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**CEYLON STANDARD: 165 : 1972**

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**SPECIFICATION FOR**  
**SOFT SOLDERS (S. I. Units)**

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**BUREAU OF CEYLON STANDARDS**



**SPECIFICATION FOR SOFT SOLDERS  
(S. I. UNITS)**

C.S. 165: 1972  
(Attached AMD 46)

Gr.3



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# CEYLON STANDARD SPECIFICATION FOR SOFT SOLDERS (METRIC UNITS)

## FOREWORD

This Ceylon Standard Specification has been prepared by the Drafting Committee on Soft Solders. It was approved by the Mechanical Engineering Divisional Committee of the Bureau of Ceylon Standards and was authorised for adoption and publication by the Council of the Bureau on 30th November 1972.

Soft solders are metals or alloys which have the ability to flow wet and join the materials to be soldered at a temperature below 450°C. The melting ranges and the typical uses of soft solders have been given in Appendix A with a view to guiding the user in the selection of the correct solder to suit his requirements.

All standard values given in this specification are in SI units. Equivalent values in imperial units are given in brackets for guidance. These equivalents have been calculated in accordance with C.S. 116 'Ceylon Standard on Principles of Conversion'.

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 observation shall be rounded off in accordance with C. S. 102 'Ceylon Standard on Presentation of Numerical Values'.

In the preparation of this standard publications of the Indian and British Standards Institutions were consulted and the assistance gained therefrom is acknowledged.

## 1. SCOPE

This standard covers the requirements for 19 grades of soft solder.

## 2. MATERIAL

Soft solder shall be made from virgin metals or clean scrap.

## 3. CHEMICAL COMPOSITION

Soft solder shall have the chemical composition given in Table 1.

## 4. CONDITIONS OF SUPPLY

4.1 Soft solder shall be supplied in one of the following forms as specified by the purchaser and shall be smoothly finished.

**TABLE 1**  
**CHEMICAL COMPOSITION OF SOFT SOLDERS**

Grade	Alloying Elements, Percent			Impurities, Percent, Maximum											Cu 0.3 Per- cent of Tin Content	
	Sn 94.5-95.5	Sb 4.75- 5.25	Pb —	Ag	Pb	Sb	As	Fe	Al	Zn	Cd	Ni	Bi	Ag 0.02		
Sn 95 Sb																
Sn 65	64.0-65.0	—	Remainder	—	—	0.60	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 60	59.0-60.0	—	Remainder	—	—	0.50	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 50	49.0-50.0	—	Remainder	—	—	0.50	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 50 Sb	49.0-50.0	2.5- 3.0	Remainder	—	—	—	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 45	44.0-45.0	—	Remainder	—	—	0.40	0.05	9.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 45 Sb	44.0-45.0	2.3- 2.7	Remainder	—	—	—	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 40	39.0-40.0	—	Remainder	—	—	0.40	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 40 Sb	39.0-40.0	2.0- 2.4	Remainder	—	—	—	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 38	37.0-38.0	—	Remainder	—	—	0.06	0.015	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 35	34.0-35.0	—	Remainder	—	—	0.25	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 35 Sb	31.0-32.0	1.7- 1.8	Remainder	—	—	—	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 30	29.0-30.0	—	Remainder	—	—	0.30	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 30 Sb	29.0-30.0	1.0- 1.7	Remainder	—	—	—	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 19	19.0-20.0	—	Remainder	—	—	—	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 18 Sb	18.0-18.5	0.75- 1.0	Remainder	—	—	—	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 5 Ag 15	4.75-5.25	—	Remainder	1.4- 1.6	—	0.10	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 5 Ag 1	4.75-5.25	—	Remainder	0.9- 1.1	—	0.10	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02
Sn 1 Ag 15	0.75-1.25	—	Remainder	1.4- 1.6	—	0.10	0.05	0.02	0.001	0.003	0.005	0.002	0.05	0.02	0.02	0.02

(i) Sticks, each approximately 375mm (14.8 in) long and weighing about 150g (0.331 lb).

(ii) Ingots, each weighing approximately 3kg (6 lb).

4.2 Soft solder may be supplied in any form other than those mentioned under 4.1 by mutual agreement between the purchaser and the manufacturer.

## 5. SAMPLING AND TESTING

5.1 Lot - In any consignment 50kg (110 lb) of soft solder of the same composition manufactured on one date under similar conditions shall constitute a lot.

5.2 A composite sample of 30g (0.066 lb) shall be taken from each lot of 50kg (110 lb) or part thereof, shall be tested for the chemical composition.

## 6. RE-TEST

If the sample prepared as in Clause 5.2, fails to meet the requirements of this standard two more tests shall be conducted on the same sample. If both test results satisfy the relevant requirements, the lot shall be considered as conforming to this standard. Should either of the re-tests fail, the lot represented shall be considered as not complying with this standard.

## 7. PACKING AND MARKING

7.1 When soft solder is supplied in the form of sticks, they shall be packed in boxes of convenient size, so that one box contains only one grade of soft solder.

7.2 Each stick shall be legibly marked with the grade of the material.

7.3 Each box of sticks and each ingot shall be legibly marked with the following information.

(i) Grade of the material.

(ii) Manufacturer's name or trade mark.

(iii) Mass of soft solder contained therein.

**APPENDIX A**  
**PROPERTIES AND APPLICATION OF SOFT SOLDER**  
(For information only)

Grade (1)	Melting Range		Typical Uses (4)	Characteristics (5)
	Solidus °C (2)	Liquidus °C (3)		
Sn 65	183	185	Work requiring low melting point or free running solder, for example, electrical, radio and instrument assemblies and machine soldering of can end-seams.	Lowest melting points of the series.
Sn 60	183	188		
Sn 50	183	212	Coppersmith's and tinsmith's bit soldering and general machine soldering, for example, soldering of can end-seams.	Moderately low melting point and short-melting range.
Sn 50 Sb	185	204		
Sn 45	183	227		
Sn 45 Sb	185	215		
Sn 40	183	234	Blowpipe soldering and soldering of side seams on high speed body-forming machines. Grade Sn 40 may also be used for electrical joints and is suitable for soldering zinc and zinc plated, galvanized or cadmium plated metals. For general soldering work, grade Sn 40 Sb may be used.	High melting point and long melting range.
Sn 40 Sb	185	227		
Sn 38	183	242		
Sn 35	183	247	Blow pipe soldering and soldering of side seams on high speed body forming machines.	High melting point and long melting range.
Sn 32 Sb	185	243	Wiping of cable and lead pipe joints, and dipping baths and where a pasty range is required.	Long melting or plastic range.
Sn 30	183	255		
Sn 30 Sb	185	248		
Sn 19	183	270	Dipping solder for lamp manufacture. For high temperature services	Long melting or plastic range.
Sn 18 Sb	185	275		
Sn 95 Sb	236	243		
Sn 5 Ag 15	296	301		
Sn 5 Ag 1	308			
Sn 1 Ag 15	309	310		

**Note: 1** - Antimonial solders are not suitable for use with zinc or galvanized articles.

**Note: 2** - Non-antimonial solders are sometimes preferred for machine soldering of containers.

**Note: 3** - Joints made by soft solders specified in this standard are not generally suitable for service at temperatures in excess of 140° C.



AMENDMENT NO. 1 APPROVED ON 1981-07-28.

CS 165:1972 SPECIFICATION FOR SOFT SOLDERS

**FOREWORD**

Delete third paragraph and substitute the following:

'All standard values given in this specification are in SI units'.

**Page 7 Clause 4.1**

Delete '(14.8 in)' in the first line, '(0.331 lb)' in the second line and '(6 lb)' in the third line.

**Clause 5.1 Lot**

Delete '(110 lb)' in the first line.

**Clause 5.2**

Delete '(0.066 lb)' in the first line and '(110 lb)' in the second line.



## **SLS CERTIFICATION MARK**

*The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI which includes surveillance inspection of the factory, testing of both factory and market samples.*

*Further particulars of the terms and conditions of the permit may be obtained from the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.*



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