SHANTHALA POWER LIMITED
ELECTRICAL TESTING LABORATORY
Shanthala No. 24, Priyadarshini Colony, Gokul Road, Hubballi, Hubli,
Dharwad-580030 Karnataka, India Mob No:09449867588
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TRANSFORMER OIL TEST REPORT

ELECTRICAL- INSULATING MATERIALS & INSULATORS	ULR No. : 1122334455

Customer Address.	
Test Company New, Test Company New, GJ, test, test, test, Gujarat-333333	**Kind Attn:** Test **Contact No:** 9898244359 **Email:** test@yopmail.com

Name of the Work: Transformer Oil Testing.
Ref: Work Order No: VJP/EEE/OD/AET/F-S-52/8899-8903, Date: 01/07/2026.
OA No: 1235-3, Date: 02/07/2026. **I/W No:** 987, Date: 15/09/2026.
Test Report No:

Sl No.	INDEX							Page No.
	PARTICULARS OF TRANSFORMER OIL SAMPLES							
	Transformer Serial No.	Identification	Plant Location	Make	Capacity	Voltage HV/LV	YOM	
1		Trf-123	Shanthala power ltd.,Hubli			11KV/170KV	2026	02-06
2	12345	Trf-1	Shanthala power ltd.,Hubli	Transformer & Rectifier Ltd	200 MVA	11KV/170KV	2025	04-06
3	1700/20	Trf-1	Shanthala power ltd.,Hubli	Transformer & Rectifier Ltd	200 VA	114V	2024	06-06

Co-Ordination By:	Test	Test Company New
Sample Collected By:	By Courier	

(Mangala.B.K)	(Suresh.S.P)	(Shreya Mysore)
Report Prepared By	**Reviewed By**	**Authorized Signatory**

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TRANSFORMER OIL TEST REPORT

ELECTRICAL- INSULATING MATERIALS & INSULATORS	ULR No. : 1122334455

Customer Name *	:	Test Company New, Test Company New, GJ, test, test, test, Gujarat-333333			
Contact Person *	:	Test	**Sample No.**	:	1233 (Drum)
Contact No *	:	9898244359	**Plant Location ***	:	Shanthala power ltd.,Hubli
E- Mail ID *	:	test@yopmail.com	**Customer Identification ***	:	Trf-123
Location of Sample Collected *	:	Shanthala power ltd.,Hubli	**Serial Number ***	:	
Last Date of Filtration *	:	NP	**Make ***	:	
Date of Sampling *	:	NP	**Capacity ***	:	
Date of Receipt *	:	17/07/2026	**Voltage (HV/LV) ***	:	11KV/170KV
Sample Tested on	:	16/07/2026	**Year of Manufacture ***	:	2026
Oil Temperature *	:		**Weather Condition ***	:	
Winding Temperature *	:		**Sample Condition on Receipt**	:	Good
Report Issue Date	:	14/10/2026	**Colour of the Oil**	:	Amber
Location of Test Performed	:	Shanthala Power Limited Electrical Testing Laboratory Hubli.			
Method of Sampling for Insulating Liquids as per IS 6855:2017					

Test Condition (LAB):	Ambient Temp in °C : 25-29	RH in % : 40-49

Sl. No.	Test Parameters	Reference Standard- IS: 1866: 2017	Drum Oil	Test Results
		Test Method	Limits Drum Oil	
1	Moisture Content (Water Content) in mg/kg	IS 6792: 2023 (Power Frequency Test Method) &IS 1866:2017 Mineral Insulating Oils in Elec Equip)	< 30(Before Filteration)/< 70 kV(After Filteration)	1
2	Resistivity (Specific Resistance) in GΩm,	IS 16840: 2018 (DC Three-Terminal Method/Guarded Electrode Method) &IS 1866:2017 Mineral Insulating Oils in Elec Equip)	No-Limits	5
3	Acidity (Neutralization Number) in mg KOH/g	IS 1448 (Part 2): 2018 (Automatic Potentiometric Titration Method) &IS 1866:2017 Mineral Insulating Oils in Elec Equip)	Max 0.01 mgKOH/g.Max	0.011
4	Interfacial Tension (IFT) in m N/m.	IS 6104: 2024 (Ring Method) &IS 1866:2017 Mineral Insulating Oils in Elec Equip)	No-Limits	29
5	Sludge/Sediment % by weight	IS 1866 (Annexure C): 2017 (Gravimetric Filtration Method) &IS 1866:2017 Mineral Insulating Oils in Elec Equip)	No sediment or Perceptible Sludge(<0.02%)	ND

(Mangala.B.K) **Report Prepared By**	(Suresh.S.P) **Reviewed By**	(Shreya Mysore) **Authorized Signatory**

TRANSFORMER OIL TEST REPORT

ELECTRICAL- INSULATING MATERIALS & INSULATORS			ULR No. : NABLT0626KA184232600000001	
6	Flash Point in 0C	IS 1448 (Part 21): 2019 (Pensky-Martens Closed CupMethod –A)	135 degree C Min	166
7	Density in g/ml	IS 1448 (Part 16): 2019 (Hydrometer Method)	Max:0.895 g/ml Max	8.0012
8	Kinematic Viscosity mm2/s, at 400C	IS 1448 (Part 25): 2018 (Capillary Viscometer Method)	15mm2/s Max	9
9	Moisture Content (Water Content) in mg/kg	IS 6792: 2023 (Power Frequency Test Method) &IS 1866:2017 Mineral Insulating Oils in Elec Equip)	< 30(Before Filteration)/< 70 kV(After Filteration)	
10	Resistivity (Specific Resistance) in GΩm,	IS 16840: 2018 (DC Three-Terminal Method/Guarded Electrode Method) &IS 1866:2017 Mineral Insulating Oils in Elec Equip)	No-Limits	
11	Acidity (Neutralization Number) in mg KOH/g	IS 1448 (Part 2): 2018 (Automatic Potentiometric Titration Method) &IS 1866:2017 Mineral Insulating Oils in Elec Equip)	Max 0.01 mgKOH/g.Max	A123

FURAN ANALYSIS:

Sl. No.	Furanic Compounds	Unit	Test Method	Limits	Test Results
1	5 Hydroxymethyl-2-Furaldehyde	µg/kg	IS 15668: 2016 (Liquid-Liquid Extraction Method-A)	No-Limits	
2	Furfuryl Alcohol				
3	2 – Furaldehyde				
4	2 – Acetyl Furan				
5	5 – Methyl –2 – Furaldehyde				
Total (µg/kg)					**0**

INTERPRETATION & OPINION ON THE TRANSFORMER OIL TEST REPORT:

Oil Parameters:
❖ The parameters of the oil sample of the transformer tested are within the permissible limits as per IS:1866-2017 “The parameters of Transformer Oil in service”.

Dissolved Gas Analysis (DGA):
❖ The gas contents are within the permissible limits as per IEEEC57.104.

Furan Analysis:
❖ The obtained Furan Test results are mentioned in the report (Refer General Guidelines in Annexure-1).

OPINION:
❖ Compared with previous results, there is **/no much** significant variation was observed.

(Mangala.B.K)	(Suresh.S.P)	(Shreya Mysore)
Report Prepared By	**Reviewed By**	**Authorized Signatory**

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TRANSFORMER OIL TEST REPORT

ELECTRICAL- INSULATING MATERIALS & INSULATORS	ULR No. : NABLT0626KA184232600000001

Customer Name *	:	Test Company New, Test Company New, GJ, test, test, test, Gujarat-333333			
Contact Person *	:	Test	**Sample No.**	:	987 (Oltc)
Contact No *	:	9898244359	**Plant Location ***	:	Shanthala power ltd.,Hubli
E- Mail ID *	:	test@yopmail.com	**Customer Identification ***	:	Trf-1
Location of Sample Collected *	:	Shanthala power ltd.,Hubli	**Serial Number ***	:	12345
Last Date of Filtration *	:	17/07/2026	**Make ***	:	Transformer & Rectifier Ltd
Date of Sampling *	:	NP	**Capacity ***	:	200 MVA
Date of Receipt *	:	30/07/2026	**Voltage (HV/LV) ***	:	11KV/170KV
Sample Tested on	:	24/07/2026	**Year of Manufacture ***	:	2025
Oil Temperature *	:		**Weather Condition ***	:	Rainy
Winding Temperature *	:		**Sample Condition on Receipt**	:	Good
Report Issue Date	:	14/10/2026	**Colour of the Oil**	:	Brown
Location of Test Performed	:	Shanthala Power Limited Electrical Testing Laboratory Hubli.			
Method of Sampling for Insulating Liquids as per IS 6855:2017					

Test Condition (LAB):	Ambient Temp in °C : 25-29	RH in % : 40-49

Sl. No.	Test Parameters	Reference Standard- IS: 1866: 2017	Oil in service	Test Results
		Test Method	Limits OLTC	
1	Moisture Content (Water Content) in mg/kg	IS 6792: 2023 (Power Frequency Test Method) &IS 1866:2017 Mineral Insulating Oils in Elec Equip)	>40kV	2

(Mangala.B.K)	(Suresh.S.P)	(Shreya Mysore)
Report Prepared By	**Reviewed By**	**Authorized Signatory**

INTERPRETATION & OPINION ON THE TRANSFORMER OIL TEST REPORT:

Oil Parameters:

❖ The parameters of the oil sample of the transformer tested are within the permissible limits as per IS:1866-2017 "The parameters of Transformer Oil in service".

❖ **Tan Delta, Resistivity, IFT & Acidity** Values are beyond the limits & other parameters of the oil sample of the transformer tested are within the permissible limits as per IS:1866-2017 "The parameters of Transformer Oil in service". **Sludge is also Traces.**

❖ BDV value is below the permissible limit & Water Content value has crossed the limits and acidity value of the oil sample of this Transformer is within the permissible limits as per IS:1866-2017 "The parameters of Transformer Oil in service".

Dissolved Gas Analysis (DGA):

❖ The gas contents are within the permissible limits as per IEEEC57.104.

❖ **Methane, Ethylene, Ethane, Acetylene, Carbon Monoxide, Carbon Dioxide & Hydrogen** gas contents are on higher side as per IEEEC57.104.

Furan Analysis:

❖ The obtained Furan Test results are mentioned in the report (Refer General Guidelines in Annexure-1).

❖ The total of the Furanic compounds are in the **Normal / Healthy transformer / Moderate deterioration / Extensive deterioration / End of life criteria** range.

OPINION:

❖ Compared with previous results, there is **/no much** significant variation was observed.

❖ Compared with previous results, **all the gas contents /Acetylene gas content are increased/ decreased.**

❖ Acidity, IFT value will not affect the operation of the transformer, but it will affect its ageing. The Acidity & Sludge of oil in the transformer will react with insulation as well as conducting material. Sludge will settle on windings, insulation etc. and cause loading & cooling problems. This will greatly shorten transformer life. Reclamation or replacement of oil will increase the service life of the transformer. It is suggested to repeat the test frequently to know its increasing trend.

❖ Tan Delta,Resistivity, Acidity, IFT & oil colour inferred that, the transformer oil is aged.

❖ Since BDV & water content values are not within permissible limits, oil needs filtration.

❖ After oil filtration, before charging transformer send one more sample for test.

❖ Methane, Ethylene & Ethane **along with Hydrogen**/ are the hot metal gases and these are produced due to the overheated of metal i.e core, winding etc. The temperature from 1500C decomposes the oil and these hot metal gases are produced.

❖ Methane, Ethylene & Ethane along with Hydrogen are the hot metal gases and these are produced due to the overheated of metal i.e core winding etc. The temperature from 1500C decomposes the oil and these hot metal gases are produced.

❖ The Acetylene gas content gets released whenever the internal incipient /persistence arcing taken place in the Transformer.

❖ Because of high concentration gas contents present in the oil, it is suggested to carrying out high vacuum filtration. So that the gases in oil can be removed and get the base value.

❖ After oil filtration before charging the transformer conduct one more sample test.

❖ CO & CO2 implies degradation of the paper insulation.

❖ It is suggested to conduct one more DGA test **After/Within One /Two /Three Months** to know the increasing trend in gas contents & also it is suggested to take necessary action in this regard.

❖ It is suggested to conduct one more DGA test **as early as possible /Immediately** to know the increasing trend in the gas contents.

❖ You may refer this matter to the manufacturers of the transformer for his expert comments & remedial measure to be taken.

❖ Since the Furanic compounds are in "**End of life criteria range**, it is suggested to conduct condition monitoring tests on transformer to know the healthiness of the transformer.

All the tests are to be repeated after **one year** to assess & ensure the condition of the transformer oil.

❖ The results are to be properly documented for future diagnostic reference

❖ These values are retained as benchmark for future reference

(Mangala.B.K)	(Suresh.S.P)	(Shreya Mysore)
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TRANSFORMER OIL TEST REPORT

ELECTRICAL- INSULATING MATERIALS & INSULATORS	ULR No. : NABLT0626KA184232600000001

Customer Name *	:	Test Company New, Test Company New, GJ, test, test, test, Gujarat-333333			
Contact Person *	:	Test	**Sample No.**	:	1122334455 (Bottom)
Contact No *	:	9898244359	**Plant Location ***	:	Shanthala power ltd.,Hubli
E- Mail ID *	:	test@yopmail.com	**Customer Identification ***	:	Trf-1
Location of Sample Collected *	:	Shanthala power ltd.,Hubli	**Serial Number ***	:	1700/20
Last Date of Filtration *	:	NP	**Make ***	:	Transformer & Rectifier Ltd
Date of Sampling *	:	NP	**Capacity ***	:	200 VA
Date of Receipt *	:		**Voltage (HV/LV) ***	:	114V
Sample Tested on	:	24/09/2026	**Year of Manufacture ***	:	2024
Oil Temperature *	:		**Weather Condition ***	:	
Winding Temperature *	:		**Sample Condition on Receipt**	:	Good
Report Issue Date	:	14/10/2026	**Colour of the Oil**	:	
Location of Test Performed	:	Shanthala Power Limited Electrical Testing Laboratory Hubli.			
Method of Sampling for Insulating Liquids as per IS 6855:2017					

Test Condition (LAB):	Ambient Temp in °C : 25-29	RH in % : 40-49

Sl. No.	Test Parameters	Reference Standard- IS: 1866: 2017	Transformer Oil	Test Results
		Test Method	Limits < 72.5kV	
1	Acidity (Neutralization Number) in mg KOH/g	IS 1448 (Part 2): 2018 (Automatic Potentiometric Titration Method) &IS 1866:2017 Mineral Insulating Oils in Elec Equip)	<0.15 mgKOH/g	
2	Sludge/Sediment % by weight	IS 1866 (Annexure C): 2017 (Gravimetric Filtration Method) &IS 1866:2017 Mineral Insulating Oils in Elec Equip)	No sediment or Perceptible Sludge(0.8% Max)	

**** END OF THE REPORT ****

(Mangala.B.K) **Report Prepared By**	(Suresh.S.P) **Reviewed By**	(Shreya Mysore) **Authorized Signatory**