# TBE buffer concentrate

## Safety data sheet

Prepared in accordance with Regulation (EC) No. 1907/2006 (REACH)

**Version 1.1 | Created: 4 February 2015 | Revised: 1 June 2015**

## SECTION 1. Identification of the substance/mixture and of the company/undertaking

<table>
<thead>
<tr>
<th><strong>Product name and description</strong></th>
<th>Tris-Borate-EDTA (TBE) buffer concentrate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trade name/Brand</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Synonym(s)</strong></td>
<td>TBE buffer</td>
</tr>
<tr>
<td><strong>REACH Number</strong></td>
<td>Not applicable, mixture</td>
</tr>
<tr>
<td><strong>CAS Number</strong></td>
<td>Not applicable, mixture</td>
</tr>
<tr>
<td><strong>EC Number</strong></td>
<td>Not applicable, mixture</td>
</tr>
</tbody>
</table>

**Recommended use**

This product is a laboratory preparation for educational use only.

Each 50 ml of the concentrated TBE buffer should be diluted with 450 ml of distilled or deionised water before use. This diluted solution should be used for DNA gel electrophoresis as described in the relevant Teacher’s and Students’ guides provided by the NCBE.

*Please note that this Safety Data Sheet refers to the TBE buffer concentrate, not to the diluted TBE buffer.*

**Uses advised against**

Do not use for protein agarose electrophoresis; use TE buffer instead.

## Supplier of the product and of this safety data sheet

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## Manufacturer of the product

Severn Biotech Limited
Unit 2
Park Lane
KIDDERMINSTER
DY11 6TJ

## Emergency telephone number

0118 9873743 (NCBE, University of Reading. 08.30–17.00 weekdays only)
SECTION 2. Hazards identification

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

<table>
<thead>
<tr>
<th>Classification</th>
<th>H315</th>
<th>H319</th>
<th>H335</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin corrosion/irritation (Category 2)</td>
<td>Serious eye Damage/Eye irritation (Category 2)</td>
<td>Specific target organ toxicity, Single exposure (Category 3)</td>
<td></td>
</tr>
</tbody>
</table>

Label elements*

**WARNING**

- H315 Causes skin irritation
- H319 Causes serious eye irritation
- H335 May cause respiratory irritation

- P260 Do not breathe dust/mist/vapour/spray
- P280 Wear protective gloves/ protective clothing/ eye protection
- P305 IF IN EYES: Rinse cautiously with water for several minutes.
- + P351 Remove contact lenses, if present and easy to do. Continue rinsing.
- P302 + P352 IF ON SKIN: Wash with plenty of soap and water

Other hazards

None found.

*Some statements above are omitted from the product label, as the volume of the mixture is less than 125 ml.

SECTION 3. Composition/Information on the ingredients

<table>
<thead>
<tr>
<th>Name of component (Synonym)</th>
<th>Weight (%)</th>
<th>EC (EINECS) number</th>
<th>CAS number</th>
<th>REACH registration number</th>
<th>Classification under Regulation (EC) No 1272/2008 [CLP]*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>80–85</td>
<td>231-791-2</td>
<td>7732-18-5</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>TRIS (Trometamol; tris(hydroxymethyl)aminomethane; 2-Amino-2-hydroxymethyl-propane-1,3-diol)</td>
<td>12</td>
<td>201-064-4</td>
<td>77-86-1</td>
<td>–</td>
<td>Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) STOT SE 3 (H335)</td>
</tr>
<tr>
<td>Boric acid [005-007-00-2]</td>
<td>2.75</td>
<td>233-139-2</td>
<td>10043-35-3</td>
<td>–</td>
<td>Repr. 1B (H360)</td>
</tr>
<tr>
<td>EDTA disodium salt dihydrate (Disodium EDTA)</td>
<td>&lt;1</td>
<td>205-358-3</td>
<td>6381-92-6</td>
<td>–</td>
<td>Acute Tox. 4 (H332)</td>
</tr>
</tbody>
</table>

*These classifications refer to the pure (100%) substances, not necessarily to the mixture supplied.

For the full text of the safety classifications (H-statements), refer to Section 16.

Note on boric acid

Boric acid, along with all boron compounds, is catagorised by the European Union as a Substance of Very High Concern (SVHC). Usually the presence of an SVHC at ≥ 0.1% would trigger additional hazard warnings on the product label and safety data sheet.

There is, however, a European Union ‘harmonised classification’ specifically for boric acid (which is widely used in building materials, cosmetics etc) meaning that additional hazard labelling is only required at ≥ 5.5%. Typically, a 10x TBE concentrate contains approximately 5% boric acid, which, depending upon the exact proportions of boric acid and other components used, may or may not require additional hazard statements. For this reason some 10x TBE concentrates, although all essentially the same product, are labelled as being more hazardous than others.

Please note, however, that while the TBE concentrate that this data sheet refers to should be diluted ten-fold before use, the boric acid content of this particular concentrate is roughly half that which is normally used in similar products. This does not affect the performance of the buffer, but it ensures that the concentration of boric acid used is well below that which may pose additional safety hazards.
SECTION 4. First aid measures

**General information**
The principal hazards from this concentrate are skin and eye contact.

**Inhalation**
Move the casualty to fresh air. If respiratory problems occur, consult a doctor.

**Skin contact**
Remove contaminated clothing, which can then be washed as normal. Wash TBE concentrate off the skin immediately with plenty of water. Seek medical attention if irritation occurs.

**Eye contact**
Check for and remove contact lenses if present. Rinse opened eye immediately with running water, also wash under the eyelids, for several minutes. Seek medical advice if irritation persists.

**Ingestion**
Rinse out mouth with water, then drink plenty of water. Do not induce vomiting. Seek medical help immediately.

**Self-protection of the first aider**
Rinse your hands with water after handling anything that has been contaminated with the TBE buffer solution.

**Most important symptoms and effects, both acute and delayed**
Irritation to the skin and eyes.

**Indication of any immediate medical attention and special treatment**
First Aid as outlined above, decontamination of clothing etc, treatment by a medical professional if symptoms persist.

**Advice to doctor**
Treat symptomatically.

SECTION 5. Fire fighting measures

**Suitable extinguishing media**
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**Extinguishing media which must not be used for safety reasons**
No information available.

**Special hazards arising from the substance or mixture**
Thermal decomposition can lead to the release of irritating gases and vapours.

**Advice for fire fighters**
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapours.

SECTION 6. Accidental release measures

The volumes of TBE buffer concentrate that are likely to be used in a school are small enough that any spill can be cleaned up easily and safely. The principal dangers are skin and eye contact, as described in Section 4 above.

**Personal precautions, protective equipment and emergency procedures**
Ensure adequate ventilation. Wear personal protective equipment, such as a lab coat, gloves and eye protection. Keep students away from the spill.

**Environmental precautions**
The TBE buffer concentrate should not be released into the environment. If it enters drains etc, it should be washed away (diluted) with plenty of water.

**Methods and materials for containment and cleaning up**
Soak up the concentrate with inert absorbent material (e.g., paper towels or sawdust). Place the waste in a suitable, closed container (e.g., a plastic bag) for disposal. Wash away any residue with plenty of water.
SECTION 7. Handling and storage

**Precautions for safe handling**

Ensure good ventilation. Wear personal protective equipment, such as a lab coat, gloves and eye protection. Do not get into eyes, on skin or clothing. Washing and eye wash facilities should be available in the work area. Prevent the formation of aerosols. Do not breathe in vapours or dust from dried-up buffer solution. Do not ingest.

**Conditions for safe storage**

Keep the TBE buffer concentrate in a tightly-closed container. Store in a dry, cool and well-ventilated place. Do not refrigerate the concentrate, although note that the diluted TBE buffer should be stored in a fridge at 3–5 °C.

SECTION 8. Exposure control/personal protection

**Control parameters**

**Exposure limits**

The product as supplied does not contain any hazardous materials with occupational exposure limits established by regulatory bodies.

**Biological limit values**

The product as supplied does not contain any hazardous materials with occupational exposure limits established by regulatory bodies.

**Derived no effect level**

No information available.

**Predicated no effect level**

No information available.

**Personal protective equipment**

**Eye protection**

Wear safety glasses. Ensure that eyewash stations are close at hand, in case of accidental splashes into the eyes.

**Hand protection**

Protective gloves.

**Skin and body protection**

Wear appropriate protective gloves and a lab coat to prevent skin exposure.

**Respiratory protection**

Not required.

**Hygiene measures**

Handle in accordance with good industrial hygiene and safety practice.

**Environmental exposure controls**

No information available.

SECTION 9. Physical and chemical properties

**Appearance**

Clear, colourless.

**Physical state**

Liquid.

**Odour**

Odourless.

**Odour threshold**

Does not apply, as the mixture is odourless.

**pH**

8.2–8.4 @ 20 °C

**Melting point / Range**

No data available.

**Boiling point / Range**

> 100 °C @ 760 mm Hg.

**Flash point**

Not applicable; does not flash.

**Evaporation rate**

No data available.

**Flammability (solid, gas)**

Not applicable as the mixture is a liquid.

**Explosion limits**

No data available.

**Vapour pressure**

No data available.

**Vapour density**

No data available.

**Density @ 20 °C**

~ 1.05 g / ml

**Relative density**

Not applicable as the mixture is a liquid.

**Solubility in water**

Readily soluble.

**Solubility in other solvents**

No data available.

**Partition coefficient: n-octanol/water**

No data available.

**Autoignition temperature**

No data available.

**Decomposition temperature**

No data available.

**Viscosity**

No data available.

**Explosive properties**

No data available.
Oxidising properties
No data available.

Other information
No additional information relevant to the safe use of the substance.

SECTION 10. Stability and reactivity

Reactivity
No information available.
Chemical stability
When stored at room temperature, the product is stable.
Possibility of hazardous reactions
None in normal use.
Conditions to avoid
Do not freeze or refrigerate. Avoid excess heat.
Incompatible materials
Strong oxidising agents.
Hazardous decomposition products
Nitrogen oxide (NO\textsubscript{x}); Carbon monoxide (CO); Carbon dioxide (CO\textsubscript{2}).

SECTION 11. Toxicological information

Acute toxicity
TRIS: LD\textsubscript{50} Oral 5900 mg/kg (Rat)
Irritation
On the skin: no irritant effect; On the eye: irritating effect.
Corrosivity
No information available.
Sensitisation
No sensitising effects known.
Repeated dose toxicity
No information available.
Carcinogenicity
No information available.
Mutagenicity
No information available.
Toxicity for reproduction
Animal tests show that boric acid may have toxic effects on human reproduction, but at the concentration supplied, this is not thought to be a problem (see Section 3).
Developmental effects
No information available.
Target organs
None known.
Other adverse effects
The toxicological properties have not been fully investigated.
Endocrine disruptor information
None known.

SECTION 12. Ecological information

Ecotoxicity effects
Do not empty into drains without dilution (see Section 13).
Toxicity
No information available.
Persistence and degradability
Biodegradable.
Bioaccumulative potential
Not expected to bioaccumulate.
Mobility in soil
No information available.
Results of PBT and vPVB assessment
Not applicable.
Other adverse effects
None known.

SECTION 13. Disposal considerations

Waste from residues/unused product
Wash down a foul water drain with plenty of water. Wipe up any spills of the solution with absorbent material (e.g., paper towels) and water. Dispose of the paper towels in the normal waste.
Contaminated packaging
Rinse with water and dispose of in normal waste according to local regulations. Recycle (the bottles are HDPE) where appropriate facilities are available.
SECTION 14. Transport information

<table>
<thead>
<tr>
<th>UN number</th>
<th>Not applicable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Transport hazard class</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Packaging group</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

SECTION 15. Regulatory information

Chemical Safety Assessment

A Chemical Safety Assessment has not been carried out.

Schools and colleges in the UK should refer to Topics in Safety, which includes chapters on both practical microbiology and work with DNA: Topics in safety (2001) [Third edition] Association for Science Education. ISBN: 0863573169.

An updated (October 2014) version of Chapter 16, covering work with DNA, can be found on the NCBE's web site: www.ncbe.reading.ac.uk and on the Association for Science Education's web site: www.ase.org.uk

SECTION 16. Other information

Full text of GHS hazard statements

H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H360 May damage fertility. May damage the unborn child.

Please refer to the Teacher's guide that accompanies the NCBE kit you are using the TBE buffer with. This can be downloaded from the NCBE's Web site: www.ncbe.reading.ac.uk

The information given in this Safety Data Sheet is based on the present state of our knowledge.

This Safety Data Sheet has been compiled and is solely intended for this product.

This Safety Data Sheet was revised on 1 June 2015, when the older (67/548/EEC [DSD]) safety classifications were deleted.

The advice in Section 8 has been simplified, bearing in mind the volumes of the mixture likely to be used in a school, and the facilities that are generally available in school laboratories.

END OF SAFETY DATA SHEET