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

1.1 Product identifier

ERM-AE103, ERM-AE101a, ERM-AE102a, ERM-AE104a, ERM-AE123, ERM-AE124, ERM-AE125

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

1.2.1 Relevant uses

Isotopic reference material

1.2.2 Uses advised against

None known.

1.3 Details of the supplier of the safety data sheet

Company

Bundesanstalt für Materialforschung und -prüfung
Division 1.1, Dr. Jochen Vogl
Unter den Eichen 87
12205 Berlin / GERMANY
Phone +49 (0)30 8104-0
Fax +49 (0)30 8104-7-2222
Homepage www.bam.de
E-mail info@bam.de

Address enquiries to

Technical information jochen.vogl@bam.de

Safety Data Sheet sdb@chemiebuero.de

1.4 Emergency telephone number

Advisory body

Germany (in German language):
Giftnotruf Berlin +49-30-30686700; Charité-Universitätsmedizin Berlin - Campus Benjamin Franklin; Hindenburgdamm 30, 12203 Berlin
Outside Germany:
To avoid language problems and in case of nonavailability it is recommended to contact your national poison control centre.
A list of national poison control centres inside the EU can be obtained at:
http://ec.europa.eu/growth/sectors/chemicals/poison-centres/index_en.htm
For poison centres outside the EU the information is listed at the world directory of poison control centres at the WHO homepage:
http://www.who.int/gho/phe/chemical_safety/poisons_centres/en/
+49 (0) 30 3068 6700
+49 (0) 30 - 30686 790

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture [REGULATION (GB) CLP]

Repr. 1B: H360FD May damage fertility. May damage the unborn child.

2.2 Label elements

The product is required to be labelled in accordance with regulation CLP.

Hazard pictograms

Signal word DANGER

Contains: Boric acid

Hazard statements H360FD May damage fertility. May damage the unborn child.

Precautionary statements

P201 Obtain special instructions before use.
P280 Wear protective clothing / eye protection / face protection.
P308+P311 IF exposed or concerned: Call a POISON CENTER / doctor.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/national regulation.

Special labelling Restricted to professional users.

2.3 Other hazards

Human health dangers Frequent persistent contact with the skin can cause skin irritation.
It is essential for pregnant women to avoid inhaling the product and not to let it come in contact with the skin.

Environmental hazards Does not contain any PBT or vPvB substances.

Other hazards Further hazards were not determined with the current level of knowledge.

SECTION 3: Composition / Information on ingredients

3.1 Substances

not applicable

3.2 Mixtures

The product is a mixture.

Range [%]	Substance
0.1 - < 1	Boric acid
	CAS: 10043-35-3, EINECS/ELINCS: 233-139-2, EU-INDEX: 005-007-00-2, Reg-No.: 01-2119486683-25-XXXX
	GHS/CLP: Repr. 1B: H360FD

Comment on component parts SVHC (Candidate List of Substances of Very High Concern for authorisation) ≥ 0.1%
CAS 10043-35-3 - Boric acid
For full text of H-statements: see SECTION 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General information Take off contaminated clothing and wash before reuse.

Inhalation Ensure supply of fresh air.
In the event of symptoms seek medical treatment.

Skin contact When in contact with the skin, clean with soap and water.
Consult a doctor if skin irritation persists.

Eye contact Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.

Ingestion Rinse out mouth and give plenty of water to drink.
Seek medical advice immediately.

4.2 Most important symptoms and effects, both acute and delayed

None known.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media Product itself is non-combustible. Fire extinguishing method of surrounding areas must be considered.

Extinguishing media that must not be used Full water jet

5.2 Special hazards arising from the substance or mixture

Risk of formation of toxic pyrolysis products.

5.3 Advice for firefighters

Use self-contained breathing apparatus.

Fire residues and contaminated firefighting water must be disposed of in accordance within the local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective clothing.

6.2 Environmental precautions

Do not discharge into the drains/surface waters/groundwater.

6.3 Methods and material for containment and cleaning up

Pick up with absorbent material (e.g. sand, sawdust, universal absorbent, diatomaceous earth).
Dispose of absorbed material in accordance within the regulations.

6.4 Reference to other sections

See SECTION 8+13

SECTION 7: Handling and storage

7.1 Precautions for safe handling

The normal safety precautions for handling chemicals must be observed.

Wash hands before breaks and after work.
Use barrier skin cream.
Do not eat, drink, smoke or take drugs at work.
Take off contaminated clothing and wash before reuse.

7.2 Conditions for safe storage, including any incompatibilities

Keep only in original container.
Prevent penetration into the ground.

Do not store together with food and animal food/diet.

Keep container tightly closed.

7.3 Specific end use(s)

See product use, SECTION 1.2

SECTION 8: Exposure controls / personal protection

8.1 Control parameters

Ingredients with occupational exposure limits to be monitored (GB)

not applicable

DNEL

Substance
Boric acid, CAS: 10043-35-3
Industrial, dermal, Long-term - systemic effects, 392 mg/kg bw/day
Industrial, inhalative, Long-term - systemic effects, 8.3 mg/m³
general population, oral, Long-term - systemic effects, 0.98 mg/kg bw/day
general population, dermal, Long-term - systemic effects, 196 mg/kg bw/day
general population, inhalative, Long-term - systemic effects, 4.15 mg/m³

PNEC

Substance
Boric acid, CAS: 10043-35-3
soil, 5.7 mg/kg
sewage treatment plants (STP), 10 mg/L
seawater, 2.9 mg/L
freshwater, 2.9 mg/L

8.2 Exposure controls

Additional advice on system design
Ensure adequate ventilation on workstation.
Measurement methods for taking workplace measurements must meet the performance requirements of DIN EN 482. For example, recommendations are given in the IFA's list of hazardous substances.

Eye protection
Safety glasses. (EN 166:2001)

Hand protection
0.11 mm; Nitrile rubber, >240 min (EN 374-1/-2/-3).
The details concerned are recommendations. Please contact the glove supplier for further information.

Skin protection
Protective clothing (EN 340)

Other
Avoid contact with eyes and skin.
It is essential for pregnant women to avoid inhaling the product and not to let it come in contact with the skin.
Personal protective equipment should be selected specifically for the working place, depending on concentration and quantity handled. The resistance of this equipment to chemicals should be ascertained with the respective supplier.

Respiratory protection
Breathing apparatus in the event of aerosol or mist formation.
Short term: filter apparatus, filter P2. (DIN EN 143)

Thermal hazards
none

Delimitation and monitoring of the environmental exposition
Comply with applicable environmental regulations limiting discharge to air, water and soil.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	liquid
Color	colourless
Odor	odourless
Odour threshold	not applicable
pH-value	ca. 4
pH-value [1%]	not determined
Boiling point [°C]	ca. 100
Flash point [°C]	not applicable
Flammability (solid, gas) [°C]	not applicable
Lower explosion limit	not applicable
Upper explosion limit	not applicable
Oxidising properties	no
Vapour pressure/gas pressure [kPa]	not applicable
Density [g/cm³]	ca. 1.0 (20 °C / 68,0 °F)
Relative density	not determined
Bulk density [kg/m³]	not applicable
Solubility in water	miscible
Solubility other solvents	No information available.
Partition coefficient [n-octanol/water]	not applicable
Kinematic viscosity	not applicable
Relative vapour density	not applicable
Evaporation speed	not applicable
Melting point [°C]	ca. 0
Auto-ignition temperature	not self-igniting
Decomposition temperature [°C]	not applicable
Particle characteristics	not applicable

9.2 Other information

none

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reactions known if used as directed.

10.2 Chemical stability

The product is stable under standard conditions.

10.3 Possibility of hazardous reactions

No hazardous reactions known.

10.4 Conditions to avoid

No dangerous reactions known if used as directed.

10.5 Incompatible materials

Alkalies

10.6 Hazardous decomposition products

No hazardous decomposition products known.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute oral toxicity

Product
ATE-mix, oral, > 2000 mg/kg

Substance
Boric acid, CAS: 10043-35-3
LD50, oral, Rat, 3765 mg/kg

Acute dermal toxicity

Product
ATE-mix, dermal, > 2000 mg/kg

Substance
Boric acid, CAS: 10043-35-3
LD50, dermal, Rabbit, 2000 mg/kg

Acute inhalational toxicity

Product
ATE-mix, inhalative, > 20 mg/l 4h

Substance
Boric acid, CAS: 10043-35-3
LC50, inhalativ (mist), Rat, 0.002 mg/L (4h), OECD 403

Serious eye damage/irritation Based on the available information, the classification criteria are not fulfilled.

Substance
Boric acid, CAS: 10043-35-3
Eye, Rabbit, OECD 405, non-irritating

Skin corrosion/irritation Based on the available information, the classification criteria are not fulfilled.

Substance
Boric acid, CAS: 10043-35-3
dermal, Rabbit, In vivo study, non-irritating

Respiratory or skin sensitisation Based on the available information, the classification criteria are not fulfilled.

Substance
Boric acid, CAS: 10043-35-3
dermal, Guinea pig, OECD 406, non-sensitizing

Specific target organ toxicity — single exposure Based on the available information, the classification criteria are not fulfilled.

Specific target organ toxicity — repeated exposure Based on the available information, the classification criteria are not fulfilled.

Substance
Boric acid, CAS: 10043-35-3
NOAEL, oral, Rat, 100 mg/kg bw/day, In vivo study, adverse effect observed

NOAEC, inhalativ (mist), Rat, 103.9 mg/m³, In vivo study, no adverse effect observed

Mutagenicity Based on the available information, the classification criteria are not fulfilled.

Substance
Boric acid, CAS: 10043-35-3
in vitro, mammalian cells, negativ

Reproduction toxicity May damage the unborn child.
May damage fertility.
Based on the available information, the classification criteria are fulfilled.
Calculation method

Substance
Boric acid, CAS: 10043-35-3
oral, Rat, BMD: 59 mg/kg bw/day, In vivo study, adverse effect observed, Effects on developmental toxicity,
NOAEL, oral, Rat, 100 mg/kg bw/day, In vivo study, adverse effect observed, Effects on fertility,

Carcinogenicity Based on the available information, the classification criteria are not fulfilled.

Substance
Boric acid, CAS: 10043-35-3
NOAEL, oral, mouse, 1150 mg/kg bw/day, OECD 451, no adverse effect observed

Aspiration hazard Based on the available information, the classification criteria are not fulfilled.

General remarks

Toxicological data of complete product are not available.

11.2 Information on other hazards

Endocrine disrupting properties Contains no ingredients with endocrine-disrupting properties.

Other information none

SECTION 12: Ecological information

12.1 Toxicity

Substance
Boric acid, CAS: 10043-35-3
NOEC, (28d), Americamysis bahia, 33.1 mg/L

12.2 Persistence and degradability

Behaviour in environment compartments not determined

Behaviour in sewage plant not determined

Biological degradability not applicable

12.3 Bioaccumulative potential

not applicable

12.4 Mobility in soil

Spillages may penetrate the soil causing ground water contamination.

12.5 Results of PBT and vPvB assessment

Based on all available information not to be classified as PBT or vPvB respectively.

12.6 Endocrine disrupting properties

Contains no ingredients with endocrine-disrupting properties.

12.7 Other adverse effects

Do not discharge product unmonitored into the environment or into the drainage.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Waste material must be disposed of in accordance with the Directive on waste 2008/98/EC as well as other national and local regulations. It is not possible to determine a waste code for this product in accordance with the European Waste Catalogue (EWC) since it is only possible to classify it according to how it is used by the customer. The waste code is to be determined within the EU in liaison with the waste-disposal operator.

Product

Coordinate disposal with the authorities if necessary.

Waste no. (recommended) 060106*

Contaminated packaging

Uncontaminated packaging may be taken for recycling.

Waste no. (recommended) 150102
150107

SECTION 14: Transport information

14.1 UN number or ID number

Transport by land according to ADR/RID	not applicable
Inland navigation (ADN)	not applicable
Marine transport in accordance with IMDG	not applicable
Air transport in accordance with IATA	not applicable

14.2 UN proper shipping name

Transport by land according to ADR/RID	NO DANGEROUS GOODS
Inland navigation (ADN)	NO DANGEROUS GOODS
Marine transport in accordance with IMDG	NOT CLASSIFIED AS "DANGEROUS GOODS"
Air transport in accordance with IATA	NOT CLASSIFIED AS "DANGEROUS GOODS"

14.3 Transport hazard class(es)

Transport by land according to ADR/RID	not applicable
Inland navigation (ADN)	not applicable
Marine transport in accordance with IMDG	not applicable
Air transport in accordance with IATA	not applicable

14.4 Packing group

Transport by land according to ADR/RID	not applicable
Inland navigation (ADN)	not applicable
Marine transport in accordance with IMDG	not applicable
Air transport in accordance with IATA	not applicable

14.5 Environmental hazards

Transport by land according to ADR/RID	no
Inland navigation (ADN)	no
Marine transport in accordance with IMDG	no
Air transport in accordance with IATA	no

14.6 Special precautions for user

Relevant information under SECTION 6 to 8.

14.7 Maritime transport in bulk according to IMO instruments

not applicable

SECTION 15: Regulatory information

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

EEC-REGULATIONS	2008/98/EC 2000/532/EC); 2010/75/EU; 2004/42/EC; (EC) 648/2004; (EC) 1907/2006 (REACH); (EU) 1272/2008; 75/324/EEC ((EC) 2016/2037); (EU) 2020/878; (EU) 2016/131; (EU) 517/2014
TRANSPORT-REGULATIONS	ADR (2021); IMDG-Code (2021, 40. Amdt.); IATA-DGR (2022)
NATIONAL REGULATIONS (GB):	EH40/2005 Workplace exposure limits (Second edition, published December 2011); UK REACH; GB CLP.
- Observe employment restrictions for people	Observe employment restrictions for mothers-to-be and nursing mothers. Observe employment restrictions for young people.
- VOC (2010/75/CE)	0 %

15.2 Chemical safety assessment

not applicable

SECTION 16: Other information

16.1 Hazard statements (SECTION 3)

H360FD May damage fertility. May damage the unborn child.

16.2 Abbreviations and acronyms:

ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route
RID = Règlement concernant le transport international ferroviaire de marchandises dangereuses
ADN = Accord européen relatif au transport international des marchandises dangereuses par voie de navigation intérieure
ATE = acute toxicity estimate
CAS = Chemical Abstracts Service
CLP = Classification, Labelling and Packaging
DMEL = Derived Minimum Effect Level
DNEL = Derived No Effect Level
EC50 = Median effective concentration
ECB = European Chemicals Bureau
EEC = European Economic Community
EINECS = European Inventory of Existing Commercial Chemical Substances
EL50 = Median effective loading
ELINCS = European List of Notified Chemical Substances
EmS = Emergency Schedules
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC-Code = International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
IC50 = Inhibition concentration, 50%
IMDG = International Maritime Code for Dangerous Goods
IUCLID = International Uniform ChemicaL Information Database
IVIS = In vitro irritation score
LC50 = Lethal concentration, 50%
LD50 = Median lethal dose
LC0 = lethal concentration, 0%
LOAEL = lowest-observed-adverse-effect level
LL50 = Median lethal loading
LQ = Limited Quantities
MARPOL = International Convention for the Prevention of Marine Pollution from Ships
NOAEL = No Observed Adverse Effect Level
NOEC = No Observed Effect Concentration
PBT = Persistent, Bioaccumulative and Toxic substance
PNEC = Predicted No-Effect Concentration
REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals
STP = Sewage Treatment Plant
TLV®/TWA = Threshold limit value – time-weighted average
TLV®STEL = Threshold limit value – short-time exposure limit
VOC = Volatile Organic Compounds
vPvB = very Persistent and very Bioaccumulative

16.3 Other information

Classification procedure Repr. 1B: H360FD May damage fertility. May damage the unborn child. (Calculation method)

Modified position

SECTION 2 been added: P308+P311 IF exposed or concerned: Call a POISON CENTER / doctor.

SECTION 2 been added: Repr. 1B

SECTION 2 been added: health hazard

SECTION 2 been added: DANGER

SECTION 2 been added: It is essential for pregnant women to avoid inhaling the product and not to let it come in contact with the skin.

SECTION 2 been added: P201 Obtain special instructions before use.

SECTION 2 been added: P405 Store locked up.

SECTION 2 been added: P501 Dispose of contents/container in accordance with local/national regulation.

SECTION 2 been added: P280 Wear protective clothing / eye protection / face protection.

SECTION 2 been added: Restricted to professional users.

SECTION 2 been added: H360FD May damage fertility. May damage the unborn child.

SECTION 11 been added: Contains no ingredients with endocrine-disrupting properties.

SECTION 11 deleted: No classification due to substance-specific concentration limits.

SECTION 11 been added: May damage fertility.

SECTION 11 been added: May damage the unborn child.

SECTION 12 been added: Contains no ingredients with endocrine-disrupting properties.

SECTION 15 been added: 5.2.7.

SECTION 15 deleted: Storage class 12 (VCI)

SECTION 15 been added: Storage class 6.1D (VCI)

SECTION 15 been added: Chemikalien-Verbotsverordnung - pay attention ChemVerbotsV.

SECTION 15 been added: Observe employment restrictions for mothers-to-be and nursing mothers. Observe employment restrictions for young people.