

འབྲུག་-----ཁྱི་གནས་ཚད།

# BHUTAN STANDARD

Apple-Specification



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**BHUTAN STANDARDS BUREAU**

**The National Standards Body of Bhutan**

**Thimphu 11001**



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Director General  
Bhutan Standards Bureau  
Rijug Lam  
Thimphu-11001  
Tel: 00975-2-325104/325401  
Fax: 00975-2-323712/328298  
Web: [www.bsb.gov.bt](http://www.bsb.gov.bt)

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# **BTS XXX: 2023**

## **FOREWORD**

Bhutan Standards Bureau (BSB) is a National Standards Body (NSB) of Bhutan. This standard for Potato C was developed by Technical Committee TC02, Food and Agriculture, Subcommittee SC 15, Fruits and Vegetables under Bhutan Standards Bureau after the draft finalization by the Food and Agriculture Technical Committee, TC 02 and approved by the Bhutan Standards Bureau Board (BSB Board) on x<sup>th</sup> Month August 2023.

This standard specifies requirements for grading, packaging and labelling for apple. This standard is drafted in accordance with the BSB Rule for Structure and Drafting of Bhutan Standards, 2018. Some of the elements of this standard may be the subject of copyrights.

This standard is subject to systematic review after five years to keep pace with the market trends, industrial and technological developments. Amendments are issued to standards as the need arises on the basis of comments.

**INTRODUCTION**

The majority of the apples are grown in three western Dzongkhags i.e. Thimphu, Paro and Haa contributing to about 90 percent of the total apple production in the country. Apples are grown at an altitude range between 1900 to 2700 masl. The main cultivars of apple are red delicious, royal delicious and golden delicious. These varieties account for over 80 percent of the total apple trees in Bhutan.

The Bhutanese apples are mostly exported to India and Bangladesh with limited grading and sorting at the source of origin. There are no set of parameters to regulate apple quality by the exporters or the regulatory bodies. In order to capture international markets, there is need to develop standard quality parameters for apple. This would ensure the quality of Bhutanese apples to meet the international market requirements and during import of apples.

The use of standards remains voluntary and when referenced by regulatory authorities as a basis for legislations, the standards become mandatory.





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## BHUTAN STANDARD

### Apple-Specification

#### 1 Scope

This Standard applies to fruits of commercial varieties of apples *Malus domestica* Borkh, of the Rosaceae family, to be supplied fresh to the consumer, after preparation and packaging. Apples for industrial processing are excluded.

#### 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.

CAC/RCP 44-1995 Code of practice for packaging and transport of fresh fruit and vegetables

BTS 139:2020 SARS 0014:2018, *Food hygiene- General principles – Code of practice*

BTS 269 CXS 1 (Amended 2009) *General guidelines on claims*

#### 3 Terms and Definition

For the purposes of this document, the following terms and definitions apply;

##### 3.1 Extraneous Matter

Any foreign substances in fruits associated with objectionable condition or practices in production, storage and/or distribution of fruits.

##### 3.2 Apples

An apple is an edible fruit produced by an apple tree (*Malus domestica*).

##### 3.3 Russetting

Russetting is a phenomenon that affects apples causing slightly harder patches of brown on the skin of the fruit.

##### 3.4 Contaminants

Any biological or chemical agent, foreign matter or other substances not intentionally added to fruits which may compromise fruit safety or suitability

#### 4 Description

##### 4.1 Shape and Color

In general, apple are roundish, oblate or oblong shapes. In addition to these three shapes, apples can also taper towards the bottom. Some apples have asymmetrical sphere or evened lopsided shapes. The color ranges from green to yellow crimson red.

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## **5 Hygiene**

The produce shall be handled in accordance with the provision in BTS 139: 2020 SARS 0014: 2020.

## **6 Contaminants**

**6.1** The produce covered by this Standard shall comply with the maximum residue limits for pesticides established by the Codex Alimentarius Commission or any other relevant national regulation.

**6.2** The produce covered by this Standard shall comply with the maximum levels of the contaminants and toxins in accordance with the General Standard for Contaminants and Toxins in Food and Feed (CXS 193-1995).

## **7 Quality Requirement**

### **7.1 Whole**

The produce shall not have any part removed nor have suffered any damage making them incomplete. The stalk (stem) may be missing, provided the break is clean and the adjacent skin is not damaged

### **7.2 Appearance**

The produce shall be clean, fresh, firm and free from any visible extraneous matter.

### **7.3 Pests and Diseases**

The produce shall be free from pests and diseases.

### **7.4 External Moisture**

shall not be any moisture on the surface of the produce; except condensation following removal from cold storage.

### **7.5 Odour**

The produce shall be free from foreign odour.

### **7.6 Dehydration**

The produce shall be free of signs of dehydration.

### **7.7 Color**

The apples shall have color that is characteristic of the variety and the area in which they are grown.

### **7.8 Defects**

The produce shall be free from:

**7.9.1** Russetting outside Calyx/stem cavity

**7.9.2** Stem or Calyx cracks (healed or well cured)

**7.9.3** Maximum length of elongated shaped defects

**7.9.4** Accumulated Blemishes & Bruising: - Bruises with slight discoloration;

**7.9.5** Scars caused by Scabs (*Venturia inaequalis*)

**7.9.6** other defects/blemish including healed hail marks

### **7.10 Maturity Requirements**

**7.10.1** The development and state of maturity of the apples shall be such as to enable them to continue their ripening process and to reach satisfactory degree of ripeness.

**7.10.2** The minimum maturity requirements shall be verified through several parameters (morphological aspect, taste, firmness, total soluble solids).

*Include transportation*

### **7.11 Color**

In all classes, the following color codes shall be applied except for green varieties:

<b>Code</b>	<b>Percentage of color</b>
A	75% or more
B	50% -74%
C	25% -49%
D	Less than 25%

## **8 Sizing**

**8.1** For all classes of fruit subjected to rules of uniformity, 10% by number or weight of apples not meeting the size indicated on the package. This tolerance may not be extended to include produce with a size below 50 mm or 70 g if the refractometric index is below 10.5°Brix.

**8.2** The contents of each package shall be uniform and contain only apples of the same origin, quality, size (if sized) and variety. The visible part of the contents of the package shall be representative of the entire contents.

**8.3** The uniformity of apples may be measured in accordance with one of the following options by diameter:

**8.3.1** The maximum diameter difference of apples in the same package shall be limited to:

**8.3.2** 5 mm if the diameter of the apples is less than 80 mm.

**8.3.3** 12 mm if the diameter of the apple is within 80 mm to 120mm.

**8.3.4** 20mm if the diameter of the apple is equal to or over 120mm.

## **9 Classification**

The produce shall be classified based on tolerance level as depicted in Table 1 & 2.

### **9.1 Class I**

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

### **9.2 Class II**

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Apples in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- slight defects in coloring;
- slight skin healed defect due to mechanical causes.

### 9.3 Class III

This class includes apples which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements. The following defects may be allowed, provided the mandarins retain their essential characteristics as regard the quality, the keeping quality and presentation:

- defects in shape;
- defects in coloring;
- skin defects due to mechanical causes.

Table 1- Percentage of Defects by Surface Area

Defects	Percentage of Defects by Surface Area		
	Class I	Class II	Class III
Russeting (smooth net-like)	3%	20%	20%
Russeting (smooth solid)	1%	5 %	33 %
Accumulation for both types of russeting should not exceed the following	3 %	20 %	50%
Cuts	Not Allowed	Not Allowed	<1%
Punctured Skin	Not Allowed	Not Allowed	<1%
Mechanical Damage	Not Allowed	Not Allowed	<3 %
Hailed	Not Allowed	< 1 %	<3 %
Bruising	Not Allowed	<2 %	<4 %
Rusting	Not Allowed	< 3 %	<5 %

Sun burn	Not Allowed	< 1 %	< 5 %
Shriveled	Not Allowed	< 1 %	<5 %
Fruit Pressure	Above 17lbs	15-16 lbs	12-15 lbs
Scald	Not Allowed	<3 %	< 5 %
Ruptured Skin	Not Allowed	Not Allowed	< 1 %

Table 2- Quality Tolerances

S.No.	Quality Tolerances	Percentage of defective produce, by number or weight		
		Class I	Class II	Class III
1	Total Tolerances for apple not satisfying the minimum requirements including defects (Refer Table 1), of which no more than:	5	10	10
2	Corresponding to the size immediately above and/or below that indicated on the package as per the sizing.	10	10	10
3	Corresponding to the color immediately above and/or below that indicated on the package as per the color.	5	10	10

## 10 Sampling

Random sampling shall be done as per any national/ internationally accepted sampling methods.

## 11 Test Methods

Laboratory may use any validated method of analysis.

## 12 Packaging

**12.1** The produce shall be packed in such a way as to protect the produce properly.

**12.2** The materials used inside the package shall be clean and of a quality such as to avoid causing any external or internal damage to the produce.

**12.3** The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labeling has been done with non-toxic materials.

**12.4** The produce should be packed in each container in compliance with the Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables (CXC 44-1995).

## 12.5 Labelling

### 12.5.1 Identification

Packers and/or dispatcher name and address or officially issued or accepted code mark.

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- 13.2** Name of Produce/Variety
- 13.3** Date of Packaging (Optional)
- 13.4** Size Range; *eg: 140-160mm*
- 13.5** Color Code
- 13.6** Net Weight (Optional)
- 13.7** Origin of produce
- 13.8** Class
- 13.9** Official inspection/certification mark (optional)

### **14 Storage and Transport**

**14.1** The produce shall be stored in well protected structure from the sun, rain and excessive heat. In addition, the store should be dry, well ventilated, free from objectionable odours and insects/ rodents proof.

**14.2** The produce should be stored at a temperature between 1-4 °C with relative humidity level from 85-90 %.

**14.2** The packages should be handled and transported in such a way that they are protected from rain, sun or other sources of excessive heat, foreign odours and any other contaminants.

**Bibliography**

- [1] International Standards for Fruit and Vegetables
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- [3] Apple quality standards, NPHC, Paro

**FOOD AND AGRICULTURE TECHNICAL COMMITTEE (TC 02)**

<b><i>Organization</i></b>	<b><i>Representative(s)</i></b>
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Bhutan Agriculture and Food Regulatory Authority, Thimphu	Mr. Kubir Nath Bhattarai (Alternate)
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Bhutan Agro Industries Limited, Thimphu	Mrs. Jigme Wangmo (Alternate)
Bhutan Exporters Association, Phuentsholing	Mr. Dorji Tshering
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Bhutan Livestock Development Corporation Limited, Thimphu	Mr. Pema Khandu (Alternate)
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Department of Agriculture, Ministry of Agriculture and Forests, Thimphu	Mr. Jimba Rabgyel (Alternate)
Department of Agricultural Marketing and Cooperatives, Ministry of Agriculture and Forests, Thimphu	Mr. Dawa Tshering
Department of Agricultural Marketing and Cooperatives, Ministry of Agriculture and Forests, Thimphu	Mr. Jamyang Lophyal (Alternate)
Department of Industry, Ministry of Economic Affairs, Thimphu	Mr. Tashi Dorji
National Post Harvest Centre, Paro	Mr. Dechen Tshering
Office of Consumer Protection, Ministry of Economic Affairs, Thimphu	Mr. Jigme Dorji
Office of Consumer Protection, Ministry of Economic Affairs, Thimphu	Chencho Zangmo (Alternate)
Bhutan Standards Bureau, Thimphu	Mr. Sherab Tenzin, Director General (Ex-officio member)

**Member Secretary**  
Cheki Zangmo  
Standardization Division  
Bhutan Standards Bureau



**Subcommittee on Fruits and Vegetables (TC02/SC15)**

<b>Organization</b>	<b>Representatives</b>
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Department of Agriculture, MoAL	Mr. Pradeep Rai Member
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**Member Secretary**  
Kesang P Namgay  
Standardization Division  
Bhutan Standards Bureau