

UNECE STANDARD DF-06
concerning the marketing and commercial
quality control of

DECORTICATED SWEET ALMONDS
moving in international trade
between and to UNECE member countries

I. DEFINITION OF PRODUCE

This standard applies to dry sweet almonds from varieties (cultivars) grown from *Prunus amygdalus L.* from which the ligneous endocarp has been removed. The standard does not apply to bitter almonds, blanched almonds, almond pieces and twins.

II. PROVISIONS CONCERNING QUALITY

The purpose of the standard is to define the quality requirements for decorticated sweet almonds at the export control stage, after preparation and packaging.

A. Minimum requirements ¹

(i) In all classes, subject to the special provisions for each class and the tolerances allowed, the almonds must be:

- intact; the absence of any part of the outerskin or a very slight scratch on the endosperm shall not be regarded as a defect;
- sound; produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- sufficiently developed;
- clean, practically free from any visible foreign matter;
- free from insects or mites whatever their stage of development;
- free from visible damage by insects, mites or other parasites;
- free from mould;
- free of abnormal external moisture;
- free of foreign smell and/or taste.

The condition of the almonds must be such as to enable them:

- to withstand transport and handling, and
- to arrive in satisfactory condition at the place of destination.

¹ *The definitions of defects are listed in the annex to this document.*

(ii) Moisture content

The almonds shall have a moisture content of not greater than 5 per cent.^{2 3}

B. Classification

Almonds are classified in the three classes as defined below:

(i) *"Extra" Class*

Almonds in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be practically free from defects with the exception of very slight superficial defects provided that these do not affect the general appearance of the produce, the quality, the keeping quality or its presentation in the package.

(ii) *Class I*

Almonds in this class must be of good quality. They must be characteristic of the variety and/or commercial type.

The following slight defects may be allowed provided that these do not affect the general appearance of the produce, the quality, the keeping quality or its presentation in the package.

- defects in shape, development or colouring
- superficial or slight scratches.

(iii) *Class II*

This class includes almonds which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified above.

The following defects may be allowed provided that the almonds retain their essential characteristics, as regards general appearance, quality, keeping quality and presentation:

- defects in shape, development or colouring
- scratches.

² *The moisture content is determined by the method given in Annex II.*

³ *Reservation of Germany in favour of a maximum moisture content of 6 per cent.*

III. PROVISIONS CONCERNING SIZING

Sizing is determined in two ways:

- (a) According to the maximum transverse axis of the mid-section expressed in millimetres and determined by means of circular-mesh sieves.
- (i) **Size-graded almonds:**
All sizes in demand by importing countries are permitted, subject to a maximum difference of 2 mm between the maximum and minimum sizes.
- (ii) **Screened almonds:**
All almonds may be screened to a required size; the indication of the screening size shall be followed, in the case of a lower limit, by the words "and over" and, in the case of an upper limit, by the words "and under".
- (b) According to the minimum and maximum number of almonds of uniform dimensions per 100 grams or per ounce (28.3459 grams). All the size grades in demand by consumer countries may be used.

Size-grading or screening is compulsory for the "Extra" class and optional for the other two classes.

(iii) **Proportion of twins:**

Depending on whether the almonds are sold with the indication "Free of twins" or without any reference to twins, the percentage of twins by weight, according to class and size-grading or screening shall be as follows:

	"Extra"	Class I	Class II
	%	%	%
Size-graded or screened almonds			
Sold as "Free of twins"	2	3	3
Sold without reference to twins	10	15	25
Non-size-graded and non-screen almonds			
Sold as "Free of twins"	n/a ³	3	5
Sold without reference to twins	n/a ³	20	40

IV. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality, colour and type shall be allowed in each package for produce not satisfying the requirements of the class indicated.

A. Quality and colour tolerances

Defects allowed	Tolerances allowed (per cent by weight of kernels)		
	Extra	Class I	Class II
Decorticated almonds			
Total tolerances specific defects ⁴	5	10	15
Bitter Kernels	3	3	4
Stunted or shrivelled kernels	0.3	2	4
Pieces (less than 5 mm)	0.3	5	8
Incomplete kernels	3	7	10
Rotten, rancid or wormy kernels	0.5	1.5	2
Mouldy Kernels ⁵	0.5 ⁶	0.5	0.5
Blemished or gummy kernels	0.5	2	2
Kernels containing dead insects or dead parasites ⁵	0.2	0.2	0.2
Dust, cortex or other extraneous matter	0.2	0.5	0.5

B. Size tolerances (styles)

For all classes where required, 10 per cent, by number or weight, of almonds not satisfying the size range immediately above or below the size indicated.

⁴ Reservation by Germany and Italy, which are in favour of separate tolerances for size-graded and screened kernels.

⁵ The national legislations of Germany and of Switzerland do not permit tolerances for produce affected by mould or rot or the presence of dead or living insects.

⁶ Reservation by the Netherlands, which is in favour of a zero tolerance for mould in the Extra class.

V. PROVISIONS CONCERNING PRESENTATION

A. Uniformity

The contents of each package may be uniform and contain only almonds of the same origin, quality and size (if sized).

The visible part of the contents of the package must be representative of the entire contents.

B. Packaging

Almonds must be packed in such a way as to protect the produce properly.

The materials used inside the package must be new, clean and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials and particularly of paper or stamps bearing trade specifications is allowed provided that the printing or labelling has been done with non-toxic ink or glue.

Packages must be free from all foreign matter.

VI. PROVISIONS CONCERNING MARKING

Each package must bear the following particulars in letters grouped on the same side, legibly and indelibly marked and visible from the outside:

A. Identification

Packer)	Name and address or
and/or)	officially issued or
Dispatcher)	accepted code mark ⁷

B. Nature of produce

- "Walnut kernels".
- Name of the variety or commercial type for "Extra" class and class I where applicable (optional for class II).

C. Origin of produce

- Country of origin and, optionally, district where grown, or the national, regional or local place name.

D. Commercial specifications

⁷ *The national legislation of a number of European countries requires the explicit declaration of the name and address.*

- class
- size (if sized) expressed in terms of:
 - the minimum or maximum diameters for size-graded almonds, e.g. 14/15 mm or
 - the minimum size followed by the words "and over" or the maximum size followed by the words "and under" for screened almonds, e.g. "22 and over", or "22 and under"; or
 - the number of almonds per 100 grams or per ounce, e.g. "80-85 per 100 grams", "22-24 per ounce".
- Where applicable, the words "non-size-graded" and/or the words "free of twins"
- crop year (optional)
- net weight, or number of package units, followed by the net unit weight in the case of packages containing such units.

E. Official control mark (optional)

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ANNEX I
DETERMINATION OF THE MOISTURE CONTENT FOR DRY PRODUCE (NUTS)
METHOD 1 - LABORATORY REFERENCE METHOD

1. Scope and application

This reference method serves to determine the moisture and volatile matter content for both inshell nuts and shelled nuts (kernels).

2. Reference

This method is based on the method prescribed by ISO: ISO 665-2000 Oilseeds - Determination of moisture and volatile matter content.

3. Definition

Moisture content and volatile matter content for dry produce (inshell nuts and shelled nuts): loss in mass measured under the operating conditions specified in ISO 665-2000 for oilseeds of medium size (see point 7.3 of ISO 665-2000). The moisture content is expressed as mass fraction, in percent, of the mass of the initial sample.

For whole nuts, when moisture content is expressed both on the whole nut and on the kernel, in cases of dispute between the two values, the moisture content value of the whole nut takes precedence.

4. Principle

Determination of the moisture and volatile matter content of a test portion by drying at $103 \pm 2^\circ \text{C}$ in an oven at atmospheric pressure, until practically constant mass is reached.

5. Apparatus (see ISO 665-2000 for more details)

- 5.1 Analytical balance sensitive to 1 mg or better.
- 5.2 Mechanical mill.
- 5.3 3 mm round-holes sieve.
- 5.4 Glass, porcelain or non-corrosive metal containers, provided with well-fitting lids, allowing the test portion to be spread to about 0.2 g/cm^2 (approximately 5 mm height).
- 5.5 Electric oven with thermostatic control capable of being regulated between 101 and 105°C in normal operation.
- 5.6 Desiccator containing an effective desiccant.

6. Procedure

Follow the operating conditions as specified in ISO 665-2000 for oilseeds of medium size (point 7 and 7.3 of ISO 665-2000), but with the following specific modifications, concerning the preparation of the test sample.

Although ISO 665-2000 sets up one initial period of 3 hours in the oven set at $103 \pm 2^\circ \text{C}$, for nuts it is recommended one initial period of 6 hours.

6.a Determination of the moisture and volatile matter content of kernels:

For shelled nuts, homogenize the laboratory sample and take a minimum of 100 g of kernels as a test sample.

For inshell nuts, take a minimum of 200 g and, using a nutcracker or hammer, remove the shells and fragments or particles of shell, using the rest as a test sample. The kernel skin (cuticle or spermoderm) is included in the test sample.

Grind and sieve the test sample until the size of the particles obtained is no greater than 3 mm. During the grinding operation, care should be taken to avoid the production of a paste (oily flour), the overheating of the sample and the consequent loss of moisture content (for example, if using a mechanical food chopper, by successive very short grinding and sieving operations).

Spread evenly over the base of the vessel about 10 g of the ground product as a test portion, replace the lid, and weigh the whole vessel. Carry out two determinations on the same test sample.

6.b Determination of moisture and volatile matter content on whole nuts (shell plus kernel):

Homogenize the laboratory sample and take a minimum of 200 g of nuts as a test sample. Remove all the foreign matter (dust, stickers, etc.) from the test sample.

Grind the whole nuts using either a Rass Mill, a Romer Mill or a Brabender apparatus or similar, without overheating the product.

Spread evenly over the base of the vessel about 15 g of the ground product as a test portion, replace the lid, and weigh the whole vessel. Carry out two determinations on the same test sample.

7. Expression of results and test report

Follow all the instructions as specified in ISO 665-2000 (point 9 and 11) for method of calculation and formulae, and for test report, without any modification.⁸

8. Precision

For conditions of repeatability and reproducibility apply specifications of ISO 665-2000 (point 10.2 and 10.3) for soya beans.

METHOD 2: RAPID METHOD

1. Principle

Determination of the moisture content using a measuring apparatus based on the principle of loss of mass by heating. The apparatus should include a halogen or infra-red lamp and a built-in analytical balance, calibrated according to the laboratory method.

The use of apparatus based on the principle of electrical conductivity or resistance, as Moisture Meters, Moisture Testers and similar, is also allowed always at condition that the apparatus has to be calibrated according with the laboratory reference method for the tested product.

2. Apparatus

- 2.1 Mechanical mill or food chopper.
- 2.2 3 mm round-holes sieve (unless indicated otherwise by the instructions for use of the apparatus).
- 2.3 Halogen or infrared lamp with built-in analytical balance sensitive to 1 mg or better.

3. Procedure

3.1 Preparation of sample

Follow the same instructions as given for the laboratory reference method (points 6.a and 6.b), unless indicated otherwise by the instructions for use of the apparatus, particularly with regard to the diameter of the fragments.

⁸ *The main points specified are as follows:*

- *moisture and volatile matter content is expressed as mass fraction, in percent, of the mass of the initial sample.*
- *The result is the arithmetic mean of the two determinations; the difference between the two determinations should not exceed 0.2 % (mass fraction).*
- *The result has to be reported to one decimal place.*

3.2 Determination of moisture content

Carry out the determination on two test portions of approximately 5 to 10 g each, unless indicated otherwise by the instructions for use of the apparatus.

Spread the test portion over the base of the test receptacle, thoroughly cleaned in advance, and note the weight of the test portion to within 1 mg.

Follow the procedure indicated in the instructions for use of the apparatus for the product to be tested, in particular with regard to the adjusting of temperatures, the duration of the test and the recording of the weight readings.

4. Expression of results

4.1 Result

The result should be the arithmetic mean of the two determinations, provided that the conditions of repeatability (4.2) are satisfied. Report the result to one decimal place.

4.2 Repeatability

The difference in absolute value between the respective results of the two determinations performed simultaneously or one immediately after the other by the same operator, under the same conditions on identical test material, must not exceed 0.2%.

5. Test report

The test report must state the method used and the results obtained. The report must contain all information necessary for the full identification of the sample.