

**Specialized Section on Standardization  
of Dry and Dried Produce**

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**Revision of UNECE Standards**  
**Cashew Kernels**

## **Cashew Kernels**

### **Submitted by the USA**

The following document has been submitted by the delegation of the United States following a decision by the Specialized Section in 2009 to revise the Standard for Cashew Kernels. A French version has been submitted by the delegation of Germany.

**Draft Revised text of UNECE STANDARD DDP-17**

concerning the marketing and commercial  
quality control of

**CASHEW KERNELS**

moving in international trade  
between and to UNECE member countries

**I. DEFINITION OF PRODUCE**

This standard applies to cashew kernels of varieties (cultivars) grown from ... {(*Anacardium occidentale* Linneaus) obtained by heating, shelling and peeling the true fruits of the cashew tree), intended for direct consumption or for food when intended to be mixed with other products for direct consumption without further processing. This standard does not apply to cashew kernels that are processed by salting, sugaring, flavoring, or roasting or for industrial processing.

Cashew kernels may be presented as:

- (a) Whole: whole kernels of characteristic shape.<sup>1</sup> The presence of a small hole at the proximal end of the kernel or a central split or crack is not considered a defect.
- (b) Brokens: Kernels where one eighth or more of the original kernel is broken off. Designations of brokens as follows:
  - (i) Butts: Kernels of not less than 3/8<sup>th</sup> of a whole kernel which have been broken crosswise but the cotyledons are still naturally attached.
  - (ii) Splits: Kernels split lengthwise naturally.
  - (iii) Pieces: Kernels which have broken into more than two pieces.

**II. PROVISIONS CONCERNING QUALITY**

The purpose of the standard is to define the quality requirements of cashew kernels at the export control stage after preparation and packaging.

However, if applied at stages following export, the holder shall be responsible for observing the requirements of the standard. The holder/seller of products not in conformity with this standard may not display such products or offer them for sale, or deliver or market them in any other manner.

**A. Minimum requirements**

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

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<sup>1</sup> *Kernels with no more than one eighth of the kernel broken off can also be considered as whole.*

- sound; produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free from any visible foreign matter (except for salt or other permitted substances)
- whole kernels and splits must sufficiently developed; no shrunken or shrivelled kernels which are extremely flat and wrinkled, or with desiccated [dehydrated], dried out or tough portions affecting more than 5% per cent of the kernel
- whole kernels and splits must free from blemishes, areas of discolouration or spread stains in pronounced contrast with the rest of the kernel affecting in aggregate more than 5% per cent of the surface of the kernel
- free from living pests, whatever their stage of development
- free from damage caused by pests, including the presence of dead insects and/or mites, their debris or excreta
- free from mould filaments visible to the naked eye
- free from rancidity
- free of abnormal external moisture
- free of foreign smell and/or taste.

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

- to withstand transportation and handling; and
- to arrive in satisfactory condition at the place of destination.

(ii) **Moisture content**

Cashew kernels shall have a moisture content of not exceeding 5.0 percent.<sup>2</sup>

**B. Classification**

In accordance with the defects allowed in section “IV. Provisions concerning tolerances”, Cashew kernels are classified into the following classes.<sup>3</sup>

"Extra" Class, Class I and Class II

The defects allowed must not affect the general appearance of the produce as regards quality, keeping quality and presentation in the package.

**III. PROVISIONS CONCERNING SIZING**

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<sup>2</sup> *The moisture content is determined by the method described in Annex I to this document.*

<sup>3</sup> *Optional designations for each class are described in Annex II to this document.*

Sizing of cashew kernels is optional.

When sized, size is determined by one of the following:

Count: - for whole kernels - the number of whole cashew kernels per kg. in accordance with the following designations:

<b>Size Designation</b>	<b>Number of kernels per Kg</b>
150	265-325
180	326-395
210	395-465
240	485-530
280	575-620
320	660-706
400	707-880
450	881-990
500	990-1100

(Screening: - for pieces - of cashew kernels determined by screening based on the following designations:

<b>Designation</b>	<b>Characteristic</b>
Large pieces:	not passing through a sieve of aperture 4.75mm
Small pieces: <sup>4</sup>	passing through a sieve of aperture 4.75mm but not passing through a sieve of aperture 2.80mm.
Very Small Pieces: <sup>5 6</sup>	passing through a sieve of aperture 2.80mm but not passing through a sieve of aperture 2.36mm.
"Baby bits" or "granules":	Plemules and fragments of kernels passing through a sieve of aperture 2.80mm but not passing through a sieve of aperture 1.70mm.

#### **IV. PROVISIONS CONCERNING TOLERANCES**

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

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<sup>4</sup> *These pieces may also be designated "Medium Brazilian Pieces".*

<sup>5</sup> *These pieces may also be designated "Small Brazilian Pieces".*

<sup>6</sup> *This sizing is optional.*

Defects allowed	Tolerances allowed percentage of defective produce, by number or weight		
	Extra	Class I	Class II
(a) Tolerances for produce not satisfying the minimum requirements,	<b>8</b>	<b>11</b>	<b>14</b>
Of which no more than			
- Not sufficiently developed, shrunken and shrivelled	1	2	5
- Mouldy, Rancid or damaged by pests, rotting or deterioration Of which	0.5	1	2
- damages by pest is no more than	0.5	0.5	1
- Living pests	0	0	0
- Speckled or spotted(black or brown)	0.5	0.5	- <sup>b</sup>
- Presence of testa	1	1	5
<b>(b) Size Tolerances</b>			
- For whole kernels not conforming to the size indicated, if sized	10	10	10
- For pieces not conforming to the size indicated, if sized	5	5	5
<b>(c) Tolerances for other defects</b>			
- Foreign matter, loose shells, shell fragments, fragments of hull, dust (by weight)	0.5	0.5	0.5
- Cashew Kernels belonging to varieties or commercial types/colour other than that indicated	5	7.5	10

## V. PROVISIONS CONCERNING PRESENTATION

### A. Uniformity

The contents of each package must be uniform and contain only cashew kernels of the same origin, quality and size (if sized) and variety or commercial type if indicated.

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

### B. Packaging

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

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

Packages must be free of all foreign matter in accordance with the table of tolerances in section “IV. Provisions concerning tolerances”.

**C. Presentation**

Cashew kernels: must be presented in bags or solid containers. All sales packages within each package must be of the same weight.

**VI. PROVISIONS CONCERNING MARKING**

Each package or case (for small retail packs) must bear the following particulars in letters grouped on the same side, legibly and indelibly marked and visible from the outside:

**A. Identification**

Packer and/or Dispatcher: Name and physical address (e.g. street/city/region/postal code and, if different from the country of origin, the country) or a code mark officially recognized by the national authority<sup>7</sup>.

**B. Nature of Produce**

- "Cashew kernels", Cashew kernel pieces
- Name of the variety and/or commercial type (optional)

**C. Origin of produce**

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

**D. Commercial specification**

- Class or alternative acceptable designations as described in Annex II
- Style ("whole", "butts", "splits" or "pieces")
- Size designation (if sized) expressed in accordance with section III
- Crop year (optional)
- Best before” followed by the date (optional).

**E. Official control mark (optional)**

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<sup>7</sup> The national legislation of a number of countries requires the explicit declaration of the name and address. However, in cases where a code mark is used, the reference “packer and/or dispatcher” (or equivalent abbreviations) must be indicated in close connection with the code mark, and the code mark should be preceded with the ISO 3166 alpha country code of the recognizing country, if not the country of origin.

Adopted 1999  
Inclusion of new Annex I 2002

## 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

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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  $0.2 \text{ g/cm}^2$  (approximately 5 mm height).
- 5.5 Electric oven with thermostatic control capable of being regulated between 101 and  $105^\circ \text{C}$  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.<sup>8</sup>

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<sup>8</sup> *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).*

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- *The result has to be reported to one decimal place.*

## **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.

##### **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.

## ANNEX II

### DESIGNATIONS OF CLASSES

Designations for each class are shown in the table below.

<b>Class</b>	<b>Quality</b>	<b>Colour</b>	<b>Optional Designation</b>
Extra	Superior quality Characteristic of variety or commercial type	White Pale Ivory Pale ash-grey Light yellow	"White"
Class I	Good quality	Light Brown Light Ivory Light ash-grey Deep ivory Yellow	"Scorched"
Class II	Do not qualify for inclusion in higher classes, but which satisfy minimum requirements specified above.	Light Brown Amber Light Blue	"Scorched Seconds"
	Immature and speckled kernels are permitted provided they do not affect the characteristic shape of the kernel.	Deep Brown Deep Blue Discoloured Black spotted	"Dessert"

## ANNEX III

### DEFINITIONS OF DEFECTS

#### A. Defects of kernels

Superficial damage: Damage adversely affecting the appearance of the product, including blemishes and areas of discoloration. Scraped kernels, where characteristic shape is not affected are not considered defective.

Intrinsic defects: Shrivelled or immature kernels: the kernel is materially shrunken, wrinkled and tough. These are considered a defect only when the kernel is deformed and does not have its characteristic shape.

Spotted or speckled: The presence of black or brown spots or specks.

#### B. Other defects from external causes

Insect damage: Containing dead insects, mites, insect fragments, webbing, frass, excreta, or visible damage caused by boring and feeding of insects and animal parasites.

Mould: Mould filaments either on the inside or the outside of the kernel visible to the naked eye.

Rancidity: Oxidation or free fatty acid production in the lipids producing a disagreeable flavour.

Decay: Significant decomposition caused by the action of micro-organisms.

Foreign Matter: Any matter or material not usually associated with the product; excludes mineral impurities.

Testa: Skin adhering to any portion of the kernel.

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