
**Equipment for harvesting — Combine
harvesters — Determination and
designation of grain tank capacity and
unloading device performance**

*Matériel de récolte — Moissonneuses-batteuses — Détermination et
désignation de la capacité et des performances du dispositif de
déchargement des trémies à grain*

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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 3.

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.

International Standard ISO 5687 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 7, *Equipment for harvesting and conservation*.

This second edition cancels and replaces the first edition (ISO 5687:1981), which has been technically revised.

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Equipment for harvesting — Combine harvesters — Determination and designation of grain tank capacity and unloading device performance

1 Scope

This International Standard specifies a method for determining and designating the capacity and unloading rate of combine harvester grain tanks and unloading systems.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 712:1998, *Cereal and cereal products — Determination of moisture content — Routine reference method*.
[ISO 5687:1999](#)

ISO 7970:—¹⁾, *Wheat (Triticum aestivum L.) — Specification*.
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ISO 7971-2:1995, *Cereals — Determination of bulk density, called “mass per hectolitre” — Part 2: Routine method*.

3 Test method

3.1 Test preparations

3.1.1 During the test the combine harvester shall be stationary, placed horizontally on a level surface and running at rated speeds. The unloading device shall be engaged at rated speed with the feed table and threshing mechanisms previously engaged.

3.1.2 The wheat used for testing shall have a moisture content not exceeding 20 % measured in accordance with ISO 712, and a maximum impurity level of 3 %, measured in accordance with ISO 7970. A sample of the test wheat shall be taken and the wet basis moisture content, in percent, and the impurity content, in percent by mass, shall be determined and recorded. Also determine the mass per litre of the test wheat measured in accordance with ISO 7971-2.

3.1.3 To ensure that the grain tank and unloading system are effectively empty before starting the rating tests, operate the grain unloading mechanism until the main unloading stream of grain has stopped and then continue to run the unloading system for at least one more minute before stopping.

¹⁾ To be published. (Revision of ISO 7970:1989)

3.2 Test procedure

3.2.1 Fill the grain tank with the test wheat by means of its own loading system up to, but not beyond, the point of spillage.

3.2.2 Commence unloading the test wheat from the combine harvester grain tank using the combine's unloading system operating at its rated speed into a suitable collection area for weighing the wheat, at the same time noting the starting time. The starting time is the moment when the unloading switch or lever is activated by the operator. Five seconds after the start of full flow from the unloading auger divert the wheat into a second suitable collection area. After a further 30 s divert the remaining wheat being unloaded into the first collection area until the flow of wheat stops when the grain tank is considered to be effectively empty. A single collection area combined with equipment to provide a continuous plot of time versus weight may be used in place of two collection areas. Note the time.

3.2.3 Weigh and note the mass of test wheat collected in the first and second collection areas.

4 Test results

4.1 The designation of grain tank capacity, in litres, shall be calculated by dividing the total mass of wheat collected in both collection areas by the mass per litre of the test wheat used.

4.2 The maximum grain tank unloading rate, in litres per second, shall be calculated from the mass of wheat collected in the second collection area divided by the wheat mass per litre and by 30 s.

4.3 The grain tank unloading time shall be given as the time, in seconds, determined in accordance with 3.2.2, required to unload the designated grain tank capacity as determined in 4.1.

4.4 The average grain tank unloading rate, in litres per second, shall be calculated by dividing the grain tank capacity as determined in 4.1 by the total grain unloading time determined in 3.2.2.

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5 Information to be reported

The following information shall be reported:

- a) machine description and model number;
- b) machine identification number;
- c) grain tank capacity, in litres;
- d) average/maximum grain tank unloading rates, in litres per second;
- e) moisture content of the test grain, in percent by mass;
- f) grain tank unloading time, in minutes and seconds;
- g) tester;
- h) testing place.

6 Grain tank capacity designation

The grain tank capacity designation of a combine harvester shall be the number of litres of wheat, rounded upwards to the nearest 100 l, that are unloaded according to the method specified in clause 3.

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