
International Standard



4150

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Green coffee — Size analysis — Manual sieving

Café vert — Analyse granulométrique — Tamisage manuel

First edition — 1980-08-01

iTeh STANDARD PREVIEW
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ISO 4150:1980

<https://standards.iteh.ai/catalog/standards/sist/dbbfa349-d0fe-496b-a2d8-43e74e0cc484/iso-4150-1980>

UDC 633.73 : 620.168.32

Ref. No. ISO 4150-1980 (E)

Descriptors : agricultural products, coffee, tests, screening (sieving), sieve analysis.

Price based on 4 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4150 was developed by Technical Committee ISO/TC 34, *Agricultural food products*, and was circulated to the member bodies in December 1977.

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It has been approved by the member bodies of the following countries:

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No member body expressed disapproval of the document.

Green coffee — Size analysis — Manual sieving

1 Scope and field of application

This International Standard specifies a routine method for carrying out size analysis of whole green coffee by manual sieving using laboratory test sieves.

2 References

ISO 3, *Preferred numbers — Series of preferred numbers.*

ISO 2395, *Test sieves and test sieving — Vocabulary.*

ISO 2591, *Test sieving.*

ISO 3310/2, *Test sieves — Technical requirements and testing — Part 2 : Metal perforated plate.*

ISO 3509, *Coffee and its products — Vocabulary.* <https://standards.iteh.ai/catalog/standards/sist/db1a1341-34e74e0cc484/iso-4150-1980>

ISO 4072, *Green coffee in bags — Sampling.*¹⁾

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

3 Definitions

For definitions of the terms used in this International Standard, see ISO 2395 for test sieves and ISO 3509 for coffee.

4 Principle

Separation of a test portion into fractions according to size by manual sieving, and expression of results as percentages by mass.

5 Apparatus

5.1 Balance, capable of weighing to the nearest 0,1 g.

5.2 Nest of test sieves, as follows :

5.2.1 Dimensions and sieving medium

The test sieves shall have a sieve surface area between 550 and 1 000 cm². Suitable test sieves, for example, are square sieves of 300 mm side and complying with the requirements of ISO 2591 except that the approximate depth of the sieve may be reduced to 25 mm.

The perforated plate used as the sieving medium shall be of metal of suitable strength, such as stainless steel, ordinary steel or zinc, 0,8 to 1,0 mm thick. Each plate shall be perforated in accordance with the dimensional requirements given in annex A or annex B of this International Standard.

The test sieves shall be marked by means of a label attached to the sieve giving the following details :

- a) nominal aperture size or the dimensions of slotted apertures (see annex A or B), or, failing this, the traditional numbering;²⁾
- b) reference to the standard(s) with which the sieve is claimed to comply;
- c) the material of the sieving medium and that of the frame;
- d) the name of the firm (manufacturer or vendor) taking responsibility for the sieve;
- e) an identification number.

5.2.2 Construction

The test sieve frames shall nest snugly with each other and with the lid and receiver.

The frame shall be smooth and the seal of the sieve so constructed as to prevent lodging of the coffee beans to be sieved.

1) At present at the stage of draft.

2) The traditional numbering is given for purposes of information. It corresponds to the number of 64ths of an inch, in the nominal aperture size of round apertures or the width of slotted apertures, closest to the metric dimension adopted.

5.2.3 Verification

New test sieves shall be verified (for example by the methods described in ISO 3310/2) and a certificate shall be available to this effect. Periodic checking should also be performed, since some changes in the dimensions of the apertures may occur after a period of use.

5.2.4 Aperture shape

5.2.4.1 Test sieves with round holes : 10 sieves (see annex A).

5.2.4.2 Test sieves with slotted holes : 7 sieves (see annex B).

5.2.5 Lid, complying with the requirements of ISO 2591.

5.2.6 Receiver, complying with the requirements of ISO 2591.

6 Sampling

Take a laboratory sample of 300 g, prepared in accordance with ISO 4072.

The same laboratory sample may be used for the examination and determination described in ISO 4149, if carried out prior to test sieving and provided that the laboratory sample is fully reconstituted for the latter test.

7 Procedure

7.1 Test portion

Weigh, to the nearest 0,1 g, 100 g of the laboratory sample.

7.2 Selection of sieves

Select a nest of sieves (5.2) with slotted apertures (5.2.4.2) if dealing with a sample of substantially peaberry coffee; otherwise use a nest of sieves with round apertures (5.2.4.1). Assemble the sieves in descending order of aperture size. From the result of a preliminary test or prior knowledge, select three or four suitable sieves, discarding the ones with larger apertures through which all beans will pass. Place the receiver (5.2.6) under the sieve with smallest apertures.

7.3 Sieving and weighing

7.3.1 Pour the test portion (7.1) over the top sieve and put the lid (5.2.5) in place.

7.3.2 Agitate gently by hand for 3 min with a slight corner-to-corner tilting action and slight vertical shaking. At the end of the operation, give a sharp knock in order that beans only loosely held in apertures will fall through. Beans remaining in

apertures shall be considered to be retained on the sieve in question.

7.3.3 If the sieves with the smaller apertures (i.e. Nos. 10, 12, 13, 14 or 15 for the sieves with round apertures) have not been selected for the first sieving operation, take the portion of beans in the receiver, and repeat the operations described in 7.3.1 and 7.3.2, using three or four sieves at a time until the sieve with the smallest apertures has been used, or until no coffee beans pass through the sieve of smallest aperture size used.

7.3.4 Weigh, to the nearest 0,1 g, the coffee beans collected on each of the further sieves used, and those which passed through (into the receiver).

7.4 Additional observations

Note whether any of the fractions contains a significant proportion of foreign matter, bean fragments or broken beans.

7.5 Number of determinations

Carry out three determinations using 100 g test portions taken from the same laboratory sample.

8 Expression of results

8.1 For each test, express the result as a percentage by mass, in the following manner :

ON (oversize or residue) (for each of the sieves used in the test) ... % (m/m)

THROUGH (undersize or fines) (for the sieve of smallest aperture size used, into the receiver) ... % (m/m)

8.2 For any test the total of "throughs" and "ons" shall be equal to $100 \pm 0,5$ %. If it is not the test is not valid and should be repeated with a new laboratory sample.

8.3 Take as the result for each sieve and for the receiver the mean of the results of the three determinations (7.5) expressed as defined above provided that the requirement in 8.2 is satisfied.

9 Test report

The test report shall show the method and type of sieve used and the result obtained. It shall give details of any foreign matter or defects found and recorded in accordance with 7.4. It shall also mention all operating details not specified in this International Standard, or regarded as optional, as well as any circumstances which may have influenced the result.

The test report shall include all information necessary for the complete identification of the sample.

Annex A

Requirements for round aperture perforated plate test sieves

Nominal diameter of aperture mm	Sieve number
8,00	20
7,50	19
7,10	18
6,70	17
6,30	16
6,00	15
5,60	14
5,00	13
4,75	12
4,00	10

The sequence of aperture diameters is taken from the R 40 series of preferred numbers in ISO 3.

The sieves Nos. 10, 12, 13, 14, 16, 17, 18 and 20 shall comply with the requirements of ISO 3310/2.

The technical specifications of sieves Nos. 15 and 19 shall be obtained by interpolation from those given in ISO 3310/2.

The arrangement of the apertures shall be such that the aperture centres are at the apices of equilateral triangles. (See figure 1.)

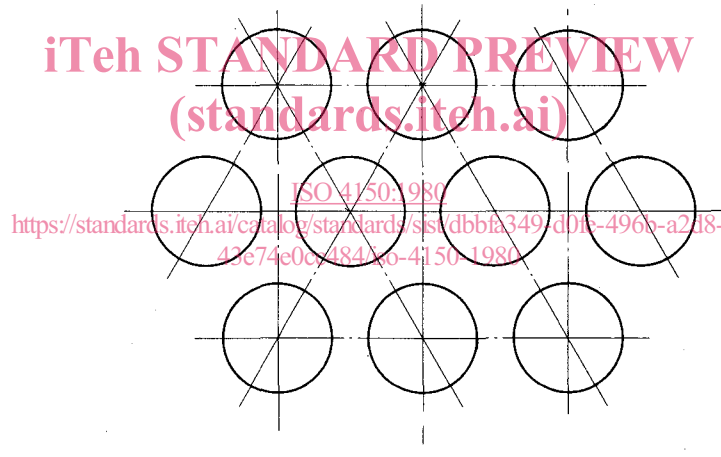


Figure 1 — Round holes with their centres at the apices of equilateral triangles

Annex B

Requirements for slotted aperture perforated plate test sieves

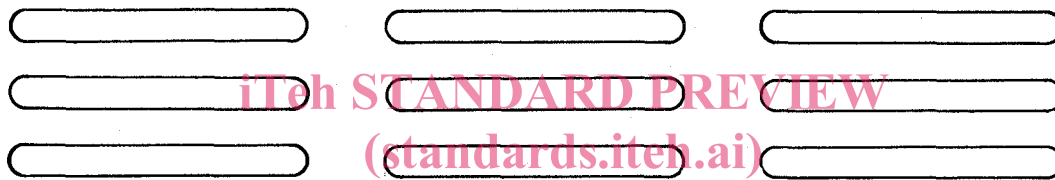
Dimensions in millimetres

Slot width	Slot length	Bridge distance		Sieve No. peaberry
		Side	End	
5,60	30	4,0	6	14
5,00	30	4,0	6	13
4,75	20	3,9	5 or 6	12
4,50	20	3,7	5 or 6	11
4,00	20	3,5	5 or 6	10
3,55	20	3,3	5 or 6	9
3,00	20	3,0	5 or 6	8

The sequence of slot widths is in accordance with the R 40 series of preferred numbers in ISO 3.

The sieves shall have the same tolerance on slot width as for the aperture diameters for round apertures given in ISO 3310/2 (for sieve No. 8 the value shall be extrapolated, i.e. 0,11 mm).

The slots shall be arranged in rows (see figure 2), line abreast, or staggered. The values given for the bridge distances should be regarded as a nominal guide.



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Figure 2 — Example of arrangement of slotted apertures in rows.
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