

Agricultural machinery — Rotary and flail mowers — Thrown-object test and acceptance criteria

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National foreword

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Summary of pages

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Agricultural machinery — Rotary and flail mowers — Thrown-object test and acceptance criteria

*Matériel agricole — Faucheuses rotatives et faucheuses-broyeuses —
Essai de projection d'objets et critères d'acceptation*



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Foreword

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ISO 17101 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 7, *Equipment for harvesting and conservation*.

Agricultural machinery — Rotary and flail mowers — Thrown-object test and acceptance criteria

1 Scope

This International Standard gives specifications and acceptance criteria for the thrown-object testing of rotary and flail mowers used in agriculture. Examples of machines are shown in Annex A. It is not applicable to

- mowers with an articulated arm,
- mowers with one or more vertical axis designed for mulching,
- pedestrian-controlled motor mowers,
- lawn mowers or machines designed as lawn mowers,
- inter-row mowing units,
- machines designed for highway and road maintenance only.

NOTE If a machine is also designed for use outside agriculture, other thrown-object tests may apply.

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 536, *Paper and board — Determination of grammage*

ISO 789-1, *Agricultural tractors — Test procedures — Part 1: Power tests for power take-off*

ISO 1974, *Paper — Determination of tearing resistance (Elmendorf method)*

ISO 2758, *Paper — Determination of bursting strength*

3 Terms and definitions

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

3.1

rotary mower

mower in which one or more functional components cut or shear by impact without mulching and rotate about a vertical axis

3.2

flail mower

mower with a multiplicity of free-swinging cutting elements that rotate about a horizontal axis, which cuts the grass by impact and mulches it with the same tools

3.3

conditioning device

mechanical device allowing the acceleration of the crop-drying process (e.g. crushing, impact, abrasion, lamination)

3.4

swath board

adjustable device for controlling the swath width

3.5

kraft paper

paper produced from pure unbleached sulfate kraft pulp with machine-finished surface

NOTE 1 It is mainly used for the manufacture of paper sacks and for lining and laminating.

NOTE 2 See 4.2.1 for details of specifications.

3.6

impact

hole in kraft paper caused by a stone passing completely through the kraft paper or tear with a deformation of the paper towards the exterior

4 Thrown-object test

4.1 Testing conditions

4.1.1 General

Tests shall be performed on horizontal hard ground.

EXAMPLE Concrete, asphalt.

Tests shall be performed using the same mower, or mower with conditioning device, and the same protective devices. If the mower can be fitted with a removable conditioning device, the test shall be performed both with and without the conditioning device. If the mower can be operated in different working positions (right side, centre or left side of the tractor, see 4.2.7), the test shall be performed with the mower in the rightmost and leftmost working positions behind the tractor, as given by the manufacturer in the instruction handbook.

Adjustable devices (e.g. swath board) which could influence the efficiency of the protective device in preventing projections shall be located in the least favourable position.

During tests, the mower shall be moved so that the tools run through the test material with a forward speed of from 2 km/h to 4 km/h.

4.1.2 Mounted, semi-mounted or trailed mowers

During tests, the mowers shall be driven at the speed recommended by the manufacturer, e.g. at power take-off (PTO) speed of 540 min^{-1} or $1\,000 \text{ min}^{-1}$, by a tractor with minimum power at least equal to the minimum (PTO) needed for the mower measured according to ISO 789-1.

4.2 Target

4.2.1 General

A target is used to record the impact of stones projected from the protected zone of the mower.

The target consists of several panels on which kraft paper is stretched such that it extends below in the lower zone (see 4.4.1) for a minimum of 50 mm. The kraft paper grammage shall be $120 \text{ g/m}^2 \pm 10 \text{ g/m}^2$, determined in accordance with ISO 536. The bursting strength shall be 500 kPa minimum, determined by using the method specified in ISO 2758. The tearing resistance shall be 1 200 mN minimum, in the machine direction, determined in accordance with the test method specified in ISO 1974. There shall be no reinforcing slat within 20 mm of the

kraft paper. There shall be no overlapping of kraft paper, and, in order to have no overlaps, the kraft paper should be stretched from the roll in the horizontal direction on the frames.

Panels 1 to 4 shall be made of a rigid frame, 2 000 mm in height (see Figures 2 to 6).

4.2.2 Panels in the operator's zone for mowers attached at the rear three-point tractor linkage

Panels 5, 7a and 7b act as a target in the operator's zone (see Figure 1); they shall be made of a rigid frame and shall comply with the specifications given in Table 1.

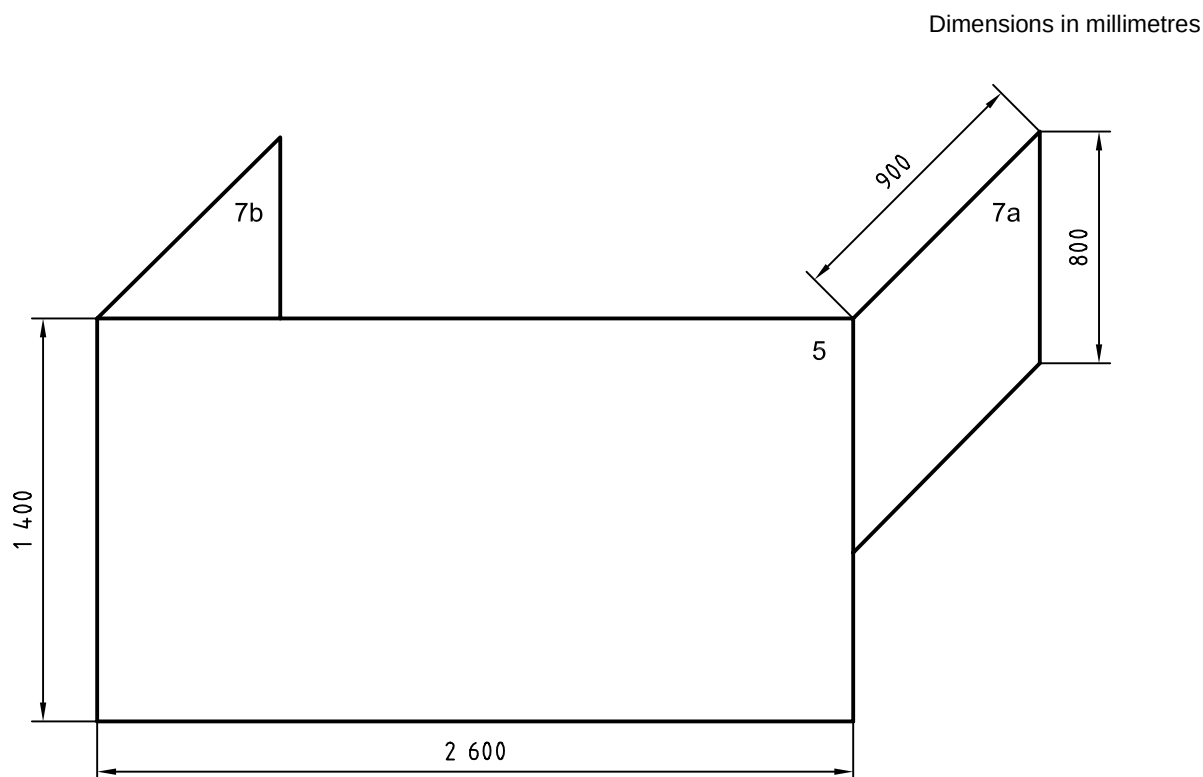


Figure 1

Table 1 — Panels 5, 7a and 7b

Dimensions in millimetres

Panel	Dimensions	Height above ground of lower edge
5	height: 1 400 width: 2 600	900
7a and 7b	height: 800 width: 900	1 500

At the rear angle of Panels 7a and 7b, there may be a slat, in contact with paper and with a maximum thickness of 3 mm.

Panel 5 connects Panels 7a and 7b and shall be perpendicular to them. Panels 7a and 7b shall be parallel to the longitudinal axis of the tractor.

Panel 5 shall be located at a horizontal distance of 800 mm in front of the axis of the lower hitch points of the mower. In order to comply with the required dimensions, it may be necessary to use an intermediate frame on