



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS C 0081 : 2002

(IEC 60695-6-31 : 1999)

(RCJ/JSA)

**Environmental testing—
Electrotechnical products—
Fire hazard testing—
Smoke obscuration—
Small scale static method—
Materials**

The code number of this Standard
changed from JIS C 0081 to the
following from 20 March 2004.

JIS C 60695-6-31:2002

ICS 13.220.40; 29.020

Reference number : JIS C 0081 : 2002 (E)

PROTECTED BY COPYRIGHT

Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal of establishing a Japanese Industrial Standard from Reliability Center for Electronic Components of Japan (RCJ)/the Japanese Standards Association (JSA), with a draft of Industrial Standard based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

This Standard has been made based on **IEC 60695-6-31** *Fire hazard testing—Part 6-31 : Smoke obscuration—Small-scale static test—Materials* for the purposes of making easy to compare this Standard with International Standard; to prepare Japanese Industrial Standard conforming with International Standard; and to propose a draft of International Standard which is based on Japanese Industrial Standard.

Date of Establishment: 2002-03-20

Date of Public Notice in Official Gazette: 2002-03-20

Investigated by: Japanese Industrial Standards Committee

Standards Board

Technical Committee on Electricity

Technology

JIS C 0081 : 2002, First English edition published in 2003-03

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 2003

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 Definitions	2
4 Test specimens	2
4.1 General	2
4.2 Number of test specimens	2
4.3 Size of test specimens	2
4.4 Conditioning of test specimens	2
5 Test procedure.....	2
5.1 Preparation and calibration of the test chamber	2
5.2 Preparation of test specimens	2
5.3 Test conditions	3
5.4 Determination of smoke opacity—running a test	3
5.5 Abnormal behaviour during a test	4
6 Expression of results	5
6.1 Specific optical density	5
7 Repeatability and reproducibility	6
8 Test report	6
Annex A (informative) Evaluation of the repeatability and the reproducibility from inter-laboratory tests	7
Annex B (informative) Example of test report—Determination of smoke opacity without air-change	10

Environmental testing— Electrotechnical products— Fire hazard testing—Smoke obscuration— Small scale static method—Materials

Introduction This Japanese Industrial Standard has been prepared based on the first edition of **IEC 60695-6-31** *Fire hazard testing—Part 6-31 : Smoke obscuration—Small-scale static test—Materials* published in 1999 without modifying the technical contents.

1 Scope This technical specification is applicable to flat, solid non-metallic specimens of materials used in electrotechnical products.

This method is not applicable to the testing of non-flat products such as insulated wires and cables, as it is not possible to obtain a satisfactory distribution of heat flux with such products.

This method may not be applicable for materials which melt and flow away from the direct impingement of heat flux and do not give a smoke emission, which is representative of current knowledge from real fire situations.

The purpose of this technical specification is to determine, under certain specific experimental conditions, the optical density of smoke produced by materials exposed vertically to a radiant heat source with or without the application of a pilot flame in a closed chamber (i.e. without air-change).

Remarks : The International Standard corresponding to this Standard is as follows.

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**.

IEC 60695-6-31 : 1999 *Fire hazard testing—Part 6-31 : Smoke obscuration—Small-scale static test—Materials* (**IDT**)

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. Concerning the indication of the year of coming into effect given to these referred standards, only the edition of indicated year constitutes the provision of this Standard but the revision and amendment made thereafter are not applied.

JIS C 0067 : 1999 *Terminology concerning fire test*

Remarks : **IEC 60695-4** : 1993 *Fire hazard testing—Part 4 : Terminology concerning fire tests* is identical with the said standard.

JIS C 0080 : 2001 *Fire hazard testing—Part 6 : Guidance and test methods on the assessment of obscuration hazard of vision caused by smoke opacity from electrotechnical products involved in fires—Section 30 : Small scale static method—Determination of smoke opacity—Description of the apparatus*

Remarks : **IEC 60695-6-30 : 1996** *Fire hazard testing—Part 6 : Guidance and test methods on the assessment of obscuration hazard of vision caused by smoke opacity from electrotechnical products involved in fires—Section 30 : Small-scale static method—Determination of smoke opacity—Description of the apparatus* is identical with the said standard.

JIS Z 8402 : 1999 (all parts) *Accuracy (trueness and precision) of measurement methods and results*

Remarks : **ISO 5725** (all parts) *Accuracy (trueness and precision) of measurement methods and results* are identical with the said standard.

IEC Guide 104 : 1997 *The preparation of safety publications and the use of basic safety publications and group safety publications*

3 Definitions For the purpose of this technical specification, definitions from **JIS C 0067** apply.

4 Test specimens

4.1 General This method is sensitive to small variations in geometry, surface orientation, thickness, mass, composition and method of preparation; results obtained by this method are therefore dependant on the above parameters.

4.2 Number of test specimens For each test on a given material, at least three test specimens shall be tested under the same conditions. Under certain circumstances, it may be necessary to test three additional test specimens (see 5.5).

4.3 Size of test specimens This method is applicable only to essentially flat solid materials.

The test specimens shall be square with sides $76^{+0.2}_{-0.6}$ mm. The thickness shall be a maximum of 25.4 mm and, when practicable, shall be that of the end-use application of the material.

For comparative testing, materials shall be tested at the same thickness as there is no known correlation between the specific optical density and thickness.

4.4 Conditioning of test specimens Before the test, the test specimens shall be preconditioned in an oven at $60\text{ °C} \pm 3\text{ °C}$ for at least 24 h and then conditioned for at least 24 h at $23\text{ °C} \pm 3\text{ °C}$ and at a relative humidity of $50\% \pm 10\%$. The test specimen shall be tested within 30 min of being conditioned.

5 Test procedure

5.1 Preparation and calibration of the test chamber Preparation and calibration of the test chamber shall be carried out as described in clause 6 of **JIS C 0080**.

5.2 Preparation of test specimens Each test specimen shall be wrapped in a single layer of aluminium foil (about 0.04 mm thick), with the bright face outside, taking care to avoid unnecessary wrinkles or perforations. It is then mounted in the test specimen holder ensuring that it is retained close against the front window by a backing board, rod and a spring arrangement behind the test specimen.