FINAL
DRAFT

INTERNATIONAL
STANDARD

**ISO/FDIS
7970**

ISO/TC **34**/SC **4**

Secretariat: SAC

Voting begins on:
2020-09-23

Voting terminates on:
2020-11-18

Wheat (*Triticum aestivum* L.) — Specification

*Blé tendre (*Triticum aestivum *L.) — Spécification*

Reference number
ISO/FDIS 7970:2020(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

This fourth edition cancels and replaces the third edition (ISO 7970:2011), which has been technically revised. The main changes compared with the previous edition are as follows:

— a precision of impurities determination has been added in Annex C.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Wheat (*Triticum aestivum* L.) — Specification

1 Scope

This document establishes minimum specifications for wheat (*Triticum aestivum* L.) grains intended for human consumption and which are the subject of international trade. It is also applicable to local wheat trade.

NOTE Wheat (*Triticum aestivum* L.) is also called “common wheat” in some regions.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 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*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
impurity
element that is conventionally considered as undesirable in a sample or batch of cereals

Note 1 to entry: In wheat, impurities comprise four main categories: *damaged wheat grains* (3.2), *other cereals* (3.13), *extraneous matter* (3.14), and *harmful and/or toxic matter* (3.17). See also Table C.1.

3.2
damaged wheat grain
grain of the main cereal that comprises the following fractions: *broken grain* (3.3), *wheat of decreased value* (3.4), *grain attacked by pests* (3.8), *unsound grain* (3.9) and *sprouted grain* (3.12) (not to count)

Note 1 to entry: See Table C.1.

3.3
broken grain
grain in which part of the endosperm is exposed or grain without germ

[SOURCE: ISO 5527:2015, 2.1.46.4]

3.4
wheat of decreased value
grain, not fully developed or with discoloration in germ and its surrounding area, that is less valuable in end-use performance due to external factors

3.5
shrivelled grain
shrunken grain
grain that is poorly filled, light and thin, and in which the build-up of reserves has been halted due to physiological or pathological factors

[SOURCE: ISO 5527:2015, 2.1.31]

3.6
immature grain
grain that is unripe and/or badly developed

3.7
black point grain
grain that has a distinct dark brown or black discoloration of the whole germ and surrounding area

3.8
grain attacked by pests
grain that shows damage owing to an attack by rodents, insects, mites or other pests

[SOURCE: ISO 11051:1994, 3.2.4, modified — "visible damage" has been changed to simply "damage".]

3.9
unsound grain
grain with a certain degree of discoloration on the surface of the kernel that could have been caused by microorganisms or abnormal heating

3.10
mouldy grain
grain that has mould visible to the naked eye on 50 % of the surface and/or in the kernel

[SOURCE: ISO 11051:1994, 3.2.3.1]

3.11
heat-damaged grain
grain with a chestnut to black colouration, resulting from the effect of too extreme heat, and of which a section of the endosperm is yellowish-grey or brownish black

[SOURCE: ISO 5527:2015, 2.1.17]

3.12
sprouted grain
grain in which the radicle or plumule is clearly visible to the naked eye and where changes make it easy to distinguish the sprouted grain from the normal grain

Note 1 to entry: Sprouted grains are reflected by the α-amylase activity and expressed as the falling number (see 4.3.4), therefore, they are not counted as *damaged wheat grains* (3.2).

3.13
other cereals
grains belonging to cereal species other than the main cereal in the sample or batch under consideration

Note 1 to entry: For the purposes of this document, the "main cereal" is wheat (*Triticum aestivum* L.).

3.14
extraneous matter
fraction consisting of *inorganic extraneous matter* (3.15) and *organic extraneous matter* (3.16)

3.15
inorganic extraneous matter
stones, glass, pieces of soil and other mineral matter

Note 1 to entry: All the components which pass through a sieve with long rounded apertures 1,00 mm wide (see ISO 5223[1]) are considered to be inorganic matter.

3.16
organic extraneous matter
animal or plant matter other than grains of wheat, *damaged wheat grains* (3.2), *other cereals* (3.13), *inorganic extraneous matter* (3.15) and *harmful and/or toxic matter* (3.17)

3.17
harmful and/or toxic matter
substances in wheat bulk that can have a damaging or dangerous effect on health

3.18
harmful and/or toxic seed
seed that, if present in quantities above a certain limit, can have a damaging or dangerous effect on health, sensory properties or technological performance

Note 1 to entry: An indicative list of these seeds is given in Annex A.

3.19
bunted grain
grain filled with a fetid smelling dust comprising the spores of bunts

Note 1 to entry: Adapted from ISO 5527:2015, 2.1.4.

3.20
***Fusarium*-contaminated grain**
grain typically characterized by thin or shrunken chalk-like kernels caused by *Fusarium* head blight

3.21
rotten grain
grain that is discoloured, swollen and soft as a result of decomposition by fungi or bacteria

3.22
ergot
sclerotium of the fungus *Claviceps purpurea*

[SOURCE: ISO 11051:1994, 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 that can affect human health. The maximum levels authorized are laid down by national regulations, or the joint FAO/WHO Codex Alimentarius Commission (see References [7] and [8]).

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 6322-1.

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.

Table 1 — Maximum levels of impurities

Impurities	Maximum permissible level % mass fraction
Broken grains	7,0[a]
Wheat of decreased value	12,0[a b]
Grains attacked by pests	2,0[a]
Unsound grains	1,0[a]
Other cereals	3,0[a]
Extraneous matter	2.0
Inorganic extraneous matter	0,5
Harmful and/or toxic matter	0,5
Each of any toxic seeds	0,05
Ergot	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 15,0 % mass fraction in total.

[b] Black point grains benefit from a tolerance of 8 % and are accounted only for the fraction above 8 %. Examples include: 5 % of black point grains are considered as 0 %, 8 % of black point grains are considered as 0 %, 10 % of black point grains are considered as 2 %.

4.3.4 α-Amylase activity

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

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.

Annex A
(informative)

Indicative list of harmful and toxic seeds

WARNING — This is a non-exhaustive list that can be added to as necessary.

Table A.1 — Toxic seeds

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

Table A.2 — Harmful seeds

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