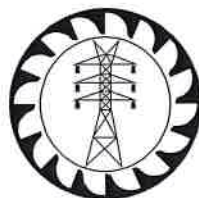


001:2018

CEB  
SPECIFICATION

---

# ALUMINIUM RE-DRAW RODS FOR ELECTRICAL PURPOSES



CEYLON ELECTRICITY BOARD  
SRI LANKA



---

Telephone: +94 11 232 8051

Fax: +94 11 232 5387

**CONTENTS**

	<b>Page</b>
1.0 SCOPE.....	3
2.0 SYSTEM PARAMETERS .....	3
3.0 SERVICE CONDITIONS.....	3
4.0 APPLICABLE STANDARDS.....	3
5.0 BASIC FEATURES .....	3
6.0 REQUIREMENTS FOR SELECTION.....	4
7.0 INFORMATION TO BE FURNISHED WITH THE OFFER .....	5
8.0 PERFORMANCE GUARANTEES AND WARRANTY.....	6
9.0 SAMPLES .....	6
10.0 SPARES.....	6
11.0 PACKING AND LABELING/MARKING.....	6
12.0 INSPECTION AND TESTING.....	7
13.0 ANNEXES.....	7
 ANNEX A: Schedule of Technical Requirements and Guaranteed Technical Particulars	 8
ANNEX B: Price Variation	9
ANNEX C: Non-Compliance Schedule	11



## SPECIFICATION FOR ALUMINIUM RE-DRAW RODS FOR ELECTRICAL PURPOSES

### 1.0 SCOPE

This specification covers the manufacture, supply and delivery of Aluminium 1350 drawing stock of 9.52 mm diameter in the temper of H14, suitable for drawing into wire for the manufacture of electrical conductors

### 2.0 SYSTEM PARAMETERS

Not Applicable

### 3.0 SERVICE CONDITIONS

(a)	Annual average ambient temperature	30 °C
(b)	Maximum ambient temperature	40 °C
(c)	Maximum relative humidity	90%
(d)	Environmental conditions	Humid tropical climate with heavily polluted atmosphere
(e)	Operational altitude	From M.S.L. to 1900 m above M.S.L.
(f)	Isokeruanic (Thunder days) level	100 days

The above are applicable for finished products using Aluminium Re-Draw Rods as a raw material.

### 4.0 APPLICABLE STANDARDS

The equipment and components supplied shall be in accordance with the latest editions of the standards specified below and amendments thereof.

(a)	ASTM B 233-97 (2016)	Standard Specification for Aluminium 1350 Drawing Stock for Electrical Purposes.
-----	----------------------	--

Material conforming to other International Standards which are equal to or higher but not less rigid than the standard specifications stipulated may be offered. When such alternative Standards are used reference to such standards shall be quoted and English language copies of such standards shall be provided with the offer.

**However in the event of discrepancy, details given in this CEB specification supersede above standards.**

### 5.0 BASIC FEATURES

#### 5.1. Technical Requirement

The chemical composition and mechanical & electrical properties of the drawing stock shall confirm to the requirements given below.



**(a) Chemical Composition**

The minimum purity of Aluminum shall not be less than 99.5%. Allowed composition for other elements is shown below:

Element	Allowed Composition %	
Silicon	Max	0.10
Iron	Max	0.40
Copper	Max	0.05
Manganese	Max	0.01
Chromium	Max	0.01
Zinc	Max	0.05
Boron	Max	0.05
Gallium	Max	0.03
Vanadium plus Lithium total	Max	0.02
Other elements each	Max	0.03
Other elements total	Max	0.10

**(b) Electrical & Mechanical Properties**

Description	Units	Value
Tensile Strength	MPa	103-138
Maximum Electrical resistivity	$\Omega$ mm <sup>2</sup> /m	0.028080
Diameter of the rod	mm	9.52
Allowable deviation from mean diameter	mm	$\pm 0.51$
Deviation at any point from specified diameter	mm	0.76

**5.2. Manufacture**

The Aluminium 1350 drawing stock of 9.52mm diameter shall be produced from continuously cast bars and shall have a temper of H14 classification. The drawing stock shall be furnished in continuous length coils without joints and the weight of each coil shall be between 1.5 MT to 2.0 MT.

**5.3. Workmanship**

The rod shall be clean, sound, smooth and free of pipes, laps, cracks, kinks, twists, seams, damaged ends, excessive oil, and other injurious defects within the limits of good commercial practice.

The rod shall be uniform in quality and temper and shall be suitable for drawing into wire at a speed of 1200 metres per minute without scraping (aluminium chips peeling out) and breaking.

**6.0 REQUIREMENTS FOR SELECTION****6.1. Quality Assurance**

The manufacturer shall possess ISO 9001:2015 or latest Quality Assurance Certification valid throughout the delivery period of this bid, for the manufacture of Aluminum Re-Draw Rods for the

plant where manufacturing is being done. The Bidder shall furnish a copy of the ISO certificate certified as true copy of the original by the manufacturer, along with the offer.

## 6.2. Manufacturing Experience

The manufacturer shall have minimum of 5 years experience in manufacturing Aluminum Re-Draw Rods. Out of this period Aluminum Re-Draw Rods should have been supplied successfully outside the country of the manufacturer for minimum of 3 years for usage in utilities.

Manufacturer shall furnish a list of purchasers with year & quantity of the product offered and details of contact person with the offer to prove his manufacturing experience.

If the manufacturer has supplied similar items to CEB for the last 3 years with proven sales records; without any adverse performance records, such manufacturers will be exempted from above requirements.

## 6.3. Test Certificates

Following Test Certificates pertaining to recent manufacture of drawing stock conforming to the referred standards in ASTM B 233-97 (2016) or any other international standard which is not less stringent, issued by:

Either

- (a) an accredited independent testing laboratory acceptable to the CEB or
- (b) an accredited or independent testing laboratory acceptable to the CEB where the tests have been witnessed by a reputed independent body/ CEB

shall be furnished with the offer. Test Certificates shall clearly indicate the relevant standard, items concerned, showing the manufacturers identity, batch No. and basic technical parameters. In case if the submitted tests are according to any other international standard which is not less stringent than the specified, then the copy of the used standard in English shall be submitted with offer.

- (a) Chemical composition as requested in Clause 5.1 (a) above.
- (b) Electrical resistivity
- (c) Tensile strength
- (d) Tolerances on diameter

Proof of accreditation by a national/ international authority shall be forwarded with the offer. Test certificates shall be complete including all the pages as issued by the testing authority. Test certificates shall be in English language. Parts of test certificates shall not be acceptable.

## 7.0 INFORMATION TO BE FURNISHED WITH THE OFFER

The following shall be furnished with the offer.

- (a) Technical details essential submitting following clearly identifying the offered items, but not limited to:
  - (i) The dimensional drawings.
  - (ii) Materials used & relevant literature and electrical properties and mechanical properties.



- (b) ISO 9001:2015 or latest Quality Assurance Certificate in accordance with clause 6.1.
- (c) Manufacturer shall furnish a list of supplies with supplied item, purchaser (specifying address contact persons and contact details, country), year & quantity to prove his manufacturing experience and outside the country sales in accordance with Clause 6.2.
- (d) Test Certificates in accordance with the clause 6.3.
- (e) Duly filled and signed 'Annex - A: Schedule of Technical Requirements and Guaranteed Technical Particulars'.

**Not furnishing above documents and details may result in offer being rejected.**

## 8.0 PERFORMANCE GUARANTEES AND WARRANTY

Manufacturer should provide CEB a warranty ensuring that each coil supplied meet the specification and any defected coil shall be replaced without extra cost during the first year after the final delivery to CEB stores.

## 9.0 SAMPLES

Two sample pieces of Aluminium drawing stock of length 1.0 meter each manufactured to the Specifications stipulated shall be supplied with the offer to facilitate analysis and evaluation.

The Bidder's identity shall be punched or marked with indelible ink on the sample rod.

## 10.0 SPARES

Not Applicable.

## 11.0 PACKING AND LABELING/ MARKING

### 11.1. Packing

- (a) The coils shall be wrapped with polythene pre-shrunk on coils to enable storage under high humid tropical weather conditions.
- (b) A minimum of six (06) strapping shall be used on a coil. The quality and the application of the wrapping shall be adequate to protect the rods from being damaged during the normal handling, shipment and storage. No steel binders/ wrapping shall be used.
- (c) The material shall be shipped in coils on pallets fitted on one circular face area of the coil in such a manner that the coils are suitable for storage with the face area in horizontal position. The pallets shall be strong enough to allow the storage of four (04) coils stacked together one on top of the other in horizontal position.

### 11.2. Identification and Labeling/ Marking

- (a) Each coil shall bear two tags showing the Manufacturer's name or trade mark, weight of the coil, coil size, aluminum number, temper of material, the words "PROPERTY OF CEYLON ELECTRICITY BOARD" and the Bid Number.
- (b) One tag shall be enclosed inside the polythene wrapping and the other tag shall be attached on the outside.



- (c) The same information given on the tag shall also be written on the outside face of the polythene wrapping using indelible ink to be clearly visible from the outside.

## 12.0 INSPECTION AND TESTING

### 12.1. Inspection

The Successful bidder shall make necessary arrangements for inspection by an Engineer appointed by the CEB and also to carry out in his presence necessary Acceptance tests on procured item and material without any additional cost. Acceptance test reports shall be a part of the shipping document. CEB may waive off the inspection either with the condition of witnessing the acceptance tests by an independent body acceptable to CEB or completely. In such a situation a notice of waive off will be issued in advance to the supplier.

### 12.2. Acceptance Tests

The successful Bidder shall make necessary arrangements for inspection by an Engineer appointed by the Purchaser to carry out in his presence the necessary following Sample / Acceptance tests as per referred standards including visual inspection, dimensional checks on material offered.

- (a) Chemical composition as requested in Clause 5.1 (a) above.
- (b) Electrical resistivity
- (c) Tensile strength
- (d) Tolerances in diameter

In addition Mill Certificates of the tests specified shall also be forwarded with the material.

## 13.0 ANNEXES

- Annex – A : Schedule of Technical Requirements and Guaranteed Technical Particulars
- Annex – B : Price Variation
- Annex – C : Non-Compliance Schedule





## ANNEX A

### SCHEDULE OF TECHNICAL REQUIREMENTS AND GUARANTEED TECHNICAL PARTICULARS

(CEB Requirements shall be filled by the procurement entity and information of the offer shall be filled by the manufacturer)

		CEB Requirement	Offered
1.	Name of the Manufacturer		
2.	Country of Origin		
3.	Manufacturing Capacity	MT/Year	
4.	Minimum purity of Aluminium	%	99.5
5.	Temper as per ASTM B 233-97 (2016)		H14
6.	Diameter of drawing stock	mm	9.52
7.	Tolerance of the diameter of drawing stock	mm	±0.51
8.	Tensile Strength of drawing stock	MPa	103-138
9.	Electrical resistivity	Ω mm <sup>2</sup> /m	0.028080
10.	Suitability for high speed drawing	m/min	1200
11.	Applicable Standards		
12.	Chemical Composition Percentage		
	(a) Silicon	0.10	
	(b) Iron	0.40	
	(c) Copper	0.05	
	(d) Manganese	0.01	
	(e) Chromium	0.01	
	(f) Zinc	0.05	
	(g) Boron	0.05	
	(h) Gallium	0.03	
	(i) Vanadium plus Lithium total	0.02	
	(j) Other elements each	0.03	
	(k) Other elements total	0.10	
	(l) Aluminium	99.5	
13.	Approximate weight of coil kg/ km	MT	1.5 -2.0
14.	Whether a certified copy of ISO 9001:2015 furnished with the offer?		As per clause 6.1
15.	Whether the entire Test Certificates in accordance with clause 6.3 furnished with the offer?		As per clause 6.3
16.	Whether all information in accordance with clause 7.0 furnished with the offer?		As per clause 7.0

.....  
Signature of the Manufacturer and seal

.....  
Date

I/We certify that the above data are true and correct

.....  
Signature of the Bidder and seal

.....  
Date





## ANNEX B

## PRICE VARIATION

The Bidders shall forward their offers on the basis of the Price Variation stipulated below.

## 1. BASIS OF THE OFFER

- (a) Bidders are required to make their offers on the basis of a Base Price ( $B_0$ ) for metal plus bidder's Fixed Price Margin (FP).
- (b) The Base Price shall be the Cash Seller's Midday Official Average Price of Aluminium High Grade 99.7% at London Metal Exchange (LME) in US Dollars on the 28<sup>th</sup> day before the closing of Bids (exclusive of the bid closing date) or the previous working day if that day is a non working day at the LME.
- (c) The Fixed Price Margin shall be quoted in the currency of choice of the Bidder in the case of foreign Bidders and in Sri Lanka Rupees in the case of Local Bidders.
- (d) Accordingly FOB Price of foreign Bidders offering Aluminium Redraw Rods from outside the country and the ex-factory price of Local Bidders shall be computed for the evaluation as;

$$[(B_0 \times US_0) + (FP \times CC)] \text{ MT}$$

Where;

- $B_0$**  - Base Price which is the Cash seller's midday official average price of Aluminium High Grade 99.7% in USD per Metric Ton at the LME on the fixed date (Clause 1(b) above).
- FP** - Fixed Price Margin per Metric ton of aluminium drawing stock in the currency allowed under Clause 1(c) above.
- MT** - Quantity of Aluminium drawing stock in Metric ton
- CC** - Currency Conversion rate from the currency of choice of the Bidder to Sri Lanka Rupees prevailing on the date of Bid opening.
- $US_0$**  - Currency Conversion rate from the US Dollars to Sri Lanka Rupees prevailing on the date of Bid opening.

## 2. AWARD PRICE

- (a) The FOB Award Price of foreign Bidders offering Aluminium Redraw Rods shall be computed as;

$$(B_1 \times MT) \text{ in US Dollars} + [FP \times MT] \text{ in the currency of choice quoted.}$$

- (b) The Ex-factory Award Price of Local Bidders offering Aluminium Redraw Rods shall be computed as;

$$(B_1 \times MT) \times US_1 + (FP \times MT) \text{ in LKR}$$



Where;

**B<sub>1</sub>** - Base Price which is the LME Official Settlement Price of Aluminium High Grade 99.7% in USD per Metric Ton at the 3<sup>rd</sup> working day immediately after the day of award

**US1** - Currency Conversion rate from the US Dollars to Sri Lanka Rupees prevailing at the 3<sup>rd</sup> working day immediately after the day of award.

(b) Intimation of the award will be faxed/e-mailed to the successful Bidder and or his agent in Sri Lanka.

### 3. CONVERSION OF CURRENCY

- (a) For the purpose of the evaluation the Price **B<sub>0</sub>** in US Dollars and the Fixed Price Margin (FP) in the currency of choice of the Bidder will be converted to Sri Lanka Rupees at the official Selling Exchange Rate of the Central Bank of Sri Lanka prevailing on the day of opening of Bids.
- (b) The payment for the supply of Aluminium Redraw Rods outside the country will be made to the Supplier at the contract price in the currency quoted for the Fixed Price Margin (FP). The base price **B<sub>1</sub>** in US Dollars will be converted to the currency of the FP at the official Selling Exchange rate at the Central Bank of Sri Lanka prevailing at the 3<sup>rd</sup> working day immediately after the day of award.
- (c) The payment for supply of Aluminium Redraw Rods from within the Country by Local Suppliers will be made in Sri Lanka Rupees. The Base Price **B<sub>1</sub>** in US Dollars will be converted to Sri Lanka Rupees at the official Selling Exchange rate at the Central Bank of Sri Lanka prevailing at the 3<sup>rd</sup> working day immediately after the day of award.

**Note:** For the calculation of LME variation Aluminium High Grade 99.7% price was selected in the absence of price for Aluminium High Grade 99.5%.





**ANNEX C**

**NON-COMPLIANCE SCHEDULE**

On this schedule the bidder shall provide a list of non-compliances with this specification, documenting the effects that such non-compliance is likely to have on the equipment life and operating characteristics. Each non-compliance shall be referred to the relevant specification clause.

Clause No.	Non-Compliance

.....  
**Signature of the Manufacturer**

.....  
**Date**

**I/We certify that the above data are true and correct**

.....  
**Signature of the Bidder and seal**

.....  
**Date**