



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS C 6575-1 : 2009

**Miniature fuses—Part 1: Definitions
of miniature fuses and general
requirements for miniature fuse-links**

ICS 29.120.50

Reference number : JIS C 6575-1 : 2009 (E)

PROTECTED BY COPYRIGHT

Date of Establishment: 1999-03-20

Date of Revision: 2009-03-20

Date of Public Notice in Official Gazette: 2009-03-23

Investigated by: Japanese Industrial Standards Committee
Standards Board

Technical Committee on Electricity Technology

JIS C 6575-1:2009, First English edition published in 2010-04

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

© JSA 2010

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

PROTECTED BY COPYRIGHT

Contents

	Page
Introduction.....	1
1 Scope.....	1
2 Normative references	1
3 Terms and definitions	2
4 General requirements	5
5 Standard ratings.....	5
6 Marking.....	5
7 General notes on tests	6
7.1 Atmospheric conditions for testing	7
7.2 Type tests	7
7.3 Fuse-base for test	8
7.4 Power supply.....	8
8 Dimensions and construction.....	8
8.1 Dimensions	8
8.2 Construction	8
8.3 Terminal	8
8.4 Alignment and configuration of terminals	8
8.5 Soldered joint	9
9 Electrical requirements	9
9.1 Voltage drop	9
9.2 Time/current characteristics	9
9.3 Breaking capacity	11
9.4 Endurance test.....	12
9.5 Maximum sustained dissipation	13
9.6 Pulse test	13
9.7 Fuse-link temperature	13
Annex A (informative) Colour coding for miniature fuse-links	15
Annex B (informative) Example of time/current characteristic presentation	17
Annex C (informative) Audit testing and surveillance—Guidelines for application of the principles of IEC 60303 (CB-FCS) to miniature fuse-links	19
Annex JA (informative) Comparison table between JIS and corresponding International Standard	20

Foreword

This translation has been made based on the original Japanese Industrial Standard 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 based on the Industrial Standardization Law.

Consequently **JIS C 6575-1 : 2005** is replaced with this Standard.

This **JIS** document is protected by the Copyright Law.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

JIS C 6575 series consists of the following 4 parts under the general title “*Miniature fuses*”:

Part 1: Definitions of miniature fuses and general requirements for miniature fuse-links

Part 2: Cartridge fuse-links

Part 3: Sub-miniature fuse-link

Part 4: Universal modular fuse-links (UMF), and non-UM through-hole and surface mount fuse-links

Miniature fuses—Part 1: Definitions of miniature fuses and general requirements for miniature fuse-links

Introduction

This Japanese Industrial Standard has been prepared based on the second edition of **IEC 60127-1** published in 2006 with some modifications of the technical contents to conform to the production status and usage situation of miniature fuses in Japan.

The portions given dotted underlines are the matters in which the contents of the original International Standard have been modified. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies the general requirements and tests applicable to all types of miniature fuses (such as cartridge fuse-links, sub-miniature fuse-links and universal modular fuse-links) for the protection of electric appliances, electronic equipment and component parts thereof normally intended to be used indoors.

Specific details on each fuse are given in subsequent parts of **JIS C 6575** standards group (hereafter referred to as “series”).

This Standard does not apply to fuses for appliances intended to be used under special conditions, such as in a corrosive or explosive atmosphere.

The object of this Standard is as follows.

- a) To establish uniform requirements for miniature fuses so as to protect appliances or parts of appliances in the most suitable way
- b) To define the performance of the fuses, so as to give guidance to designers of electrical appliances and electronic equipment and to ensure replacement of fuse-links by those of similar dimensions and characteristics
- c) To define methods of testing
- d) To define the maximum sustained dissipation of fuse-links to ensure good compatibility of stated power acceptance when used with fuse-holders according to this Standard (see **IEC 60127-6**).

NOTE : The International Standard corresponding to this Standard is as follows.
IEC 60127-1:2006 Miniature fuses—Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links (MOD)

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

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. For standard with the year indication, only the

edition of the indicated year shall be applied and any revisions (including amendments) made thereafter shall not be applied. For those without the indication of the year, the most recent edition (including amendments) shall be applied.

IEC 60038 *IEC standard voltages*

IEC 60127-6:1994 *Miniature fuses—Part 6: Fuse-holders for miniature cartridge fuse-links*, Amendment 1 (1996) and Amendment 2 (2002)

3 Terms and definitions

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

3.1 fuse

device that, by the fusing of one or more of its specially designed and proportioned components, opens the circuit in which it is inserted by breaking the current when this exceeds a given value for a sufficient time

NOTE : The fuse comprises all the parts that form the complete device.

3.2 miniature fuse

fuse in which the fuse-link is a miniature fuse-link

3.3 fuse-link

part of a fuse including the fuse-element(s) intended to be replaced after the fuse has operated

3.4 enclosed fuse-link

fuse-link in which the fuse-element is totally enclosed, so that during operation within its rating it cannot produce any harmful external effects, for example, due to development of an arc, the release of gas or the ejection of flame or metallic particles

3.5 miniature fuse-link

enclosed fuse-link of rated breaking capacity not exceeding 2 kA and which has at least one of its principal dimensions not exceeding 10 mm

NOTE : Principal dimensions are length, width, height and diameter.

3.6 sub-miniature fuse-link

miniature fuse-link of which the case (body) has no principal dimension exceeding 10 mm

3.7 universal modular fuse-link

miniature fuse-link primarily adapted for direct electrical connection to printed circuit boards or other conductive substrates, incorporating features designed to provide a degree of non-interchangeability where necessary

3.8 fuse-link contact

conductive part of a fuse-link designed to engage with a fuse-base contact or with a fuse-carrier contact

3.9 fuse-holder

combination of a fuse-base with its fuse-carrier

3.10 fuse-base (fuse-mount)

fixed part of a fuse provided with contacts and terminals for connection to the system

3.11 fuse-base contact (fuse-mount contact)

conductive part of a fuse-base, connected to a terminal designed to engage with a fuse-carrier contact or with a fuse-link contact

3.12 fuse-carrier

movable part of a fuse designed to carry a fuse-link

3.13 fuse-carrier contact

conductive part of a fuse-carrier connected to a fuse-link contact and designed to engage with a fuse-base contact

3.14 fuse-element

part of the fuse-link designed to melt when the fuse operates

3.15 homogeneous series (of fuse-links)

series of fuse-links, deviating from each other only in such characteristics that, for a given test, the testing of one or a reduced number of particular fuse-links of the series may be taken as representative of all the fuse-links of the series

NOTE : Fuse-links are considered as forming a homogeneous series when the characteristics comply with the following.

- The bodies have the same dimensions, material and method of manufacture.
- The caps or other end closures of the body have the same dimensions, materials and method of attachment and sealing.
- The granular filler, if any, of the body is of the same material and completeness of filling. It should be of the same size or any variation of the grain size with rated current should be monotonous.
- The fuse-elements are of the same material with the same principles of design and construction; any changes of fuse-element dimensions with rated current should be monotonous.
- The rated voltage is the same.
- For low-breaking capacity fuse-links it is only necessary to test the maximum rated breaking capacity in a homogeneous series.

3.16 rating

general term employed to designate the characteristic values that together define the operating conditions upon which the tests are based and for which the fuse is designed

NOTE : Examples of rated values usually stated for fuses are as follows.

- voltage (U_N)
- current (I_N)
- breaking capacity

3.17 time/current characteristics (of a fuse-link)

- a) For a.c.: a curve giving, under stated conditions of operation, the value of time expressed as virtual time as a function of the prospective symmetrical current expressed as the r.m.s. value
- b) For d.c.: a curve giving, under stated conditions of operation, the value of time expressed as actual time as a function of the d.c. prospective current

NOTE : Time/current characteristics are usually stated for a fuse-link relate to the pre-arcing time and the operating time.

3.18 conventional non-fusing current

value of current specified so that the fuse-link is capable of carrying for a specified time (conventional time) without melting

3.19 prospective current (of a circuit and with respect to a fuse)

current that would flow in a circuit, if a fuse situated therein were replaced by a link of negligible impedance

3.20 pre-arcing time (melting time)

interval of time between the beginning of a current large enough to cause a break in the fuse-element and the instant when an arc is initiated

3.21 arcing time

interval of time between the instant of the initiation of the arc and the instant of final arc extinction

3.22 operating time (total clearing time)

sum of the pre-arcing time and the arcing time

3.23 virtual time

value of I^2t divided by the square of the prospective current value

NOTE : The values of the virtual times, usually stated for a fuse-link, is the value of pre-arcing time or of operating time.

3.24 I^2t (joule integral)

integral of the square of current over a given time interval

$$I^2t = \int_{t=0}^t i^2 dt$$

NOTE 1 The pre-arcing I^2t is the I^2t integral extended over the pre-arcing time of the fuse.

NOTE 2 The operating I^2t is the I^2t integral extended over the operating time of the fuse.

NOTE 3 The energy in joules released in 1Ω of resistance in a circuit protected by a fuse is equal to the value of the operating I^2t expressed in A^2s .

3.25 breaking capacity of a fuse-link

value (r.m.s. for a.c.) of prospective current that a fuse-link is capable of breaking at a stated voltage under prescribed conditions of use and behaviour