

**SRI LANKA STANDARD 184 : 2012**  
UDC 668.525.53

**SPECIFICATION FOR  
OIL OF CEYLON CINNAMON LEAF  
(First Revision)**

**SRI LANKA STANDARDS INSTITUTION**



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**SLS 184 : 2012**

**Gr. 6**

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**SPECIFICATION FOR OIL OF CEYLON CINNAMON LEAF**  
**(First Revision)**

## **FOREWORD**

This standard was approved by the Sectoral Committee on Agricultural and Food Products and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2012-01-27.

Ceylon cinnamon leaf oil of commerce is derived from steam distillation of mature leaves of the true cinnamon, *Cinnamomum zeylanicum* Blume, cultivated in Sri Lanka. The main constituent of oil of Ceylon cinnamon leaf is eugenol. The oil of Ceylon cinnamon leaf is used in spice flavours, in perfumery and as a source of eugenol.

This standard was first published in 1972. From the point of view of International trade, it is most essential that standardization should be effected at the International level in addition to the National level. Therefore, the Committee responsible for the preparation of this standard felt that it should be revised in view of the present trade practices and also to suit the product currently being manufactured and exported. Basic changes have been made in presentation aspects.

In this revision, gas chromatographic method for determination of chemical composition of the oil which is progressively used in the country, has been included for guidance only under Annex **A**.

Information on the flashpoint is given in Annex **B**.

This standard is subject to the restrictions imposed under the Sri Lanka Food Act No. 26 of 1980, Department of Export Agriculture Development Act No. 46 of 1992 and the regulations framed thereunder, wherever applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the results of a test or an analysis, shall be rounded off in accordance with **SLS 102**. The number of significant places to be retained in the rounded off value shall be the same as that of the specified value in this standard.

## **1 SCOPE**

This standard specifies the requirements and the methods of sampling and testing for oil of Ceylon cinnamon leaf obtained from *Cinnamomum zeylanicum* Blume.

## 2 REFERENCES

- SLS 102 Rules for rounding off numerical values
- SLS 210 Methods for the preparation of test samples for essential oils
- SLS 211 Methods for labeling and marking of containers for essential oils
- SLS 212 Methods for packing of essential oils
- SLS 213 Methods for sampling of essential oils
- SLS 572 Methods for analysis of essential oils
  - Part 1 : Determination of relative density
  - Part 2 : Determination of refractive index
  - Part 3 : Determination of optical rotation
  - Part 4 : Evaluation of miscibility in ethanol
  - Part 5 : Determination of content of phenols
  - Part 8 : General guidance on chromatographic profiles

## 3 DEFINITION

For the purpose of this standard, the following definition shall apply:

**3.1 oil of Ceylon cinnamon leaf :** Essential oil obtained by steam distillation of the leaf material derived from the species of the true cinnamon *Cinnamomum zeylanicum* Blume, of the Lauraceae family , growing in Sri Lanka.

## 4 REQUIREMENTS

### 4.1 Physical properties

#### 4.1.1 *Appearance, colour and odour*

The oil shall be of clear, mobile liquid, free from sediment and suspended matter. The oil shall be of light to dark amber in colour and shall have characteristic spice-like odour, reminiscent of eugenol.

#### 4.1.2 *Solubility in ethanol*

One volume of the oil shall be soluble in 2 volumes of 70 percent (v/v) ethanol at 28 °C, when tested as prescribed in **SLS 572 : Part 4**.

#### 4.1.3 *Relative density*

The relative density of the oil at 28 °C shall be not less than 1.0340 and not more than 1.0500, when tested as prescribed in **SLS 572 : Part 1**.

#### 4.1.4 *Refractive index*

The refractive index of the oil at 28 °C shall be not less than 1.5250 and not more than 1.5400, when tested as prescribed in **SLS 572 : Part 2**.

#### 4.1.5 *Optical rotation*

The optical rotation of the oil at 28 °C shall be not less than – 2.5° and not more than + 2°, when tested as prescribed in **SLS 572 : Part 3**.

### 4.2 **Chemical constituent**

#### 4.2.1 *Phenol* (as eugenol) content

Phenol (as eugenol) content shall not be less than 75 per cent by mass and not more than 85 per cent by mass, when tested as prescribed in **SLS 572 : Part 5**.

### 4.3 **Chromatographic analysis**

Analysis of the cinnamon leaf oil shall be carried out by gas chromatographic method described in **Part 8** of **SLS 572**. In the chromatogram obtained, the representative and characteristic components given in Table 1 shall be identified. The proportions of these major components shall be as given in Table 1. This constitutes the chromatographic analysis of the essential oil.

**TABLE 1 – Chromatographic analysis**

SI. No. (1)	Component (2)	Minimum % (3)	Maximum % (4)
i)	<i>trans</i> -Cinnamic aldehyde	0.8	4.0
ii)	Eugenol	75.0	85.0
iii)	<i>trans</i> -Cinnamyl acetate	1.1	1.8
iv)	Eugenyl acetate	1.3	3.0
v)	Benzyl benzoate	2.0	4.0
vi)	Linalol	1.5	3.5

NOTE : *The chromatographic analysis is normative, contrary to typical chromatograms given for information in Annex A.*

## 5 **PACKAGING AND STORAGE**

5.1 The packaging shall be in accordance with **SLS 212**.

**5.2** The product shall be protected from direct light and stored in a cool and dry place.

**5.3** The product shall be supplied in air-tight and preferably amber-coloured glass or epoxy coated metal containers, permitting a minimum of air space, or as agreed to between the purchaser and the supplier.

## **6 MARKING AND/OR LABELLING**

The container shall be marked or labelled legibly and indelibly with the following information:

- a) Name of the product including botanical name of the plant;
- b) The name or trade name and the address of the manufacturer or distributor;
- c) The gross mass, tare and net mass;
- d) Month and Year of manufacture;
- e) Batch number;
- f) Cautionary notice, if any; and
- g) Any other information requested by the buyer.

**6.2** The marking and labelling shall also be in accordance with **SLS 211**.

## **7 SAMPLING**

Unless otherwise agreed to between the purchaser and the supplier, the procedure given in **SLS 213** shall be followed for sampling. The sample shall be prepared in accordance with the **SLS 210**.

## **8 METHODS OF TEST**

Test for determination of all the requirements shall be conducted on the composite sample as per the test methods prescribed in **Part 1, 2, 3, 4, 5, and 8** of **SLS 572**.

## **9 CRITERIA FOR CONFORMITY**

The lot shall be declared as conforming to the standard, if the composite sample satisfies all the requirements specified in the standard.



**ANNEX A**  
(Informative)

**Typical chromatogram of the analysis by gas chromatography of the essential oil of  
Ceylon cinnamon leaf ( *Cinnamomum zeylanicum* Blume)**

**Gas Chromatographic Analysis of Cinnamon leaf oil I**

**Gas chromatographic conditions : Detector - Flame ionization detector type (FID)**

Column	:	Capillary, fused silica, 30 m. long and 0.25 mm internal diameter
Thickness of film	:	0.25µm
Stationary phase	:	DB-1 & DB Wax , Rtx wax boded phase fused silica
Oven temperature	:	temperature programming from 75 <sup>0</sup> C to 100 <sup>0</sup> C at rate of 5 <sup>0</sup> C /minand from 100 <sup>0</sup> C to 220 <sup>0</sup> C at rate of 6 <sup>0</sup> C
Injector temperature	:	230 <sup>0</sup> C
Detector temperature	:	240 <sup>0</sup> C
Programme rate	:	5 <sup>0</sup> C
Carrier gas	:	Helium
Split ratio	:	1:30
Carrier gas Flow rate	:	1ml/min

**Peak identification - Major compounds**

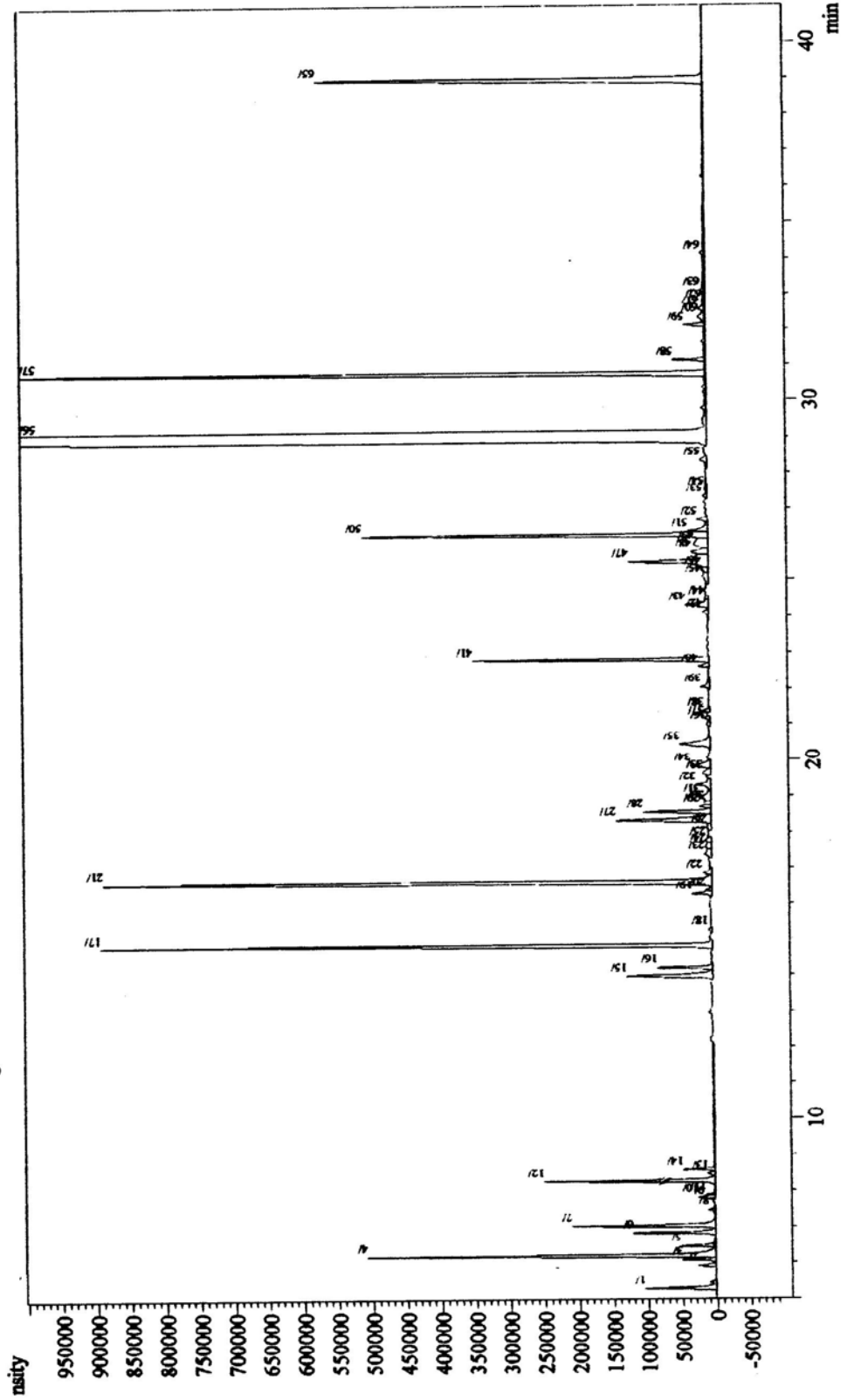
	<b>Peak No.</b>	<b>Rt time</b>	<b>Compound</b>	<b>Percent</b>
1.	5	6.4	α- Pinene	1.3
2.	12	8.3	Camphene	4.7
3.	17	14.8	β- Caryo[phyllene	2.2
4.	50	26.2	tr- Cinnamaldehyde	2.3
5.	56	28.3	Eugenol	77.9
6.	57	30.8	Eugenyl acetate	2.9
7.	65	38.9	Benzyl benzoate	2.5

**GC SOLUTION**

Sample Information

SAMPLE NAME : CINNAMON LEAF OIL; SAMPLE ID : CINNAMON LEAF OIL INJ. VOLUME : 0.3  
DATA NAME : C:\GCsolution\Data\Project1\CINNAMON LEAF OIL.gcd; METHOD NAME : C:\GCsolution\Data\Project1\citronella oil 2.gcm; REPORT FILE :

Chromatogram - Channel 1 CINNAMON LEAF OIL C:\GCsolution\Data\Project1\CINNAMON LEAF OIL.gcd1.gcd



Peak Table - Channel 1

Peak#	Ret. Time	Area	Area%	Height	Height%	Unit	Mark	Cmpd Name
1	5.290	370956	0.2713	102435	0.5604		SV	
2	5.921	89611	0.0655	26058	0.1426		V	
3	6.078	160867	0.1176	47962	0.2624		V	
4	6.204	1711304	1.2514	501668	2.7447		SV	
5	6.458	143921	0.1052	47003	0.2572		T	
6	6.821	406899	0.2976	119373	0.6531		V	
7	7.020	738171	0.5398	207734	1.1365		V	
8	7.444	47771	0.0349	9725	0.0532		V	
9	7.758	46088	0.0337	15927	0.0871		V	
10	7.811	77877	0.0569	24673	0.1350		V	
11	7.869	48644	0.0356	13322	0.0729		SV	
12	8.259	830548	0.6074	248259	1.3582		V	
13	8.459	45041	0.0329	10286	0.0563		V	
14	8.582	371107	0.2714	46321	0.2534		SV	
15	13.961	639852	0.4679	124759	0.6826		V	
16	14.199	277672	0.2031	80561	0.4408		V	
17	14.835	3023449	2.2110	886855	4.8521		V	
18	15.264	36319	0.0266	6759	0.0370		V	
19	16.267	122078	0.0893	28579	0.1564		V	
20	16.346	36264	0.0265	9652	0.0528		V	
21	16.626	4594947	3.3602	883179	4.8320		V	
22	16.850	84263	0.0616	13155	0.0720		V	
23	17.365	99758	0.0730	9785	0.0535		V	
24	17.572	84431	0.0617	8406	0.0460		V	
25	17.761	56504	0.0413	8281	0.0453		V	
26	18.098	57917	0.0424	6255	0.0342		V	
27	18.325	764727	0.5592	138568	0.7581		V	
28	18.546	391459	0.2863	98420	0.5385		V	
29	18.689	76047	0.0556	16301	0.0892		V	
30	18.775	56405	0.0412	10093	0.0552		V	
31	18.957	172319	0.1260	16208	0.0887		V	
32	19.306	153495	0.1122	21702	0.1187		V	
33	19.637	95969	0.0702	11914	0.0652		V	
34	19.836	191041	0.1397	28868	0.1579		V	
35	20.442	335212	0.2451	44006	0.2408		V	
36	20.995	37739	0.0276	4746	0.0260		V	
37	21.152	37991	0.0278	8287	0.0453		V	
38	21.383	45995	0.0336	8815	0.0482		V	
39	22.039	89557	0.0655	12685	0.0694		V	
40	22.611	78030	0.0571	16522	0.0904		V	
41	22.789	1201653	0.8787	341919	1.8707		V	
42	24.099	69668	0.0509	8222	0.0450		V	
43	24.296	207033	0.1514	33757	0.1847		V	
44	24.457	35666	0.0261	5030	0.0275		V	
45	25.088	124197	0.0908	9425	0.0516		V	
46	25.297	72263	0.0528	10329	0.0565		V	
47	25.507	716382	0.5239	116243	0.6360		V	
48	25.766	168691	0.1234	24079	0.1317		V	
49	25.996	267127	0.1953	19875	0.1087		V	
50	26.262	2111926	1.5444	501556	2.7441		V	
51	26.355	172382	0.1261	28777	0.1574		V	
52	26.682	80962	0.0592	15356	0.0840		V	
53	27.331	41739	0.0305	6594	0.0361		V	
54	27.536	41596	0.0304	3949	0.0216		V	
55	28.348	95002	0.0695	9898	0.0542		V	
56	29.128	106554504	77.9214	11491844	62.8730		SV	
57	30.752	4099722	2.9981	1055865	5.7767		TV	
58	31.126	187145	0.1369	46218	0.2529		TV	
59	32.113	109910	0.0804	29423	0.1610		TV	
60	32.347	92929	0.0680	8943	0.0489		TV	
61	32.557	58268	0.0426	8531	0.0467		TV	
62	32.760	42799	0.0313	2889	0.0158		TV	
63	33.090	65811	0.0481	6602	0.0361		TV	
64	34.132	44455	0.0325	5711	0.0312		TV	
65	38.963	3356049	2.4542	562715	3.0787		TV	
Total		136746126	100.0000	18277856	100.0000			

**ANNEX B**  
(Informative)

**Flashpoint**

**B-1 General Information**

For safety reasons, transport companies, insurance companies and people in charge of safety services require information on the flashpoints of essential oils, which in most cases are flammable products.

A comparative study on the relevant methods of analysis (See ISO/TR 11018) concluded that it was difficult to recommend a single apparatus for standardization purposes, given that:

- there is wide variation in the chemical composition of essential oils;
- the volume of the sample needed for certain requirements would be too costly for high-priced essential oils;
- as there are several different types of equipment which can be used for the determination, user cannot be expected to use one specified type only.

Consequently, it was decided to give a mean value for the flashpoint in an informative annex for information in order to meet the requirements of the interested parties.

The equipment with which this value was obtained should be specified.

For further information, see ISO/ TR 11018 – Essential oils – General guidance on the determination of flashpoint.

**B-2 Flashpoint of the oil of Ceylon cinnamon leaf**

The mean value is +93 °C.

NOTE : *Obtained with “closed-cup” method.*

## SRI LANKA STANDARDS INSTITUTION

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