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Durum wheat (*Triticum durum* Desf.) — Specification

Blé dur (Triticum durum Desf.) — Spécifications



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Foreword

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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 11051 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Subcommittee SC 4, *Cereals and pulses*.

Annexes A, B and C form an integral part of this International Standard. Annexes D and E are for information only.

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Durum wheat (*Triticum durum* Desf.) — Specification

1 Scope

This International Standard lays down minimum specifications for durum wheat (*Triticum durum* Desf.) intended for human consumption and forming the subject of international trade.

It also gives methods for the determination of the level of impurities (annex A) and the proportion of non-wholly-vitreous grains (annex B). Annex C gives a list of typical insect pests of stored cereals. Annex D gives an informative list of harmful and toxic seeds.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 712:1985, *Cereals and cereal products — Determination of moisture content (Routine reference method)*.

ISO 950:1979, *Cereals — Sampling (as grain)*.

ISO 3093:1982, *Cereals — Determination of falling number*.

ISO 5223:1983, *Test sieves for cereals*.

ISO 7971:1986, *Cereals — Determination of bulk density, called "mass per hectolitre" (Reference method)*.

3 Definitions

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

3.1 impurities: Damaged wheat grains and all organic and inorganic materials other than durum wheat grains.

NOTE 1 The impurities comprise four main categories, as follows: damaged durum wheat grains (3.2), other cereals (3.3), extraneous matter (3.4), and harmful and/or toxic seeds (3.5), bunted grains (3.6) and ergot (3.7). (See also table A.1.)

3.2 damaged durum wheat grains

3.2.1 broken grains: All grains of durum wheat in which part of the endosperm is exposed, or wheat without germ.

3.2.2 shrivelled grains: Shrivelled (shrunken), light, thin whole grains, in which accumulation of nutritive elements is finished owing to physiological and pathological influences, and which pass through a sieve with long rounded apertures 1,90 mm wide.

3.2.3 unsound grains

3.2.3.1 mouldy grains: Grains which have moulds visible to the naked eye on 50 % of the surface and/or in the kernel.

3.2.3.2 heat-damaged grains: Grains which have a chestnut to black coloration, and of which a section of the endosperm has a coloration which is between yellowish-grey and brownish-black, resulting from the effect of heat.

3.2.4 grains attacked by pests: Grains which show visible damage owing to attack by rodents, insects, mites or other pests.

3.2.5 sick wheat: Grains which show, at places other than on the germ itself, colorations between brown and brownish-black.

3.2.6 fusaria-contaminated grains: Grains of which the pericarp is contaminated by mycelia of *Fusarium* spp. These grains have a slightly scalded, shrivelled appearance and show diffuse spots, with badly delimited contours, of pink or white coloration.

3.2.7 non-wholly-vitreous grains: Grains which are partially vitreous.

3.3 other cereals: Cereal grains belonging to species other than *Triticum durum* Desf.

3.4 extraneous matter

(1) All the components of the sample (after the removal of ergot), with the exception of grains of other cereals (3.3), grains of durum wheat, harmful and/or toxic seeds (3.5) and bunted grains (3.6), which are retained by a sieve with long rounded apertures 3,55 mm × 20,0 mm, and all the components which pass through a sieve with long rounded apertures 1,00 mm × 20,0 mm.

NOTE 2 By convention, the latter should be considered as inorganic material.

(2) All organic components (after the removal of ergot) other than grains of durum wheat, other cereals, harmful and/or toxic seeds (3.5) and bunted grains (3.6) (i.e. foreign seeds, fragments of straw, dead insects and fragments of insects, etc.) and inorganic components (i.e. stone, sand, etc.) which pass through a sieve with long rounded apertures 3,55 mm × 20,0 mm and which are retained by a sieve with long rounded apertures 1,00 mm × 20,0 mm.

3.5 harmful and/or toxic seeds: Seeds which if present in quantities above a certain limit may have a toxic, harmful, damaging or dangerous effect on health, organoleptic properties or technological performance.

NOTE 3 An informative list of these seeds is given in annex D.

3.6 bunted grains: Grains filled with a fetid-smelling dust comprising the spores of bunts, i.e. *Tilletia caries*, *Tilletia controversa*, *Tilletia foetida*, *Tilletia intermedia*, *Tilletia triticoidea* and *Neovossia indica*.

3.7 ergot: Sclerotium of the fungus *Claviceps purpurea*.

4 Requirements

4.1 General, organoleptic and health characteristics

Durum wheat grains shall be sound, clean, have no foreign odours or odours denoting any deterioration, and shall be free of additives and toxic substances.

Pesticide residues and other contaminants shall not exceed the maximum levels laid down in the national legislation of the country of destination or, in the absence of such legislation, the maximum levels laid down by the joint FAO/WHO Codex Alimentarius Commission.

The durum wheat shall be free from any of the living insects listed in annex C visible to the naked eye upon thorough inspection.

4.2 Physical and chemical characteristics

4.2.1 Moisture content

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

NOTE 4 Lower moisture contents are required for certain destinations, in relation to the climate, duration of transport and of storage. For further information see ISO 6322-1, ISO 6322-2 and ISO 6322-3.

4.2.2 Bulk density

The bulk density (mass per hectolitre) of durum wheat shall be determined using instruments calibrated according to the reference method given in ISO 7971, and it shall not be less than 75 kg/hl.

4.2.3 Impurities

The maximum levels of impurities, determined using the method described in annex A, shall not exceed the values specified in table 1.

The maximum content of broken grains, shrivelled grains, unsound grains, grains attacked by pests, and other cereals, determined in accordance with the method described in annex A, shall not exceed 15 % (*m/m*) in total.

4.2.4 α -Amylase activity

The α -amylase activity, determined in accordance with ISO 3093 and expressed as the falling number, shall not be less than 160.

NOTE 5 The germinated grains are not taken into consideration as such, but by the α -amylase activity which results from their presence, expressed as the falling number.

4.2.5 Content of non-wholly-vitreous grains

The content of non-wholly-vitreous grains, determined in accordance with the procedure described in annex B, and calculated according to B.4.1, shall not exceed 40 %.

5 Sampling

Sampling shall have been carried out in accordance with ISO 950.

6 Test methods

The tests shall be carried out using the methods specified in 4.2.

Table 1 — Maximum levels of impurities

Impurities	Definition given in	Maximum permissible level % (<i>m/m</i>)
Broken grains ¹⁾	3.2.1	7 ¹⁾
Shrivelled grains ¹⁾	3.2.2	5 ¹⁾
Unsound grains ¹⁾	3.2.3	1 ¹⁾
Grains attacked by pests ¹⁾	3.2.4	2 ¹⁾
Sick wheat	3.2.5	5,8
Fusaria-contaminated grains	3.2.6	1,5
Other cereals ¹⁾	3.3	3 ¹⁾
Extraneous matter	3.4	2
Non-organic material		0,5
Harmful and/or toxic seeds, bunted grains and ergot	3.5 to 3.7	0,5
Ergot	3.7	0,05

1) The maximum content of broken grains, shrivelled grains, unsound grains, grains attacked by pests, and other cereals shall not exceed 15 % (*m/m*) in total.