
Cocoa beans — Specification and quality requirements

Fèves de cacao — Spécifications et exigences de qualité

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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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html. (standards.iteh.ai)

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This third edition of ISO 2451 cancels and replaces ISO 2451:2014, ISO 1114:1977 and ISO 2291:1980, which have been technically revised.

Introduction

The original International Standards on cocoa beans (ISO 1114, ISO 2291, ISO 2292 and ISO 2451) were developed many years ago when cocoa production was largely within the control of governments of cocoa producing countries. Accordingly, the quality regime for cocoa was embedded in the farm to port supply chain process supported by marketing boards, which executed a regulatory and supervisory function. Governments were more actively involved in the cocoa sector and therefore had a greater interest in, and adherence to, these International Standards. With the progressive liberalisation of the cocoa production process in many of the producing countries from the mid-1980s onwards, the interest in updating the International Standards for cocoa was rather diminished and, at the same time, the private sector in the international cocoa trade recognized there was a need to ensure that appropriate International Standards were maintained within commercial contracts in order to meet trade and industry requirements.

Consequently, this document seeks to integrate relevant parts of the above mentioned International Standards and to adapt new rules and processes to ensure that the correlation between International Standards and commerce is properly maintained.

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Cocoa beans — Specification and quality requirements

1 Scope

This document specifies the requirements, classification, sampling, test methods, packaging and marking for cocoa beans.

Recommendations relating to storage and disinfestation are given as a guide in [Annexes G](#) and [H](#) respectively. [Annex I](#) is for informative purposes only and sets out a sampling procedure for preliminary quality analysis which can be adopted by agreement of all interested parties.

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 2292:2017, *Cocoa beans — Sampling*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2292 and the following apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

adulteration

alteration of the composition of a *lot* (3.18) of cocoa by any means whatsoever

3.2

bean cluster

two or more beans joined together which cannot be easily separated by using the finger and thumb of both hands

3.3

bean count

total number of whole beans per 100 g determined under specific conditions

Note 1 to entry: The specific conditions and the test method are specified in [Annex D](#).

3.4

broken bean

cocoa bean (3.5) of which a *fragment* (3.14) is missing, the remaining part being more than half of a whole bean

3.5

cocoa bean

seed of the cocoa tree (*Theobroma cacao* Linnaeus)

Note 1 to entry: Commercially, and for the purposes of this document, the term refers to the whole seed, which has been fermented and dried.

3.6

cocoa related matter

bean clusters (3.2), *broken beans* (3.4) and associated *fragments* (3.14) and/or *pieces of shell* (3.21) that do not pass through the *sieve* (3.23)

3.7

contamination

presence of a smoky, hammy or other smell not typical to cocoa, or a substance not natural to cocoa, which is revealed during the *cut test* (3.8) or physical inspection of a *reference sample* (3.22)

3.8

cut test

procedure by which the cotyledons of cocoa beans are exposed for the purpose of determining the incidence of defective and/or *slaty beans* (3.25), and/or *violet or purple beans* (3.29), and/or the presence of *contamination* (3.7) within a *test sample* (3.28)

Note 1 to entry: The procedure for the cut test is specified in [Annex E](#).

3.9

defective bean

internally *mouldy bean* (3.20) and/or *insect-damaged bean* (3.17)

3.10

dry cocoa

cocoa beans (3.5) which have been evenly dried throughout and of which the moisture content meets specific requirements

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Note 1 to entry: These requirements are specified in [5.2.4](#).

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Note 2 to entry: Dry cocoa can be considered as a commercial term.

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3.11

fair fermented beans

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cocoa beans (3.5) that are not more than 10 % slaty and 10 % defective by count of the *test sample* (3.28)

3.12

flat bean

cocoa bean (3.5) that is too thin to be cut to give a complete surface of the cotyledons

3.13

foreign matter

any substance other than *cocoa beans* (3.5), *cocoa related matter* (3.6) and *sieving* (3.24)

Note 1 to entry: Husk and placenta are to be considered as foreign matter.

3.14

fragment

piece of *cocoa bean* (3.5) equal to or less than half the original bean

3.15

germinated bean

cocoa bean (3.5) of which the seed germ has pierced the shell as evidenced either by the physical presence of the seed germ or by a hole in the shell following its detachment

3.16

good fermented beans

cocoa beans (3.5) that are not more than 5 % slaty and 5 % defective by count of the *test sample* (3.28)

3.17**insect-damaged bean
infested bean**

cocoa bean (3.5) of which the internal parts are found to contain insects or mites at any stage of development, or show signs of damage caused thereby, which are visible to the naked eye

3.18**lot**

quantity of *cocoa beans* (3.5) in bags or in bulk established at any point in the cocoa supply chain and from which primary samples and/or incremental samples are to be drawn for quality analysis purposes

Note 1 to entry: The requirements for sampling are specified in ISO 2292.

3.19**main crop**

bean count (3.3) consistent/typical for the beans normally produced during the main harvest period of that particular origin

Note 1 to entry: Light crop (mid crop) is the bean count consistent/typical for the beans normally produced in the period outside main harvest for that particular origin.

3.20**mouldy bean**

cocoa bean (3.5) on the internal parts of which mould is visible to the naked eye

Note 1 to entry: Mould is not to be confused with white spot, which is a concentration of theobromine or cocoa fat.

3.21**piece of shell**

part of the shell without any of the kernel

3.22**reference sample**

representative sample prepared by successively quartering the composite sample such that a minimum of 2 kg net remains

[SOURCE: ISO 2292:2017, 3.7]

3.23**sieve**

screen with round holes, the diameter of which are 5,0 mm

3.24**sieving**

material that passes through a *sieve* (3.23)

3.25**slaty bean**

cocoa bean (3.5) that shows a slaty colour on at least half of the surface of the cotyledons exposed by the *cut test* (3.8) irrespective of texture

3.26**smoky bean**

cocoa bean (3.5) with a smoke-off flavour

Note 1 to entry: A flavour that is reminiscent of wood smoke, acrid smoke, burnt rubber, smoked bacon or soot.

3.27

preliminary test sample

quarter of the reference sample obtained by using a splitter/divider, which can be less than 600 g

Note 1 to entry: [Annex I](#) specifies the procedure and flowchart for the preliminary quality analysis in which the preliminary test samples are used.

3.28

test sample

not less than 600 g of cocoa beans drawn from the *reference sample* ([3.22](#)) by using a flat-bottomed shovel drawn across the middle of the reference sample

Note 1 to entry: The test sample shall be obtained after sieving in accordance with the method specified in [Annex B](#) and removing the *cocoa related matter* ([3.6](#)), *flat beans* ([3.12](#)) and *foreign matter* ([3.13](#)) in accordance with the method specified in [Annex C](#).

3.29

violet or purple bean

cocoa bean ([3.5](#)) that shows a violet or purple colour on at least half of the surface of the cotyledons exposed by the *cut test* ([3.8](#))

4 Preparation

Cocoa beans shall be fermented and then dried until their moisture content no longer exceeds the percentage as specified in [5.2.4](#). Cocoa beans prepared in this manner are commercially referred to as dry cocoa.

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5 Requirements

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5.1 General requirements

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5.1.1 Odour

Lots of cocoa beans shall be free from contamination.

5.1.2 Adulteration

Lots of cocoa beans shall be free from any evidence of adulteration.

5.1.3 Living insects and other infestation

Lots of cocoa beans shall be virtually free from living insects, insect eggs, larvae, and any other developmental stages, free from mites, rodents, or other types of infestation.

5.1.4 Violet or purple beans

Lots of cocoa beans shall be within the range for violet or purple beans, if specified, typical for the grade or origin.

5.2 Specific requirements

5.2.1 Cocoa related matter

The combined mass of the cocoa related matter shall not exceed 3,5 % of the mass of the reference sample representing the lot.

5.2.2 Flat beans

Flat beans shall not exceed 1,5 % of the mass of the reference sample representing the lot.

5.2.3 Foreign matter

Foreign matter shall not exceed 0,75 % of the mass of the reference sample representing the lot.

5.2.4 Moisture content

The moisture content of lots of cocoa beans on loading in the producing country shall not exceed 8,0 % by mass, and on discharge outside the producing country shall not exceed 7,5 % by mass.

5.2.5 Sieving

The sieving shall be carried out in accordance with the method specified in [Annex B](#). The mass of the sieving shall not exceed 1,5 % of the mass of the reference sample representing the lot.

5.3 Other quality characteristics

Lots of cocoa beans shall be

- reasonably free from germinated beans,
- uniform in size and colour,
- fermented, and
- fit for production of foodstuff.

5.4 Grade determination

5.4.1 Classification for cocoa beans

Lots of cocoa beans shall be classified according to the categories listed below. Either [Table 1](#), [Table 2](#) or [Table 3](#) shall be used for the classification. For all three types of classifications, the proportion of beans with defects shall be determined by the test method specified in [Annex E](#). As an exception, for the purpose of [Table 3](#), germinated beans shall not be considered as beans with defects.

Table 1 — Producing country internal classification for fermented beans

Grade	Percentage of beans		
	Mouldy	Slaty	Insect-damaged and/or germinated
1	3	3	3
2	4	8	6

NOTE 1: The percentages are the maximum.
NOTE 2: The percentages given in the last column apply to the combined total of all the defects specified in the column header.

Table 2 — Producing country internal classification for “unfermented” beans

Grade	Percentage of beans		
	Mouldy	Slaty	Insect-damaged and/or germinated
1	3	≥ 20	3
2	4	≥ 20	6

NOTE 1: The percentages are the maximum.
NOTE 2: The percentages given in the last column apply to the combined total of all the defects specified in the column header.