



**WHO Reference Panel**  
**1st WHO Erythropoietin Antibody Reference Panel**  
**Panel B**  
**NIBSC code: 15/242**  
**Instructions for use**  
**(Version 1.0, Dated 29/01/2016)**

## 1. INTENDED USE

The Reference Panel of human monoclonal antibodies against human erythropoietin (EPO) is intended to facilitate in selection of an assay capable of detecting all EPO antibodies, for evaluating the performance of antibody assays and for assay validation. The antibodies have been grouped into:

Panel A coded 15/240;  
12/272 IgG2 (Low affinity, non-neutralizing)  
12/268 IgG2 (Moderate affinity, weakly neutralizing)  
12/274 IgM (Low affinity, non-neutralizing)  
12/264 IgG4 (High affinity, neutralizing)  
13/158 IgG1 (High affinity, strongly neutralizing)

Panel B coded 15/242;  
12/266 IgG1 (Low affinity, weakly neutralizing)  
12/260 IgG2 (High affinity, strongly neutralizing)  
13/150 IgG4 (High affinity, strongly neutralizing)  
12/270 IgM (Moderate affinity, weakly neutralizing)

13/122 IgG1 Negative control antibody

Both panels and the negative control antibody are available separately.

The EPO antibody reference panel represents 1) non-neutralizing antibodies, usually pre-existing, 2) early onset antibodies, typically non-neutralizing, IgM and IgG1, and 3) those characteristic of a neutralizing antibody-mediated pure red cell aplasia - IgG1, IgG2 and IgG4 isotypes.

Detailed characteristics of these antibodies have been described (Mytych et al 2012). Further information on the panel can be found in the collaborative study report for 1st WHO Erythropoietin antibody reference panel (see reference in section 9, WHO/BS/2015.2265).

## 2. CAUTION

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

The material is not of human or bovine origin. 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

There is no unitage assigned to these preparations.

## 4. CONTENTS

Country of origin of biological material: United Kingdom.

Panel B comprises 4 individually coded ampoules, each containing approximately 25µg EPO monoclonal antibody and includes:

12/266 IgG1 (Low affinity, weakly neutralizing)  
12/260 IgG2 (High affinity, strongly neutralizing)  
13/150 IgG4 (High affinity, strongly neutralizing)  
12/270 IgM (Moderate affinity, weakly neutralizing)

Panel A and the negative control antibody are available separately.

## 5. STORAGE

Unopened ampoules should be stored 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 manufacturers 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**

Dissolve the total contents of the ampoule in 1.0ml of sterile distilled water. This solution will contain EPO antibody at a concentration of approximately 25µg/ml. Use carrier protein where extensive dilution is required. The EPO antibodies should be diluted in a matrix that is compatible with clinical samples.

## 8. STABILITY

Reference materials are held at NIBSC within assured, temperature-controlled storage facilities and they 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 have indicated that this material is suitably stable, when stored at -20°C or below, for the assigned values to remain valid until the material is withdrawn or replaced. These studies have also shown that the material is suitably stable for shipment at ambient temperature without any effect on the assigned values. Once reconstituted, diluted or aliquoted, users should determine the stability of the material according to their own method of preparation, storage and use. Users who have data supporting any deterioration in the characteristics of any reference preparation are encouraged to contact NIBSC.

## 9. REFERENCES

This standard was produced under WHO guidelines cited in the WHO Technical Reports Series, No. 932, 2006, Annex 2.

Proposed 1<sup>st</sup> WHO Erythropoietin antibody reference panel.  
WHO/BS/2015.2265

Mytych DT, Barger TE, King C, Grauer S, Haldankar R, Hsu E, Wu MM, Shiwalkar M, Sanchez S, Kuck A, Civoli F, Sun J, Swanson SJ (2012) Development and characterization of a human antibody reference panel against erythropoietin suitable for the standardization of ESA immunogenicity testing. J Immunol Methods. 382(1-2):129-41.

## 10. ACKNOWLEDGEMENTS

We are thankful to Amgen for their generous donations of EPO antibody preparations used in the collaborative study, and to the study participants for their contributions in evaluating the preparations.

## 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](mailto: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

Physical and Chemical properties				
<b>Classification in accordance with Directive 2000/54/EC, Regulation (EC) No 1272/2008:</b> <b>Not applicable or not</b>	Corrosive:	No		
Physical appearance: Freeze dried powder				
Stable: Yes	Oxidising:	No		
Hygroscopic: No	Irritant:	No		
Flammable: No	Handling:	See caution, Section 2		
Other (specify):	Contains material of human 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 ampoule 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

**Country of origin for customs purposes\***: 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.

**Net weight:** 4.6g

**Toxicity Statement:** Toxicity not assessed

**Veterinary certificate or other statement** if applicable.

**Attached:** 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\\_standardsrev2004.pdf](http://www.who.int/bloodproducts/publications/TRS932Annex2_Inter_biol_standardsrev2004.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.