

TP CENTRAL ODISHA DISTRIBUTION LIMITED

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CORRIGENDUM – 01

Tender Enquiry No.: TPCODL/ P&S/ 1000011976/ 26-27

Tender for “ONE YEAR RATE CONTRACT OF SUPPLY OF CONSUMABLE ITEMS AT DT REPAIR WORKSHOP”.

Subject: *updated Technical specification attached below.*

All other terms and conditions of the original tender shall remain unaltered.

Dated: 25.07.2026

Yours faithfully,
-sd-
HOD - TPCODL

Contracts Office : 1st Floor, Anuj Building, Plot No. 29, Satya Nagar,
Bhubaneswar – 751007.

Corporate Office : TP **CENTRAL** ODISHA DISTRIBUTION LIMITED ,
(A Joint Venture of Tata Power and Government of Odisha)

Registered Office/Corporate Office: Power House Square, Unit-8, Bhubaneswar, 751012, Tel: 0674-2541575 Web:
www.tpcentralodisha.com, E-mail: tpcodl@tpcentralodisha.com ,CIN: U40109OR2020 PLC032901 **Page 1 of 1**

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TECHNICAL SPECIFICATION

FOR CONSUMABLES TOWARDS FACILITATING TRANSFORMER REPAIRING WORKS

SL.NO	NAME OF THE MATERIAL	FOR SPECIFICATION REFER PAGE NO.
1	HT TINNED BRASS STUD WITH FITTINGS- M12	2 – 3
2	LT TINNED BRASS STUD WITH FITTINGS- M12	
3	LT TINNED BRASS STUD WITH FITTINGS- M20	
4	LT TINNED BRASS STUD WITH FITTINGS- M30	
5	LT TINNED BRASS STUD WITH FITTINGS- M42	
6	BRASS NUT 12 MM	4
7	BRASS NUT 16 MM	
8	BRASS NUT 20 MM	
9	BRASS NUT 25 MM	
10	BRASS NUT 30 MM	
11	BRASS WASHER 12 MM	
12	BRASS WASHER 16 MM	
13	BRASS WASHER 20 MM	
14	BRASS WASHER 30 MM	5
15	TINNED BRASS HT STUD CAP	
16	COPPER WIRE 18.5 SWG	5 – 6
17	COPPER WIRE 15 SWG	
18	COPPER WIRE 13.5 SWG	
19	COPPER WIRE 10 SWG	
20	BRAZING ROD-COPPER	6

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SPECIFICATION FOR - HT & LT TINNED BRASS STUD WITH FITTINGS (Different Sizes)

1. SCOPE:

This specification covers design, manufacture, testing and dispatch of LT & HT Brass Stud/Bushing rods for transformers of various ratings.

2. APPLICABLE STANDARDS:

Material covered under this specification shall confirm to the requirements stated in latest editions of relevant applicable standards as follows:

Sl. No.	IS	Description
1	IS 319 (Part 1): 2007	free-cutting brass bars, rods, and sections
2	IS: 1364	Hexagon nuts
3	IS: 1359	Electroplated Coatings of Tin
4	IS: 3488	Brass Bars, Rods and Sections Suitable for Forgings
5	IS: 4218	General Purpose Metric Screw Threads
6	IS 8536:2021	Fasteners — Bolts, Screws, Studs and Nuts

**In case of any conflict on any technical particular in the specification, the stricter requirement mentioned in the relevant standard shall be valid.*

3. CLIMATIC CONDITIONS OF THE INSTALLATION:

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	150 cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Speed	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)
11	Wind velocity	300 km/hr.

Environmentally, some of the regions, where the work will take place includes hilly areas, subject to high relative humidity, which can give rise to condensation. Atmosphere is generally laden with mild acid and dust due to industrial activities. Some places are in heavily industrial polluted areas. On occasions, the combination of humid, acidic and dust condensation may create pollution conditions for outdoor equipment's. Therefore, outdoor materials and equipment's shall be designed and protected for use exposed, heavily polluted, acidic, corrosive, tropical and humid atmosphere.

4. GENERAL TECHNICAL REQUIREMENT:

Sr No.	Dimension Particular	LT Studs				HT Stud
		10KVA – 100KVA	250KVA – 400KVA	500KVA	1000KVA	10KVA-750kVA

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1	Rod Length	205mm	260mm	290mm	350mm	134mm
2	Diameter	12mm	20mm	30mm	42mm	12mm

The bushing rod (round type) and nuts shall be made of tin coated FORGED brass material with both side thread & thickness of the Tin Coated will be 10 μ m mm minimum. The brass stud for transformer shall consist of Stem, Hexagonal nut, Washer top end, washer stem and sealing washer (Nitrile - oil seal).

Oil seals provided with the brass stud/busing rod shall be suitable for making oil tight joints, and there shall be no deleterious effects on oil seal when it is continuously in contact with hot oil. The oil seal provided in between transformer bushing rod and tank; the material shall be nitrile rubberized oil resistant conical gasket/seals conforming to type IV (class 4C) of IS 11149. Oil seals shall be weatherproof.

Nitrile Butadiene — Rubber shall be used as oil seal material in the form of 'O' rings, cords, flat strips, sheets and other moulded gaskets etc. used for transformers. The material with stand temperatures in the range of -4 to +120 °C .

The material of oil seals shall be free from defects such as blisters, holes, bubbles, cracks, inclusions, flow marks etc. shall be given smooth finish.

Oil resistant nitrile rubber made from vulcanized butadiene/acrylonitrile rubber compound shall have a hardness of 70 to 75 IRHD.

The hexagonal nuts used shall conform to IS: 1364(part 3). Washers shall be as per IS:2016 Following tests shall be carried out at the works of the manufacturer before dispatch.

Pictures for reference purpose only:

HT STUD WITH FITTINGS



LT STUD WITH FITTINGS



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SPECIFICATION FOR – BRASS NUT (Different Sizes) - FORGED

The hexagonal nuts shall be manufactured from forged brass material conforming to the applicable brass material specification, and the dimensions shall conform to IS 1364 (latest revision).

The thickness of the nut should be as follows:

Sl. No.	Item Description	Required Dimensions	Thickness
1	Brass nut	Inside Diameter - 12 mm	6mm
2	Brass nut	Inside Diameter - 16 mm	8mm
3	Brass nut	Inside Diameter - 20 mm	9mm
4	Brass nut	Inside Diameter - 25 mm	12mm
5	Brass nut	Inside Diameter - 30 m	12mm



The threads shall conform to IS 4218 (ISO General Purpose Metric Screw Threads), latest revision.

Tolerance: - Unless otherwise specified, the permissible tolerances on dimensions of machined components shall conform to IS 2102 (latest revision).

SPECIFICATION FOR – BRASS WASHER (Different Sizes) – FORGED

The brass plain washers confirming to forged material & shall conform to IS 2016.

The thickness of the Washer should be as follows:

Sl. No.	Item Description	Required Dimensions	Thickness
1	Brass Washer	Inside Diameter - 12 mm	2mm
2	Brass Washer	Inside Diameter - 16 mm	2mm
3	Brass Washer	Inside Diameter - 20 mm	2mm
4	Brass Washer	Inside Diameter - 30 mm	3mm



Tolerance: - General dimensional tolerances shall conform to IS 2102 (latest revision).

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SPECIFICATION FOR - TINNED BRASS HT STUD CAP

The tin coated **FORGED** brass material stud caps shall be manufactured from Forged brass conforming to **IS 319 (Part 1)**. The stud cap shall be suitable for M12 studs with a hole diameter of 12 mm.



SPECIFICATION FOR – SINGLE STRANDED EC GRADE COPPER WIRE WITH SUPER ENAMEL COVERING INSULATION

1. SCOPE

This specification covers the technical requirements of design, engineering, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at site/store of Normal **18.5/15/13.5/10 SWG EC Grade CU Super Enamelled Wire of RR SHRMIK/KHAITAN make.**

APPLICABLE STANDARDS

Single Stranded EC Grade Super Enamelled Copper Winding Wire shall be manufactured from electrolytic grade copper conforming to IS 191 and shall be insulated with enamel in accordance with IS 13730 (relevant part), latest revision.

2. CLIMATIC CONDITIONS OF THE INSTALLATION

SL.NO	CLIMATIC CONDITIONS OF THE INSTALLATION	The atmosphere across coastal divisions of TPCODL is very saline, laden with salt, acid and dust suspended during dry months and subjected to fog in cold months.
a)	Maximum Ambient Temperature	50°C
b)	Maximum Daily Average Ambient Temperature	35°C (recommended as per IS 1180/IS 2026)
c)	Minimum Ambient Temperature	0 °C
d)	Maximum Humidity	95 %
e)	Minimum Humidity	15 %
f)	Average Annual Rainfall	1800 mm
g)	Average Wind Speed prevailing in the area	200 km/hr.
h)	Average Thunderstorms prevailing in the area	70 days per annum
i)	Average dust storms prevailing in the area	20 days per annum
j)	Average number of rainy days per annum	160
k)	Maximum Altitude above sea level	1000 m (recommended as per IS 1180/IS 2026 unless otherwise specified)
l)	Rainy months	June to October

3. GENERAL TECHNICAL REQUIREMENTS

Description – The wire is meticulously insulated with six layers of craft paper, providing superior electrical insulation properties. This insulation not only guards against electrical leakage but also enhances the wire's

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resistance to temperature fluctuations and environmental factors, critical for the demanding environment within distribution transformers.

Size of Bare Conductor –

- 18.5 SWG – 1.118 mm
- 15 SWG – 1.8 mm
- 13.5 SWG – 2.2 mm
- 10 SWG – 3.3 mm

Durability and Reliability – Crafted from high-grade materials and designed to withstand the demanding conditions within transformers, this wire offers exceptional durability. It ensures long-term reliability, reducing the need for maintenance and replacement.



SPECIFICATION FOR – BRAZING ROD COPPER (Dia-3mm and 7% Phosphorous, 2% Silver & 91 % Copper)

The preferable would be

Brazing rod Copper 91% - Phosphorus 7% - Silver 2% high melting point alloy, ideal for brazing on copper pipes, with silver, perfect for capillary welding.



Copper Brazing Rod, 3 mm diameter, composition approximately 90–91% Copper, 7% Phosphorus and 2% Silver, conforming to IS 2927 or equivalent AWS A5.8 / ISO 17672 standard.

DIMENSION: Brazing Rod (Copper) – 3mm & Length—500 mm

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TECHNICAL SPECIFICATION

FOR CONSUMABLES TOWARDS FACILITATING TRANSFORMER REPAIRING WORKS

SL.NO.	NAME OF THE MATERIAL	FOR SPECIFICATION REFER PAGE NO.
21	ALUMINUM SOLDERING WIRE	2
22	ALUMINUM SOLDERING FLUX	
23	BRAZING ROD-ALLUMINIUM ALLOY	3
24	3/4 inch PRV	
25	1 inch PRV	
26	1 1/4 inch PRV	
27	ARCING HORN (LOWER)	4
28	ARCING HORN (UPPER)	
29	1/2 inch IRON CAP	
30	3/4 INCH WHEEL VALVE	5
31	1 INCH WHEEL VALVE	
32	1 INCH T VALVE	
33	VALVE PLUG-3/4TH INCH	6
34	VALVE PLUG-1 INCH	
35	1/2 inch breather pipe	
36	Radiator (500kVA)	7

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SPECIFICATION FOR - ALUMINUM SOLDERING WIRE – (Each pack of 500 grms)

Soldering Wire of good quality suitable for jointing materials to be provided. (% of TIN & % LEAD will be 63 & 37 respectively)



Aluminium soldering wire shall be suitable for soldering aluminium conductors and shall be supplied with compatible non-corrosive aluminium flux. The material shall conform to IS 5479 (1985).

SPECIFICATION FOR - ALUMINUM SOLDERING FLUX – (Each pack of 100 grms)

Soldering Flux of good quality needs to be provided which should be of enhanced performance and high resistance to corrosion.



Benefits & Features

- Lead free eutectic alloy (liquidus = solidus temperature)
- Alloy exceeds J-STD-006C and meets ASTM B 32 purity requirements
- Flux meets J-STD-004B
- Fast wetting
- Fast flowing
- Non-corrosive
- Non-conductive residue

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SPECIFICATION FOR - BRAZING ROD-ALLUMINIUM ALLOY

(Dia-3mm and 5 % Silicon & 95 % Alluminium)

High Strength Aluminium Brazing rods : These rods are made from aluminium-silicon alloys and are suitable for use in brazing aluminum with 5% Silicon & 95% Alluminium. The rods shall be suitable for brazing aluminium alloys such as AA1100, AA3003, AA3004, AA5052, AA6061 and AA6063. The rods shall be available in diameters ranging from 1/16 inch (1.6 mm) to 3/32 inch (2.4 mm) and should conform to IS 5897:1985.



DIMENSION:

Brazing Rod (Aluminium-Silicon Alloy)

Diameter—3mm & Length—1000mm

SPECIFICATION FOR – PRV (Different Sizes) Material shall be BRASS

Make – YOGYA/VIAT

PRVs required for DTs of two sizes 1 inch, 1 ¼ inch and 3/4th inch material of brass.



Standard	Title	Relevance
IS 2026 (Part 1)	Power Transformers – General	Specifies that transformers shall be provided with suitable pressure relief/protection devices where applicable.
IS 2026 (Part 3)	Insulation Levels, Dielectric Tests and External Clearances	Covers transformer construction requirements; PRV forms part of the transformer accessories.
IS 1180 (Part 1)	Outdoor Type Oil-Immersed Distribution Transformers	Specifies requirements for accessories fitted on distribution transformers, including pressure relief devices where specified.
IEC 60076-22	International Standard	Widely referred to by manufacturers for transformer accessories including PRVs.

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SPECIFICATION FOR – ARCING HORN LOWER & UPPER – 11KV

The arcing horns should be of galvanizing iron (GI). The diameter of arcing horns for 11KV should be 8mm. The arcing horn shall be suitable for 11 kV outdoor distribution transformers and shall be manufactured from corrosion-resistant conductive material. It shall be designed to protect the HV bushing from flashover and shall be mounted in accordance with the approved drawing and the requirements of IS 2099/IS 1180.



SPECIFICATION FOR – ½ inch IRON CAP (ID – 19mm)

All the caps need to be made up of Cast Iron and should be of the following dimensions:

Sl. No.	Item	Description	Material
1	½ inch—19mm	IRON CAP	Cast Iron



The breather cap shall be robust, corrosion-resistant and suitable for outdoor installation. It shall be under **IS 1180 (Part 1)** and **IS 2026**, with detailed dimensions and material defined in the purchaser's drawing or manufacturer's specification.

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SPECIFICATION FOR – WHEEL VALVE (Material shall be Cast Iron)

The drain/filling valve shall be of wheel-operated type. The valve body shall be manufactured from Grey Cast Iron Grade FG 200 conforming to IS 210. The valve shall be suitable for transformer insulating oil and shall be leak-proof under service conditions.

Wheel valves need to be made up of Cast Iron and should be of the following dimensions:

Sl. No.	Item	Description	Material
1	3/4 th inch	Wheel Valve	Cast Iron
2	1 inch	Wheel Valve	Cast Iron



The Wheel valve should be of 1 inch size and made up of Cast Iron . The washers on one side need to be of Teflon.

SPECIFICATION FOR – 1 INCH T VALVE (Material shall be MS)



The T-valve should be of 1 inch size and made up of Mild Steel. The washers on either sides need to be of Teflon. The base mild steel material typically should conform to IS 2062 and the threaded variants should align with IS 554 for pressure-tight joints on threads.

SPECIFICATION FOR – VALVE PLUG Different Sizes (Materials shall be CI with Galvanised)

The component shall be manufactured from Grey Cast Iron conforming to IS 210 and shall be hot-dip galvanized in accordance with IS 4759.

The Dimensions of valve Plugs should be as follows:

Sl. No.	Item	Description	Material
1	3/4 th inch	Valve Plug	Galvanised Cast Iron
2	1 inch	Valve Plug	Galvanised Cast Iron

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SPECIFICATION FOR – ½ INCH BREATHER PIPE (ID-15 mm X OD-19mm - GI)

The breather pipe shall be manufactured from Mild Steel (MS) tube conforming to IS 1239 (Part 1).



The breather pipe should be of MS & outside diameter of the thread will be ID-15 mm X OD-19mm.

SPECIFICATION FOR – RADIATOR 500KVA

The radiator shall be fabricated from high-quality mild steel sheets conforming to IS 1079. It shall be suitable for transformer oil service, leak-proof, and capable of withstanding the specified pressure and vacuum tests. The radiator shall form an integral part of the transformer conforming to IS 1180 (Part 1) and IS 2026.

(H - 800mm, W - 300mm, Header Dia - 90 mm, No. of Fins - 7 & Thickness - 1.0mm)

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Outer side of radiators will be 02 coats of zinc phosphate red oxide primer & inner surface will be coat with oil resistant insulating varnish.

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TECHNICAL SPECIFICATION FOR CONSUMABLES TOWARDS FACILITATING TRANSFORMER REPAIRING WORKS

SL.NO.	NAME OF THE MATERIAL	FOR SPECIFICATION REFER PAGE NO.
37	1/2 INCH GI WASHER	2
38	5/8 inch GI Washer	
39	5/8 inch GI Nut (Thickness- 15 mm)	
40	1/2 inch GI Nut (Thickness- 12 mm)	
41	1/2 inch GI Bolt (Length-1.5 inch)	3
42	5/8 inch GI Bolt (Length-1.5 inch)	
43	3/8 inch GI Bolt --Length-3.0 inch	
44	GALVANISED WASHER 3/8 INCH (Thickness- 2 mm)	
45	GALVANISED SPRING WASHER 3/8 INCH (Thickness- 2 mm)	
46	GALVANISED NUT 3/8 INCH (Thickness- 8 mm)	4
47	5/16 inch GI Nut (Thickness- 7 mm)	
48	LT EPOXY BUSHING 1000A 1.1KV (inside Length with 4 hole--85 mm & Outside Length with 3 hole-175mm)(Width--60 mm & thickness 12mm)	5 – 6

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SPECIFICATION FOR – GI WASHER (Different Sizes) Thickness – 2mm

The galvanized iron plain washers shall conform to IS 2016 for plain washers. The dimensions of the Washer should be as follows:

Sl. No.	Item Description	Required Dimension
1	½ inch	Thickness – 2mm
2	5/8 inch	Thickness – 2mm



Tolerance: - The permissible tolerances on the dimensions of the mechanical parts shall conform to IS 2102 .

SPECIFICATION FOR – GI NUT (Different Size)

The hexagonal galvanized steel nuts shall conform to IS 1364 (Part 3). The dimensions of the nuts should be as follows:

Sl. No.	Item Description	Required Dimensions
1	½ inch	Thickness – 12mm
2	5/8 inch	Thickness – 15mm



The mechanical properties shall conform to IS 1367 (Part 6). The threads shall conform to IS 4218 (latest revision).

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SPECIFICATION FOR – GI BOLT (Different Sizes)

The hexagonal GI bolts shall conform to IS 1367 (Part 13) and IS 12427 for hot-dip galvanized coatings on threaded fasteners.

The dimensions of the bolts should be as follows:

Sl. No.	Description	Dimension
1	1/2 inch GI Bolt	Length-1.5 inch
2	5/8 inch GI Bolt	Length-1.5 inch
3	3/8 inch GI Bolt	Length-3.0 inch



The bolt threads shall conform to IS 4218 (Parts 1 to 4). Prior to hot-dip galvanizing, the threads shall be checked using GO and NOT GO threaded ring gauges in accordance with IS 2334.

Tolerance: - The dimensional tolerances of the bolts shall conform to the applicable requirements of IS 1364, and the hot-dip galvanized coating shall conform to IS 1367 (Part 13) and IS 12427.

SPECIFICATION FOR – GALVANISED WASHER 3/8 inch(Thickness – 2mm)

The galvanized iron (GI) plain washers shall conform to IS 2016 (latest revision).

Tolerance: Unless otherwise specified, the permissible tolerances on the dimensions of mechanical parts shall conform to **IS 2102 (latest revision)**.

SPECIFICATION FOR – GALVANISED SPRING WASHER 3/8 inch (Thickness – 2mm)

The Galvanized spring washers that conform to Indian standards (IS) typically adhere to IS: 3063 for plain washers.



Tolerance: - Unless otherwise specified allowable tolerance on a dimension of any mechanical part shall be in accordance with class of IS: 2102(latest version)

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SPECIFICATION FOR – GALVANISED NUT 3/8 INCH (Thickness – 8mm)

The hexagonal GI bolts shall conform to IS 1367 (Part 13) and IS 12427 for hot-dip galvanized coatings on threaded fasteners.

The threads shall conform to IS 4218 (Parts 1 to 4).

Tolerance: Unless otherwise specified, the permissible tolerances on the dimensions of the bolts shall conform to **IS 1367 (Part 2)**.

SPECIFICATION FOR – 5/16 inch GI NUT (Thickness – 7mm)

The hexagonal GI bolts shall conform to IS 1367 (Part 13) and IS 12427 for hot-dip galvanized coatings on threaded fasteners.

The threads shall conform to IS 4218 (Parts 1 to 4).

Tolerance: Unless otherwise specified, the permissible tolerances on the dimensions of the bolts shall conform to IS 1367 (Part 2).

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SPECIFICATION FOR - LT EPOXY BUSHING 1000A 1.1KV(EC grade Copper with Tin Coated)

(Inside Length with 4 hole--85 mm & Outer side towards Length with 3 hole-175mm)

(Width--60 mm & thickness 12mm)

1.0 SCOPE:

This specification covers the design, manufacture, testing, inspection, packing and supply of LT Epoxy Bushings rated 1000A, 1.1kV for distribution transformers.

2.0 APPLICABLE STANDARDS:

The equipment (and the materials used) covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian standards & other relevant standards for components, BEE & CEA guidelines with latest amendment from time to time, thereof, some of which are listed below:

IS 2099 (latest revision) and IEC 60137	LT Side of 11/0.433 kV, 500 kVA Distribution Transformer
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3.0 CLIMATIC CONDITIONS OF THE INSTALLATION:

The material shall be suitable for following climatic conditions,

1. Maximum altitude above sea level 1,000m
2. Maximum ambient air temperature 50°C
3. Maximum daily average ambient air temperature 35°C
4. Minimum ambient air temperature 0°C
5. Maximum relative humidity 95%
6. Average number of thunderstorm days per annum (isokeraunic level) 70
7. Average number of rainy days per annum 120
8. Average annual rainfall 150cm
9. Earthquakes of an intensity in horizontal direction - equivalent to seismic acceleration of 0.3g
10. Earthquakes of an intensity in vertical direction - equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)
11. Wind velocity: 300 km/hr, 200 km/hr and 160 km/hr.

Environmentally, some of the regions, where the work will take place includes coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators. Some places are in heavily industrial polluted areas.

Therefore, Outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive and humid coastal atmosphere.

The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1 g.

GENERAL TECHNICAL REQUIREMENTS:

Bushing: The bushings shall conform **IS 2099 (latest revision)** and **IEC 60137** for bushing upto and including voltage up to 1000 volts.

The dimensions of bushings of the following voltage classes shall conform to Indian Standard mentioned against them.

Parameter	Specification
Rated Voltage	1.1 kV
Rated Current	1000 A
Frequency	50 Hz
Material	High-grade Epoxy Resin & EC grade Copper with Tin Coated
Conductor	EC grade Copper with Tin Coated

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Inside Length	85 mm
Inside Holes	4 Nos
Outside Length	175 mm
Outside Holes	3 Nos
Width	60 mm
Thickness	12 mm
Minimum Creepage	25 mm/kV (minimum)
Application	LT Side of Distribution Transformer



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TECHNICAL SPECIFICATION FOR CONSUMABLES TOWARDS FACILITATING TRANSFORMER REPAIRING WORKS

SL.NO.	NAME OF THE MATERIAL	FOR SPECIFICATION REFER PAGE NO.
49	ROLL GASKET RC 70C (40X6 MM)	2 – 4
50	ROLL GASKET RC 70C (50X6 MM)	
51	ROLL GASKET RC 70C (50X8 MM)	
52	RUBBER CORK GASKET FOR T/F (2'X3'X4MM)	
53	RUBBERISED CORK GASKET (2'X3'X6MM)	
54	RUBBERSIED CORK SHEET 8 MM (2'X3'X8MM)	
55	LT BUSHING GASKET 28 X 50 X 6 MM	
56	LT BUSHING GASKET 12 X 32 X 4 MM	
57	LT BUSHING GASKET 40 X 72 X 8 MM	
58	LT BUSHING GASKET 52 X 90 X 10 MM	
59	HT BUSHING GASKET 78 X 109 X 6 MM	
60	LT BUSHING GASKET 12 X 32 X 6 MM	
61	LT BUSHING GASKET 28x60x8 MM	
62	LT BUSHING GASKET 18x42x8 MM	
63	LT BUSHING GASKET ID 40X28 & OD 70MM, thickness-6mm	
64	LT BUSHING GASKET ID 46X36 & OD 90MM, thickness-8mm	
65	LT BUSHING GASKET ID 54 & OD 90X110MM, thickness-8mm	
66	LT BUSHING GASKET ID 40 & OD 85X70MM, thickness-8mm	

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SPECIFICATION FOR – ROLL GASKET RC 70C (Different Sizes) Each Roll – 20 M, Make – NUCORK

1. SCOPE

This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at site/store of Joint less Rubberized cork sheets (oil resistant Gaskets) in various forms/shapes used with the distribution transformers for making oil tight joints. The Size of sheet shall be as per the item code description.

It is not the intent to specify completely herein all the details of technical design and construction of material. However, the material shall conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation in manner acceptable to the purchaser, who will interpret the meanings of drawings and specification and shall have the power to reject any work or material which, in his judgment is not in accordance therewith. The offered material shall be complete with all components necessary for their effective and trouble free operation. Such components shall be deemed to be within the scope of Bidder's supply irrespective of whether those are specifically brought out in this specification and/or the commercial order or not.

2. APPLICABLE STANDARDS:

Gaskets shall be of Rubberized Cork Sheet Grade RC-70C conforming to IS 4253 (Part 2), latest revision. The gasket shall be oil-resistant and suitable for mineral insulating transformer oil.

CLIMATIC CONDITIONS OF THE INSTALLATION

3. CLIMATIC CONDITIONS:		
a)	Maximum Ambient Temperature	50°C
b)	Maximum Daily Average Ambient Temperature	40 °C
c)	Minimum Ambient Temperature	2 °C
d)	Maximum Humidity	99.7 %
e)	Minimum Humidity	15 %
f)	Average Annual Rainfall	1800 mm
g)	Average Wind Speed prevailing in the area	200 km/hr.
h)	Average Thunderstorms prevailing in the area	70 days per annum
i)	Average dust storms prevailing in the area	20 days per annum
j)	Average number of rainy days per annum	160
k)	Maximum Altitude above sea level	1200 m
l)	Rainy months	June to October

Note: The atmosphere across coastal divisions of TPCODL is very saline, laden with salt, acid and dust suspended during dry months and subjected to fog in cold months. The design of the equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.3g.

4. GENERAL TECHNICAL REQUIREMENTS:

Sr. No.	Description	Requirement
1	Application	Suitable for making oil tight joints on LV & HV side of the Distribution Transformers
2	Applicable Standard	IS 4253 (Part2) : 2008 (Amendment No-2 Feb-2018)
3	Type	Type C (Grade RC-70C) as per IS 4253 Part 2

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4	Hardness ,IRHD(International Rubber Hardness Degree)	70±5 (Hardness shall be tested as per IS 3400 :Part 2)
5	Dimensional changes (Max %)	1.5
6	Tensile strength (KPa, Min)	1550
7	Compressibility (at 2800 KPa), %	25-35
8	Compression set at 110 degree Centigrade for 24 hrs, % Max	85
9	Recovery, %, Min	80
10	Chemical test on water extract	
10.1	pH, where applicable	5.0-8.5
10.2	Chloride content (as chloride ion)	0.2 % Max
10.3	Sulphate content (as sulphate ion)	0.2 %, Max
11	Material	Nitrile butadiene Rubber(NBR) + Cork
11.1	Granulated cork (Max.)	0.5 to 1.0 mm
11.2	Colour	Natural
12	Permissible variation in thickness	±0.25 mm (as per IS 4253 (Part 2), applicable revision).

REQUIREMENT:

SI No.	Standard	Dimensions	Length
12.1	RC 70C	40 x 6 mm	20 metres
12.2	RC 70C	50 x 6 mm	20 metres
12.3	RC 70C	50 x 8 mm	20 metres



SPECIFICATION FOR – RUBBERISED CORK GASKET SHEET (Different Sizes) Make – NUCORK

Sl. No.	Description	Requirement
1	RUBBERISED CORK GASKET (2'X3'FT)	Thickness – 4mm (Without negative tolerance)
2	RUBBERISED CORK GASKET (2'X3'FT)	Thickness – 6mm (Without negative tolerance)
3	RUBBERISED CORK GASKET (2'X3'FT)	Thickness – 8mm (Without negative tolerance)

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SPECIFICATION FOR – BUSHING GASKETS (Different Sizes) Make – NUCORK

Sl. No.	Description	ID	OD	Thickness
1	HT BUSHING GASKET	78mm	109mm	6mm
2	LT BUSHING GASKET	12mm	32mm	4mm
3		40mm	72mm	8mm
4		52mm	90mm	10mm
5		28mm	50mm	6mm
6		12mm	32mm	6mm
7		28mm	60mm	8mm
8		18mm	42mm	8mm
9		40X28mm	70mm	6mm
10		46X36mm	90mm	8mm
11		54mm	90X110mm	8mm
12		40mm	85X70mm	8mm



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TECHNICAL SPECIFICATION FOR CONSUMABLES TOWARDS FACILITATING TRANSFORMER REPAIRING WORKS

SL.NO.	NAME OF THE MATERIAL	FOR SPECIFICATION REFER PAGE NO.
67	INSULATING PRESS BOARD 1.50MM	2 - 4
68	INSULATING PRESS BOARD 3.00MM	
69	FIBERGLASS INSULATING SLEEVING 4MM	4
70	FIBERGLASS INSULATING SLEEVING 6MM	
71	FIBERGLASS INSULATING SLEEVING 8MM	
72	FIBERGLASS TUBE 3/8 INCH	5
73	FIBERGLASS TUBE 5/8 INCH	
74	FIBERGLASS TUBE 1/4	
75	FIBERGLASS TUBE 3/4 INCH	
76	CREPE PAPER	
77	BAKELITE SHEET-0.5MM(5 inchx5 inch)	6
78	OIL SEAL FOR LT BUSHING RD10-100KVA TRF. (ID-12 mm) (Nucork make & Nitrile bonded rubber)	6 – 7
79	LT CONICAL WASHER 16MM(Nucork make & Nitrile bonded rubber)	
80	OIL SEAL FOR LT BUSHING RD 250&400KVA TRF. (20 mm)(Nucork make & Nitrile bonded rubber)	
81	LT CONICAL WASHER 25MM(Nucork make & Nitrile bonded rubber)	
82	OIL SEAL FOR LT BUSHING ROAD630 KVA TRF. (30 mm)(Nucork make & Nitrile bonded rubber)	
83	OIL SEAL FOR 11KV BUSHING.(12mm)(Nucork make & Nitrile bonded rubber)	
84	OIL SEAL FOR LT BUSHING 1000KVA (Nucork make & Nitrile bonded rubber)	

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SPECIFICATION FOR – INSULATING PRESS BOARD(Different Sizes)(L-2100mm X W-1050mm) **(Make-Raman Board/Senapathy Whiteley Pvt. Ltd)**

1. SCOPE

Electrical insulation pressboard shall be manufactured from high-purity cellulose obtained from long-fibre coniferous wood pulp. It shall be formed into a homogeneous fibrous sheet without the use of any adhesive or bonding agent and compressed under controlled conditions to obtain the required density and mechanical strength. Owing to its high chemical purity, excellent dielectric strength and oil compatibility, the pressboard shall be suitable for use as an insulating material in oil-immersed power and distribution transformers, electrical machines and other electrical equipment. The pressboard shall be supplied in standard thicknesses ranging from 0.8 mm to 4.0 mm, unless otherwise specified. The material shall be suitable for use in the repair and refurbishment of oil-immersed distribution transformers.

2. CLIMATIC CONDITIONS:		
a)	Maximum Ambient Temperature	50°C
b)	Maximum Daily Average Ambient Temperature	35°C (recommended as per IS 1180/IS 2026)
c)	Minimum Ambient Temperature	0 °C
d)	Maximum Humidity	95 %
e)	Minimum Humidity	15 %
f)	Average Annual Rainfall	1800 mm
g)	Average Wind Speed prevailing in the area	200 km/hr.
h)	Average Thunderstorms prevailing in the area	70 days per annum
i)	Average dust storms prevailing in the area	20 days per annum
j)	Average number of rainy days per annum	160
k)	Maximum Altitude above sea level	1000 m (recommended as per IS 1180/IS 2026 unless otherwise specified)
l)	Rainy months	June to October

Note: The atmosphere across coastal divisions of TPCODL is very saline, laden with salt, acid and dust suspended during dry months and subjected to fog in cold months. The design of the equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.3g.

3. FEATURES:

- Insulation class A (105 ° C)
- Natural Coloured
- Hot-pressed pressboard, 100% sulphate pulp
- High hardness and stiffness
- Low shrinkage and compatibility
- High purity and mechanical strength
- Good compatibility with liquid dielectrics
- Further processing is ensured since the pressboard can be punched , folded, cut and formed without difficulty

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Sl. No.	Description	Thickness	Size (L X W) in mm
1	INSULATING PRESS BOARD	1.50mm	L – 2100mm X W – 1050mm
2	INSULATING PRESS BOARD	3.00mm	L – 2100mm X W – 1050mm



REQUIREMENT:

4. GENERAL TECHNICAL REQUIREMENTS:

SL. NO.	PARTICULARS	TEST STANDARD	STANDARD VALUE
1	Thickness tolerance	IEC 60641-2	
	i) ≤ 1.6 mm		± 7.5 %
	ii) > 1.6 mm to 4 mm		± 5.0 %
2	Apparent Density(g/cm ³)	IEC 60641-2	
	i) ≤ 1.6 mm		1.0 – 1.20 g/cm ³
	ii) > 1.6 mm - 4.0mm		1.0 – 1.20 g/cm ³
3	Min. tensile strength M.D. Unfolded	IEC 60641-2	
	i) ≤ 1.6 mm		100N/mm ²
	ii) > 1.6 mm to 4 mm		105 N/mm ²
4	Min. tensile strength C.M.D. unfolded	IEC 60641-2	
	i) ≤ 1.6 mm		75N/mm ²
	ii) > 1.6 mm to 4 mm		80N/mm ²
5	Min. Elongation M.D unfolded	IEC 60641-2	3.0 %
6	Min. Elongation C.M.D unfolded	IEC 60641-2	4.0 %
7	Max. Moisture content	IEC 60641	6.0 %
8	Max. Ash content	IEC 60641	1.0 %
9	PH of aqueous extract	IEC 60641	6.0-9.0
10	Max. Shrinkage M.D		0.5 %
11	Max. Shrinkage C.M.D		0.7 %
12	Max. Thickness shrinkage		5.0 %
13	Min. Oil absorption		
	i) ≤ 1.6 mm		11.00%
	ii) > 1.6 mm to 4 mm		7.5 %
14	Reversible Compressibility (Crev)		

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	i) ≤ 1.6 mm		45%
	ii) > 1.6 mm to 4 mm		50%
15	Min. breakdown voltage in oil		
	i) ≤ 1.6 mm		40kV/mm
	ii) > 1.6 mm to 4 mm		35kV/mm
16	Max. Conductivity of aqueous		
	Extract		
	i) ≤ 1.6 mm		5.0 mS/m
	ii) > 1.6 mm to 4 mm		6.0mS/m

SPECIFICATION FOR FIBERGLASS INSULATING SLEEVING (Different Sizes) Each Length – 1M

SPECIFICATION FOR SLEEVING

Fiberglass insulating sleeving should possess reliable heat resistance and good electrical performance. It can be used for wiring insulation and mechanic protection for F grade electrical machinery and electric appliances. The inner layer should be made of glass fibre woven and coated with acrylate at high temperature. It should conform to IS 11654 Part-III.

Sizes: - Diameter as stated on below.

Sl. No.	Description	Size (Diameter)	Length
1	FIBERGLASS INSULATING SLEEVING	4mm	1 meter
2	FIBERGLASS INSULATING SLEEVING	6mm	1 meter
3	FIBERGLASS INSULATING SLEEVING	8mm	1 meter



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SPECIFICATION FOR FIBERGLASS TUBE (Different Sizes) Each Length – 1M

Synthetic Resin Bonded Paper Tube should consist of phenolic paper pre-peg laminated and formed into tube format in round shape. The material should design for class E thermal grade and conform to IEC 61212-3-2.

Sizes: - Size as stated on Below Table.

Sl. No.	Description	Size (Diameter)	Length
1	FIBERGLASS INSULATING TUBE	3/8 INCH	1 meter
2	FIBERGLASS INSULATING TUBE	5/8 INCH	1 meter
3	FIBERGLASS INSULATING TUBE	¾ INCH	1 meter
4	FIBERGLASS INSULATING TUBE	3/4 INCH	1 meters



SPECIFICATION FOR – CREPE PAPER (Each roll – 300gram)

(Make-Raman Board/Senapathy Whiteley Pvt. Ltd)

The required dimensions for crepe Paper are Width 25mm, thickness 3 mil and must conform to IS 9335-3-3 (1984).



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SPECIFICATION FOR – BAKELITE SHEET - 0.5MM (5 inch x 5 inch)

The bakelite sheet should be of 0.5mm thickness with size of 5 inch x 5 inch. It should conform to IS 2036-1995.



SPECIFICATION FOR – CONICAL WASHER (Different Sizes) Make - NUCORK (Material-Nitrile bonded rubber)

SCOPE:

This specification covers the technical requirements of design, manufacture, test at manufacturer's works, packing & forwarding, supply and unloading of 'O' shaped ring type oil seal to be used in different type of transformer for making oil tight joints at stores/site for efficient and trouble free operation.

APPLICABLE STANDARDS:

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian Standards and shall conform to the regulations of the local authorities:

- a) IS 3347: Part 1 : Sec 2 : 1979 Dimensions for Porcelain Transformer Bushings for Use in Lightly Polluted Atmospheres - Part 1 : Up to and Including 1 Kv - Section 2 : Metal Parts.
- b) IS 3347 : Part III : Sec 2 : 1982 Dimensions for Porcelain Transformer Bushings for Use in Lightly Polluted Atmospheres - Part III : 17.5 kV Bushings - Section 2 : Metal Parts.
- c) IS 4253: Part II: 1980 Specification for cork composition sheets - Part II: Cork and Rubber.

CLIMATIC CONDITIONS OF THE INSTALLATION:

2. CLIMATIC CONDITIONS:		
a)	Maximum Ambient Temperature	50°C
b)	Maximum Daily Average Ambient Temperature	35°C (recommended as per IS 1180/IS 2026)
c)	Minimum Ambient Temperature	0 °C
d)	Maximum Humidity	95 %
e)	Minimum Humidity	15 %
f)	Average Annual Rainfall	1800 mm
g)	Average Wind Speed prevailing in the area	200 km/hr.
h)	Average Thunderstorms prevailing in the area	70 days per annum

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i)	Average dust storms prevailing in the area	20 days per annum
j)	Average number of rainy days per annum	160
k)	Maximum Altitude above sea level	1000 m (recommended as per IS 1180/IS 2026 unless otherwise specified)
l)	Rainy months	June to October

4. GENERAL TECHNICAL REQUIREMENTS

S. No	Description	Units	Requirement
1.	Material		Nitrile Butadiene Rubber (NBR) conforming to Type IV, Class 4C of IS 11149 (latest revision), oil-resistant
2.	Physical Properties		
a	Hardness	IRHD	70±5
b	Tensile Strength (min)	Mpa	10.0
c	Elongation at Break (min)	%	250
d	Compression set at 70°C for 24 hrs. (max)	%	25
3.	Ageing in Transformer oil at 100°C for 72 hrs.		
a	Volume change		
Description	Dimensions (mm)		
	Outer Dia.	Inner Dia.	Height
Oil Seal for LT bushing rod RD 10-100KVA Trf.	22	12	13
LT Conical washer 16mm	30	16	13
Oil Seal for LT bushing rod RD 250 & 400KVA Trf.	30	20	16
LT Conical washer 25mm	45	25	16
Oil seal for 11 KV Bushing rod	30	12	18
Oil seal for LT bushing rod 630 KVA Trf.	45	30	19
Oil seal for LT bushing rod 1000 KVA	65	42	22



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TECHNICAL SPECIFICATION FOR CONSUMABLES TOWARDS FACILITATING TRANSFORMER REPAIRING WORKS

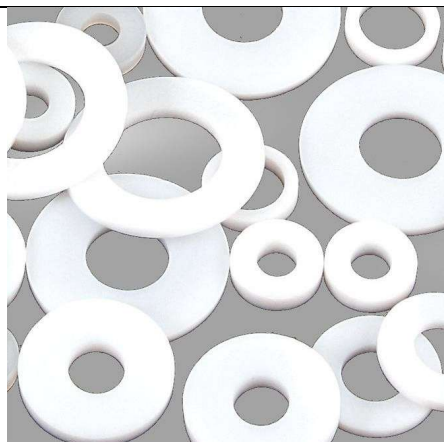
SL.NO.	NAME OF THE MATERIAL	FOR SPECIFICATION REFER PAGE NO.
85	VALVE WASHER-1/2 INCH(Thick- 4 mm) (Teflon type)	2
86	VALVE WASHER-3/4TH INCH (Thick- 4 mm) (Teflon type)	
87	VALVE WASHER-1 INCH (Thick- 4 mm) (Teflon type)	
88	VALVE WASHER-5/8 INCH (Thick- 4 mm) (Teflon type)	
89	UV PROTECTED ACRELIC SHEET-4MM (Size- 1 feet X 1 feet)	
90	11KV HIGHLY POLLUTED HT BUSHING250 AMP	3 – 4
91	LT BUSHING 1.1KV,250 AMP. (M12)	4 – 5
92	LT BUSHING 1.1KV,630 AMP. (M20)	
93	LT BUSHING 1.1KV,1000 AMP. (M30)	
94	LT BUSHING 1.1KV,2000 AMP (M42)	
95	COTTON TAPE 3/4 (Each Roll-35 Mtr.)	5
96	COTTON TAPE 1" (Each Roll-35 Mtr.)	
97	COTTON WEBBING TAPE 1 INCH (Each Roll-30 Mtr.)	
98	COTTON WEBBING TAPE 1.5 INCH (Each Roll-30 Mtr.)	
99	TAPPING SWITCH 7 POSITION, 11 KV,60 A. with handle	6
100	TAPPING SWITCH 5 POSITION, 11 KV,60 A. with handle	
101	TAPPING SWITCH 9 POSITION, 11 KV,60 A. with handle	
102	TAPPING SWITCH 5 POSITION, 33 KV,60 A. with handle	
103	SILICA GEL BREATHER CAPACITY 500GM (Alluminum Top Polycarbonate sheet with 3 mm thickness Body of clear View)	6 – 13
104	SILICA GEL BREATHER CAPACITY 1 KG (Alluminum Top Polycarbonate sheet with 3 mm thickness Body of clear View)	
105	SILICA GEL BREATHER CAPACITY 250GM (Alluminum Top Polycarbonate sheet with 3 mm thickness Body of clear View)	

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SPECIFICATION FOR – VALVE WASHER (Thick- 4 mm) (Teflon type)

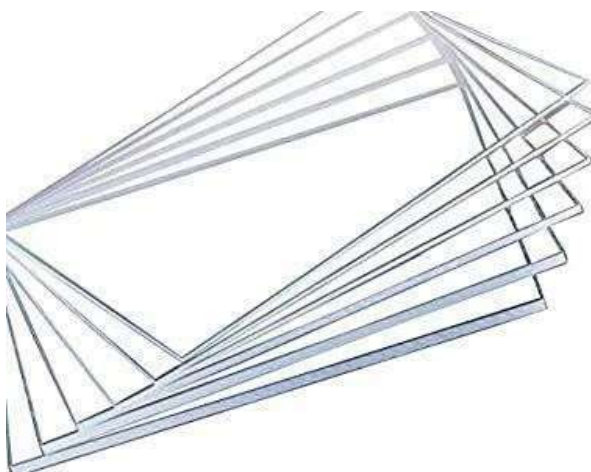
The valve washers should be made up of Teflon and of the following sizes.

Sl. No.	Item	Description	Dimension
1	½ INCH	Teflon Type Valve Washer	25 X 13 X 4 mm
2	¾ TH INCH	Teflon Type Valve Washer	30 X 19 X 4 mm
3	1 INCH	Teflon Type Valve Washer	35 X 25 X 4 mm
4	5/8 TH INCH	Teflon Type Valve Washer	27 X 16 X 4mm



SPECIFICATION FOR – UV PROTECTED ACRYLIC SHEET-4MM **(Size- 1 feet X 1 feet)**

The UV Protected Acrylic sheet of thickness 4mm with dimension – 1ft X 1ft.
Make – Pidilite Acrylic/ AKMY Polyplast/ LEXAN



UV Protection: Compounded to block UV rays, ensuring long-lasting optical clarity without yellowing or cracking.

Finish: High Gloss

Light Transmittance: Up to 92-93%

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SPECIFICATION FOR – 11KV HIGHLY POLLUTED HT BUSHING 250 AMP , Make-CJI/GE

1.0 SCOPE:

This specification covers technical requirements of design, manufacture, performance, testing at manufacturer's works, packing, forwarding, supply and unloading at stores/site, performance of LV & HV Bushing.

2.0 APPLICABLE STANDARDS:

The equipment (and the materials used) covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian standards & other relevant standards for components, BEE & CEA guidelines with latest amendment from time to time, thereof, some of which are listed below:

IS8603(Part-I)	Dimensions for porcelain transformers bushings for use in heavily polluted atmospheres 12/17.5kV, 24kV and 36kV
IS 3347(Part-1 sec-1)	DIMENSIONS FOR PORCELAIN TRANSFORMER BUSHINGS FOR USE IN NORMAL AND LIGHTLY POLLUTED ATMOSPHERES PART 1 UP TO AND INCLUDING 1 kV (Section 1 Porcelain Parts)
IS 7421(latest amendment of IS)	SPECIFICATION FOR PORCELAIN BUSHINGS FOR ALTERNATING VOLTAGES UP TO AND INCLUDING 1 000 V

3.0 CLIMATIC CONDITIONS OF THE INSTALLATION:

a)	Maximum Ambient Temperature	50°C
b)	Maximum Daily Average Ambient Temperature	35°C (recommended as per IS 1180/IS 2026)
c)	Minimum Ambient Temperature	0 °C
d)	Maximum Humidity	95 %
e)	Minimum Humidity	15 %
f)	Average Annual Rainfall	1800 mm
g)	Average Wind Speed prevailing in the area	200 km/hr.
h)	Average Thunderstorms prevailing in the area	70 days per annum
i)	Average dust storms prevailing in the area	20 days per annum
j)	Average number of rainy days per annum	160
k)	Maximum Altitude above sea level	1000m (as per IS 1180/IS 2026)
l)	Rainy months	June to October

Environmentally, some of the regions, where the work will take place includes coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators. Some places are in heavily industrial polluted areas.

Therefore, Outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive and humid coastal atmosphere.

The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1 g.

4.0 GENERAL TECHNICAL REQUIREMENTS:

Bushing: The bushings shall conform to IS: 2000-1968(latest) & IS 2099:1986 Bushing for Alternating voltage above 1000 Volts.

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The dimensions of bushings of the following voltage classes shall conform to Indian Standard mentioned against them.

Parameter	Value
Voltage	12 kV
Current	250 A
Thread	As per design
Frequency	50 Hz
Application	Distribution Transformer
Voltage Class	Indian Standards
Upto 11KV Bushings	IS 8603/IS3347/IS2099

Creepage Distance: The minimum specific creepage distance (in millimeters per units of UN) for bushings, one or both ends of which are intended to be out doors shall be for very heavily polluted atmospheres **25 mm/kV** .



SPECIFICATION FOR – LT BUSHING 1.1KV (Different Rating), Make-CJI/GE

Parameter	Value
Voltage	1.1 kV
Current	250 A
Thread	As per design
Frequency	50 Hz
Application	Distribution Transformer
Voltage Class	Indian Standards
Upto 1.1KV Bushings	IS 3347 (Part 1/Section 1)/IS7421

Creepage Distance: The minimum specific creepage distance (in millimeters per units of UN) for bushings, one or both ends of which are intended to be out doors shall be for very heavily polluted atmospheres **25 mm/kV** .



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Sl. No.	Description	Current	ID (in mm)
1	LT BUSHING 1.1KV,250 AMP. (M12) (Make-CJI/GE)	250 A	12mm
2	LT BUSHING 1.1KV,630 AMP. (M20) (Make-CJI/GE)	630 A	20mm
3	LT BUSHING 1.1KV,1000 AMP. (M30) (Make-CJI/GE)	1000 A	30mm
4	LT BUSHING 1.1KV,2000 AMP (M42) (Make-CJI/GE)	2000 A	42mm

SPECIFICATION FOR – COTTON TAPE (Each Roll – 35mtr.) & COTTON WEBBING TAPE (Each Roll 30 mtr.)

The preferable make for cotton tape and weaving tape should be Lotus. Both should conform to IS 1923.Required size for both mentioned below.

DESCRIPTION, DIMENSION & SIZE:

Cotton tape - 3/4TH INCH – 35meter each roll

Cotton tape – 1 INCH – 35meter each roll

Webbing tape – 1 INCH - 30meter each roll

Webbing tape - 1.5 INCH – 30meter each roll



COTTON TAPE

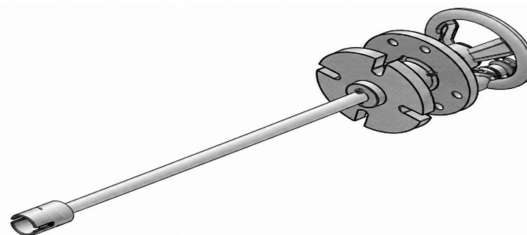
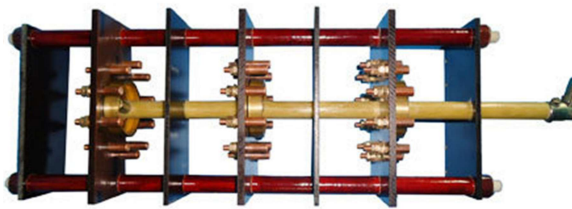


WEBBING TAPE

SPECIFICATION FOR – TAP SWITCH WITH HANDLE

Make- Alwaye Load Selectors/ Paragon Tap Changers Pvt. Ltd.

- a) The tap switch should be appropriate for 11KV & 33KV and of 60A rating.
- b) The Stud of the Tap Switch will be minimum 10mm.



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SL. NO.	DESCRIPTION	NO. OF POSITION	RATING
1	TAPPING SWITCH OF 60A Rating	7	11KV
2	TAPPING SWITCH OF 60A Rating	5	11KV
3	TAPPING SWITCH OF 60A Rating	9	11KV
4	TAPPING SWITCH OF 60A Rating	5	33KV

SPECIFICATION FOR – SILICA GEL BREATHER OF DIFFERENT CAPACITY ,Make – YOGYA/ANUSHREE

(Aluminum Top Polycarbonate sheet with 3 mm thickness Body of clear View)

SCOPE	This specification covers the technical requirements of design, manufacturing & testing at manufacturer's works, packing, forwarding, supply and unloading at store of 'Silica Gel Breather ' of various sizes required for safe and satisfactory operation of transformer.
APPLICABLE STANDARDS	The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International standard / IEC and shall conform to the regulations of the local authorities. IS 3401: 1992 Specification for Silica Gel. IS 11149:1984 Specification of rubber gasket BS EN 50216-5 Transformer and reactors fitting- dehydrating breathers IS 3639 Requirements for fittings and accessories used in power transformers. It ensures that parts like valves, flanges, and cooling equipment fit perfectly, making maintenance and replacement easy.

GENERAL TECHNICAL REQUIREMENTS

Item Description	Requirement
Material of Body	Clear Transparent, UV stabilized/retardant, polycarbonate. The body sheet shall be of minimum 3 mm thickness up to 2kg breather capacity
Top and bottom cover material	Pressure Die Cast Aluminium with powder coating (In 100g, 150g, 250g, 500g and 1kg rating without bottom plate i.e. complete body in polycarbonate material shall be preferred)
Gasket material for all gasket	Class 3B, Type III as per IS 11149 Nitrile rubber (Oil resistant gaskets)
Silica gel size	3-5 mesh (4 to 6.73mm) up to 2kg capacity breather and 4-2 Mesh (4.76 to 10 mm) for 5kg to 15kg capacity breathers
Breathing hole on top and bottom plate	Minimum 2 on top and 2 on bottom sheet shall be provided
Breathing holes on oil cup	Minimum 2 number (on opposite side) with Minimum 2.5mm diameter
Oil cup material	Clear Transparent, UV stabilized/retardant, polycarbonate

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Silica gel breather Capacity	250gms, 500grams, 1kg
Silica gel color change on moisture absorption	From Blue to Pink
Breather size	Breather size should be such that it should accommodate the desired quantity of the silica gel as per weight in kg and as specified granules size in this specs.
Tie rods Material	All tie rods should be of stainless steel material SS 304
Hardware	All hardware shall be of stainless steel and washers to be provided for all nuts
Tie rods	1. For below 3kg capacity single tie rod of M8 size or side fixing arrangement on top cover at three places
Mounting arrangement	1. Up to 2 kg capacity of Silicagel breather shall have top threaded mounting arrangement with 1/2" size having 3/4" BSP threading.
Oil cup fixing	If the fixing arrangement of oil cup is provided on threaded arrangement at center of cup then the central stem shall be provided with nylon or alternate material to accommodate the thermal expansion of SS metal stem. If metallic clamp is provided to hold the cup then the clamp should be of stainless steel and size should be minimum 3mm diameter.
DESCRIPTION	1. Silica gel breather is used for avoiding the moisture ingress in to transformer as the moisture ingress is detrimental to the health of the transformer. Hence the design of breather housing should be such that no air shall go inside except from desired air path through oil cup. The sealing of top and bottom caps should intact such that it should with stand pressure of 0.35kg/cm² for 30 minutes in air. 2. Body shall be made of Transparent yet Unbreakable UV stabilized virgin Polycarbonate Plastic. The procurement records of polycarbonate shall be checked during inspection. 3. Polycarbonate body sheet shall be of minimum 3 mm thickness up to 2kg breather capacity. 4. Top & Bottom sheet shall be made of die cast Aluminium & joined with body through nitrile butadiene rubber gaskets such that no air can pass even under pressure or vacuum. 5. Rubber gasket shall be Class 3B, Type III as per IS 11149 (Oil resistant). OEM Test reports to be provided during inspection. 6. Sealant used for fixing should be UV stabilized and temperature withstand up to 55-60 degrees. 7. Top and bottom cap shall be powder coated. (The surface should be made smooth with shot blasting or with seven tank method and not by Phosphate Cleaning processes) paint shall be dark gray color.

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	8. Oil cup shall be made of polycarbonate shall be fitted with nitrile gasket on top and shall be fitted on lower die cast Aluminum sheet or polycarbonate housing. 9. Two breathing holes shall be provided on oil cup which shall be covered with stickers while dispatch. Stickers shall be easily removable after installation of breather on transformer at site. 10. Breathing holes shall be provided on top and bottom die casted AL sheet (2 on upper side and 2 on lower side). 11. For breather up to 2 kg capacity one supporting tie rod of SS 304 of M8 size can be provided along the central axis of polycarbonate body. Min. Three SS nuts to be used one top plate, two at bottom plate one inside one outside with washer. Alternately completely molded oil cup also accepted based on sample approvals during tender and not after award of order. 12. For breather greater than 2 kg capacity shall have 4 Number of supporting tie rods of SS 304 of M8 size shall be provided outside the polycarbonate body. 13. Upper side Al die casted cap shall be provided with following fixing arrangement, 14. Up to 2 kg capacity of Silicagel breather shall have top threaded mounting arrangement with 1/2" size having 3/4" BSP threading. 15. 2kg and above capacity shall have flange mounting with 4 holes of 12mm diameter (15mm diameter for 15kg) on 83 PCD. 16. The top fixing arrangement in mold or with 32 A/F hex bolt shall have minimum 6 mm wall thickness for breathers up to 2kg. 17. Oil cup shall have visible Collar with label or level paint marking to indicate desired oil filling level. The label shall have mention of 'Oil Level'. The sticker is not accepted. 18. In any capacity holding clamp if used then it should be of stainless steel. Alternately designs of holding oil cup shall be accepted based on tender sample approval. Design should meet the requirements and sturdy. 19. If the fixing arrangement of oil cup is provided on threaded arrangement at center of cup then following are applicable, a. The central stem shall be provided with nylon or alternate material to accommodate the thermal expansion of SS metal steam. b. The inside threading stem in oil cup shall have four number supporting reinforcement stiffener of min. 2-4mm thick so that shall not be broken easily. c. The height of the central stem in oil cup shall be above the oil level mark and well inside air channel collar around 3/4 height of oil cup.
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20. The air channel inner collar at bottom plate shall be extended more than half around $\frac{3}{4}$ height of oil cup inside the oil cup such that if oil level is at $\frac{3}{4}$ of cup then also the filtered air through oil shall pass in the breather.

21. Silica gel crystal size shall be as per US mesh size and

a. 3-5 mesh (4 to 6.73mm) up to 2kg capacity breather
If breather found with smaller or bigger granules same shall not be accepted. There shall not any negative tolerance on Silicagel weight as per capacity.

22. The top opening shall be fixed with PVC removable cap threaded type which can be easily removed at site.

23. For 250gm, 500gm & 1 kg without bottom metal casting plate i.e. complete polycarbonate molding body is also accepted. (Acrylic is not accepted in any of the rating).

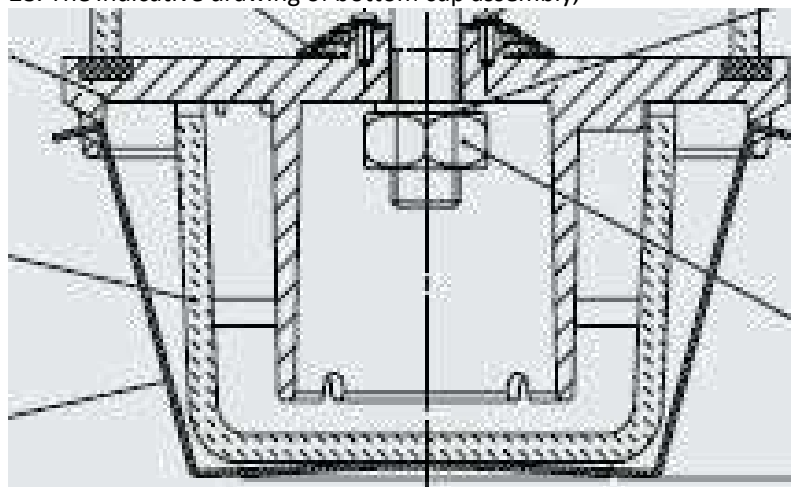
24. The clear view height shall be minimum 80mm for 500 grams & minimum 100 mm for 1kg and 120mm for 2 kg design. It is preferred to have design with longer height and shorter diameter of the breather so that air filter path can be longer to extract moisture.

25. The watershed or bottom collar near oil cup shall be minimum 10mm extended over gasket on oil cup.

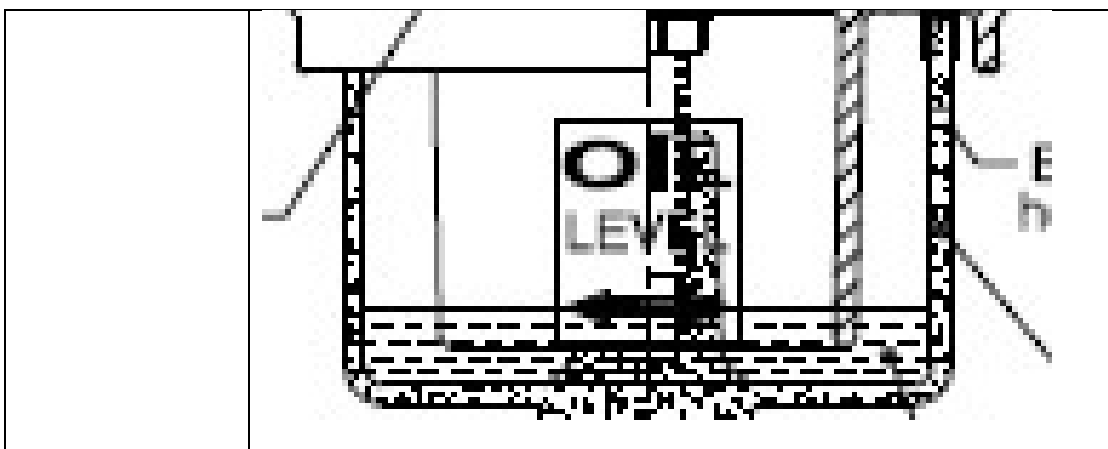
26. The oil cup shall have brass threaded nut housed inside or alternate material so that thermal expansion of metal and polycarbonate can be taken care without cracks.

27. Only UV resistant polycarbonate material to be used for transparent body and oil cup. OEM Test report & sourcing documents to be provided for the material during inspection.

28. The indicative drawing of bottom cup assembly,



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Sl. No.	Description	Capacity
1	SILICA GEL BREATHER Type -1	250grams with 3mm thickness body
2	SILICA GEL BREATHER Type -2	500grams with 3mm thickness body
3	SILICA GEL BREATHER Type -3	1KG with 3mm thickness body

TP CENTRAL ODISHA DISTRIBUTION LIMITED

TECHNICAL SPECIFICATION

FOR CONSUMABLES TOWARDS FACILITATING TRANSFORMER REPAIRING WORKS

SL.NO.	NAME OF THE MATERIAL	FOR SPECIFICATION PAGE NO
106	Acetylene Gas (Refilling)	2
107	Oxygen Gas (Refilling)	
108	Hydranal TM Coulomat AG	3
109	Methanol Specially dried 99%	
110	Chloroform 99%	4
111	Vacuum Oil for filter machine	
112	Enamel Paint Red	5
113	Enamel Paint Yellow	6
114	Enamel Paint Blue	
115	Petroleum Jelly	
116	Paint (White)	7
117	Paint (Black)	
118	Fevicol	
119	Electrical Grease	8
120	Varnish	
121	Hold Tite	9
122	Smoke Grey Paint	
123	Primer	
124	Thinner	10
125	Tarpin Oil	
126	Plastic steel putty(A)	11
127	Plastic steel 5 minutes Putty (SF)	
128	Rust Cleaner WD40	12
129	Round Brush	
130	Paint Brush	
131	Pitambari Powder	
132	Belt for Oven Blower	13
133	Old Banyan and Cotton Cloth	
134	Jute Bag	14
135	Resin Bonded Cartridges, 50micron	
136	Resin Bonded Cartridges, 01 micron	
137	4" Grinding Wheel	15
138	4" Cutting Wheel	16
139	12 No. Welding Rod	
140	10 No. Welding Rod	
	TERMS AND CONDITIONS	17 – 19

TP CENTRAL ODISHA DISTRIBUTION LIMITED

SPECIFICATION FOR ACETYLENE GAS (REFILLING)

As a highly flammable gas, Dissolved acetylene is primarily used in welding and cutting processes, making it essential for metal fabrication works.

Acetylene is dissolved in a solvent in specially designed cylinders filled with a porous mass. Since the gas is dissolved into the mass, it is sometimes called 'dissolved acetylene'. The exceptionally high flame temperature of acetylene (3100°C) makes it ideal for oxy-acetylene cutting, heat treating and torch brazing.

BA Scope: We have got the cylinder at our Workshop. The scope would be refilling of Gas in Empty DA Tank with transportation to and fro DT Workshop Choudwar to refilling centre. The capacity of the DA gas tank is 6.21cum.



SPECIFICATION FOR OXYGEN GAS (REFILLING)

The Oxygen gas to be refilled should preferably be a type of oxygen used in industrial settings, like manufacturing plants, for tasks that would include combustion and oxidation primarily for welding, cutting, brazing and metal fabrication purpose.

BA Scope: We have got the cylinder at our Workshop. The scope would be refilling of Gas in Empty DA Tank with transportation to and fro DT Workshop Choudwar to refilling centre. The capacity of the Oxygen gas tank is 7cum.



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SPECIFICATION FOR HYDRANAL™ COULOMAT AG

Hydranal's purpose is to provide a comprehensive line of Karl Fischer (KF) titration reagents, solvents, and standards for accurately determining water content in DT oil sample, ensuring safety, ease of use, and accuracy of measurement in Oil PPM Kit.

We require **500 ml bottle of preferably Honeywell make** and should conform to IS **2362:1993**.



SPECIFICATION FOR METHANOL

Methanol is used as a solvent, fuel additive, and chemical feedstock and plays a vital role in the testing of DT oil sample during analysis using Oil PPM Kit. It should conform to IS 517:2020.

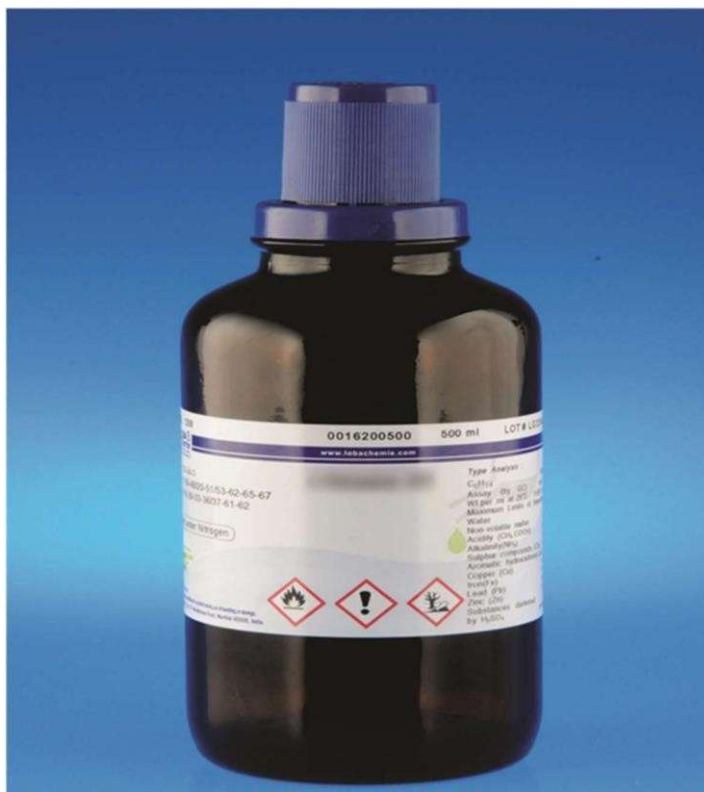
We require **specially dried 99% Methanol in 500 ml bottle of preferably LOBA make**.



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SPECIFICATION FOR CHLOROFORM

In an oil PPM (parts per million) test kit, chloroform is used as a solvent and reagent to help separate and identify the substance being measured, such as Polychlorinated Biphenyls (PCBs) in transformer oils. It dissolves non-polar compounds like lipids or specific contaminants, facilitating a chemical reaction or phase separation that produces a color change, allowing for the visual estimation of parts per million of the substance.



We require **99% Chloroform** of capacity 500 ml bottle of preferably **LOBA** make and should conform to IS 5296.

SPECIFICATION FOR VACUUM OIL FOR FILTER MACHINE

Vacuum Oil required for Filter Machine to be **5 liters capacity** and preferably of **grade VM4 (Servo Make) or Vacuum Pump Oil (Mobil Make)**. The vacuum pump oil should be of high-grade and specifically designed for high-vacuum diffusion pumps. It should meet GOST: 23013 – 78 / IS 11159 (Part 4) : 2011 and be characterized by a very low vapor pressure and high thermal stability, which in turn, would help maintain a consistent vacuum, minimize oil evaporation, and protect against wear and corrosion.



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SPECIFICATION FOR ENAMEL PAINT RED

Enamel paint for metals is an oil-based or water-based paint that is used for both interior and exterior applications. It is glossy, thin, and has protective attributes.

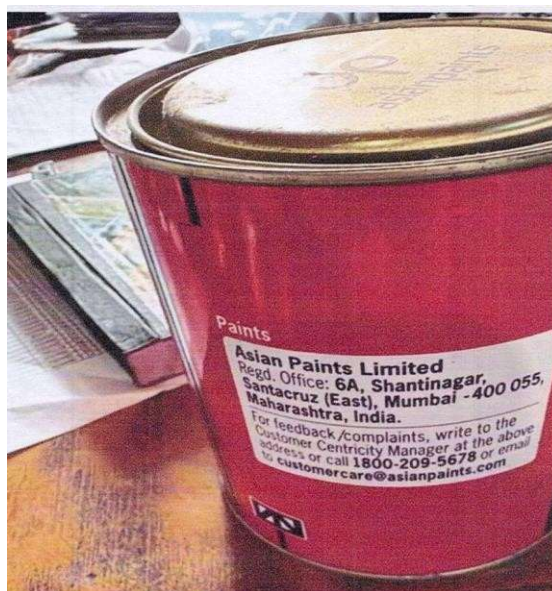
We require oil – based paint for colouring HT and LT stud caps on R-phase of the transformer.

The alkyd resin base needs to be adjusted in order to get optimized red colour for flexibility, drying time, or chemical and UV resistance. To ensure a high-quality finish, the mixture must meet the following

Key Technical Specifications (Conforming to IS 2932)

- Paint Type: Modified synthetic alkyd resin
- Colour & Shade: Signal Red (Shade No. 537 as per IS 5).
- Finish: High gloss, smooth, and uniform.
- Drying Time: Surface dry $\leq$ 3 hours; Hard dry $\leq$ 18 hours.
- Gloss Value: > 80 at a 60-degree head.
- Dry Film Thickness (DFT): 25 - 30 microns per coat.
- Viscosity: Brushing consistency, around 90-100 seconds using Ford Cup No. 4 at 27° C

We require **red paint of capacity 500 ml bottle of preferably Asian Paint / Berger/ Nerolac make**.



TP CENTRAL ODISHA DISTRIBUTION LIMITED

SPECIFICATION FOR ENAMEL PAINT YELLOW

Enamel paint for metals is an oil-based or water-based paint that is used for both interior and exterior applications. It is glossy, thin, and has protective attributes.

We require oil – based paint for colouring HT and LT stud caps on Y-phase of the transformer.

The alkyd resin base needs to be adjusted in order to get optimized yellow colour for flexibility, drying time, or chemical and UV resistance. To ensure a high-quality finish, the mixture must meet the following Key Technical Specifications (Conforming to **IS 2932**)

- **Type:** Oil-based, air-drying synthetic enamel or epoxy enamel.
- **Color:** Chrome/Jasmine Yellow (often matching Shade No. 356 or Shade No. 397 under standard color codes).
- **Finish:** Smooth, high gloss. Gloss Value: > 80 at a 60-degree head.

We require **yellow paint of capacity 500 ml bottle of preferably Asian Paint / Berger / Nerolac make.**

SPECIFICATION FOR ENAMEL PAINT BLUE

Enamel paint for metals is an oil-based or water-based paint that is used for both interior and exterior applications. It is glossy, thin, and has protective attributes.

We require oil – based paint for coloring HT and LT stud caps on B-phase of the transformer.

The alkyd resin base needs to be adjusted in order to get optimized blue colour for flexibility, drying time, or chemical and UV resistance. To ensure a high-quality finish, the mixture must meet the following Key Technical Specifications (Conforming to **IS 2932**)

- **Material Type:** Synthetic Enamel.
- **Resin Base:** Modified alkyd resin base. (Natural rosins are prohibited).
- **Standard Conformance:** The paint should conform to IS 2932 (Enamel, Synthetic, Exterior).
- **Color Shade:** Sky Blue (Shade No. 101) or Oxford Blue as per IS 5 (Colors for ready mixed paints).
- **Finish:** Glossy or High Gloss.
- **Drying Time:** Touch dry: 3 to 4 hours. And Hard dry: Overnight.

We require **blue paint of capacity 500 ml bottle of preferably Asian Paint / Berger / Nerolac make.**

SPECIFICATION FOR PETROLEUM JELLY

Industrial grade petroleum jelly prioritizes performance over purity. Unlike cosmetic grades, it is minimally refined, resulting in a yellow to amber color and a mild petroleum smell. It serves as a heavy-duty lubricant, corrosion inhibitor, and water-repellent.

We require petroleum jelly **of capacity 1kg pack of preferably Apar Industries / Divyol / Naturon**



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SPECIFICATION FOR PAINT (WHITE)

Colour of paint shall be white of **capacity 500 ml bottle** each. The makes for Paint will be preferably **Asian paint/Berger/ Nerolac make** . It should be conforming to **IS 2932**.



SPECIFICATION FOR PAINT (BLACK)

Colour of paint shall be Black of **capacity 500 ml bottle** each. The makes for Paint will be preferably **Asian paint/Berger/ Nerolac make**. It should be conforming to **IS 2932**.



SPECIFICATION FOR FEVICOL:



The pack of Fevicol will be SH type and 1 kg pack of make preferably Pidilite with conformance to IS 848:2006.

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SPECIFICATION FOR ELECTRICAL GREASE (AP3) :

The electrical grease should be of AP3 grade and would be preferentially of **1kg packets**. The preferable makes would be **BOSCH/TATA/ HP/GULF** and should conform to **IS 12203** (for industrial applications).



SPECIFICATION FOR VARNISH

The pack of Varnish will be **1 litre pack** of make preferably **Asian/Dr Beck** and should conform to IS 524.



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SPECIFICATION FOR HOLD TITE

We require Hold Tite should be of **Pidilite Industries** make and supplied in **500 gm packs** and should conform to IS 3447.



SPECIFICATION FOR SMOKE GREY PAINT (POLYURETHANE)

We require Smoke Grey PU Paint should be of **Grand Polycoats/ Nippon/Asian** make and supplied in **20 Litre packs** and should conform to **IS 13213:2018** (Polyurethane Full Gloss Enamel - Specification) and **IS 5:2004** (Colors for Ready Mixed Paints).



SPECIFICATION FOR PRIMER

We require Primer should be of **Berger/Asian** make and supplied in **4 Litre packs** and should conform to IS 13759:2017.

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SPECIFICATION FOR THINNER

We require PU Thinner 001 grade and should be of **Grand Polycoats/ Nippon/Asian** make and supplied in **20 Litre packs** and should conform to IS 13213.



SPECIFICATION FOR TARPIN OIL



We require Tarpin oil should be of **Berger/Asian** make and supplied in **01 Litre packs** and should conform to IS 533:2007.

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SPECIFICATION FOR PLASTIC STEEL PUTTY(A)

Plastic steel putty is a metal-filled epoxy used for repairing cracks, breaks, and wear in metal. This is crucial as it can check oil leakage in transformers at the earliest possible.

We require Plastic Steel Putty(A) should be of **Devcon make and supplied in 500 gm packs**. It should conform to IS 12994.



SPECIFICATION FOR PLASTIC STEEL 5 MINUTES PUTTY (SF)



We require Plastic Steel 5 minutes Putty (SF) of **Devcon make and supplied in 500 gm packs**. It should conform to IS 12994.

SPECIFICATION FOR RUST CLEANER (WD 40)

Rust cleaner WD 40 are formulated to dissolve and remove rust-to-metal bonds.

WD-40 Multi-Use Product (Aerosol Penetrant)

- Formulation: Features petroleum base oils, isoparaffin, and aliphatic hydrocarbons.
- Temperature Performance: Operates effectively from -20° C to +90° C.

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- Corrosion Protection: Provides up to 72 hours of 30% salt spray protection and displaces moisture.
- Viscosity: 2.8 cSt @ 100° F.
- Material Compatibility: Safe on metal, alloys, plastics, and most rubbers

We require Rust cleaner WD40 of capacity 420 ml bottle of preferably Pidilite make and should conform to IS 1153:2000.



SPECIFICATION FOR BRUSH



The following dimension brushes are required:

- a) Small round brush- 1/2 inch size.
- b) Brush - 2 inch size.

SPECIFICATION FOR PITAMBARI POWDER

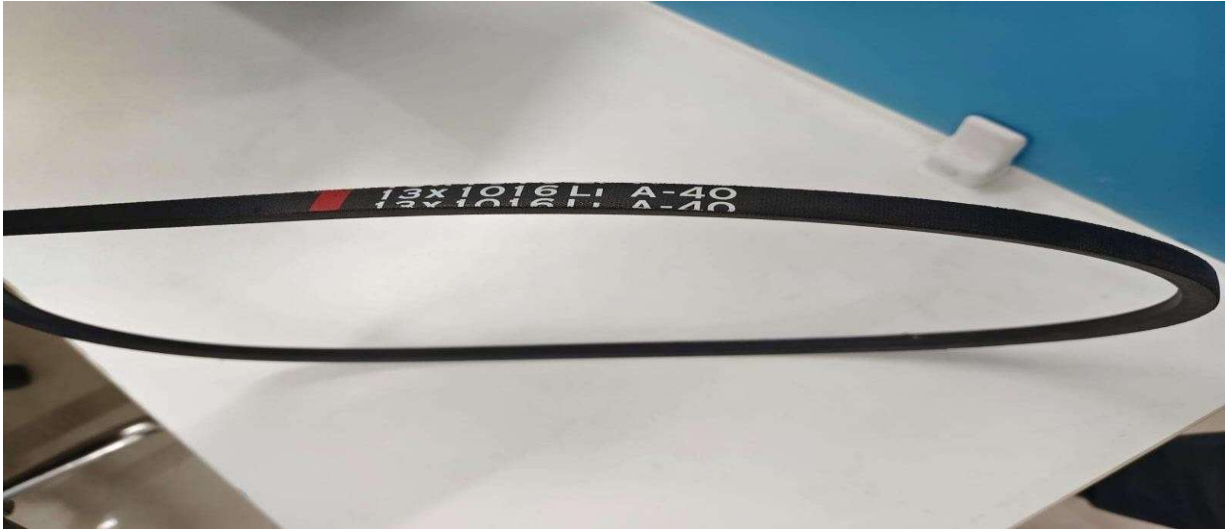
This is essential to clean soiled brass objects especially studs in case of transformers.

The Packets should be preferably of 1 Kg weights which should conform to IS 5487:1992



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SPECIFICATION OF BELT FOR OVEN BLOWER:



Key Features

- Top Width: 13.0 mm
- Thickness: 8.0 mm
- Angle: 40A
- Standard: IS2494, BS3790, ISO4184, DIN2215, JIS K 6323, IP 20
- Ambient Temperature Range: + 70 degree C to -18 degree C
- Features: Antistatic, Oil and Heat Resistant
- Belt Colour: Black
- Weight: 20 grams
- Product Type: A 40 Industrial V Belt ; Should be ISI marked.
- Material: Rubber

SPECIFICATION FOR OLD BANIAN AND COTTON CLOTH

Old and torn cotton (banian) cloth is ideal for oil works due to its high absorbency and softness, making it effective for cleaning grease, oil, and other fluids from DTs as well as for polishing surfaces without scratching.

It serves as a cost-effective and readily available option for DT workshops in tasks like wiping spills and dusting. Cotton waste cloth (especially banian cloth) is highly absorbent, effectively soaking up water, oil, kerosene, and other liquid material from the CCAs as well as Tank surfaces.

Old Cotton Cloth with **minimum 2 feet X 2 feet** size are required.

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SPECIFICATION FOR JUTE BAG

Jute bags are required in DTWS towards being used in oil work primarily for oil spill cleanup. Due to its high absorbing capability, the further scattering of oil gets checked on a large scale. Also the same can be used for absorbing water from floor in case of accidental spillage and rainy seasons. The dimensions preferably should be: **Length--48 inch & width--24 inch.**



SPECIFICATION FOR RESIN BONDED CARTRIDGES

Resin bonded filter cartridges are used in oil filtration to provide depth filtration, trapping particles deep within the filter media, which extends the oil's lifespan and increases their dirt-holding capacity. Their rigid, resin-bonded structure prevents collapse under high-pressure or high-viscosity conditions, ensuring consistent performance, preventing bypass, and offering broad chemical compatibility for oils.

We require **good quality Brown colour resin bonded cartridges for 01 micron and 50 micron with ID = 28mm; OD = 65mm and Length = 20 inches.**

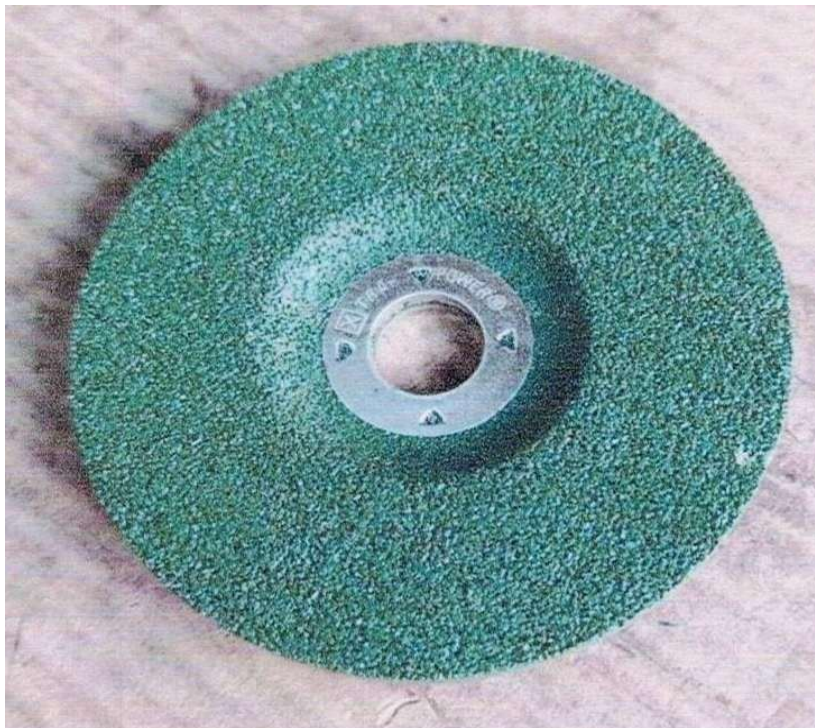
The dimension will be ID-28mm & OD-65mm and should conform to IS 6034.

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SPECIFICATION FOR 4" GRINDING WHEEL

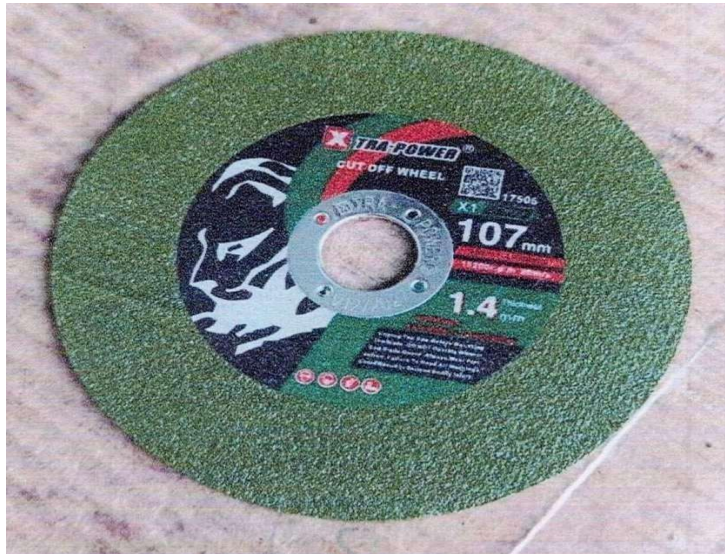
We require a pack of 25 numbers 4" size grinding wheel of Bosch make as it conforms to IS 603 Part 5 : 2023.



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SPECIFICATION FOR 4" CUTTING WHEEL

We require a pack of 25 numbers 4" size cutting wheel of Bosch make as it conforms to IS 1991 (Parts 1–9) and IS 603 (Part 5).



SPECIFICATION FOR WELDING RODS:



The welding rods need to be provided in the following dimensions:

Sl. No.	Item Description	Diameter	Length
1	10 mm welding rod	3.15mm	450 mm
2	12 mm welding rod	2.5mm	350 mm

Each of the welding rod packs should have ISI mark and should conform to IS 1278. The make of the welding rod preferably ADOR/ESAB/TATA.

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TERMS & CONDITIONS

NAME PLATE AND MARKING:

Each Individual packet shall be marked with the following: -

- (a) Manufacturer's name & trade mark
- (b) Date of manufacture
- (c) Grade
- (d) Marked with the standard mark
- (e) PROPERTY OF TPCODL
- (f) P.O. No with date
- (g) Item Description
- (h) Material Code

TESTS

All Routine, Acceptance & Type tests shall be summited during the drawing approval in accordance with the relevant IS/IEC.

PRE-DESPATCH INSPECTION

Equipment shall be subject to inspection by a duly authorized representative of the TPCODL. Inspection may be made at the manufacture premises or virtually at the option of the TPCODL and the equipment if found unsatisfactory as to workmanship or material is liable to rejection. Inspection by the TPCODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by the TPCODL.

Following documents shall be sent along with material”

- a) Test reports
- b) MDCC issued by TPCODL
- c) Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable

INSPECTION AFTER RECEIPT AT STORE

The material received at Central Stores, Choudwar store shall be inspected for acceptance and shall be liable for rejection, if found different from the approved drawing / GTP.

GUARANTEE

Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the TPCODL up to a period of at least 12 months from the date of commissioning or 18 months from the date of last supplies made under the contract whichever is later, (the time scale of 12/18 months could be enhanced subject to mutual agreements). Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the TPCODL, failing which the TPCODL will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the TPCODL's own charges (@ 20% of expenses incurred), from the Bidder or from the "Security cum

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Performance Deposit” as the case may be.

PACKING

Supplier shall ensure that all equipment covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. No single use plastic to be used in packing material. Packing should be done with environment friendly recyclable materials.

MINIMUM TESTING FACILITIES

Bidder shall have adequate in-house testing facilities for carrying out all routine tests, acceptance tests as per Indian /International standards.

MANUFACTURING ACTIVITIES

The bidder shall get the approved drawing and GTP before start of manufacturing activity. The successful bidder will have to submit details of the offered design & components for approval as per specification. CAT-A/CAT-B is mandatory to start manufacturing.

DRAWING AND DOCUMENTS

Following documents shall be prepared based on TPCODL specifications and statutory requirements with complete BOM and shall be submitted with the bid:

- Completely filled in Technical Particulars.
- General description of the equipment and all components including brochures.
- Type test Certificates

After the contract, four (4) copies of the drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval and shall subsequently provide four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy of all the drawing, GTP, test certificates shall be submitted after the final approval of the same to the TPCODL .

Following Drawings/Documents shall be submitted after the award of the contract

S. No	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	√		√
2	Manual/Catalogues/drawings for all components.		√	
3	Technical details and test certificates.		√	√
5	Installation Instructions		√	√
6	Instructions for use		√	√
7	Transport/shipping dimension Drawing		√	√
8	QA & QC Plan	√	√	√
9	Routine, Acceptance and Type test Certificates	√	√	√

GURANTEED TECHNICAL PARTICULARS

The Bidder need to give clause wise compliance.

TP CENTRAL ODISHA DISTRIBUTION LIMITED

SCHEDULE OF DEVIATIONS

(TO BE ENCLOSED WITH TECHNICAL BID)

All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the TPCODL's specifications:

We confirm that there are no deviations apart from those mentioned above

Sl. No.	Clause No.	Details of deviation with justifications

Seal of the Company

Designation
Signature