
Gel ink ball pens and refills —

Part 1: General use

Stylos à bille à encre gel et recharges —

Partie 1: Utilisation générale

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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).

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A list of all parts in the ISO 27668 series can be found on the ISO website.

Introduction

This document is applicable to gel ink ball pens for general use.

ISO 27668-2 is applicable to gel ink ball pens for documentary use.

For documentary use, some requirements, in addition to those for general use, are necessary

- a) to ensure the legibility of lettering, and
- b) for the handling and storage of documents over long periods of time (these requirements are often discussed with the archivist).

An example of documentary use is the preparation of documents that are required as evidence.

Furthermore, pens which meet the requirements for documentary use produce lines which are more resistant to modification (e.g. attempts to falsify a document) than those for general use.

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Gel ink ball pens and refills —

Part 1: General use

1 Scope

This document establishes minimum quality requirements for gel ink ball pens (refillable and non-refillable) and refills for general use.

Additional requirements for gel ink ball pens for documentary use are given in ISO 27668-2.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*

ISO 105-B02, *Textiles — Tests for colour fastness — Part B02: Colour fastness to artificial light: Xenon arc fading lamp test*

ISO 534, *Paper and board — Determination of thickness, density and specific volume*

ISO 535, *Paper and board — Determination of water absorptiveness — Cobb method*

ISO 536, *Paper and board — Determination of grammage*

ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness)*

ISO 2144, *Paper, board and pulps — Determination of residue (ash) on ignition at 900 degrees C*

ISO 5627, *Paper and board — Determination of smoothness (Bekk method)*

ISO 8791-4, *Paper and board — Determination of roughness/smoothness (air leak methods) — Part 4: Print-surf method*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 pen

writing instrument equipped with a feeding system which deposits a writing fluid on a surface

Note 1 to entry: It is available in refillable or non-refillable (disposable) form.

3.2

ball pen

pen with a writing fluid feeding system based on a rotatable ball writing tip integrated either within the pen itself or within a refill

3.3

gel ink ball pen

ball pen which deposits a writing fluid whose viscosity decreases markedly with rotation of the ball when writing and increases back to or near to the original viscosity in non-movement, i.e. when not writing

Note 1 to entry: See Annex A.

3.4

cartridge

disposable container for the writing fluid, which is detached when empty and replaced by a (new) full container

Note 1 to entry: Adapted from ISO 9175-1:1988, 3.4.

3.5

refill

identifiable assembly of components, usually removable from a complete pen, with which it is possible to write independently of the complete pen, but which lacks either characteristics or components which would make it suitable for use as a pen

3.6

write test machine

device for mechanically generating a line with a pen or refill on a writing surface and which can be adjusted for

- a writing angle between 60° and 90°, [ISO 27668-1:2017](https://standards.iteh.ai/catalog/standards/sist/5ce31887-f52c-412e-bd8c-98d285272755/iso-27668-1-2017)
- writing load from 0,1 N to 5 N, <https://standards.iteh.ai/catalog/standards/sist/5ce31887-f52c-412e-bd8c-98d285272755/iso-27668-1-2017>
- writing speed between 1 m/min and 10 m/min, and
- line pitch between 1 mm and 5 mm,

with a continuous spiral line (100 mm circumference) and a fixed or rotating motion along the longitudinal axis of the pen or refill; the writing surface is to be placed on a polished stainless steel plate

[SOURCE: ISO 12756:2016, 3.1.7]

3.7 Test parameters

3.7.1 Resistance to chemical influences including water

3.7.1.1

water resistance

ability of a line written on specified testing paper to remain visible after immersion in distilled or deionized water for a specified length of time

3.7.1.2

ethanol resistance

ability of a line written on specified testing paper to remain visible after immersion in a specified ethanol solution for a specified length of time

3.7.1.3

hydrochloric acid resistance

ability of a line written on specified testing paper to remain visible after immersion in a specified hydrochloric acid solution for a specified length of time

3.7.1.4**ammonium hydroxide resistance**

ability of a line written on specified testing paper to remain visible after immersion in a specified ammonium hydroxide solution for a specified length of time

3.7.1.5**bleaching resistance**

ability of a line written on specified testing paper to remain visible after treatment in a specified bleaching solution for a specified length of time

3.7.2 Resistance to physical influences**3.7.2.1****erasure resistance**

ability of a line written on specified testing paper to resist erasure using specified procedures with a specified eraser without altering the surface of the testing paper

3.7.2.2**light resistance**

ability of a line written on specified testing paper to remain visible after exposure to specified light for a specified length of time

3.7.3 Other parameters**3.7.3.1****strike through**

condition in which a writing fluid has penetrated through specified testing paper so as to appear on the opposite side of the paper from the written line

3.7.3.2**drying time**

length of time required for a line drawn on specified testing paper to become non-smearing

3.7.3.3**reproducibility**

ability of an original written line to be reproduced by a specified photocopier, microfilm processor or telefacsimile machine

3.7.3.4**shelf life**

minimum expected storage life, measured from the date of manufacture, during which the product maintains its specified performance when stored under specified conditions, and during which the pen or refill is unused

3.7.3.5**cap-off time**

length of time during which unused roller ball pen and gel ink ball pen maintain their writing ability when stored horizontally without their cap after writing

3.7.3.6**writing speed**

rate of line generation

3.7.3.7**point load**

vertical component of force applied to a writing tip during line generation