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Green coffee — Guidelines for storage and transport

Café vert — Lignes directrices pour l'entreposage et le transport

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 8455 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 15, *Coffee*.

This second edition cancels and replaces the first edition (ISO 8455:1986), which has been technically revised.

Green coffee — Guidelines for storage and transport

1 Scope

This International Standard gives guidelines for conditions aimed to minimize the risks of infestation, contamination, and quality deterioration of green coffee (also known as raw coffee) in bags and "big-bags" (see Note), in bulk and in silos, being the subject of international commerce, from the time of its packing for export until the time of its arrival in the importing country.

NOTE The term "big bag" refers to modern flexible containers in woven plastics fibre, able to contain about 1 000 l of loose coffee beans.

2 Normative references

The following referenced documents are indispensable for the application 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 1446, *Green coffee — Determination of water content — Basic reference method*

ISO 3509, *Coffee and coffee products — Vocabulary*

ISO 4072, *Green coffee in bags — Sampling*

ISO 4149, *Green coffee — Olfactory and visual examination and determination of foreign matter and defects*

ISO 6666, *Coffee sampling — Triers for green and in parchment coffee*[1)]

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

ISO 6673, *Green coffee — Determination of loss in mass at 105 °C*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3509 apply.

1) To be published. (Revision of ISO 6666:1983)

4 Conditions of putting into storage

4.1 Quality characteristics for storage

4.1.1 Green coffee before storing should be free from signs of insect infestation, rodent contamination, mould and other contamination (determined in accordance with ISO 4149 and ISO 6667 as necessary). Coffee beans should be sufficiently dry so as not to be unnecessarily vulnerable to subsequent moulding, but not so dry as to cause unnecessary bean breakage. Coffee moisture content (see the next paragraph) shall always be determined, in accordance with ISO 1446 or ISO 6673. The method used should be indicated.

Since upper and lower acceptable moisture limits depend on the method and apparatus used for measurement, they should be established by practical experience and made explicit in specifications and contracts.

4.1.2 The bags, “big bags”, containers or silos in which the green coffee is to be stored should be inspected before use to ensure that they are odour free, free from signs of insect infestation, rodent contamination and other contamination, as well as being physically sound.

4.2 Putting green coffee into storage

4.2.1 Green coffee intended for storage, after being packed for export should be moved with minimum delay to well-ventilated, well-maintained storage areas or facilities. The temperature and relative humidity of the air surrounding bagged coffee in store should be sufficiently constant and low enough (as determined by practical experience) to ensure that the original quality of the coffee is preserved throughout the duration of storage.

4.2.2 All inland transport vehicles should be inspected by a person in authority before loading green coffee, to ensure that they are in a good sanitary condition, defined as the absence of filth (fragments of insects, hair of rodents, etc.), mould, chemical contamination or other contamination.

4.2.3 During inland transportation to and from storage facilities, the bagged green coffee should be protectively covered to prevent stray contamination and weather damage. Green coffee should be especially protected from rehydration. Airproof sealing of non-transpiring containers can lead to condensation, and should be avoided.

5 Conditions for storage

5.1 Location of the warehouse

Warehouses should not be built in places where cold air accumulation can occur; therefore low and humid areas should be avoided. They should be built on a high ground level, and wall and foundations should be waterproof insulated, in order to exclude external wetness.

The warehouse should be oriented in east-west, north-south direction, with the shorter wall facing the sunny side, in order to save on insulation; consequently, it is preferred that the length faces east-west. The doors of the warehouse should never face a direction from which winds that might be harmful to the quality of the coffee are expected.

5.2 Surroundings of the storage facilities

5.2.1 Spills should be cleaned up promptly.

5.2.2 Waste, dunnage, and refuse should be removed promptly.

5.2.3 Equipment should be stored in such a manner that it cannot provide harbourage for rodents, insects, or birds.

5.2.4 There should be no poor drainage areas, which could provide a breeding place for insects or other pests.

5.2.5 There should be a pest-control programme for the surrounding grounds and regular inspections of the area. A recognized pest-control agency should be employed.

5.2.6 Hard surface areas should be kept in a broom-clean condition.

5.3 Building and interior of the storage facilities

5.3.1 To control the effects of solar irradiation, the covering of the warehouse should be fitted with thermal insulation. To protect the quality of the highest stacks, a minimum distance of 2 m should be allowed between the last upper row of bags and the ridge height of the warehouse.

5.3.2 Buildings should be structurally sound, free of leaks, rodent-proof, and bird-proof.

5.3.3 All pipes that are subject to condensation should be adequately insulated.

5.3.4 Buildings should be kept in a broom-clean condition; there should be a clean-up programme both for spills and for routine cleaning to avoid accumulation of dirt and debris on the floor.

5.3.5 Cargo spillage should be removed immediately.

5.3.6 Rubbish should be regularly removed and properly disposed of.

5.3.7 An adequate bird, rodent, insect, and other pest-control programme should be maintained, supervised by a recognized pest-control agency.

5.3.8 There should be regular inspection of buildings in support of the clean-up programme by a person in authority.

5.3.9 Any toilet facilities should be separated from the coffee storage area, totally enclosed, and maintained in a sanitary condition.

5.4 Storage and handling

5.4.1 Bagged coffee should be stored well away from outside walls, separated by a distance which at least allows inspection and sanitary maintenance of the floor between coffee and walls; moreover, said distance favours adequate ventilation. The recommended distance between bagged coffee and the walls is more than 0,8 m.

5.4.2 Both air temperature and humidity are important and basic items for the conservation of coffee, and should undergo appropriate control. A temperature of about 22 °C and a relative air humidity not more than 60 % are recommended. Product moisture should be monitored, in order not to exceed the conservation limits recommended in 4.1.1.

5.4.3 Storage near openings (windows, doors, etc.) subject to effects of the weather should be avoided.

5.4.4 Illumination control, both natural and artificial, is critical for the quality and conservation of coffee, light being one of the degradation factors of colour and quality. The warehouse should not have natural illumination, and the artificial illumination should be turned on for periods as short as possible. Coffee shall be maintained the majority of the time completely in the dark, the conditions nonetheless being compatible with those of a safe working environment. Artificial illumination should be placed in alleys and corridors only, never on top of the bags, and switched on by sections in order not to harm the quality of the coffee beans.

5.4.5 No bagged coffee should be in direct contact with the flooring, pallets or other separating devices, which should be clean and dry throughout; waterproofing of the floor is recommended. If wooden pallets are in use, protection from splinters may be achieved by sandwiching sheets of strengthened cardboard between the bag containing coffee and the pallet.

5.4.6 Storage of green coffee next to or in the area of potentially contaminating cargo (e.g. chemicals, odorous or dusty materials, green coffee triage, other commodities that might possibly be infested), should be avoided.

5.4.7 Coffees of different qualities should be kept in distinct places within the warehouse to avoid any possible contamination of good quality coffee by bad coffee beans. A different place is recommended for storage of organic coffee, to avoid possible cross-contamination with coffees that require any kind of fumigation.

5.4.8 The entry of vehicles into the warehouse should be prevented, in order to avoid changes in temperature, humidity, and light levels, as well as harmful fuel gases. If vehicle entry into the warehouse is unavoidable, there should be a system to avoid exhaust fumes contaminating the product. There are several possible methods; one of them is an antechamber for loading and unloading with two gates, where only the outer one is opened for the entering vehicle. Another method is to utilize shelters situated just outside the warehouse doors.

5.4.9 Dispersed load, fallen from the bags or blocks, should be removed immediately; accidents of this type occur rarely when the conditions of storage of the coffee are correct.

5.4.10 Inside the warehouse, the use of machines or any other activity that may interfere with the complete storage process of the product should be avoided. If there is machinery to process or reprocess coffee, or any other machinery, it should be guaranteed that they are properly isolated from places where coffee is stored.

5.4.11 Bagged coffee and reserve pallets should be maintained in a clean condition and in exceptional cases provided with a protective covering (if necessary). Covering practices and cover materials that restrict ventilation of bagged coffee or that adversely affect coffee quality should be avoided.

5.4.12 Bagged coffee in store should be sampled (in accordance with ISO 4072 and ISO 6666) and regularly inspected for any evidence of damage or quality deterioration (determined in accordance with ISO 4149 and ISO 6667, as applicable).

5.4.13 Bagged coffee should always be protected from rain and spray water by protective covering, both during transport and storage.

6 Conditions of maritime transit

6.1 Ports of embarkation and disembarkation

6.1.1 The waiting time for green coffee loaded on vehicles or in freight containers to be transferred to a ship should be kept to a minimum. Loaded vehicles or containers should be kept in the shade where possible; additionally, to minimize increases in the temperature of the coffee beans, light-coloured protective coverings should be used.

6.1.2 Green coffee should not be loaded into leaky, odorous, or unsanitary containers, nor into containers whose ceilings, walls or floor are wet or show sign of dampness. They should preferably be inspected by a person in authority before being loaded. It is recommended that the containers be constructed to generate an isothermal environment where the external environment has little influence on the temperature of the load.

6.1.3 During loading and unloading, green coffee cargo should be protected from contact with other potentially contaminating cargo.

6.1.4 Green coffee in bags should not be placed on an unclean or contaminated wharf surface.

6.1.5 It is recommended that the transferring time in the harbour be no longer than 72 h.

6.2 Maritime transport

6.2.1 Cargo holds of ships should be cleaned prior to loading.

6.2.2 Only clean, dry pallets or Marino-type slings should be used if cargo is unitized. Rope-type slings, when used, should be clean.

6.2.3 Green coffee cargo should be protected from salt-water damage and ship sweat. Stowage of green coffee next to, or in the area of, potentially contaminating cargo (e.g. chemicals, odorous or dusty materials, green coffee triage or other commodities that might possibly be infested) should be avoided.

6.2.4 An adequate pest-control programme should be maintained.

6.2.5 Bagged green coffee, whether containerized or not, should be stowed below deck in ventilated holds well away from heated or refrigerated areas.

6.2.6 Samples from the load next to the walls of the container should be randomly collected; it is recommended to make at least one moisture measurement before loading and another one in the same bags on arrival.