

# Samic Elect Oil Series Un-inhibited Oils

High Quality Transformer Oil

## Product Data Sheet



### Product Description

Samic Elect Oil Series of Un-inhibited Transformer oils are severely refined hydro-cracked / hydro-treated virgin un-inhibited Mineral insulating oils with highest degree of purity and stability. It is manufactured from judiciously selected blend of latest technology feed stocks, which is highly suitable for all grades of Power & distribution Transformers, Circuit Breakers, Oil filled switches and X-ray equipment.

### Performance & Customer Benefits

- Very low sulphur and no DBDS.
- Low Pour point.
- High dielectric strength.
- Non corrosive as tested by all present methods, DIN & ASTM tests & New IEC 62535 method.
- Low viscosity oils offering excellent and fast heat transfer.
- 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
- Compatible with transformer construction material.

### Main Application

Samic Elect Oil Series Un-inhibited Transformer oils are highly suitable for all grades of

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

### Specifications & Recommendations

Samic Elect Oil Series Un-inhibited Transformer oils conforms 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.

### Typical Physical Characteristics

Test Description (Specification Limit)	Test Method	ELECT OIL	ELECT OIL A	ELECT OIL U	ELECT OIL B
<b>Function</b>					
Kinematic Viscosity at 40°C mm <sup>2</sup> /s, Max	BS EN ISO 3104	-	16.5 <sup>1</sup>	12.0	11
at 27°C mm <sup>2</sup> /s, Max	IS 1448 (part-25)	27	-	-	-
at -15°C mm <sup>2</sup> /s, Max	BS EN ISO 3104	-	800	-	-
at -30°C mm <sup>2</sup> /s, Max		-	-	1800	1800
Pour Point °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	30	30	30	30
As Delivered		60	50	70	70
After treatment					
Density at 20°C, g/ml, Max	BS EN ISO 3675	-	0.895	0.895	0.895
at 29.5°C, g/ml, Max	IS 1448	0.890	-	-	-
DDF at 90°C, Max	IEC 60247	0.002	0.005	0.005	0.005

The above figures are typical of blends with normal production tolerance and do not constitute a specification.

Test Description (Specification Limit)	Test Method	ELECT OIL	ELECT OIL A	ELECT OIL U	ELECT OIL B
Refining/stability					
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 °C, 18hrs	DIN 51353	Non Corrosive			
Cu Strip, 140 °C, 19 hrs	BS 5680 /IS 335 Annex B	Non Corrosive			
Cu Strip, 150 °C, 48 hrs	ASTMD1275-B	Non Corrosive			
Cu Strip & Paper 150 °C, 72 hrs	IEC 62535 :08	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
Performance					
Oxidation Stability <sup>1</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°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
Health, safety and environment (HSE)					
Flash Point, PMCC, °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			
Conforms to Standards					
IS 335: 05 <sup>3</sup>		✓	✓	✓	✓
IEC 296:82:Class I & BS 148:98: Class I		x	✓	✓	✓
IEC 296:82:Class II & BS 148:98 Class II		x	x	x	✓
IEC 60296:03 Table 2 : U		x	x	✓	✓
JS 2320 Class I		x	✓	✓	✓

The above figures are typical of blends with normal production tolerance and do not constitute a specification

**Note:**

- For JS C2320 Kin. Viscosity limits will be maintained at 13mm<sup>2</sup>/sec max.
- The Oxidation stability test is performed at 100°C & 120°C, or 110°C with O<sub>2</sub> or Air as per prescribed procedure under IEC/BS or ASTM or IS.
- While IEC 60296:03 permits limit of Total Acidity at 1.2 mg KOH/g Max and Sludge at 0.8%Max. Elect Oil U conforms to more stringent limits.
- As per IS 335, transformer oils with Antioxidant content up to 0.05% are considered as uninhibited oils.
- ELECT OIL will meet and surpass other tests as per IS 335, including Specific Resistance & Ageing Characteristics.
- SAMIC ELECTOIL Series UN-INHIBITED** oils are intended for use in equipment where normal oxidation resistance is required.

**Packaging Options:**

Samic Elect Oil Series Un-inhibited Transformer oils are offered in 200-210 litres of steel drums and also in bulk in Flexi bags or ISO tanks.

**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, fibers, etc. Hence, care should be taken to store Samic Elect Oil Series Un-inhibited Transformer 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 these oils should always be stored indoors in climate controlled environments.