INTERNATIONAL STANDARD

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Road vehicles — Fuse-links —

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

Véhicules routiers — Liaisons fusibles —

Partie 10: Liaisons fusibles à languette (type plat) type L (courant fort miniature)

Reference number
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Foreword

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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).

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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 WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 22, *Road vehicles*, Subcommittee SC 32, *Electrical and electronic components and general system aspects*.

ISO 8820 consists of the following parts, under the general title *Road vehicles — Fuse-links*:

— *Part 1: Definitions and general test requirements*

— *Part 2: User guidelines*

— *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) Types SF 30 and SF 51 and test fixtures*

— *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)*

Road vehicles — Fuse-links —

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

1 Scope

This part of ISO 8820 specifies fuse-links with tabs (blade type) Type L (high current miniature) for use in road vehicles. It establishes, for this fuse-link type, the rated current, test procedures, performance requirements, and dimensions.

This part of ISO 8820 is applicable for fuse-links with a rated voltage of 32 V, a current rating of ≤60 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 documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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 document, 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

Current rating A	Colour
20	yellow
25	white
30	green
35	dark green
40	orange
50	red
60	blue

5 Tests and requirements

5.1 General

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 a maximum of 0,5 mΩ for Type L (high current miniature) 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.

5.2 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	—	—	—	—	—	—
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 rating.

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 60 A fuse-link.

5.3 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.

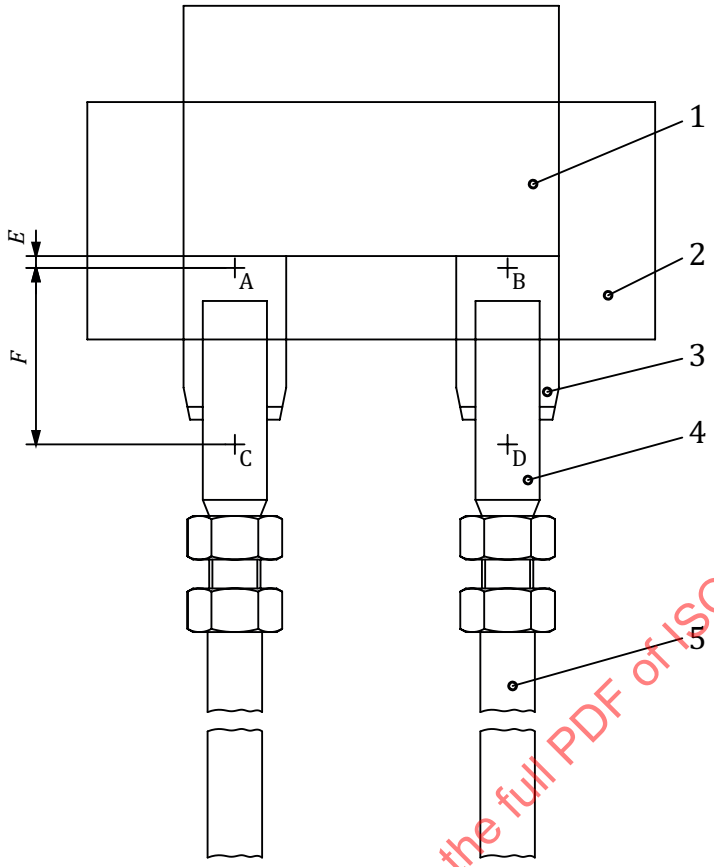
Table 3 — Test cable sizes

Rated current, I_R A	**Conductor cross-sectional area** mm^2	**Length** mm
20	1,5	500 ± 50
25	2,5	
30		
35	4,0	
40		
50	6,0	
60		
[a] Conductor material according to ISO 6722-1.		

5.4 Voltage drop

5.4.1 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
2 test fixture
3 fuse blade
4 test clip (cantilevered contact system, receptacle to accept tabs as defined in Table 7)
5 cable size according to Table 3
E (1,5 ± 0,5) mm
F (15,5 ± 1) mm

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

Figure 1 — Test schematic

5.4.2 Requirements

See Table 4.

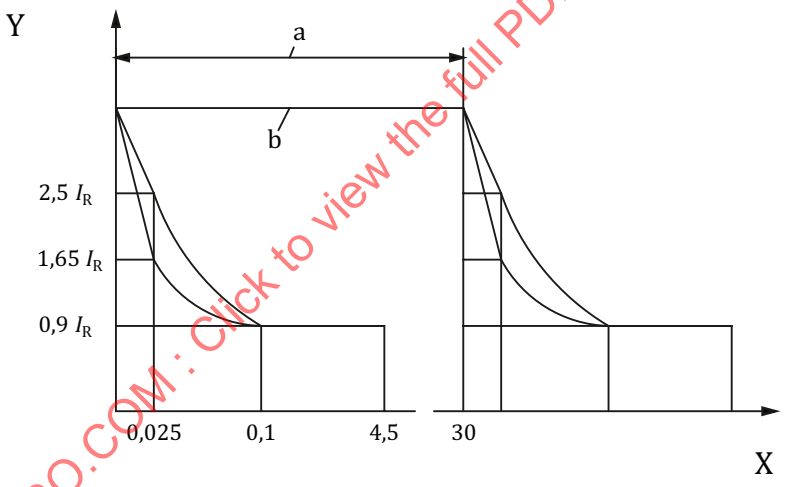
Table 4 — Voltage drop

Fuse rating A	Maximum voltage drop, U_{AB} mV
20	125
25	
30	120
35	
40	
50	
60	

5.5 Transient current cycling

5.5.1 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.



Key

X time, s

Y current

a One cycle.

b (5,6 … 6) I_R for I_R > 5 A.

Figure 2 — Transient current cycling

5.5.2 Requirements

See ISO 8820-1.

5.6 Environmental conditions

See ISO 8820-1.

5.7 Operating time rating

5.7.1 Test

See ISO 8820-1. For I_R, the test duration is 100 h.

5.7.2 Requirement

See Table 5.

After activation, the current through the fuse-link shall not exceed 0,5 mA at the rated voltage of the fuse-link.

Table 5 — Operating times

Test current A	Operating time s	
	min	max
I_R	360 000	∞
1,35 I_R	60	300
1,6 I_R	10	70
2,0 I_R	2	30
3,5 I_R	0,2	7,0
6 I_R	0,04	1,0

5.8 Current steps

5.8.1 Test

See ISO 8820-1.

5.8.2 Requirement

See ISO 8820-1. After activation, the current through the fuse-link shall not exceed 0,5 mA at the rated voltage of the fuse-link.

5.9 Breaking capacity

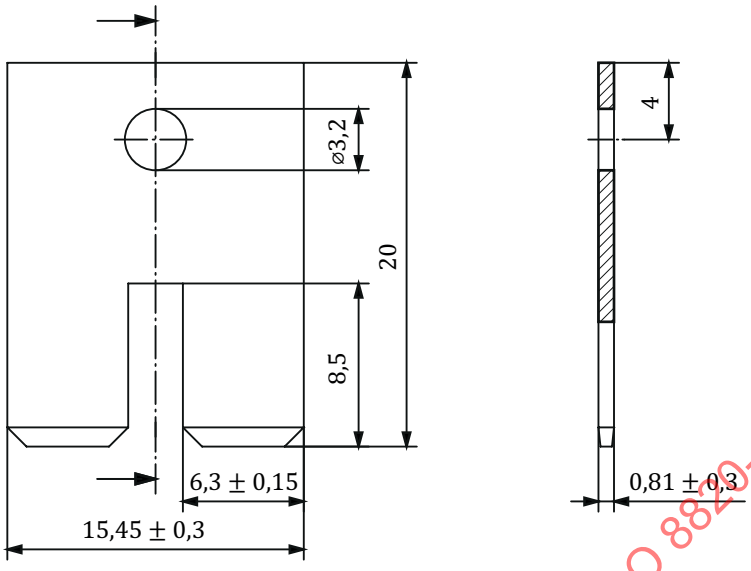
5.9.1 Test

See ISO 8820-1.

Test at 1 000 A with cable sizes as shown in Table 3.

Use appropriate test dummy according to Figure 3.

Dimensions in millimetres



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

Figure 3 — Test dummy for Type L fuse-links

5.9.2 Requirement

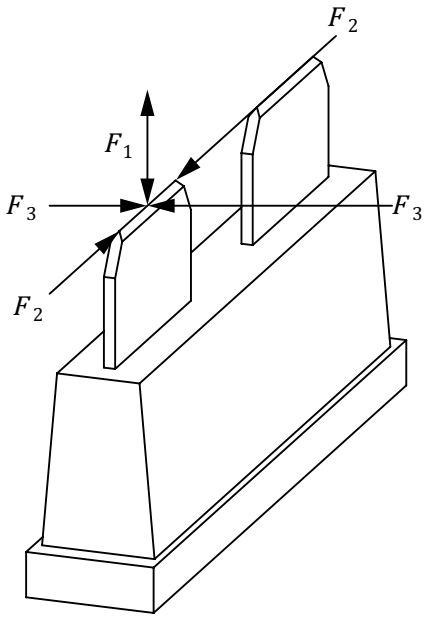
See ISO 8820-1.

After the test, the current through the fuse-link shall not exceed 0,5 mA at the rated voltage of the fuse-link.

5.10 Strength of terminals

Table 6 — Terminal forces

F_1 N	F_2 N	F_3 N
70 ± 1	15 ± 1	7,5 ± 1



NOTE The arrows indicate the directions of applied forces, F_1 ... F_3.

Figure 4 — Application of forces

5.10.1 Test

A force (F_1 ... F_3) shall be applied to each of the tabs of the fuse-link in accordance with Figure 4. The force shall be held for 2 s. The test force shall not be applied abruptly.

5.10.2 Requirements

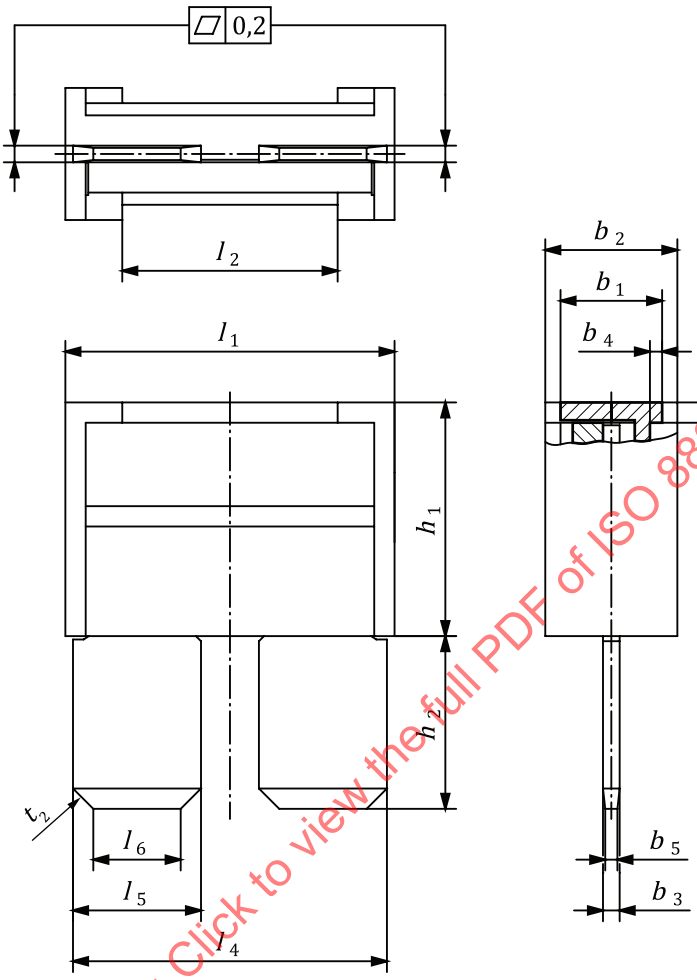
The deformation of the test sample shall not exceed 0,5 mm. After the test, the insulator shall be intact and the terminals shall not be removed from the insulator.

5.11 Temperature rise

See Annex A.

6 Dimensions

Dimensions in millimetres



Key

t_2 taper

Figure 5 — Fuse-link Type L

Table 7 — Dimensions of fuse-links with tabs, Type L

Dimension	Value	Tolerance
l_1	16,2	±0,3
l_2	10,6	±0,3
l_4	15,45	±0,3
l_5	6,3	±0,2
l_6	4,3	±0,5
b_1	5	±0,3
b_2	6,5	±0,3
b_3	0,82	+0,05 −0,04
b_4	0,6	±0,2
b_5	0,6	max
h_1	11,5	±0,3
h_2	8,5	+0 −0,5
h_4	1	±0,5

6.1 Designation example

Designation of a fuse-link Type L in accordance with this part of ISO 8820 for a nominal current of 30 A:

Fuse-link ISO 8820 - L – 30