REQUEST FOR QUOTATION - ONLINE BIDDING

MMI:PU:RF:003

BHARAT HEAVY ELECTRICALS LIMITED
Electronics Division
PB No. 2606, Mysore Road Bangalore - 560026
INDIA

RFQ NUMBER: SAKERC0001

RFQ DATE : [redacted]

Due Date/Day: [redacted]
Time [redacted]

Please submit your lowest quotation subject to our terms and conditions attached for the material mentioned below. "Quotation to be submitted in E Procurement portal only"

(for all correspondence)
Purchase Executive : Santosh Kumar
Phone : 8004939865
Fax :
E-mail: kumar.santosh@bhel.in

Sl No.	Description	Qty	Unit	Delivery qty	Delivery Date
1	CU2855276020 PTFE EXTRD 7/0.3 600V 2/2X0.5MM² IT- * HSN/SAC : Doc No.- PS409045 Rev - 04 PTFE INSULATED CABLE COLOUR GREY, 2X2X0.5SQMM VOLTAGE GRADE:600V AS PER TABLE -1, CBL-TYPE-1 OF PSPEC NO. PS409045	70,000	M	70,000	[redacted]
2	CU2855276039 PTFE EXTRD 7/0.3 600V 4/2X0.5MM² IT- * HSN/SAC : Doc No.- PS409045 Rev - 04 PTFE INSULATED CABLE COLOUR GREY, 4X2X0.5SQMM VOLTAGE GRADE:600V AS PER TABLE -1, CBL-TYPE-2 OF PSPEC NO. PS409045	40,000	M	40,000	[redacted]

Total Number of Items - 2

1.
2.

NOTES:
1. This RFQ is governed by:
a) INSTRUCTIONS TO BIDDERS/SELLERS and GENERAL CONDITIONS OF CONTRACT FOR PURCHASE available at **http://edn.bhel.com (RFQ-PO Terms & Conditions)**
b) Any other specific Terms and Conditions mentioned. of offers are required to furnish authorization letter for the same.
2. Tender Result can be viewed in the website.
* The HSN/SAC no mentioned against the line items in the RFQ are indicative only.

For and On behalf of BHEL.

Santosh Kumar
Control Equipment

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Total Number of Items - 2

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For and On behalf of BHEL.

Santosh Kumar
Control Equipment

PURCHASE SPECIFICATION FOR 2 PAIR 0.5 SQMM PTFE CABLE AS PER CABLE TYPE-1 OF PS/409/045

Enclosures:

1) PQR for Purchase specification PS/409/045
2) Purchase specification PS/409/045
3) Datasheet Sample
4) Quality Plan Sample

Note:

Vendor shall provide following documents for evaluation of offer

1) Signed copy of Purchase specification PS/409/045
2) Technical Datasheet
3) No Deviation Certificate

Date : 17 Apr 2024	**BHEL ELECTRONICS DIVISION**	**CE-ENGG-TGC**

PQR for Purchase specification PS/409/045

Prequalification requirements for bidders of 2 PAIR 0.5 SQMM PTFE Cable as per Purchase specification PS/409/045

S.NO	Criteria	Document Required
1	The bidder should be a manufacturer of 2 PAIR 0.5 SQMM PTFE cable or similar cable for 2 years or more.	Purchase order copy for supply of similar item from 2 years or more to any corresponding power plant or process industry
2	The Bidder shall submit valid type test certificates complying with relevant standards mentioned in the specification on the date of submission of Offer against this tender. The following type tests must be included in the test report. a) Tensile tests before heat ageing after heat ageing at 240 deg C for 36 hours on core Insulation and also on Sheath b) Elongation at break before and after Heat ageing at 240deg C for 36 hours in percent before heat ageing and After heat Ageing on core and also on sheath c) Resistance to pressure after 4 hours at 240 deg C under constant pressure At high temperature VOE -472 part-609,303 d) Impulse voltage strength (VOE 0472 Part 511) e) Conductor resistance, Volume resistivity, Insulation resistance, Dielectric strength, Spark test, High Voltage test ***OR*** The supplier should have supplied same category and same conductor cross sectional area cable as mentioned in the bid to BHEL against an earlier purchase order	Type test certificates conducted in a NABL accredited laboratory ***OR*** Purchase order copy for supply of the item to BHEL
3	The bidder should have supplied same category Purchase order copies product for 30% of total bid quantity in last 3 financial years, to any corresponding power plant or process industry.	Purchase order copy for supply of similar item with at least 30% of current bid quantity to any corresponding power plant or process industry

Note:
PMD vendors registered with BHEL against the material code are excluded from the above PQR requirements

PURCHASE SPECIFICATION

FOR

TEFLON(PTFE) INSULATED CABLE

REVISION : 04

APPROVED BY :

S K RANGANATH

PREPARED	ISSUED	DATE
D.V.V.R.	ENGG	20-04-2011

REVISION HISTORY SHEET

REV No.	DATE	NATURE OR CHANGE	REASON	PREPARED BY	APPROVED BY
01	09-02-1994	SECOND ISSUE	SL 2.1 SL 4.5 ADDED	R S Sharma	B S Vishwanatha
02	02-11-2010	THIRD ISSUE	Revised To take care of latest regulations , requirements and supplier feedback	DVVR.	SKR
03	27-01-2011	THIRD ISSUE	Revised by removing individual pair shielding, through al mylar tape and other irrelevant tests not applicable for PTFE cables.	DVVR.	SKR
04	20-04-2011	FOURTH ISSUE	Al Mylar Tape shielding, added and silver braiding/ screening removed which is technically equivalent.	DVVR.	SKR

REVISION : 04 DATE: 20-04-2011

APPROVED BY :
S K RANGANATH

PREPARED	ISSUED	DATE
D.V.V.R.	ENGG	20-04-2011

GENERAL :-

This specification is intended to cover the design, manufacture, testing at manufacturer's works, inspection, packing and dispatch of TEFLON (PTFE) INSULATED Instrumentation cables used in power stations.

Cables shall be designed and manufactured to meet the operating conditions and shall not result in damage due to transportation, storage and installation. Cables shall be suitable for laying in trays, ducts, conduits both in wet and dry locations.

1.1 This cable is meant for wiring transmitters, solenoid valves of working voltage of < 60 V

1.2 Voltage Grade	: 600 V
1.3 Operating Temp. Rating	: -10 DEG C to + 200 DEG C

2.0 CONDUCTOR:

2.1 Material	: Silver plated copper (min 1.00 micron)
2.2 Nominal cross section	: See Table 1
2.3 No. of wires x Single wire diameter	: See Table 1
2.4 Overall diameter of bunched conductor	: See Table 1

3.0 CORE

3.1 Insulation Material	:PTFE Wrapped and Sintered/ PTFE extruded
3.2 Insulation Thickness	: See Table 1
3.3 Overall diameter of each core	: See Table 1
3.4 Colour Code	: See Table 1

4.0 FURTHER CONSTRUCTION

4.1 Stranding Construction	: See Table 1
4.2 Lay	: See Table 1
4.3 Lapping of cores	: Glass yarn Filler/Silicon oil Filler
4.4 Wrapping of cores	: See Table 1
4.5 Shield Braid & coverage	: See Table 1

SPECIFICATION FOR TEFLON (PTFE) INSULATED CABLE

5.0 OUTER SHEATH:

5.1 Material	: PTFE Tapped and sintered/PTFE extruded
5.2 Wall Thickness	: 0.5 mm +/- 0.1 mm
5.3 Overall diameter of cable	: See Table 1
5.4 colour	: Grey
5.5 BHEL-Edn Code for Cables	: See Table 1

6.0 ELECTRICAL TESTS & CABLE PARAMETERS(Routine Tests and acceptance criteria)

6.1 Conductor resistance in ohms / km at 20^{O}C (VDE 0472 part 501) (IS : 8130)	: See Table 1
6.2 Volume resistivity (ohms / cm) at room temp of 20^{O} C (VDE 0472 part 502 C) (IS : 5831)	: $\geq 10^{14}$ (max)
6.3 Insulation resistance at 20 C (M ohm/km) (VDE 0472 part 502 C) (IS : 5831)	: $\geq$ 500 M ohm/km (max)
6.8 Di – Electric strength (VDE 0472 part 509)	
6.8.1 Core to core	: 2 K. Volts for 1 min.
6.8.2 Core to shield	: 2 K. Volts for 1 min.
6.9 Spark Test*:	: 3.4kV/sec continuous on extruded line.
6.10 High Voltage Test	:2.5KV for 1 min (max) for 600V grade cable.

(Note: *spark test is conducted during cable extrusion /manufacturing process and reports conducted by vendor shall be acceptable)

7.0 TYPE TEST

(required to be conducted together with routine tests for establishing the vendor.)

7.1.1	Tensile tests before heat ageing on core insulation	: ≥ 10 N/mm sq
7.1.2	Tensile test after heat ageing at 240deg C for 336 hours on core	: ≥ 10 N/mm sq
7.1.3	Tensile test before heat Ageing on Sheath	: ≥ 10 N/mm sq
7.1.4	Tensile test after heat ageing at 240deg C for 36 hours on core	: ≥ 10 N/mm sq
7.2	Elongation at break before and after Heat ageing at 240deg C for 336 hours In percent before heat ageing on core	: ≥ 200%
7.4	After heat Ageing on core	: ≥ 200%
7.5	Before heat Ageing on sheath	: ≥ 200%
7.6	After heat Ageing on sheath	: ≥ 200%
7.7	Resistance to pressure after 4 hours At 240deg C under constant pressure At high temperature VDE -472 part-609, 303	:Max 50%
7.8	Impulse voltage strength (VDE 0472 Part 511)	:Surge of 5.0 KV Dc, 1.25 Micro seconds

SPECIFICATION FOR TEFLON (PTFE) INSULATED CABLE

8.0 SUPPLY CONDITIONS:

8.1 The applicable specifications shall be in accordance with the latest edition together with the current amendments.

8.2 CABLE DRUMS :

Cables shall be supplied in non-returnable drums. The drums shall be of heavy construction. All wooden components shall be manufactured from seasoned wood. All ferrous parts used shall be treated with a suitable rust preventive finish or coating to avoid rusting during transit and storage. Packing should be suitable for surface transportation sea worthy packing. Tolerance of +/-5% excess quantity of type of cable ordered shall be allowed. The cable shall be dispatched in 500 metres of coils. Maximum 10% of the ordered quantity of each type cable ordered can be dispatched in shorter length. However, pieces shorter than 100 metres will not be accepted.

8.3 INSPECTION AND TESTING PROGRAM:
The test requirement have been detailed in the end of the specification.
The inspection will be carried out by the purchaser or their authorised representative at suppliers work or at BHEL-EDN.

8.4 GUARANTEE AND PENALTY:

The contractor shall guarantee satisfactory performance of the material supplied under all conditions and requirement as laid down by this specification.

If the contractor fails to fulfil these requirements, he shall rectify or replace the defective lot on free of cost within a period of three months and prove the guarantee. If the contractor fails to prove the guarantee the purchaser reserves the right to take alterations to make up the deficiency and all expenses incurred by the purchaser in this regard shall be debited to the contractor's account. This is without any prejudice to any other contractual right which the purchaser may have against the contractor.

8.5 PROTECTION DURING MANUFACTURE AND SHIPMENT:

In case of materials to be stored for a long period at site, these are to be provided with special treatment for preserving the same for long time storage.

Cables shall be placed on reels in such a manner that it will be protected from injury during transit. Each end of the cable shall be finally and properly secured to the reel. The ends of each length shall be sealed with PVC caps & PVC tapes to prevent ingress of moisture, before dispatch. The reels shall be secured firmly in position so that these will not shift during transit.

Reels shall be of heavy construction. A label shall be securely attached to each end of the reel indicating the purchaser's order number, length of cable, size of conductor, number of cores, type of cable and voltage for which it is suitable. A tag containing the information shall be attached to the leading end or the cable inside the drum. An arrow and suitable accompanying wordings shall be marked on one end of the reel indicating the direction in which it should be rolled.

SPECIFICATION FOR TEFLON (PTFE) INSULATED CABLE

Packing shall be sturdy and adequate to protect the cable from injury by corrosion, dampness, heavy rains, breakage and vibrations encountered during transportation, handling and storage at the plant site, it should be suitable for transport by sea.

8.6 MARKING:

The label shall be securely attached to the drum with the following information. **Material code**, Cable type & Size, BHEL order no., Manufacturer's name and Trade Mark. Batch No./Date of mfg.

8.7 ADDITIONAL CONDITIONS FOR SUPPLY OF CABLES:

a. Whenever a conductor is broken, the supplier can join the same by welding or brazing process only.

b. The conductor resistance measured for a length of 25 cms and compared with the resistance of the conductor without any joint shall not be more than 5% of the resistance of adjacent conductor.

c. Tensile strength of such joined conductor shall be not less than 90% of the value of the conductor without joint.

d. Joining of core insulation or jacket insulation material is not acceptable.

e. No repair work on insulation of core or jacket is acceptable.

f. Supplier shall offer all the cores for physical inspection before jacketing is done.

g. Jacketing shall not be done unless the physical inspection is completed and clearance is given.

h. The supplier shall furnish test certificates along with the supply of ordered quantity. The test certificate should confirm that the cable conforms to the specification and should also contain the "Routine tests" results. The supplier shall also certify in the test certificate that the cable supplied does not have any joints in the insulation.

i. Supplier shall introduce and maintain a separate job card for BHEL supplies.

j. This job card shall give complete information as the number of conductor joints in cable and the cores in which such a joint is made.

k. A written down procedure shall be given for making a conductor joint.

l. Joint of conductor shall not occur closer than 50 ft. (1524 cm).

SPECIFICATION FOR TEFLON (PTFE) INSULATED CABLE

Table – 1

Sl. No of Specs	CABLE TYPE – 1 2X2X0.5 mm Sq. DIN/VDE type: JE-Li6YVC6Y	CABLE TYPE – 2 4X2X0.5 mm Sq DIN/VDE type: JE-Li6YVC6Y	CABLE TYPE – 3 5X1.5 mm Sq. DIN/VDE type: JE-Li6YV6Y
2.0	CONDUCTOR		
2.1	TEFLON (PTFE) insulated silver plated copper (SPC) conductor (min 1.00 micron)	TEFLON (PTFE) insulated silver plated copper (SPC) conductor (min 1.00 micron)	TEFLON (PTFE) insulated silver plated copper (SPC) conductor (min 1.00 micron)
2.2	0.5 mm Sq.	0.5 mm Sq.	1.5 mm Sq.
2.3*	7/0.3 mm*	7/0.3 mm*	14/0.37 mm* or 30/0.25mm
2.4	0.9 mm ± 0.1 mm	0.9 mm ± 0.1 mm	1.6mm ± 0.1 mm
3.0	CORE		
3.2	Nominal=0.25mm Min. at any Point=0.20mm	Nominal=0.25mm Min. at any Point=0.20mm	Nominal=0.3mm Min. at any Point=0.25mm
3.3	1.4 to 1.6 mm	1.4 to 1.6 mm	2.2 to 2.4 mm
3.4	Pair – 1 : Blue, Red Pair – 2 :Grey, Yellow	Pair – 1 : Blue, Red Pair – 2 :Grey, Yellow Pair - 3 : Green, Brown Pair – 4 : White, Black	Green, Black, Blue, Brown, Orange.
4.0	FURTHER CONSTN:		
4.1	Pair twisted	Pair twisted	Not applicable
4.2	10-14 Twist/Mtr	10-14 Twist/Mtr	Not applicable
4.4	TEFLON (PTFE) foil of 0.025 mm(min)	TEFLON (PTFE) foil of 0.025 mm(min)	TEFLON (PTFE) foil of 0.025 mm(min)

*** No of wires X single wire diameter spec given above may vary as per vendor machine processing capabilities but must achieve the nominal cross section given above (2.2). Relevant VDE and IEC standards for ultra thin wires may be followed.**

SPECIFICATION FOR TEFLON (PTFE) INSULATED CABLE

Table – 1 (continued)

Sl. No. of Specs	CABLE TYPE – 1 2X2X0.5 mm Sq. DIN/VDE type: JE-Li6YVC6Y	CABLE TYPE – 2 4X2X0.5 mm Sq DIN/VDE type: JE-Li6YVC6Y	CABLE TYPE – 3 5X1.5 mm Sq. DIN/VDE type: JE-Li6YV6Y
4.5	Overall shielding shall be with Al Mylar tape of 55micron nominal thickness so as to provide 100% coverage and 50% overlap with multi strand drain wire of SPC wire size of 0.90mm dia(7/0.3mm)	Overall shielding shall be with Al Mylar tape of 55micron nominal thickness so as to provide 100% coverage and 50% overlap with multi strand drain wire of SPC wire size of 0.90mm dia(7/0.3mm)	Not Applicable

SPECIFICATION FOR TEFLON (PTFE) INSULATED CABLE

Table – 1 (continued)

Sl. No. of Specs	CABLE TYPE – 1 2X2X0.5 mm Sq. DIN/VDE type: JE-Li6YVC6Y	CABLE TYPE – 2 4X2X0.5 mm Sq DIN/VDE type: JE-Li6YVC6Y	CABLE TYPE – 3 5X1.5 mm Sq. DIN/VDE type: JE-Li6YV6Y
5.0	OUTER SHEATH		
5.3	OVERALL DIAMETER 7.6mm Nominal	9.0 mm Nominal	7.3 mm Nominal
5.5	BHEL-Edn Code: CU2855276020	CU2855276039	CN9075943032
6.1	ROUTINE TESTS: <=36.7 ohm/km to <=40.5ohm/km (max)(core) <=73.4 ohm/km to <=81.5ohm/km (max)(loop) For 0.5sqmm cable With given tolerance As in point 2.4 above.	ROUTINE TESTS: <=36.7 ohm/km to <=40.5ohm/km (max)(core) <=73.4 ohm/km to <=81.5ohm/km (max)(loop) For 0.5sqmm cable With given tolerance As in point 2.4 above.	ROUTINE TESTS: <=13.3 ohm/km to <=14.1ohm/km (max) (Core)

I **Routine Tests(Tests to be conducted and reports Furnished)**

a) Visual (as in 2.0, 3.0, 4.0, 5.0 above)
b) Construction details(as in 2.0, 3.0, 4.0, 5.0 above)
c) Dimensions(as in 5.3 above)
d) Thickness (as in 5.2 above)
e) Insulation resistance(as in 6.3 above)
f) High voltage (as in 6.10 above)
g) Spark Test (as in 6.9 above)
h) Volume Resistivity (as in 6.2 above)
i) Conductor resistance (as in 6.1 above)
j) Markings/End Sealings (as in 8.6 above)
k) Overlay/coverage/continuity(as in 4.0 above)

VENDOR'S NAME & ADDRESS :-			SAMPLE QUALITY PLAN				QAP REF: REV NO: DATE:			
Sr No.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	TYPE/METHOD OF CHECK	QUANTUM OF CHECK	REFERANCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY M	AGENCY B	Remarks
A	**RAW MATERIAL & BOUGHT OUT ITEM INSPECTION**									
1	Conductor	Surface finish	Visual	Sample	BHEL Specification		Supplier Test Cert.I RMTA	-	V	
		Conductor Resistance	Electrical tests	do	do					
		Dimension	Measurement	do	do					
2	PTFE Insulation and sheath (Jacket)	Surface finish	Visual	do	do					
		Thickness	Measurement	do	do					
B	**IN PROCESS INSPECTION**									
1	Conductor	Surface finish	Visual	Start of production	BHEL Specification		Job Card	P	V	
		Dimension	Measurement							
		Number of Strands	do	do	do					
		Resistance	Electrical test	do	do					
2	Core Insulation	Surface finish	Visual	Start of production	BHEL Specification					
		Core identification	Visual							
		Thickness (minimum)	Measurement	do	do					
		Spark test	Electrical test	100%	do					
3	Outer sheath (Jacket)	Surface Finish	Visual	Start of production	BHEL Specification					
		Sheath Thickness	Measurement							
		Dia over outersheath	Measurement	do	do					
C	**FINAL TESTING**									
1	**ROUTINE TEST**	a) Visual	Visual	1 Sample I Lot	BHEL Specification		I.R	P	W	
		b) Construction details	Visual		BHEL Specification					
		c) Dimensions	Measurement		BHEL Specification					
		d) Thickness	Measurement		BHEL Specification					
		e) Insulation resistance	Electrical		BHEL Specification					
		f) High voltage	Electrical		BHEL Specification					
		g) Volume Resistivity	Electrical		BHEL Specification					
		i) Conductor resistance	Electrical		BHEL Specification					
		j) MarkingsIEnd Sealings	Visual		BHEL Specification					
		k) Tensile tests before heat ageing on core insulation	Physical		BHEL Specification					
		l) Tensile test before heat Ageing on Sheath	Physical		BHEL Specification					
		m) Overlay / Coverage / Continuity	Physical		BHEL Specification					
		n) Spark Test	Electrical		BHEL Specification		T.R	P	V	
2	**TYPE TEST**	a) Tensile tests before heat ageing and after heat ageing at 240 deg C for 36 hours on core insulation	Physical	1 Sample I Lot	BHEL Specification		T.R	P	V	
		c) Tensile test before heat Ageing and after heat ageing at 240 deg C for 36 hours on core	Physical		BHEL Specification					
		e) Elongation at break before and after Heat ageing at 240 deg C for 36 hours In percent before heat ageing and After heat Ageing on core	Physical		BHEL Specification					
		e) Elongation at break before and after Heat ageing at 240 deg C for 36 hours In percent before heat ageing and After heat Ageing on Sheath	Physical		BHEL Specification					
		i) Resistance to pressure after 4 hours At 240 deg C under constant pressure At high temperature VOE -472 part-609,303	Physical		BHEL Specification					
		j) Impulse voltage strength (VOE 0472 Part 511)	Physical		BHEL Specification					

Legend : M : Manufacturer / Sub-Supplier B : BHEL, P : Perform, W : Witness and V : Verification as appropriate.

Prepared By: Vendor Seal/Signature

Approved By: BHEL Seal/Signature

SAMPLE DATASHEET			
VENDOR NAME & ADDRESS			**DOC REF:** **REV:** **DATE:**
SR No	**DESCRIPTION**	**Unit**	**2 PAIR 0.5 SQMM**
	BHEL Material Code		**CU2855276020**
1	**Make**		
2	Rated Voltage	V	600V
3	Operating Temperature Rating	Deg C	(-10 Deg C to +200 Deg C)
4	**Conductor**		
	a) Material		**Silver Plated Copper (Min 1.0 micron)**
	b) Nominal Crossection	mm2	0.5
	c) Number of wires x single wire dia	Nos/mm	7/0.3
	d) Overall Dia of bunched Conductor	mm	*
5	**INSULATION**		
	a) Insulation Material		**PTFE Tape Wrapped & Sintered**
	b) Thickness (Min/Nom)	mm	0.25/0.3
	c) Overall dia of each core	mm	1.4-1.6
	d) Color Code		Pair 1: Blue, Red Pair 2: Grey, Yellow
6	Min. number of twists of cores in a pair	No	10-14 twist/meter
7	Filler		Glass yarn filler
8	**Overall shielding**		
	a) Material		Aluminum-Mylar Tape
	b) Type		Helical
	c) Thickness (Min.)	mm	0.055
	d) Overlap/Coverage	%	50/100
9	**DRAIN WIRE (For Overall shielding)**		
	a) Material		Annealed Silver Plated Copper
	b) Size	AWG	20 (i.e 0.51Sqmm)
	c) No. of strands/ approx. strand size	No/mm	7 / 0.3
10	**OUTER SHEATH**		
	a) Material		**PTFE Tape Wrapped & Sintered**
	b) Thickness	mm	0.5 ± 0.1
	c) Colour		Grey
	d) Overall diameter of cable (Nom)	mm	*
11	**ELECTRICAL PARAMETERS**		
	a) Conductor resistance at 20 Deg. C	ohms/km	
	b) Min. Insulation resistance at 20 Deg.C	Mohm/km	500
	c) Max. Mutual capacitance between conductors at 0.8kHz	nF/km	200
	d) Min. Cross-talk figure at 0.8kHz	dB	60
	e) High voltage test	kV(rms)	2.5 KV for 1 min
	g) Dielectric strength Core to Core		2 KV for 1 min
	h) Dielectric strength Core to Shield		2 KV for 1 min
	i) Min. Volume resistivity at 20 Deg. C	ohm/cm	1014
12	**ELECTRICAL CHARACTERISTICS**		
	a) Max. D.C. resistance at 20 Deg. C.·	ohm/Km	<=13.3 ohm/km to <=14.1ohm/km (Max)
	b) High Voltage Test		2.5KV for 1 min (Max)
	c) Insulation Resistance	Mohm/Km	500 (Max)
13	Tolerance on Individual Drum Length and Overall quantity.	%	+5%
14	Marking details		The label shall be securely attached to the drum with the following information. Material code, Cable type & Size, BHEL order no., Manufacturer's name and Trade Mark. Batch No./Date of mfg.

Note*:* All * marked fields to be filled by Vendor

PURCHASE SPECIFICATION FOR 4 PAIR 0.5 SQMM PTFE CABLE AS PER CABLE TYPE-2 OF PS/409/045

Enclosures:

1) PQR for Purchase specification PS/409/045
2) Purchase specification PS/409/045
3) Datasheet Sample
4) Quality Plan Sample

Note:

Vendor shall provide following documents for evaluation of offer

1) Signed copy of Purchase specification PS/409/045
2) Technical Datasheet
3) No Deviation Certificate

Date : 17 Apr 2024	**BHEL ELECTRONICS DIVISION**	**CE-ENGG-TGC**

PQR for Purchase specification PS/409/045

Prequalification requirements for bidders of 4 PAIR 0.5 SQMM PTFE Cable as per Purchase specification PS/409/045

S.NO	Criteria	Document Required
1	The bidder should be a manufacturer of 4 PAIR 0.5 SQMM PTFE cable or similar cable for 2 years or more.	Purchase order copy for supply of similar item from 2 years or more to any corresponding power plant or process industry
2	The Bidder shall submit valid type test certificates complying with relevant standards mentioned in the specification on the date of submission of Offer against this tender. The following type tests must be included in the test report. a) Tensile tests before heat ageing after heat ageing at 240 deg C for 36 hours on core Insulation and also on Sheath b) Elongation at break before and after Heat ageing at 240deg C for 36 hours in percent before heat ageing and After heat Ageing on core and also on sheath c) Resistance to pressure after 4 hours at 240 deg C under constant pressure At high temperature VOE -472 part-609,303 d) Impulse voltage strength (VOE 0472 Part 511) e) Conductor resistance, Volume resistivity, Insulation resistance, Dielectric strength, Spark test, High Voltage test ***OR*** The supplier should have supplied same category and same conductor cross sectional area cable as mentioned in the bid to BHEL against an earlier purchase order	Type test certificates conducted in a NABL accredited laboratory ***OR*** Purchase order copy for supply of the item to BHEL
3	The bidder should have supplied same category Purchase order copies product for 30% of total bid quantity in last 3 financial years, to any corresponding power plant or process industry.	Purchase order copy for supply of similar item with at least 30% of current bid quantity to any corresponding power plant or process industry

Note:
PMD vendors registered with BHEL against the material code are excluded from the above PQR requirements

PURCHASE SPECIFICATION

FOR

TEFLON(PTFE) INSULATED CABLE

REVISION : 04

APPROVED BY :

S K RANGANATH

PREPARED	ISSUED	DATE
D.V.V.R.	ENGG	20-04-2011

REVISION HISTORY SHEET

REV No.	DATE	NATURE OR CHANGE	REASON	PREPARED BY	APPROVED BY
01	09-02-1994	SECOND ISSUE	SL 2.1 SL 4.5 ADDED	R S Sharma	B S Vishwanatha
02	02-11-2010	THIRD ISSUE	Revised To take care of latest regulations , requirements and supplier feedback	DVVR.	SKR
03	27-01-2011	THIRD ISSUE	Revised by removing individual pair shielding, through al mylar tape and other irrelevant tests not applicable for PTFE cables.	DVVR.	SKR
04	20-04-2011	FOURTH ISSUE	Al Mylar Tape shielding, added and silver braiding/ screening removed which is technically equivalent.	DVVR.	SKR

REVISION : 04 DATE: 20-04-2011

APPROVED BY :
S K RANGANATH

PREPARED	ISSUED	DATE
D.V.V.R.	ENGG	20-04-2011

GENERAL :-

This specification is intended to cover the design, manufacture, testing at manufacturer's works, inspection, packing and dispatch of TEFLON (PTFE) INSULATED Instrumentation cables used in power stations.

Cables shall be designed and manufactured to meet the operating conditions and shall not result in damage due to transportation, storage and installation. Cables shall be suitable for laying in trays, ducts, conduits both in wet and dry locations.

1.1 This cable is meant for wiring transmitters, solenoid valves of working voltage of < 60 V

1.2 Voltage Grade	: 600 V
1.3 Operating Temp. Rating	: -10 DEG C to + 200 DEG C

2.0 CONDUCTOR:

2.1 Material	: Silver plated copper (min 1.00 micron)
2.2 Nominal cross section	: See Table 1
2.3 No. of wires x Single wire diameter	: See Table 1
2.4 Overall diameter of bunched conductor	: See Table 1

3.0 CORE

3.1 Insulation Material	:PTFE Wrapped and Sintered/ PTFE extruded
3.2 Insulation Thickness	: See Table 1
3.3 Overall diameter of each core	: See Table 1
3.4 Colour Code	: See Table 1

4.0 FURTHER CONSTRUCTION

4.1 Stranding Construction	: See Table 1
4.2 Lay	: See Table 1
4.3 Lapping of cores	: Glass yarn Filler/Silicon oil Filler
4.4 Wrapping of cores	: See Table 1
4.5 Shield Braid & coverage	: See Table 1

SPECIFICATION FOR TEFLON (PTFE) INSULATED CABLE

5.0 OUTER SHEATH:

5.1 Material	: PTFE Tapped and sintered/PTFE extruded
5.2 Wall Thickness	: 0.5 mm +/- 0.1 mm
5.3 Overall diameter of cable	: See Table 1
5.4 colour	: Grey
5.5 BHEL-Edn Code for Cables	: See Table 1

6.0 ELECTRICAL TESTS & CABLE PARAMETERS(Routine Tests and acceptance criteria)

6.1 Conductor resistance in ohms / km at 20^{O}C (VDE 0472 part 501) (IS : 8130)	: See Table 1
6.2 Volume resistivity (ohms / cm) at room temp of 20^{O} C (VDE 0472 part 502 C) (IS : 5831)	: $\geq 10^{14}$ (max)
6.3 Insulation resistance at 20 C (M ohm/km) (VDE 0472 part 502 C) (IS : 5831)	: $\geq$ 500 M ohm/km (max)
6.8 Di – Electric strength (VDE 0472 part 509)	
6.8.1 Core to core	: 2 K. Volts for 1 min.
6.8.2 Core to shield	: 2 K. Volts for 1 min.
6.9 Spark Test*:	: 3.4kV/sec continuous on extruded line.
6.10 High Voltage Test	:2.5KV for 1 min (max) for 600V grade cable.

(Note: *spark test is conducted during cable extrusion /manufacturing process and reports conducted by vendor shall be acceptable)

7.0 TYPE TEST

(required to be conducted together with routine tests for establishing the vendor.)

7.1.1	Tensile tests before heat ageing on core insulation	: ≥ 10 N/mm sq
7.1.2	Tensile test after heat ageing at 240deg C for 336 hours on core	: ≥ 10 N/mm sq
7.1.3	Tensile test before heat Ageing on Sheath	: ≥ 10 N/mm sq
7.1.4	Tensile test after heat ageing at 240deg C for 36 hours on core	: ≥ 10 N/mm sq
7.2	Elongation at break before and after Heat ageing at 240deg C for 336 hours In percent before heat ageing on core	: ≥ 200%
7.4	After heat Ageing on core	: ≥ 200%
7.5	Before heat Ageing on sheath	: ≥ 200%
7.6	After heat Ageing on sheath	: ≥ 200%
7.7	Resistance to pressure after 4 hours At 240deg C under constant pressure At high temperature VDE -472 part-609, 303	:Max 50%
7.8	Impulse voltage strength (VDE 0472 Part 511)	:Surge of 5.0 KV Dc, 1.25 Micro seconds

SPECIFICATION FOR TEFLON (PTFE) INSULATED CABLE

8.0 SUPPLY CONDITIONS:

8.1 The applicable specifications shall be in accordance with the latest edition together with the current amendments.

8.2 CABLE DRUMS :

Cables shall be supplied in non-returnable drums. The drums shall be of heavy construction. All wooden components shall be manufactured from seasoned wood. All ferrous parts used shall be treated with a suitable rust preventive finish or coating to avoid rusting during transit and storage. Packing should be suitable for surface transportation sea worthy packing. Tolerance of +/-5% excess quantity of type of cable ordered shall be allowed. The cable shall be dispatched in 500 metres of coils. Maximum 10% of the ordered quantity of each type cable ordered can be dispatched in shorter length. However, pieces shorter than 100 metres will not be accepted.

8.3 INSPECTION AND TESTING PROGRAM:
The test requirement have been detailed in the end of the specification.
The inspection will be carried out by the purchaser or their authorised representative at suppliers work or at BHEL-EDN.

8.4 GUARANTEE AND PENALTY:

The contractor shall guarantee satisfactory performance of the material supplied under all conditions and requirement as laid down by this specification.

If the contractor fails to fulfil these requirements, he shall rectify or replace the defective lot on free of cost within a period of three months and prove the guarantee. If the contractor fails to prove the guarantee the purchaser reserves the right to take alterations to make up the deficiency and all expenses incurred by the purchaser in this regard shall be debited to the contractor's account. This is without any prejudice to any other contractual right which the purchaser may have against the contractor.

8.5 PROTECTION DURING MANUFACTURE AND SHIPMENT:

In case of materials to be stored for a long period at site, these are to be provided with special treatment for preserving the same for long time storage.

Cables shall be placed on reels in such a manner that it will be protected from injury during transit. Each end of the cable shall be finally and properly secured to the reel. The ends of each length shall be sealed with PVC caps & PVC tapes to prevent ingress of moisture, before dispatch. The reels shall be secured firmly in position so that these will not shift during transit.

Reels shall be of heavy construction. A label shall be securely attached to each end of the reel indicating the purchaser's order number, length of cable, size of conductor, number of cores, type of cable and voltage for which it is suitable. A tag containing the information shall be attached to the leading end or the cable inside the drum. An arrow and suitable accompanying wordings shall be marked on one end of the reel indicating the direction in which it should be rolled.

SPECIFICATION FOR TEFLON (PTFE) INSULATED CABLE

Packing shall be sturdy and adequate to protect the cable from injury by corrosion, dampness, heavy rains, breakage and vibrations encountered during transportation, handling and storage at the plant site, it should be suitable for transport by sea.

8.6 MARKING:

The label shall be securely attached to the drum with the following information. **Material code**, Cable type & Size, BHEL order no., Manufacturer's name and Trade Mark. Batch No./Date of mfg.

8.7 ADDITIONAL CONDITIONS FOR SUPPLY OF CABLES:

a. Whenever a conductor is broken, the supplier can join the same by welding or brazing process only.

b. The conductor resistance measured for a length of 25 cms and compared with the resistance of the conductor without any joint shall not be more than 5% of the resistance of adjacent conductor.

c. Tensile strength of such joined conductor shall be not less than 90% of the value of the conductor without joint.

d. Joining of core insulation or jacket insulation material is not acceptable.

e. No repair work on insulation of core or jacket is acceptable.

f. Supplier shall offer all the cores for physical inspection before jacketing is done.

g. Jacketing shall not be done unless the physical inspection is completed and clearance is given.

h. The supplier shall furnish test certificates along with the supply of ordered quantity. The test certificate should confirm that the cable conforms to the specification and should also contain the "Routine tests" results. The supplier shall also certify in the test certificate that the cable supplied does not have any joints in the insulation.

i. Supplier shall introduce and maintain a separate job card for BHEL supplies.

j. This job card shall give complete information as the number of conductor joints in cable and the cores in which such a joint is made.

k. A written down procedure shall be given for making a conductor joint.

l. Joint of conductor shall not occur closer than 50 ft. (1524 cm).

SPECIFICATION FOR TEFLON (PTFE) INSULATED CABLE

Table – 1

Sl. No of Specs	CABLE TYPE – 1 2X2X0.5 mm Sq. DIN/VDE type: JE-Li6YVC6Y	CABLE TYPE – 2 4X2X0.5 mm Sq DIN/VDE type: JE-Li6YVC6Y	CABLE TYPE – 3 5X1.5 mm Sq. DIN/VDE type: JE-Li6YV6Y
2.0	CONDUCTOR		
2.1	TEFLON (PTFE) insulated silver plated copper (SPC) conductor (min 1.00 micron)	TEFLON (PTFE) insulated silver plated copper (SPC) conductor (min 1.00 micron)	TEFLON (PTFE) insulated silver plated copper (SPC) conductor (min 1.00 micron)
2.2	0.5 mm Sq.	0.5 mm Sq.	1.5 mm Sq.
2.3*	7/0.3 mm*	7/0.3 mm*	14/0.37 mm* or 30/0.25mm
2.4	0.9 mm ± 0.1 mm	0.9 mm ± 0.1 mm	1.6mm ± 0.1 mm
3.0	CORE		
3.2	Nominal=0.25mm Min. at any Point=0.20mm	Nominal=0.25mm Min. at any Point=0.20mm	Nominal=0.3mm Min. at any Point=0.25mm
3.3	1.4 to 1.6 mm	1.4 to 1.6 mm	2.2 to 2.4 mm
3.4	Pair – 1 : Blue, Red Pair – 2 :Grey, Yellow	Pair – 1 : Blue, Red Pair – 2 :Grey, Yellow Pair - 3 : Green, Brown Pair – 4 : White, Black	Green, Black, Blue, Brown, Orange.
4.0	FURTHER CONSTN:		
4.1	Pair twisted	Pair twisted	Not applicable
4.2	10-14 Twist/Mtr	10-14 Twist/Mtr	Not applicable
4.4	TEFLON (PTFE) foil of 0.025 mm(min)	TEFLON (PTFE) foil of 0.025 mm(min)	TEFLON (PTFE) foil of 0.025 mm(min)

*** No of wires X single wire diameter spec given above may vary as per vendor machine processing capabilities but must achieve the nominal cross section given above (2.2). Relevant VDE and IEC standards for ultra thin wires may be followed.**

SPECIFICATION FOR TEFLON (PTFE) INSULATED CABLE

Table – 1 (continued)

Sl. No. of Specs	CABLE TYPE – 1 2X2X0.5 mm Sq. DIN/VDE type: JE-Li6YVC6Y	CABLE TYPE – 2 4X2X0.5 mm Sq DIN/VDE type: JE-Li6YVC6Y	CABLE TYPE – 3 5X1.5 mm Sq. DIN/VDE type: JE-Li6YV6Y
4.5	Overall shielding shall be with Al Mylar tape of 55micron nominal thickness so as to provide 100% coverage and 50% overlap with multi strand drain wire of SPC wire size of 0.90mm dia(7/0.3mm)	Overall shielding shall be with Al Mylar tape of 55micron nominal thickness so as to provide 100% coverage and 50% overlap with multi strand drain wire of SPC wire size of 0.90mm dia(7/0.3mm)	Not Applicable

SPECIFICATION FOR TEFLON (PTFE) INSULATED CABLE

Table – 1 (continued)

Sl. No. of Specs	CABLE TYPE – 1 2X2X0.5 mm Sq. DIN/VDE type: JE-Li6YVC6Y	CABLE TYPE – 2 4X2X0.5 mm Sq DIN/VDE type: JE-Li6YVC6Y	CABLE TYPE – 3 5X1.5 mm Sq. DIN/VDE type: JE-Li6YV6Y
5.0	OUTER SHEATH		
5.3	OVERALL DIAMETER 7.6mm Nominal	9.0 mm Nominal	7.3 mm Nominal
5.5	BHEL-Edn Code: CU2855276020	CU2855276039	CN9075943032
6.1	ROUTINE TESTS: <=36.7 ohm/km to <=40.5ohm/km (max)(core) <=73.4 ohm/km to <=81.5ohm/km (max)(loop) For 0.5sqmm cable With given tolerance As in point 2.4 above.	ROUTINE TESTS: <=36.7 ohm/km to <=40.5ohm/km (max)(core) <=73.4 ohm/km to <=81.5ohm/km (max)(loop) For 0.5sqmm cable With given tolerance As in point 2.4 above.	ROUTINE TESTS: <=13.3 ohm/km to <=14.1ohm/km (max) (Core)

I **Routine Tests(Tests to be conducted and reports Furnished)**

a) Visual (as in 2.0, 3.0, 4.0, 5.0 above)
b) Construction details(as in 2.0, 3.0, 4.0, 5.0 above)
c) Dimensions(as in 5.3 above)
d) Thickness (as in 5.2 above)
e) Insulation resistance(as in 6.3 above)
f) High voltage (as in 6.10 above)
g) Spark Test (as in 6.9 above)
h) Volume Resistivity (as in 6.2 above)
i) Conductor resistance (as in 6.1 above)
j) Markings/End Sealings (as in 8.6 above)
k) Overlay/coverage/continuity(as in 4.0 above)

SAMPLE DATASHEET			
VENDOR NAME & ADDRESS			**DOC REF:** **REV:** **DATE:**
SR No	**DESCRIPTION**	**Unit**	**4 PAIR 0.5 SQMM**
	BHEL Material Code		**CU2855276039**
1	**Make**		
2	Rated Voltage	V	600V
3	Operating Temperature Rating	Deg C	(-10 Deg C to +200 Deg C)
4	**Conductor**		
	a) Material		**Silver Plated Copper (Min 1.0 micron)**
	b) Nominal Crossection	mm2	0.5
	c) Number of wires x single wire dia	Nos/mm	7/0.3
	d) Overall Dia of bunched Conductor	mm	*
5	**INSULATION**		
	a) Insulation Material		**PTFE Tape Wrapped & Sintered**
	b) Thickness (Min/Nom)	mm	0.25/0.3
	c) Overall dia of each core	mm	1.4-1.6
	d) Color Code		Pair 1: Blue, Red, Pair 2: Grey, Yellow Pair 3: Green, Brown, Pair 4: White, Black
6	Min. number of twists of cores in a pair	No	10-14 twist/meter
7	Filler		Glass yarn filler
8	**Overall shielding**		
	a) Material		Aluminum-Mylar Tape
	b) Type		Helical
	c) Thickness (Min.)	mm	0.055
	d) Overlap/Coverage	%	50/100
9	**DRAIN WIRE (For Overall shielding)**		
	a) Material		Annealed Silver Plated Copper
	b) Size	AWG	20 (i.e 0.51Sqmm)
	c) No. of strands/ approx. strand size	No/mm	7 / 0.3
10	**OUTER SHEATH**		
	a) Material		**PTFE Tape Wrapped & Sintered**
	b) Thickness	mm	0.5 ± 0.1
	c) Colour		Grey
	d) Overall diameter of cable (Nom)	mm	*
11	**ELECTRICAL PARAMETERS**		
	a) Conductor resistance at 20 Deg. C	ohms/km	
	b) Min. Insulation resistance at 20 Deg.C	Mohm/km	500
	c) Max. Mutual capacitance between conductors at 0.8kHz	nF/km	200
	d) Min. Cross-talk figure at 0.8kHz	dB	60
	e) High voltage test	kV(rms)	2.5 KV for 1 min
	g) Dielectric strength Core to Core		2 KV for 1 min
	h) Dielectric strength Core to Shield		2 KV for 1 min
	i) Min. Volume resistivity at 20 Deg. C	ohm/cm	1014
12	**ELECTRICAL CHARACTERISTICS**		
	a) Max. D.C. resistance at 20 Deg. C.·	ohm/Km	<=13.3 ohm/km to <=14.1ohm/km (Max)
	b) High Voltage Test		2.5KV for 1 min (Max)
	c) Insulation Resistance	Mohm/Km	500 (Max)
13	Tolerance on Individual Drum Length and Overall quantity.	%	+5%
14	Marking details		The label shall be securely attached to the drum with the following information. Material code, Cable type & Size, BHEL order no., Manufacturer's name and Trade Mark. Batch No./Date of mfg.

Note*:* All * marked fields to be filled by Vendor

VENDOR'S NAME & ADDRESS :-			SAMPLE QUALITY PLAN				QAP REF: REV NO: DATE:			
Sr No.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	TYPE/METHOD OF CHECK	QUANTUM OF CHECK	REFERANCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY M	AGENCY B	Remarks
A	**RAW MATERIAL & BOUGHT OUT ITEM INSPECTION**									
1	Conductor	Surface finish	Visual	Sample	BHEL Specification		Supplier Test Cert.I RMTA	-	V	
		Conductor Resistance	Electrical tests	do	do					
		Dimension	Measurement	do	do					
2	PTFE Insulation and sheath (Jacket)	Surface finish	Visual	do	do					
		Thickness	Measurement	do	do					
B	**IN PROCESS INSPECTION**									
1	Conductor	Surface finish	Visual	Start of production	BHEL Specification		Job Card	P	V	
		Dimension	Measurement							
		Number of Strands	do	do	do					
		Resistance	Electrical test	do	do					
2	Core Insulation	Surface finish	Visual	Start of production	BHEL Specification					
		Core identification	Visual							
		Thickness (minimum)	Measurement	do	do					
		Spark test	Electrical test	100%	do					
3	Outer sheath (Jacket)	Surface Finish	Visual	Start of production	BHEL Specification					
		Sheath Thickness	Measurement							
		Dia over outersheath	Measurement	do	do					
C	**FINAL TESTING**									
1	**ROUTINE TEST**	a) Visual	Visual	1 Sample I Lot	BHEL Specification		I.R	P	W	
		b) Construction details	Visual		BHEL Specification					
		c) Dimensions	Measurement		BHEL Specification					
		d) Thickness	Measurement		BHEL Specification					
		e) Insulation resistance	Electrical		BHEL Specification					
		f) High voltage	Electrical		BHEL Specification					
		g) Volume Resistivity	Electrical		BHEL Specification					
		i) Conductor resistance	Electrical		BHEL Specification					
		j) MarkingsIEnd Sealings	Visual		BHEL Specification					
		k) Tensile tests before heat ageing on core insulation	Physical		BHEL Specification					
		l) Tensile test before heat Ageing on Sheath	Physical		BHEL Specification					
		m) Overlay / Coverage / Continuity	Physical		BHEL Specification					
		n) Spark Test	Electrical		BHEL Specification		T.R	P	V	
2	**TYPE TEST**	a) Tensile tests before heat ageing and after heat ageing at 240 deg C for 36 hours on core insulation	Physical	1 Sample I Lot	BHEL Specification		T.R	P	V	
		c) Tensile test before heat Ageing and after heat ageing at 240 deg C for 36 hours on core	Physical		BHEL Specification					
		e) Elongation at break before and after Heat ageing at 240 deg C for 36 hours In percent before heat ageing and After heat Ageing on core	Physical		BHEL Specification					
		e) Elongation at break before and after Heat ageing at 240 deg C for 36 hours In percent before heat ageing and After heat Ageing on Sheath	Physical		BHEL Specification					
		i) Resistance to pressure after 4 hours At 240 deg C under constant pressure At high temperature VOE -472 part-609,303	Physical		BHEL Specification					
		j) Impulse voltage strength (VOE 0472 Part 511)	Physical		BHEL Specification					

Legend : M : Manufacturer / Sub-Supplier B : BHEL, P : Perform, W : Witness and V : Verification as appropriate.

Prepared By: Vendor Seal/Signature

Approved By: BHEL Seal/Signature

Price Variation Formula for Instrumentation cable

1) Prices for Instrumentation cables shall be variable as per following Price variation formula.

Cable Type	Formula
Instrumentation cables	$P= P_o+CuF\ (Cu-Cu_o)$

Where,

P : PO price (₹/Km)
Po : Quoted Price (₹/Km)
CuF : Copper Variation Factor (as per Table-I)
Cu : Price of copper wire/rod for the first working day of the month, one month prior to the date of firm's Inspection call or date of delivery as per P.O whichever is earlier (₹/MT).
Cu_o : Price of copper wire/rod for the first working day of the month, one month prior to the date of issue of RFQ (₹/MT).

2) Price Variation shall be applicable for Order Quantity and subsequent lots (if any) till completion of requirement.

3) Base date for prices

a) Initial Price: Base date shall be-1st working day of the previous month to the date of issue of tender enquiry (RFQ date).
b) Final Price: The first working day of month, one month prior to the date of firm's Inspection call or date of delivery as per P.O whichever is earlier

4) Variation factor value for CuF as applicable shall be as per Table-I for Instrumentation cable types as per technical Specifications.

5) Price Variation shall be payable within agreed contractual delivery period. In case of delay is attributable to vendor, for the payment purpose, the Price variation shall be calculated based on rates applicable on the first working day of month, one month prior to the date of expiry of contractual delivery date or the first working day of month, one month prior to the date on which cable is notified as being ready for inspection, whichever is beneficial to BHEL.

Table-I

S No	Item Code BHEL	Item Detail	CuF
1	CU2855276020	PTFE EXTRD 7/0.3 600V 2/2X0.5MM²	0.0236
2	CU2855276039	PTFE EXTRD 7/0.3 600V 4/2X0.5MM²	0.0424

CIN No. U99999MH1970GAPO14629

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Cir. No.: IEEMA(PVC)CABLE (R-1)/02/2025 **February 2025**

To All members of cable division and respective PVC mailing list
All utilities and listed purchasing organizations

Basic prices of raw materials used in the manufacture of Insulated Cables
Prevailing as on 1st working day of the month of February 2025

This is for the application in IEEMA's Price Variation Clauses as under:

1.For XLPE Insulated EHV Cables (66 kV to 400 kV) Viz: IEEMA(PVC)/EHV Cable/2019 (R-2) effective from 1st Apr 2023
2.For 3.3-33 KV XLPE Insulated Armoured Single & Three core Screen Cables Viz: IEEMA (PVC)/MV SCREEN CABLE/2019 (R-1) effective from 1st Apr 2023
3.For LV PVC & XLPE Insulated Cables Viz: IEEMA(PVC)/CABLE (R-1) /2017 effective from 1st Nov 2017
4.For Instrumentation Cables viz: IEEMA (PVC)/Instrumentation Cable/2022 effective from 1st Jan 2023
5.For Solar PV DC Cables Viz: IEEMA(PVC)/CABLE (R-1) /2017 effective from 1st Nov 2017
6.For LV and HV Aluminium & Aluminium Alloy, XLPE Aerial Bunch cables Viz: IEEMA (PVC) /AB Cable/2017 effective from 1st November 2017
7.For 6 Quad Railway Signaling Cables as per RDSO specification Viz: IEEMA (PVC)/QUAD CABLE/2019 effective from 1st September 2019

Sr. no.	Raw materials		Price		Variation over previous month
1.	**LME ALUMINIUM : (Al)**				
	LME Average Settlement Price including Premium for Ingot	**Rs.**	**2,74,686/MT**	**+**	**10,497.00**
2.	**COPPER : (Cu)** Price of copper wire rod	**Rs.**	**8,79,199/MT**	**+**	**41,678.00**
	COPPER : (Cu) copper wire rod 19.6 mm #	**Rs.**	**8,86,228/MT**	**+**	**41,610.00**
3.	**LEAD : (Pb)**				
	Price of Pig Lead (99.97%)	**Rs.**	**2,00,100/MT**	**+**	**2,500.00**
4.	**PVC COMPOUND : (PVC)**				
	PVC	**Rs.**	**1,58,825 /MT**	**(-)**	**1,000.00**
	HR PVC	**Rs.**	**1,59,825 /MT**	**(-)**	**1,000.00**
5.	**XLPE COMPOUND : (CC)**				
	For LV Cable	**Rs.**	**1,59,158/MT**	**+**	**5,024.00**
	For MV Cable	**Rs.**	**1,81,567/MT**	**+**	**5,431.00**
	For EHV Cable	**Rs.**	**1,86,937/MT**	**(-)**	**325.00**
6.	**POLYMER COMPOUND : (POC)**				
	Polythelene PE ST7	**Rs.**	**1,45,000/MT**	**+**	**1,750.00**
	Zero halogen low smoke (LSZH)	**Rs.**	**1,67,000/MT**		**NIL**

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Cir. No.: IEEMA(PVC)CABLE (R-1)/02/2025 **February 2025**

Sr. no.	Raw materials	Price	Variation over previous month
7.	**STEEL FOR ARMOURING : (Fe)**		
	a) Round 1.40 mm dia	**Rs. 75,250/MT**	**NIL**
	b) Round 1.60 mm dia	**Rs. 74,750/MT**	**NIL**
	c) Round 2.00 mm dia	**Rs. 73,250/MT**	**NIL**
	d) Round 2.50 mm dia	**Rs. 71,250/MT**	**NIL**
	e) Round 3.15 mm dia	**Rs. 70,250/MT**	**NIL**
	f) Round 4.00 mm dia	**Rs. 70,250/MT**	**NIL**
	g) Flat 4 mm x 0.8 mm	**Rs. 76,250/MT**	**NIL**
8.	**STEEL TAPES GALVANIZED : (Fe) (as per IS:3975)**		
	a) 25 X 0.5 mm	**Rs. 1,03,333/MT**	**+ 583.00**
	b) 32 X 0.8 mm	**Rs. 99,250/MT**	**+ 250.00**

QE/PVC/24(R-07)
ISSUED DATE: 06.03.2025

Authorised Signatory

This price to be used ONLY for supply of Contact Wires to Railways as per RDSO specifications which is made from 19.6 mm Copper Rod. Copper factor to be agreed mutually by supplier and buyer and to be declared by the supplier at the time of quotation.