

SVENSK STANDARD

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Road vehicles – Environmental conditions and testing for electrical and electronic equipment for drive system of electric propulsion vehicles – Part 4: Climatic loads (ISO 19453-4:2018, IDT)

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The International Standard ISO 19453-4:2018 has the status of a Swedish Standard. This document contains the official version of ISO 19453-4:2018.

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Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för EI- och hybridfordon, SIS/TK 517.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

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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).

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For an explanation on the voluntary nature of standards, 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

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 32, *Electrical and electronic components and general system aspects*.

A list of all parts in the ISO 19453 series can be found on the ISO website.

Road vehicles — Environmental conditions and testing for electrical and electronic equipment for drive system of electric propulsion vehicles —

Part 4: Climatic loads

1 Scope

This document specifies requirements for the electric propulsion systems and components with maximum working voltages according to voltage class B. It does not apply to high voltage battery packs (e.g. for traction) and systems and components inside. It describes the potential environmental stresses and specifies tests and requirements recommended for different stress levels on/in the vehicle.

This document describes climatic loads.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 16750-1, *Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 1: General*

ISO 19453-1, *Road vehicles — Environmental conditions and testing for electrical and electronic equipment for drive system of electric propulsion vehicles — Part 1: General*

ISO 20653, *Road vehicles — Degrees of protection (IP code) — Protection of electrical equipment against foreign objects, water and access*

IEC 60068-1:2013, *Environmental testing — Part 1: General and guidance*

IEC 60068-2-1, *Environmental testing — Part 2-1: Tests — Test A: Cold*

IEC 60068-2-2, *Environmental testing — Part 2-2: Tests — Test B: Dry heat*

IEC 60068-2-11, *Basic environmental testing procedures — Part 2-11: Tests — Test Ka: Salt mist*

IEC 60068-2-14, *Environmental testing — Part 2-14: Tests — Test N: Change of temperature*

IEC 60068-2-30, *Environmental testing — Part 2-30: Tests — Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60068-2-52:2017, *Environmental testing — Part 2-52: Tests — Test Kb: Salt mist, cyclic (sodium chloride solution)*

IEC 60068-2-60, *Environmental testing — Part 2-60: Tests — Test Ke: Flowing mixed gas corrosion test*

IEC 60068-2-78, *Environmental testing — Part 2-78: Tests — Test Cab: Damp heat, steady state*

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems — Part 1: Principles, requirements and tests*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16750-1 and ISO 19453-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

4 Operating temperature ranges

Choose the applicable temperature range from [Table 1](#) to be presented in the specifications of the device under test (DUT).

In the case of hot soak, choose from [Table 2](#) the relative temperature increase ΔT_{HS} and add it to the maximum temperature T_{max} to have the absolute hot soak temperature (T_{maxHS}).

$$T_{max} + \Delta T_{HS} = T_{maxHS}$$

For further details, refer to [5.2.1](#).

The paint repair temperature (T_{maxPR}) can be set to a higher value than the operating temperature. Specify this temperature in the specifications of the DUT.

Table 1 — Operating temperature ranges

Code	Minimum operating temperature	Maximum operating temperature
	T_{min} °C	T_{max} °C
A	-20	65
B	-30	65
C	-40	65
D		70
E		75
F		80
G		85
H		90
I		95
J		100
K		105
L		110
M		115
N		120
O		125
P		130
Q		140
R		150
S		155
T		160
U		165
V		170
W	175	
X	180	
Z	As agreed	

Table 2 — Relative temperature increase in hot soak

Code	ΔT_{HS} K
a	15
b	30
c	50
z	As agreed

NOTE The code letter is defined as a combination of [Tables 1](#) and [2](#), e.g. Hb ($T_{max} = 90$ °C and $\Delta T_{HS} = 30$ K).