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**Pen systems —**

**Part 1:  
Glass cylinders for pen-injectors for  
medical use**

*Systèmes de stylos-injecteurs —*

*Partie 1: Cylindres en verre pour des stylos-injecteurs à usage médical*



Reference number  
ISO 13926-1:2004(E)

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## Foreword

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 13926-1 was prepared by Technical Committee ISO/TC 76, *Transfusion, infusion and injection equipment for medical and pharmaceutical use*.

This third edition cancels and replaces the second edition (ISO 13926-1:1998), which has undergone a minor revision, correcting dimensions  $d_5$  in Table 1 and the uppermost angle in Figure 1.

ISO 13926 consists of the following parts, under the general title *Pen systems*:

- *Part 1: Glass cylinders for pen-injectors for medical use*
- *Part 2: Plungers and discs for pen-injectors for medical use*

## **Introduction**

The potency, purity, stability and safety of a drug during its manufacture and storage can be strongly affected by the nature and performance of the primary pack.

This part of ISO 13926 deals with glass cylinders used with pen-injectors in accordance with ISO 11608-1. It is applicable to primary packs in direct contact with the drug.

NOTE Aluminium caps for insulin pen-injector systems are covered by ISO 11040-3.

# Pen systems —

## Part 1:

# Glass cylinders for pen-injectors for medical use

## 1 Scope

This part of ISO 13926 specifies the design, dimensions, materials, performance and test methods for glass cylinders used with pen-injectors for medical use.

It applies to the primary container used in direct contact with the drug.

## 2 Normative references

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

ISO 720, *Glass — Hydrolytic resistance of glass grains at 121 °C — Method of test and classification*

ISO 4802-1, *Glassware — Hydrolytic resistance of the interior surfaces of glass containers — Part 1: Determination by titration method and classification*

ISO 4802-2, *Glassware — Hydrolytic resistance of the interior surfaces of glass containers — Part 2: Determination by flame spectrometry and classification*

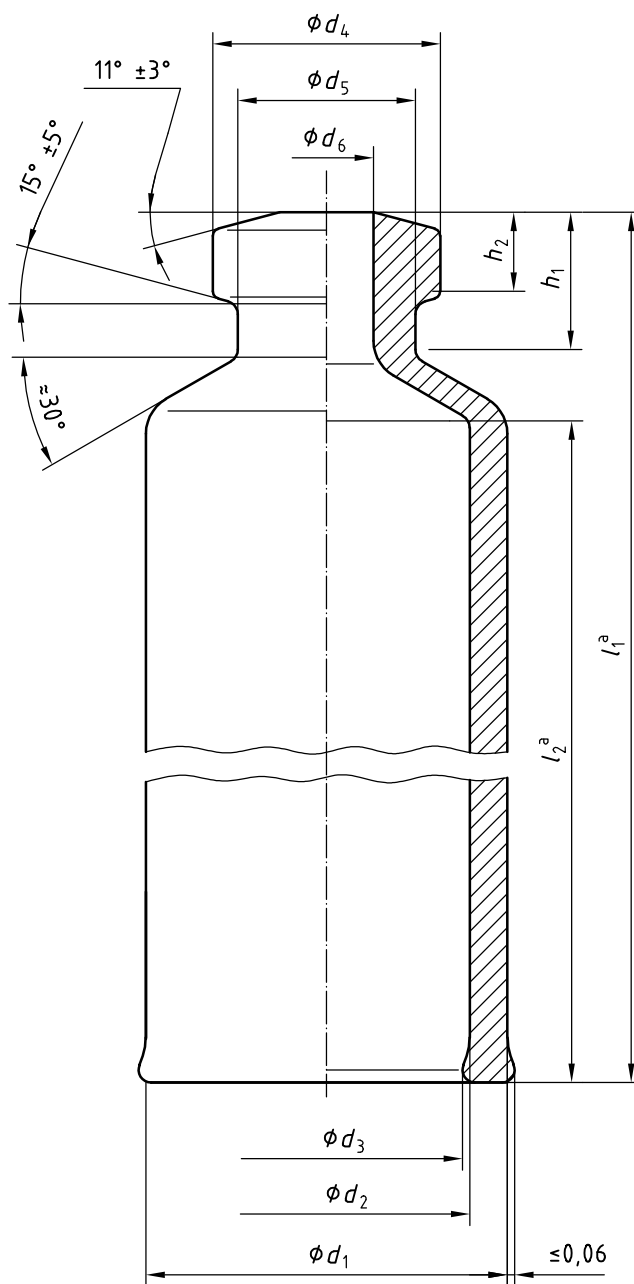
## 3 Dimensions

The dimensions of the glass cylinders shall be as shown in Figure 1 and as given in Table 1.

The dimensions of the bore ( $d_6$ ) shall be maintained for a depth of  $h_1$ .

Variations in the design of the truncated cone are allowed, if at the same time the following conditions are fulfilled:

- the truncated cone of the neck opening has the same height as the neck length ( $h_1$ );
- the stated tolerances of the neck opening are maintained;
- the diameter of the neck opening at the inner end may be a maximum of 0,3 mm smaller than at the top.



<sup>a</sup> Lengths  $l_1$  and  $l_2$  shall be agreed upon between manufacturer and customer.

**Figure 1 — Configuration of glass cylinders for pen-injectors**

Table 1 — Dimensions of glass cylinders for pen-injectors

Dimensions in millimetres

$d_1$	tol.	$d_2$	tol.	$d_3$	$d_4$	tol.	$d_5$	tol.	$d_6$	tol.	$h_1$	tol.	$h_2$	tol.
	±		±	min.		±		±		±		±		±
8,65	0,1	6,85	0,1	6,55	7,15	0,2	5,5	0,35	3,15	0,2	5,0	0,20	2,9	0,1
10,85	0,1	8,65	0,1	8,35	7,15	0,2	5,5	0,35	3,15	0,2	5,0	0,20	2,9	0,1
10,95	0,15	9,25	0,1	8,95	7,15	0,2	5,5	0,35	3,15	0,2	5,0	0,20	2,9	0,1
11,60	0,15	9,65	0,1	9,35	7,15	0,2	5,5	0,35	3,15	0,2	5,0	0,20	2,9	0,1
14,00	0,15	12,00	0,15	11,65	9,5	0,2	7,6	0,35	4,5	0,2	5,0	0,50	2,9	0,15
14,45	0,15	11,85	0,15	11,50	9,5	0,2	7,6	0,35	4,5	0,2	5,0	0,50	2,9	0,15
18,25	0,15	16,05	0,15	15,50	9,5	0,2	7,6	0,35	4,5	0,2	5,0	0,50	2,9	0,15

## 4 Requirements

### 4.1 Material

Colourless (cl) or amber (br) glass of the hydrolytic resistance grain class in accordance with ISO 720 - HGA 1 shall be used.

It shall correspond to the glass type 1 of the relevant Pharmacopoeia.

A change in the chemical composition of the glass material shall be notified to the user at least nine months in advance.

The glass material used for glass cylinders shall not contain seeds or bubbles to an extent which will interfere with the visual examination of the contents.

### 4.2 Performance

#### 4.2.1 Sealing surface

Glass cylinders shall have a sealing surface which is flat and free from ripples or undulations.

#### 4.2.2 Hydrolytic resistance

When tested in accordance with ISO 4802-1 or ISO 4802-2, the hydrolytic resistance of the internal surface of the glass cylinder shall comply with the requirements for class HC 1 container glass.

Before conducting the test, the bottom end of the cylinder shall be sealed with a suitable closure element, e.g. silicone rubber.

#### 4.2.3 Annealing quality

If the glass cylinder is annealed, the maximum residual stress shall not produce an optical retardation exceeding 40 nm per millimetre of glass thickness, when the glass cylinder is viewed in a strain viewer.

The optical retardation test method shall be agreed upon between glass manufacturer and customer.

## 5 Designation

Glass cylinders for pen-injectors for medical use shall be designated by a reference to this part of ISO 13926, followed by the colour of the glass and the nominal diameter  $d_1$  expressed in millimetres.

EXAMPLE A glass cylinder for pen-injectors for medical use, made of colourless (cl) glass tubing of the hydrolytic resistance container class ISO 4802 - HC 1 and a nominal diameter  $d_1 = 11,6$  mm, complying with the requirements of this part of ISO 13926 is designated as follows:

**Cylinder ISO 13926-1 - cl - 11,6**

## 6 Marking

The package shall be marked with the following information:

- a) the designation of the cylinders;
- b) identifying number (if the cylinder is printed), e.g. lot, batch, etc.;
- c) the number of cylinders it contains;
- d) the name or symbol of the manufacturer.

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## Bibliography

- [1] ISO 11040-3, *Prefilled syringes — Part 3: Aluminium caps for dental local anaesthetic cartridges*
- [2] ISO 11608-1, *Pen-injectors for medical use — Part 1: Pen-injectors — Requirements and test methods*

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