3rd INTERNATIONAL STANDARD FOR FACTORS II, VII, IX, AND X PLASMA
NIBSC Code: 99/826
Version 02, Dated 02 June 2004

1. THE STANDARD


2. POTENCY

The standard was calibrated by 19 laboratories in 11 countries against the 2nd International Standard for Factors II, VII, IX and X, Plasma (94/746). The standard was also compared against fresh and frozen normal pooled plasma in the participating laboratories (total number of donors ≥300). Significant differences were found for all four factors between the potencies estimated relative to the 2nd IS and the normal plasma pools. To partially rectify the discrepancy, the 3rd IS was assigned with the mean of the potency estimates relative to the 2nd IS and the local normal pools. This means there is a shift in the IU between the 2nd and 3rd IS of 1.5%, 5%, 4% and 3% for FII, VII, IX, X respectively. The following are the assigned potencies:

- FII - 0.91 IU/ampoule
- FVII - 1.00 IU/ampoule
- FIX - 0.86 IU/ampoule
- FX - 0.93 IU/ampoule

3. BULK MATERIAL AND FILLING

Plasma from 24 donors, collected in CPD-adenine from the North London Blood Transfusion Centre, was buffered with HEPES to a final concentration of 0.04 mol/L. After overnight storage at 4°C, the plasma donations were pooled, distributed in 1mL quantities into ampoules, and freeze-dried under conditions used for international biological standards¹. Each individual donation was tested and found negative for anti-HIV 1/2, HBsAg and anti-HCV. The mean fill weight calculated from 102 check weights was 1.1136 g (CV 0.09%). The mean residual moisture estimated from 6 ampoules was 0.17%.

4. CAUTION

THIS PREPARATION IS NOT FOR ADMINISTRATION TO HUMANS

The preparation contains material of human origin. The material has been tested and found negative for anti HIV 1 and 2, anti-HCV and HBsAg. 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 probably will include the wearing of protective gloves and avoiding the generation of aerosols. Care should be exercised in opening ampoules or vials, to avoid cuts.
5. STORAGE

Unopened ampoules should be stored in the dark at or below –20°C.

6. RECONSTITUTION

Allow ampoules to warm to room temperature. Open ampoule, taking care to ensure that all material is in the lower part, and reconstitute with 1.0 mL distilled water.

7. DIRECTIONS FOR OPENING AMPOULES

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 (labelled) 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.

8. STABILITY

It is the policy of WHO not to assign an expiry date to their international reference materials. Accelerated degradation studies have indicated that the standard is suitably stable, with less than 0.3% estimated loss per year at the storage temperature of –20°C or below, for all 4 factors. The assigned values remain valid until the standard is withdrawn or replaced. These studies have also shown that the standard is suitably stable for shipment at ambient temperature without any effect on the assigned values.

9. CITATION

In all publications including data sheets in which this material is referenced, it is important that the WHO status of the preparation, specified by the title of the preparation, the name and address of the WHO International Laboratory for Biological Standards at NIBSC and the NIBSC code number are cited and cited correctly.

10. PRODUCT LIABILITY

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11. REFERENCE


12. FURTHER INFORMATION:

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## 13. MATERIAL SAFETY SHEET

<table>
<thead>
<tr>
<th>Physical properties (at room temperature)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical appearance</td>
</tr>
<tr>
<td>Fire hazard</td>
</tr>
</tbody>
</table>

### Chemical properties

<table>
<thead>
<tr>
<th>Stable</th>
<th>Yes</th>
<th>Corrosive:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hygroscopic</td>
<td>Yes</td>
<td>Oxidising:</td>
<td>No</td>
</tr>
<tr>
<td>Flammable</td>
<td>No</td>
<td>Irritant:</td>
<td>No</td>
</tr>
<tr>
<td>Other (specify)</td>
<td>Contains material of human origin</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Handling:

See caution

### 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 a virucidal agent. Rinse area with a virucidal agent followed by water.

Absorbent materials used to treat spillage should be treated as biologically hazardous waste.