

# PHILIPPINE NATIONAL STANDARD

PNS/BAFPS 11:2004  
ICS 65.020.20

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## Fresh fruit – Pummelo - Specification

**Foreword**

The formulation of this Philippine National Standard for Fresh Fruits – Pummelo, PNS/BAFPS 11:2004 was initially undertaken in July 2001 under the Bureau of Agriculture and Fisheries Product Standards (BAFPS) Technical Assistance on Safety and Quality Standards Covering Products of High Value Commercial Crops, in view of the increasing demand of the commodity for the domestic and export markets.

In 2003, the Bureau of Agriculture and Fisheries Product Standards (BAFPS) conducted series of technical reviews and public consultations nationwide on the draft standards for fresh pummelo fruits prior to its approval.

The Technical Committee and Sub-Committees of BAFPS organized through Special Order No. 411, series of 2001 set the classification of fresh pummelo fruit based on their physical characteristics and current practices on production and trading.

**Fresh Fruits – Pummelo – Specification**

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**1 Scope**

This standard establishes a system of grading and classifying commercial pummelo fruits grown from *Citrus grandis* L. of the Rutaceae family produced in the Philippines to be supplied fresh to the consumer.

**2 References**

PNS ISO 874:2004 – Fresh fruits and vegetables – Sampling contains provisions which, through reference in this text form part of this national standard. At the time of publication, the edition indicated was valid.

**3 Definitions**

For the purpose of this standard, the following definitions shall apply:

**3.1****clean**

the fruit is free from any foreign matter

**3.2****damage**

any defect or combination of defects which materially detracts from the appearance of the edible qualities of the pummelo

**3.3****edible portion**

the fleshy portion of the fruit that can be eaten

**3.4****fairly well colored**

the color characteristic of the variety predominates, except for an aggregate area of one tenth of the fruit surface

**3.5****fairly well formed**

the pummelo is slightly misshapened but is not appreciably deformed

**3.6****fairly smooth texture**

the rind is fairly smooth for the variety and size of the fruit

**3.7****firm**

the pummelo is not soft and shriveled

**3.8**

**mature**

the fruit has reached the stage of development and ripeness (Annex A)

**3.9**

**pummelo**

a large typically spheroid or pyriform fruit belonging to the citrus family, characterized by thick rind for some varieties covering the edible portion. The albedo is soft and white or pink. Flavor varies from sweet acid to subacid

**3.10**

**reasonably well colored**

the color characteristics of the variety predominates, except for an aggregate area of twenty percent of the fruit surface

**3.11**

**severely damaged**

any defect or combination of defects which severely detracts from the appearance of the edible or marketing qualities of the pummelo

**3.12**

**similar varietal characteristics**

the pummelos are similar in type characters as to color, shape and variety (Annex B)

**3.13**

**slightly rough texture**

the rind is not materially ridged, grooved or wrinkled

**3.14**

**smooth texture**

the rind is smooth and free from lumps and ridges

**3.15**

**well formed**

the pummelo has the shape characteristics of the variety

**4 Damage/Defects**

**4.1 Kinds of damage/defects**

**4.1.1 Discoloration** – There is distinct deviation from the typical color of the fruit.

**4.1.2 Melanose** – A disease of the fruit caused by fungus that produces thickened, light brown and often gummy spots on the rind of the fruit.

**4.1.3 Mite damage** – Spots, wounds or lesions on the peel caused by mites.

**4.1.4 Scab** – Patches with fissured corky tissues on the fruit.

**4.1.5 Sooty mold** – Black powdery substance appearing on the rind.

**4.1.6 Sun scald** – When a portion of the surface of the fruit is affected by golden yellow appearance.

**4.2 Types of insect pest that causes damage**

**4.2.1 Rind borer**

**4.2.2 Scale insect**

**5 Varieties**

Several known varieties of pummelo are listed in Annex B.

**6 Minimum requirements**

In all classes, subject to the special provisions for each class and tolerances allowed, pummelos shall meet the following requirements:

**6.1** Pummelo must be mature and firm.

**6.2** Pummelo must be reasonably clean and free from any visible foreign matter.

**6.3** Pummelo must be free from damages caused by diseases, insect, pests and free from chemical residues.

**7 Classification**

Pummelos are classified into three classes according to its general appearance, quality and condition as defined below:

**7.1 Extra class** – Pummelos are of superior quality, consist of one variety, well formed, with smooth texture, and free from damages caused by: scab, sooty mold, rind borer, mite and scale insect. They shall be free from defects with the exception of very slight superficial defects, provided that these do not affect the general appearance of the produce, the keeping quality and presentation in the package.

**7.2 Class I** – Pummelos in this class are of good quality, consist of similar varietal characteristics, well formed, with fairly smooth texture, free from damages caused by: rind borer, mite, and scale insect, scab, mealy bug and free from melanose and in the case of damage caused by sunscald, ten percent of the surface area, in aggregate, shall be permitted.

**7.3 Class II** – Pummelos which do not qualify for inclusion in the higher classes but satisfy the minimum requirements specified in Section 5. Pummelos in this class have similar varietal characteristics, well-formed, with smooth to slightly rough texture. The fruit shall be free from melanose and severe damages caused by: scab, sooty mold, rind borer, mite and scale insect and in the case of damage caused by sunscald, ten percent of the surface area, in aggregate, shall be permitted.

**8 Size classification**

Pummelos may be classified according to weight as shown in Table 1.

**Table 1 – Classification according to weight**

Size	Weight (g)	Number of pieces/20 kg/box
Extra small	< 400	> 50
Small	401 – 600	49 – 34
Medium	601 – 800	33 – 25
Large	801 – 1000	24 – 20
Extra large	> 1000	> 19

**9 Tolerances**

**9.1 Extra class**

Two percent by count of the pummelos in any lot shall meet the requirements of the class and shall conform to the requirements of class I.

**9.2 Class I and class II**

Five and ten percent by count of the pummelos for classes I and II, respectively in any lot shall meet the requirements of the classes and shall conform to the requirements of class II.

**9.3** Pummelo with more than the specified tolerance shall be rejected (see Figures 1, 2 and 3 for rejected pummelo).

**10 Sampling**

Sampling method to be used shall conform to the requirements specified in PNS ISO 874:2004, Fresh fruits and vegetables – Sampling.

**11 Provisions concerning presentation**

**11.1 Uniformity**

Each package shall contain pummelos of the same variety and /or commercial type, origin, quality, color and size (or lot for produce presented in bulk). The visible part of the package shall be the representative of the entire contents.



**Figure 1 – Example of rejected pummelo**



**Figure 2 – Example of rejected pummelo**



**Figure 3 – Example of rejected pummelo**

## **11.2 Packaging**

Pummelos shall be properly packed in suitable containers to protect the fruits from mechanical damage, facilitate handling and transport. The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable proper handling and shipping of pummelo fruits.

## **12 Marking or labelling**

Each package shall have a label or legible characters grouped on the same side, stamped in indelible ink to provide the following:

- 12.1** Name of product, variety or commercial type;
- 12.2** Class and size;
- 12.3** Net weight (in kilograms);
- 12.4** Name of shipper/importer/consignee; and
- 12.5** The words “Product of the Philippines”.

## **13 Contaminants**

### **13.1 Heavy Metals**

Pummelos shall comply with those maximum residue levels for heavy metals established by the Codex Alimentarius Commission for this commodity.



**13.2 Pesticide Residues**

Pummelos shall comply with those maximum residue levels established by the Codex Alimentarius Commission for this commodity.

**14 Hygiene**

**14.1** Pummelos shall be prepared and handled in accordance with appropriate sections of the Recommended International Code of Practice – General Principles of Food Hygiene (CAC/RCP 1 – 1969, Rev. 2-1985) and other relevant Codex texts such as Codes of Hygiene Practice and Codes of Practice.

**14.2** Pummelos shall comply with microbial criteria established in accordance with the principles for the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21 – 1997).

**15 Compliance and specification**

When found to comply with the requirements specified in this Philippine Standard Specification, the lot, the batch, or the consignment from which the samples have been drawn, shall be deemed to comply with this Philippine National Standard Specification.

**Annex A**

**Maturity**

**A.1 Days from flower opening to harvest**

- a) 'Amoy Mantan', 'Maga llanes', = 166-210 days from flower opening
- b) 'Siamese', 'Suiwuluk' = 156-173 days from flower opening

**A.2 Visual indices (for the above varieties)**

- a) Peel color – Dark green to light green
- b) Fruit size
  - 1. Polar diameter = 10.57 cm – 16.25 cm
  - 2. Equatorial diameter – 10.97 cm – 17.43 cm
- c) Rind is glossy
- d) Oil gland – closer distance but bigger in size
- e) Calyx lift and curl

**A.3 Characteristics**

- a) Ease in harvesting/abscission
- b) Hollow sound emitted by fruit when tapped

**A.4 Chemical**

- a) Minimum TSS – 9.0° Brix
- b) Minimum TA – 0.63%
- c) Solid to acid ratio – 15:1
- d) Minimum juice content – 36%

## Annex B

Table B– Characteristics of commercially grown pummelo cultivars

Variety	Fruit weight (g)	Edible portion (%)	Fruit shape	Rind color	Flesh color	Rind texture	Fruit maturity	Number of segment	Juice content
1. 'Magallanes'	771.95	57.32	Ellipsoid	Sap green to greenish yellow	Rosine purple	Rough to smooth	156	11.47±0.95	28.87
2. 'Amoy Mantan'	883.41	56.84	Ellipsoid to spheroid	Yellowish green to yellow	Light pink	Rough to smooth	159	10.89±0.72	30.68
3. 'Sunwuiluk'	932.77	48.43	Spheroid to sub spheroid	Sap green to greenish yellow	Greenish white	Rough to smooth	156	12.90±1.27	30.77
4. 'Chandler'	750.00	N/A	Spheroid	Green to yellow	Pink to dark pink	Smooth with minute hairs	N/A	N/A	N/A
5. 'Aroman'	1050.00	61.25	Pyriform	Mimosa yellow	Chrome yellow	Rough to smooth	N/A	N/A	N/A
6. 'Amoyco'	804.39	60.14	Oblong	Charteuse green	Neyron rose	Rough to smooth	N/A	N/A	N/A
7. 'Mintal'	657.14	50.65	Oblong	Aurcolin pink	Rhodonina pink	Rough to smooth	N/A/	N/A	N/A

Sources: Davao Experimental Station: 1988; Morton, 1986; Herradura (personal communication).

Estellana, Noel T. and Rufino Odtojan. 1962. Characterization of Some Pummelo (*Citrus grandis* L.) Cultivars:

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Philippine Regional Standards (Region XI 01:1988)

**Department of Agriculture  
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