

ANDREW YULE & COMPANY LIMITED
(A Government of India Enterprise)
Chennai Operation, Electrical Division
5/346 OLD MAHABALIPURAM ROAD
PERUNGUDI, CHENNAI: 600 096

TENDER DOCUMENTS FOR FABRICATION OF PAPER INSULATED COPPER CONDUCTOR
(JOB WORK)

ANDREW YULE & CO. LTD. invites e-Tender under single stage two part system (**Part I: Techno-Commercial Bid and Part II: Price Bid**) for finalizing rate contract for supply of Paper Insulated Copper Conductor, "**Scope of Work / Technical Specification**" as specified in this tender document.

Tender document may be downloaded from MSTC website www.mstcecommerce.com/eprochome/aycl. Corrigenda or clarifications, if any, shall be hosted on the above mentioned websites only.

AYCL reserves the right to accept or reject any tender.

We request you to submit your offer for the Paper Covered Copper Conductor as per our Technical Specification enclosed.

	Quantity (MT)
a) 15.01 sq.mm and above& Insulation up to 0.8 mm	61.00
b) 15.01 sq.mm and above & insulation above 0.8 mm	61.00
c) 15 sq.mm and below & insulation of any thickness	37.00
d) 3 bunched conductor	41.00
1) Individual conductor Area above 14.00 Sq.mm	
2) Insulation (0.25 mm, 0.65 mm)	

The following formula will be used for identifying the L1 bidder.

30.36 % (Rate for 15.01 Sq mm& above, insulation up to 0.8 mm)
+ 30.64 % (Rate for 15 .01 Sq mm& above, insulation above 0.8 mm)
+ 18.68 % (Rate for 15 Sq mm& below, insulation of any thickness)
+ 20.31 % (Rate for 3 bunched conductor)

The quantities mentioned are indicative only and the order will be released based on actual requirement.

The quantity mentioned in the Tender is our approximate requirement up to 30.06.2019.

Andrew Yule reserves the right to increase the tender quantity by 30 %.

DELIVERY: To be intimated from time to time as per our requirement.

VALIDITY: Your offer should be valid for acceptance for a minimum period of 90 days from the date of tender opening.

The buyer reserves the right to accept or reject any or all the tenders or to waive any informality, minor deviation or omission without assigning any reasons whatsoever.

Schedule of Tender

1.	TENDER NO.	<u>T-09/2018-19</u>
2.	MODE OF TENDER	e-Procurement System Online submission of Part I - Techno-Commercial Bid and Part II - Price Bid through www.mstcecommerce.com/eprochome/aycl The intending bidders are required to submit their offer electronically through this e-tendering portal. No physical tender is acceptable by AYCL/MSTC
3.	E-Tender No. / Event No.	AYCL/Electrical Division CO/25/18-19/ET/108
4.	Date of publication of e-Tender through publication MSTC/AYCL websites and Central Public Procurement Portal	09.07.2018
5	Date of availability of NIT to the Vendors for downloading	09.07.2018
6	Earnest Money Deposit	<ul style="list-style-type: none"> • Earnest Money Deposit” of Rs.20,000 (Rupees Twenty Thousand only) should be paid by thro’ NEFT/RTGS • Other document as described in Annexure II & II A
7	Date of Starting of e-Tender for submission of Online Techno-Commercial Bid and Price Bid at www.mstcecommerce.com/eprochome/aycl	09.07.2018 -5.00 PM
8	Date of closing of Online e-tender for submission of Techno-Commercial Bid & Price Bid at www.mstcecommerce.com/eprochome/aycl	23.07.2018 -11.00 AM
9	Last date of submission/ uploading details of EMD & other documents at www.mstcecommerce.com/eprochome/aycl	23.07.2018 -11.00 AM.
10	Date & time of opening of Part-I (Techno-Commercial Bid)	23.07.2018 – 11.15AM
11	Date & time of opening of Part-II (Price Bid)	To be intimated to the eligible vendor separately by email.

List of Annexure

Important Instructions for E-procurement	Annexure-I
Terms& Conditions	Annexure-II
General Terms& Conditions	Annexure-III
Online Techno commercial terms	Annexure-IV
Price Sheet	Annexure-V
Specification	Annexure -VI

Important Instructions for E-procurement

This is an e-procurement event of ANDREW YULE & COMPANY LTD Ltd.

You are requested to read the Terms & Conditions (Annexure- II,III,IV) of this tender before submitting your online tender. Tenderers who do not comply with the Conditions with documentary proof (wherever required) will not qualify in the Tender for opening of Price Bid.

1. Process of E-tender:

A) **Registration:** The process involves vendor's registration with MSTC e-procurement portal which is free of cost. Only after registration, the vendor(s) can submit his/their bids electronically. Electronic Bidding for submission of Techno-Commercial Bid as well as Price Bid over the internet will be done. The Vendor should possess Class III signing type Digital Signature Certificate. Vendors are to make their own arrangement for bidding from a PC connected with Internet. MSTC is not responsible for making such arrangement. (Bids will not be recorded without Digital Signature).

SPECIAL NOTE: THE PRICE BID AND THE COMMERCIAL BID HAS TO BE SUBMITTED ON-LINE AT www.mstcecommerce.com/eprochome/aycl

- 1) Vendors are required to register themselves online with www.mstcecommerce.com → e-Procurement → PSU / Govt. depts. → Register as Vendor under AYCL- Filling up details and creating own user id and password → Submit.
- 2) Vendors will receive a system generated mail confirming their registration in their email which has been provided during filling the registration form.

In case of any clarification, please contact MSTC/AYCL (before the scheduled time of the e-Tender).

Contact person (ANDREW YULE & COMPANY LTD):

1. Mr. A T E Pandian
Manager (Materials)
Ph. No: (044) 2496-0793
Email: atepandian@andrewyule.com

2. Mr Kingsley Rueben
Technical Assistant (EDP)
Mobile No: 91 9884446378
Email: reuben@andrewyule.com

3. Mr. R.Tamilselvan
Engineer (Materials)
Mobile. No: 91 9788520864
Email: tamilselvan@andrewyule.com

Contact person (E-Commerce, MSTC Ltd):

1. Mr. Vikash Kumar Jaiswal

Regional Manager (ERO)

Mobile No: 9903042449

Email: vikash@mstcindia.co.in

2) Mr. Pritam Biswas

Assistant Manager (ERO)

Mobile- 9903248755

Email: pbiswas@mstcindia.co.in

3) Mr. Mayank Jain

Assistant Manager (ERO)

Mobile- 9721277969

Email: mhjain@mstcindia.co.in

Help Desk No.: 033 22901004, will operate on all working days from 10 AM to 6 PM for online support to the vendors

System Requirement:

- i) Windows XP-SP3 or above / Windows 7 Operating System
- ii) IE-7 or above Internet browser.
- iii) Signing & Encryption type digital signature
- iv) JRE 7 update 79 software to be downloaded and installed in the system. Security level should be medium
- v) To enable ALL active X controls and disable 'use pop up blocker' under Tools → Internet Options → custom level (Please run IE settings from the page www.mstcecommerce.com once)

2. Part-I: Uploading of EMD & other Documents:

Within specified Date & time the vendor must submit the documents as per the annexure. (Annexure II & II (A))

Bidding in e-Tender:

- a. No interest will be paid on EMD. EMD of the unsuccessful bidder(s) will be refunded by ANDREW YULE & COMPANY LTD. EMD to be paid along with the Document within the last date as mentioned in SOT.
- b. The process involves Electronic Bidding for submission of Techno Commercial Bid as well as Price Bid.
- c. The bidder(s) should submit their Techno Commercial Bids, upload payment details of tender fee, EMD & other documents and Price Bid through online in MSTC website

www.mstcecommerce.com → e-procurement → Psu / Govt depts. → Login under AYCL → My Menu → Auction Floor Manager → live event → Selection of the live event.

- d. The bidder should allow to run an application namely enApple by accepting the risk and clicking on run. This exercise has to be done twice immediately after opening of Bid floor. Then they have to fill up Common terms /Commercial specification and save the same. After that clicking on the Techno-Commercial bid, if this application is not run then the bidder will not be able to save / submit his Techno-Commercial bid.
- e. After filling the Techno-Commercial Bid, bidder should click 'save' for recording their Techno-Commercial bid. Once the same is done, the Price Bid link becomes active and the same has to be filled up and then bidder should click on "**Save**" to record their Price Bid. Then once both the Techno-Commercial bid & Price Bid has been saved, the bidder can click on the "**Submit**" button to register their bid.
- f. Vendors are instructed to use link in **My Menu** to **Upload Documents** in document library. Multiple documents can be uploaded. Maximum size of single document for upload is 5 MB.
- g. Once documents are uploaded in the library, vendors can attach documents through *Attach Document* link against the particular tender. For further assistance please follow instructions of vendor guide.
- h. In all cases, bidder should use their own ID and Password along with Digital Signature at the time of submission of their bid.
- i. During the entire e-tender process, the bidders will remain completely anonymous to one another and also to everybody else.
- j. The e-tender floor shall remain open from the pre-announced date & time and for as much duration as mentioned above.
- k. Techno-Commercial bid will be opened electronically on specified date and time as given in the NIT. Bidder(s) can download Technical Comparative statement.
- l. Price bid will be opened electronically on specified date and time given in the NIT. Bidder(s) can download Price Comparative statement.
- m. All entries in the tender should be entered in online Technical & Commercial Formats without any ambiguity.
- n. All electronic bids submitted during the e-tender process shall be legally binding on the bidder. Any bid will be considered as the valid bid offered by that bidder and acceptance of the same by the Buyer will form a binding contract between Buyer and the Bidder for execution of supply. Such successful tenderer shall be called hereafter **SUPPLIER**.
- o. It is mandatory that all the bids are submitted with Digital Signature Certificate otherwise the same will not be accepted by the system.

- p. Buyer reserves the right to cancel or reject or accept or withdraw or extend the tender in full or part as the case may be without assigning any reason thereof.
- q. No deviation of the terms and conditions of the tender document is acceptable. Submission of bid in the e-tender floor by any bidder confirms his acceptance of terms & conditions for the tender.
- s. Unit of Measure (UOM) is indicated in the e-tender Floor. Rate to be quoted should be in Indian Rupee as per UOM indicated in the e-tender floor/tender document.

E-tender cannot be accessed after the due date and time mentioned in NIT.

All notices / corrigendum and correspondence to the bidder(s) shall be sent by email only during the process till finalization of tender by ANDREW YULE & COMPANY LTD/MSTC LTD. Hence the bidders are required to ensure that their corporate email I.D. provided is valid and updated at the stage of registration of vendor with MSTC. Bidders are also requested to ensure validity of their DSC (Digital Signature Certificate).

Any order resulting from this open e-tender shall be governed by the terms and conditions mentioned therein.

No deviation to the technical and commercial terms & conditions are allowed.

ANDREW YULE & COMPANY LTD has the right to cancel this e-Tender without assigning any reason thereof.

The online tender should be submitted strictly as per the terms and conditions and procedures laid down in the website www.mstcecommerce.com/eprochome/aycl of MSTC Ltd.

The bidders must upload all the documents required as per terms of NIT. Any other document uploaded which is not required as per the terms of the NIT shall not be considered.

The bid will be evaluated based on the filled-in technical & commercial formats.

Bidders are requested to read the vendor guide and see the video in the page www.mstcecommerce.com/eprochome/mstc of MSTC Ltd. to familiarize them with the system before bidding.

**ANDREW YULE & COMPANY LIMITED
Chennai Operation, Electrical Division**

General Information

Ref. Tender No.: T-09/18-19

(This document should be uploaded along with EMD)

The applicants are required to furnish full information to the queries included in this form. In giving the particulars, the supporting documents/certificates as called for per queries at places, must be tagged with the application for evidencing the information furnished in the application.

1. Name of the firm in full :

2. Address, Telephone No.,

Fax No. & E-mail :

a) Address :

b) Telephone No. :

c) Fax No. :

d) E-mail ID :

3. Status of the organization :

4. Trade License No.

**(Please attach a photo
copy of the license)** :

5. Banker's name

(a) Name of the Bank :

(b) Name of the Branch :

(c) Account No. :

Note : A copy of Banker's Certificate to be attached.

6. GST Registration No.

7. I. T. Permanent Account No.:

8. Financial Capacity : Year (2016-17)

(a) Fixed capital :

(b) Working capital :

I/we hereby certify that the particulars furnished by me/us above are true to the best of my / our knowledge and belief and mis-representations of facts will render me/us liable to my/our action as may be deemed fit by Andrew Yule & Co. Ltd. (Chennai Operation) & have the sole discretion to reject or accept my/our candidature.

(Signature of the Applicant)
Office Stamp/Seal.

Place :

Date ;

List of attachments:

The following documents are to be uploaded online at

www.mstcecommerce.com/eprochome/aycl

1. EMD : Rs. 20,000/= *

* Bidders may request for exemption from submitting EMD (Refer details given in General terms & conditions)

2. Tender fee Rs: 200 /= should be paid by way of RGTS/ NEFT *

* Bidders participating in the tender should upload the UTR details towards cost of tender document.

3. List of customers

4. Copies of purchase orders & Performance Certificate from at least three reputed transformers manufacturers for having supplied fabrication of Paper covered copper conductor for transformers above 10 MVA rating during the year 2016-2017. Offers received without copies of purchase orders & performance certificate for the year 2016-17 will be rejected.

5. Bidders should have a minimum turnover of Rs: 2 crores per annum (or) Labour charges turnover of minimum Rs: 30 Lakhs per annum. Please enclose copy of last 3 years P&L Account. (2014-15, 2015-16, 2016-17) Proof to be uploaded.

OFFERS RECEIVED WITHOUT ANY OF THE ABOVE WILL BE REJECTED

Note: Those who had participated and qualified in our earlier tender no.T.05/17-18 or bidders in AYCL-Chennai approved vendor list for fabrication of Paper Covered Copper Conductor need not submit the documents for sl.no.3, 4 and Annexure II (General Information). Proof of turnover for year 2016-17 alone needs to be submitted.

GENERAL & TERMS AND CONDITIONS

- 1) EMD: Rs. 20,000.00 (Rupees Twenty thousand only), should be paid by way of RGTS/ NEFT.

For bidders already enlisted with AYCL- Chennai Operation, having outstanding amount more than the EMD amount or who have already submitted the EMD against our earlier tenders or those who have security deposit with Andrew Yule may apply for adjustment of the same. The total EMD should be Rs:20,000/=

Bidders who are MSMED units may apply for exemption from furnishing EMD by making a specific request in writing and enclosing the necessary document in support of the same.

Bidders whose turnover is more than Rs: 50 crores may apply for exemption from furnishing EMD by making a specific request in writing and enclosing the necessary document in support of the same

If reason for non-submission of EMD or adjustment against the outstanding balance for EMD is not mentioned in Techno-commercial bid of tender, the tender will be rejected.

- 2) After the finalization of tender, individual rate contract will be issued to all successful bidders and the individual order will be released to all successful bidders based on the distribution of tender quantity as shown below,

Distribution of Tender quantity among all the qualified bidders.

Negotiated L1 price will be offered to other bidders whose price bid was opened. The tender quantity will be split among bidders as follows.

- a) If only one bidder (among L2, L3, L4, L5, L6, etc) agrees to match the negotiated L1 bidders price then tender quantity will be split as follows

L1 bidder will get 70 % of Tender quantity

Other bidder who agreed to match the negotiated L1 landed price will get 30 % of Tender quantity

- b) If two or more bidders (among L2, L3, L4, L5, L6, etc) agree to match the negotiated L1 bidders landed price then Tender quantity will be split as follows

L1 bidder will get 60 % of Tender quantity

Next higher bidder than L1 bidder who agrees to match the negotiated L1 landed price (Bidder 'A') will get 25 % of Tender quantity

Next higher bidder than Bidder 'A' who agrees to match the negotiated L1 landed price will get 15 % of Tender quantity.

- c) If none of the other bidders whose price bid was opened agree to match the negotiated L1 price L1 bidder will get the entire tender quantity

3) THE RIGHTS OF THE COMPANY

Bidders who have quote other payment terms & condition having financial implication will be loaded as per Andrew Yule's norms.

We reserve the right to accept or reject any or all the tenders or to waive any informality, minor deviation or omission without assigning any reasons whatsoever.

Short Closure of Rate Contract: We reserves the right to short close the rate contract at any point of time during validity of the contract with suitable prior notice to the bidders / vendors

Our Bank details for making RTGS payment.

Bank Name and Address	ALLAHABAD BANK CHENNAI ADYAR BRANCH 19,1ST STREET, PADMANABHA NAGAR CHENNAI 600 020
IFSC Code	ALLA0211103
Account No	20276303182
Account Name	ANDREW YULE & COMPANY LIMITED

TECHNICAL SPECIFICATIONS

1. QUALITY:

- a. Material should be as per our Specification No.SMC 101 REV.0(Fourth issue) and will be inspected as per our inspection plan no.QAP 106 REV.1
- b. As far as possible, joints in individual bobbins should be avoided. However, in the event of a joint (which should be limited to 1 joint for every coil of CC Rod) the same should be clearly marked in the bobbin and the joint should be left free without brazing / joint.
- c. The paper used shall be Electrical grade Insulation kraft paper of imported origin (Munksjo/Amotofors) 2 / 2.5 mil for inner layers and 3 mil minimum for outer layers and the outer layer shall be overlapped with minimum 25 % overlap as per IS 7404 part II.

Wherever the insulation is 0.8 mm and above the following specification to be followed:

All layers shall be applied in the same direction. All layers other than the outermost layer of paper shall be BUTT WOUND with 30% staggering and 2 mil thickness maximum. The outermost layer shall be overlapped minimum 25 % overlap as per IS 7404 part II and 3-mil thickness minimum.

CONDUCTOR OF EQUAL LENGTH

The material as required should be supplied in equal number of spools/multiples of spools with equal weight in each spool as that would be mentioned in our purchase order.

PACKING: If the weight per bobbin is not specified, the copper conductors of the wooden bobbin with net weight should not exceed 100 kgs. The conductors should be wrapped in polythene cover to avoid damage and dust deposition. Then the conductor should be covered with corrugated paper. The copper should not be wound till the brim of the bobbin flanges. Nailing on the bobbin should be avoided so that there will not be any damages to the paper covering of the conductors.

On the bobbin itself you should indicate GROSS WEIGHT, NETT WEIGHT TARE WEIGHT, BARE SIZE, INSULATION BUILT UP, COVERED SIZE ORDER NUMBER AND REEL NUMBER, JOB NUMBER.

TECHNO-COMMERCIAL TERMS FOR PAPER INSULATED COPPER CONDUCTOR

(**To be filled online in mstc portal**)

SL NO	TERMS & CONDITIONS	VENDOR RESPONSE
1	<p>REQUIREMENT</p> <p><i>E-Tender offers are invited for Entering into Rate Contract for fabrication of Paper Insulated copper conductor (Job work) as per our Specification as per the following details.</i></p> <p>PICC – 200 MT Approx</p> <p>The quantity mentioned in the Tender is our approximate requirement up to 30.06.2019.</p> <p>Andrew Yule reserves the right to increase the tender quantity by 30 %.</p>	AGREE
2	PICC should be as per our Specification No.SMC 101 REV.0 (Fourth issue) and will be inspected as per our inspection plan no.QAP 106 REV.1 enclosed	AGREE
3	The rate quoted should be valid for supplies up to 30.06.2019	AGREE
4	Validity period of the offer: Your offer should be valid for acceptance for a minimum period of 90 days from the date of tender opening	AGREE
5	<p>Your fabrication rate should be inclusive of the following:</p> <p>a) Delivery of finished Paper Insulated Copper Conductors at our Stores at Perungudi.</p> <p>b) Insurance and freight are to your account.</p>	AGREE
6	<p>RAW MATERIALS</p> <p>We will be issuing the copper wire rods of sizes ranging from 8mm to 11 mm. We will deliver this material at your Stores at our cost under Returnable delivery challan. Unloading at your end is in your scope. However if you collect the materials, we will pay the transportation cost at actual. For every 100 kgs of raw material sent by us, you have to return 100 kgs of finished paper covered copper conductor.</p>	AGREE
7	Delivery: You have to deliver as per our requirement. The size, quantity and delivery schedule will be informed to you vide separate order and you have to effect supplies accordingly. The finished conductor should be delivered within a maximum of 21 days of date of issue of raw material as per the delivery schedule mentioned in our purchase orders. .	AGREE
8	TOLERANCE ON QUANTITY: We will not allow any negative tolerance in quantity. Tolerance on each size should be limited to + 0.5%. Any quantity received in excess i.e. more than the tolerance quantity will be rejected.	AGREE
9	Security Deposit - The EMD amount of the successful Bidder will be retained as security deposit towards the execution of the order and the same will be released after completion of order.	AGREE

10	Risk purchase clause: The company reserve the right to impose risk purchase clause as " For delay in execution / supply we shall have every right to do the same through some other agency/s which shall deemed fit and the additional cost of the same (Incidental/Consequential) shall be to your account which with respect to our intimation or observation whatsoever.	AGREE
11	Liquidated damage : If the delivery is delayed beyond the date of scheduled date of dispatch in the purchase order, penalty will be levied @ 1/2% per week subject to a maximum of 5%	AGREE
12	Legal condition: Any contract entered against this tender will be as per the following legal condition It is recorded that this purchase order / contract / agreement is executed and concluded by and between the parties hereto at premises No.5/346, Old Mahabalipuram Road, Perungudi, Chennai 600 096 and in the event any dispute arises out of this agreement between the parties only the appropriate Civil Court in the City of Kolkata shall have the exclusive jurisdiction to entertain, try and determine the said proceedings in exclusion of all other courts.	AGREE
13	The credit period will start from the date of receipt of material at Andrew Yule, Perungudi, Chennai.	AGREE
14	On being awarded the contract, the bidder should execute Bank Guarantee for Rs:60 lakhs or for the value of cc rod supplied in favour of ANDREW YULE & CO.LTD. (Valid up 30.09.19) towards security for material issued (For 2 coils – 5.3 MT- Rs: 32 lakhs, For 3 coils – 7.95 MT- Rs:48 lakhs ,& For 4 coils – 10.6 MT- Rs:64 lakhs.	Remarks Field
15	PAYMENT TERMS: Direct Credit	AGREE
16	Please indicate the number of days of direct credit. (Andrew Yule payment terms is minimum 120 days direct credit. If the offered payment terms is less than 120 days , bids will be opened at the sole discretion of Andrew Yule & price will be loaded as per Andrew Yule norms)	Remark field
17	EMD : Rs. 20,000/= UP LOADED Bidders may request for exemption from submitting EMD (Refer details given in General terms & conditions	Remark field
18	Tender fee Rs: 200 /= should be paid by way of RGTS/ NEFT UP LOADED Bidders participating in the tender should upload the UTR details towards cost of tender document.	Remark field
19	Customer Profile UP LOADED ** Those who had participated and qualified in our earlier tender no.T.05/17-18 or bidders in AYCL-Chennai approved vendor list for fabrication of Paper Covered Copper Conductor need not submit the customer profile.	Remark field
20	Copies of purchase orders & Performance Certificate from at least three reputed transformers manufacturers for having supplied fabrication of Paper covered copper conductor for transformers above 10 MVA rating during the year 2016-2017. Offers received without copies of purchase orders & performance certificate for the year 2016-17will be rejected. UP LOADED	Remark field

	** Those who had participated and qualified in our earlier tender no.T.05/17-18 or bidders in AYCL-Chennai approved vendor list for fabrication of Paper Covered Copper Conductor need not submit the Performance Certificate	
21	<p>Bidders should have a minimum turnover of Rs: 2 crores per annum (or) Labour charges turnover of minimum Rs: 30 Lakhs per annum. Please enclose copy of last 3years P&L Account.(2014-15, 2015-16, 2016-17)UP LOADED</p> <p>** Those who had participated and qualified in our earlier tender no.T.05-17/18 or bidders in AYCL-Chennai approved vendor list for fabrication of Paper Covered Copper Conductor, balance sheet (P&L A/c) for 2016-17 only needs to be uploaded.</p>	Remark field
22	Please indicate the quantity of Paper Insulated Copper Conductors you will be able to supply per month	Remark field

PRICE FORMAT FOR SUPPLY OF PAPER INSULATED COPPER CONDUCTORS

Sl. No	DESCRIPTION	Quantity	FABRICATION RATE PER KG(In Rs) (Including Packing, Forwarding, Freight & Insurance etc) (Rs)	IGST (%) (If not applicable please enter Zero)	CGST (%) (If not applicable please enter Zero)	SGST (%) (If not applicable please enter Zero)	Landed cost per No (In Rs)
	Paper Insulated Copper Conductors	Kg	A	B	C	D	Landed Cost =a
1	15.01 sq.mm and above, Insulation up to 0.8 mm	61000					
2	15.01 sq.mm and above, Insulation above 0.8 mm	61000					
3	15 sq.mm and below, Insulation of any thickness	37000					
4	3 Bunched conductor 1) Individual conductor Area above 14.00 Sq.mm 2) Insulation (0.25 mm, 0.65 mm)	41000					



ANDREW YULE & CO. LTD.
T & S UNIT, MADRAS.

SPEC. No. SMC 101

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SPECIFICATION FOR RECTANGULAR/ROUND COPPER CONDUCTOR

I. GENERAL REQUIREMENTS

1. Type : Electrolytic grade copper
2. Application : For winding transformer coils

II. SPECIFICATIONS

1. Reference Standards : IS 7404 part I & II/1991, IS 6160/4971
IS 4800 part-I/1968.
IS 9335 part-3/Sec-1/1984
2. Process : Generally Annealed
3. Material composition (for copper) :
Copper + silver = 99.90% Min
Bismuth = 0.001% Max
Lead = 0.005% Max
All other impurities
excluding silver & oxygen = 0.03% Max
Oxygen = 0.06% Max
Total of Bismuth, Lead & other impurities shall not exceed = 0.1%
4. Material characteristics

CHARACTERISTICS	UNIT	REQUIRED VALUE	TOLERANCE
Bare conductor size	MM	Specified in our PO	Table - 1
Insulation built up	Mm	Specified in our PO	Table - 2
Corner radius (applicable for rectangular conductors only)	Mm	Refer table 3	
Tensile strength	MN/sq.m	As per Table 4	MAX
Elongation	%	As per Table 4	MIN
Grade of Paper (Type)		1.2-2M	

Revision	Description	Prepared	Approved	Date
0	Fourth Issue	<i>[Signature]</i>	<i>[Signature]</i>	20-7-13





ANDREW YULE & CO. LTD.
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CHARACTERISTICS	UNIT	REQUIRED VALUE	TOLERANCE
Paper width	mm	1.5 times the sum of width & thickness of the conductor with max. of 25mm.	
Overlap	%	25% of the width of paper	MIN
Resistance at 20 °c per unit volume	Ohms/Cu.cm	0.017241	MAX

Mode of lapping (unless otherwise specified)

- i) Two layers
When there are two layers, both of them shall be overlap wound in the opposite directions.
- ii) More than two layers.
All layers shall be applied in the same direction, all except the outermost layer shall be butt wound and the outer most layer shall be overlap wound. Within each group of papers the position of the butt joint of any layer, relative to the layer below shall be progressively displaced by approximately 30% of the paper width

III. TESTS :

Following routine tests are to be conducted as per IS 7404 part I & II.

1. Bare conductor dimension
2. Insulation built up
3. Corner radius
4. Tensile strength
5. Elongation
6. Paper width
7. Overlap
8. Resistance per unit volume
9. Mode of lapping

IV EXTENT OF CHECK

Each reel shall be checked for all the parameters mentioned in clause III

0	Revision	0	Issue	20-7-13
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ANDREW YULE & CO. LTD.
T & S UNIT, MADRAS.

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V. PACKING

The paper covered rectangular / round conductor shall be tightly and evenly wound on reels. The maximum weight of the reels shall not exceed 100 Kgs and the outer diameter of reel shall not exceed 530mm. Each reel should contain only 80% of the overall diameter. If joints are made in the conductor same should be marked with red paper tape before and after the joints 25 mm apart and the no. of joints shall be indicated in the label.

A label should be attached to the drum containing following details

- i) Manufacturer's name
- ii) Dimensions of the conductor - Bare & Covered
- iii) Weight of the wire both gross & net
- iv) No. of joints if any.

VI. DOCUMENTS

Test Certificate indicating the reel no, parameters checked as per clause III shall accompany each consignment

VII. ACCEPTANCE CRITERIA

As per SPT 114 (For Internal use only).



0	Revised	Issue	Prepared	Approved	20-7-13
Revision		Description			Date



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TABLE 1.A. DIAMETER AND TOLERANCE OF PAPER COVERED ROUND COPPER CONDUCTORS.

NOMINAL CONDUCTOR DIAMETER	Tolerance	Ordinary Covering		Fine Covering	
		Overall Diameter Max	Increase in Diameter Min	Overall Diameter Max	Increase in Diameter Min
mm	mm	mm	mm	mm	mm
0.630	±0.006	0.885	0.200	0.810	0.150
0.710	±0.007	0.990	0.225	0.890	0.150
0.750	±0.008	1.035	0.225	0.935	0.150
0.800	±0.008	1.085	0.225	0.985	0.150
0.850	±0.009	1.135	0.225	1.035	0.150
0.900	±0.009	1.185	0.225	1.085	0.150
0.950	±0.010	1.235	0.225	1.135	0.150
1.000	±0.010	1.285	0.225	1.210	0.175
1.060	±0.011	1.345	0.225	1.270	0.175
1.120	±0.011	1.405	0.225	1.330	0.175
1.180	±0.012	1.465	0.225	1.390	0.175
1.250	±0.013	1.540	0.225	1.465	0.175
1.320	±0.013	1.610	0.225	1.535	0.175
1.400	±0.014	1.715	0.250	1.640	0.200
1.500	±0.015	1.815	0.250	1.740	0.200
1.600	±0.016	1.915	0.250	1.840	0.200
1.700	±0.017	2.015	0.250	1.940	0.200
1.800	±0.018	2.120	0.250	2.045	0.200
1.900	±0.019	2.220	0.250	2.145	0.200
2.000	±0.020	2.370	0.300	2.270	0.225
2.120	±0.021	2.490	0.300	2.390	0.225
2.240	±0.022	2.610	0.300	2.510	0.225
2.360	±0.024	2.735	0.300	2.635	0.225
2.500	±0.025	2.875	0.300	2.775	0.225
2.650	±0.027	3.025	0.300	2.930	0.225
2.800	±0.028	3.180	0.300	3.080	0.225
3.000	±0.030	3.380	0.300	3.280	0.225
3.150	±0.032	3.530	0.300	3.430	0.225

0	Revised	Issue	Prepared	Approved	20-7-13
Revision	Description				



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TABLE 1.B TOLERANCE ON NOMINAL DIMENSIONS (RECTANGULAR CONDUCTORS)

Dimension (Width or Thickness)		Tolerance
Over mm	Upto and including mm	+ mm -
	3.15	0.030
3.15	6.30	0.050
6.30	12.50	0.070
12.50	16.00	0.100

TABLE 2.a TOLERANCE ON COVERING(RECTANGULAR CONDUCTORS)

Increase Due to Covering mm	Negative Tolerance Percent
0.25 to 0.5 inclusive	10.0
Over 0.5 upto and including 1.25	7.5
Over 1.25	5.0

TABLE 2.B TOLERANCE ON SPECIAL COVERING (ROUND CONDUCTORS)

Increase Due to Covering mm	Tolerance \pm Percent
0.25 to 0.5	10.0
Over 0.5 to 1.30	7.5
Over 1.30	5.0

TABLE 3 RADIUS ON CORNERS (RECTANGULAR CONDUCTORS)

Nominal Thickness of Conductor		Corner Radius
Over mm	Upto and including mm	Mm
	1.00	Semicircular
1.00	1.60	0.50
1.60	2.24	0.65
2.24	3.55	0.80
3.55		1.00

0	Fourth	2554c	Ruboth	25-7-13
Revision	Description	Prepared	Approved	Date





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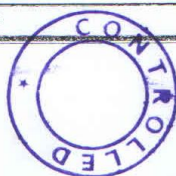
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TABLE 4.A. DIAMETER AND ELONGATION OF ROUND CONDUCTORS

NOMINAL CONDUCTOR DIAMETER MM	ELONGATION % MIN
0.560	26
0.630	27
0.710	28
0.750	28
0.800	28
0.850	28
0.900	29
0.950	29
1.000	30
1.060	30
1.120	30
1.180	31
1.250	31
1.320	32
1.400	32
1.500	32
1.600	32
1.700	32
1.800	32
1.900	32
2.000	33
2.120	33
2.240	33
2.360	33
2.500	33
2.650	34
2.800	34
3.000	34
3.150	34
3.350	34
3.500	35
3.750	35

0	Fourth Issue	Prepared	Approved	20.7.13
Revision	Description	prepared	Approved	Date





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TABLE 4.B.TENSILE STRENGTH AND ELONGATION FOR RECTANGULAR CONDUCTORS

Nominal Thickness of Conductor		Tensile Strength Max.	Elongation Min.
Over mm	Upto and including mm	MN/sq. mm	Percent
2.5	2.5 5.6	265 255	30 35

0	Final Issue	Prepared	Approved	20-7-13
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SPT114

I. ACCEPTANCE CRITERIA FOR RECTANGULAR / ROUND COPPER CONDUCTOR
FOR SPEC.NO.SMC 101

SL.NO	CHARACTERISTICS	UNIT	REQUIRED VALUE	TOLERANCE
01	Bare conductor size	mm	As per PO.	Table 1
02	Insulation built-up	mm	As per PO.	Table 2
03	Resistance at unit volume at 20 deg c	Ohms/cubic cm	0.017241	MAX



0	FIRST ISSUE	<i>A. H.</i>	<i>(82)</i>	10-1-97
Revision	Description	Prepared	Approved	Date

GDD111



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MATERIAL INSPECTION PLAN

QAP - 106/R.-1

COPPER STRIPS AND WIRES

Method of inspection :

1. Verification of manufacturer's test certificates for the following parameters

- a) Bare copper dimension
- b) Covered
- c) Resistivity
- d) Tensile strength
- e) Elongation
- f) Hardness

2. Checks on the material at our works.

- a) Dimensions of bare copper
- b) Dimensions with insulation
- c) Physical verification
- e) Packing slip on bobbin

Inspection will be carried out in one bobbin for a particular size.

Prepared by : *TS. R. S. S. S. S.*
Designation : A M - QC
Date : *17/11*

Approved by : *[Signature]*
Designation : D M - QC
Date : *17/11*