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Road vehicles — Fuse-links —

Part 11:
Fuse-links with tabs (blade type) Type M (medium-high current)

Véhicules routiers — Liaisons fusibles —

Partie 11: Liaisons fusibles à languette (type plat) type M (courant moyen-élevé)

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 22/SC 32 "Electrical and electronic components and general system aspects".

ISO 8820 consists of the following parts.

— Part 1: Definitions and general test requirements

— Part 2: User's guide

— Part 3: Fuse-links with tabs (blade type) Type C (medium), Type E (high current) and Type F (miniature)

— Part 4: Fuse-links with female contacts (Type A) and bolt-in contacts (Type B) and their test fixtures

— Part 5: Fuse links with axial terminals (Strip fuse-links) Type SF30 and SF51 and test fixture

— Part 6 Single-bolt fuse-links

— Part 7: Fuse-links with tabs (Type G) with rated voltage of 450 V

— Part 8: Fuse-links with bolt-in contacts (Type H and J) with rated voltage of 450 V

— Part 9: Fuse-links with shortened tabs (Type K)

— Part 10: Fuse-links with tabs Type L (high current miniature)

— Part 11: Fuse-links with tabs Type M (medium-high current)

— Part 12: Fuse-links with tabs (blade type) Type N (sub miniature)

— Part 13: Fuse-links with tabs (blade type) Type P (sub miniature three tabs)

Road vehicles — Fuse-links —

Part 11: **Fuse-links with tabs (blade type) Type M (medium-high current)**

1 Scope

This standard specifies fuse-links with tabs (blade-type) Type M (medium-high current) for use in road vehicles. It establishes, for these fuse-link types, the rated current, test procedures, performance requirements and dimensions.

This standard is applicable for fuse-links with a rated voltage of 32 V and a current rating of ≤ 80 A and a breaking capacity of 1 000 A intended for use in road vehicles.

This Part of ISO 8820 is intended to be used in conjunction with ISO 8820-1 and with ISO 8820-2. The numbering of its clauses corresponds to that of ISO 8820-1 whose requirements are applicable, except where modified by requirements particular to this part of ISO 8820.

2 Normative references

The following referenced documents are indispensable for the application 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 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

ISO 6722-1, *Road vehicles — 60 V and 600 V single-core cables — Part 1: Dimensions, test methods and requirements for copper conductor cables*

ISO 8820-1, *Road vehicles — Fuse-links — Part 1: Definitions and general test requirements*

ISO 8820-2, *Road vehicles — Fuse-links — Part 2: User guidelines*

3 Terms and definitions

For the purposes of this part of ISO 8820, the terms and definitions given in ISO 8820-1 apply.

4 Marking, labelling and colour coding

See ISO 8820-1 and Table 1.

Table 1 — Fuse-link colour coding

Rated current, I_R (A)	**Colour Type M**
20	yellow
25	white
30	green

Table 1 *(continued)*

Rated current, I_R (A)	Colour Type M
35	dark green
40	orange
50	red
60	blue
70	brown
80	black

5 Tests and requirements

5.1 General

5.1.1 Test criteria

In addition to carrying out the test procedures in accordance with ISO 8820-1 the following criteria shall apply:

Tests shall be performed following the test sequences in Table 2.

The test fixtures for electrical tests shall be designed in accordance with Figure 1.

The connection resistance shall be ≤ 0,35 mΩ Type M (medium-high current) to ensure the proper function of the test fixture;

Fuse-links according to this part of ISO 8820 shall provide for visible evidence of an open fuse element.

5.1.2 Test sequence

Table 2 — Test sequence

No	Test		Clause	Sample groups						
				1	2	3	4	5	6	7
1	Dimensions		6	X	X	X	—	—	—	—
2	Marking, labelling and colour coding		4	X	X	X	X	X	X	X
3	Fuse-link voltage drop		5.2	X	X	X	—	—	—	—
4	Strength of terminals		5.8	X	X	X	—	—	—	—
5	Environmental conditions	Climatic load	5.4	—	—	—	X	—	—	—
6		Chemical load		—	—	—	—	X	—	—
7		Mechanical load		—	—	—	—	—	X	—
8	Transient current cycling		5.3	—	—	—	—	—	—	X
9	Fuse-link voltage drop		5.2	—	—	—	X	X	X	X
10	Current steps		5.6	—	—	X	—	—	—	—
11	Breaking capacity		5.7	X	—	—	—	—	—	—

[a] Not required for 80A fuse-link type M

Table 2 *(continued)*

No	Test		Clause	Sample groups						
				1	2	3	4	5	6	7
12	Operating time rating test	I_R [a]	5.5	—	X	—	X	X	X	X
		1,35 I_R		—	Y	—	Y	Y	Y	Y
		1,60 I_R		—	Y	—	Y	Y	Y	Y
		2,00 I_R		—	Y	—	Y	Y	Y	Y
		3,50 I_R		—	Y	—	Y	Y	Y	Y
		6,00 I_R		—	Y	—	Y	Y	Y	Y
13	Strength of terminals		5.8	X	X	X	X	X	X	X

Each sample group shall contain a minimum of 10 fuse-links for each rated current.

For the operating time rating tests marked "Y", the sample groups 2, 4, 5, 6 and 7 shall be divided equally. These fuse-links are intended to be subjected to a single operating time-rating test only.

NOTE A dash (—) indicates that the test is not required.

[a] Not required for 80A fuse-link type M

5.2 Test cable sizes

Test cable sizes shall be as given in Table 3. All tests for a particular fuse-link rating shall be performed using the same cable size.

Test cable sizes are specified to allow comparative fuse-link tests to be carried out. The cable size specified herein does not necessarily indicate the size of cable to be used in the vehicle application.

Table 3 — Test cable sizes

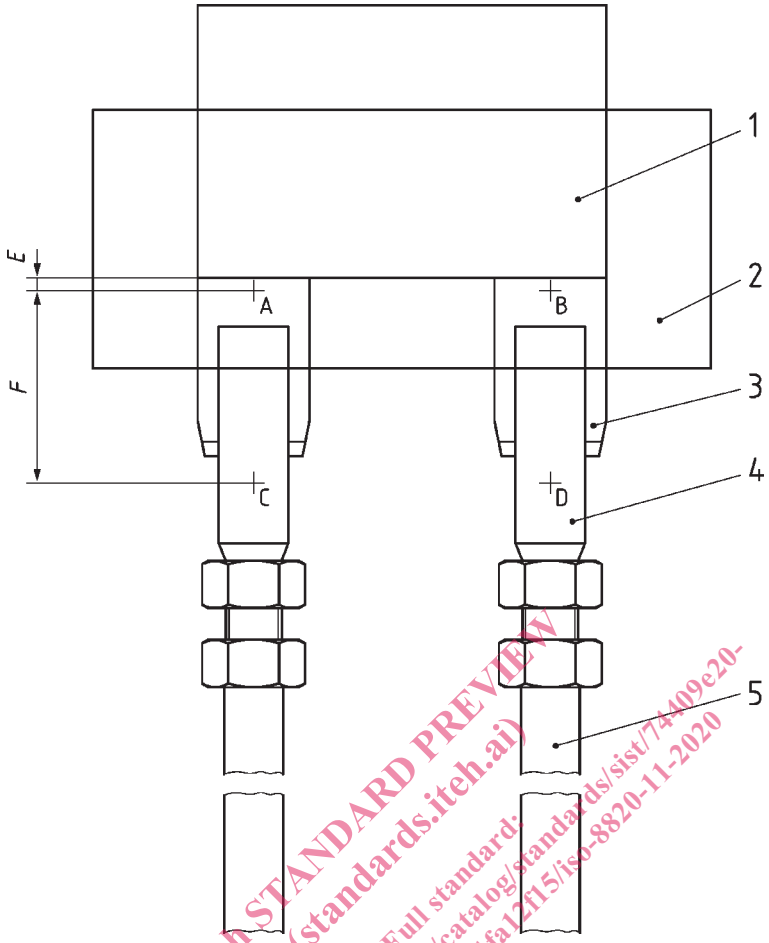
Rated current, I_R (A)	**Conductor cross-sectional area**[a] (mm^2)	**Length** (mm)
20	2,5	500 ± 50
25	2,5	
30	4,0	
35		
40		
50	6,0	
60		
70	10,0	
80		

[a] Conductor material according to ISO 6722-1

5.3 Voltage drop

5.3.1 Tests

The voltage drop U_{AB} shall be measured at points A and B across the fuse-link tabs as shown in Figure 1.



Key

1	Fuse-link	5	Cable size according to Tables 3
2	Test fixture	E	1,5 ± 0,5 mm
3	Fuse blade	F	28 ± 1 mm
4	Test clip (cantilevered contact system, receptacle to accept tabs as defined in Table 7)		

Figure 1 — Test schematic

NOTE Points A and B are the measuring points for the voltage drop. Points A, C and B, D are the measuring points for connection resistance.

5.3.2 Requirements

See Table 4.

Table 4 — Voltage drop

Rated current, I_R	Max. voltage drop U_{AB}
(A)	(mV)
20	<125
25	<125

Table 4 *(continued)*

30	<120
35	
40	
50	
60	
70	<110
80	

Dimensions in millimetres

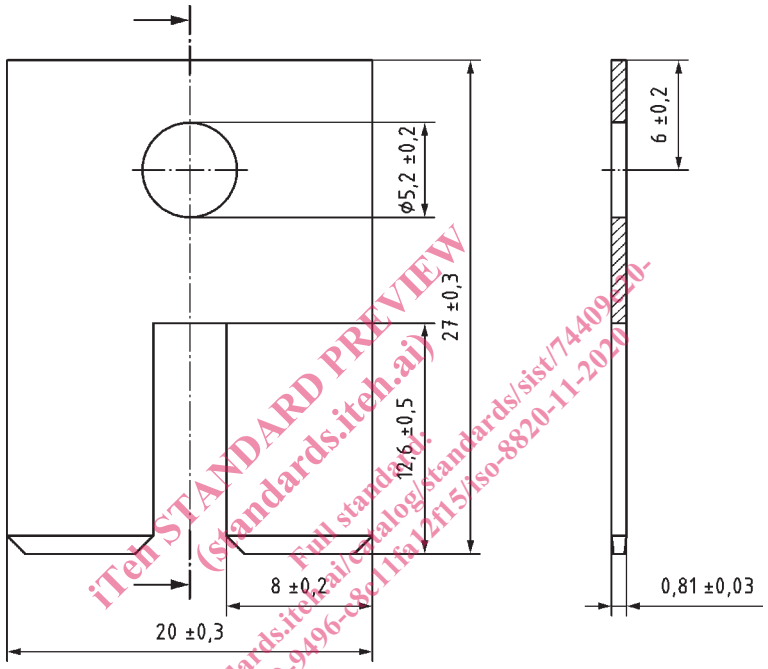


Figure 2 — Test dummy

Where not specified in the figure, the common tolerances shall be in accordance with tolerance class m as specified in ISO 2768-1.

5.4 Transient current cycling

5.4.1 Test

See Figure 2 and ISO 8820-1. At an elapsed time of 0,025 s on-time, the current shall fall to a value between 1,65 I_R and 2,5 I_R. At no time during the first 4,5 s of each cycle the steady state current shall fall below 0,9 I_R.