Second edition
2019-01

Prefilled syringes —

Part 6: Plastic barrels for injectables and sterilized subassembled syringes ready for filling

Seringues préremplies —

Partie 6: Cylindres en plastique pour produits injectables et seringues pré-assemblées stérilisées préremplissables

Reference number
ISO 11040-6:2019(E)

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Published in Switzerland

Contents

Page

Foreword

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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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 76 *Transfusion, infusion and injection, and blood processing equipment for medical and pharmaceutical use*.

This second edition cancels and replaces the first edition (ISO 11040-6:2012), which has been technically revised. The main changes compared to the previous edition are as follows:

— Scope has been extended by adding sterilized subassembled syringes ready for filling. Appropriate requirements and test methods have been included;

— general requirements have been added on quality systems, testing, and documentation;

— requirements on labelling have been revised;

— requirements on packaging have been added;

— requirements on syringes barrels have been revised by:

  — adding requirements and related test methods for flange breakage and tip breakage (cone or staked in needle head) resistance, and

  — adding requirements on lubrication.

A list of all parts in the ISO 11040 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Ampoules and injection bottles have been mainly used as primary packaging material for the administration of injectables. However, for the injection of the liquid medicinal products stored in these containers, a hypodermic syringe combined with the appropriate injection cannula is also needed. This requires that the medicinal product be transferred into the hypodermic syringe before its final use. This procedure is not only time-consuming; it can also easily result in mix-ups and possible contamination.

In conjunction with the appropriate sealing components, prefilled single-use syringes conforming to this document form a safe system for the transport, storage and administration of medicine. Due to relatively simple handling procedures, they permit fast injection of the medicinal products contained within them.

Such prefilled syringes permit immediate injection of the product contained after relatively simple handling. These syringes can also be used in injectors with automated functions where further and particular requirements apply.

In more recent years, new technological developments have been made to provide prefilled syringes on the basis of polymers as a material for the barrel of a prefilled syringe system; these developments have been spurred by progress in polymer science and introduction of novel polymers.

This document can also be used by engineers as a basis for the development and marketing of standardized filling and processing equipment, e.g. so-called tub and nest filling presentations. Manufacturers of filling equipment and ancillary processing equipment can use this document to achieve a certain degree of unification with regard to the design of these standardized items of equipment.

Based on the dimensions of the prefilled syringes, appropriate components, such as rubber plungers, tip caps, needle shields, and other closure systems can also be standardized. In conjunction with the right sealing components, they offer a system for (parenteral) injectable use. It is advised to contact the component and system provider for verifying the component compatibility, e.g. for silicone-oil free or lubricant free systems or if specific matching of components is required. The producers of filling machines can apply this document to achieve a degree of standardization in the equipment of the machines.

For sterilized sub-assembled syringes ready for filling, the responsibility for the process steps relevant to the injectable product lies with the manufacturer[1)]. Following the assembly of the needle shield on syringes with a staked needle or tip caps for the Luer cone version, the subassembled syringes are placed into nests. The nests, in turn, are placed into a plastic tub. The syringes in the nest are protected by means of an insert liner and the tub itself is sealed by a sealing lid (which is currently and, so far, primarily achieved using a porous material). Thus, the tub properly sealed with the sealing lid represents the “sterile barrier system”. The sealed tub is then wrapped into a sealable bag and, thus, ready for sterilization. Various sterilization methods can be applied with polymer syringes e.g. Gamma, E-beam, X-Ray irradiation, Moist Heat (autoclave), ethylene oxide.

The sterilized subassembled syringes ready for filling are delivered to the pharmaceutical companies in a sterile condition, where they are processed on suitable machines.

Compatibility tests with the intended drug product are carried out under the responsibility of the market authorization holder before the final approval is granted. This is described in 11040-8.

NOTE Primary packaging materials are an integral part of medicinal products. Thus, the principles of the current Good Manufacturing Practices (cGMP) apply to the manufacturing of these components (e.g. ISO 15378).

1) Washing after injection moulding for endotoxin reduction can be eliminated provided that the moulding, assembling and packaging steps into the sealed sterile barrier system (tub and nest) takes place in a monitored cleanroom (ISO 14644) and accompanied by microbial cleanroom monitoring.