

## HyVolt III

### Electrical Insulating Oil Marketing Specification

This Type A, TVAL inhibited electrical insulating oil is produced from a severely hydrotreated naphthenic oil meeting the general specifications of Table 3 as defined in IEC 60296, ed. 5, 2020.

TEST DESCRIPTION	TEST METHOD	SPECIFICATIONS		TYPICAL VALUES
		MIN	MAX	
<b>Function</b>				
Viscosity, mm <sup>2</sup> /s at 40°C	ISO 3104		12.0	9.5
Viscosity, mm <sup>2</sup> /s at -30°C	ISO 3104		1800	1021
Pour Point, °C	ASTM D5950		-40	-65
Water Content, mg/kg	IEC 60814		30	5
Breakdown Voltage, kV, Before Treatment, 2.5 mm	IEC 60156	30		45
Breakdown Voltage, kV, After Treatment, 2.5 mm	IEC 60156	70		72
Density at 20°C, kg/m <sup>3</sup>	ISO 12185		895	877
DDF at 90°C	IEC 60247		0.005	0.001
<b>Refining/Stability</b>				
Color	ISO 2049		L0.5	L0.5
Appearance	IEC 60296	PASS		PASS
Acidity, mg KOH/g	IEC 62021-1		0.01	<0.01
Interfacial Tension, mN/m	ASTM D971	43		49
Corrosive Sulfur	DIN 51353	Noncorrosive		Noncorrosive
Corrosive Sulfur	ASTM D1275	Noncorrosive		Noncorrosive
Potentially Corrosive Sulfur	IEC 62535	Noncorrosive		Noncorrosive
DBDS, mg/kg	IEC 62697-1	Not detected (<5)		Not detected
Inhibitors, %	IEC 60666	0.08	0.40	0.37
Metal Passivator Additives, mg/kg	IEC 60666	Not detected (<5)		Not detected
Other Additives	IEC 60296	See <sup>a</sup>		Not detected
Sulfur, wt%	ISO 14596		0.05	0.001
Furfural Content, mg/kg	IEC 61198	Not detected (<0.05)		Not detected
Stray Gassing	IEC 60296 Clause A.4 <sup>b</sup>			
Hydrogen, µl/l		Non-stray gassing (<50)		<5
Methane, µl/l		Non-stray gassing (<50)		<1
Ethane, µl/l		Non-stray gassing (<50)		<1
<b>Performance</b>				
Oxidation Stability at 120°C, 500 hours	IEC 61125			
Total Acidity, mg KOH/g			0.30	0.01
Sludge, %			0.05	0.01
DDF at 90°C			0.050	0.013
<b>Health, Safety and Environment</b>				
Flash Point, PMCC, °C	ISO 2719	135		142
PCA Content, %	IP 346		3	<3
PCB Content, mg/kg	IEC 61619	Not detected (<2)		Not detected

HyVolt III is a product of Ergon Refining, Inc.

<sup>a</sup> As per IEC 60296, ed. 5, 2020, this product contains no undeclared additives.

<sup>b</sup> Oil saturated with air in the presence of copper.

May 19, 2020