
**Machinery for forestry — Falling-object
protective structures (FOPS) —
Laboratory tests and performance
requirements**

*Matériel forestier — Structures de protection contre les chutes d'objets
(FOPS) — Essais de laboratoire et exigences de performance*

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Published in Switzerland

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 8083 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 15, *Machinery for forestry*.

This second edition cancels and replaces the first edition (ISO 8083:1989), which has been technically revised.

A new bolt and nut class as well as the –20 °C temperature class for Charpy V-notch impact strength have been added. The normative references have been updated and the model test report modified to be more complete from the point of test laboratory accreditation. In addition, the text has been editorially rearranged for clarity.

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Introduction

Special forestry machinery needs a falling-object protective structure (FOPS) standard of its own. It is recognized that there are various classes and sizes of forestry machinery that operate in a variety of environmental conditions as well as variations in log size the machines are capable of handling. Therefore, two alternative levels of acceptance criteria are given.

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Machinery for forestry — Falling-object protective structures (FOPS) — Laboratory tests and performance requirements

1 Scope

This International Standard establishes a consistent, reproducible means of evaluating characteristics of falling-object protective structures (FOPS) under loading, and prescribes performance requirements for a representative specimen under such loading. It is applicable to mobile or self-propelled, specially designed forestry machines as defined in ISO 6814.

NOTE Research work is being done to develop a test method and criteria for certain polycarbonate materials and constructions where the present requirement levels may not be adequate.

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 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*

ISO 898-1:1999, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs*

ISO 898-2:1992, *Mechanical properties of fasteners — Part 2: Nuts with specified proof load values — Coarse thread*

ISO 3164, *Earth-moving machinery — Laboratory evaluations of protective structures — Specifications for deflection-limiting volume*

ISO 3411, *Earth-moving machinery — Human physical dimensions of operators and minimum operator space envelope*

ISO 6814, *Machinery for forestry — Mobile and self-propelled machinery — Terms, definitions and classification*

ISO 8082, *Self-propelled machinery for forestry — Roll-over protective structures — Laboratory tests and performance requirements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

falling-object protective structure

FOPS

system of structural members arranged in such a way as to provide operators with reasonable protection from falling objects (e.g. trees, rocks)

3.2
deflection-limiting volume
DLV

orthogonal approximation of large, seated, male operator as defined in ISO 3411 wearing normal clothing and a protective helmet

3.3
roll-over protective structure
ROPS

system of structural members whose primary purpose is to reduce the possibility of a seat-belted operator being crushed should the machine roll over

NOTE These structural members include any subframe, bracket, mounting, socket, bolt, pin, suspension or flexible shock absorber used to secure the system to the machine frame, but exclude mounting provisions that are integral with the machine frame.

4 Laboratory tests

CAUTION — Some of the tests specified in this International Standard involve the use of processes which could lead to a hazardous situation.

4.1 Apparatus

4.1.1 Standard laboratory drop test object, made of steel, as shown in Figure 1.

4.1.2 Means of raising the standard laboratory drop object to the required height.

4.1.3 Means of releasing the standard drop test object so that it drops without restraint.

4.1.4 Hard surface, of such firmness that it is not penetrated by the vehicle or test bed under the loading of the drop test.

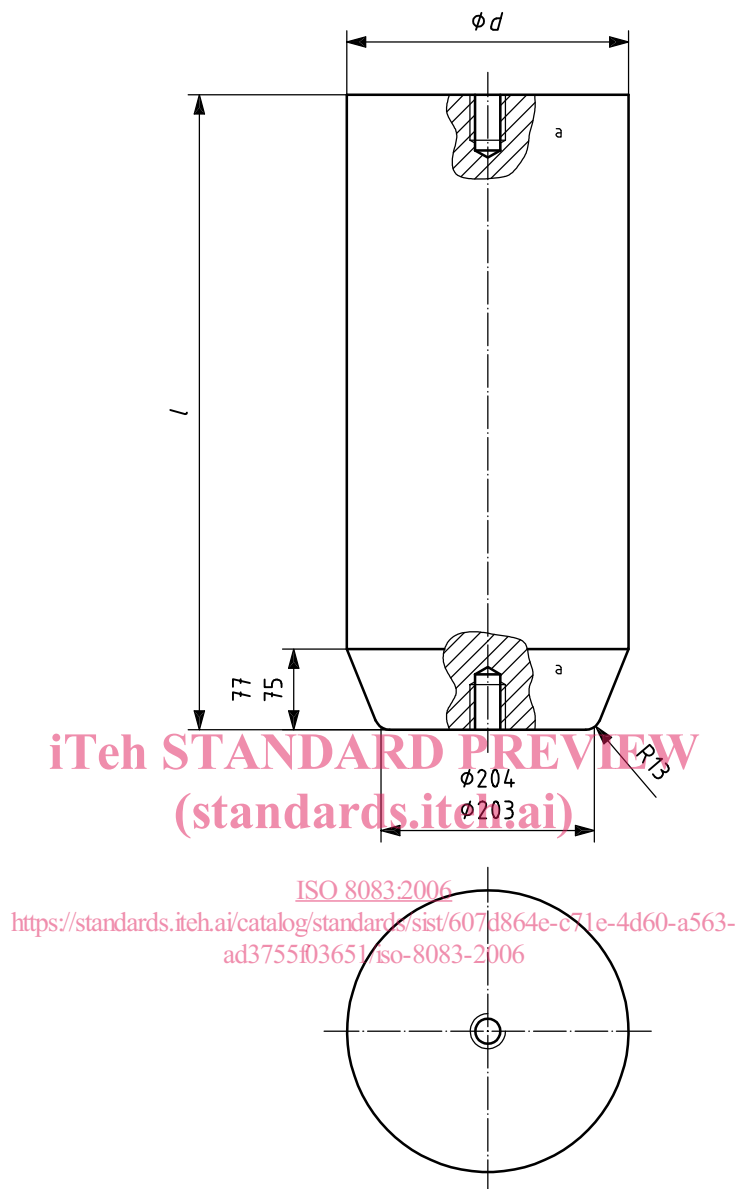
4.1.5 Measuring device, to determine whether the FOPS enters the deflection-limiting volume during the drop test.

4.2 Test conditions

4.2.1 DLV and its location

The DLV and its location shall be in accordance with ISO 3164. The DLV should be fixed firmly to the same part of the machine as that to which the operator's seat is secured, and should remain there during the entire formal test period.

Dimensions in millimetres



NOTE Dimensions d and l are optional, depending on the mass of the test object required to match the drop height that will provide the energy specified in 4.3.4. For example, for a drop test object mass of 227 kg:

- $d = 255$ to 260 mm;
- $l = 583$ to 585 mm.

^a May be drilled and tapped for a lifting eye.

Figure 1 — Standard laboratory drop test object