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Wheat (*Triticum aestivum* L.) — Specification

Blé tendre (Triticum aestivum L.) — Spécifications

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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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 7970 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Subcommittee SC 4, *Cereals and pulses*.

This second edition cancels and replaces the first edition (ISO 7970:1989), which has been technically revised.

Annexes B and C form a normative part of this International Standard. Annex A is for information only.

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Wheat (*Triticum aestivum* L.) — Specification

1 Scope

This International Standard lays down minimum specifications for wheat (*Triticum aestivum* L.) intended for human consumption and which is the subject of international trade.

It also gives an indicative list of harmful and toxic seeds (annex A), a list of unacceptable mite and insect pests of stored cereals (annex B) and a method for the determination of impurities (annex C).

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, *Cereals and cereal products — Determination of moisture content (Routine reference method)*.

[ISO 7970:2000](#)

ISO 3093, *Cereals — Determination of falling number*.

[http://www.iso.org/iso/standards/sist/4caaa18a-a1be-4d13-ac15-1e143e3eff6c/iso-7970-2000](#)

ISO 5223, *Test sieves for cereals*.

ISO 6639-3, *Cereals and pulses — Determination of hidden insect infestation — Part 3: Reference method*.

ISO 6639-4, *Cereals and pulses — Determination of hidden insect infestation — Part 4: Rapid methods*.

ISO 7971, *Cereals — Determination of bulk density, called "mass per hectolitre" (Reference method)*.

ISO 7971-2, *Cereals — Determination of bulk density called "mass per hectolitre" — Part 2: Routine method*.

ISO 13690, *Cereals, pulses and milled products — Sampling of static batches*.

3 Terms and definitions

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

3.1

impurities

damaged wheat grains and all organic and inorganic materials other than wheat grains

NOTE The impurities comprise four main categories as follows: damaged wheat grains (3.2), other cereals (3.3), extraneous matter (3.4), and harmful and/or toxic seeds, bunted grains and ergot (3.5). (See also Table C.1.)

3.2 Damaged wheat grains

3.2.1

broken grains

grains of wheat in which part of the endosperm is exposed

NOTE This includes wheat without germ.

3.2.2

shrivelled grains

whole grains, whatever their condition, which pass through a sieve with long rounded apertures 1,70 mm wide

3.2.3 Unsound grains

3.2.3.1

mouldy grains

grains which have moulds visible to the naked eye on one-third of the surface and/or in the kernel

3.2.3.2

heat-damaged grains

grains which have a chestnut to black coloration resulting from an abnormal increase in the temperature of the grain during storage and/or drying

3.2.4

grains attacked by pests

grains which show damage visible to the naked eye, owing to attack by rodents, insects, mites or other pests

3.2.5

sprouted grains

grains which have started to sprout

NOTE

Sprouted grains are not taken into account as such, but according to the α -amylase activity which results from their presence and which is expressed as the Falling Number (see 4.3.4).

3.3

other cereals

cereal grains belonging to species other than *Triticum aestivum* L.

3.4

extraneous matter

after removal of ergot, this category includes:

- all the components of the sample, with the exception of grains of other cereals (3.3), grains of wheat, harmful and/or toxic seeds (3.5.1) and bunted grains (3.5.2), which are retained by a sieve with long rounded apertures 3,55 mm wide, and all the components which pass through a sieve with long rounded apertures 1,00 mm wide (by convention, the latter are considered to be inorganic);
- all the organic components other than grains of wheat, other cereals (3.3), harmful and/or toxic seeds (3.5.1), bunted grains (3.5.2), foreign seeds, fragments of straw, dead insects and fragments of insects, etc., and inorganic components such as stone and sand, which pass through a sieve with long rounded apertures 3,55 mm wide and which are retained by a sieve with long rounded apertures 1,00 mm wide

3.5 Harmful and/or toxic seeds, bunted grains and ergot

3.5.1

harmful and/or toxic seeds

seeds which if present in quantities above a certain limit may have a damaging or dangerous effect on health, organoleptic properties or technological performance

NOTE An indicative list of these seeds is given in annex A.

3.5.2**bunted grains**

grains filled with a fetid-smelling dust comprising the spores of bunts, i.e. *Tilletia caries* (DC.) Tul. syn. *Tilletia tritici* (Bjerk.) R. Wolff, *Tilletia controversa* Kühn, syn. *Tilletia brevifaciens* C.W. Fischer, *Tilletia foetida* (Wallr.) Liro, syn. *Tilletia laevis* Kühn, *Tilletia indica* Mitra

3.5.3**ergot**

sclerotium of the fungus *Claviceps purpurea*

4 Requirements**4.1 General characteristics and organoleptic properties**

Wheat grains shall be sound, clean and have no foreign odours or odours denoting any deterioration.

4.2 Health characteristics

4.2.1 Wheat grains shall not contain additives, toxic substances, pesticides residues or other contaminants which can affect human health. The maximum levels authorized are laid down by the joint FAO/WHO Codex Alimentarius Commission.

4.2.2 Wheat shall be free from the living insects listed in annex B, when determined according to part 3 or 4 of ISO 6639, and of mites when determined by the sieving method.

4.3 Physical and chemical characteristics**4.3.1 Moisture content**

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The moisture content of wheat, determined in accordance with ISO 712, shall not be greater than 15,5 % (mass fraction).

NOTE Lower moisture contents are required for certain destinations, in relation to the climate, and duration of transport and storage. For further information, see ISO 6322, parts 1, 2 and 3.

4.3.2 Bulk density

The bulk density, called "mass per hectolitre", of wheat shall be determined using instruments calibrated according to the reference method given in ISO 7971 or, by default, according to the routine method given in ISO 7971-2, and shall not be less than 70 kg/hl.

4.3.3 Impurities

The maximum impurities content, determined using the method described in annex C, shall not exceed the value given in Table 1.

The maximum content of damaged wheat grains (broken grains, shrivelled grains, unsound grains, grains attacked by pests) and other cereals, determined in accordance with the method described in annex C, shall not exceed 15 % (mass fraction) in total.

Table 1 — Maximum levels of impurities

Impurities	Definition given in	Maximum permissible level % (mass fraction)
Broken grains	3.2.1	7 ^a
Shrivelled grains	3.2.2	8 ^a
Unsound grains	3.2.3	1 ^a
Grains attacked by pests	3.2.4	2 ^a
Other cereals	3.3	3 ^a
Extraneous matter	3.4	2
Inorganic material	3.4	0,5
Harmful and/or toxic seeds, bunted grains and ergot	3.5	0,5
Each of any toxic seeds	3.5	0,05
Ergot	3.5.3	0,05

^a The maximum content of broken grains, shrivelled grains, unsound grains, grains attacked by pests and other cereals shall not exceed 15 % (mass fraction) in total.

4.3.4 α -Amylase activity

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The α -amylase activity (see 3.2.5), determined in accordance with ISO 3093, and expressed as the Falling Number, shall be not less than 160.

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5 Sampling

Sampling shall be carried out in accordance with ISO 13690.

6 Test methods

The tests shall be carried out using the methods specified in 4.3 and annex C.

Annex A (informative)

Indicative list of harmful and toxic seeds

WARNING — This is a non-exhaustive list which could be completed if the necessity arose.

A.1 Toxic seeds

Botanical name	Common name
<i>Acroptilon repens</i> (L.) DC.	
<i>Agrostemma githago</i> L.	Corn-cockle
<i>Coronilla varia</i> L.	Coronilla, Crown vetch
<i>Crotalaria</i> spp.	Crotalaria
<i>Datura fastuosa</i> L.	
<i>Datura stramonium</i> L.	Stramony, thorn apple
<i>Heliotropium lasiocarpum</i> Fisher et C.A. Meyer	Heliotrope
<i>Lolium temulentum</i> L.	Darnel
<i>Ricinus communis</i> L.	Castor-oil plant
<i>Sophora alopecuroides</i> L.	Stagger bush, Russian centaury
<i>Sophora pachycarpa</i> Schrank ex C.A. Meyer	
<i>Thermopsis montana</i>	Buffalo pen
<i>Thermopsis lanceolata</i> R. Br. in Aiton	
<i>Trichoderma incanum</i>	

A.2 Harmful seeds

Botanical name	Common name
<i>Allium sativum</i> L.	Garlic
<i>Cephalaria syriaca</i> (L.) Roemer et Shultes	Teasel
<i>Melampyrum arvense</i> L.	Cow-cockle
<i>Melilotus</i> spp.	Melilot
<i>Sorghum halepense</i> (L.) Pers.	Johnson grass
<i>Trogonella foenum-graecum</i> L.	Fenugreek