WHO International Standard
4th WHO International Standard for Diptheria Toxoid (Adsorbed)
NIBSC code: 07/216
Instructions for use
(Version 2.0, Dated 29/11/2012)

1. INTENDED USE
This standard preparation was prepared from a batch of purified diphtheria toxoid, adsorbed (Lot No. DAST-BKN0701) supplied by Biken, Japan. The purified toxoid had a diphtheria antigen content of 200 Lf/ml adsorbed to aluminium phosphate (1.5 mg/ml). The purified toxoid met the minimum requirements for biological products, Japan. The standard was prepared at NIBSC and stabilised by 1:1 dilution of the purified toxoid with 3.5% w/v Polygeline (Haemaccel®, Kora Healthcare, Dublin) to give a final concentration of 1.75 % w/v Polygeline. This material was then distributed into ampoules (1 ml per ampoule) and freeze-dried in the NIBSC Standards Processing Division in August 2007. The freeze-dried product is intended for use as a primary standard in assays to measure the potency of diphtheria vaccine (adsorbed) or for calibration of secondary reference materials.

2. CAUTION
This preparation is not for administration to humans or animals in the human food chain

The active ingredient in Haemaccel®, Polygeline, is derived from bovine gelatin. Haemaccel® is licensed for human use and does not contain bovine material sourced from a territory considered to be a BSE risk. As with all materials of biological origin, this preparation should be regarded as potentially hazardous to health. It should be used and discarded according to your own laboratory’s safety procedures. Such safety procedures should include the wearing of protective gloves and avoiding the generation of aerosols. Care should be exercised in opening ampoules or vials, to avoid cuts.

3. UNITAGE
The candidate standard was calibrated in an International Collaborative Study involving 30 laboratories in 20 different countries [1]. Calibration of the standard was based on results obtained in WHO/Ph. Eur. protection methods against the 3rd WHO International Standard for Diptheria Toxoid, Adsorbed (98/560). The replacement standard was adopted by the WHO ECBS in October 2009. The replacement standard, coded 07/216, has a defined potency of 213 International Units (IU) per ampoule based on the results returned by 19 laboratories who performed WHO/Ph. Eur. protection assays for calibration of the candidate material [1].

4. CONTENTS
Country of origin of biological material: Japan.
Each ampoule of the freeze dried standard preparation contains approximately 100 Lf of purified diphtheria toxoid, 0.75 mg aluminium phosphate and 17.5 mg Polygeline (degraded, cross-linked gelatin polypeptides). The ampoules contain no bacteriostat and should not be assumed to be sterile.

5. STORAGE
Ampoules should be stored in the dark at -20°C.
Please note: because of the inherent stability of lyophilized material, NIBSC may ship these materials at ambient temperature.

6. DIRECTIONS FOR OPENING
DIN ampoules have an easy-open' coloured stress point, where the narrow ampoule stem joins the wider ampoule body. Tap the ampoule gently to collect the material at the bottom (labeled) end. Ensure that the disposable ampoule safety breaker provided is pushed down on the stem of the ampoule and against the shoulder of the ampoule body. Hold the body of the ampoule in one hand and the disposable ampoule breaker covering the ampoule stem between the thumb and first finger of the other hand. Apply a bending force to open the ampoule at the coloured stress point, primarily using the hand holding the plastic collar.
Care should be taken to avoid cuts and projectile glass fragments that might enter the eyes, for example, by the use of suitable gloves and an eye shield. Take care that no material is lost from the ampoule and no glass falls into the ampoule. Within the ampoule is dry nitrogen gas at slightly less than atmospheric pressure. A new disposable ampoule breaker is provided with each DIN ampoule.

7. USE OF MATERIAL
No attempt should be made to weigh out any portion of the freeze-dried material prior to reconstitution.
After opening, the entire contents of each ampoule should be completely re-suspended in 1 ml of sterile water or other suitable solution such as 0.9% NaCl. It is recommended that the reconstituted standard be used as soon as possible after reconstitution and on the same day.

DO NOT FREEZE THE RECONSTITUTED STANDARD.

8. STABILITY
Reference materials are held at NIBSC within assured, temperature-controlled storage facilities. Reference Materials should be stored on receipt as indicated on the label.

It is the policy of WHO not to assign an expiry date to their International Reference Materials. Accelerated degradation studies performed during collaborative study [1] suggest that this material will be suitably stable when stored at the recommended storage temperature of -20°C, and the assigned potency value remains valid until the material is withdrawn or replaced.

Users who have any data supporting any change in the characteristics of this material are encouraged to contact NIBSC.

9. REFERENCES

10. ACKNOWLEDGEMENTS
Dr Toshiyuki Onishi (Biken, Japan) is gratefully acknowledged for donation of the purified toxoid material used in preparation of the replacement standard. All participants of the collaborative study performed to calibrate this replacement standard are gratefully acknowledged.

11. FURTHER INFORMATION
Further information can be obtained as follows;
This material: enquiries@nibsc.org
WHO Biological Standards:
http://www.who.int/biologicals/en/
JCTLM Higher order reference materials:
Derivation of International Units:
http://www.nibsc.org/standardisation/international_standards.aspx
Ordering standards from NIBSC:
http://www.nibsc.org/products/ordering.aspx
NIBSC Terms & Conditions:
http://www.nibsc.org/terms_and_conditions.aspx
12. CUSTOMER FEEDBACK
Customers are encouraged to provide feedback on the suitability or use of the material provided or other aspects of our service. Please send any comments to enquiries@nibsc.org

13. CITATION
In all publications, including data sheets, in which this material is referenced, it is important that the preparation’s title, its status, the NIBSC code number, and the name and address of NIBSC are cited and cited correctly.

14. MATERIAL SAFETY SHEET
Classification in accordance with Directive 2000/54/EC, Regulation (EC) No 1272/2008: Not applicable or not classified

<table>
<thead>
<tr>
<th>Physical and Chemical properties</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical appearance:</strong></td>
<td>Freeze-dried powder</td>
</tr>
<tr>
<td><strong>Stable:</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Hygroscopic:</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Flammable:</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Corrosive:</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Oxidising:</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Irritant:</strong></td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Handling:</strong></td>
<td>See caution, Section 2</td>
</tr>
<tr>
<td><strong>Other (specify):</strong></td>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicological properties</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Effects of inhalation:</strong></td>
<td>Not established, avoid inhalation</td>
</tr>
<tr>
<td><strong>Effects of ingestion:</strong></td>
<td>Not established, avoid ingestion</td>
</tr>
<tr>
<td><strong>Effects of skin absorption:</strong></td>
<td>Not established, avoid contact with skin</td>
</tr>
</tbody>
</table>

**Suggested First Aid**
- **Inhalation:** Seek medical advice
- **Ingestion:** Seek medical advice
- **Contact with eyes:** Wash with copious amounts of water. Seek medical advice
- **Contact with skin:** Wash thoroughly with water.

**Action on Spillage and Method of Disposal**
Spillage of contents should be taken up with absorbent material wetted with an appropriate disinfectant. Rinse area with an appropriate disinfectant followed by water. Absorbent materials used to treat spillage should be treated as biological waste.

15. LIABILITY AND LOSS
In the event that this document is translated into another language, the English language version shall prevail in the event of any inconsistencies between the documents. Unless expressly stated otherwise by NIBSC, NIBSC’s Standard Terms and Conditions for the Supply of Materials (available at http://www.nibsc.org/About_Us/Terms_and_Conditions.aspx or upon request by the Recipient) (“Conditions”) apply to the exclusion of all other terms and are hereby incorporated into this document by reference. The Recipient’s attention is drawn in particular to the provisions of clause 11 of the Conditions.

16. INFORMATION FOR CUSTOMS USE ONLY

<table>
<thead>
<tr>
<th><strong>Country of origin for customs purposes</strong>:</th>
<th>United Kingdom</th>
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</thead>
<tbody>
<tr>
<td>* Defined as the country where the goods have been produced and/or sufficiently processed to be classed as originating from the country of supply, for example a change of state such as freeze-drying.</td>
<td></td>
</tr>
<tr>
<td><strong>Net weight:</strong></td>
<td>0.031 g</td>
</tr>
<tr>
<td><strong>Toxicity Statement:</strong></td>
<td>Non-toxic</td>
</tr>
<tr>
<td><strong>Veterinary certificate or other statement if applicable:</strong></td>
<td>Attached: No</td>
</tr>
</tbody>
</table>

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WHO International Laboratory for Biological Standards,
UK Official Medicines Control Laboratory