

$$\% \text{ drained weight} = \frac{\text{Drained weight}}{\text{Net weight of contents}} \times 100$$

Net wt. of contents = Gross weight – tare weight of the can.

For canned tomatoes use a sieve with square openings of 11.2 mm x 11.2 mm.

For products in sauce, use a sieve with square openings of 0.3 mm x 0.3 mm;

Wash the contents on the sieve with water until free of adhering substances; spread on sieve and drain for 5 minutes, dry the underside of the sieve and weigh.

(Ref: - F.A.O Manuals of Food Quality Control 14 / 8 page 183 / Codex Alimentarius Commission Recommended method 36 / 7 – 1970, and method 44 – 1972)

1.5 Internal condition of the can:

Examine the internal surface for any corrosion, pitting, scratching, defects in lacquering, leakages, discolouration, detinning etc.

1.6 Determination of soluble solids

1.6.1 Principle:-

Measurement of the refractive index of the test solution at 20 °C, using a refractometer, and use of tables correlating refractive index with soluble solids content (expressed as Sucrose), or direct reading of the soluble solids content on the refractometer.

1.6.2 Apparatus

- a) **Refractometer** - indicating the refractive index by means of a scale graduated in 0.001, in order to allow readings to be estimated to 0.0002.

Refractometer - indicates the percentage by mass of Sucrose by means of a scale graduated in 0.5 %, in order to allow readings to be estimated to 0.25 %. This refractometer shall be adjusted so that at 20 ° C it registers for distilled water a soluble solid (Sucrose) content of zero.

- b) **Water circulating apparatus** - to maintain the temperature of the prisms of the refractometer constant to within 0.5 °C in the neighbourhood of 20 °C which is the reference temperature. If the temperature of circulating water is different from 20 °C use temperature correction as per table on page no.
- c) **Beaker**- capacity 250 ml

1.6.3 Procedure:

1.6.3.1 Preparation of test solution

(a) Clear liquid products

Thoroughly mix the sample and use it directly for determination.

(b) Semi thick products (purees etc)

Thoroughly mix the sample. Press a part of the sample through a gauge/muslin cloth folded in four, rejecting the first drops of the liquid and reserving the remainder of the liquid for the determination

(c) Thick products (jams, Jellies etc)

Weigh into the tared beaker to the nearest 0.01 gm, a suitable quantity (upto 40 gm) of the sample and add 100 – 150 ml of distilled water. Heat the contents of the beaker to boiling and allow to boil gently for 2- 3 minutes, stirring with a glass rod. Cool the contents and mix thoroughly. After 20 minutes weigh to the nearest 0.01gm, then filter through a fluted filter paper or a Buchner funnel into a dry vessel. Reserve the filtrate for determination

1.6.3.2 Determination

Adjust the water circulation in order to operate at the required temperature and allow it to flow to bring the prisms of the refractometer to the same temperature which shall remain constant to within 0.5°C during the determination.

Put a small quantity of the test solution (2- 3 drops are sufficient) on the fixed prism of the refractometer and immediately adjust the movable prism. Suitably illuminate the field of view. Bring the line dividing the light and dark parts of the surface in the field of view to the crossing of the threads and read the value of refractive index.

Determine percent sugar from the table

If the determination has been carried out at a temperature other than $20^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ the following corrections are required

(a) For the scale indicating refractive index apply the formula

$$n_D^{20} = n_D^t + 0,0013(t - 20)$$

where

n_D^{20} is the refractive index at 20°C ;

n_D^t is the refractive index at the temperature of measurement;

t is the temperature of measurement, in degrees Celsius.

(b) For the scale indicating percentage by mass or Sucrose correct the result according to the table 1

1.6.3.3 Calculation

(a) Refractometer with refractive index scale

Read from table 2 the percentage mass of sucrose corresponding to the value of refractive index corrected for temperature if necessary. In the case of liquid or semi thick products the soluble solid content is equal to the number found. If the determination has been carried out on a diluted sample the soluble solid content is equal to

$$\frac{P \times m1}{m0}$$

Where,

P is the percentage by mass of soluble solids in the diluted solution m0 is the mass, in gm of the sample before dilution m 1 is the mass in gm of the sample after dilution

Take the result as the arithmetic mean of two determinations. Express the result to one decimal place

(b) Refractometer with sugar scale

In the case of liquid or semi thick products the soluble solid content, as a percentage by mass of the sucrose is equal to the value read, corrected for temperature if necessary. If the determination has been made on a diluted solution calculate the soluble solids as shown above

Take the result as the arithmetic mean of two determinations.

(Ref: - I.S 13815: 1993 / I.S.O 2173: 1978 Fruit and Vegetable Products Determination of Soluble solid Content - Refractometer method)

IS 13815 : 1993
ISO 2173 : 1978

TABLE 1 – Correction of readings of the refractometer with scale indicating sucrose for a temperature different from 20 ± 0,5 °C

Temperature °C	Scale reading for soluble solids content, % (m/m)									
	5	10	15	20	25	30	40	50	60	70
	Corrections to be subtracted									
15	0,29	0,31	0,33	0,34	0,34	0,35	0,37	0,38	0,39	0,40
16	0,24	0,25	0,26	0,27	0,28	0,28	0,30	0,30	0,31	0,32
17	0,18	0,19	0,20	0,21	0,21	0,21	0,22	0,23	0,23	0,24
18	0,13	0,13	0,14	0,14	0,14	0,14	0,15	0,15	0,16	0,16
19	0,06	0,06	0,07	0,07	0,07	0,07	0,08	0,08	0,08	0,08
	Corrections to be added									
21	0,07	0,07	0,07	0,07	0,08	0,08	0,08	0,08	0,08	0,08
22	0,13	0,14	0,14	0,15	0,15	0,15	0,15	0,16	0,16	0,16
23	0,20	0,21	0,22	0,22	0,23	0,23	0,23	0,24	0,24	0,24
24	0,27	0,28	0,29	0,30	0,30	0,31	0,31	0,31	0,32	0,32
25	0,35	0,36	0,37	0,38	0,38	0,39	0,40	0,40	0,40	0,40

TABLE 2 – Refractive index and corresponding percentage by mass of soluble solids (sucrose)

Refractive index	Soluble solids (sucrose) content	Refractive index	Soluble solids (sucrose) content	Refractive index	Soluble solids (sucrose) content	Refractive index	Soluble solids (sucrose) content
n_D^{20}	% (m/m)	n_D^{20}	% (m/m)	n_D^{20}	% (m/m)	n_D^{20}	% (m/m)
1,333 0	0	1,367 2	22	1,407 6	44	1,455 8	66
1,334 4	1	1,368 9	23	1,409 6	45	1,458 2	67
1,335 9	2	1,370 6	24			1,460 6	68
1,337 3	3	1,372 3	25	1,411 7	46	1,463 0	69
1,338 8	4			1,413 7	47	1,465 4	70
1,340 3	5	1,374 0	26	1,415 8	48		
		1,375 8	27	1,417 9	49	1,467 9	71
1,341 8	6	1,377 5	28	1,420 1	50	1,470 3	72
1,343 3	7	1,379 3	29			1,472 8	73
1,344 8	8	1,381 1	30	1,422 2	51	1,475 3	74
1,346 3	9			1,424 3	52	1,477 8	75
1,347 8	10	1,382 9	31	1,426 5	53		
		1,384 7	32	1,428 6	54	1,480 3	76
1,349 4	11	1,386 5	33	1,430 8	55	1,482 9	77
1,350 9	12	1,388 3	34			1,485 4	78
1,352 5	13	1,390 2	35	1,433 0	56	1,488 0	79
1,354 1	14			1,435 2	57	1,490 6	80
1,355 7	15	1,392 0	36	1,437 4	58		
		1,393 9	37	1,439 7	59	1,493 3	81
1,357 3	16	1,395 8	38	1,441 9	60	1,495 9	82
1,358 9	17	1,397 8	39			1,498 5	83
1,360 5	18	1,399 7	40	1,444 2	61	1,501 2	84
1,362 2	19			1,446 5	62	1,503 9	85
1,363 8	20	1,401 6	41	1,448 8	63		
		1,403 6	42	1,451 1	64		
1,365 5	21	1,405 6	43	1,453 5	65		

1.7 Determination of Sodium Chloride (salt content) in brine:

1.7.1 Principle: