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UNECE Standard FFV-50 concerning the marketing and commercial quality control of apples

Note by the secretariat

I. Definition of produce

This standard applies to apples of varieties (cultivars) grown from *Malus domestica* Borkh. to be supplied fresh to the consumer, apples for industrial processing being excluded.

II. Provisions concerning quality

The purpose of the standard is to define the quality requirements for apples at the export-control stage after preparation and packaging.

However, if applied at stages following export, products may show in relation to the requirements of the standard:

- · a slight lack of freshness and turgidity
- for products graded in classes other than the "Extra" Class, a slight deterioration due to their development and their tendency to perish.

The holder/seller of products may not display such products or offer them for sale, or deliver or market them in any manner other than in conformity with this standard. The holder shall be responsible for observing such conformity.

A. Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the apples must be:

- · intact
- sound; produce affected by rotting or deterioration such as to make it unfit for consumption is excluded
- clean, practically free of any visible foreign matter
- · practically free from pests
- free from damage caused by pests affecting the flesh
- free from serious watercore, with the exception of Fuji and their mutants
- · free of abnormal external moisture
- free of any foreign smell and/or taste.

The development and condition of the apples must be such as to enable them:

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

B. Maturity requirements

The apples must be sufficiently developed, and display satisfactory ripeness.

The development and state of maturity of the apples must be such as to enable them to continue their ripening process and to reach the degree of ripeness required in relation to the varietal characteristics.

In order to verify the minimum maturity requirements, several parameters can be considered (e.g. morphological aspect, taste, firmness and refractometric index).

C. Classification

Apples are classified in three classes, as defined below:

(i) "Extra" Class

Apples in this class must be of superior quality. In shape, size and colouring they must be characteristic of the variety¹ and the stalk must be intact.

Apples must express the following minimum surface colour characteristic of the variety²:

- 3/4 of total surface red coloured in case of colour group A
- 1/2 of total surface mixed red coloured in case of colour group B

A non-exhaustive list of varieties providing a classification on colouring and russeting is set out in the annex to this standard.

² Reservation by the United States: For "Extra" Class and Class I, due to differences in its national legislation that allow different colour requirements.

• 1/3 of total surface slightly red coloured, blushed or striped in case of colour group C.

The flesh must be perfectly sound.

They must be free from defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- · very slight skin defects
- very slight russeting³, such as
 - Brown patches that may not go outside the stem cavity and may not be rough and/or
 - · Slight isolated traces of russeting.

(ii) Class I

Apples in this class must be of good quality. In shape, size and colouring they must be characteristic of the variety¹.

Apples must express the following minimum surface colour characteristic of the variety:

- 1/2 of total surface red coloured in case of colour group A
- 1/3 of total surface mixed red coloured in case of colour group B
- 1/10 of total surface slightly red coloured, blushed or striped in case of colour group C.

The flesh must be perfectly sound.

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:

- · a slight defect in shape
- a slight defect in development
- · slight defects in colouring
- slight bruising not exceeding 1 cm² in area and not discoloured
- slight skin defects, which must not extend over more than:
 - 2 cm in length for defects of elongated shape
 - 1 cm² of the total surface area for other defects, with the exception of scab (Venturia inaequalis), which must not extend over more than 0.25 cm², cumulative, in area
- slight russeting³, such as
 - brown patches that may go slightly beyond the stem or pistil cavities but may not be rough and/or
 - thin net-like russeting not exceeding 1/5 of the total fruit surface and not contrasting strongly with the general colouring of the fruit and/or

³ Varieties marked with "R" in the annex are exempt from the provisions on russeting.

- dense russeting not exceeding 1/20 of the total fruit surface, while
- thin net-like russeting and dense russeting taken together may not exceed a maximum of 1/5 of the total surface of the fruit.

The stalk may be missing, provided the break is clean and the adjacent skin is not damaged.

(iii) Class II

This class includes apples that do not qualify for inclusion in the higher classes but satisfy the minimum requirements specified above.

The flesh must be free from major defects.

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

- · defects in shape
- · defects in development
- · defects in colouring
- slight bruising not exceeding 1.5 cm² in area which may be slightly discoloured
- skin defects, which must not extend over more than:
 - 4 cm in length for defects of elongated shape
 - 2.5 cm² total surface area for other defects, with the exception of scab (Venturia inaequalis), which must not extend over more than 1 cm², cumulative. in area
- slight russeting³, such as:
 - brown patches that may go beyond the stem or pistil cavities and may be slightly rough and/or
 - thin net-like russeting not exceeding 1/2 of the total fruit surface and not contrasting strongly with the general colouring of the fruit and/or
 - dense russeting not exceeding 1/3 of the total fruit surface while
 - thin net-like russeting and dense russeting taken together may not exceed a maximum of 1/2 of the total surface of the fruit.

III. Provisions concerning sizing

Size is determined either by the maximum diameter of the equatorial section or by weight.

For all varieties and for all classes the minimum size is 60 mm, if measured by diameter, or 90 g, if measured by weight. Fruit of smaller sizes may be accepted if the Brix level of the produce is equal to or greater than 10.5° Brix and the size is not smaller than 50 mm or 70 g.

To ensure uniformity in size⁴:

- (a) For fruit sized by diameter, the difference in diameter between fruit in the same package shall be limited to:
 - 5 mm for "Extra" Class fruit and for Classes I and II fruit packed in rows and layers5;
 - 10 mm for Class I fruit packed loose in the package or in consumer packages.6;
- (b) For fruit sized by weight:
 - For "Extra" Class and Class I apples packed in rows and layers, the difference in weight between the lightest and the heaviest fruit in the same package shall be limited to:

Range (g)	Weight difference (g)
70-90	15
91-135	20
136-200	30
201-300	40
> 301	50

 For Class I fruit packed loose in the package or in consumer packages, the difference in weight between the heaviest and the lightest fruit shall be limited to:

Range (g)	Weight difference (g)		
70-135	35		
136-300	70		
> 301	100		

There is no sizing uniformity requirement for Class II fruit packed loose in the package or in consumer packages.

IV. Provisions concerning tolerances

At all marketing stages, tolerances in respect of quality and size shall be allowed in each lot for produce not satisfying the requirements of the class indicated.

A. Quality tolerances

(i) "Extra" Class

A total tolerance of 5 per cent, by number or weight, of apples not satisfying the requirements of the class but meeting those of Class I is allowed. Within this tolerance not more than 0.5 per cent in total may consist of produce satisfying the requirements of Class II quality.

⁴ Reservation by the United States: Due to differences in the national legislation that allows the uniformity by diameter up to 12.5 mm for all apples irrespective of their size and/or class.

⁵ However, for apples of the varieties Bramley's Seedling (Bramley, Triomphe de Kiel) and Horneburger, the difference in diameter may amount to 10 mm.

⁶ However, for apples of the varieties Bramley's Seedling (Bramley, Triomphe de Kiel) and Horneburger, the difference in diameter may amount to 20 mm.

(ii) Class I

A total tolerance of 10 per cent, by number or weight, of apples not satisfying the requirements of the class but meeting those of Class II is allowed. Within this tolerance not more than 1 per cent in total may consist of produce satisfying neither the requirements of Class II quality nor the minimum requirements, or of produce affected by decay.

(iii) Class II

A total tolerance of 10 per cent, by number or weight, of apples satisfying neither the requirements of the class nor the minimum requirements is allowed. Within this tolerance not more than 2 per cent in total may consist of produce affected by decay.

B. Size tolerances

For all classes: a total tolerance of 10 per cent, by number or weight, of apples not satisfying the requirements as regards sizing is allowed. This tolerance may not be extended to include produce with a size:

- 5 mm below the minimum diameter, when size is determined by diameter;
- 10 g below the minimum weight, when size is determined by weight.

V. Provisions concerning presentation

A. Uniformity

The contents of each package must be uniform and contain only apples of the same origin, variety, quality, and size (if sized) and the same degree of ripeness.

In the case of the "Extra" Class, uniformity also applies to colouring.

However, a mixture of apples of distinctly different varieties may be packed together in a sales unit⁷, provided they are uniform in quality and, for each variety concerned, in origin.

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

B. Packaging

The apples must be packed in such a way as to protect the produce properly. In particular, consumer packages of a net weight exceeding 3 kg shall be sufficiently rigid to ensure proper protection of the produce.

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.

Stickers individually affixed to the produce shall be such that, when removed, they neither leave visible traces of glue, nor lead to skin defects.

Packages must be free of all foreign matter.

⁷ The sales unit should be designed to be purchased in its entirety.

VI. Provisions concerning marking

Each package⁸ 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/shipper: 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 authority⁹.

B. Nature of produce

- "Apples" if the contents are not visible from the outside
- Name of the variety.

The name of the variety can be replaced by a synonym. The name of the mutant or a trade name can only be given in addition to the variety or the synonym.

In the case of sales units containing a mixture of apples of distinctly different varieties, names of the different varieties.

C. Origin of produce

Country of origin and, optionally, district where grown, or national, regional or local place name. In the case of sales units containing a mixture of distinctly different varieties of apples of different origins, the indication of each country of origin shall appear next to the name of the variety concerned.

D. Commercial specifications

- Class
- Size, or for fruit packed in rows and layers, number of units.

If identification is by the size, this should be expressed:

 for produce subject to the uniformity rules, as minimum and maximum diameters or minimum and maximum weight

According to the Geneva Protocol, footnote 2, "Package units of produce prepacked for direct sale to the consumer shall not be subject to these marking provisions but shall conform to the national requirements. However, the markings referred to shall in any event be shown on the transport packaging containing such package units".

The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark, and the code mark should be preceded by the ISO 3166 (alpha) country/area code of the recognizing country, if not the country of origin.

(b) for produce not subject to the uniformity rules, the diameter or weight of the smallest fruit in the package followed by "and over" or equivalent denomination or, if appropriate, the diameter or weight of the largest fruit in the package.

E. Official control mark (optional)

Annex

Non-Exhaustive List of Apple Varieties¹⁰

1. Some of the varieties listed in the following may be marketed under names for which trademark protection has been sought or obtained in one or more countries. Names believed by the United Nations to be varietal names are listed in the first column. Other names by which the United Nations believes the variety may be known are listed in the second and third columns. None of these three columns is intended to include trademarks. References to known trademarks have been included in the fourth column for information only. The presence of any trademarks in the fourth column does not constitute any licence or permission to use that trademark – such licence must come directly from the trademark owner. In addition, the absence of a trademark in the fourth column does not constitute any indication that there is no registered/pending trademark for such a variety.¹¹

Variety	Mutant	Synonyms	Trade names	Colour group	Russeting
African Red			African Carmine	В	
Akane		Tohoku 3	Primerouge ®	В	
Alborz Seedling				C	
Aldas				В	
Alice				В	
Alkmene		Early Windsor		C	
Alro				В	
Alwa				В	
Amasya				В	
Angold				C	
Antej		Antei		В	
Apollo		Beauty of Blackmoor		С	

Fruits of varieties that are not part of the list must be graded according to their varietal characteristics. Coloured varieties as well as those showing a characteristic russeting should be included in the list to provide information about the varietal characteristics. The update of the list may be requested through the Specialized Section for the Standardization of Fresh Fruit and Vegetables.

Some of the varietal names listed in the first column may indicate varieties for which patent protection has been obtained in one or more countries. Such proprietary varieties may only be produced or traded by those authorized by the patent holder to do so under an appropriate licence. The United Nations takes no position as to the validity of any such patent or the rights of any such patentholder or its licensee regarding the production or trading of any such variety.

Variety	Mutant	Synonyms	Trade names	Colour group	Russeting
Arkcharm		Arkansas No 18, A 18		С	
Arlet				В	R
Aroma				С	
	Mutants of Aroma, e.g.			С	
	Amorosa			С	
Auksis				В	
Beacon				A	
Belfort		Pella		В	
Belle de Boskoop					R
	Mutants of Belle de Boskoop, e. g.				R
	Boskoop rouge	Red Boskoop Roter Boskoop			R
Belle fleur double					
Belorrusskoje Maļinovoje		Belorusskoe Malinovoe, Byelorusskoe Malinovoe		В	
Berlepsch		Freiherr von Berlepsch		С	
	Mutants of Berlepsch, e. g.			С	
	Berlepsch rouge	Red Berlepsch, Roter Berlepsch		С	
Blushed Golden					
Bogatir		Bogatyr			
Bohemia				В	
Braeburn				В	
	Mutants of Braeburn, e. g.			В	
	Hidala		Hillwell ®	В	

Variety	Mutant	Synonyms	Trade names	Colour group	Russeting
	Joburn		Aurora [™] , Red Braeburn [™] , Southern Rose [™]	В	
	Lochbuie Red Braeburn			В	
	Mahana Red		Redfield ®	В	
	Mariri Red		Eve [™] , Red Braeburn [™] , Southern Rose [™]	В	
	Redfield		Red Braeburn™, Southern Rose™	В	
	Royal Braeburn			В	
Bramley's Seedling		Bramley, Triomphe de Kiel			
Brettacher Sämling					
Calvilles, Groupe des					
Cardinal				В	
Carola		Kalco		C	
Caudle			Cameo™	В	
Charden					
Charles Ross					
Civni			Rubens ®	В	
Coromandel Red		Corodel		A	
Cortland				В	
Cox's Orange Pippin		Cox orange		С	R
	Mutants of Cox's Orange Pippin, e. g.			С	R
	Cherry Cox			С	R
Crimson Bramley					
Cripps Pink			Pink Lady ®	С	

Variety	Mutant	Synonyms	Trade names	Colour group	Russeting
	Mutants of Cripps Pink, e. g.			С	
	Pink rose			С	
	Rosy Glow			C	
	Ruby Pink			C	
Cripps Red			Sundowner™	C ¹²	
Dalinbel				В	R
Delblush			Tentation ®		
Delcorf			Delbarestivale ®	С	
	Mutants of Delcorf, e. g.			С	
	Dalili		Ambassy ®	С	
	Monidel			C	
Delgollune			Delbard Jubilé®	В	
Delicious ordinaire		Ordinary Delicious		В	
Deljeni			Primgold ®		
Delikates				В	
Delor				C	
Discovery				С	
Doč Melbi		Doch Melbi		С	
Dunn's Seedling					R
Dykmanns Zoet				C	
Egremont Russet					R
Elan					
Elise		Red Delight	Roblos ®	A	
Ellison's orange		Ellison		C	
Elstar				C	
	Mutants of Elstar, e. g.				
	Bel-El		Red Elswout™	С	

 $^{^{12}}$ With minimum 20% for Class I and Class II.

Variety	Mutant	Synonyms	Trade names	Colour group	Russeting
	Daliest		Elista™	С	
	Daliter		Elton™	С	
	Elshof			С	
	Elstar Armhold			С	
	Elstar Reinhardt			С	
	Goedhof		Elnica™	C	
	Red Elstar			С	
	Valstar			С	
Empire				A	
Falstaff				С	
Fiesta		Red Pippin		С	
Florina			Querina ®	В	
Forele				В	
Fortune					R
Fuji				В	
	Mutants of Fuji, e. g.			В	
	Kiku			В	
Gala				С	
	Mutants of Gala, e. g.			С	
	Annaglo			С	
	Baigent		Brookfield ®	С	
	Galaxy			С	
	Mitchgla		Mondial Gala ®	С	
	Obrogala			С	
	Regala			С	
	Regal Prince		Gala Must ®	С	
	Tenroy		Royal Gala ®	С	
Garcia					
Ginger Gold					
Gloster				В	
Goldbohemia					

Variety	Mutant	Synonyms	Trade names	Colour group	Russeting
Golden Delicious					
	Mutants of Golden Delicious				
Golden Russet					R
Golden Supreme		Gradigold, Golden Extreme			
Goldrush		Coop 38			
Goldstar					
Granny Smith					
Gravensteiner		Gravenstein			
	Mutants of Gravensteiner, e. g.				
	Gravenstein rouge	Red Gravenstein, Roter Gravensteiner			
Greensleeves					
Holsteiner Cox		Holstein			R
	Mutants of Holsteiner Cox, e. g.				R
	Holstein rouge	Red Holstein, Roter Holsteiner Cox			R
Honeycrisp			Honeycrunch ®	С	
Honey gold					
Horneburger					
Howgate Wonder		Manga			
Idared				В	
Iedzēnu				В	
Ilga				В	
Ingrid Marie				В	R
Iron			Demir Apple	С	
Isbranica				С	

Variety	Mutant	Synonyms	Trade names	Colour group	Russeting
Jacob Fisher					
Jacques Lebel					
Jamba				С	
James Grieve					
	Mutants of James Grieve, e. g.				
	James Grieve rouge	Red James Grieve			
Jarka				С	
Jerseymac				В	
Jester					
Jonagold ¹³				C	
	Mutants of Jonagold, e. g.			С	
	Crowngold			С	
	Daligo			С	
	Daliguy	Jonasty		С	
	Dalijean	Jonamel		C	
	Decosta			C	
	Jomar		Marnica ®	C	
	Jomured	Van de Poel		C	
	Jonabel			С	
	Jonabres			С	
	Jonagold Boerekamp		Early Queen ®	С	
	Jonagold 2000	Excel		С	
	Jonagored Supra			С	
	Jonaveld		First Red ®	С	
	King Jonagold			С	
	New Jonagold	Fukushima		С	

However, for the variety Jonagold at least one-tenth of the surface of the fruit in Class II must be striped with red colouring.

Variety	Mutant	Synonyms	Trade names	Colour group	Russeting
	Novajo	Veulemanns		С	
	Primo			С	
	Red Jonaprince		Wilton's ®, Red Prince ®	С	
	Romagold	Surkijn		С	
	Rubinstar			С	
	Schneica	Jonica		С	
	Wilmuta			С	
Jonalord				С	
Jonathan				В	
Julia				В	
Jupiter					
Karmijn de Sonnaville				С	
Katja		Katy		В	
Kent					R
Kidd's Orange Red				С	R
Kim				В	
Koit				С	
Koričnoje Novoje		Korichnoe Novoe, Korichnevoe Novoe		С	
Kovaļenkovskoje				В	
Krameri Tuvioun				В	
Kukikovskoje				В	
Lady Williams				В	
Lane's Prince Albert					
Laxton's Superb				С	R
Ligol				В	
Lobo				В	

Variety	Mutant	Synonyms	Trade names	Colour group	Russeting
Lodel				A	
Lord Lambourne				С	
Maigold				В	
McIntosh				В	
Meelis				В	
Melba				С	
Melodie				В	
Melrose				С	
Meridian				С	
Moonglo				С	
Morgenduft		Imperatore		В	
Mutsu			Crispin ®		
Noris				В	
Normanda				С	
Nueva Europa				С	
Nueva Orleans				В	
Odin				В	
Ontario				В	
Orlik				В	
Orlovskoje polosatoje				С	
Ozark Gold					
Paula Red				В	
Pero de Cirio					
Piglos				В	
Pikant				В	
Pikkolo				С	
Pilot				С	
Pimona				C	
Pinova			Corail ®	С	
Pirella			Pirol ®	В	

Variety	Mutant	Synonyms	Trade names	Colour group	Russeting
Piros				С	
Prima				В	
Rafzubex			Rubinette ® Rosso	A	
Rafzubin			Rubinette ®	С	
Rajka				В	
Rambour d'hiver					
Rambour Franc				В	
Reanda				В	
Rebella				С	
Red Delicious				A	
	Mutants of Red Delicious, e. g.			A	
	Erovan	Early Red One		A	
	Fortuna Delicious			A	
	Oregon	Oregon Spur Delicious		A	
	Otago			A	
	Red Chief			A	
	Red King			A	
	Red Spur			A	
	Red York			A	
	Richared			A	
	Royal Red			A	
	Shotwell Delicious			A	
	Stark Delicious			A	
	Starking			A	
	Starkrimson			A	
	Starkspur			A	
	Topred			A	
	Well Spur			A	
Red Dougherty				A	

Variety	Mutant	Synonyms	Trade names	Colour group	Russeting
Redkroft				A	
Regal				A	
Regina				В	
Reglindis				С	
Reine des Reinettes		Gold Parmoné, Goldparmäne		С	
Reineta Encarnada				В	
Reinette Blanche du Canada		Reinette du Canada, Canada Blanc, Kanadarenette			R
Reinette de France					
Reinette de Landsberg					
Reinette de Orléans					
Reinette Grise du Canada		Graue Kanadarenette			R
Reinette Rouge du Canada				В	
Relinda				С	
Remo				В	
Renora				В	
Resi				В	
Resista					
Retina				В	
Rewena				В	
Roja de Benejama		Verruga, Roja del Valle, Clavelina		A	
Rome Beauty		Belle de Rome, Rome		В	
	Mutants of Rome Beauty, e. g.			В	

Variety	Mutant	Synonyms	Trade names	Colour group	Russeting
	Red Rome			В	
Rosana				В	
Royal Beauty				A	
Rubin (Czech cultivar)				С	
Rubin (Kazakhstan cultivar)				В	
Rubinola				В	
Rudens Svītrainais		Osennee Polosatoe, Rudeninis Dryzuotasis, Rudens Svitrotais, Streifling, Streifling Herbst, Sügisjoonik, Syysjuovikas and numerous others		С	
Saltanat				В	
Sciearly			Pacific Beauty™	A	
Scifresh			Jazz™	В	
Sciglo			Southern Snap™	A	
Sciray		GS48		A	
Scired			Pacific Queen™	A	R
Sciros			Pacific Rose™	A	
Selena				В	
Shampion				В	
Sidrunkollane Talioun					
Sinap Orlovskij					
Snygold		Earlygold			
Sommerregent				С	
Spartan				A	

Variety	Mutant	Synonyms	Trade names	Colour group	Russeting
Splendour				A	
St. Edmunds Pippin					R
Starks's Earliest				С	
Štaris		ris		A	
Sturmer Pippin					R
Summerred				В	
Sügisdessert				С	
Sunrise				A	
Sunset					R
Suntan					R
Sweet Caroline				С	
Talvenauding				В	R
Tellisaare				В	
Tiina		Tina		С	
Topaz				В	
Tydeman's Early Worcester		Tydeman's Early		В	
Veteran				В	
Vista Bella		Bellavista		В	
Wealthy				В	
Worcester Pearmain				В	
York				В	
Zailijskoje		Zailiyskoe		В	
Žigulovskoje		Zhigulevskoe	;	С	

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The OECD Scheme for the Application of International Standards for Fruit and Vegetables has published an explanatory illustrated brochure on the application of this standard. The publication may be obtained from the OECD bookshop at: www.oecdbookshop.org.

The text of the standard for apples was previously part of a combined standard for apples and pears (FFV-01), published in 1960 and revised in 1996 and 2000.