



## ELECTROL<sup>®</sup> - Uninhibited Transformer Insulating oils

**Description:** ELECTROL<sup>®</sup> Series of Uninhibited Transformer oils are severely refined hydro-cracked / hydro-treated virgin Mineral insulating oils with highest degree of purity and stability. ELECTROL<sup>®</sup> oils are manufactured from judiciously selected blend of latest technology feed stocks.

ELECTROL<sup>®</sup> Series of Uninhibited Transformer oils are intended for use in equipment where normal oxidation resistance is required. For more severe applications, requiring operations at elevated temperatures & greater oxidation resistance, our range of ELECTROL<sup>®</sup> Inhibited & ELECTROL<sup>®</sup> Inhibited High Grade oils may be considered.

**Characteristics:** ELECTROL<sup>®</sup> oils offer special advantages over 'conventional' transformer oils, such as;

- Very low sulphur and no DBDS.
- Non corrosive as tested by all present and proposed methods, i.e. meet requirements of the standard DIN & ASTM tests and also the proposed CIGRE test.
- Higher Flash point, resulting on Low evaporation losses and better safety
- Remarkably low sludge and acidity formation, in both ageing and oxidation tests, results in longer life of oil and equipment
- Low viscosity oils offering excellent and fast heat transfer

**Applications :** ELECTROL<sup>®</sup> oils are highly suitable for all grades of

- Power Transformers, Distribution Transformers,
- Circuit Breakers,
- Oil filled switches
- X-ray equipment.

**Quality/Approvals:** ELECTROL<sup>®</sup> Uninhibited oil series conform to and exceed the requirements of IS 335:2005, IEC 60296:2003, (superseding IEC 296:1982 Class I & Class II ), BS 148:1998 Class I & Class II & JIS C2320 Class I.

**Packaging Options:** ELECTROL<sup>®</sup> oils are offered in 200-210 ltr. Steel Drums & in bulk in Flexi bags or ISO tanks. Within India, ELECTROL<sup>®</sup> oils are delivered through a company owned dedicated purpose built Road Tankers.

**Storage Precautions:** Extreme care is taken while packing these products, including filling of drums in inert atmosphere, as Electrical Insulating oils / Transformer oils are very sensitive to very minute concentrations of contaminants, such as moisture, particulate matter, fibres, etc. Hence, care should be taken to store ELECTROL<sup>®</sup> oils in a clean and dry condition. It is strongly recommended that all storage tanks / drums be maintained such that oil is not in contact with atmospheric air. Also Oils should always be stored indoors in climate controlled environments

**Health & Safety:** See corresponding product MSDS

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**ELECTROL<sup>®</sup> - Uninhibited Transformer Insulating oils**

Test Description	Test Method	Specification Limits				
		ELECTROL <sup>®</sup>	ELECTROL <sup>®</sup> A	ELECTROL <sup>®</sup> U	ELECTROL <sup>®</sup> B	
<b>Function</b>						
Kinematic Viscosity	at 40 <sup>o</sup> C mm <sup>2</sup> /s, Max	BS EN ISO 3104	-	16.5 <sup>1</sup>	12.0	11
	at 27 <sup>o</sup> C mm <sup>2</sup> /s, Max	IS 1448 (part-25)	27	-	-	-
	at -15 <sup>o</sup> C mm <sup>2</sup> /s, Max	BS EN ISO 3104	-	800	-	-
	at -30 <sup>o</sup> C mm <sup>2</sup> /s, Max		-	-	1800	1800
Pour Point <sup>o</sup> C, Max	BS EN ISO 3016	≤ - 6	≤ -30	≤ -40	≤ -45	
Water Content, in Bulk, mg/kg, Max	IEC 60814	50	20	20	20	
		in Drum & IBC mg/kg, Max	50	30	30	30
Break Down Voltage, kV, Min	IEC & BS 60156	As Delivered	30	30	30	30
		After treatment	60	50	70	70
Density	at 20 <sup>o</sup> C, g/ml, Max	BS EN ISO 3675	-	0.895	0.895	0.895
	at 29.5 <sup>o</sup> C, g/ml, Max	IS 1448	0.890	-	-	-
DDF at 90 <sup>o</sup> C, Max	IEC 60247	0.002	0.005	0.005	0.005	
<b>Refining/stability</b>						
Appearance	Visual	Transparent Clear, odourless liquid free from suspended impurities				
Neutralisation Value / Acidity, mg KOH/g, Max	IEC 62021-1 BS 148 -1998	0.03	0.02	0.01	0.01	
Interfacial tension, mN/m, Min	ISO 6295	40	40	40	40	
Total Sulphur Content, % , Max	BS 2000 Part 373 ISO 14596	No general requirement.		0.15%	0.15%	
Corrosive Sulphur silver strip, 100 <sup>o</sup> C, 18hrs	DIN 51353	Non Corrosive				
	Cu Strip, 140 <sup>o</sup> C, 19 hrs	BS 5680 /IS 335 Annex B	Non Corrosive			
	Cu Strip, 150 <sup>o</sup> C, 48 hrs	ASTM D1275-B	Non Corrosive			
	(CIGRE Proposed)150 <sup>o</sup> C, 72 hrs	TF A2-32.01( method 2)	Non corrosive			
Antioxidant Additives, %, Max	IEC 60666/ BS 5984	0.05% <sup>4</sup>	Not detectable	Not detectable	Not detectable	
2-Furfural content, mg/kg, Max	IEC & BS 61198	-	0.10	0.10	0.10	
<b>Performance</b>						
Oxidation Stability <sup>2</sup> , 164 hrs	IEC & BS 61125 METHOD- A & C	- Total acidity, mg KOH/g, Max	0.4	0.4	0.4 <sup>3</sup>	0.4
		- Sludge, %, Max	0.1	0.1	0.1 <sup>3</sup>	0.1
		DDF at 90 <sup>o</sup> C, Max	IEC 60247	-	-	0.5
Gassing tendency at 50 Hz after 120 Min. mm <sup>3</sup> /min, Method A (Max)	BS 5797 / IEC 60628.A	No general requirement	+5	+5	+5	
<b>Health, safety and environment (HSE)</b>						
Flash Point, PMCC, <sup>o</sup> C, Min	BS EN ISO 2719	140	140	135	130	
Polycyclic Aromatics (PCA) content, % Max	BS 2000 (P: 346)	3.00				
Polychlorinated biphenyls (PCB) content	IEC & BS 61619	Not Detectable				
<b>Conforms to Standards</b>						
	IS 335: 05 <sup>5</sup>	✓	✓	✓	✓	
	IEC 296:82:Class I & BS 148:98: Class I	x	✓	✓	✓	
	IEC 296:82Class II & BS 148:98 Class II	x	x	x	✓	
	IEC 60296:03 Table 2 : U	x	x	✓	✓	
	IS 2320 Class I	x	✓	✓	✓	
<p>Note: 1. For IS C2320 Kin. Viscosity limits will be maintained at 13 mm<sup>2</sup>/s, Max</p> <p>2. The Oxidation stability test is performed at 100 C &amp; 120<sup>o</sup> C, or 110<sup>o</sup> C with O<sub>2</sub> or Air, as per the prescribed procedure under IEC / BS or ASTM or IS.</p> <p>3. While IEC 60296:03 permits limit of Total Acidity at 1.2 mg KOH/g Max and Sludge at 0.8% Max, <b>ELECTROL<sup>®</sup> U</b> conforms to more stringent limits.</p> <p>4. As per IS 335, transformer oils with Antioxidant content upto 0.05% are considered as uninhibited oils</p> <p>5. <b>ELECTROL</b> will meet and surpass other tests as per IS 335, including Specific Resistance &amp; Ageing Characteristics</p> <p>The above data is indicative of recent average Values only. Minor variations, which do not affect product performance or quality, may be expected in manufacture. <b>Specific requirements (e.g. Custom viscosities, specific regional/tender requirements, etc) will be custom-made on request</b></p>						

**Health & Safety:** See corresponding product MSDS

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