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IS 1166 (1986): Condensed Milk, Partly Skimmed and Skimmed
Condensed Milk [FAD 19: Dairy Products and Equipment]



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(Reaffirmed 2003)
2009

Indian Standard

**SPECIFICATION FOR
CONDENSED MILK, PARTLY SKIMMED AND
SKIMMED CONDENSED MILK**

(*Second Revision*)

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**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002**

Indian Standard

SPECIFICATION FOR CONDENSED MILK, PARTLY SKIMMED AND SKIMMED CONDENSED MILK (*Second Revision*)

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AMENDMENT NO. 1 MAY 1991
TO
IS 1166 : 1986 SPECIFICATION FOR CONDENSED
MILK, PARTLY SKIMMED AND SKIMMED
CONDENSED MILK

(Second Revision)

(Page 6, clause 5.1) — Substitute the following for the existing clause:

'5.1 The product shall be packed in clean and sound containers (*see* IS 9991 : 1988 Specification for condensed milk cans) or in thermoformed cups/blister packs made of polystyrene with top cap/closure made out of metallized polyester film or aluminium foil coated with food grade lacquer or in tetrapacks or collapsible tubes or in barrels of adequate mechanical strength capable of withstanding the normal handling and transportation in such a way as to protect it from deterioration. The packaging shall be hermetically sealed. The product shall be packed in quantities of 200 g, 400 g, 1 kg and thereafter in multiples of 1 kg. Where the product is filled in tetrapacks, the quantities shall be 200 ml, 250 ml, 500 ml and 1 litre subject to approval by the Weights and Measures Act. For bulk transaction of condensed milk the packaging and quantities may be as agreed to between the purchaser and the supplier.'

[Page 7, clause 5.2, Sl No. (f), line 2] — Insert the word 'have' after 'directions'.

(Page 9, clause C-1, line 3) — Substitute 'polarimetric' for 'volumetric.'

AMENDMENT NO. 2 NOVEMBER 1995
TO
IS 1166 : 1986 SPECIFICATION FOR CONDENSED
MILK, PARTLY SKIMMED AND SKIMMED
CONDENSED MILK

(*Second Revision*)

(*Page 6, clause 4.1.10.1*) — Substitute the following for the existing clause:

'4.1.10.1 *Shigella* and *Salmonella* — *Shigella* and *Salmonella* shall be absent per 25 g of the product when determined as per the method prescribed in IS 5887 (Part 3) : 1976‡.

NOTE — The requirements for *Salmonella* and *Shigella* shall be tested in a recognized laboratory and not in the factory premises.'

(*Page 6, clause 4.1.10.4, line 2*) — Substitute 'per gram of' for 'in'.

(*Page 6, clause 4.1.10.4*) — Add the following clause after 4.1.10.4:

'4.1.10.5 *E. Coli* — *E. Coli* shall be absent per gram of the product when determined as per the method prescribed in IS 5887 (Part 1) : 1976††.'

(*Page 6, foot-note with '‡' mark*) — Substitute the following for the existing title:

'‡Methods for detection of bacteria responsible for food poisoning: Part 3 Isolation and identification of *Salmonella* and *Shigella* (first revision).'

(*Page 6*) — Add the following foot-note at the end:

'††Methods for detection of bacteria responsible for food poisoning : Part 1 Isolation, identification and enumeration of *Escherichia Coli* (first revision).'

(*Page 7, clause 7.2, line 2*) — Substitute 'IS 1070 : 1992*' for 'IS 1070 - 1960*'.

(*Page 7, foot-note with '*' mark*) — Substitute 'Reagent grade water (*third revision*)' for the existing title.

(FAD 57)

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**AMENDMENT NO. 3 MAY 2002
TO
IS 1166 : 1986 SPECIFICATION FOR CONDENSED
MILK, PARTLY SKIMMED AND SKIMMED
CONDENSED MILK**

(*Second Revision*)

(Page 4, clause 4.1) — Substitute the following for the existing clause:

'4.1 All types of the product (*see* 3.1) shall conform to the requirements given in 4.1.1 to 4.1.10.'

(FAD 57)

Reprography Unit, BIS, New Delhi, India

Indian Standard
SPECIFICATION FOR
CONDENSED MILK, PARTLY SKIMMED AND
SKIMMED CONDENSED MILK
(*Second Revision*)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 27 February 1986, after the draft finalized by the Dairy Products Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Condensed, partially skimmed or skimmed condensed milk are produced by the evaporation in *vacuo* of milk either whole, partially skimmed, skimmed or reconstituted or recombined milk with suitable adjustment of milk solids and with the addition of sucrose in the form of refined sugar. The removal of water in this way leads to the possibility of the storage of the resulting products unchanged for an appreciable length of time. The products are preserved by their high sucrose content.

0.2.1 In addition to its wide use by individual consumers in the place of fluid milk, the products are also used in the manufacture of bakery products, confectionery, ice cream and other food products.

0.2.2 The requirement for lactose crystals as stipulated would ensure good texture of the products and should not be considered as a minimum requirement from health point of view.

0.3 This standard was first published in 1957 and revised in 1973 to incorporate a number of modifications due to technological developments in the field at that time. In this revision, various requirements have been up-dated; requirements for partly skimmed condensed milk have been included and a new requirement for the absence of coagulase+e *Staphylococcus aureus* has been specified. Also, the references to the latest methods of test have been given. As per the recommendation of the Central Committee for Food Standards, the terminology 'full-cream condensed milk' has been modified as 'condensed milk' as this product on reconstitution does not give milk with fat percentage as specified in the PFA Rules.

0.4 While formulating this standard, due consideration has been given to the relevant rules prescribed by the Government of India under the Prevention of Food Adulteration Act, 1954 and the Standards of Weights and Measures (Packaged Commodities) Rules, 1977. This standard is, however, subject to the restrictions imposed under these Acts, wherever applicable.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of test for condensed milk, partly skimmed and skimmed condensed milk.

1.1.1 This standard does not apply to any form of concentrated milk not packed in sealed unit containers, intended for dilution into standardized, toned, double-toned, or skimmed milk.

2. TERMINOLOGY

2.1 Condensed Milk — means concentrated standardized milk or partially skimmed or skimmed milk, obtained by the removal of part of its water content. It contains added sugar.

3. TYPES

3.1 The material shall be of the following three types:

- a) Condensed milk,
- b) Partially skimmed condensed milk, and
- c) Skimmed condensed milk.

4. REQUIREMENTS

4.1 All the types of the product (*see 3.1*), shall conform to the requirements and specifications given in 4.1.1 to 4.1.9.

4.1.1 The products shall be manufactured from fresh, whole, standardized, reconstituted or recombined milk obtained from cow milk or buffalo milk or a mixture thereof (milk solids suitably processed may also be used) suitably standardized to give the final products as given in Table 1. The milk and/or milk solids used in the manufacture shall be free from non-permitted additives.

*Rules for rounding off numerical values (*revised*).

TABLE 1 COMPOSITIONAL SPECIFICATION FOR CONDENSED MILK, PARTLY SKIMMED AND SKIMMED CONDENSED MILK

(Clause 4.1.11)

SL No.	CHARACTERISTIC	REQUIREMENTS FOR			METHOD OF TEST, REF TO	
		Condensed Milk	Partly Skimmed Condensed Milk	Skimmed Condensed Milk	Appendix of this Standard	Other Indian Standards
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Total milk solids, percent by mass, <i>Min</i>	31.0	28.0	26.0	B	—
ii)	Fat, percent by mass	Not less than 9.0	Above 3.0 and below 9.0	Not more than 0.5	—	IS : 11762-1986*
iii)	Sucrose, percent by mass, <i>Min</i>	40	40	40	C	—
iv)	Titrateable acidity (as lactic acid), percent by mass, <i>Max</i>	0.35	0.35	0.35	D	—
v)	Accelerated storage test	To satisfy the requirements of the test			E	—

*Method for determination of fat content in condensed milk and evaporated milk (Reference Method).

4.1.2 The products may contain added refined lactose, permitted flavours, calcium chloride, citric acid, sodium citrate, sodium salts of orthophosphoric acid and polyphosphoric acid. Such additions shall not exceed 0.3 percent by mass of the finished products.

4.1.3 Quality of Ingredients — All ingredients shall be clean, of good quality and safe. They shall conform to their normal quality requirements, such as colour, flavour and odour.

4.1.4 Colour — The products shall have whitish to light brown colour.

4.1.5 Flavour and Taste — The flavour of the products shall be pleasant and clean. It shall be free from rancid, fruity, mouldy, tallowy, cooked, sour, sandy [see IS : 5126 (Part 2)-1969*] and any other objectional odour and taste. These may be judged on the basis of their sensory characteristics (see IS : 10029-1981†).

*Glossary of general terms for sensory evaluation of foods: Part 2 Quality characteristics.

†Method for sensory evaluation of sweetened condensed milk.

4.1.6 Sugar used in the manufacture of condensed milk, full-cream and condensed milk, skimmed, shall conform to IS : 1679-1960* or any other good quality food grade sugar may be used.

4.1.7 The products may be fortified with vitamins A, D and B groups. The vitamins shall be of food grade. Levels of fortification shall be declared on the container. However, even with this fortification, exclusive use of condensed milk for infant is not recommended.

4.1.8 *Size of Lactose Crystals* — The material shall not have more than 30 percent of the lactose crystals of the size greater than 15 μm , when determined by the method given in Appendix A.

4.1.9 *Hygienic Conditions* — The material should be, as far as possible, manufactured and packed under hygienic conditions in the licensed premises (see IS : 2491-1972†).

4.1.9.1 The basic principles of hygiene should be applied with appropriate modifications.

4.1.10 *Microbiological Specifications*

4.1.10.1 *Bacterial count* — The colony count per gram of the product shall not be more than 500 when determined according to the method prescribed in IS : 5402-1969‡.

4.1.10.2 *Coliform count* — The test for coliform bacteria shall be absent in the product when determined according to the method prescribed in IS : 5401-1969§.

4.1.10.3 *Yeast and mould count* — The mould count of the products shall not be more than 10 when determined according to the method prescribed in IS : 5403-1969||.

4.1.10.4 *Coagulase* staphylococcus aureus* — The *Staphylococcus aureus* shall be absent in the products when determined according to the method prescribed in IS : 5887 (Part 2)-1976¶.

5. PACKING AND MARKING

5.1 *Packing* — The material shall be packed in properly sealed, clean and sound food grade containers (see IS : 9991-1981**) or barrels of adequate

*Specification for sugar used in food preservation industry.

†Code for hygienic conditions for food processing units (first revision).

‡Method for plate count of bacteria in foodstuffs.

§Methods for detection and estimation of coliform bacteria in foodstuffs.

||Method for yeast and mould count in foodstuffs.

¶Methods for detection of bacteria responsible for food poisoning: Part 2 Isolation, identification and enumeration of *Staphylococcus aureus* and faecal streptococci (first revision).

**Specification for condensed milk cans.

mechanical strength capable of withstanding the normal handling and transportation in quantities of 200 g, 400 g, 1 kg and thereafter in multiples of 1 kg in such a way as to protect it from deterioration.

5.2 Marking — Each container shall be legibly and indelibly marked with the following particulars:

- a) Name of the manufacturer;
- b) Type of material;
- c) Batch or code number;
- d) Minimum net mass;
- e) Levels of fortification of vitamins, if done;
- f) The contents of this container, on reconstitution as per the directions in litre(s) of standardized, toned, double toned or skimmed milk with added sugar (depending upon the type of the material); and
- g) Any other requirement under the standards of Weights and Measures (Packaged commodities) Rules, 1977.

5.3 BIS Certification Marking

The product may also be marked with Standard Mark.

5.3.1 The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6. SAMPLING

6.1 The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in Appendix F.

7. TESTS

7.1 Tests shall be carried out as prescribed in the appropriate appendices given under 4.1.8 and col 6 and 7 of Table 1.

7.2 Quality of Reagents — Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS : 1070-1960*) shall be used where the use of water as a reagent is intended.

NOTE — 'Pure chemicals' shall mean the chemicals that do not contain impurities which affect the results of analysis.

*Specification for water for general laboratory use (*second revision*).

APPENDIX A

(Clause 4.1.8)

DETERMINATION OF SIZE OF LACTOSE CRYSTALS

A-1. APPARATUS

A-1.1 Depression Slide

A-1.2 Microscope

A-1.3 Ocular Lens and Circular Glass Pieces — Marked with a number of tiny uniform squares. Ocular scale shall be standardized with the stage micrometer to get readings in terms of microns. The circular glass piece and ocular lens shall be then fitted inside the eye piece.

A-2. PROCEDURE

A-2.1 Preparation of the Slide — Place a small drop of well mixed sample (see F-3.2.1) with the help of spatula on a clean depression slide. Spread the sample evenly on the slide. Transfer a small portion of the sample on a clear slide and cover with a cover slip. Press the cover slip with the forefinger till a uniform thin film is formed in between the slide and cover slip. Soon after the preparation of the slide, observe the slide under the microscope first under low power and then under high power lens.

A-2.2 Measurement and Count of Crystals — On an average, 30 squares in the same field or just adjacent to the first counted field, where required, are taken for measurement of lactose crystals. Count the number of crystals in each square and note the measurement according to their size as less than 10, 10 to 12, 13 to 15, 16 to 25 and over 25 μ . Repeat the same procedure for all 30 squares. Add the total number of crystals under each range and calculate the percentage.

APPENDIX B

[Table 1, Item (i)]

DETERMINATION OF TOTAL MILK SOLIDS

B-0. GENERAL

B-0.1 Two methods have been specified. Method 1 may be used for routine analysis whereas Method 2 may be used in case of dispute.

B-1. METHOD 1

B-1.1 In order to determine total milk solids, determine the total solids by the method prescribed in IS : 11622-1986* and subtract the percentage by mass of sucrose in the material (*see* Appendix D).

B-2. METHOD 2

B-2.1 In case of dispute, total milk solids should be determined by adding percentages of fat, protein, lactose and ash in the material. Percentage of fat shall be as determined in IS : 11762-1986† and of protein as determined in IS : 7219-1973‡. Methods for determination of lactose and ash shall be as given under 13 and 16 respectively of IS : 1479 (Part 2)-1961§.

B-2.2 The methods described under B-1 and B-2 should agree within an error of 0.2 percent of milk solids-not-fat or 0.3 percent of total milk solids content.

A P P E N D I X C

[Table 1, Item (iii)]

DETERMINATION OF SUCROSE**C-1. METHOD**

C-1.1 Two methods, one polarimetric as given in IS : 11764-1986|| and the other volumetric as given in C-2 of IS : 4079-1967¶ have been prescribed for the determination of sucrose. The volumetric method shall be used for routine purposes, and for reference purposes, the volumetric (Lane-Eynon) method shall be used.

A P P E N D I X D

[Table 1, Item (iv)]

DETERMINATION OF TITRATABLE ACIDITY**D-1. REAGENTS**

D-1.1 Standard Sodium Hydroxide Solution — approximately 0.1 N.

D-1.2 Phenolphthalein Indicator Solution — Dissolve 0.5 g of phenolphthalein in 100 ml of 50 percent ethyl alcohol.

*Method for determination of total solids content in condensed milk.

†Method for determination of fat content in condensed milk and evaporated milk (Reference Method) (*under print*).

‡Method for determination of protein in foods and feeds.

§Method of test for dairy industry: Part 2 Chemical analysis of milk.

||Method for determination of sucrose content by the polarimetric method in condensed milk (*under print*).

¶Specification for canned RASOGOLLA.

IS : 1166 - 1986

D-2. PROCEDURE

D-2.1 Weigh accurately about 10 g of the material in a suitable dish or basin. Add 30 ml of lukewarm water. Add one ml of phenolphthalein indicator solution. Shake well and titrate against standard sodium hydroxide solution. Stir vigorously throughout. Complete the titration in 20 seconds. Keep in another dish or basin about 10 g of the material diluted with 30 ml of lukewarm water as a blank for comparison of colour. The persistence of a slight pinkish tinge for 30 seconds indicates the end point. The titration shall be preferably made in north light or under illumination from a daylight lamp.

D-3. CALCULATION

D-3.1 Titratable acidity (as lactic acid), percent by mass = $\frac{9 AN}{M}$

where

A = volume in ml of standard sodium hydroxide required for titration,

N = normality of standard sodium hydroxide solution, and

M = mass in g of the material taken for the test.

A P P E N D I X E

[*Table 1, Item (v)*]

ACCELERATED STORAGE TEST

E-1. GENERAL

E-1.1 The purpose of this test is to determine the shelf life of the product. In order that the period of the test is shortened, the possible existent microorganisms and their spores are given the optimum temperature at which they thrive. If they do not show their presence even at the end of this test, the material passes the test.

E-2. PROCEDURE

E-2.1 Incubate the samples at a temperature of $37 \pm 1^\circ\text{C}$ for 14 days.

E-2.2 The samples shall pass the test if :

- a) the cans do not show any bulge due to positive pressure within;
and
- b) the product inside the can has not curdled or thinned and is free from any objectionable taste, odour and sliminess.

APPENDIX F

(Clause 6.1)

SAMPLING OF CONDENSED MILK, PARTLY SKIMMED AND SKIMMED CONDENSED MILK

F-1. GENERAL REQUIREMENTS

F-1.0 In drawing, preparing, storing and handling test samples, in addition to the following precautions and directions, those given in Section 1 and 13 of IS : 11546-1985*, should as far as possible be observed.

F-1.1 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from extraneous contamination.

F-1.2 The sample containers shall be of such a size that sufficient head space is allowed for expansion at the top. This space shall not be too large as air exerts detrimental action. The samples shall be kept in a manner so that they do not deteriorate in composition before analysis.

F-1.3 The sample containers shall be labelled to give the nature of the product, the date of sampling, the number of samples taken from the lot and the size of the lot.

F-2. SCALE OF SAMPLING

F-2.1 Lot — All the containers, in a single consignment, of the same size shall constitute a lot. If the consignment is declared to consist of different batches of manufacture, the batches shall be marked separately and the groups of containers in each batch shall constitute separate lots.

F-2.1.1 For ascertaining the conformity of the material to the requirements of this specification, samples shall be tested from each lot separately.

F-2.2 The number of containers to be selected from a lot shall depend on the size of the lot, quantity of material in the container and shall be as given in Table 2.

F-2.3 These containers shall be selected at random from the lot. In order to ensure the randomness of selection, procedures given in IS : 4905-1968† may be followed.

F-2.4 In addition to the containers selected according to F-2.2 and F-2.3, two more containers shall be selected at random from the lot for testing the shelf-life and microbiological requirements.

*Methods of sampling of milk and milk products.

†Methods for random sampling.

TABLE 2 NUMBER OF CONTAINERS TO BE SELECTED FOR SAMPLING

FOR CONTAINERS OF 400 g TO 5 kg		FOR CONTAINERS OF MORE THAN 5 kg AND UP TO 20 kg	
Number of Containers in the Lot	Sample Size for Tests Other than Microbiological	Number of Containers in the Lot	Sample Size for Tests Other than Microbiological
(1)	(2)	(3)	(4)
Up to 300	3	Up to 100	2
301 to 500	5	101 to 300	3
501 to 1 000	7	301 to 500	4
1 001 and above	10	501 and above	5

NOTE — The scale of sampling for containers of 200 g and above 20 kg shall be as agreed to between the purchaser and the vendor.

F-3. TEST SAMPLES AND REFEREE SAMPLES

F-3.1 On storage of condensed milk, separation, of the constituents such as fat, lactose may occur. It is necessary to mix the contents of the container prior to analysis and for this purpose the procedure given in F-3.1.1 is recommended.

F-3.1.1 Heat the container in a water-bath at about 40°C until the sample has nearly reached this temperature. Open the container at the edge of the lid. Reincorporate all the material adhering to the lid into the container. Mix the contents thoroughly by stirring with a spoon or spatula in such a way that the top layers as well as contents of the lower corners are moved and mixed. Repeat the stirring before drawing the sample for testing various characteristics (other than shelf-life and microbiological) in the specification.

F-3.2 Preparation of Individual Samples — The number of containers given in col 2 or 4 of Table 2, whichever is applicable shall be taken from the lot and contents of each of these containers shall be mixed thoroughly according to the procedure given in F-3.1. Draw with a suitable sampling instrument approximately equal quantities of material from different parts of the same container till about 150 g of material is obtained. This shall be divided into three equal parts. Each part so obtained shall constitute an individual sample representing the container and shall be transferred immediately to thoroughly clean and dry container, sealed air-tight with the particulars given in F-1.5. The individual samples so obtained shall be divided into three sets in such a way that each set has a sample representing each selected container. One of these sets shall be marked for the purchaser, another for the vendor and the third for the referee.

F-3.3 Preparation of Composite Sample — From the material from each selected container, remaining after the individual sample has been taken, approximately equal quantities of material shall be taken and mixed thoroughly so as to form a composite sample weighing about 200 g. This composite sample shall be divided into three equal parts and transferred to clean and dry containers, sealed air-tight and labelled with the particulars given in F-1.5. One of these composite samples shall be for the purchaser, another for the vendor and the third for the referee.

F-3.4 Samples for Shelf-Life and Microbiological Requirements (see 10.3.2.3 of IS : 11546-1985*) — For preparing the test sample for shelf-life and microbiological requirements, the procedure given in F-3.4.1 shall be followed for each of the containers selected according to F-2.4.

F-3.4.1 Sterilize the edge of the lid all round with alcohol and open the lid aseptically. Introduce a sterile pipette, mix contents thoroughly by repeated drawing and releasing the condensed milk through the pipette, take about 100 g of material and transfer to a sterile sample bottle containing the diluent.

F-3.4.2 One of the sample containers selected for shelf-life and microbiological tests (see F-2.4) shall be labelled as 'sample for shelf-life' and the other sample container labelled as 'sample for bacterial count, coliform count, yeast and mould count and *staphylococcus aureus*'. These containers shall be divided into three equal sets and labelled with all the particulars of sampling given in F-1.5. One of these sets of sample containers shall be for the purchaser, another for the vendor and the third for the referee. Sample shall be stored in a refrigerator (below 5°C) till required for analysis to prevent any changes in microflora.

F-3.5 Referee Samples — Referee samples shall consist of a set of individual samples (F-3.2), composite sample (F-3.3) and a set of samples for shelf-life and microbiological examination (F-3.4) marked for this purpose and shall bear the seals of the purchaser and the vendor. These shall be kept at a place agreed to between the purchaser and the vendor so as to be used in case of a dispute between the two.

F-4. NUMBER OF TESTS

F-4.1 Tests for the determination of total milk solids, fat and sucrose shall be conducted on each of the samples constituting a set of individual samples.

F-4.2 Tests for colour, flavour and taste and titratable acidity shall be conducted on the composite sample.

*Methods of sampling for milk and milk products.

F-4.3 Tests for shelf-life, bacterial count, coliform count, yeast and mould count and *staphylococcus aureus* shall be conducted on the respective samples (see F-3.4.2) constituting a set of test samples labelled with the words 'sample for shelf-life' and 'sample for bacterial count, coliform count, yeast and mould count and *staphylococcus aureus*'.

F-5. CRITERIA FOR CONFORMITY

F-5.1 The lot shall be declared as conforming to all the requirements of the specification if F-5.1.1 to F-5.1.3 are satisfied.

F-5.1.1 The test results on each of the individual samples for the determination of requirements given in F-4.1 shall satisfy the corresponding specification requirements.

F-5.1.2 The test results on the composite sample for the requirements given in F-4.2 shall satisfy the corresponding specification requirements.

F-5.1.3 The test results for shelf-life, bacterial count, coliform count, yeast and mould count, and *staphylococcus aureus* (see F-4.3) shall satisfy the corresponding specification requirements.

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