
**Road vehicles — Comparison between
ISO 26262-12 and other parts of
the ISO 26262 series to support
motorcycle adaptation**

*Véhicules routiers — Comparaison entre l'ISO 26262-12 et les
autres parties de la série ISO 26262 pour soutenir l'adaptation aux
motocycles*

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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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This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 38, *Motorcycles and mopeds*.

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Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The ISO 26262 series is the adaptation of the IEC 61508 series, its purpose is to address the sector-specific needs of electrical and/or electronic (E/E) systems within road vehicles.

This adaptation applies to all activities during the safety lifecycle of safety-related systems comprised of electrical, electronic and software components.

E/E systems on motorcycles comply with the ISO 26262 series by meeting all of the requirements of ISO 26262-2:2018 through ISO 26262-9:2018. However, some requirements can require a degree of tailoring in order to apply them to motorcycles. In such cases, these tailored requirements supersede the corresponding requirements of the ISO 26262 series.

The specific requirements for motorcycles compared in this document correspond to requirements of ISO 26262-2:2018, 5.4.2 and 6.4.9; ISO 26262-3:2018, Clause 6; ISO 26262-4:2018, 7.4.4; and ISO 26262-4:2018, Clause 8.

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Road vehicles — Comparison between ISO 26262-12 and other parts of the ISO 26262 series to support motorcycle adaptation

1 Scope

This document lists differences between ISO 26262-12:2018 and other parts of the ISO 26262 series, and supports the adaptation of the ISO 26262 series for motorcycles by clarifying the intention.

This document is based on ISO 26262-12:2018 and makes a comparison with the following documents:

- ISO 26262-2:2018,
- ISO 26262-3:2018,
- ISO 26262-4:2018.

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 26262-1:2018, *Road vehicles — Functional safety — Part 1: Vocabulary*

[ISO/TR 3152:2022](#)

3 Terms and definitions

For the purposes of this document, the terms, definitions and abbreviated terms given in ISO 26262-1 apply.

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

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

4 General

4.1 Overview

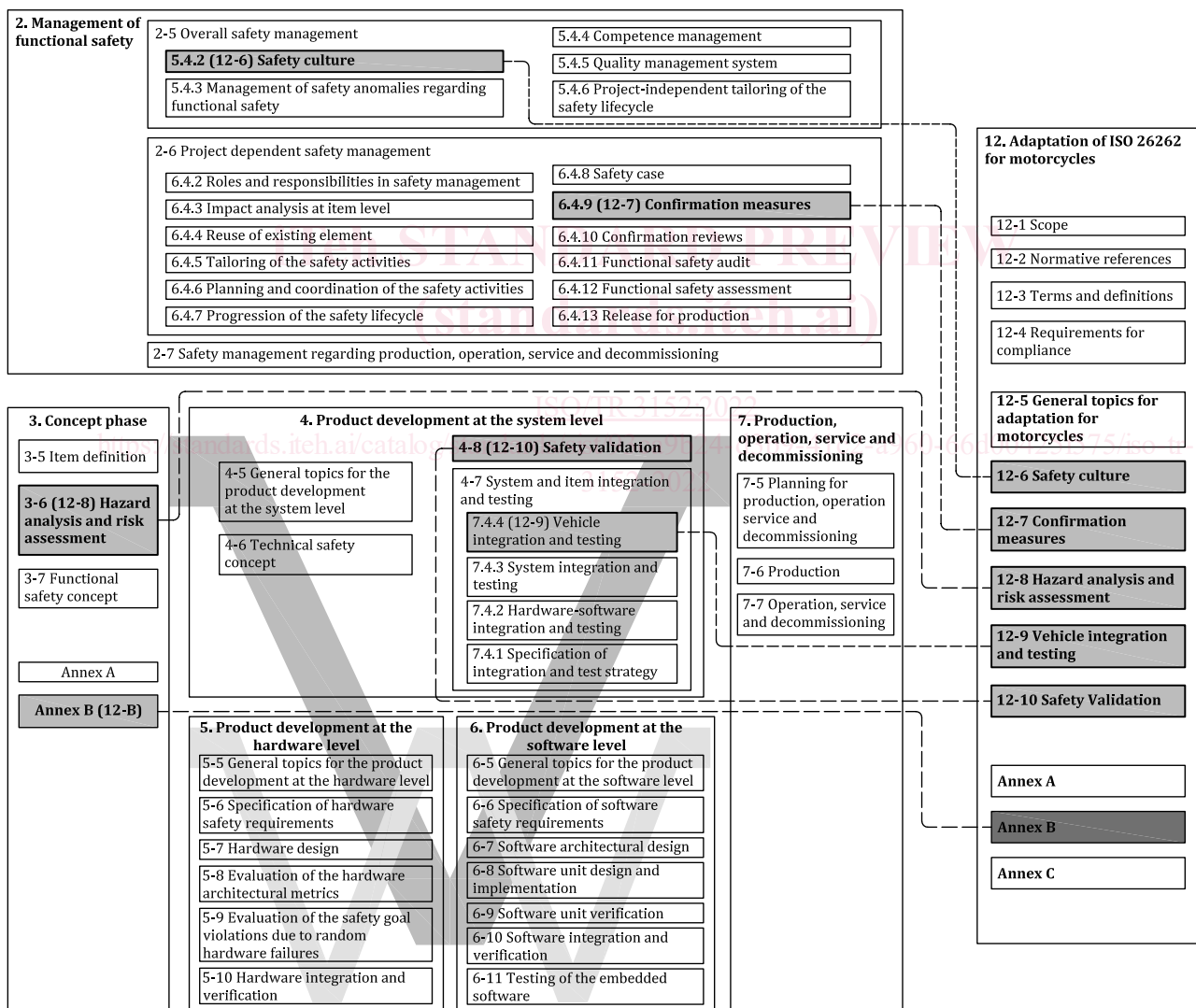
The objective of this clause is to give an overview of the comparison in this document. This clause describes the contents of ISO 26262-12:2018 and the superseded clauses from ISO 26262-2:2018, ISO 26262-3:2018 and ISO 26262-4:2018. However, identical clauses (Clause 1 to Clause 4) in all parts are excluded from comparison. Additionally, annexes are also excluded from the comparison because of their informative nature.

123 differences are identified as the target of categorization by comparison. The overview for each clause is as follows.

- In Clause 5 regarding safety culture, 5 differences are categorized. These are mainly relevant to communication channels and changed because these are implemented to limited models of motorcycle.

- In Clause 6 regarding confirmation measures, 16 differences are categorized. These are mainly relevant to the level of independence required for confirmation reviews of work products and the definition of their level, and these are changed to adapt the scale of motorcycle development. ISO 26262-12:2018, Figure 3 is added for better understanding of independence.
- In Clause 7 regarding hazard analysis and risk assessment, 72 differences are categorized. These are mainly relevant to how the dynamic behaviour of motorcycle differed from other vehicles, and these are adapted by the classification of parameters for hazardous event (severity, exposure and controllability) and the introduction of MSIL.
- In Clause 8 regarding vehicle integration and testing, 20 differences are categorized. And in Clause 9 regarding safety validation, 10 differences are categorized. These are mainly relevant to the test feasibility for motorcycle and there is no assignment for ASIL D due to ASIL-MSIL mapping.

Figure 1 is reprinted from ISO 26262-12:2018 and it shows the relation of ISO 26262-12:2018 and the other parts of ISO 26262 series.



SOURCE: ISO 26262-12:2018, Figure 2

Figure 1 — Overview of ISO 26262-12:2018 and the relation to the other parts

For detailed explanation of Figure 1, Table 1 shows the list of clauses/subclauses of ISO 26262-12:2018 and the superseded clauses/subclauses of the other parts of the ISO 26262 series, and remarks for them.

Table 1 — Comparison of contents

Clause/subclause of ISO 26262-12:2018	Superseded clause/sub-clause	Remark
5 General topics for adaptation for motorcycles	—	—
5.1 Objectives	N/A	Original
5.2 General	N/A	Original
6 Safety culture	—	—
6.1 Objective	N/A	Original
6.2 Requirements and recommendations	ISO 26262-2:2018, 5.4.2	Modified
7 Confirmation measures	—	—
7.1 Objective	N/A	Original
7.2 Requirements and recommendations	ISO 26262-2:2018, 6.4.9	Modified
8 Hazard analysis and risk assessment	—	—
8.1 Objectives	ISO 26262-3:2018, 6.1	Modified
8.2 General	ISO 26262-3:2018, 6.2	Modified
8.3 Input to this clause	—	—
8.3.1 Prerequisites	ISO 26262-3:2018, 6.3.1	Identical
8.3.2 Further supporting information	ISO 26262-3:2018, 6.3.2	Identical
8.4 Requirements and recommendations	—	—
8.4.1 Initiation of the hazard analysis and risk assessment	ISO 26262-3:2018, 6.4.1	Modified
8.4.2 Situation analysis and hazard identification	ISO 26262-3:2018, 6.4.2	Modified
8.4.3 Classification of hazardous events	ISO 26262-3:2018, 6.4.3	Modified
8.4.4 Determination of safety goals	ISO 26262-3:2018, 6.4.4	Modified
8.4.5 Verification	ISO 26262-3:2018, 6.4.6	Modified
8.5 Work products	ISO 26262-3:2018, 6.5	Identical
9 Vehicle integration and testing	—	—
9.1 Objective	N/A	Original
9.2 Requirements and recommendations	—	—
9.2.1 Vehicle integration	ISO 26262-4:2018, 7.4.4.1	Identical
9.2.2 Test goals and test methods during vehicle testing	ISO 26262-4:2018, 7.4.4.2	Modified
10 Safety validation	—	—
10.1 Objective	ISO 26262-4:2018, 8.1	Modified
10.2 General	ISO 26262-4:2018, 8.2	Identical
10.3 Inputs to this clause	—	—
10.3.1 Prerequisites	ISO 26262-4:2018, 8.3.1	Identical
10.3.2 Further supporting information	ISO 26262-4:2018, 8.3.2	Identical
10.4 Requirements and recommendations	—	—
10.4.1 Safety validation environment	ISO 26262-4:2018, 8.4.1	Modified
10.4.2 Specification of safety validation	ISO 26262-4:2018, 8.4.2	Identical
NOTE 1 The notation "N/A" in the superseded clause/subclause column means that that clause is not applicable because comparison target is added as original.		
NOTE 2 The notations in the remark column are as follows:		
— —: clauses are not for comparison, for example, clause includes only title;		
— Original: clauses are added in ISO 26262-12:2018;		
— Modified: clauses include partially superseded requirements from other parts;		
— Identical: clauses are same requirements of other parts.		

Table 1 (continued)

Clause/subclause of ISO 26262-12:2018	Superseded clause/sub-clause	Remark
10.4.3 Execution of safety validation	ISO 26262-4:2018, 8.4.3	Modified
10.4.4 Evaluation	ISO 26262-4:2018, 8.4.4	Identical
10.5 Work products	ISO 26262-4:2018, 8.5	Identical
NOTE 1 The notation “N/A” in the superseded clause/subclause column means that that clause is not applicable because comparison target is added as original.		
NOTE 2 The notations in the remark column are as follows:		
— —: clauses are not for comparison, for example, clause includes only title;		
— Original: clauses are added in ISO 26262-12:2018;		
— Modified: clauses include partially superseded requirements from other parts;		
— Identical: clauses are same requirements of other parts.		

4.2 Categorization of differences

[Table 2](#) explains the method of categorization of differences between ISO 26262-12:2018 and other parts of ISO 26262:2018 series.

Table 2 — Categorization of differences

Categorization	Remarks
Added	It is intended difference to add new phrase, figure or table.
Deleted	It is intended difference to delete existing phrase, figure or table.
Modified	It is intended difference to modify phrase to adapt.
Unintended	It is unintended difference but acceptable.

The following differences are excluded from comparison and categorization results because they have no impact on the section meaning:

- reference number;
- existence of symbol, e.g. comma, hyphen, quotation mark;
- word form, e.g. singular/plural, verb form;
- article and preposition.

4.3 Interpretation of comparison tables

The comparison and categorization results are listed in tables. Different parts of sections are underlined except in case of figure or table constitution or no comparison target. Each superscript for individualization is shown with parentheses because of the possibility of confusing them with the original superscripts of compared sections as follows:

- superscript for footnote: marked by a letter and noted at the bottom of table, e.g. a, b, c;
- superscript for category: marked by number and noted in rightmost column, e.g. (1), (2), (3).

The notation “N/A” in first column and second column means that there is no section to be compared.

5 Comparison of safety culture

This clause explains the differences in content relating to safety culture between ISO 26262-12:2018 and ISO 26262-2:2018. The differences and their categorization are listed in [Table 3](#).

Table 3 — Comparison of safety culture

Sections according to:		No.	Category
ISO 26262-12:2018	ISO 26262-2:2018		
6.1 Objective To provide a tailoring of ISO 26262-2:2018, 5.4.2 for motorcycle. ⁽¹⁾	N/A	1	Added
6.2.1 The organization shall create, foster, and sustain a safety culture that supports and encourages the effective achievement of functional safety <u>for motorcycles</u> ⁽²⁾ .	5.4.2.1 The organization shall create, foster, and sustain a safety culture that supports and encourages the effective achievement of functional safety.	2	Added
6.2.3 The organization shall institute and maintain effective communication channels between functional safety, cybersecurity, and other <u>potentially interacting</u> ⁽³⁾ disciplines that are related to the achievement of functional safety, <u>if applicable</u> ⁽⁴⁾ .	5.4.2.3 The organization shall institute and maintain effective communication channels between functional safety, cybersecurity, and other disciplines that are related to the achievement of functional safety.	3 4	Added Added
N/A	5.4.2.3 EXAMPLE 2 Communication channels between functional safety and non-E/E related safety such as mechanical safety. ⁽⁵⁾	5	Deleted

6 Comparison of confirmation measures

This clause explains the differences in content relating to confirmation measures between ISO 26262-12:2018 and ISO 26262-2:2018. The differences and their categorization are listed in [Table 4](#).

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Table 4 — Comparison of confirmation measures

Sections according to:		No.	Category
ISO 26262-12:2018	ISO 26262-2:2018		
7.1 Objective The objective of this clause is to define the independency requirements of confirmation measures associated with ASIL. ⁽¹⁾	N/A	1	Added
7.2.1 NOTE 1 For motorcycles, Table 1 of this document replaces ISO 26262-2:2018, Table 1. ⁽²⁾	N/A	2	Added
Table 1 (Columns of ASIL A, B and C) ⁽³⁾	Table 1 (Columns of ASIL A, B, C and D) ⁽³⁾	3	Deleted
Table 1 (1st row, 1st column) Confirmation review of the impact analysis at item level (see ISO 26262-2:2018, 6.5.1) Independence with regard to <u>those creating the work product</u> ⁽⁴⁾	Table 1 (1st row, 1st column) Confirmation review of the impact analysis at the item level (see 6.5.1) Independence with regard to <u>the author of the impact analysis and project management</u> ⁽⁴⁾	4	Modified