
**Wheat (*Triticum aestivum* L.) —
Specification**

Blé tendre (Triticum aestivum L.) — Spécifications

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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

This third edition cancels and replaces the second edition (ISO 7970:2000), which has been technically revised.

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Wheat (*Triticum aestivum* L.) — Specification

1 Scope

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

2 Normative references

The following normative documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of referenced document (including any amendments) applies.

ISO 712, *Cereals and cereal products — Determination of moisture content — Reference method*

ISO 3093, *Wheat, rye and their flours, durum wheat and durum wheat semolina — Determination of the falling number according to Hagberg-Perten*

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 7971-1, *Cereals — Determination of bulk density, called mass per hectolitre — Part 1: Reference method*

ISO 7971-3, *Cereals — Determination of bulk density, called mass per hectolitre — Part 3: Routine method*

ISO 24333, *Cereals and cereal products — Sampling*
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3 Terms and definitions

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

3.1

impurities

all the elements which are conventionally considered as undesirable in a sample or batch of cereals

[ISO 5527:1995^[5], 1.4]

NOTE In wheat, impurities comprise four main categories: damaged wheat grains (3.1.1), other cereals (3.1.2), extraneous matter (3.1.3), and harmful and/or toxic matter (3.1.4). (See also Table C.1.)

3.1.1

damaged wheat grains

all the matter of a sample of grain other than the basic cereal which comprises the following fractions: broken grains, wheat of decreased value, grains attacked by pests, unsound grains and sprouted grains

3.1.1.1

broken grains

grains in which part of the endosperm is exposed, or grains without germ

[ISO 5527:1995^[5], 1.4.9]

3.1.1.2

wheat of decreased value

grains, not fully developed or with discoloration in germ and its surrounding area, which are less valuable in end-use performance due to external factors

3.1.1.2.1

shrivelled grains

shrunken grains

grains which are poorly filled, light and thin, whose build-up of reserves has been halted due to physiological or pathological factors

[ISO 5527:1995^[5], 1.4.7]

3.1.1.2.2

immature grains

grains which are unripe and/or badly developed

3.1.1.2.3

black point grains

grains have a distinct dark brown or black discoloration of the whole germ and surrounding area

3.1.1.3

grains attacked by pests

grains which show damage owing to attack by rodents, insects, mites or other pests

NOTE Adapted from ISO 11051:1994^[6], 3.2.4.

3.1.1.4

unsound grains

grains with certain degree of discoloration on surface of the kernel which may be caused by microorganisms or abnormal heating

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3.1.1.4.1

mouldy grains

grains which have moulds visible to the naked eye on 50 % of the surface and/or in the kernel

[ISO 11051:1994^[6], 3.2.3.1] <https://standards.iteh.ai/catalog/standards/sist/eb4143d8-ee4e-45e9-bf06-ad72d2c1d7a1/iso-7970-2011>

3.1.1.4.2

heat-damaged grains

grain whose external appearance has been changed or which have undergone modifications of functional properties due to spontaneous heating or drying at an excessively high temperature

[ISO 5527:1995^[5], 1.4.10]

3.1.1.5

sprouted grains

grains in which the radicle or plumule is clearly visible to the naked eye

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).

3.1.2

other cereals

grains belonging to cereal species other than the main cereal in the sample or batch under consideration

[ISO 5527:1995^[5], 1.4.1]

NOTE For the purposes of this International Standard, the "main cereal" is wheat (*Triticum aestivum* L.)

3.1.3

extraneous matter

fraction consisting of inorganic extraneous matter and organic extraneous matter

3.1.3.1**inorganic extraneous matter**

stones, glass, pieces of soil and other mineral matter from the fraction retained by a sieve with long rounded apertures 3,55 mm wide and from the fraction retained by a sieve with long rounded apertures 1,00 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)

3.1.3.2**organic extraneous matter**

any animal or plant matter other than grains of wheat, damaged wheat grains (3.1.1), other grains (3.1.2), inorganic extraneous matter (3.1.3.1) and harmful and/or toxic matter (3.1.4)

3.1.4**harmful matter****toxic matter**

any substances in wheat bulk that can have a damaging or dangerous effect on health

3.1.4.1**harmful seeds**

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

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

3.1.4.2**bunted grains**

fungal structures which approximate the shape of normal grain, filled with fetid-smelling spores of the bunts *Tilletia caries*, *Tilletia controversa*, *Tilletia foetida*, *Tilletia intermedia*, *Tilletia triticooides*, *Neovossia indica*

NOTE Adapted from ISO 5527:1995^[5], 1.4.12.

3.1.4.3**Fusarium damaged grains**

grains typically characterized by thin or shrunken chalk-like kernels caused by *Fusarium* head blight

3.1.4.4**rotten grains**

grains which are discolored, swollen and soft as a result of decomposition by fungi or bacteria

3.1.4.5**ergot**

sclerotium of the fungus *Claviceps purpurea*

[ISO 11051:1994^[6], 3.7]

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

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

4.2 Health characteristics

4.2.1 Wheat grains shall not contain added compounds, heavy metals, mycotoxins, pesticides residues or other contaminants which can affect human health. The maximum levels authorized are laid down by national regulation, or the joint FAO/WHO Codex Alimentarius Commission (see References [7] to [14]).

4.2.2 Wheat shall be free from the living insects listed in Annex B, when determined in accordance with ISO 6639-3 or ISO 6639-4, and of mites when determined by the sieving method.

4.3 Physical and chemical characteristics

4.3.1 Moisture content

The moisture content of wheat, determined in accordance with ISO 712, shall not be greater than 14,5 % mass fraction.

NOTE It is possible that different water contents are required for certain destinations, in relation to the climate, and duration of transport and storage. For further information, see ISO 6322^[3].

4.3.2 Bulk density

The bulk density, called mass per hectolitre, of wheat shall be determined using instruments calibrated in accordance with the reference method specified in ISO 7971-1 or, by default, in accordance with the routine method specified in ISO 7971-3. It shall not be less than 70 kg/hl.

4.3.3 Impurities

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

The maximum content of damaged wheat grains (broken grains, wheat of decreased value, 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.

4.3.4 α -Amylase activity

The α -amylase activity (see 3.1.1.5), determined in accordance with ISO 3093, and expressed as the falling number, shall be not less than 180 s.

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5 Sampling

Sampling shall be carried out in accordance with ISO 24333.

6 Test methods

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

Table 1 — Maximum levels of impurities

Impurities	Definition	Maximum permissible level % mass fraction
Broken grains	3.1.1.1	7 ^a
Wheat of decreased value	3.1.1.2	12 ^{ab}
Grains attacked by pests	3.1.1.3	2 ^a
Unsound grains	3.1.1.4	1 ^a
Other cereals	3.1.2	3 ^a
Extraneous matter	3.1.3	2
Inorganic extraneous matter	3.1.3.1	0,5
Harmful and/or toxic matter	3.1.4	0,5
Each of any toxic matter	3.1.4.1 to 3.1.4.5	0,05

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

^b For soft wheat, the colored grains of germ are accounted above 8 % mass fraction.

Annex A (informative)

Indicative list of harmful and toxic seeds

WARNING — This is a non-exhaustive list which can be augmented as necessary.

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