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Rice — Specification

Riz — Spécifications

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Foreword

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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).

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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.
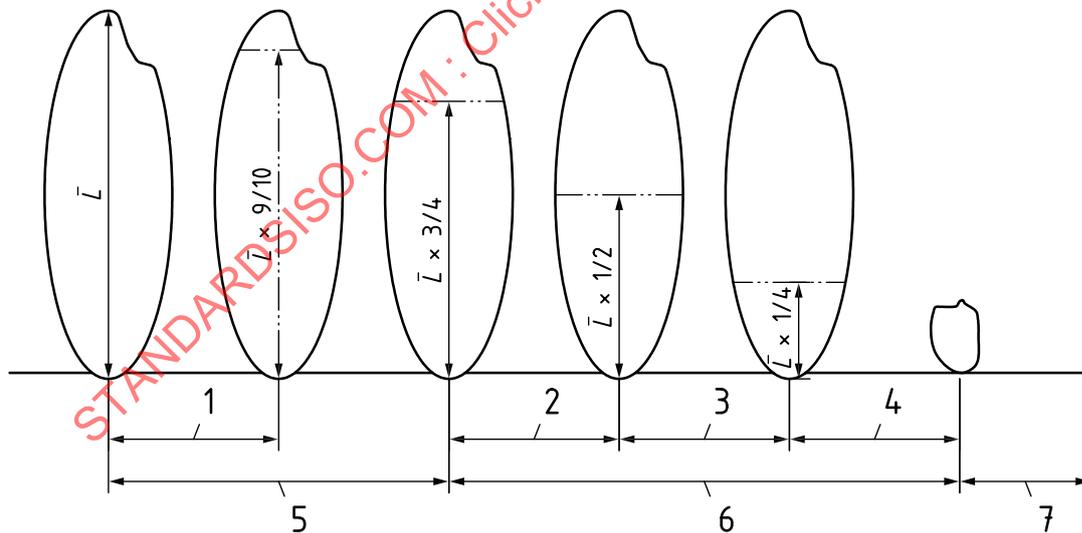
Key

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)	$\overline{L}$	*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 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
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
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	—	—
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):

$$C_V = \frac{s}{\overline{L}} \times 100 \tag{1}$$

where

s is the standard deviation;

$\overline{L}$ 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.

Annex A
(normative)

Methods of analysis for rice specifications

A.1 Principle

Manual separation and weighing of the broken kernels and head kernels of the categories given in Table 1.

A.2 Apparatus

A.2.1 Sample divider, conical sampler or multiple-slot sampler with a distribution system.

EXAMPLE   A sample divider as specified in ISO 24333[5].

A.2.2 Test sieve, with round apertures of diameter 1,4 mm, see ISO 5223[1].

A.2.3 Tweezers, **scalpel** and **paintbrush**.

A.2.4 Small bowls.

A.2.5 Balance, capable of being read to the nearest 0,01 g.

A.2.6 Tray, or other means, coloured in contrast with the colour of the rice to be evaluated.

A.2.7 Measuring device not deforming the kernels, capable of being read to the nearest 0,01 mm.

A.3 Sampling

Sampling is not part of the method specified in this document. A recommended sampling method is given in ISO 24333[5].

It is important the laboratory receive a truly representative sample that has not been damaged or changed during transport or storage.

A.4 Procedure

A.4.1 General

Note if an unusual or off smell is detected, as well as the presence of any anomaly. Verify the presence of living or dead insects by visual examination and report their number.

A.4.2 Preparation of the test sample

Weigh and carefully mix the laboratory sample to make it as homogeneous as possible. Then reduce it, if necessary, using a sample divider (A.2.1) to obtain a test sample of about 800 g.

Divide the obtained test sample into two equal test portions of about 400 g, using the sample divider (A.2.1).

A.4.3 Determination

A.4.3.1 General

When a kernel or a part of kernel can be classified in more than one category with reference to Table 1, it shall be classified in the category where the maximum permissible value is the lowest. All parts of kernels which get stuck in the apertures of a test sieve shall be considered as being retained by the test sieve.

A.4.3.2 Non-parboiled husked rice

Weigh one of the test portions (see A.4.2) to the nearest 0,01 g, record the mass as m_w and spread it on the tray (A.2.6). Separate the inorganic extraneous matter, the organic extraneous matter, the paddy, the non-parboiled milled rice, the parboiled husked rice and the parboiled milled rice into small bowls (A.2.4), with the aid of the tweezers, scalpel and paintbrush (A.2.3). Weigh the six fractions obtained to the nearest 0,01 g, and record the masses as m_1, m_2, m_3, m_4, m_5, m_6, m_7 and m_8.

Divide the second test portion with the divider (A.2.1) in order to obtain four different aliquot parts of about 100 g each.

Weigh the first aliquot part to the nearest 0,01 g and record the mass as m_x. Spread it out and separate the damaged kernels, the immature or malformed kernels and the red kernels into small bowls. Weigh the three fractions obtained to the nearest 0,01 g and record the masses as m_9, m_{10} and m_{11}.

Weigh the second aliquot part to the nearest 0,01 g and record the mass as m_y. Separate the chips by the test sieve (A.2.2), then spread out the remainder and separate the broken kernels, classifying them into large broken kernels, medium broken kernels and small broken kernels. Put the fractions obtained into small bowls. Weigh the four fractions to the nearest 0,01 g and record the masses as m_{12}, $m_{13,}$ m_{14} and m_{15}.

Proceed with the laboratory milling of the third aliquot part. Weigh the milled rice to the nearest 0,01 g and record the mass as m_z. Spread it out and separate the heat-damaged kernels, the chalky kernels and the waxy rice into small bowls. Weigh the three fractions obtained to the nearest 0,01 g and record the masses as m_{16}, m_{17} and m_{18}.
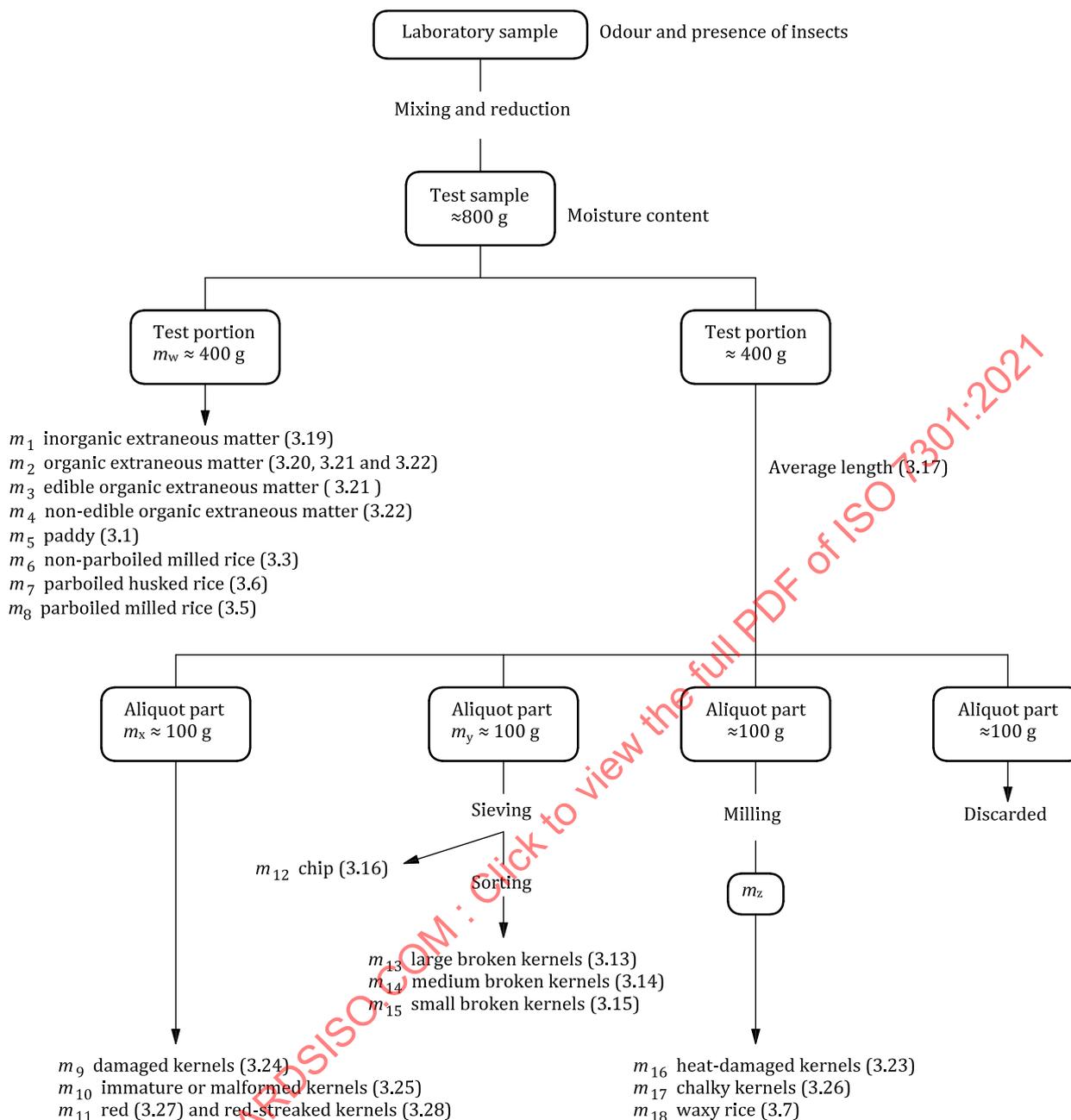
See Figure A.1.

Figure A.1 — Scheme of procedure for non-parboiled husked rice

A.4.3.3 Non-parboiled milled rice

Weigh one of the test portions (see A.4.2) to the nearest 0,01 g, record the mass as m_w and spread it on the tray (A.2.6). Separate the inorganic extraneous matter, the organic extraneous matter, the paddy, the non-parboiled husked rice, the parboiled husked rice and the parboiled milled rice into small bowls (A.2.4), with the aid of the tweezers, scalpel and paintbrush (A.2.3). Weigh the six fractions obtained to the nearest 0,01 g and record the masses as m_1, m_2, m_3, m_4, m_5, m_6, m_7 and m_8.

Divide the second test portion with the divider (A.2.1) in order to obtain four different aliquot parts of about 100 g each.

Weigh the first aliquot part to the nearest 0,01 g and record the mass as m_x. Spread it out and separate the heat-damaged kernels, the damaged kernels, the immature or malformed kernels, the chalky kernels

and the red kernels, together with the red-streaked kernels and the waxy rice, into small bowls. Weigh the six fractions obtained to the nearest 0,01 g and record the masses as m_9, m_{10}, m_{11}, m_{12}, m_{13} and m_{14}.

Weigh the second aliquot part to the nearest 0,01 g and record the mass as m_y. Separate the chips by the test sieve ([A.2.2](#)), then spread out the remainder and separate the broken kernels, classifying them into large broken kernels, medium broken kernels and small broken kernels. Put the fractions obtained into small bowls. Weigh the four fractions to the nearest 0,01 g and record the masses as m_{15}, m_{16}, m_{17} and m_{18}.
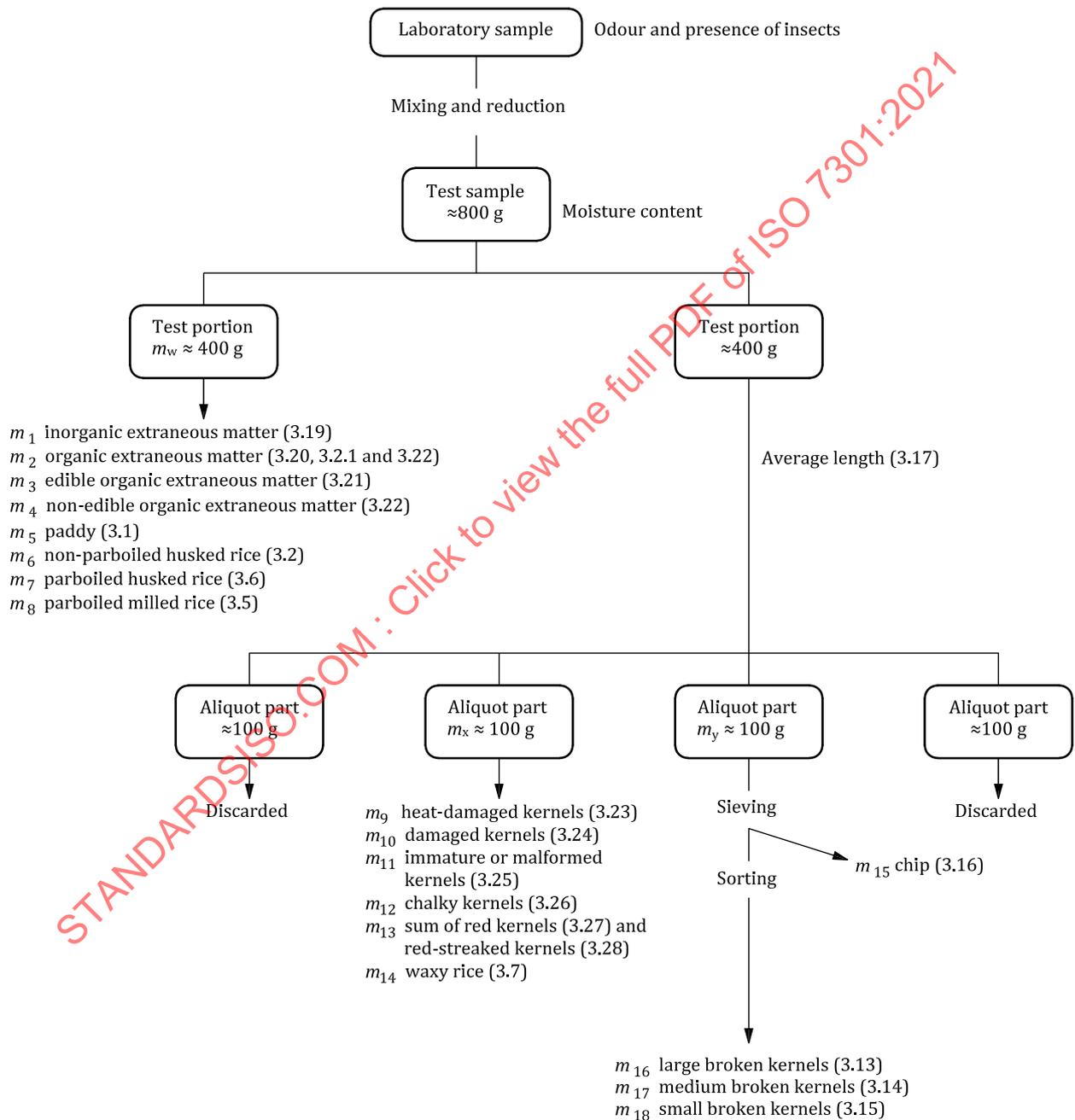
See [Figure A.2](#).

Figure A.2 — Scheme of procedure for non-parboiled milled rice

A.4.3.4 Parboiled husked rice

Weigh one of the test portions (see A.4.2) to the nearest 0,01 g, record the mass as m_w and spread it on the tray (A.2.6). Separate the inorganic extraneous matter, the organic extraneous matter, the paddy, the non-parboiled husked rice, the non-parboiled milled rice and the parboiled milled rice into small bowls (A.2.4) with the aid of the tweezers, scalpel and paintbrush (A.2.3). Weigh the six fractions obtained to the nearest 0,01 g and record the masses as m_1, m_2, m_3, m_4, m_5, m_6, m_7 and m_8.

Divide the second test portion with the divider (A.2.1) in order to obtain four different aliquot parts of about 100 g each.

Weigh the first aliquot part to the nearest 0,01 g and record the mass as m_x. Spread it out and separate the damaged kernels, the immature or malformed kernels and the red kernels into small bowls. Weigh the three fractions obtained to the nearest 0,01 g and record the masses as m_9, m_{10} and m_{11}.

Weigh the second aliquot part to the nearest 0,01 g and record the mass as m_y. Separate the chips by the test sieve (A.2.2), then spread out the remainder and separate the broken kernels, classifying them into large broken kernels, medium broken kernels and small broken kernels. Put the fractions obtained into small bowls. Weigh the four fractions to the nearest 0,01 g and record the masses as m_{12}, m_{13}, m_{14} and m_{15}.

Proceed with the laboratory milling of the third aliquot part. Weigh the milled rice to the nearest 0,01 g and record the mass as m_z. Spread it out and separate the heat-damaged kernels, the partly gelatinized kernels and the pecks into small bowls. Weigh the three fractions obtained to the nearest 0,01 g and record the masses as m_{16}, m_{17} and m_{18}.

Proceed with the milling of the fourth aliquot part and determine the percentage of waxy rice in accordance with Annex B.

See Figure A.3.
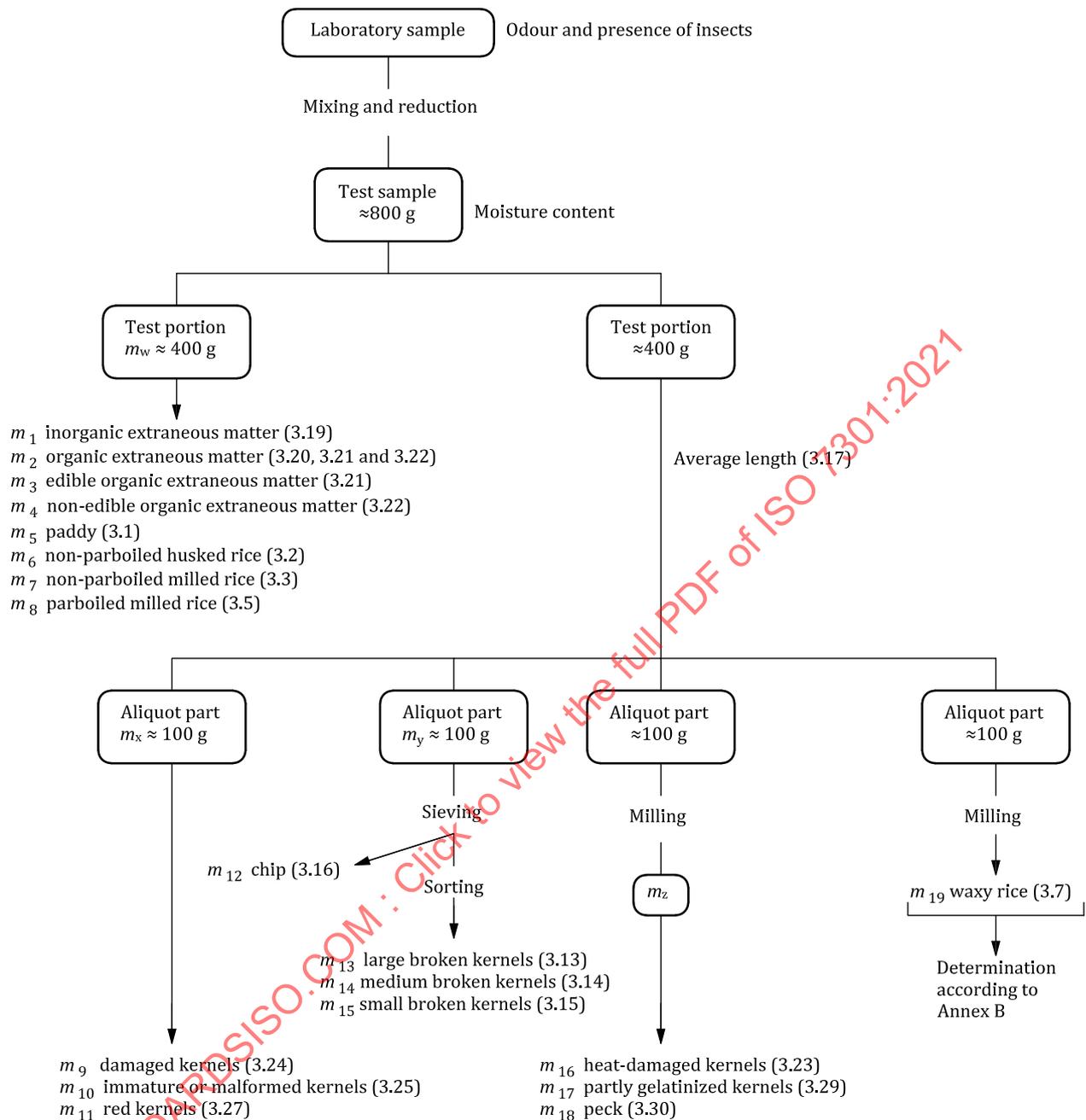
Figure A.3 — Scheme of procedure for parboiled husked rice

A.4.3.5 Parboiled milled rice

Weigh one of the test portions (see A.4.2) to the nearest 0,01 g, record the mass as m_w and spread it on the tray (A.2.6). Separate the inorganic extraneous matter, the organic extraneous matter, the paddy, the non-parboiled husked rice, the non-parboiled milled rice and the parboiled husked rice into small bowls (A.2.4) with the aid of the tweezers, scalpel and paintbrush (A.2.3). Weigh the six fractions obtained to the nearest 0,01 g and record the masses as m_1, m_2, m_3, m_4, m_5, m_6, m_7 and m_8.

Divide the second test portion with the divider (A.2.1) in order to obtain four different aliquot parts of about 100 g each.

Weigh the first aliquot part to the nearest 0,01 g and record the mass as m_x. Spread it out and separate the heat-damaged kernels, the damaged kernels, the immature or malformed kernels and the red kernels, together with the red-streaked kernels, the partly gelatinized kernels and the pecks, into small

bowls. Weigh the six fractions obtained to the nearest 0,01 g and record the masses as m_9, m_{10}, m_{11}, m_{112}, m_{13} and m_{14}.

Weigh the second aliquot part to the nearest 0,01 g and record the mass as m_y. Separate the chips by the test sieve (A.2.2), then spread out the remainder and separate the broken kernels, classifying them into large broken kernels, medium broken kernels and small broken kernels. Put the fractions obtained into small bowls. Weigh the four fractions to the nearest 0,01 g and record the masses as m_{15}, m_{16}, m_{17} and m_{18}.

Weigh the third aliquot part to the nearest 0,01 g and determine the percentage of waxy rice in accordance with Annex B.
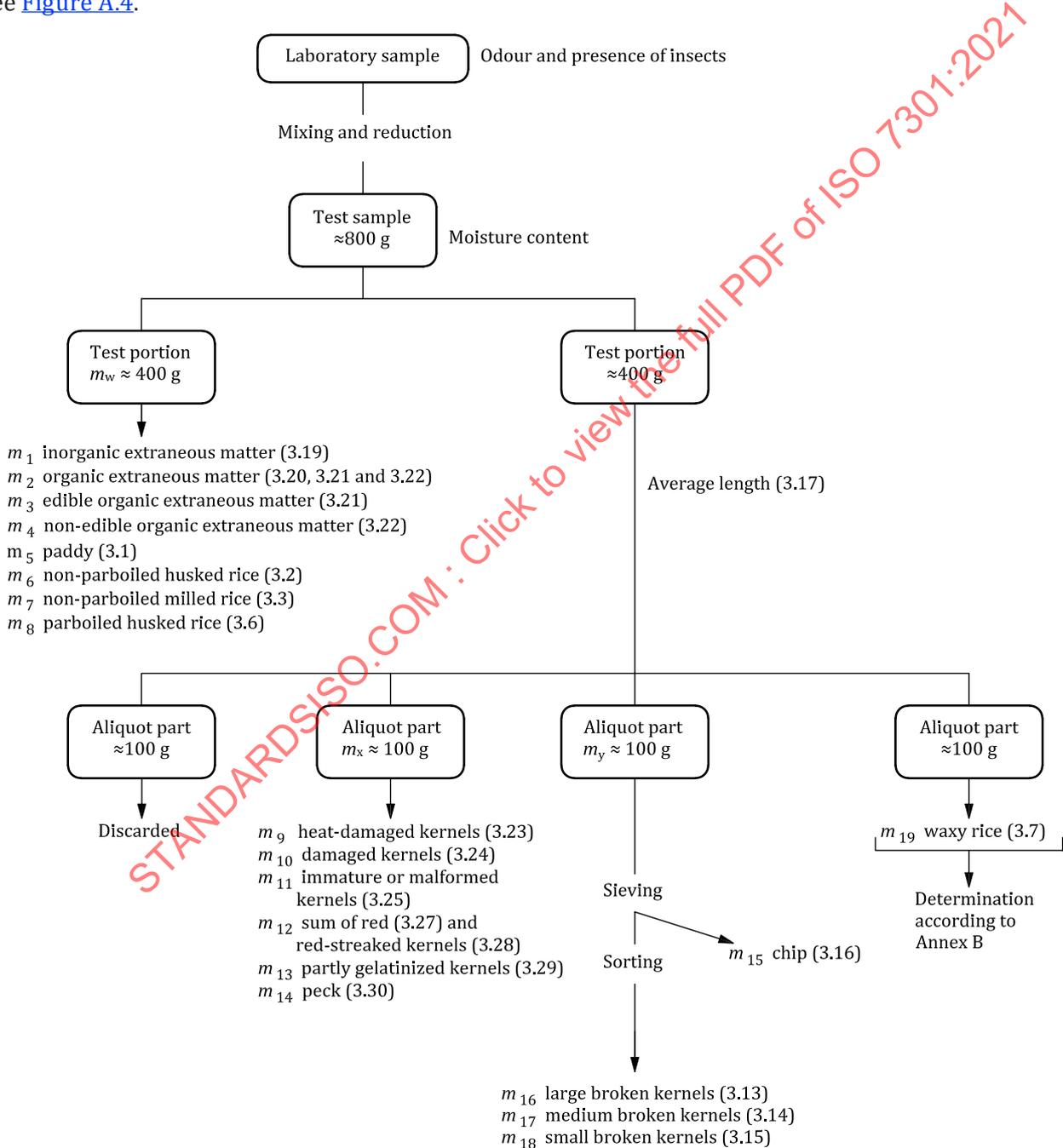
See Figure A.4.

Figure A.4 — Scheme of procedure for parboiled milled rice

A.5 Expression of results

Report the result obtained for the categories given in Table A.1 as a mass fraction, expressed as a percentage, of the product as received.

Table A.1 — Expression of results

Categories	Non-parboiled husked rice[a]	Non-parboiled milled rice[b]	Parboiled husked rice[c]	Parboiled milled rice[d]
Inorganic extraneous matter	$\dfrac{m_1 \times 100}{m_w}$	$\dfrac{m_1 \times 100}{m_w}$	$\dfrac{m_1 \times 100}{m_w}$	$\dfrac{m_1 \times 100}{m_w}$
Organic extraneous matter	$\dfrac{m_2 \times 100}{m_w}$	$\dfrac{m_2 \times 100}{m_w}$	$\dfrac{m_2 \times 100}{m_w}$	$\dfrac{m_2 \times 100}{m_w}$
Edible organic extraneous matter	$\dfrac{m_3 \times 100}{m_w}$	$\dfrac{m_3 \times 100}{m_w}$	$\dfrac{m_3 \times 100}{m_w}$	$\dfrac{m_3 \times 100}{m_w}$
Non-edible organic extraneous matter	$\dfrac{m_4 \times 100}{m_w}$	$\dfrac{m_4 \times 100}{m_w}$	$\dfrac{m_4 \times 100}{m_w}$	$\dfrac{m_4 \times 100}{m_w}$
Paddy	$\dfrac{m_5 \times 100}{m_w}$	$\dfrac{m_5 \times 100}{m_w}$	$\dfrac{m_5 \times 100}{m_w}$	$\dfrac{m_5 \times 100}{m_w}$
Non-parboiled husked rice	—	$\dfrac{m_6 \times 100}{m_w}$	$\dfrac{m_6 \times 100}{m_w}$	$\dfrac{m_6 \times 100}{m_w}$
Non-parboiled milled rice	$\dfrac{m_6 \times 100}{m_w}$	—	$\dfrac{m_7 \times 100}{m_w}$	$\dfrac{m_7 \times 100}{m_w}$
Parboiled husked rice	$\dfrac{m_7 \times 100}{m_w}$	$\dfrac{m_7 \times 100}{m_w}$	—	$\dfrac{m_8 \times 100}{m_w}$
Parboiled milled rice	$\dfrac{m_8 \times 100}{m_w}$	$\dfrac{m_8 \times 100}{m_w}$	$\dfrac{m_8 \times 100}{m_w}$	—
Heat-damaged kernel	$\dfrac{m_{16} \times 100}{m_z}$	$\dfrac{m_9 \times 100}{m_x}$	$\dfrac{m_{16} \times 100}{m_z}$	$\dfrac{m_9 \times 100}{m_x}$
Damaged kernel	$\dfrac{m_9 \times 100}{m_x}$	$\dfrac{m_{10} \times 100}{m_x}$	$\dfrac{m_9 \times 100}{m_x}$	$\dfrac{m_{10} \times 100}{m_x}$
Immature or malformed kernel	$\dfrac{m_{10} \times 100}{m_x}$	$\dfrac{m_{11} \times 100}{m_x}$	$\dfrac{m_{10} \times 100}{m_x}$	$\dfrac{m_{11} \times 100}{m_x}$
Chalky kernel	$\dfrac{m_{17} \times 100}{m_z}$	$\dfrac{m_{12} \times 100}{m_x}$	—	—
Partly gelatinized kernel	—	—	$\dfrac{m_{17} \times 100}{m_z}$	$\dfrac{m_{13} \times 100}{m_x}$
Peck	—	—	$\dfrac{m_{18} \times 100}{m_z}$	$\dfrac{m_{14} \times 100}{m_x}$

[a] For the meaning of the symbols, refer to the scheme of procedure given in Figure A.1.

[b] For the meaning of the symbols, refer to the scheme of procedure given in Figure A.2.

[c] For the meaning of the symbols, refer to the scheme of procedure given in Figure A.3.

[d] For the meaning of the symbols, refer to the scheme of procedure given in Figure A.4.

Table A.1 *(continued)*

Categories	Non-parboiled husked rice[a]	Non-parboiled milled rice[b]	Parboiled husked rice[c]	Parboiled milled rice[d]
Red and red-streaked kernel	$\dfrac{m_{11} \times 100}{m_x}$	$\dfrac{m_{13} \times 100}{m_x}$	$\dfrac{m_{11} \times 100}{m_x}$	$\dfrac{m_{12} \times 100}{m_x}$
Waxy rice	$\dfrac{m_{18} \times 100}{m_z}$	$\dfrac{m_{14} \times 100}{m_x}$	$\dfrac{m_{19} \times 100}{m_{19}+m_{20}}$	$\dfrac{m_{19} \times 100}{m_{19}+m_{20}}$
Large broken kernel	$\dfrac{m_{13} \times 100}{m_y}$	$\dfrac{m_{16} \times 100}{m_y}$	$\dfrac{m_{13} \times 100}{m_y}$	$\dfrac{m_{16} \times 100}{m_y}$
Medium broken kernel	$\dfrac{m_{14} \times 100}{m_y}$	$\dfrac{m_{17} \times 100}{m_y}$	$\dfrac{m_{14} \times 100}{m_y}$	$\dfrac{m_{17} \times 100}{m_y}$
Small broken kernel	$\dfrac{m_{15} \times 100}{m_y}$	$\dfrac{m_{18} \times 100}{m_y}$	$\dfrac{m_{15} \times 100}{m_y}$	$\dfrac{m_{18} \times 100}{m_y}$
Chip	$\dfrac{m_{12} \times 100}{m_y}$	$\dfrac{m_{15} \times 100}{m_y}$	$\dfrac{m_{12} \times 100}{m_y}$	$\dfrac{m_{15} \times 100}{m_y}$
Average length	$\overline{L}$	$\overline{L}$	$\overline{L}$	$\overline{L}$
Coefficient of variation of the length (see 4.3)	C_V	C_V	C_V	C_V

[a] For the meaning of the symbols, refer to the scheme of procedure given in Figure A.1.

[b] For the meaning of the symbols, refer to the scheme of procedure given in Figure A.2.

[c] For the meaning of the symbols, refer to the scheme of procedure given in Figure A.3.

[d] For the meaning of the symbols, refer to the scheme of procedure given in Figure A.4.

Report the result for each category to one decimal place by rounding it to the nearest integral multiple. If there are two successive integral multiples equally near to the given number, the even integral multiple should be selected as the rounded number. Carry out the rounding always in one step.

Although ISO 80000-1[6] specifies two different rules for rounding if there are two successive integral multiples equally near to the given number, for the purposes of this document the above-mentioned rule (i.e. ISO 80000-1[6], rule A) should be used, as in this way the rounding errors are minimized.

EXAMPLES

Given number	Rounded number
18,23	18,2
18,26	18,3
18,37	18,4
18,25	18,2
18,35	18,4
18,347	18,3
18,251	18,3