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Green coffee — Defect reference chart

Café vert — Table de référence des défauts

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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.

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 10470 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Sub-Committee SC 15, *Coffee*.

Annexes A and B of this International Standard are for information only.

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Introduction

This International Standard provides information as to the main types of defect to be found in green coffee, and a qualitative assessment of their relative contribution to any system of quality grading of green coffees in which they occur.

A more quantitative assessment is not possible, since the assessment of defects is necessarily subjective, being dependent upon the significance to particular consumers or producers of the flavour (after roasting/brewing) and appearance factors, singly or combined, in the type of green coffee concerned.

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Green coffee — Defect reference chart

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1 Scope

This International Standard gives a listing in chart form of the main types of defect recognized as being potentially present in green coffee. Each of the main types of commercial green coffee is considered separately, as follows:

- wet-processed Arabica (WPA);
- dry-processed Arabica (DPA);
- dry-processed Robusta (DPR).

The chart gives definitions and characteristics of each defect, together with its likely cause, and its effect on roasting and on brew flavour of the roasted bean.

A qualitative assessment of the effects of the defects on appearance and flavour is also given in terms of their generally accepted significance.

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 3509:1989, *Coffee and its products — Vocabulary*.

ISO 6667:1985, *Green coffee — Determination of proportion of insect-damaged beans*.

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 3509 apply. For the convenience of users of this International Standard, the definitions are repeated here in quotation marks and the clause number is given in brackets.

Item	Name of defect	Definition/characteristics	Cause	Effect on roasting/brew flavour	Qualitative grading of defect ¹⁾
4 WET-PROCESSED ARABICA (WPA) COFFEE					
4.1 Defects in green coffee beans					
4.1.1 Field-damaged beans or process-damaged beans					
4.1.1.1	black bean	<p>a) "Coffee bean of which more than one-half of the external surface and interior is black." [2.3.11]</p> <p>b) "Coffee bean of which more than one-half of the external surface is black." [2.3.11]</p> <p>NOTE — Generally small sized. Cells have little fibrous structure. Low reflectance colour value, especially at 666 nm. Bean has an adherent silverskin and undesirable appearance.</p>	<p>In Africa, effect on cherries/beans whilst on trees with coffee berry disease (anthracnosis) due to attack by <i>Colletotrichum coffeanum</i> and other species of fungi.</p> <p>Other possible causes are:</p> <ol style="list-style-type: none"> 1) carbohydrate deficiency in the beans due to poor cultural practices; 2) immature beans have been affected by faulty drying in parchment, e.g. high temperatures (without microbiological development); 3) mature/immature beans/cherries subjected to over-fermentation by moulds, and subsequent drying. See 4.1.2. 	<p>Slow to roast; roasted black beans tend to be yellowish.</p> <p>Flavour differences from different causes; generally harsh flavour (ashy).</p>	VS
4.1.1.2	partly black bean	<p>a) "Coffee bean of which half or less than one-half of the external surface and interior is black."</p> <p>b) "Coffee bean of which half or less than one-half of the external surface is black." [2.3.12]</p>	As for 4.1.1.1	As for 4.1.1.1	MS
4.1.1.3	insect-damaged bean (see also 4.1.4)	<p>"Coffee bean damaged internally or externally by insect attack." [2.3.7]</p> <p>NOTE — There are at least two or three small holes or tunnels in the bean, 0,3 mm to 1,5 mm in diameter, neatly cut and circular.²⁾</p>	Attack on cherries by <i>Hypothenemus haempel</i> (coffee berry borer).	Slightly darker colour than normal beans on roasting. Slightly bitter flavour.	M

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Item	Name of defect	Definition/characteristics	Cause	Effect on roasting/brew flavour	Qualitative grading of defect ¹⁾
4.1.1.4	dark brown bean	Coffee bean with brown-black colour.	Attack by <i>Antestia</i> bugs or blight on cherry, whilst immature. Also caused by over-ripe berries and faulty pulping.	Slightly fruity/cherry taste; sometimes harsh/commonish.	MS
4.1.1.5	amber bean	Coffee bean with yellow colour, usually semi-transparent.	Iron deficiency in the soil.	Lack of acidity (i.e. commonish flavour).	MS
4.1.1.6	malformed bean	"Coffee bean whose abnormal shape makes it clearly distinguishable." [2.3.6] NOTE — Includes the elephant bean.	Growth defect.	Uneven roast with respect to normal beans; less acidity.	M
4.1.1.7	shell	"Malformed bean presenting a cavity." [2.3.3]	Growth defect.	May split on roasting and char at edges.	M
4.1.2 Harvest-damaged beans or process-damaged beans					
4.1.2.1	immature bean; quaker bean	"Unripe coffee bean often with a wrinkled surface." [2.3.13] NOTE — Bean has a very adherent silverskin. Cell walls and internal structure are not fully developed. Colour reflectance curve is lower than normal, with minimum at 666 nm (chlorophyll in silverskin) except when black.	Beans from cherries picked before ripe (i.e. green, yellow skins). Final colour of beans depends on drying conditions, ranging from a metallic green colour to dark green to almost black with glossy silverskin (see 4.1.1.1). Low occurrence in WPA because of pulping stage and removal by flotation in water.	Slow and irregular roast. More bitterness; lack of acidity and astringency; commonish flavour.	S
4.1.2.2	waxy bean	Coffee bean with translucent waxy appearance. Range of colours from yellowish green to dark reddish brown, which is the most typical. Cells have decayed fibrous appearance, as well as the surface. Bean has an adherent silverskin.	Beans from cherries picked when over-ripe (brown skins). Fermentative effect of bacteria on surface and interior.	Gives various flavour effects from fruity to sulfurous.	S

Item	Name of defect	Definition/characteristics	Cause	Effect on roasting/brew flavour	Qualitative grading of defect ¹⁾
4.1.2.3	bean with foxy silverskin	Coffee bean similar in reflectance colour spectrum to 4.1.2.2, with reddish visual colour. Bean has regular cell and surface structure.	As for 4.1.2.2, except there is only a small bacterial effect.	Little effect on flavour.	M
4.1.3 Defects occurring during processing					
4.1.3.1	pulper-nipped bean; pulpercut bean	"Wet-processed coffee bean, cut or bruised during pulping, often with brown or blackish marks." [2.3.21] NOTE — May have crushed appearance. https://standards.iteh.ai/standards/sist/356637eb-e18c-4734-b0d9-a51d77d013f5/iso-10470-1993	Faulty adjustment of pulping machine or feeding with under-ripe cherries or malformed beans.	Will affect flavour according to degree of damage. Slightly putrid to stinker taste.	M
4.1.3.2	bean fragment	"Fragment of a coffee bean of volume less than half a bean." [2.3.4]	General handling. Formed mainly during dehulling operations.	Difficulties occur in roasting. May affect flavour.	M
4.1.3.3	broken bean	"Fragment of a coffee bean of volume equal to or greater than half a bean." [2.3.5]	General handling. Formed mainly during dehulling operations.	Uneven roast. Less acidity.	M
4.1.3.4	sour bean	"Coffee bean deteriorated by excess fermentation, with a very light brown-reddish colour internally and producing a sour taste when roasted and infused." [2.3.17] NOTE — May have a waxy appearance.	Due to excess treatment in fermentation step.	Sour flavour; other effects may occur, e.g. oniony/potatoey flavour.	VS
4.1.3.5	stinker bean	"Coffee bean giving off, on being freshly cut, a very unpleasant odour. The bean may be light-brown or brownish, or have occasionally a waxy appearance." [2.3.16] NOTE — There are distinctive fluorescence effects, serving as a means of identification.	Cause not certain, but associated with fermentation and washing stages where some beans have been retained over-long or exposed to polluted water. Delay in pulping can also cause stinker beans.	Foul odour; rotten flavour.	VS
4.1.3.6	blotchy bean; spotted bean	"Coffee bean showing irregular greenish, whitish or, sometimes, yellow patches." [2.3.18]	Faulty drying of the parchment (e.g. broken parchment).	Non-specific downgrading of flavour.	M

Item	Name of defect	Definition/characteristics	Cause	Effect on roasting/brew flavour	Qualitative grading of defect ¹⁾
4.1.3.7	bean in parchment	"Coffee bean entirely or partially enclosed in its parchment (endocarp)." [2.3.10]	Faulty hulling and separation of the dry parchment.	Non-specific downgrading of flavour.	MS
4.1.3.8	dried cherry (pod)	"Dried fruit of the coffee tree, comprising its external envelopes and one or more beans." [2.3.9]	Not expected in WPA as pulp is prereduced; may occur accidentally.	Non-specific downgrading of flavour.	MS
4.1.3.9	withered bean	"Coffee bean which is wrinkled and light in weight." [2.3.19]	Not clearly identified and distinguished in WPA.	Non-specific downgrading of flavour.	MS
4.1.4 Defects occurring during storage					
4.1.4.1	spongy bean (faded whitish bean)	"Coffee bean of consistency analogous to that of cork, i.e. whose tissues may be indented by pressure of fingernail, and generally whitish in colour." [2.3.14]	Moisture absorption during storage/transportation leading to enzyme activation.	Roasts rapidly tending to carbonize. Lack of acidity (commonish flavour); woody flavour with poor aroma.	MS
4.1.4.2	white low density bean; floater bean	"Coffee bean, white in colour and very light in weight, with a density well below that of a healthy bean." [2.3.15]	Cause not known.	Non-specific downgrading of flavour.	MS
4.1.4.3	white bean	Coffee bean with white surface. NOTE — Not generally found in WPA.	Discolouration of surface due to bacteria of the genus <i>Coccus</i> , during storage/transportation. Associated with old crop coffee.	Non-specific downgrading of flavour.	MS
4.1.4.4	mouldy bean	"Coffee bean showing mould growth or evidence of attack by mould visible to the naked eye." [2.3.20]	Temperature/humidity conditions favourable to mould growth in storage/transportation.	Musty odour and flavour.	VS
4.1.4.5	insect-damaged bean (as 4.1.1.3)	"Coffee bean damaged externally or internally by insect attack." [2.3.7] NOTE — Differs from 4.1.1.3 in that one or more large holes are evident. ²⁾	Attack by <i>Araceurus</i> insect during storage, due to inadequate storage control.	Non-specific downgrading of flavour.	M

Item	Name of defect	Definition/characteristics	Cause	Effect on roasting/brew flavour	Qualitative grading of defect ¹⁾
4.1.4.6	insect-infested bean	a) live-insect-infested bean: "Coffee bean harbouring one or more live insects at any stage of development." [2.3.8.1] b) dead-insect-infested bean: "Coffee bean containing, one or more dead insects or insect fragments." [2.3.8.2]	As for 4.1.4.5.	Non-specific downgrading of flavour.	M
<p>ISO 10470:1993</p> <p>4.2 Defects originating from coffee fruit</p> <p>http://www.iso.org/standards/std/356637eb-e18c-4734-b0d9-1d77d013f5/iso-10470-1993</p>					
4.2.1 Dried parts of the coffee fruit					
4.2.1.1	piece of parchment	"Fragment of dried endocarp (parchment)." [2.3.2]	Inadequate separation after hulling the parchment.	Non-specific downgrading of flavour.	M
4.2.1.2	husk fragment	"Fragment of the dried external envelope (pericarp)." [2.3.1] NOTE — Divisible into small/large.	Not expected in WPA as beans are depulped.	Non-specific downgrading of flavour.	M
4.3 Foreign matter					
4.3.1 Sticks or dried twigs, or stalks originally holding the coffee cherry, or other woody vegetable matter					
4.3.1.1	large stick	"Twig approximately 3 cm in length (usually 2 cm to 4 cm)." [2.2.5]	Inadequate separation/cleaning.	Non-specific downgrading of flavour.	VS
4.3.1.2	medium stick	"Twig approximately 1,5 cm in length (usually 1 cm to 2 cm)." [2.2.6]	Inadequate separation/cleaning.	Non-specific downgrading of flavour.	S
4.3.1.3	small stick	"Twig approximately 0,5 cm in length (usually less than 1 cm)." [2.2.7]	Inadequate separation/cleaning.	Non-specific downgrading of flavour.	M