



JAPANESE  
INDUSTRIAL  
STANDARD

Translated and Published by  
Japanese Standards Association

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JIS S 6061 : 2020

(JWIMA/JSA)

**Gel ink ball pens and refills**

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ICS 01.100.40 ; 97.180

Reference number : JIS S 6061 : 2020 (E)

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S 6061 : 2020

Date of Establishment: 2005-01-20

Date of Revision: 2020-12-21

Date of Public Notice in Official Gazette: 2020-12-21

Investigated by: Japanese Industrial Standards Committee

Standards Board for ISO area

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JIS S 6061 : 2020, First English edition published in 2021-10

Translated and published by: Japanese Standards Association  
Mita MT Building, 3-13-12, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

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## Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Writing Instruments Manufacturers Association (JWIMA)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act. This edition replaces the previous edition (**JIS S 6061**:2010), which has been technically revised.

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# Gel ink ball pens and refills

## Introduction

This Japanese Industrial Standard has been prepared based on **ISO 27668-1** : 2017, Edition 3 and **ISO 27668-2** : 2009, Edition 1 with some modifications of the technical contents to reflect the actual usage of the products in Japan.

The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JA.

## 1 Scope

This Standard specifies the requirements for gel ink ball pens and refills for general and documentary use (hereafter referred to as gel ink ball pens and refills, respectively).

**NOTE** The International Standards corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 27668-1 : 2017 *Gel ink ball pens and refills — Part 1 : General use*

ISO 27668-2 : 2009 *Gel ink ball pens and refills — Part 2 : Documentary use* (DOC) (overall evaluation : MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standards and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS K 0116 *General rules for atomic emission spectrometry*

JIS K 0121 *General rules for atomic absorption spectrometry*

JIS K 6253-3 *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 3 : Durometer method*

JIS K 8085 *Ammonia solution (Reagent)*

JIS K 8101 *Ethanol (99.5) (Reagent)*

JIS K 8180 *Hydrochloric acid (Reagent)*

JIS L 0804 *Grey scale for assessing change in colour*

**NOTE** Corresponding International Standard : ISO 105-A02 *Textiles — Tests for colour fastness — Part A02 : Grey scale for assessing change in colour*

JIS L 0841 Test methods for colour fastness to daylight

JIS L 0843 *Test methods for colour fastness to xenon arc lamp light*

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

JIS P 8118 *Paper and board — Determination of thickness, density and specific volume*

NOTE Corresponding International Standard : ISO 534 *Paper and board — Determination of thickness, density and specific volume*

JIS P 8119 *Paper and board — Determination of smoothness by Bekk method*

NOTE Corresponding International Standard : ISO 5627 *Paper and board — Determination of smoothness (Bekk method)*

JIS P 8124 *Paper and board — Determination of grammage*

NOTE Corresponding International Standard : ISO 536 *Paper and board — Determination of grammage*

JIS P 8140 *Paper and board — Determination of water absorptiveness — Cobb method*

NOTE Corresponding International Standard : ISO 535 *Paper and board — Determination of water absorptiveness — Cobb method*

JIS P 8151 *Paper and board — Determination of roughness/smoothness (air leak methods) — Print-surf method*

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

JIS P 8252 *Paper, board and pulps — Determination of residue (ash) on ignition at 900 degrees C*

NOTE Corresponding International Standard : ISO 2144 : 1997 *Paper, board and pulps — Determination of residue (ash) on ignition at 900 degrees C*

JIS S 6060 Writing and marking instruments — Specification for caps to reduce the risk of asphyxiation

JIS Z 8703 Standard atmospheric conditions for testing

JIS Z 8803 Methods for viscosity measurement of liquid

### 3 Terms and definitions

For the purpose of this Standard, the following terms and definitions apply.

#### 3.1

##### 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 (see 3.4)

### 3.2

#### gel ink

ink 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

### 3.3

#### gel ink ball pen

ball pen for writing using the gel ink

### 3.4

#### refill

long and narrow container to the end of which a writing device is attached

It is an 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 should make it suitable for use as a pen.

## 4 Classification

### 4.1 Classification according to use and structure

The gel ink ball pens shall be classified as shown in Table 1 according to their use and structure.

**Table 1 Classification according to use and structure**

| Classification according to use and its code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Classification according to structure |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| For general use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Non-refillable<br>Refillable          |
| For documentary use (DOC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Non-refillable<br>Refillable          |
| <p><b>NOTE</b> An example of documentary use is the preparation for documents that are required as evidence. For this purpose, in addition to the requirements for pens for general use, pens for documentary use are required to ensure legibility of lettering, be suitable for handling and storage of documents during long periods of time and thus be more resistant to modification (e.g. attempts to falsify a document) than those for general use.</p> <p>The symbol “DOC” is the abbreviation for “Documentary use”.</p> |                                       |

### 4.2 Classification of refills according to shape and dimensions

Refills shall be classified into five types (J to L, G2, N) according to their shapes and dimensions as specified in Clause 6.

#### 4.3 Classification according to line width and ball diameter

Gel ink ball pens and refills shall be classified as shown in Table 2 according to the line width and ball diameter.

**Table 2 Classification according to line width and ball diameter**

| Unit: mm                               |      |                                |
|----------------------------------------|------|--------------------------------|
| Classification according to line width | Code | Ball diameter                  |
| Ultra fine                             | UF   | Under 0.40                     |
| Extra fine                             | EF   | 0.40 or over to and excl. 0.55 |
| Fine                                   | F    | 0.55 or over to and excl. 0.75 |
| Medium                                 | M    | 0.75 or over to and excl. 1.00 |
| Broad                                  | B    | 1.00 or over                   |

## 5 Quality

### 5.1 Viscosity of gel ink

When tested in accordance with 9.3.1, the gel ink shall have a viscosity ratio ( $\eta_1/\eta_2$ ) of 2.0 or more and apparent viscosity ( $\eta_3$ ) of 20 mPa • s or more.

### 5.2 Quality of gel ink ball pens and refills

The quality of gel ink ball pens and refills shall satisfy the requirements in Table 3.