



**WHO International Standard  
Minimum Potency of Anti-A and Anti-B Blood Grouping Reagents  
NIBSC code: 03/188 & 03/164  
Instructions for use  
(Version 3.0, Dated 04/04/2008)**

### 1. INTENDED USE

The quality of blood grouping reagents is clearly an important factor for safe blood transfusion. Preparations 03/188 and 03/164 are intended to define, by international consensus, the recommended minimum potency of anti-A and anti-B blood grouping reagents, respectively, in tube tests.

The international minimum potency standards for anti-A and anti-B blood grouping reagents, codes 03/188 and 03/164, respectively, were evaluated against a wide range of commercial anti-A and anti-B blood grouping reagents, respectively, in an international collaborative study involving 16 laboratories in 9 countries. Laboratories titrated 03/188 and 03/164 in parallel with as many commercial anti-A and anti-B reagents as were available to them according to specified haemagglutination methodology. Comparisons were also made with existing reference preparations for anti-A and anti-B (WHO IS, CBER/FDA reference preparations and British minimum potency reference preparations). The ratios of the mean endpoint titres of the anti-A or anti-B reagents or reference preparations to those of 03/188 and 03/164, respectively, within each laboratory were calculated. By international consensus, a 1 in 8 dilution of the reconstituted contents of 03/188 was deemed appropriate to define the minimum acceptable potency of anti-A blood grouping reagents. A 1 in 4 dilution of the reconstituted contents of 03/164 was deemed appropriate to define the minimum acceptable potency of anti-B blood grouping reagents.

### 2. CAUTION

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

Preparations 03/188 and 03/164 each contain the lyophilized residue of culture supernatant containing murine monoclonal antibodies. 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

N/A

### 4. CONTENTS

Country of origin of biological material: United Kingdom.  
Preparations 03/188 and 03/164 each contain the lyophilized residue of 1 ml culture supernatant containing monoclonal IgM anti-A (BRIC 131; kindly donated by the IBGRL, Bristol, UK) and anti-B (ES4; kindly donated by Alba Bioscience, Edinburgh, UK), respectively. For the anti-A, the imprecision of the filling (coefficient of variation) was 0.08%, and the residual moisture content was 0.8%; for the anti-B, the imprecision of the filling (coefficient of variation) was 0.08%, and the residual moisture content was 1.2%.

### 5. STORAGE

Store unopened ampoules 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. Various types of ampoule breaker are available commercially. To open the ampoule,

tap the ampoule gently to collect material at the bottom (labelled) end and follow manufacturer's instructions provided with the ampoule breaker.

### 7. USE OF MATERIAL

No attempt should be made to weigh out any portion of the freeze-dried material prior to reconstitution.

RECONSTITUTE THE AMPOULE CONTENTS WITH 1.0 ML DISTILLED OR DEIONISED WATER.

Allow several minutes at RT, with occasional vortexing, for reconstitution.

A 1 in 8 dilution of the reconstituted contents of 03/188 defines the recommended minimum acceptable potency of anti-A blood grouping reagents, in tube tests.

A 1 in 4 dilution of the reconstituted contents of 03/164 defines the recommended minimum acceptable potency of anti-B blood grouping reagents, in tube tests.

#### ***For parallel titrations of 03/188 or 03/164 and anti-A or anti-B blood grouping reagents, respectively:***

Make a 1 in 8 dilution of reconstituted 03/188 in buffered saline containing 2% (w/v) BSA i.e. mix 1 volume reconstituted contents with 7 volumes of buffered saline containing 2% (w/v) BSA. This is the starting concentration of 03/188 for comparison with anti-A blood grouping reagents.

Make a 1 in 4 dilution of reconstituted 03/164 in buffered saline containing 2% (w/v) BSA i.e. mix 1 volume reconstituted contents with 3 volumes of buffered saline containing 2% (w/v) BSA. This is the starting concentration of 03/164 for comparison with anti-B blood grouping reagents.

Prepare doubling dilution series of 03/188 (from the 1 in 8 pre-dilution) and the anti-A blood grouping reagent (from neat), using buffered saline containing 2% (w/v) BSA as diluent. Mix one volume of each starting concentration and dilution with one volume of a 2% (v/v) suspension of A or A<sub>2</sub> or A<sub>2</sub>B cells in glass test tubes, and incubate the contents at RT (19-25°C) for 5 min.

Prepare doubling dilution series of 03/164 (from the 1 in 4 pre-dilution) and the anti-B blood grouping reagent (from neat), using buffered saline containing 2% (w/v) BSA as diluent. Mix one volume of each starting concentration and dilution with one volume of a 2% (v/v) suspension of B or A<sub>1</sub>B cells in glass test tubes, and incubate the contents at RT (19-25°C) for 5 min.

Centrifuge the tests for 1 min at approximately 1000 rpm (100-125 g) or for 15 sec at approximately 3400 rpm (900-1000 g) or for a time and at a speed appropriate for the centrifuge being used, or for the shortest time at the lowest speed recommended by the reagent manufacturer. Ensure that the centrifugation does not result in an excessive force being necessary to dislodge the cell button prior to observation. Re-suspend the cell button by gentle agitation and macroscopically grade the reaction according to conventional criteria.

ANTI-A BLOOD GROUPING REAGENTS FOR USE IN TUBE TESTS SHOULD HAVE A POTENCY TITRE AT LEAST EQUAL TO THAT OF 03/188 WHEN RECONSTITUTED AND PRE-DILUTED AS SPECIFIED ABOVE.

ANTI-B BLOOD GROUPING REAGENTS FOR USE IN TUBE TESTS SHOULD HAVE A POTENCY TITRE AT LEAST EQUAL TO THAT OF 03/164 WHEN RECONSTITUTED AND PRE-DILUTED AS SPECIFIED ABOVE.



### 8. STABILITY

It is the policy of WHO not to assign an expiry date to their international reference materials. They remain valid with the assigned potency or recommended usage and status until withdrawn or amended.

Reference materials are held at NIBSC within assured, temperature-controlled storage facilities. Reference materials should be stored on receipt as indicated on the label. Once reconstituted, users should determine the stability of the material according to their own conditions of storage and use.

NIBSC follows the policy of WHO with respect to its reference materials.

Accelerated degradation studies on 03/188 and 03/164 indicate that the lyophilized materials will be adequately stable at -20°C.

Users who have data supporting any deterioration in the characteristics of any reference preparation are encouraged to contact NIBSC.

### 9. REFERENCES

SJ Thorpe, B Fox, AB Heath, M Scott, M de Haas, S Kochman and A Padilla. International Standards for minimum potency of anti-A and anti-B blood grouping reagents: evaluation of candidate preparations in an international collaborative study. Vox Sang 2006; 91:336-344.

### 10. ACKNOWLEDGEMENTS

We thank The International Blood Group Reference Laboratory and Alba Bioscience for the culture supernatants, and the participants of the collaborative study.

### 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:

<http://www.bipm.org/en/committees/jc/jctlm/>

Derivation of International Units:

[http://www.nibsc.org/standardisation/international\\_standards.aspx](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](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

Physical and Chemical properties	
Physical appearance: Lyophilisate	Corrosive: No
Stable: Yes	Oxidising: No
Hygroscopic: No	Irritant: No
Flammable: No	Handling: See caution, Section 2
Other (specify):	Contains material of murine origin

Toxicological properties	
Effects of inhalation:	Not established, avoid inhalation
Effects of ingestion:	Not established, avoid ingestion
Effects of skin absorption:	Not established, avoid contact with skin
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](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

<b>Country of origin for customs purposes*:</b> United Kingdom
* 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.
<b>Net weight:</b> 0.01g
<b>Toxicity Statement:</b> Toxicity not assessed
<b>Veterinary certificate or other statement</b> if applicable.
<b>Attached:</b> No

### 17. CERTIFICATE OF ANALYSIS

NIBSC does not provide a Certificate of Analysis for WHO Biological Reference Materials because they are internationally recognised primary reference materials fully described in the instructions for use. The reference materials are established according to the WHO Recommendations for the preparation, characterization and establishment of international and other biological reference standards [http://www.who.int/bloodproducts/publications/TRS932Annex2\\_Inter\\_biol\\_efstandardsrev2004.pdf](http://www.who.int/bloodproducts/publications/TRS932Annex2_Inter_biol_efstandardsrev2004.pdf) (revised 2004). They are officially endorsed by the WHO Expert Committee on Biological Standardization (ECBS) based on the report of the international collaborative study which established their suitability for the intended use.