Short term Oral	3.5 mg/m ³	Workers	Systemic
	DNEL	Long term Dermal	7 mg/kg bw/day	Workers	Systemic
	DNEL	Short term Dermal	10 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	0.6 mg/m ³	Consumers	Systemic
	DNEL	Short term Inhalation	0.87 mg/m ³	Consumers	Systemic
	DNEL	Long term Dermal	3.5 mg/kg bw/day	Consumers	Systemic
	DNEL	Short term Dermal	5 mg/kg bw/day	Consumers	-
	DNEL	Long term Oral	0.4 mg/kg bw/day	Consumers	Systemic
DNEL	Short term Oral	0.5 mg/kg bw/day	Consumers	Systemic	

PNECs

Product/ingredient name	Type	Compartment Detail	Value	Method Detail
Barium diboron tetraoxide	-	Fresh water	0.0078 mg/l	Assessment Factors
	-	Marine water	0.00078 mg/l	Assessment Factors
	-	Fresh water sediment	0.0551 mg/kg	Equilibrium Partitioning
	-	Marine water sediment	0.00551 mg/kg	Equilibrium Partitioning
	-	Sewage Treatment Plant	10 mg/l	Assessment Factors
	-	Soil	0.00645 mg/kg	-

8.2 Exposure controls

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

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: 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 : Wear suitable protective clothing, gloves and eye/face protection.

Product name:

MFP

SECTION 8: Exposure controls/personal protection

- 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** : 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.
- 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

9.1 Information on basic physical and chemical properties

Appearance

Physical state	Solid.
Colour	White.
Odour	Not available.
Odour threshold	Not available.
pH	9.5 to 11 [Conc. (% w/w): 0.4%]
Melting point/freezing point	1367.5°C
Initial boiling point and boiling range	Not available.
Flash point	Not applicable. (solid)
Evaporation rate	Not available.
Flammability (solid, gas)	Non-flammable.
Vapour pressure	0.00000011 kPa [room temperature]
Vapour density	Not available.
Relative density	Not applicable.
Density	0.714 g/cm ³ [25°C (77°F)](Bulk density) / 3.25 – 3.35 g/cm ³ (Density)
Solubility(ies)	Partially soluble in the following materials: n-octanol.
Solubility in water	0.822 g/l
Partition coefficient: n-octanol/ water	0.699
Auto-ignition temperature	Not applicable.
Decomposition temperature	Not available.
Viscosity	Dynamic (room temperature): Not applicable.
Explosive properties	Not applicable.
Oxidising properties	Not applicable.

9.2 Other information

No additional information.

Product name:

MFP

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** Under normal conditions of storage and use, hazardous reactions will not occur.
- 10.4 Conditions to avoid** No specific data.
- 10.5 Incompatible materials** No specific data.
- 10.6 Hazardous decomposition products** Under normal conditions of storage and use, hazardous decomposition products should not be produced. Hazardous combustion products : See Section 5.2 of the safety data sheet.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
barium diboron tetraoxide	LC50 Inhalation Dusts and mists	Rat	>3.54 mg/l	4 hours
	LD50 Dermal	Rabbit - Male, Female	>2000 mg/kg	-
	LD50 Oral	Rat - Female	530 mg/kg	-
	LD50 Oral	Rat - Male	850 mg/kg	-

Conclusion/Summary Harmful if swallowed.

Irritation/Corrosion

Skin Not irritating

Eyes Not irritating

Sensitiser

Product/ingredient name	Route of exposure	Species	Result
barium diboron tetraoxide	skin	Guinea pig	Not sensitizing

Skin Based on available data, the classification criteria are not met.

Respiratory Based on available data, the classification criteria are not met.

Mutagenicity

Product/ingredient name	Test	Experiment	Result
barium diboron tetraoxide	-	Experiment: In vitro Subject: Bacteria	Negative
	-	Experiment: In vitro Subject: Mammalian-Animal	Negative

Conclusion/Summary No mutagenic effect.

Carcinogenicity

Conclusion/Summary Not available.

Reproductive toxicity

Product name:

MFP

SECTION 11: Toxicological information

Product/ingredient name	Maternal toxicity	Fertility	Developmental toxin	Species	Dose	Exposure	
barium diboron tetraoxide	Negative	-	-	Rabbit	Oral: 10 mg/kg (NOAEL)	-	
	-	-	Negative	Rabbit	Oral: 20 mg/kg (NOAEL)	-	

Conclusion/Summary Based on available data, the classification criteria are not met.

Developmental toxicity

Conclusion/Summary Based on available data, the classification criteria are not met.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on likely routes of exposure Not available.

Potential acute health effects

Inhalation No known significant effects or critical hazards.

Ingestion Harmful if swallowed.

Skin contact No known significant effects or critical hazards.

Eye contact No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

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

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

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

Eye contact No specific data.

Delayed and immediate effects as well as 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

Product name:

MFP

SECTION 11: Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
barium diboron tetraoxide	Sub-chronic NOAEL Oral	Rat - Male	70 mg/kg (systemic toxicity)	91 days; 7 days per week

Conclusion/Summary Based on available data, the classification criteria are not met.

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 May damage fertility.

Other information Not available.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
barium diboron tetraoxide	Acute EC50 7.8 mg/l	Algae	72 hours
	Acute EC50 >100 mg/l Fresh water	Micro-organism	3 hours
	Acute LC50 151 mg/l	Fish - Lepomis macrochirus	96 hours
	Acute LC50 145 mg/l Fresh water	Fish - Rasbora heteromorpha	96 hours
	Acute NOEC >1.1 mg/l	Algae	72 hours
	Acute NOEC 42.8 mg/l	Fish - Lepomis macrochirus	96 hours
	Acute NOEC 25.6 mg/l	Fish - Oncorhynchus mykiss	96 hours
	Acute NOEC 100 mg/l Fresh water	Micro-organism	3 hours

Conclusion/Summary Not available.

12.2 Persistence and degradability

Conclusion/Summary Inorganic salt. Testing not required according to Column 2 of Annexes VII, VIII, IX or X, or parts 1-2 of Annex XI of Regulation (EC) No. 1907/2006.

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Barium diboron tetraoxide	0.699	-	low

12.4 Mobility in soil

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

Mobility Not available.

12.5 Results of PBT and vPvB assessment

PBT Not available.

P: Not available. B: Not available. T: Yes.

vPvB No.

vP: Not available. vB: Not available.

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

Product name:

MFP

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

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

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.

This preparation is not classified as dangerous according to international transport regulations (ADR/RID, IMDG or ICAO/IATA).

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (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.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles Restricted to professional users.

Other EU regulations

Product name:

MFP

SECTION 15: Regulatory information

Product/ingredient name	Carcinogenic effects	Mutagenic effects	Developmental effects	Fertility effects
barium salts	-	-	-	Repr. 1B, H360F (Fertility) (oral)

Ozone depleting substances (1005/2009/EU)

Ingredient name	Status
Not listed.	

Prior Informed Consent (PIC) (649/2012/EU)

Ingredient name	Annex	Status
Not listed.		

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

15.2 Chemical safety assessment

Complete.

SECTION 16: Other information

✔ Indicates information that has changed from previously issued version.

Abbreviations and acronyms

ATE = Acute Toxicity Estimate
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 DMEL = Derived Minimal Effect Level
 DNEL = Derived No Effect Level
 EUH statement = CLP-specific Hazard statement
 PBT = Persistent, Bioaccumulative and Toxic
 PNEC = Predicted No Effect Concentration
 RRN = REACH Registration Number
 vPvB = Very Persistent and Very Bioaccumulative

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Acute Tox. 4, H302 Repr. 1B, H360F (Fertility)	Calculation method Calculation method
Full text of abbreviated H statements	H302 Harmful if swallowed. H360F (oral) May damage fertility if swallowed. H360F May damage fertility.
Full text of classifications [CLP/GHS]	Acute Tox. 4, H302 ACUTE TOXICITY (oral) - Category 4 Repr. 1B, H360F (oral) REPRODUCTIVE TOXICITY (Fertility) (oral) - Category 1B Repr. 1B, H360F REPRODUCTIVE TOXICITY (Fertility) - Category 1B
Date of printing	10/06/2019
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Product name:

MFP

SECTION 16: Other information

Date of previous issue 06/06/2019

Version 4.1

This version supersedes any version issued before this date.

Notice to reader

The information in this SDS is provided in good faith and 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 relied upon to compile this SDS. This SDS relates only to the specific material designated herein and is not valid for use of the material in combination with any other material or outside the applications described herein.

No warranty with regard to the properties of the material is hereby expressed or implied. Final determination of suitability for purpose 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 that these are the only hazards that exist.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mono-constituent substance
Product name : MFP

Section 1 - Title

Short title of the exposure scenario : GES 1 Industrial re-packaging of powder.

List of use descriptors : **Identified use name:** GES 1 Industrial re-packaging of powder.
Process Category: PROC08b
Substance supplied to that use in form of: As such
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC02

Environmental contributing scenarios : **Environmental exposure arising due to industrial re-packaging of barium diboron tetraoxide powder.** - ERC02

Health Contributing scenarios : **Transfer of substance or mixture (charging and discharging) at dedicated facilities** - PROC08b

Number of the ES	: 1
Processes and activities covered by the exposure scenario	: Section 2.1 describes the environmental releases that may occur with industrial re-packaging of barium diboron tetraoxide. Section 2.2 describes the conditions for controlling worker exposures to barium diboron tetraoxide during the re-packaging of barium diboron tetraoxide in industrial settings. During the re-packing process, 25 kg bags of the substance are re-packaged into a larger 500 kg bag. This process is carried out 6-7 times per year. Operators manually cut open 20 of the 25 kg bags and pour them into the large 500 kg. The handling time is typically < 1 hour. This process is described by PROC 8b.

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Environmental exposure arising due to industrial re-packaging of barium diboron tetraoxide powder.	
The following emission sources are considered: Release to air from process : 2.5%; Release to soil from process: 0.01%; Release to waste water from process: 0.028%. Fraction used at main source:100%. Fraction tonnage to region:100%.	
Product characteristics	: Melting point: 1367,5 °C (101,3 kPa) Vapour pressure: 0.00010799 Pa (25°C) Water solubility (g/l): 0,822 (25°C)
Amounts used	: Maximum allowable site tonnage: 5 Tonnes/year. Fraction used at main source:: 100%. Fraction tonnage to region:100%.
Frequency and duration of use	: Emission days: 10
Other conditions affecting environmental exposure	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Limit release rate to waste water to: 0.14 kg/day. Other Operational Conditions (environment): No special measures required.
Technical conditions and measures at process level (source) to prevent release	: Emission fractions for air and soil should not exceed those specified by ERC 2. All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Limit release rate to waste water to: 0.14 kg/day
Date of issue/Date of revision	: 23/09/2015

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	: Limit release rate to waste water to 0.14 kg/day
Organisational measures to prevent/limit release from site	: No special measures are required.
Conditions and measures related to sewage treatment plant	: Size of municipal sewage system/treatment plant: 2,000,000 L/day River flow rate: 18,000 m ³ /day SimpleTreat default removal rates are sufficient for removal in the STP.
Conditions and measures related to external treatment of waste for disposal	: Dust from the extraction system should be stored and collected by a certified waste company.
Conditions and measures related to external recovery of waste	: Dust from the extraction system should be stored and collected by a certified waste company.

Contributing scenario controlling worker exposure for 2: Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product characteristics	: Melting point: 1367,5 °C (101,3 kPa) Vapour pressure: 0.00010799 Pa (25°C) Water solubility (g/l): 0,822 (25°C)
Physical state	: Powder.
Frequency and duration of use/exposure	: During the re-packaging process, operators may manually cut open smaller bags (e.g. 25 kg) and re-package them into larger bags (e.g. 500 kg). Workers involved in the industrial re-packaging of barium diboron tetraoxide powder conduct transfer activities for < 1 hour per day. Re-packaging processes may be carried out 6-7 times per year.
Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default)
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied
Technical conditions and measures to control dispersion from source towards the worker	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	: No specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Section 3 - Exposure estimation and reference to its source

Website:	: Not applicable.
Exposure estimation and reference to its source - Environment: 1: Environmental exposure arising due to industrial re-packaging of barium diboron tetraoxide powder.	
Exposure assessment (environment):	: Environmental exposures were calculated using the CHESAR model using the EU TGD algorithms. Removal in the STP was estimated using the SimpleTreat model.
Exposure estimation and reference to its source	: Refer to section 8: PNEC Summary Freshwater: 0.007 mg/l - Risk characterisation ratio (PEC/PNEC): 0.939. Freshwater sediment: 0.052 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.939. Marine water: 7.318E-4 mg/l - Risk characterisation ratio (PEC/PNEC): 0.938. Marine water sediment: 0.005 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.938. Soil: 0.004 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.602. Sewage Treatment Plant: 0.07 mg/l - Risk characterisation ratio (PEC/PNEC): <0.01.
Exposure estimation and reference to its source - Workers: 2: Transfer of substance or mixture (charging and discharging) at dedicated facilities	
Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary Worker - inhalative, long-term - systemic: 0.014 mg/m ³ - Risk characterisation ratio: <0.01. Worker - inhalative, short-term - local: 0.28 mg/m ³ - Risk characterisation ratio: 0.08. Worker - dermal, long-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.02. Worker - dermal, short-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.014 Worker - combined, long-term - systemic - Risk characterisation ratio: 0.025. Worker - combined, short-term - systemic - Risk characterisation ratio: 0.094.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	: In order to work within the boundaries of the ES the following conditions should be met: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Limit release rate to waste water to 0.14 kg/day.
Health	: In order to work within the boundaries of the ES the following conditions should be met: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training.

Additional good practice advice beyond the REACH CSA

Environment

: Efficacy of all emission RMMs and waste treatment procedures should be routinely assessed and confirmed to be functioning correctly.

Health

: Do not eat, drink or smoke when using this product.
Ensure operatives are trained to minimise exposures.
Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).
Always wash hands and exposed skin thoroughly after using barium diboron tetraoxide or any surfaces/machinery that may have come into contact with barium diboron tetraoxide.
Machinery should be regularly maintained and checked for proper function.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mono-constituent substance
Product name : MFP

Section 1 - Title

Short title of the exposure scenario : GES 2 Industrial formulation in paint.
List of use descriptors : **Identified use name:** GES 2 Industrial formulation in paint.
Process Category: PROC05, PROC08b
Substance supplied to that use in form of: As such
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC02
Environmental contributing scenarios : **Environmental exposure arising due to industrial formulation of paint with barium diboron tetraoxide powder.** - ERC02
Health Contributing scenarios : **Mixing or blending in batch processes for formulations (powder and liquid formulations).** - PROC05
Transfer of substance or preparation at dedicated sites (liquid preparation) - PROC08b
Transfer of substance or preparation at dedicated sites (powder) - PROC08b

Number of the ES	: 2
Processes and activities covered by the exposure scenario	: Section 2.1 describes the environmental releases that may occur with industrial formulation of paint with barium diboron tetraoxide. Section 2.2 describes the conditions for controlling worker exposures to barium diboron tetraoxide when the substance is used in the formulation of paint in industrial settings. During the paint formulation process, barium diboron tetraoxide powder may be mixed or blended in batch processes. Mixing can involve powder or liquid formulations. These processes are described by PROC 5 (assuming a worst case scenario, the assessments have been carried out for the mixing of powders). At the start of process, bags of barium diboron tetraoxide powder are unloaded and added to the paint formulation systems (PROC 8b - handling powders). At the end of the processes, formulated paint products containing the substance at concentrations between 3 - 5% w/w are transferred into containers for storage and transportation (PROC 8b - liquid formulations).

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Environmental exposure arising due to industrial formulation of paint with barium diboron tetraoxide powder.	
The following emission sources are considered: Release to air from process: 2.5%; Release to soil from process: 0.031%; Release to waste water from process: 0.01%. Fraction tonnage to region: 100%.	
Product characteristics	: Melting point: 1367.5°C (101,3 kPa) Vapour pressure: 0.00010799 Pa (25°C) Water solubility (g/l): 0.822 (25°C)
Amounts used	: 120 Tonnes/year. Maximum allowable site tonnage: 45 Tonnes/year. Fraction tonnage to region: 100%.
Frequency and duration of use	: Emission days: 100.
Date of issue/Date of revision	: 23/09/2015

Other conditions affecting environmental exposure	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Limit release rate to waste water to 0.14 kg/day. Other Operational Conditions (environment): No special measures required.
Technical conditions and measures at process level (source) to prevent release	: Emission fractions for air and soil should not exceed those specified by ERC 2. All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Limit release rate to waste water to 0.14 kg/day.
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	: Limit release rate to waste water to 0.14 kg/day.
Organisational measures to prevent/limit release from site	: No special measures are required.
Conditions and measures related to sewage treatment plant	: Size of municipal sewage system/treatment plant: 2,000,000 L/day River flow rate: 18,000 m ³ /day SimpleTreat default removal rates are sufficient for removal in the STP.
Conditions and measures related to external treatment of waste for disposal	: No specific measures identified.
Conditions and measures related to external recovery of waste	: No special measures are required.

Contributing scenario controlling worker exposure for 2: Mixing or blending in batch processes for formulations (powder and liquid formulations).

Product characteristics	: Melting point: 1367.5°C (101.3kPa). Vapour pressure: 0.00010799 Pa (25°C). Water solubility (g/l): 0.822 (25°C). liquid preparations: 3 - 5% w/w (Barium diboron tetraoxide) or Powder.
Amounts used	: Not applicable.
Frequency and duration of use/exposure	: Workers involved in processes where powder or liquid formulations are unloaded, mixed or blended in batch processes or are transferred into containers for storage and transportation, carry out these activities for short-durations (e.g. less than 1 hour/day).
Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 Kg (Default).
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied
Technical conditions and measures to control dispersion from source towards the worker	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : No specific measures identified.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation at dedicated sites (liquid preparation)

Product characteristics : Melting point: 1367.5°C (101.3kPa).
Vapour pressure: 0.00010799 Pa (25°C).
Water solubility (g/l): 0.822 (25°C).
liquid preparations: 3 - 5% w/w (Barium diboron tetraoxide) or Powder.

Amounts used : Not applicable.

Frequency and duration of use/exposure : Workers involved in processes where powder or liquid formulations are unloaded, mixed or blended in batch processes or are transferred into containers for storage and transportation, carry out these activities for short-durations (e.g. less than 1 hour/day).

Human factors not influenced by risk management : Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m³/person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2).
Body weight: 70 Kg (Default).

Other conditions affecting workers exposure : Indoor use

Technical conditions and measures at process level (source) to prevent release : Technical conditions limiting release: Not applied

Technical conditions and measures to control dispersion from source towards the worker : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : No specific measures identified.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation at dedicated sites (powder)

Product characteristics : Melting point: 1367.5°C (101.3kPa).
Vapour pressure: 0.00010799 Pa (25°C).
Water solubility (g/l): 0.822 (25°C).
liquid preparations: 3 - 5% w/w (Barium diboron tetraoxide) or Powder.

Amounts used : Not applicable.

Frequency and duration of use/exposure : Workers involved in processes where powder or liquid formulations are unloaded, mixed or blended in batch processes or are transferred into containers for storage and transportation, carry out these activities for short-durations (e.g. less than 1 hour/day).

Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 Kg (Default).
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied
Technical conditions and measures to control dispersion from source towards the worker	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	: No specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Section 3 - Exposure estimation and reference to its source

Website:	: Not applicable.
Exposure estimation and reference to its source - Environment: 1: Environmental exposure arising due to industrial formulation of paint with barium diboron tetraoxide powder.	
Exposure assessment (environment):	: Environmental exposures were calculated using the CHESAR model using the EU TGD algorithms. Removal in the STP was estimated using the SimpleTreat model.
Exposure estimation and reference to its source	: Refer to section 8: PNEC Summary Freshwater: 0.007 mg/L - Risk characterisation ratio (PEC/PNEC): 0.939. Freshwater sediment: 0.052 mg/Kg - Risk characterisation ratio (PEC/PNEC): 0.939. Marine water: 7.318E-4 mg/L - Risk characterisation ratio (PEC/PNEC): 0.938. Marine water sediment: 0.005 mg/Kg - Risk characterisation ratio (PEC/PNEC): 0.938. Soil: 0.004 mg/Kg - Risk characterisation ratio (PEC/PNEC): 0.602. Sewage Treatment Plant: 0.07 mg/L - Risk characterisation ratio (PEC/PNEC): <0.01.
Exposure estimation and reference to its source - Workers: 2: Mixing or blending in batch processes for formulations (powder and liquid formulations).	
Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary Worker - inhalative, long-term - systemic : 0.07 mg/m ³ - Risk characterisation ratio: 0.028. Worker - inhalative, short-term - systemic: 1.4 mg/m ³ - Risk characterisation ratio: 0.400. Worker - dermal, long-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.020.
Date of issue/Date of revision	: 23/09/2015

Worker - dermal, short-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.014.
 Worker - combined, long-term - systemic - Risk characterisation ratio: 0.048.
 Worker - combined, short-term - systemic - Risk characterisation ratio: 0.414.

Exposure estimation and reference to its source - Workers: 3: Transfer of substance or preparation at dedicated sites (liquid preparation)

Exposure assessment (human): : ECETOC TRA worker v3
 Used ART model.
 No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.

Exposure estimation and reference to its source : Refer to section 8: DNEL/DMEL Summary

Worker - inhalative, long-term - systemic : 0.026 mg/m³ - Risk characterisation ratio: 0.01.
 Worker - inhalative, short-term - systemic: 0.130 mg/m³ - Risk characterisation ratio: 0.037.
 Worker - dermal, long-term - systemic: 0.034 mg/kg bw/day - Risk characterisation ratio: 0.005.
 Worker - dermal, short-term - systemic: 0.034 mg/kg bw/day - Risk characterisation ratio: 0.003.
 Worker - combined, long-term - systemic - Risk characterisation ratio: 0.015.
 Worker - combined, short-term - systemic - Risk characterisation ratio: 0.041.

Exposure estimation and reference to its source - Workers: 4: Transfer of substance or preparation at dedicated sites (powder)

Exposure assessment (human): : ECETOC TRA worker v3
 Used ART model.
 No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.

Exposure estimation and reference to its source : Refer to section 8: DNEL/DMEL Summary

Worker - inhalative, long-term - systemic : 0.014 mg/m³ - Risk characterisation ratio < 0.01.
 Worker - inhalative, short-term - systemic: 0.280 mg/m³ - Risk characterisation ratio: 0.080.
 Worker - dermal, long-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.020.
 Worker - dermal, short-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.014.
 Worker - combined, long-term - systemic - Risk characterisation ratio: 0.025.
 Worker - combined, short-term - systemic - Risk characterisation ratio: 0.094.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	: In order to work within the boundaries of the ES the following conditions should be met: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Limit release rate to waste water to 0.14 kg/day.
Health	: In order to work within the boundaries of the ES the following conditions should be met: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training.

Additional good practice advice beyond the REACH CSA

Environment	: Efficacy of all emission RMMs and waste treatment procedures should be routinely assessed and confirmed to be functioning correctly.
Health	: Do not eat, drink or smoke when using this product. Ensure operatives are trained to minimise exposures. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Always wash hands and exposed skin thoroughly after using barium diboron tetraoxide or any surfaces/machinery that may have come into contact with barium diboron tetraoxide. Machinery should be regularly maintained and checked for proper function.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mono-constituent substance
Product name : MFP

Section 1 - Title

Short title of the exposure scenario : GES 3 Industrial use in coating of PVC truck foil and coating of electric wires.

List of use descriptors : **Identified use name:** GES 3 Industrial use in coating of PVC truck foil and coating of electric wires.
Process Category: PROC05, PROC08b
Substance supplied to that use in form of: As such
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC03

Environmental contributing scenarios : **Environmental exposure arising due to industrial use in coating of PVC truck foil and coating of electric wires.** - ERC03

Health Contributing scenarios : **Mixing or blending in batch processes for formulations (powder and liquid formulations).** - PROC05
Transfer of substance or preparation at dedicated sites (powder) - PROC08b
Transfer of substance or preparation at dedicated sites (liquid preparation) - PROC08b

Number of the ES	: 3
Processes and activities covered by the exposure scenario	: GES 3 Industrial use in coating of PVC truck foil and coating of electric wires.

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Environmental exposure arising due to industrial use in coating of PVC truck foil and coating of electric wires.	
The following emission sources are considered: Release to air from process: 20%; Release to soil from process: 0.1%; Release to waste water from process; 0.14%. Fraction used at main source:100%. Fraction tonnage to region:100%.	
Product characteristics	: Melting point: 1367.5°C (101.3 kPa). Vapour pressure: 0.00010799 Pa (25°C) Water solubility (g/l): 0.822 (25°C)
Amounts used	: 50 Tonnes/year. Maximum allowable site tonnage: 5 Tonnes/year. Fraction tonnage to region:100%.
Frequency and duration of use	: Emission days: 50.
Other conditions affecting environmental exposure	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Limit release rate to waste water to 0.14 kg/day. Limit release rate to air to 20 kg/day. Other Operational Conditions (environment): No special measures required.
Technical conditions and measures at process level (source) to prevent release	: Emission fractions for soil should not exceed those specified by ERC 3. All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Limit release rate to waste water to 0.14 kg/day. Limit release rate to air to 20 kg/day.
Date of issue/Date of revision	: 23/09/2015

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	: Limit release rate to waste water to 0.14 kg/day. Limit release rate to air to 20 kg/day.
Organisational measures to prevent/limit release from site	: No special measures are required.
Conditions and measures related to sewage treatment plant	: Size of municipal sewage system/treatment plant: 2,000,000 L/day River flow rate: 18,000 m ³ /day SimpleTreat default removal rates are sufficient for removal in the STP.
Conditions and measures related to external treatment of waste for disposal	: No specific measures identified.
Conditions and measures related to external recovery of waste	: No special measures are required.

Contributing scenario controlling worker exposure for 2: Mixing or blending in batch processes for formulations (powder and liquid formulations).

Product characteristics	: Melting point: 1367.5 °C (101.3 kPa). Vapour pressure : 0.00010799 Pa (25°C) Water solubility (g/l): 0.822 (25°C). liquid preparations: 10-20% w/w (Barium diboron tetraoxide) or Powder.
Amounts used	: Not applicable.
Frequency and duration of use/exposure	: Workers involved in processes where powder or liquid formulations are unloaded, mixed or blended in batch processes or are transferred into containers for storage and transportation, carry out these activities for short-durations (e.g. less than 1 hour/day).
Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default).
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied
Technical conditions and measures to control dispersion from source towards the worker	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	: No specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Contributing scenario controlling worker exposure for 3: Transfer of substance or preparation at dedicated sites (powder)

Product characteristics	: Melting point: 1367.5 °C (101.3 kPa). Vapour pressure : 0.00010799 Pa (25°C) Water solubility (g/l): 0.822 (25°C). liquid preparations: 10-20% w/w (Barium diboron tetraoxide) or Powder.
Amounts used	: Not applicable.
Frequency and duration of use/exposure	: Workers involved in processes where powder or liquid formulations are unloaded, mixed or blended in batch processes or are transferred into containers for storage and transportation, carry out these activities for short-durations (e.g. less than 1 hour/day).
Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default).
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied
Technical conditions and measures to control dispersion from source towards the worker	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	: No specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Contributing scenario controlling worker exposure for 4: Transfer of substance or preparation at dedicated sites (liquid preparation)

Product characteristics	: Melting point: 1367.5 °C (101.3 kPa). Vapour pressure : 0.00010799 Pa (25°C) Water solubility (g/l): 0.822 (25°C). liquid preparations: 10-20% w/w (Barium diboron tetraoxide) or Powder.
Amounts used	: Not applicable.
Frequency and duration of use/exposure	: Workers involved in processes where powder or liquid formulations are unloaded, mixed or blended in batch processes or are transferred into containers for storage and transportation, carry out these activities for short-durations (e.g. less than 1 hour/day).
Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default).
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied

Technical conditions and measures to control dispersion from source towards the worker	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	: No specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Section 3 - Exposure estimation and reference to its source

Website:	: Not applicable.
Exposure estimation and reference to its source - Environment: 1: Environmental exposure arising due to industrial use in coating of PVC truck foil and coating of electric wires.	
Exposure assessment (environment):	: Environmental exposures were calculated using the CHESAR model using the EU TGD algorithms. Removal in the STP was estimated using the SimpleTreat model.
Exposure estimation and reference to its source	: Refer to section 8: PNEC Summary Freshwater: 0.007 mg/l - Risk characterisation ratio (PEC/PNEC): 0.939. Freshwater sediment: 0.052 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.939. Marine water: 7.318E-4 mg/l - Risk characterisation ratio (PEC/PNEC): 0.938. Marine water sediment: 0.005 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.938. Soil: 0.006 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.921. Sewage Treatment Plant: 0.07 mg/l - Risk characterisation ratio (PEC/PNEC): <0.01.
Exposure estimation and reference to its source - Workers: 2: Mixing or blending in batch processes for formulations (powder and liquid formulations).	
Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary Worker - inhalative, long-term - systemic : 0.07 mg/m ³ - Risk characterisation ratio: 0.028. Worker - inhalative, short-term - systemic: 1.4 mg/m ³ - Risk characterisation ratio: 0.400. Worker - dermal, long-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.020. Worker - dermal, short-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.014. Worker - combined, long-term - systemic - Risk characterisation ratio: 0.048. Worker - combined, short-term - systemic - Risk characterisation ratio: 0.414.

Exposure estimation and reference to its source - Workers: 3: Transfer of substance or preparation at dedicated sites (powder)

Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary Worker - inhalative, long-term - systemic : 0.014 mg/m ³ - Risk characterisation ratio: 0.006. Worker - inhalative, short-term - systemic: 0.280 mg/m ³ - Risk characterisation ratio: 0.080. Worker - dermal, long-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.020. Worker - dermal, short-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.014. Worker - combined, long-term - systemic - Risk characterisation ratio: 0.025. Worker - combined, short-term - systemic - Risk characterisation ratio: 0.094.

Exposure estimation and reference to its source - Workers: 4: Transfer of substance or preparation at dedicated sites (liquid preparation)

Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary Worker - inhalative, long-term - systemic : 0.078 mg/m ³ - Risk characterisation ratio: 0.031. Worker - inhalative, short-term - systemic: 0.390 mg/m ³ - Risk characterisation ratio: 0.111. Worker - dermal, long-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.020. Worker - dermal, short-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.014. Worker - combined, long-term - systemic - Risk characterisation ratio: 0.051. Worker - combined, short-term - systemic - Risk characterisation ratio: 0.125.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	: In order to work within the boundaries of the ES the following conditions should be met: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Limit release rate to waste water to 0.14 kg/day. Limit release rate to air to 20 kg/day.
Health	: In order to work within the boundaries of the ES the following conditions should be met: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training.

Additional good practice advice beyond the REACH CSA

Environment	: Efficacy of all emission RMMS and waste treatment procedures should be routinely assessed and confirmed to be functioning correctly.
Health	: Do not eat, drink or smoke when using this product. Ensure operatives are trained to minimise exposures. Supervision in place to check that the RMMS in place are being used correctly and OCs followed Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Always wash hands and exposed skin thoroughly after using barium diboron tetraoxide or any surfaces/machinery that may have come into contact with barium diboron tetraoxide. Machinery should be regularly maintained and checked for proper function.

Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

Product definition : Mono-constituent substance
Product name : MFP

Section 1 - Title

Short title of the exposure scenario : GES 5 Professional use in paint

List of use descriptors : **Identified use name:** GES 5 Professional use in paint
Process Category: PROC08a, PROC10, PROC11, PROC19
Substance supplied to that use in form of: In a mixture
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC08f

Environmental contributing scenarios : **Environmental exposure arising due to professional use in paint.** - ERC08f

Health Contributing scenarios : **Rolling, Brushing** - PROC10
Spraying (professional) - PROC11
Manual activities involving hand contact - PROC19
Transfer of substance or mixture (charging and discharging) at non-dedicated facilities - PROC08a

Number of the ES	: 5
Processes and activities covered by the exposure scenario	: Section 2.1 describes the environmental releases that may occur with professional use in paints. Section 2.2 describes the conditions for controlling worker exposures to barium diboron tetraoxide during the use of the substance in paints used professional settings. The substance is typically used in anti-corrosion pre-treatment painting products at concentrations between 3-5 % w/w. Professional painters may apply these products using a brush or roller (PROC 10) or by spraying (PROC 11). Before applying this products, professional workers may transfer them from/to containers ready for application (PROC 8a) and mix them manually in containers (PROC 5).

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Environmental exposure arising due to professional use in paint.	
The following emission sources are considered: Release to air from process: 15%; Release to soil from process: 0.5%; Release to waste water from process: 1%. Fraction tonnage to region:10%.	
Product characteristics	: Melting point: 1367.5°C (101.3 kPa).. Vapour pressure 0.00010799 Pa (25°C). Water solubility (g/l): 0.822 mg/l (25°C).
Amounts used	: 40 Tonnes/year. Daily amount for wide dispersive uses: 2.2 E-5 tonne. Fraction tonnage to region:: 10%.
Frequency and duration of use	: Emission days: 365.
Other conditions affecting environmental exposure	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Other Operational Conditions (environment): No special measures required.
Date of issue/Date of revision	: 23/09/2015

Technical conditions and measures at process level (source) to prevent release	: Emission fractions for air and soil should not exceed those specified by ERC 8f. All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Organisational measures to prevent/limit release from site	: No special measures are required.
Conditions and measures related to sewage treatment plant	: Size of municipal sewage system/treatment plant: 2,000,000 L/day River flow rate: 18,000 m ³ /day SimpleTreat default removal rates are sufficient for removal in the STP.
Conditions and measures related to external treatment of waste for disposal	: No special measures required.
Conditions and measures related to external recovery of waste	: Not applicable.

Contributing scenario controlling worker exposure for 2: Rolling, Brushing

Product characteristics	: Melting point: 1367.5 °C (101.3 kPa). Vapour pressure: 0.00010799 Pa (25°C). Water solubility (g/l): 0.822 mg/l (25°C). Concentration of the substance in the mixture: 3-5% w/w Barium diboron tetraoxide.
Amounts used	: Not applicable.
Frequency and duration of use/exposure	: Professional workers using painting products containing barium diboron tetraoxide (e.g. anti-corrosion pre-treatment paints) may apply these using a brush, or a roller or by spraying for up to 8 hrs per day. Product may be mixed by hand and transferred to and from containers for up to 8 hrs per day.
Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default)
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied
Technical conditions and measures to control dispersion from source towards the worker	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	: No specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	: Dermal protection required for hand mixing operations: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness 90%.

Contributing scenario controlling worker exposure for 3: Spraying (professional)

Product characteristics	: Melting point: 1367.5 °C (101.3 kPa). Vapour pressure: 0.00010799 Pa (25°C). Water solubility (g/l): 0.822 mg/l (25°C). Concentration of the substance in the mixture: 3-5% w/w Barium diboron tetraoxide.
Amounts used	: Not applicable.
Frequency and duration of use/exposure	: Professional workers using painting products containing barium diboron tetraoxide (e. g. anti-corrosion pre-treatment paints) may apply these using a brush, or a roller or by spraying for up to 8 hrs per day. Product may be mixed by hand and transferred to and from containers for up to 8 hrs per day.
Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default)
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied
Technical conditions and measures to control dispersion from source towards the worker	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	: No specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	: Dermal protection required for hand mixing operations: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness 90%.

Contributing scenario controlling worker exposure for 4: Manual activities involving hand contact

Product characteristics	: Melting point: 1367.5 °C (101.3 kPa). Vapour pressure: 0.00010799 Pa (25°C). Water solubility (g/l): 0.822 mg/l (25°C). Concentration of the substance in the mixture: 3-5% w/w Barium diboron tetraoxide.
Amounts used	: Not applicable.
Frequency and duration of use/exposure	: Professional workers using painting products containing barium diboron tetraoxide (e. g. anti-corrosion pre-treatment paints) may apply these using a brush, or a roller or by spraying for up to 8 hrs per day. Product may be mixed by hand and transferred to and from containers for up to 8 hrs per day.
Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default)
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied

Technical conditions and measures to control dispersion from source towards the worker : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : No specific measures identified.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Dermal protection required for hand mixing operations: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness 90%.

Contributing scenario controlling worker exposure for 5: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product characteristics : Melting point: 1367.5 °C (101.3 kPa).
Vapour pressure: 0.00010799 Pa (25°C).
Water solubility (g/l): 0.822 mg/l (25°C).
Concentration of the substance in the mixture: 3-5% w/w Barium diboron tetraoxide.

Amounts used : Not applicable.

Frequency and duration of use/exposure : Professional workers using painting products containing barium diboron tetraoxide (e.g. anti-corrosion pre-treatment paints) may apply these using a brush, or a roller or by spraying for up to 8 hrs per day. Product may be mixed by hand and transferred to and from containers for up to 8 hrs per day.

Human factors not influenced by risk management : Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m³/person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default)

Other conditions affecting workers exposure : Indoor use

Technical conditions and measures at process level (source) to prevent release : Technical conditions limiting release: Not applied

Technical conditions and measures to control dispersion from source towards the worker : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : No specific measures identified.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Dermal protection required for hand mixing operations: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness 90%.

Section 3 - Exposure estimation and reference to its source

Website: : Not applicable.

Exposure estimation and reference to its source - Environment: 1: Environmental exposure arising due to professional use in paint.

Exposure assessment (environment):	: Environmental exposures were calculated using the CHESAR model using the EU TGD algorithms. Removal in the STP was estimated using the SimpleTreat model.
Exposure estimation and reference to its source	: Refer to section 8: PNEC Summary Freshwater: 3.643E-4 mg/l - Risk characterisation ratio (PEC/PNEC): 0.047. Freshwater sediment: 0.003 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.047. Marine water: 3.592E-5 mg/l - Risk characterisation ratio (PEC/PNEC): 0.046. Marine water sediment: 2.539E-4 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.046. Soil: 4.09E-9 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.178. Sewage Treatment Plant: 1.95E-4 - Risk characterisation ratio (PEC/PNEC): <0.01.

Exposure estimation and reference to its source - Workers: 2: Rolling, Brushing

Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary Worker - inhalative, long-term - systemic: 0.056 mg/m ³ - Risk characterisation ratio: 0.022. Worker - inhalative, short-term - systemic: 0.244 mg/m ³ - Risk characterisation ratio: 0.064. Worker - dermal, long-term - systemic: 1.371 mg/kg bw/day - Risk characterisation ratio: 0.196. Worker - dermal, short-term - systemic: 1.371 mg/kg bw/day - Risk characterisation ratio: 0.137. Worker - combined, long-term - systemic - Risk characterisation ratio: 0.218. Worker - combined, short-term - systemic - Risk characterisation ratio: 0.201.

Exposure estimation and reference to its source - Workers: 3: Spraying (professional)

Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary Worker - inhalative, long-term - systemic: 0.255 mg/m ³ - Risk characterisation ratio: 0.102. Worker - inhalative, short-term - systemic: 1.020 mg/m ³ - Risk characterisation ratio: 0.291. Worker - dermal, long-term - systemic: 5.357 mg/kg bw/day - Risk characterisation ratio: 0.765. Worker - dermal, short-term - systemic: 5.357 mg/kg bw/day - Risk characterisation ratio: 0.536. Worker - combined, long-term - systemic - Risk characterisation ratio: 0.867. Worker - combined, short-term - systemic - Risk characterisation ratio: 0.827.

Exposure estimation and reference to its source - Workers: 4: Manual activities involving hand contact

Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary Worker - inhalative, long-term - systemic: 5.60E-4 mg/m ³ - Risk characterisation ratio: 2.24E-4. Worker - inhalative, short-term - systemic: 2.24E-3 mg/m ³ - Risk characterisation ratio: 6.40E-4. Worker - dermal, long-term - systemic: 0.707 mg/kg bw/day - Risk characterisation ratio: 0.101. Worker - dermal, short-term - systemic: 0.707 mg/kg bw/day - Risk characterisation ratio: 0.071. Worker - combined, long-term - systemic - Risk characterisation ratio: 0.101. Worker - combined, short-term - systemic - Risk characterisation ratio: 0.071.

Exposure estimation and reference to its source - Workers: 5: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary Worker - inhalative, long-term - systemic: 0.186 mg/m ³ - Risk characterisation ratio: 0.074. Worker - inhalative, short-term - systemic: 0.186 mg/m ³ - Risk characterisation ratio: 0.053. Worker - dermal, long-term - systemic: 0.686 mg/kg bw/day - Risk characterisation ratio: 0.098. Worker - dermal, short-term - systemic: 0.686 mg/kg bw/day - Risk characterisation ratio: 0.069. Worker - combined, long-term - systemic - Risk characterisation ratio: 0.172. Worker - combined, short-term - systemic - Risk characterisation ratio: 0.122.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Health	: Dermal protection required for hand mixing operations: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training.

Additional good practice advice beyond the REACH CSA

Environment

: Efficacy of all emission RMMs and waste treatment procedures should be routinely assessed and confirmed to be functioning correctly.

Health

: Do not eat, drink or smoke when using this product.
Always wash hands and exposed skin thoroughly after using barium diboron tetraoxide or any surfaces/machinery that may have come into contact with barium diboron tetraoxide.
Ensure operatives are trained to minimise exposures.
Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).
Machinery should be regularly maintained and checked for proper function.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mono-constituent substance
Product name : MFP

Section 1 - Title

Short title of the exposure scenario : GES 4 Industrial use in coating/painting of articles.

List of use descriptors : **Identified use name:** GES 4 Industrial use in coating/painting of articles.
Process Category: PROC05, PROC07, PROC08b, PROC10, PROC13
Substance supplied to that use in form of: In a mixture
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC05

Environmental contributing scenarios : **Environmental exposure arising due to industrial use in coating/painting of articles.** - ERC05

Health Contributing scenarios : **Mixing or blending in batch processes for formulation or preparations (liquids).** - PROC05
Mixing or blending in batch processes for formulation or preparations (solid). - PROC05
Industrial spraying (automated process) - PROC07
Rolling, Brushing - PROC10
Transfer of substance or preparation at dedicated sites (liquid) - PROC08b
Transfer of substance or preparation at dedicated sites (solid) - PROC08b
Treatment by dipping and pouring - PROC13

Number of the ES	: 4
Processes and activities covered by the exposure scenario	<p>: Section 2.2 describes the conditions for controlling worker exposures to barium diboron tetraoxide during the use of the substance in the coating/painting or articles in industrial settings. This scenario includes the use of the substance in the coating of textile fabrics. Coatings and paints typically contain the substance at concentrations between 3 and 5% w/w. Coatings applied to textile fabrics may include the substance at concentrations up to 10% w/w.</p> <p>Coatings and paints containing the substance may be mixed or blended in batch processes (PROC 5). These coatings and paints may be applied to surfaces or articles by automated spraying processes (PROC 7). The potential for exposure during this process is limited to when workers are inspecting these operations. Operators may also apply coatings containing the substance to surfaces or articles using a brush or a roller (PROC 10) or by dipping (PROC 13). During the preparation of coating and paints, the substance (in the powdered form) and its formulations are loaded or unloaded to/from containers (PROC 8b; solid and liquid respectively).</p> <p>As an example, when used in the coating of textile fabrics, the substance in the powdered form is blended into water based polymer dispersions (e.g. liquid formulations) using a batch blending process (e.g. PROC 5). These compounded dispersions will be applied to the surface of a textile fabric using a spray, a roller or by dipping (as described by PROCs 7, 10 and 13 respectively). The treated textile coated with the dispersion will then be dried by the application of heat to remove water.</p>

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Environmental exposure arising due to industrial use in coating/painting of articles.

The following emission sources are considered: Release to air from process: 8%; Release to soil from process: 1%; Release to waste water from process: 0.14%.
Fraction tonnage to region: 100%.

Product characteristics	: Melting point: 1367,5°C (101.3 kPa) Vapour pressure: 0.00010799 Pa (25°C). Water solubility (g/l): 0.822 g/l (25°C)
Amounts used	: 15Tonnes/year. Maximum allowable site tonnage:15 Tonnes/year. Fraction tonnage to region:: 100%.
Frequency and duration of use	: Emission days: 150.
Other conditions affecting environmental exposure	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Limit release rate to waste water to 0.14 kg/day. Limit release rate to air to 8 kg/day. Other Operational Conditions (environment): No special measures required.
Technical conditions and measures at process level (source) to prevent release	: Emission fractions for soil should not exceed those specified by ERC 5. All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Limit release rate to waste water to 0.14 kg/day. Limit release rate to air to 8 kg/day.
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	: Limit release rate to waste water to 0.14 kg/day. Limit release rate to air to 8 kg/day.
Organisational measures to prevent/limit release from site	: No special measures are required.
Conditions and measures related to sewage treatment plant	: Size of municipal sewage system/treatment plant 2,000,000 L/day River flow rate:18,000 m ³ /day SimpleTreat default removal rates are sufficient for removal in the STP.
Conditions and measures related to external treatment of waste for disposal	: No special measures required.
Conditions and measures related to external recovery of waste	: No special measures are required.

Contributing scenario controlling worker exposure for 2: Mixing or blending in batch processes for formulation or preparations (liquids).

Product characteristics	: Melting point: 1367.5°C (101.3 kPa) Vapour pressure: 0.00010799 (25°C). Water solubility (g/l): 0.822 (25°C). Concentration of the substance in the mixture:< 10% w/w Barium diboron tetraoxide
Amounts used	: Not applicable.

Frequency and duration of use/exposure	: 8 hours per day
Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default)
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied
Technical conditions and measures to control dispersion from source towards the worker	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	: No specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Contributing scenario controlling worker exposure for 3: Mixing or blending in batch processes for formulation or preparations (solid).

Product characteristics	: Melting point: 1367.5°C (101.3 kPa) Vapour pressure: 0.00010799 (25°C). Water solubility (g/l): 0.822 (25°C). Concentration of the substance in the mixture:< 10% w/w Barium diboron tetraoxide
Amounts used	: Not applicable.
Frequency and duration of use/exposure	: 8 hours per day
Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default)
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied
Technical conditions and measures to control dispersion from source towards the worker	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	: No specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Contributing scenario controlling worker exposure for 4: Industrial spraying (automated process)

Product characteristics	: Melting point: 1367.5°C (101.3 kPa) Vapour pressure: 0.00010799 (25°C). Water solubility (g/l): 0.822 (25°C). Concentration of the substance in the mixture:< 10% w/w Barium diboron tetraoxide
Amounts used	: Not applicable.
Frequency and duration of use/exposure	: 8 hours per day
Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default)
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied
Technical conditions and measures to control dispersion from source towards the worker	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	: No specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Contributing scenario controlling worker exposure for 5: Rolling, Brushing

Product characteristics	: Melting point: 1367.5°C (101.3 kPa) Vapour pressure: 0.00010799 (25°C). Water solubility (g/l): 0.822 (25°C). Concentration of the substance in the mixture:< 10% w/w Barium diboron tetraoxide
Amounts used	: Not applicable.
Frequency and duration of use/exposure	: 8 hours per day
Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default)
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied
Technical conditions and measures to control dispersion from source towards the worker	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : No specific measures identified.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Contributing scenario controlling worker exposure for 6: Transfer of substance or preparation at dedicated sites (liquid)

Product characteristics : Melting point: 1367.5°C (101.3 kPa)
Vapour pressure: 0.00010799 (25°C).
Water solubility (g/l): 0.822 (25°C).
Concentration of the substance in the mixture:< 10% w/w Barium diboron tetraoxide

Amounts used : Not applicable.

Frequency and duration of use/exposure : 8 hours per day

Human factors not influenced by risk management : Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m³/person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default)

Other conditions affecting workers exposure : Indoor use

Technical conditions and measures at process level (source) to prevent release : Technical conditions limiting release: Not applied

Technical conditions and measures to control dispersion from source towards the worker : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Organisational measures to prevent/limit releases, dispersion and exposure : No specific measures identified.

Conditions and measures related to personal protection, hygiene and health evaluation

Personal protection : Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Contributing scenario controlling worker exposure for 7: Transfer of substance or preparation at dedicated sites (solid)

Product characteristics : Melting point: 1367.5°C (101.3 kPa)
Vapour pressure: 0.00010799 (25°C).
Water solubility (g/l): 0.822 (25°C).
Concentration of the substance in the mixture:< 10% w/w Barium diboron tetraoxide

Amounts used : Not applicable.

Frequency and duration of use/exposure : 8 hours per day

Human factors not influenced by risk management : Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m³/person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default)

Other conditions affecting workers exposure : Indoor use

Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied
Technical conditions and measures to control dispersion from source towards the worker	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	: No specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Contributing scenario controlling worker exposure for 8: Treatment by dipping and pouring

Product characteristics	: Melting point: 1367.5°C (101.3 kPa) Vapour pressure: 0.00010799 (25°C). Water solubility (g/l): 0.822 (25°C). Concentration of the substance in the mixture: < 10% w/w Barium diboron tetraoxide
Amounts used	: Not applicable.
Frequency and duration of use/exposure	: 8 hours per day
Human factors not influenced by risk management	: Standard values from the CSR under normal conditions. The respiration volume under conditions of use is 10m ³ /person (default value for a worker breathing for an 8 hour work day in Guidance Section R 8.4.2). Body weight: 70 kg (Default)
Other conditions affecting workers exposure	: Indoor use
Technical conditions and measures at process level (source) to prevent release	: Technical conditions limiting release: Not applied
Technical conditions and measures to control dispersion from source towards the worker	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Organisational measures to prevent/limit releases, dispersion and exposure	: No specific measures identified.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Effectiveness: 95%.

Section 3 - Exposure estimation and reference to its source

Website:	: Not applicable.
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Exposure estimation and reference to its source - Environment: 1: Environmental exposure arising due to industrial use in coating/painting of articles.

Exposure assessment (environment):	: Environmental exposures were calculated using the CHESAR model using the EU TGD algorithms. Removal in the STP was estimated using the SimpleTreat model.
Exposure estimation and reference to its source	: Refer to section 8: PNEC Summary
	Freshwater: 0.007 mg/l - Risk characterisation ratio (PEC/PNEC): 0.939.
	Freshwater sediment: 0.052 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.939.
	Marine water: 7.318 E-4 mg/l - Risk characterisation ratio (PEC/PNEC): 0.938.
	Marine water sediment: 0.005 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.938.
	Soil: 0.006 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.994.
	Sewage Treatment Plant: 0.07 mg/l - Risk characterisation ratio (PEC/PNEC): <0.01.

Exposure estimation and reference to its source - Workers: 2: Mixing or blending in batch processes for formulation or preparations (liquids).

Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary
	Worker - inhalative, long-term - systemic: 0.390 mg/m ³ - Risk characterisation ratio: 0.156.
	Worker - inhalative, short-term - systemic: 0.390 mg/m ³ - Risk characterisation ratio: 0.111.
	Worker - dermal, long-term - systemic: 0.069 mg/kg bw/day - Risk characterisation ratio: 0.010.
	Worker - dermal, short-term - systemic: 0.069 mg/kg bw/day - Risk characterisation ratio: 0.007.
	Worker - combined, long-term - systemic - Risk characterisation ratio: 0.166.
	Worker - combined, short-term - systemic - Risk characterisation ratio: 0.118.

Exposure estimation and reference to its source - Workers: 3: Mixing or blending in batch processes for formulation or preparations (solid).

Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary
	Worker - inhalative, long-term - systemic: 0.5 mg/m ³ - Risk characterisation ratio: 0.200.
	Worker - inhalative, short-term - systemic: 2 mg/m ³ - Risk characterisation ratio: 0.571.
	Worker - dermal, long-term - systemic: 0.686 mg/kg bw/day - Risk characterisation ratio: 0.098.
	Worker - dermal, short-term - systemic: 0.686 mg/kg bw/day - Risk characterisation ratio: 0.069.
	Worker - combined, long-term - systemic - Risk characterisation ratio: 0.298.

Worker - combined, short-term - systemic - Risk characterisation ratio: 0.640.

Exposure estimation and reference to its source - Workers: 4: Industrial spraying (automated process)

Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary Worker - inhalative, long-term - systemic: 0.200 mg/m ³ - Risk characterisation ratio: 0.08. Worker - inhalative, short-term - systemic: 0.800 mg/m ³ - Risk characterisation ratio: 0.229. Worker - dermal, long-term - systemic: 0.214 mg/kg bw/day - Risk characterisation ratio: 0.031. Worker - dermal, short-term - systemic: 0.214 mg/kg bw/day - Risk characterisation ratio: 0.021. Worker - combined, long-term - systemic - Risk characterisation ratio: 0.111. Worker - combined, short-term - systemic - Risk characterisation ratio: 0.250.

Exposure estimation and reference to its source - Workers: 5: Rolling, Brushing

Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary Worker - inhalative, long-term - systemic: 0.11 mg/m ³ - Risk characterisation ratio: 0.044. Worker - inhalative, short-term - systemic: 0.44 mg/m ³ - Risk characterisation ratio: 0.126. Worker - dermal, long-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.020. Worker - dermal, short-term - systemic: 0.137 mg/kg bw/day - Risk characterisation ratio: 0.014. Worker - combined, long-term - systemic - Risk characterisation ratio: 0.064. Worker - combined, short-term - systemic - Risk characterisation ratio: 0.140.

Exposure estimation and reference to its source - Workers: 6: Transfer of substance or preparation at dedicated sites (liquid)

Exposure assessment (human):	: ECETOC TRA worker v3 Used ART model. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
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Exposure estimation and reference to its source : Refer to section 8: DNEL/DMEL Summary
 Worker - inhalative, long-term - systemic: 0.390 mg/m³ - Risk characterisation ratio: 0.156.
 Worker - inhalative, short-term - systemic: 0.390 mg/m³ - Risk characterisation ratio: 0.111.
 Worker - dermal, long-term - systemic: 0.069 mg/kg bw/day - Risk characterisation ratio: 0.010.
 Worker - dermal, short-term - systemic: 0.069 mg/kg bw/day - Risk characterisation ratio: 0.007.
 Worker - combined, long-term - systemic - Risk characterisation ratio: 0.166.
 Worker - combined, short-term - systemic - Risk characterisation ratio: 0.118.

Exposure estimation and reference to its source - Workers: 7: Transfer of substance or preparation at dedicated sites (solid)

Exposure assessment (human): : ECETOC TRA worker v3
 Used ART model.
 No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.

Exposure estimation and reference to its source : Refer to section 8: DNEL/DMEL Summary
 Worker - inhalative, long-term - systemic: 0.07 mg/m³ - Risk characterisation ratio: 0.028.
 Worker - inhalative, short-term - systemic: 0.280 mg/m³ - Risk characterisation ratio: 0.080.
 Worker - dermal, long-term - systemic: 0.686 mg/kg bw/day - Risk characterisation ratio: 0.098.
 Worker - dermal, short-term - systemic: 0.686 mg/kg bw/day - Risk characterisation ratio: 0.069.
 Worker - combined, long-term - systemic - Risk characterisation ratio: 0.126.
 Worker - combined, short-term - systemic - Risk characterisation ratio: 0.149.

Exposure estimation and reference to its source - Workers: 8: Treatment by dipping and pouring

Exposure assessment (human): : ECETOC TRA worker v3
 Used ART model.
 No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.

Exposure estimation and reference to its source : Refer to section 8: DNEL/DMEL Summary
 Worker - inhalative, long-term - systemic: 0.039 mg/m³ - Risk characterisation ratio: 0.156.
 Worker - inhalative, short-term - systemic: 0.039 mg/m³ - Risk characterisation ratio: 0.111.
 Worker - dermal, long-term - systemic: 0.069 mg/kg bw/day - Risk characterisation ratio: 0.010.
 Worker - dermal, short-term - systemic: 0.069 mg/kg bw/day - Risk characterisation ratio: 0.007.
 Worker - combined, long-term - systemic - Risk characterisation ratio: 0.166.
 Worker - combined, short-term - systemic - Risk characterisation ratio: 0.118.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	: In order to work within the boundaries of the ES the following conditions should be met: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Limit release rate to air to 8 kg/day. Limit release rate to waste water to 0.14 kg/day.
Health	: In order to work within the boundaries of the ES the following conditions should be met: Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training.

Additional good practice advice beyond the REACH CSA

Environment	: Efficacy of all emission RMMs and waste treatment procedures should be routinely assessed and confirmed to be functioning correctly.
Health	: Do not eat, drink or smoke when using this product. Ensure operatives are trained to minimise exposures. Supervision in place to check that the RMMs in place are being used correctly and OCs followed Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Always wash hands and exposed skin thoroughly after using barium diboron tetraoxide or any surfaces/machinery that may have come into contact with barium diboron tetraoxide. Machinery should be regularly maintained and checked for proper function.

Annex to the extended Safety Data Sheet (eSDS)

Consumer

Identification of the substance or mixture

Product definition : Mono-constituent substance
Product name : MFP

Section 1 - Title

Short title of the exposure scenario : GES 6 Consumer use in paint.

List of use descriptors : **Identified use name:** GES 6 Consumer use in paint.
Substance supplied to that use in form of: In a mixture
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC08f
Market sector by type of chemical product: PC09a

Environmental contributing scenarios : **Environmental exposure arising due to consumer use in paint.** - ERC08f

Health Contributing scenarios : **Brush and rolling painting - solvent rich paint** - PC09a
Brush and rolling painting - High solid paint - PC09a
Brush and rolling painting - Waterborne paint - PC09a
Brush and rolling painting - Waterborne wall paint - PC09a
Brush and rolling painting - Spraying paint (pneumatic spraying) - PC09a

Number of the ES	: 6
Processes and activities covered by the exposure scenario	: Section 2.1 describes the environmental releases that may occur with consumer use in paints. Section 2.2 describes the conditions for controlling consumer exposures to barium diboron tetraoxide during the use of the substance in a range of painting products used by consumers. The substance may be incorporated into a range consumer painting products which include solvent rich, high solid and waterborne paint. The in-use concentration of the substance in these products ranges from 3-5% w/w. These products may be applied using a brush, a roller or by spraying (e.g. pneumatic spraying).

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: Environmental exposure arising due to consumer use in paint.	
The following emission sources are considered: Release to air from process: 15%; Release to soil from process: 0.5%; Release to waste water from process: 1%. Fraction tonnage to region: 10%.	
Product characteristics	: Melting point: 1367.5°C (101.3 kPa) Vapour pressure: 0.00010799 Pa (25°C). Water solubility (g/l): 0.822 mg/l (25°C).
Amounts used	: 20 Tonnes/year. Daily amount for wide dispersive uses: 1.1E-5 tonne. Fraction tonnage to region:10%.
Frequency and duration of use	: Emission days: 365.
Other conditions affecting environmental exposure	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Other Operational Conditions (environment): No special measures required.

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48/55

Conditions and measures related to sewage treatment plant	: Size of municipal sewage system/treatment plant: 2,000,000 L/day River flow rate:: 18,000 m ³ /day SimpleTreat default removal rates are sufficient for removal in the STP.
Conditions and measures related to external treatment of waste for disposal	: No special measures required.
Conditions and measures related to external recovery of waste	: No special measures are required.

Contributing scenario controlling consumer exposure for 2: Brush and rolling painting - solvent rich paint

Product characteristics	: Melting point: 1367.5°C (101.3 kPa) Vapour pressure: 0.00010799 Pa (25°C). Water solubility (g/l): 0.822 (25°C) Concentration of the substance in the mixture:<5 w/w Barium diboron tetraoxide
Amounts used	: Not applicable.
Frequency and duration of use/exposure	: Consumers may apply paints containing barium diboron tetraoxide using a brush or a roller or using a pneumatic sprayer. Consumers are likely to use these painting products infrequently (e.g. 1-2 times per year). Brush and roller applications may typically be carried out for up to 2 hours per day. Spraying applications are expected to be of shorter duration (e.g. < 15 minutes per day).
Human factors not influenced by risk management	: Standard values from the RIVM Factsheet for consumer using painting products. The default inhalation rate for light exercise is assumed as 33 m ³ /day. Body weight: 60 kg (Default).
Other given operational conditions affecting consumers exposure	: Not applicable.
Conditions and measures related to personal protection and hygiene	
Personal protection	: It is anticipated as a worst-case that consumers will not wear any personal protective equipment. Under these conditions; the risk characterization described in Section 3 indicates that potential exposures arising from this use scenario to not pose an unacceptable health risk to consumers with respect to systemic toxicity. No hazards have been identified for the substance regarding skin or eye irritation or skin sensitization hence specific measures in relation to these endpoints are not required. However, consumers should always follow the manufacturer's instructions on the use of painting products, read associated safety information and apply any advice related to personal protection, hygiene and health.

Contributing scenario controlling consumer exposure for 3: Brush and rolling painting - High solid paint

Product characteristics	: Melting point: 1367.5°C (101.3 kPa) Vapour pressure: 0.00010799 Pa (25°C). Water solubility (g/l): 0.822 (25°C) Concentration of the substance in the mixture:<5 w/w Barium diboron tetraoxide
Amounts used	: Not applicable.
Frequency and duration of use/exposure	: Consumers may apply paints containing barium diboron tetraoxide using a brush or a roller or using a pneumatic sprayer. Consumers are likely to use these painting products infrequently (e.g. 1-2 times per year). Brush and roller applications may typically be carried out for up to 2 hours per day. Spraying applications are expected to be of shorter duration (e.g. < 15 minutes per day).
Human factors not influenced by risk management	: Standard values from the RIVM Factsheet for consumer using painting products. The default inhalation rate for light exercise is assumed as 33 m ³ /day. Body weight: 60 kg (Default).

Other given operational conditions affecting consumers exposure : Not applicable.

Conditions and measures related to personal protection and hygiene

Personal protection : It is anticipated as a worst-case that consumers will not wear any personal protective equipment. Under these conditions; the risk characterization described in Section 3 indicates that potential exposures arising from this use scenario to not pose an unacceptable health risk to consumers with respect to systemic toxicity. No hazards have been identified for the substance regarding skin or eye irritation or skin sensitization hence specific measures in relation to these endpoints are not required. However, consumers should always follow the manufacturer's instructions on the use of painting products, read associated safety information and apply any advice related to personal protection, hygiene and health.

Contributing scenario controlling consumer exposure for 4: Brush and rolling painting - Waterborne paint

Product characteristics : Melting point: 1367.5°C (101.3 kPa)
Vapour pressure: 0.00010799 Pa (25°C).
Water solubility (g/l): 0.822 (25°C)
Concentration of the substance in the mixture:<5 w/w Barium diboron tetraoxide

Amounts used : Not applicable.

Frequency and duration of use/exposure : Consumers may apply paints containing barium diboron tetraoxide using a brush or a roller or using a pneumatic sprayer. Consumers are likely to use these painting products infrequently (e.g. 1-2 times per year). Brush and roller applications may typically be carried out for up to 2 hours per day. Spraying applications are expected to be of shorter duration (e.g. < 15 minutes per day).

Human factors not influenced by risk management : Standard values from the RIVM Factsheet for consumer using painting products. The default inhalation rate for light exercise is assumed as 33 m³/day. Body weight: 60 kg (Default).

Other given operational conditions affecting consumers exposure : Not applicable.

Conditions and measures related to personal protection and hygiene

Personal protection : It is anticipated as a worst-case that consumers will not wear any personal protective equipment. Under these conditions; the risk characterization described in Section 3 indicates that potential exposures arising from this use scenario to not pose an unacceptable health risk to consumers with respect to systemic toxicity. No hazards have been identified for the substance regarding skin or eye irritation or skin sensitization hence specific measures in relation to these endpoints are not required. However, consumers should always follow the manufacturer's instructions on the use of painting products, read associated safety information and apply any advice related to personal protection, hygiene and health.

Contributing scenario controlling consumer exposure for 5: Brush and rolling painting - Waterborne wall paint

Product characteristics : Melting point: 1367.5°C (101.3 kPa)
Vapour pressure: 0.00010799 Pa (25°C).
Water solubility (g/l): 0.822 (25°C)
Concentration of the substance in the mixture:<5 w/w Barium diboron tetraoxide

Amounts used : Not applicable.

Frequency and duration of use/exposure : Consumers may apply paints containing barium diboron tetraoxide using a brush or a roller or using a pneumatic sprayer. Consumers are likely to use these painting products infrequently (e.g. 1-2 times per year). Brush and roller applications may typically be carried out for up to 2 hours per day. Spraying applications are expected to be of shorter duration (e.g. < 15 minutes per day).

Human factors not influenced by risk management : Standard values from the RIVM Factsheet for consumer using painting products. The default inhalation rate for light exercise is assumed as 33 m³/day. Body weight: 60 kg (Default).

Other given operational conditions affecting consumers exposure : Not applicable.

Conditions and measures related to personal protection and hygiene

Personal protection : It is anticipated as a worst-case that consumers will not wear any personal protective equipment. Under these conditions; the risk characterization described in Section 3 indicates that potential exposures arising from this use scenario to not pose an unacceptable health risk to consumers with respect to systemic toxicity. No hazards have been identified for the substance regarding skin or eye irritation or skin sensitization hence specific measures in relation to these endpoints are not required. However, consumers should always follow the manufacturer's instructions on the use of painting products, read associated safety information and apply any advice related to personal protection, hygiene and health.

Contributing scenario controlling consumer exposure for 6: Brush and rolling painting - Spraying paint (pneumatic spraying)

Product characteristics : Melting point: 1367.5°C (101.3 kPa)
Vapour pressure: 0.00010799 Pa (25°C).
Water solubility (g/l): 0.822 (25°C)
Concentration of the substance in the mixture:<5 w/w Barium diboron tetraoxide

Amounts used : Not applicable.

Frequency and duration of use/exposure : Consumers may apply paints containing barium diboron tetraoxide using a brush or a roller or using a pneumatic sprayer. Consumers are likely to use these painting products infrequently (e.g. 1-2 times per year). Brush and roller applications may typically be carried out for up to 2 hours per day. Spraying applications are expected to be of shorter duration (e.g. < 15 minutes per day).

Human factors not influenced by risk management : Standard values from the RIVM Factsheet for consumer using painting products. The default inhalation rate for light exercise is assumed as 33 m³/day. Body weight: 60 kg (Default).

Other given operational conditions affecting consumers exposure : Not applicable.

Conditions and measures related to personal protection and hygiene

Personal protection : It is anticipated as a worst-case that consumers will not wear any personal protective equipment. Under these conditions; the risk characterization described in Section 3 indicates that potential exposures arising from this use scenario to not pose an unacceptable health risk to consumers with respect to systemic toxicity. No hazards have been identified for the substance regarding skin or eye irritation or skin sensitization hence specific measures in relation to these endpoints are not required. However, consumers should always follow the manufacturer's instructions on the use of painting products, read associated safety information and apply any advice related to personal protection, hygiene and health.

Section 3 - Exposure estimation and reference to its source

Website: : Not applicable.

Exposure estimation and reference to its source - Environment: 1: Environmental exposure arising due to consumer use in paint.

Exposure assessment (environment):	: Environmental exposures were calculated using the CHESAR model using the EU TGD algorithms. Removal in the STP was estimated using the SimpleTreat model.
Exposure estimation and reference to its source	: Refer to section 8: PNEC Summary Freshwater: 3.588E-4 mg/l - Risk characterisation ratio (PEC/PNEC): 0.046. Freshwater sediment: 0.003 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.046. Marine water: 3.538 E-5 mg/l - Risk characterisation ratio (PEC/PNEC): 0.045. Marine water sediment: 2.5 E-4 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.045. Soil: 0.001 mg/kg - Risk characterisation ratio (PEC/PNEC): 0.177. Sewage Treatment Plant: 5.476 E-5 - Risk characterisation ratio (PEC/PNEC): <0.01.

Exposure estimation and reference to its source - Consumers: 2: Brush and rolling painting - solvent rich paint

Exposure assessment (human):	: A quantitative risk characterisation for potential short-term and long-term systemic effects via the dermal and inhalation routes has been carried out using the ConsExpo 4.1 and default parameters provided in the RIVM Factsheet for Paint Products. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
Exposure estimation and reference to its source	: Refer to section 8: DNEL/DMEL Summary Consumer - inhalative, long-term - systemic: 6.0 E-5 mg/m ³ - Risk characterisation ratio: <0.01. Consumer - inhalative, short-term - systemic: 6.5 E-4 mg/m ³ - Risk characterisation ratio: <0.01. Consumer - dermal, long-term - systemic: 3.0 mg/kg bw/day - Risk characterisation ratio: 0.86. Consumer- dermal, short-term - local and systemic: 3.0 mg/kg bw/day - Risk characterisation ratio: 0.60. Consumer - combined, long-term - systemic - Risk characterisation ratio: 0.86. Consumer - combined, short-term - systemic - Risk characterisation ratio: 0.60.

Exposure estimation and reference to its source - Consumers: 3: Brush and rolling painting - High solid paint

Exposure assessment (human):	: A quantitative risk characterisation for potential short-term and long-term systemic effects via the dermal and inhalation routes has been carried out using the ConsExpo 4.1 and default parameters provided in the RIVM Factsheet for Paint Products. No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.
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Exposure estimation and reference to its source : Refer to section 8: DNEL/DMEL Summary

Consumer - inhalative, long-term - systemic: 1.0 E-4 mg/m³ - Risk characterisation ratio: <0.01.
 Consumer- inhalative, short-term - local and systemic: 1.1 E-3 mg/m³ - Risk characterisation ratio: <0.01.
 Consumer - dermal, long-term - systemic: 3 mg/kg bw/day - Risk characterisation ratio: 0.86.
 Consumer- dermal, short-term - local and systemic: 3 mg/kg bw/day - Risk characterisation ratio: 0.60.
 Consumer - combined, long-term - systemic - Risk characterisation ratio: 0.86.
 Consumer - combined, short-term - systemic - Risk characterisation ratio: 0.60.

Exposure estimation and reference to its source - Consumers: 4: Brush and rolling painting - Waterborne paint

Exposure assessment (human): : A quantitative risk characterisation for potential short-term and long-term systemic effects via the dermal and inhalation routes has been carried out using the ConsExpo 4.1 and default parameters provided in the RIVM Factsheet for Paint Products.

No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.

Exposure estimation and reference to its source : Refer to section 8: DNEL/DMEL Summary

Consumer - inhalative, long-term - systemic: 5.8 E-6 mg/m³ - Risk characterisation ratio: <0.01.
 Consumer - inhalative, short-term - systemic: 6.3 E-5 mg/m³ - Risk characterisation ratio: <0.01.
 Consumer - dermal, long-term - systemic: 3 mg/kg bw/day - Risk characterisation ratio: 0.86.
 Consumer- dermal, short-term - local and systemic: 3 mg/kg bw/day - Risk characterisation ratio: 0.60.
 Consumer - combined, long-term - systemic - Risk characterisation ratio: 0.86.
 Consumer - combined, short-term - systemic - Risk characterisation ratio: 0.60.

Exposure estimation and reference to its source - Consumers: 5: Brush and rolling painting - Waterborne wall paint

Exposure assessment (human): : A quantitative risk characterisation for potential short-term and long-term systemic effects via the dermal and inhalation routes has been carried out using the ConsExpo 4.1 and default parameters provided in the RIVM Factsheet for Paint Products.

No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.

Exposure estimation and reference to its source : Consumer - inhalative, long-term - systemic : 1.7 E-5 mg/m³ - Risk characterisation ratio: <0.01.
 Consumer - inhalative, short-term - systemic: 1.9 E-4 mg/m³ - Risk characterisation ratio: <0.01.
 Consumer - dermal, long-term - systemic: 3 mg/kg bw/day - Risk characterisation ratio: 0.86.
 Consumer- dermal, short-term - local and systemic: 3 mg/kg bw/day - Risk characterisation ratio: 0.60.

Consumer - combined, long-term - systemic - Risk characterisation ratio: 0.86.
 Consumer - combined, short-term - systemic - Risk characterisation ratio: 0.60.

Exposure estimation and reference to its source - Consumers: 6: Brush and rolling painting - Spraying paint (pneumatic spraying)

Exposure assessment (human): : A quantitative risk characterisation for potential short-term and long-term systemic effects via the dermal and inhalation routes has been carried out using the ConsExpo 4.1 and default parameters provided in the RIVM Factsheet for Paint Products.

No hazards have been identified for the substance with respect to local effects following long or short-term inhalation or dermal exposures. There is no evidence for a local irritant effect on the respiratory tract; the substance is not classified as a skin or eye irritant or as a skin sensitiser. No assessments are therefore required for local effects following short or long-term inhalation or dermal exposures.

Exposure estimation and reference to its source : Refer to section 8: DNEL/DMEL Summary

Consumer - inhalative, long-term - systemic: 0.009 mg/m³ - Risk characterisation ratio: 0.02.

Consumer- inhalative, short-term - local and systemic: 0.54 mg/m³ - Risk characterisation ratio: 0.62.

Consumer - dermal, long-term - systemic: 1.20 mg/kg bw/day - Risk characterisation ratio: 0.34.

Consumer- dermal, short-term - local and systemic: 1.20 mg/kg bw/day - Risk characterisation ratio: 0.24.

Consumer - combined, long-term - systemic - Risk characterisation ratio: 0.36.
 Consumer - combined, short-term - systemic - Risk characterisation ratio: 0.86.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	: All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Health	: It is anticipated as a worst-case that consumers will not wear any personal protective equipment. Under these conditions; the risk characterization described in Section 3 indicates that potential exposures arising from this use scenario to not pose an unacceptable health risk to consumers with respect to systemic toxicity. No hazards have been identified for the substance regarding skin or eye irritation or skin sensitization hence specific measures in relation to these endpoints are not required. However, consumers should always follow the manufacturer's instructions on the use of painting products, read associated safety information and apply any advice related to personal protection, hygiene and health.

Additional good practice advice beyond the REACH CSA

Environment	: Not available.
Health	: Consumers should read and follow manufacturer's instructions carefully. Paints intended for use by consumers may contain a range of ingredients, some of which may have intrinsic hazards. Consumers may be advised to avoid contact with the eyes and skin and to wash hands after use. Use of gloves and eye protection while handling these products may be recommended according to the manufacturer's instructions.

Product name:

MFP

MFP



REGULATORY FACT SHEET

Ecolabel

EU - Flower

The product is not compliant with EU flower ecolabel for outdoor paints and varnishes (2014/312/EU)

The product is not compliant with EU flower ecolabel for indoor paints and varnishes (2014/312/EU)

REACH

This product and all of its ingredients are compliant with REACH.

The Buckman's REACH position paper and SVHC statement can be obtained on demand.

Contact Details

For Regulatory content questions, please contact the Regulatory Affairs team on the e-mail address sds@buckman.com

For questions about the materials of construction, please contact the Field Equipment Team EMEA on the e-mail address FieldEquipmentDep_EMEA@buckman.com.

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This document can be considered as an official statement
This version supersedes any version issued before this date.

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