

UL 198C

ISBN 0-7629-0168-3

High-Interrupting-Capacity Fuses, Current-Limiting Types

Underwriters Laboratories, Inc. (UL)
333 Pfingsten Road
Northbrook, IL 60062-2096

UL Standard for Safety
for
High-Interrupting-Capacity Fuses, Current-Limiting Types, UL 198C

Fifth Edition, Dated July 21, 1986

Revisions: This Standard contains revisions through and including February 25, 1998.

Announcement Bulletin: This Standard contains the announcement bulletin dated November 11, 1994. The announcement bulletin is located at the end of the Standard.

A change is indicated by a note following the affected item. The note is preceded and followed by an asterisk.

The revisions dated February 25, 1998 include a reprinted title page (page 1) for this Standard.

The revisions dated February 25, 1998 were issued to correct typographical errors.

As indicated on the title page (page 1), this UL Standard for Safety is an American National Standard. Attention is directed to the note on the title page of this Standard outlining the procedures to be followed to retain the approved text of this ANSI/UL Standard.

As indicated on the title page (page 1), this UL Standard for Safety has been adopted by the Department of Defense.

The master for this Standard at UL's Northbrook Office is the official document insofar as it relates to a UL service and the compliance of a product with respect to the requirements for that product and service, or if there are questions regarding the accuracy of this Standard.

UL's Standards for Safety are copyrighted by UL. Neither a printed copy of a Standard, nor the distribution diskette for a Standard-on-Diskette and the file for the Standard on the distribution diskette should be altered in any way. All of UL's Standards and all copyrights, ownerships, and rights regarding those Standards shall remain the sole and exclusive property of UL.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical photocopying, recording, or otherwise without prior permission of UL.

Revisions of UL Standards for Safety are issued from time to time. A UL Standard for Safety is current only if it incorporates the most recently adopted revisions.

UL provides this Standard "as is" without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose.

In no event will UL be liable for any special, incidental, consequential, indirect or similar damages, including loss of profits, lost savings, loss of data, or any other damages arising out of the use of or the inability to use this Standard, even if UL or an authorized UL representative has been advised of the possibility of such damage. In no event shall UL's liability for any damage ever exceed the price paid for this Standard, regardless of the form of the claim.

UL will attempt to answer support requests concerning WordPerfect, Envoy, and Standards-on-Diskette. However, this support service is offered on a reasonable efforts basis only, and UL may not be able to resolve every support request. UL supports a Standards-on-Diskette only if it is used under the conditions and operating systems for which it is intended. UL's support policies may change from time-to-time without notification.

UL reserves the right to change the format, presentation, file types and formats, delivery methods and formats, and the like of both its printed and electronic Standards without prior notice.

Standards-on-Diskette purchasers agree to defend, indemnify, and hold UL harmless from and against any loss, expense, liability, damage, claim, or judgement (including reasonable attorney's fees) resulting from any error or deviation introduced while purchaser is storing a Standard-on-Diskette on the purchaser's computer system.

If a single-user version Standards-on-Diskette was purchased, one copy of this Standard may be stored on the hard disk of a single personal computer, or on a single LAN file-server or the permanent storage device of a multiple-user computer in such a manner that this Standard may only be accessed by one user at a time and for which there is no possibility of multiple concurrent access. The original distribution diskette should be stored in a safe place.

If a multiple-user version Standards-on-Diskette was purchased, one copy of the Standard may be stored on a single LAN file-server, or on the permanent storage device of a multiple-user computer. The number of concurrent users shall not exceed the number of users authorized for the Standards-on-Diskette version. The original distribution diskette should be stored in a safe place.

Standards-on-Diskette are intended for on-line use, such as for viewing the requirements of a Standard, conducting a word search, and the like. Only one copy of the Standard may be printed from each single-user version of a Standards-on-Diskette. Only one copy of the Standard may be printed for each authorized user of a multiple-user version of a Standards-on-Diskette. An employee of an organization purchasing a Standard-on-Diskette can make a copy of the page or pages being viewed for their own fair and/or practical internal use. Because of differences in the computer/software/printer setup used by UL and those of Standards-on-Diskette purchasers, the printed copy obtained by a purchaser may not look exactly like the on-line screen view or the printed Standard.

The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the note following the affected item. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

A change in an effective date is indicated by a note following the affected item, and giving both the previous effective date and the new date the requirement becomes effective.

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this Standard including those requirements with a specified future effective date, unless the applicant specifically requests that the product be judged under the current requirements. However, if the applicant elects this option, it should be noted that compliance with all the requirements in this Standard will be required as a condition of continued Listing and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

Copyright 1998 Underwriters Laboratories Inc.

This Standard consists of pages dated as shown in the following checklist:

Page	Date
1	July 21, 1986 (Reprinted February 25, 1998)
2	—
3	June 21, 1990
4	July 21, 1986
5	October 6, 1992
6	February 25, 1998
7	October 6, 1992
8	June 21, 1990
9	July 21, 1986
10	March 26, 1987
11, 12	July 21, 1986
13	October 6, 1992
14 — 20	July 21, 1986
21, 22	October 6, 1992
23	July 21, 1986
24	October 6, 1992
25, 26	June 21, 1990
26A	October 6, 1992
27	July 21, 1986
28	June 21, 1990
29 — 32	July 21, 1986
33, 34	October 6, 1992
34A	March 26, 1987
35	October 6, 1992

JULY 21, 1986
(Title Page Reprinted: February 25, 1998)



1

UL 198C

Standard for

High-Interrupting-Capacity Fuses, Current-Limiting Types

The First Three editions were numbered UL 198.2

First Edition — January, 1970
Second Edition — June, 1970
Third Edition — September, 1974
Fourth Edition — May, 1981

Fifth Edition

July 21, 1986

Approval as an American National Standard (ANSI) covers the numbered paragraphs on pages dated July 21, 1986 through February 25, 1998. These pages should not be discarded when revised or additional pages are issued if it is desired to retain the ANSI approved text.

An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc.

Approved as ANSI C33.99-1974, June 20, 1974
Approved as ANSI/UL 198C-1986, February 19, 1986
Approved as ANSI/UL 198C-1997, January 30, 1997

The Department of Defense (DoD) has adopted UL 198C on March 9, 1992. The publication of revised pages or a new edition of this standard will not invalidate the DoD adoption.

Revisions of this standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements.

ISBN 0-7629-0168-3

COPYRIGHT © 1974, 1998 UNDERWRITERS LABORATORIES INC.

TABLE OF CONTENTS

FOREWORD

INTRODUCTION

1. Scope	5
2. Glossary	5
3. Units of Measurement	6
3A. Undated References	6

CONSTRUCTION

4. General	6
5. Class G Fuses	6
6. Class CC Fuses	7
7. Class J and Class L Fuses	8

PERFORMANCE

8. General	11
9. Current-Carrying-Capacity Test	16
10. Temperature Test	16
11. Clearing-Time Current Test	19
12. Overload Clearing Test at Rated Voltage Test	21
13. Interrupting and Current-Limiting Ability Test	21

HIGH-CURRENT TEST-CIRCUIT CALIBRATION AND INSTRUMENTATION

14. Galvanometers	28
15. Circuit Calibration	30
16. Power-Factor Determination	30
17. Available Current	32
18. Peak Let-Through Current	32
19. Recovery Voltage	32
20. Comparison of Instrumentation	33
21. Determination of I^2t	34
22. Final Calibration	34

RATINGS

23. Details	34
-------------------	----

MARKINGS

24. Details	35
-------------------	----

FOREWORD

A. This Standard contains basic requirements for products covered by Underwriters Laboratories Inc. (UL) under its Follow-Up Service for this category within the limitations given below and in the Scope section of this Standard. These requirements are based upon sound engineering principles, research, records of tests and field experience, and an appreciation of the problems of manufacture, installation, and use derived from consultation with and information obtained from manufacturers, users, inspection authorities, and others having specialized experience. They are subject to revision as further experience and investigation may show is necessary or desirable.

B. The observance of the requirements of this Standard by a manufacturer is one of the conditions of the continued coverage of the manufacturer's product.

C. A product which complies with the text of this Standard will not necessarily be judged to comply with the Standard if, when examined and tested, it is found to have other features which impair the level of safety contemplated by these requirements.

D. A product employing materials or having forms of construction differing from those detailed in the requirements of this Standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be judged to comply with the Standard.

E. UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of UL represent its professional judgment given with due consideration to the necessary limitations of practical operation and state of the art at the time the Standard is processed. UL shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of or reliance upon this Standard.

F. Many tests required by the Standards of UL are inherently hazardous and adequate safeguards for personnel and property shall be employed in conducting such tests.

INTRODUCTION

1. Scope

1.1 These requirements cover nonrenewable cartridge fuses that limit the peak let-through current and the total amperes-squared-seconds and that exhibit current-limiting characteristics above specified values of current. These fuses are to be employed in accordance with the National Electrical Code, NFPA 70.

1.2 These requirements cover fuses of the classes and ratings shown in Table 1.1.

TABLE 1.1

CLASSES AND RATINGS OF FUSES

Fuse Class	A-C Voltage Rating	Ampere Rating	Interrupting Rating RMS Symmetrical Amperes
G	480	0 — 60	100,000
CC	600	0 — 30	200,000
J	600	0 — 600	200,000
L	600	601 — 6000	200,000

Revised Table 1.1 effective July 6, 1993

1.3 A product that contains features, characteristics, components, materials, or systems new or different from those in use when the standard was developed, and that involves a risk of fire, electric shock, or injury to persons shall be evaluated using the appropriate additional component and end-product requirements as determined necessary to maintain the level of safety for the user of the product as originally anticipated by the intent of this standard.

Paragraph 1.3 added June 21, 1990

2. Glossary

2.1 CASE SIZE — Fuses of all ratings for which the size of the cartridge is the same — for example, 31 — 60 A, 250 V; 61 — 100 A, 600 V.

2.2 CLEARING TIME — The total time measured from the beginning of the specified overcurrent condition until the interruption of the circuit. The clearing time is equal to the sum of the melting time and the arcing time.

2.3 CURRENT-LIMITING FUSE — A fuse that safely interrupts all available currents within its interrupting rating and, within its current-limiting range, limits the clearing time at rated voltage to an interval equal to or less than the first major or symmetrical current-loop duration and limits peak let-through current to a value less than the peak current that would be possible with the fuse replaced by a solid conductor of the same impedance.

2.4 CURRENT-LIMITING RANGE — That range of rms symmetrical available currents equal to and less than the interrupting rating in which the total clearing time at rated voltage and frequency is less than 1/2 cycle.

2.5 INTERRUPTING RATING — The rating specifying the highest rms symmetrical, alternating current that the fuse is required to interrupt under the conditions of these requirements.

2.6 I^2t — (AMPERES-SQUARED-SECONDS) — An expression of the energy available as a result of current flow, meaningful only for adiabatic conditions. As used here, the term is normally applied during the melting, arcing, or total clearing time of the fuse under which, in the later instance, it is often designated as "Clearing I^2t ."

2.7 MAXIMUM ENERGY — The test condition under which, in a specified maximum time (1/2 cycle), the maximum amount of heat possible is generated in the fuse before clearing.

2.8 MELTING TIME — The time required for the current to melt the current-responsive element.

2.9 NORMAL-FREQUENCY RECOVERY VOLTAGE — The normal-frequency rms voltage impressed upon the fuse after the circuit is cleared and after high-frequency transients subside.

2.10 PEAK LET-THROUGH CURRENT (I_p) — The maximum instantaneous current through the fuse during the total clearing time.

2.11 RATING TESTS — Carrying-capacity, temperature, and clearing-time current tests.

2.12 RECOVERY VOLTAGE — The voltage impressed upon the fuse after a circuit is cleared.

2.13 THRESHOLD CURRENT — The rms symmetrical available current at the threshold of the current-limiting range, where melting of the current-responsive element has occurred at approximately 90 degrees on the symmetrical current wave and total clearing time is less than 1/2 cycle at rated voltage, rated frequency, and with a circuit power factor of 20 percent or less.

Paragraph 2.13 revised February 25, 1998

2.14 THRESHOLD RATIO — The ratio obtained by dividing the threshold current by the continuous-current rating of the fuse.

3. Units of Measurement

3.1 If a value for measurement is followed by a value in other units in parentheses, the second value may be only approximate. The first stated value is the requirement.

3A. Undated References

3A.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

Paragraph 3A.1 added June 21, 1990

CONSTRUCTION

4. General

4.1 Iron or steel, plated or unplated, shall not be used for parts that are depended upon to carry current.

4.2 Connections between the fusible link and the terminals of a fuse shall be such that a solid and permanent electrical connection is provided. The connection shall be soldered, brazed or welded, or shall otherwise be made permanently secure.

4.3 The tube of a fuse shall be ceramic, melamine-impregnated glass fiber, or the equivalent.

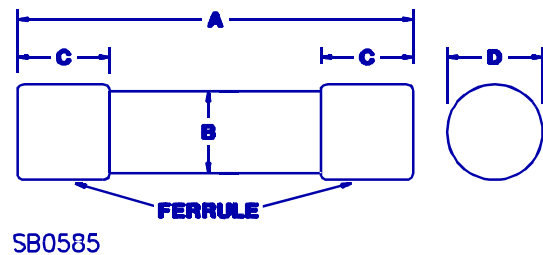
Paragraph 4.3 revised February 25, 1998

4.4 An adhesive employed in a fuse shall secure together the parts that it is intended to secure. See paragraphs 8.6 — 8.9.

5. Class G Fuses

5.1 A ferrule (see Figure 5.1) shall be of brass or copper and shall be circular in cross section.

FIGURE 5.1
CLASS G FUSES



5.2 The dimensions of a Class G fuse shall be in accordance with Figure 5.1 and Table 5.1.

TABLE 5.1
DIMENSIONS OF CLASS G FUSES IN INCHES (mm)^a

Cartridge Size, Amperes	Overall Length of Fuse	Maximum Outside Diameter of Tube	Minimum Length of Ferrule	Outside Diameter of Ferrule
	A	B	C	D
0 — 15	1.31 (33.3)	0.38 (9.5)	0.28 (7.1)	0.406 (10.31)
16 — 20	1.41 (35.7)	0.38 (9.5)	0.28 (7.1)	0.406 (10.31)
21 — 30	1.62 (41.3)	0.38 (9.5)	0.28 (7.1)	0.406 (10.31)
31 — 60	2.25 (57.1)	0.38 (9.5)	0.50 (12.7)	0.406 (10.31)

^aTolerances: A, ± 0.03 inch (± 0.8 mm); D, ± 0.006 inch (± 0.15 mm)

Revised Table 5.1 effective July 6, 1993

6. Class CC Fuses

6.1 A ferrule shall be brass or copper and shall be circular in cross section. See Figure 6.1.

6.2 The dimensions of a Class CC fuse shall be in accordance with Table 6.1.

FIGURE 6.1

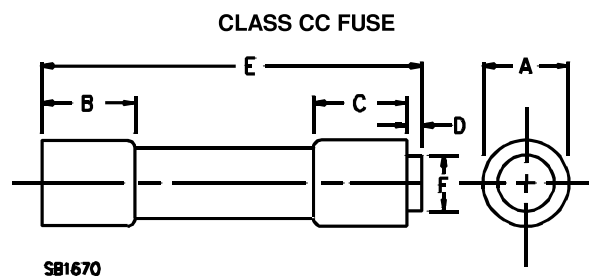


TABLE 6.1

DIMENSIONS OF CLASS CC FUSES

Rating		Dimensions in Inches (mm)					
Volts	Amperes	Ferrule Diameter A ^a	Ferrule Length B ^a	Ferrule Length C ^a	Rejection Length D ^a	Overall Length E ^b	Rejection Diameter F ^a
600	0 — 30	0.405 (10.29)	0.375 (9.53)	0.375 (9.53)	0.125 (3.18)	1.500 (38.10)	0.250 (6.35)

^aTolerance: ± 0.005 inch (± 0.13 mm)

^bTolerance: ± 0.031 inch (± 0.79 mm)

7. Class J and Class L Fuses

7.1 The blades of a fuse shall be of cooper or brass and shall be in proper alignment.

7.2 Class L fuse blades shall be plated with cadmium, nickel, silver, tin or other means that has been shown by investigation to provide equivalent protection.

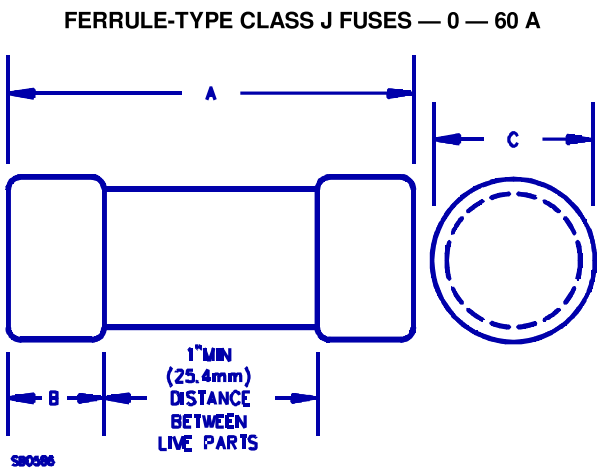
7.3 Except for a press-fitted assembly of materials not subject to shrinkage or warping due to heat or moisture, alignment of the blades shall be maintained by a means other than friction between surfaces.

7.4 A knife-blade fuse employing a press-fitted assembly shall withstand, without measurable misalignment of the blades, a torque of 20 lbf-in (2.26 N•m) applied as follows. One blade is to be securely clamped in a vise and the specified torque is to be applied about the long axis of the fuse with a wrench and weight or with a torque wrench.

7.5 The dimensions of a Class J fuse shall be in accordance with Figures 7.1 and 7.2 and Tables 7.1 and 7.2.

7.6 Except as noted in paragraph 7.7, the dimensions of a Class L fuse shall be in accordance with Figure 7.3 and Table 7.3.

FIGURE 7.1



7.7 A Class L fuse may have different mounting holes from those shown in Figure 7.3 provided that the fuse is interchangeable with a fuse of like rating that has holes as shown in Figure 7.3. The fuse is not to be interchangeable with a fuse having a current rating lower than the lowest value in the rating bracket in Table 7.3 that includes the fuse under consideration.

TABLE 7.1

DIMENSIONS OF FERRULE-TYPE CLASS J FUSES
IN INCHES (mm)^a

Cartridge Size in Amperes	Overall Length A	Minimum Length of Ferrule B	Outside Diameter of Ferrule C
0 — 30	2.25 (57.1)	0.50 (12.7)	0.812 (20.62)
31 — 60	2.37 (60.3)	0.63 (15.9)	1.062 (26.97)

^aTolerances: A, ±0.03 inch (±0.8 mm); C, ±0.008 inch (±0.20 mm).

FIGURE 7.2
KNIFE-BLADE TYPE CLASS J FUSES —
61-600 A

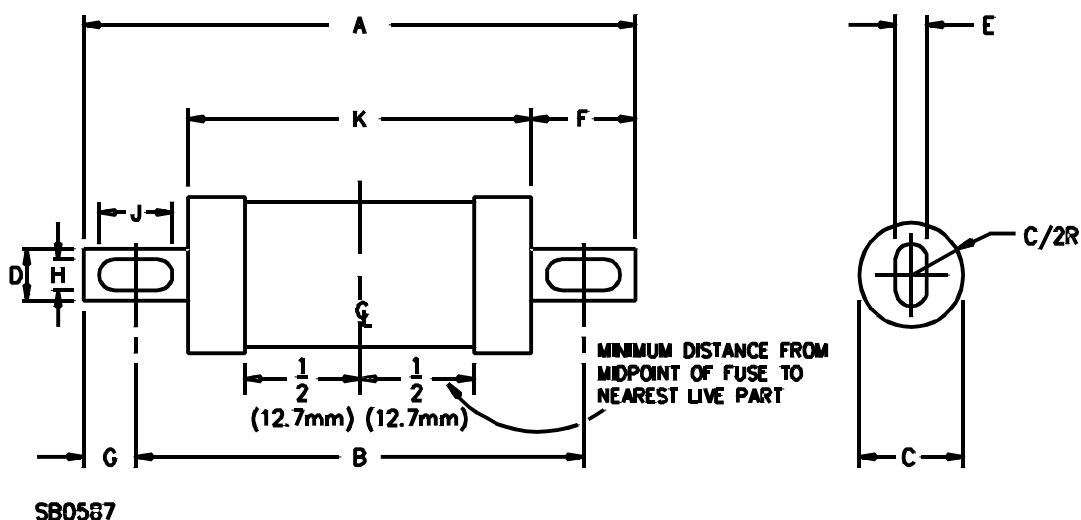


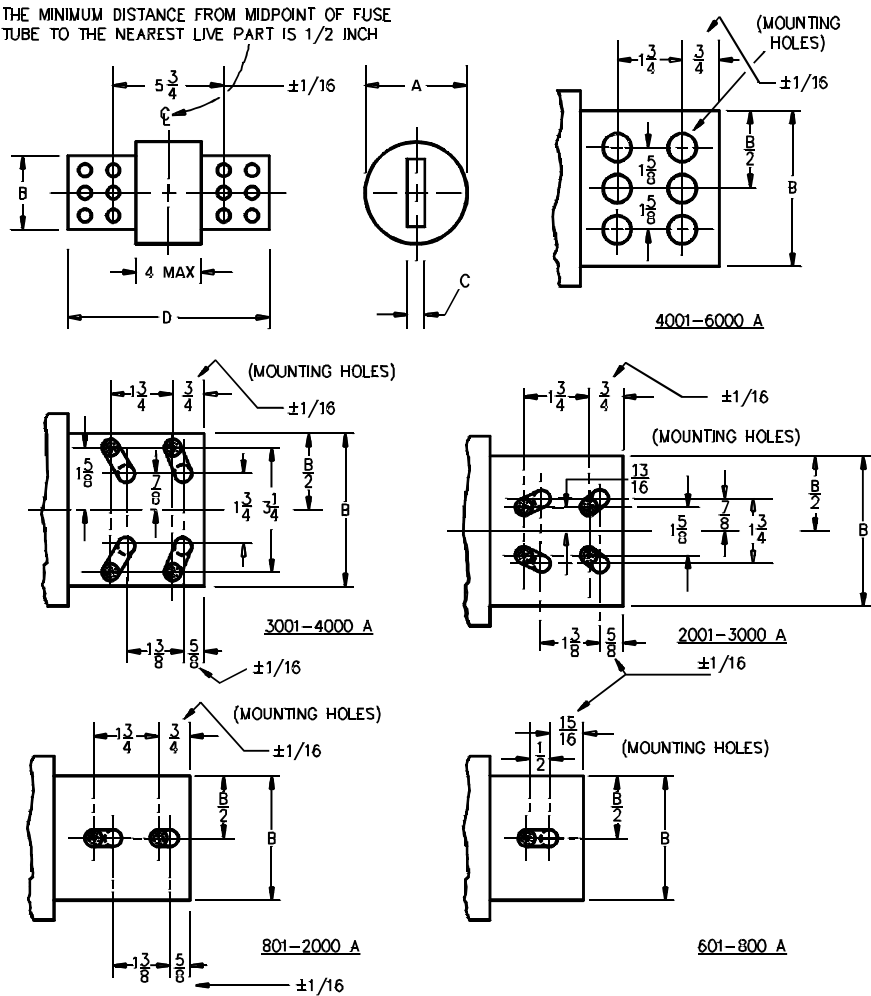
TABLE 7.2
DIMENSIONS OF KNIFE-BLADE TYPE CLASS J FUSES IN INCHES (mm)^a

Cartridge Size in Amperes	Overall Length A	Distance Between Centers of Slot B	Maximum Diameter ^b C	Width of Blades D	Thickness of Blades E	Length of Blades F	Distance From End of Blade to Center of Slot G	Width of Slot H	Length of Slot J	Length of Tube K
61 — 100	4.62 (117.5)	3.62 (92.1)	1.13 (28.6)	0.750 (19.05)	0.125 (3.18)	1.00 (25.4)	0.50 (12.7)	0.281 (7.14)	0.375 (9.52)	2.62 (66.7)
101 — 200	5.75 (146.0)	4.38 (111.1)	1.63 (41.3)	1.125 (28.58)	0.188 (4.78)	1.37 (34.9)	0.69 (17.5)	0.281 (7.14)	0.375 (9.52)	3.00 (76.2)
201 — 400	7.12 (181.0)	5.25 (133.4)	2.13 (54.0)	1.625 (41.28)	0.250 (6.35)	1.87 (47.6)	0.94 (23.8)	0.406 (10.32)	0.531 (13.49)	3.37 (85.7)
401 — 600	8.00 (203.2)	6.00 (152.4)	2.63 (66.7)	2.000 (50.80)	0.375 (9.52)	2.12 (54.0)	1.00 (25.4)	0.531 (13.49)	0.688 (17.48)	3.75 (95.2)

^aTolerances: A, ± 0.09 inch (± 2.4 mm); B, ± 0.06 inch (± 1.6 mm); D, ± 0.035 inch (± 0.89 mm); E, ± 0.003 inch (± 0.08 mm); F, ± 0.03 inch (± 0.8 mm); G, ± 0.03 inch (± 0.8 mm); H, ± 0.005 inch (± 0.13 mm); J, plus 0.062, minus 0.000 inch (plus 1.57 mm, minus 0.00 mm); K, ± 0.03 inch (± 0.8 mm).

^bC/2 includes maximum dimensions over projection.

FIGURE 7.3
CLASS L FUSES



ALL DIMENSIONS IN INCHES (1/64 INCH = 0.4mm, 1 INCH = 25.4mm)
SC0655-1

ALL TOLERANCES ARE $\pm 1/64$ INCH UNLESS OTHERWISE NOTED.

5/8 $\pm$ 1/32 INCH SLOTS OR HOLES MAY BE USED. SHADED HOLES INDICATE DRILLING REQUIRED FOR CLASS L FUSE MOUNTING.

Inches	1/64	1/32	1/16	1/2	5/8	3/4	13/16	7/8	15/16	1-3/8	1-5/8	1-3/4	3-1/4	4	5-3/4
mm	0.4	0.8	1.6	12.7	15.9	19.0	20.6	22.2	23.8	34.9	41.3	44.4	82.6	101.6	146.0

TABLE 7.3
DIMENSIONS OF CLASS L FUSES IN INCHES (mm)^a

Cartridge Size In Amperes	Maximum Diameter A	Width of Blades B	Thickness of Blades C	Overall Length D
601 — 800	2.53 (64.3)	2.0 (50.8)	0.375 (9.5)	8.63 (219.1)
801 — 1200	2.78 (70.6)	2.0 (50.8)	0.375 (9.5)	10.75 (273.0)
1201 — 1600	3.03 (77.0)	2.38 (60.3)	0.44 (11.1)	10.75 (273.0)
1601 — 2000	3.53 (89.7)	2.75 (69.8)	0.50 (12.7)	10.75 (273.0)
2001 — 2500	5.03 (127.8)	3.50 (88.9)	0.75 (19.0)	10.75 (273.0)
2501 — 3000	5.03 (129.8)	4.0 (101.6)	0.75 (19.0)	10.75 (273.0)
3001 — 4000	5.78 (146.8)	4.75 (120.6)	0.75 (19.0)	10.75 (273.0)
4001 — 5000	7.16 (181.8)	5.25 (133.4)	1.0 (25.4)	10.75 (273.0)
5001 — 6000	7.16 (181.8)	5.75 (146.0)	1.0 (25.4)	10.75 (273.0)

^aTolerances: B, ± 0.06 inch (± 1.6 mm); C, ± 0.03 inch (± 0.8 mm); D, ± 0.09 inch (± 2.4 mm).

PERFORMANCE

8. General

8.1 Samples of fuses shall be subjected to the tests indicated in Table 8.1.

8.2 All power factors are to be lagging, with circuit resistance and reactance in series connections.

8.3 A current-limiting reactor shall not have a ferromagnetic core or structure.

8.4 Test of fuses are to be performed on groups of samples referred to herein as sets. The number of samples constituting a set are given in Table 8.2 and in Table 8.3.

8.5 Tables 8.2 and 8.3 are based on the assumption that the same internal construction features, such as link material and shape, are constant for any fuse-case size. If the internal features, such as link material, change at some intermediate rating in a particular fuse-case size, this fact is to be taken into account during selection of test samples, and enough samples are to be selected so that constructions involving each different type of material are subjected to the complete test program outlined in Table 8.1.

TABLE 8.1
TESTS OF FUSES

	Fuse Classes			
	CC	G	J	L
Carrying Capacity — 110 %	X	X	X	X
Temperature	X	X	X	X
200% Clearing-Time Current	X	X	X	—
150% Clearing-Time Current	—	—	—	X
135% Clearing-Time Current	X	X	X	—
500% Clearing-Time Current	—	—	X	—
Overload Clearing at Rated Voltage	X	X	X	—
Interrupting and Current Limiting Ability				
Interrupting Ability	X	X	X	X
Maximum Energy	X	X	X	X
Maximum Threshold Ratio	X	X	X	X
Let-Through Current and Clearing I^2t	X	X	X	X
Intermediate Interrupting Ability	X	X	X	X
Low Interrupting Ability	X	X	—	—
Overload	X	X	—	—

8.6 To determine whether the adhesive complies with the requirement in paragraph 4.4, samples of the fuse are to be subjected to the interrupting ability, low interrupting ability, and overload clearing at rate voltage tests. Except as noted in paragraph 8.9, before being tested, samples are to be conditioned in an oven at the temperature and time described in paragraph 8.7 and other samples are to be conditioned for a minimum of 5 days in a humidity cabinet having a relative humidity of 93 ± 2 percent at $32.0 \pm 2.0^\circ\text{C}$ ($89.6 \pm 3.6^\circ\text{F}$).

8.7 The oven conditioning described in paragraph 8.6 is to be conducted for 1000 hours. The oven temperature is to be taken from the intersection of a selected temperature-index line in Figure 8.1 with the 1000-hour line, where the temperature index T is, at the manufacturer's option, either (1) the maximum observed operating temperature of the adhesive, or (2) the maximum acceptable operating temperature of any part in contact with the adhesive. Intermediate temperature indices are to be interpolated. The maximum observed operating temperature is that attained with the fuse carrying 110 percent of rated current, while in a 25°C (77°F) ambient. Measurement may be made in ambients of 18 — 32°C (65 — 90°F), and the reading adjusted to 25°C . The maximum acceptable operating temperature is the sum of two values: (1) the rise acceptable in the temperature test, and (2) 25°C .

Exception: On the same selected temperature-index line in Figure 8.1, a shorter or longer time at the corresponding higher or lower temperature may be employed if agreeable to all concerned, provided that the time is not less than 300 hours.

8.8 After the conditioning, the fuses are to be brought to and tested at room temperature to determine their performance.

8.9 Conditioning tests on the adhesive can be omitted if the fuse performs acceptably during the interrupting ability, low interrupting ability, and overload clearing at rated voltage with the adhesive omitted.

Class CC and Class G Fuses

8.10 One set of fuses of each of the ratings of 15, 20, 30, and 60 A for Class G and 15, 20, and 30 A for Class CC shall be provided for the rating tests, and enough fuses of these ratings are to be provided for the overload and the interrupting tests. See Table 8.2.

8.11 If the manufacturer so elects, the fuses used in the temperature (110-percent current) test may be used for the clearing-time current test. The temperature of the fuses is not to be higher than that of the ambient air when the 135-percent and 200-percent current tests are started.