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Road vehicles — Light alloy wheels — Lateral impact test

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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. 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/TC22/SC33/WG5.

Introduction

The purpose of this International Standard is to improve the repetitious accuracy and the application for increasing wheel diameters and static wheel loads.

Therefore, it is necessary to describe the test rig in more details and include additional descriptions for failure criteria.

Road vehicles — Light alloy wheels — Lateral impact test

1. Scope

This International Standard specifies a laboratory test procedure to evaluate the axial (lateral) kerb impact collision properties of a wheel manufactured either wholly or partly of light alloys. It is intended for passenger car applications, and special vehicle applications where the wheel may impact the kerb, with the purpose of screening and/or quality control of the wheel.

The vocabulary used is in accordance with ISO 3911.

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 3911, *Wheels and rims for pneumatic tyres — Vocabulary, designation and marking*

3. Terms and definitions

No terms and definitions are listed in this document.

The list below is always included after each option:

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4. Test equipment

4.1 **New wheels**, fully processed, representative of wheels intended for vehicle application, fitted with a tyre.

Tyres and wheels used in the tests should not be used subsequently on a vehicle.

4.2 **Impact loading test machine** with a vertically acting steel striker having an impacting face, in accordance with Figure 1. The striker mass, m, within a tolerance of ± 2 %, expressed in kilograms, shall be as follows:

$$m = 0{,}6W + 180$$

where W is the maximum static wheel loading, as specified by the wheel and/or vehicle manufacturer, expressed in kilograms.

4.3 **Mass** of 1 000 kg.

5. Calibration

Ensure, by means of a test calibration adapter, that the 1 000 kg mass (4.3) applied vertically to the centre of the wheel fixing as shown in Figure 2 causes a deflection of 7,5 mm ± 0,75 mm when measured at the centre of the beam.

The adjusted Drop Height (ADH), the height that a mass must be dropped from to replicate free fall from 230mm as measured by time of 12.31 + 0,3 ms to pass through a distance of 25.4 mm prior to tire contact. Tests are to be conducted at adjusted drop height.

NOTE Annex A gives guidelines and practical examples to measure the time to pass through a distance.

6. Test procedure

6.1 Mount the test wheel (4.1) and tyre in the test machine (4.2) such that the impact loading is applied to the rim flange of the wheel. The wheel shall be mounted with its axis at an angle of 13° ± 1° to the vertical with its highest point presented to the striker.

The tyre mounted on the test wheel shall be specified by the vehicle manufacturer. If no tyre is specified, the tyre shall be the smallest nominal section width tubeless radial-ply tyre intended for use on that wheel. The inflation pressure shall be that specified by the vehicle manufacturer or, in the absence of such specification, it shall be 200 kPa.

The temperature of the test environment shall remain within the range 10 °C to 30 °C throughout the test period.

6.2 Ensure that the wheel is mounted on the hub fixture with dimensionally representative fixings such as would be used on a vehicle. Manually tighten the fixings to a value or by a method recommended by the vehicle or wheel manufacturer.

Because the design of wheel centre members can vary, test a sufficient number of locations on the wheel rim circumference to ensure that the integrity of the centre members is assessed. Use new wheels each time.

6.3 Ensure that the striker is over the tyre, and overlaps the rim flange by 25 mm ± 1 mm. Raise the striker to a height of 230 mm ± 2 mm above the highest part of the rim flange and allow it to fall. Tire section must not overlap the striker plate in both the radial and lateral direction.

7. Failure criteria

The wheel is considered to have failed the test if any of the following apply:

a) visible fracture(s) (not by dye penetrant) penetrating through a section of the centre member of the wheel assembly as shown in figure 3 – spoke and hub section;

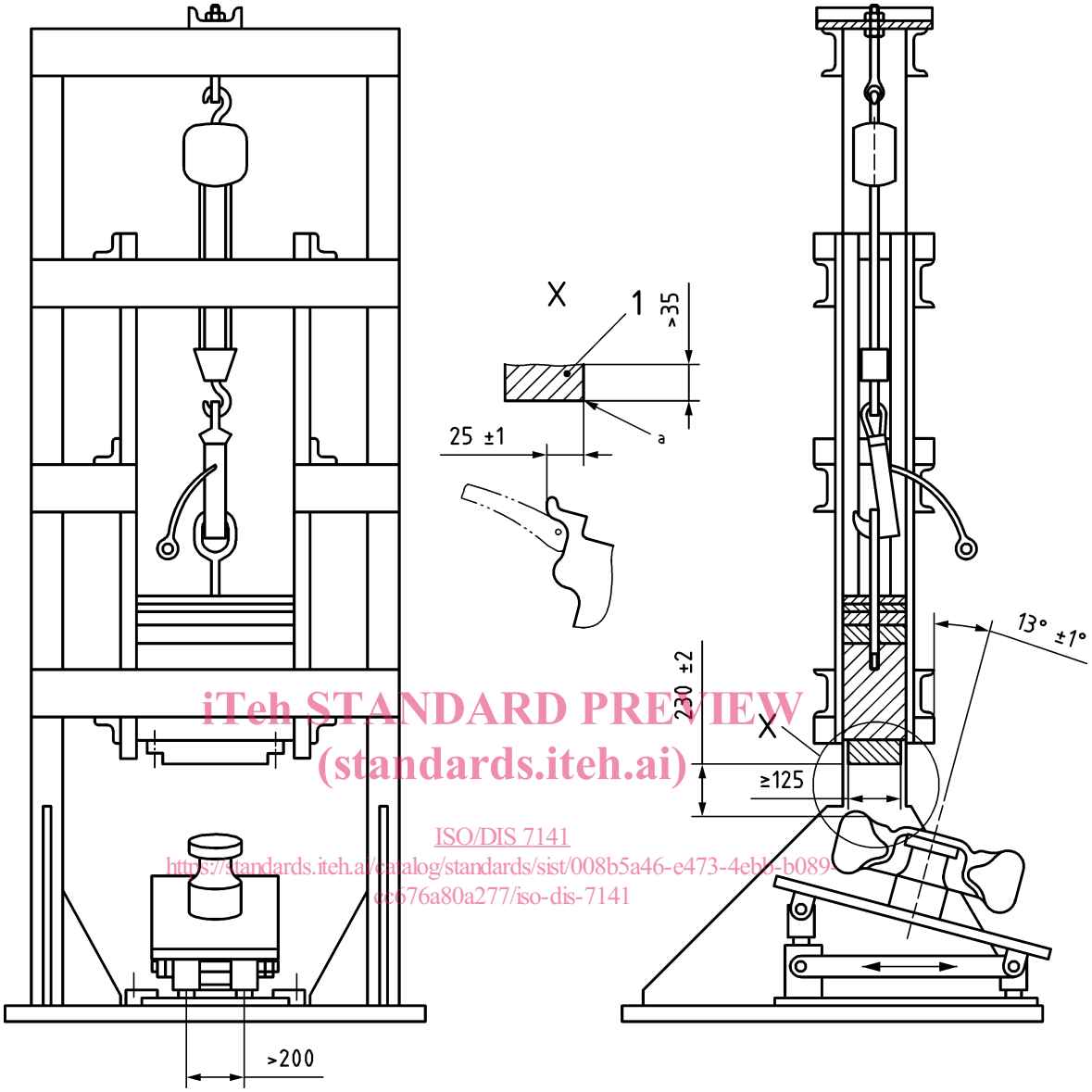
b) the centre member separates from the rim;

c) the tyre loses all air pressure within 1 min.

The wheel is not considered to have failed the test by deformation of the wheel assembly or by fractures in the area of the rim section struck by the face plate of the striker.

NOTE 1: Fractures in the area of the rim under the striker including separation of the flange as shown in figure 3 – outer rim horn does not constitute failure to meet the acceptance criteria.
NOTE 2: If it is suspected that one of the acceptance criteria is not met due to subsequent impacts caused by the mass rebounding or the mass resting on the tire, means should be employed to capture the mass after first impact. Only one impact is intended.
NOTE 3: Non-adhering material (for e.g. aero blades) or additional styling and aero elements will not be scored.

Dimensions in millimetres



Key

1 steel striker

a Sharp edge broken by radius (up to 1mm) or chamfer, 45° x 0,5 mm up to 1,0 mm

Figure 1 — Impact loading test machine