
**Transfusion equipment for medical
use —**

**Part 4:
Transfusion sets for single use, gravity
feed**

Matériel de transfusion à usage médical —

*Partie 4: Appareils de transfusion non réutilisables à alimentation par
gravité*

Sample Document

get full document from standards.iteh.ai



Reference number
ISO 1135-4:2015(E)

© ISO 2015

Sample Document

get full document from standards.iteh.ai



COPYRIGHT PROTECTED DOCUMENT

© ISO 2015, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 General requirements	2
3.1 Nomenclature for components of the transfusion set.....	2
3.2 Maintenance of sterility.....	2
4 Materials	3
5 Physical requirements	3
5.1 Particulate contamination.....	3
5.2 Leakage.....	3
5.3 Tensile strength.....	3
5.4 Closure-piercing device.....	3
5.5 Tubing.....	4
5.6 Filter for blood and blood components.....	4
5.7 Drip chamber and drip tube.....	4
5.8 Flow regulator.....	4
5.9 Flow rate of blood and blood components.....	4
5.10 Injection site.....	5
5.11 Male conical fitting.....	5
5.12 Protective caps.....	5
6 Chemical requirements	5
6.1 Reducing (oxidizable) matter.....	5
6.2 Metal ions.....	5
6.3 Titration acidity or alkalinity.....	5
6.4 Residue on evaporation.....	5
6.5 UV absorption of extract solution.....	5
7 Biological requirements	6
7.1 General.....	6
7.2 Sterility.....	6
7.3 Pyrogenicity.....	6
7.4 Haemolysis.....	6
7.5 Toxicity.....	6
7.6 Assessment of blood component depletion.....	6
7.7 Assessment of damage to blood components.....	6
8 Labelling	7
8.1 General.....	7
8.2 Unit container.....	7
8.3 Shelf or multi-unit container.....	7
9 Packaging	8
10 Disposal	8
Annex A (normative) Physical tests	9
Annex B (normative) Chemical tests	13
Annex C (normative) Biological tests	15
Bibliography	16

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 76, *Transfusion, infusion and injection, and blood processing equipment for medical and pharmaceutical use*.

This sixth edition of ISO 1135-4, together with the first edition of ISO 1135-5, cancels and replaces the fifth edition (ISO 1135-4:2012), which has been technically revised with the following changes:

- the scope has been restricted to gravity feed applications and the whole document aligned accordingly;
- transfusion sets for single use used in conjunction with pressure infusion apparatus are now covered by ISO 1135-5;
- 3.3 “Designation examples” has been deleted;
- the Normative references and the Bibliography have been updated;
- some minor editorial changes were introduced in the whole document.

ISO 1135 consists of the following parts, under the general title *Transfusion equipment for medical use*:

- *Part 3: Blood-taking sets for single use*
- *Part 4: Transfusion sets for single use, gravity feed*
- *Part 5: Transfusion sets for single use with pressure infusion apparatus*

Transfusion equipment for medical use —

Part 4:

Transfusion sets for single use, gravity feed

1 Scope

This part of ISO 1135 specifies requirements for single use transfusion gravity sets for medical use in order to ensure their compatibility with containers for blood and blood components as well as with intravenous equipment.

Secondary aims of this part of ISO 1135 are to provide guidance on specifications relating to the quality and performance of materials used in transfusion sets, to present designations for transfusion set components, and to ensure the compatibility of sets with a range of cellular and plasma blood components.

In some countries, the national pharmacopoeia or other national regulations are legally binding and take precedence over this part of ISO 1135.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 594-1¹⁾, *Conical fittings with a 6 % (Luer) taper for syringes, needles and certain other medical equipment — Part 1: General requirements*

ISO 594-2¹⁾, *Conical fittings with 6 % (Luer) taper for syringes, needles and certain other medical equipment — Part 2: Lock fittings*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 3826-1:2013, *Plastics collapsible containers for human blood and blood components — Part 1: Conventional containers*

ISO 3826-2, *Plastics collapsible containers for human blood and blood components — Part 2: Graphical symbols for use on labels and instruction leaflets*

ISO 7864, *Sterile hypodermic needles for single use*

ISO 10993-1, *Biological evaluation of medical devices — Part 1: Evaluation and testing within a risk management process*

ISO 10993-4, *Biological evaluation of medical devices — Part 4: Selection of tests for interactions with blood*

ISO 14644-1, *Cleanrooms and associated controlled environments — Part 1: Classification of air cleanliness*

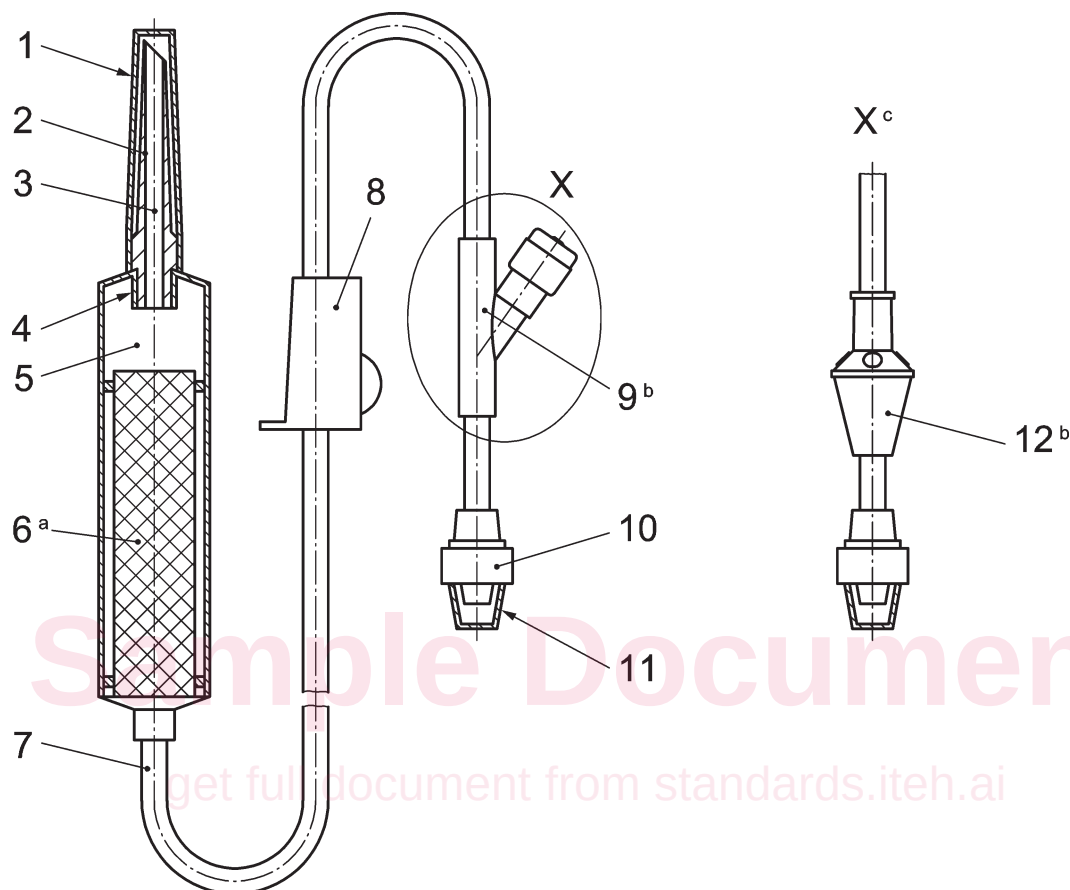
ISO 15223-1, *Medical devices — Symbols to be used with medical device labels, labelling and information to be supplied — Part 1: General requirements*

1) To be replaced by ISO 80369-7.

3 General requirements

3.1 Nomenclature for components of the transfusion set

The nomenclature for components of transfusion sets is given in [Figure 1](#).



Key

- | | |
|---|---|
| 1 protective cap of the closure-piercing device | 9 injection site |
| 2 closure-piercing device | 10 male conical fitting |
| 3 fluid channel | 11 protective cap of the male conical fitting |
| 4 drip tube | 12 elastomeric buffer |
| 5 drip chamber | a Indicates alternative locations of the filter for blood and blood components. Other designs are acceptable, if the same safety aspects are ensured. |
| 6 filter for blood and blood components | b Injection site and elastomeric buffer are optional. |
| 7 tubing | c Optional design. |
| 8 flow regulator | |

Figure 1 — Example of a transfusion set

3.2 Maintenance of sterility

The transfusion set shall be provided with protective caps to maintain sterility of the internal parts of the set until the set is used.

4 Materials

The materials from which the transfusion sets given in [Clause 3](#) are manufactured shall comply with the requirements specified in [Clause 5](#). If components of the transfusion set come into contact with blood and blood components, they shall additionally comply with the requirements specified in [Clauses 6](#) and [7](#).

5 Physical requirements

5.1 Particulate contamination

The transfusion sets shall be manufactured under conditions that minimize particulate contamination. All parts shall be smooth and clean at the fluid pathway surfaces. When tested as specified in [A.1](#), the number of particles detected shall not exceed the contamination index limit.

5.2 Leakage

The transfusion set, when tested in accordance with [A.2](#), shall show no signs of air leakage.

5.3 Tensile strength

Any connections between the components of the transfusion set, excluding protective caps, shall withstand a static tensile force of not less than 15 N for 15 s.

5.4 Closure-piercing device

5.4.1 The dimensions of the closure-piercing device shall conform to the dimensions shown in [Figure 2](#).

NOTE The dimension of 15 mm in [Figure 2](#) is a reference measurement. The cross-section of the piercing device at this site is a circle.

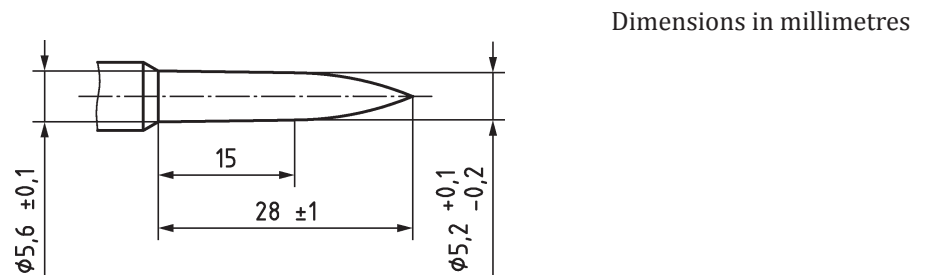


Figure 2 — Dimensions of the closure-piercing device

5.4.2 The closure-piercing device shall be capable of piercing and penetrating the closure of a container for blood and blood components without prepiercing. No coring should occur during this procedure.

NOTE 1 A carefully controlled surface treatment of the closure-piercing device (e.g. siliconization) is recommended to facilitate its insertion into the blood bag port. The same effect can be achieved by a careful selection of material for the closure-piercing device. Typical results including test equipment for penetration forces between spikes and blood bag ports have been published. See References [\[9\]](#) and [\[10\]](#).

NOTE 2 A central closure-piercing device tip is preferred to an asymmetric design in order to aid its insertion.

5.4.3 When inserted into a blood bag port conforming to ISO 3826-1:2013, the closure-piercing device shall resist a pull force of 15 N for 15 s.