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Rice — Specification

Riz — 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.

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 7301:2011), which has been technically revised. The main changes compared with the previous edition are as follows:

— the terms and definitions have been updated;

— the method for the determination of the average length originally given in A.4.3.2 and A.4.3.3 has been deleted, and a reference to ISO 11746 has been added.

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.

Rice — Specification

1 Scope

This document establishes the minimum specifications for rice (*Oryza sativa* L.) that is subject to international trade. It is applicable to husked rice and milled rice (aromatic and not aromatic), parboiled or not, intended for direct human consumption. It does not apply to other products derived from rice nor to waxy rice (glutinous rice).

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 11746, *Rice — Determination of biometric characteristics of kernels*

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
paddy
paddy rice
rough rice
rice retaining its husk after threshing

3.2
husked rice
brown rice
cargo rice
paddy (3.1) from which only the husk has been removed

Note 1 to entry: The processes of husking and handling can result in some loss of bran.

3.3
milled rice
white rice
husked rice (3.2) from which some or all of the bran and embryo have been removed by mechanical milling

3.4
parboiled rice
rice subjected to a hydrothermical treatment so that the starch is fully gelatinized, followed by a drying process

3.5
parboiled milled rice
milled rice (3.3) obtained from *paddy* (3.1) or *husked rice* (3.2) subjected to a hydrothermical treatment so that the starch is fully gelatinized, followed by a drying process

3.6
parboiled husked rice
husked rice (3.2) obtained from *paddy* (3.1) subjected to a hydrothermical treatment so that the starch is fully gelatinized, followed by a drying process

3.7
waxy rice
glutinous rice
varieties of rice whose kernels have a white and opaque appearance

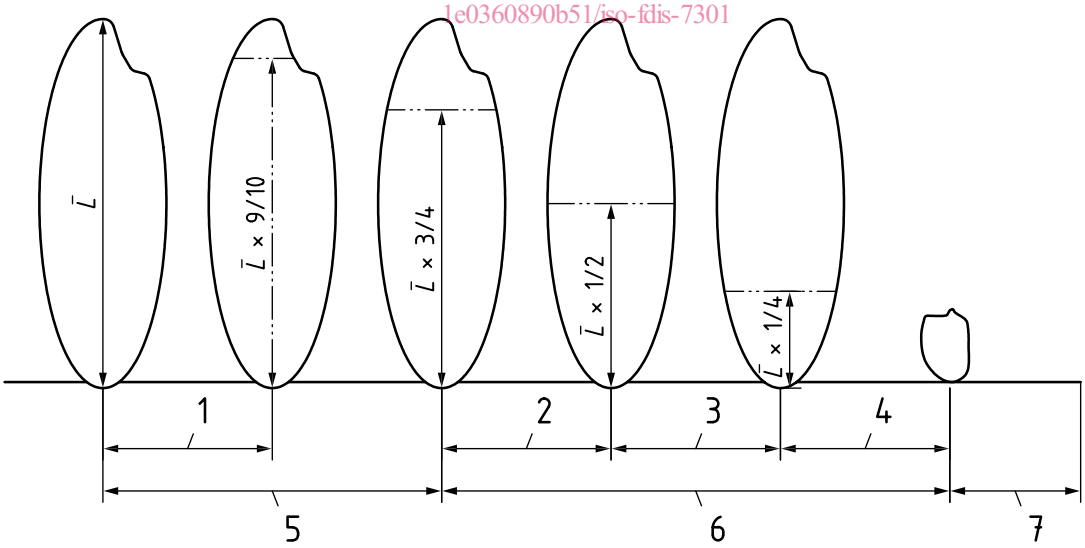
Note 1 to entry: The starch of waxy rice contains an extremely low level of amylose, consisting almost entirely of amylopectin. The kernels have a tendency to stick together after cooking.

3.8
aromatic rice
variety of rice releasing a particular aroma (e.g. roasted nuts, popcorn) that increases during cooking

3.9
entire kernel
husked or milled kernel without any broken part

3.10
whole kernel
husked or milled kernel with a length greater than or equal to nine-tenths of the *average length* (3.17) of an *entire kernel* (3.9)

Note 1 to entry: See Figure 1.



Key

1	*whole kernel* (3.10)	5	*head rice* (3.11)
2	*large broken kernel* (3.13)	6	*broken kernel* (3.12)
3	*medium broken kernel* (3.14)	7	*chip* (3.16)
4	*small broken kernel* (3.15)	$\bar{L}$	*average length* (3.17)

Figure 1 — Size of kernel, broken kernel and chip

3.11
head rice
whole kernel (3.10) or part of a kernel with a length greater than or equal to three-quarters of the *average length* (3.17) of an *entire kernel* (3.9)

Note 1 to entry: See Figure 1.

3.12
broken kernel
part of a kernel with a length less than three-quarters of the *average length* (3.17) of an *entire kernel* (3.9) but which does not pass through a test sieve with round apertures having a diameter of 1,4 mm

3.13
large broken kernel
part of a kernel with a length less than three-quarters of but greater than one-half of the *average length* (3.17) of an *entire kernel* (3.9)

Note 1 to entry: See Figure 1.

3.14
medium broken kernel
part of a kernel with a length less than or equal to one-half of but greater than one-quarter of the *average length* (3.17) of an *entire kernel* (3.9)

Note 1 to entry: See Figure 1.

3.15
small broken kernel
part of a kernel with a length less than or equal to one-quarter of the *average length* (3.17) of an *entire kernel* (3.9) but which does not pass through a test sieve with round apertures having a diameter of 1,4 mm

Note 1 to entry: See Figure 1.

3.16
chip
part of a kernel that passes through a test sieve and with round apertures having a diameter of 1,4 mm

Note 1 to entry: The test sieve should conform to ISO 5223[1].

3.17
average length
$\bar{L}$
arithmetic mean of the length of the *entire kernels* (3.9) that are not *immature or malformed* (3.25) in the test sample

Note 1 to entry: Calculation of the average length is given in ISO 11746.

3.18
extraneous matter
inorganic and organic non-toxic matter other than kernels or parts of *husked rice* (3.2) or *milled rice* (3.3)

3.19
inorganic extraneous matter
matter, such as stone, sand and dust

3.20
organic extraneous matter
matter including edible and non-edible

3.21
edible organic extraneous matter
matter, such as bran, foreign seeds, flour lumps

3.22
non-edible organic extraneous matter
matter, such as husk, straw

3.23
heat-damaged kernel
head rice (3.11) or *broken kernel* (3.12) that has changed its normal colour

Note 1 to entry: This category includes kernels that are a yellow to dark yellow colour in the case of non-parboiled rice and an orange to dark orange colour in the case of *parboiled rice* (3.4), likely due to a microbiological alteration.

3.24
damaged kernel
head rice (3.11) or *broken kernel* (3.12) showing evident deterioration due to moisture, pests, disease or other causes, but excluding *heat-damaged kernels* (3.23)

3.25
immature or malformed kernel
head rice (3.11) or *broken kernel* (3.12) that is unripe or badly developed

3.26
chalky kernel
head rice (3.11) or *broken kernel* (3.12) of non-parboiled rice, except *waxy rice* (3.7), whose whole surface has an opaque and floury appearance

3.27
red kernel
head rice (3.11) or *broken kernel* (3.12) having a red bran covering more than one-quarter of its surface

3.28
red-streaked kernel
head rice (3.11) or *broken kernel* (3.12) with red bran streaks of a length greater than or equal to one-half of its length but where the surface covered by these red streaks is less than one-quarter of the total surface

3.29
partly gelatinized kernel
head rice (3.11) or *broken kernel* (3.12) of *parboiled rice* (3.4) that is not fully gelatinized and shows a distinct white opaque area

3.30
peck
head rice (3.11) or *broken kernel* (3.12) of *parboiled rice* (3.4) of which more than one-quarter of the surface is dark brown or black in colour due to the parboiling process

3.31
stress-cracked kernel
whole kernel (3.10) non-parboiled with an uninterrupted stress-crack line covering at least three quarters of the kernel width

4 Specifications

4.1 General, sensory and health specifications

Kernels of rice, husked or milled, broken or not, shall be sound, clean and free from foreign odours or odour which indicates deterioration. They shall also be free from toxic or any harmful matter.

The level of additives and pesticides and other contaminants shall not exceed the maximum applicable limits.

NOTE These limits can vary depending on the national regulations of the country of destination and in the case of their absence do not exceed the CODEX maximum limits[7].

Living insects which are visible to the naked eye shall not be present.

4.2 Physical and chemical specifications

4.2.1 The mass fraction of moisture shall be not greater than 15,0 %.

NOTE Lower moisture contents can be required for certain destinations depending on the climate, duration of transport and storage. For further details, see ISO 6322-1[2], ISO 6322-2[3] and ISO 6322-3[4].

4.2.2 The physical specifications shall be determined in accordance with the method specified in Annex A and shall not exceed the limits given in Table 1.

Table 1 — Limits of physical specifications

Specification	Non-parboiled husked rice	Non-parboiled milled rice	Parboiled husked rice	Parboiled milled rice
Inorganic extraneous matter, % mass fraction	0,5	0,5	0,5	0,5
Organic extraneous matter, % mass fraction	1,0	0,5	1,0	0,5
Edible organic extraneous matter	1,0	0,5	1,0	0,5
Non-edible organic extraneous matter	0,5	0,5	0,5	0,5
Paddy, % mass fraction	2,5	0,3	2,5	0,3
Non-parboiled husked rice, % mass fraction	—	1,0	1,0	1,0
Non-parboiled milled rice, % mass fraction	1,0	—	1,0	1,0
Parboiled husked rice, % mass fraction	1,0	1,0	—	1,0
Parboiled milled rice, % mass fraction	1,0	1,0	1,0	—
Chip, % mass fraction	0,1	0,1	0,1	0,1
Heat-damaged kernel, % mass fraction	2,0[a]	2,0	2,0[a]	2,0
Damaged kernel, % mass fraction	4,0	3,0	4,0	3,0
Immature or malformed kernel, % mass fraction	8,0	2,0	8,0	2,0
Chalky kernel, % mass fraction	5,0[a]	5,0	—	—

Key

— not applicable

[a] After milling.

[b] Full red husked (cargo) rice is not considered here.

[c] The percentage of stressed cracked kernels is agreed between the supplier and the customer and depends on the intended use of rice. The determination of stress-cracked kernels shall be carried out in accordance with Annex C.

Table 1 *(continued)*

Specification	Non-parboiled husked rice	Non-parboiled milled rice	Parboiled husked rice	Parboiled milled rice
Red kernel and red-streaked kernel, % mass fraction	12,0[b]	12,0	12,0[b]	12,0
Partly gelatinized kernel, % mass fraction	—	—	11,0[a]	11,0
Peck, % mass fraction	—	—	4,0	2,0
Waxy rice, % mass fraction	1,0[a]	1,0	1,0[a]	1,0
Stress-cracked kernel	—[c]	—	—	—

Key

— not applicable

[a] After milling.

[b] Full red husked (cargo) rice is not considered here.

[c] The percentage of stressed cracked kernels is agreed between the supplier and the customer and depends on the intended use of rice. The determination of stress-cracked kernels shall be carried out in accordance with Annex C.

4.3 Minimum specifications subject to agreement

The specifications shall be clearly defined in any agreement between the supplier and the customer and shall include as a minimum:

a) the total percentage of broken kernels permitted, classified according to the agreed categories, and the relative proportion of each category;

b) the total percentage permitted, not exceeding the maximum values for the specifications detailed in Table 1, determined in accordance with the method described in Annex A.

For a specific kind of rice or a specific variety of rice, in order to evaluate the homogeneity of the lot, the agreement can specify both the average length of an entire kernel and its related coefficient of variation, C_V, in %, determined by using Formula (1):

$$C_V = \frac{s}{\bar{L}} \times 100 \quad (1)$$

where

s is the standard deviation;

$\bar{L}$ is the average length.

Specifications shall be determined in accordance with the method described in Annex A.

5 Test methods

The moisture content shall be determined in accordance with ISO 712.

The biometric characterization shall be determined in accordance with ISO 11746.

The other tests shall be carried out using the methods specified in Annexes A and B.

6 Packaging

The packaging material shall not transmit any smell or taste and shall not contain substances which can damage the product or constitute a health risk. If bags are used, they shall be clean, sufficiently strong and well stitched or sealed.