

Unofficial Translation

In the event of any doubt or misunderstanding arising from this translation, the standard in Thai will be held to be authoritative.

Thai Industrial Standard For Canned pineapple TIS 51-2530(1987)

1. Scope

- 1.1 This standard specifies styles, types of pack, composition, requirements, food additives, contaminants, hygiene, quantity, marking and labelling, sampling and criteria for conformity, and analyses of canned pineapple.

2. Definitions

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

- 2.1 CANNED PINEAPPLE : The product prepared from pineapple packed with packing media with or without food additives and other ingredients in container, and processed by heat in an appropriate manner so as to prevent spoilage or destroy the growth of micro-organisms.
- 2.2 PINEAPPLE : Pineapple conforming to the characteristics of Ananas comosus (L.) Merr. or other varieties for canning from which peel and core have been removed.
- 2.3 PACKING MEDIA : Water, pineapple juice and nutritive sweeteners, individually or in combination, packed in canned pineapple.
- 2.4 DRAINED WEIGHT : The weight of canned pineapple after the packing media have been drained by the method directed in this standard.
- 2.5 CAN : A cylindrical container made of tinfoil, chromium plated tin free steel or aluminium of which the top and the bottom coated or not coated with lacquer.
- 2.6 WATER CAPACITY OF THE CONTAINER : The volume or weight of distilled water at 20°C which the sealed container will hold when completely filled.

3. Styles

Canned pineapple is available in 12 styles as follows:

- 3.1 *Whole* : A whole unit of pineapple being trimmed into cylinder.
- 3.2 *Slices* or *spiral slices* or *whole slice* or *rings* : Uniformly cut, circular slices or rings cut across the axis of the pineapple cylinders defined as in clause 3.1.
- 3.3 *Half slices* : Uniformly cut, approximately semi-circular halves of slices or rings defined as in clause 3.2.
- 3.4 *Quarter slices* : Uniformly cut, one-fourth portions of slices or rings as in clause 3.2 or approximately halves of half slices as in clause 3.3.
- 3.5 *Broken slices* : Arc-shaped portions which may not be uniform in size and/or shape.

- 3.6 *Chunks* : Short, thick pieces cut from thick slices or the pineapple cylinder, and predominantly more than 12 mm in both thickness and width and less than 38 mm in length.
- 3.7 *Spears* or *fingers* : Long, slender pieces cut radially and lengthwise of the cored pineapple cylinder predominantly 65 mm or longer.
- 3.8 *Tidbits* : Reasonably uniform, wedge-shaped sectors cut from slices or rings (defined as in clause 3.2, 3.3, 3.4 or 3.5), predominantly from 8 mm to 13 mm in thickness.
- 3.9 *Diced* or *Cubes* : Cube-shaped pieces, being 14 mm or less in the longest edge dimensions.
- 3.10 *Pieces* : Irregular shapes and sizes not identifiable as a specific style and does not include chunks or chips style.
- 3.11 *Chips* : Small, irregular shapes and sizes of pineapple pieces similar to that left over after dicing of pineapple and which may be included in crushed style.
- 3.12 *Crushed* or *crisp cut* : Finely cut or shredded or grated or diced pieces of pineapple and which may include chips.

4. Types of pack

- 4.1 Regular pack : Canned pineapple packed with liquid packing medium and containing at least 58% drained weight for all styles except whole, and at least 63% drained weight for crushed or chips styles.
- 4.2 Heavy pack : Chips or crushed styles with or without nutritive sweeteners and containing at least 73% drained weight.
- 4.3 Solid pack : Chips or crushed styles with or without nutritive sweeteners and containing at least 78% drained weight.

5. Composition

Apart from pineapple, the product is prepared from the composition as follows :

- 5.1 Packing media, one or more of the following :
- (1) Water
 - (2) Mixture of water and pineapple juice
 - (3) Pineapple juice, natural or clarified
 - (4) Dry nutritive sweeteners :
 - Sucrose,
 - Invert sugar,
 - Dextrose,
 - Dried glucose syrup,
 without added liquid except such slight amounts of steam or natural pineapple juice as occur in the normal canning of the product.
 - (5) Syrup : a mixture of the packing media as clause (1), (2) or (3) and the substance as clause (4).
- 5.2 Other permitted ingredients : spices, spice oils, vinegar and mint.

6. Requirements

- 6.1 Colour
The canned pineapple shall have the colour normal for the varietal type or the ingredients use.
Compliance is checked by visual inspection.
- 6.2 Flavour
Canned pineapple shall have an odour and flavour characteristic of that imparted by the pineapple and the ingredients used.
Compliance is checked by visual inspection.
- 6.3 Texture
The product shall be prepared from mature pineapple, reasonably firm in texture, compact in structure and free from porosity. The drained pineapple shall contain no more than 7% by weight of core material.
Compliance is checked by the test of clause 13.1.1.
- 6.4 Uniformity of size and shape
Each individual container shall be packed with pineapple of the same style with a regular size and shape as follows :
- 6.4.1 *Slices or spiral slices or whole slices or rings* : The weight of the largest slice in the container shall be not more than 1.4 times the weight of the smallest.
- 6.4.2 *Half slices or quarter slices* : The weight of the largest slice in the container shall be not more than 1.75 times the weight of the smallest, except for an occasional broken piece due to splitting or an occasional whole slice not completely cut through.
- 6.4.3 *Spears or fingers* : The weight of the largest unbroken unit in the container shall be not more than 1.4 times the weight of the smallest unbroken unit.
- 6.4.4 *Tidbits* : Not more than 15% of the drained weight of pineapple in the container may consist of tidbits, each of which shall weigh less than three-fourths of the average weight of the untrimmed tidbits.
- 6.4.5 *Chunks* : Not more than 15% of the drained weight of pineapple in the container may consist of pieces which weigh less than 5 g each.
- 6.4.6 *Cubes or diced*
- 6.4.6.1 Not more than 10% of the drained weight of pineapple in the container may consist of pieces of the size passable through a screen of 8 mm square openings; and
- 6.4.6.2 Not more than 15% of the drained weight of pineapple in the container may consist of pieces weighing more than 3 g each.
- 6.5 Allowance for defects
The following features of certain common defects may be allowable in the amounts not greater than the maximum limits specified in Table 1.
- 6.5.1 Blemish : Areas which contrast strongly in colour or texture with the normal pineapple tissue including deep fruit eyes, pieces of shell, brown spots, bruised portions and other abnormalities.
- 6.5.2 Broken : A unit severed into definite parts; all of such portions that equal the size of a full-size unit are considered one defect.
This defect is determined only in styles of slices and spears.
- 6.5.3 Excessive trim : A unit trimmed to the extent that its normal shape and conformation is destroyed and detracts from the appearance of such unit; or a unit trimmed away exceeds 5% of the average weight of the perfectly formed unit in the container for that style.
This defect is determined only in styles of whole, half slices, quarter slices and spears.

6.6 Acidity and alkalinity

The pH value of the product shall not exceed 4.5.

Compliance is checked by the test of clause 13.1.2.

Table 1
Permissible limitations of defects
(clause 6.5)

Item	Styles	Defects	
		Units with excessive trim	Blemish or broken
1	<i>Whole</i>	10% by count of fruit units*	3 blemishes per fruit unit
2	<i>Slices or spiral slices or whole slices or rings</i> <i>Half slices</i> <i>Quarter slices</i>	(a) 1 unit if 10 or less per can ; (b) 2 units if over 10 but not over 27 per can ; (c) 7.5% by count if over 27 per can	(a) 1 unit if 5 or less per can ; (b) 2 units if over 5 but not over 10 per can ; (c) 4 units if over 10 but not over 32 per can ; (d) 12.5% by count if over 32 per can
3	<i>Spears</i>	15% by count of all units	Same as No.2
4	<i>Broken slices</i> <i>Tidbits</i> <i>Chunks</i> <i>Cubes or diced pieces</i> <i>Pieces</i>	not applicable	12.5% by count of all units
5	<i>Chips</i> <i>Crushed or crisp cut</i>	not applicable	1.5% by weight of the drained fruit

* Based on the average from all containers in the sample.

6.7 Cut-out strength

The cut-out strength, being determined when packed in syrup, is classified into 4 as follows:

Extra-light syrup:	not less than 10° Brix
Light syrup:	not less than 14° Brix
Heavy syrup:	not less than 18° Brix
Extra heavy syrup:	not less than 22° Brix

Analysis is as directed in clause 13.1.3. The average degrees Brix shall be not less than the declare and no container shall have a Brix value lower than that of the minimum of the next category below.

7. Food additives

Types and amounts of food additives, if used, shall be as follows :

7.1 Natural fruit essence, suitable amounts of use

7.2 Mint oil, suitable amounts of use

7.3 Acidifying agent

Citric acid, suitable amounts of use

7.4 Antifoaming agent

Dimethylpolysiloxane, not exceeding 10 mg/kg

Analysis is as directed in *Food Additives Analytical Manual*. U.S. Food and Drug Administration. Prepared by Roberta M. Ma and Murrel P. Morris 1965.

NOTE Suitable amounts of use means the appropriate amount of food additive is used to the extent possible in good manufacturing practice.

8. Contaminant

8.1 Tin, not exceeding 250 mg/kg

Analysis is as directed in clauses 25.131 to 25.138 of AOAC (1984).

9. Hygiene

9.1 The hygiene in manufacturing canned pineapple shall be in accordance with TIS 61, Standard for hygienic practice for canned fruit and vegetable products.

9.2 When tested as in clause 13.2.1, the cans shall not swell.

In case of non- swollen can, there shall be no abnormalities in colour, odour nor other characteristics of canned pineapple.

9.3 When tested as in clause 13.2.2, the product shall be free from pathogenic micro-organisms or toxic substances originating from micro-organisms in amounts which may represent a hazard to health.

10. Quantity

10.1 The fill of container shall not be less than 90% of the water capacity of the container. Compliance is checked by the test of clause 13.1.4.

10.2 The average drained weight shall not be less than the values specified in Table 2 and there shall be no unreasonable shortage in individual containers.

Compliance is checked by the test of clauses 32.001 to 32.002 of AOAC (1984).

Table 2
Drained weight
(clause 10.2)

Styles and types of pack	Drained weight Percentage of the water capacity of the container
All styles (except the styles of whole, chips and crushed)	58
Regular pack Chips and crushed	63
Heavy pack Chips and crushed	73
Solid pack Chips and crushed	78

11. Marking and labelling

- 11.1 Each can of canned pineapple shall bear at least number, letter or mark indicating clearly and legibly the following information :
- (1) Styles (as in clause 3)
 - (2) Packing medium and cut-out strength if packed in syrup as defined in clause 5.1 (5)
 - (3) Only for *crushed* or *crisp cut* style packed in pineapple juice as clause 5.13(3), the statement as "Unsweetened" or "No sugar added" may be declare
 - (4) Only for *crushed* or *crisp cut* style packed in pineapple juice and sugar, the following can be substituted for the cut-out strength defined as in clause (2) :
Extra lightly sweetened instead of "Extra light syrup";
Lightly sweetened instead of "Light syrup";
Heavily sweetened instead of "Heavy syrup";
Extra heavily sweetened instead of "Extra heavy syrup"
 - (5) Other permitted composition and food additives
 - (6) Net weight
 - (7) Month and year of manufacture or of expiration or month and year appropriate for consumption
 - (8) Name and address of manufacturer or trade-mark, or name and address of packer or distributor
 - (9) Country of origin
- 11.2 Each carton shall bear at least number, letter or mark indicating clearly and legibly the following information :
- (1) Styles (as in clause 3)
 - (2) Net weight of each individual can
 - (3) Number of cans
- 11.3 In case foreign language is used, the meaning shall correspond to that in Thai.
- 11.4 Any person who manufactures the product conforming to this standard may use the Standards Mark in connection with his product only after having received a licence from the Industrial Product Standards Council.

12. Sampling and criteria for conformity

- 12.1 Lot : Herein refers to canned pineapple of the same style; having the same fill of container; bearing the same name, brand, trade-mark and other similar characteristics, being manufactured at the same period or delivered or transacted at the same time.
- 12.2 Sampling and acceptance shall be in accordance with the following sampling plan or its technically equivalent.
- 12.2.1 Sampling and acceptance for the tests of requirements, quantity, and marking and labelling.
 - 12.2.1.1 Sampling shall be done at random from the same lot in accordance with the sample size specified in the inspection level I of Table 3. Every sample shall be inspected for marking and labelling prior to the conformity tests of requirements and quantity. In case of dispute, the inspection level II shall apply.
 - 12.2.1.2 The lot shall be considered as having passed the test provided that the total number of samples failing to meet the requirements of clauses 6 and 11 does not exceed the acceptance number given in Table 3, and that every sample satisfied every requirement of clause 10.

12.2.2 Sampling and acceptance for analysis of food additives and contaminant

12.2.2.1 Take an equal portion of sample from each unit of container taken as clause 12.2.1.1 to make a composite sample of not less than 500 g.

12.2.2.2 The lot shall be considered as having passed the test if the sample meets the requirements of clauses 7 and 8.

12.2.3 Sampling and acceptance for microbiological analysis

12.2.3.1 Eight units of containers shall be taken at random from the same lot.

Table 3
Sampling plan
(clause 12.2.1)

Lot size (N)	Inspection level			
	Level I		Level II	
	Sampling size	Acceptance number	Sampling size	Acceptance number
1. Net weight equal to or less than 1 kg				
Up to 4 800	6	1	13	2
4 801 to 24 000	13	2	21	3
24 001 to 48 000	21	3	29	4
48 001 to 84 000	29	4	48	6
84 001 to 144 000	48	6	84	9
144 001 to 240 000	84	9	126	13
more than 240 000	126	13	200	19
2. Net weight greater than 1 kg but not more than 4.5 kg				
Up to 2 400	6	1	13	2
2 401 to 15 000	13	2	21	3
15 001 to 24 000	21	3	29	4
24 001 to 42 000	29	4	48	6
42 001 to 72 000	48	6	84	9
72 001 to 120 000	84	9	126	13
more than 120 000	126	13	200	19
3. Net weight greater than 4.5 kg				
Up to 600	6	1	13	2
601 to 2 000	13	2	21	3
2 001 to 7 200	21	3	29	4
7 201 to 15 000	29	4	48	6
15 001 to 24 000	48	6	84	9
24 001 to 42 000	84	9	126	13
more than 42 000	126	13	200	19

12.2.3.2 The lot shall be considered as having passed the test if all samples meet the requirements of clause 9.2.

12.3 Criteria for conformity

The lot shall be deemed as conforming to this standard if all samples of canned pineapple meet every requirement of clauses 12.2.1.2, 12.2.2.2 and 12.2.3.2.

13. Analyses

13.1 Physical and chemical analyses

13.1.1 Pineapple core

Having been determined for the drained weight, the sample shall be cored particularly at the tough fibrous portion. Compare the weight to the previous determination.

13.1.2 Acidity and alkalinity

The sample shall be blended until the solid and the liquid portions are homogeneously mixed, then determined for the pH value by using the pH meter.

13.1.3 Cut-out strength

The cut-out strength shall be determined by blending all the liquid and the solid content of the container until a homogeneous mixture is obtained, filter the mixture, then read the cut-out strength of the syrup at the temperature of 20°C, using a refractometer. The result is expressed in degrees Brix.

13.1.4 Water capacity of the container and fill of the container

The determination is made by weighing the distilled water at 20°C which has been completely filled in the container in lieu of the canned pineapple and convert into volume.

13.1.4.1 In determination of the water capacity of the container, fill the can with distilled water to the level of 4.8 mm below the upper end of the seam.

13.1.4.2 In determination of the fill of container, fill the can with distilled water to the level actually completed with canned pineapple.

13.2 Microbiological analysis

13.2.1 Incubation test

Six cans of sample shall be incubated for 14 days at 37°C and the other two kept at room temperature as comparative samples.

13.2.1.1 If swollen cans are found during the incubation, the lot shall be considered as not conforming to the requirements.

13.2.1.2 If no swollen cans are found at the end of the 14-day incubation, the cans shall be examined for the following abnormalities in the content :

- (1) Colour,
- (2) Odour,
- (3) Other abnormal conditions.

The lot shall be considered as not conforming to the requirements if the abnormalities as above are found in the content.

13.2.1.3 The content already passed the tests in clauses 13.2.1.1 and 13.2.1.2 shall be determined for micro-organisms as prescribed in clause 13.2.2.

13.2.2 Determination of micro-organisms

Micro-organisms shall be examined in accordance with the method specified under the topic of acid food of TIS 335 : Part 1, Standard for methods of food analysis : Canned food.