

Eaton Cooper Power Series Voltage Regulator Mineral Oil Characteristics

Eaton Cooper Power series voltage regulators filled with mineral oil will contain a dielectric fluid which is new, clear, and bright. Inhibitors are added to the dielectric fluid to slow the sludging process that occurs as the voltage regulator ages. Below are typical characteristics of mineral oil as it is received from the vendor, as well as the characteristics of new mineral oil as it is received in new equipment. The values are based upon the ANSI Standard C57.106.2008, Tables 1 and 2.

Table 1. Electrical Characteristics

Characteristic	Value (from vendor)	Value (in new equipment)	Units of Measure	ASTM Reference
Dielectric Strength	30	30	kV (min)	D877
Dissipation Factor @ 25°C @ 100°C	0.05% (max) 0.30% (max)	0.15% (max) 1.5% (max)		D924 D924
Gassing Tendency	+30 (max)		µL/min	D2300

Table 2. Physical and Chemical Characteristics

Characteristic	Value (from vendor)	Value (in new equipment)	Units of Measure	ASTM Reference
Aniline Point	63-83		°C	D611
Anti-Oxidant Content (inhibitor)	0.3%			D2668
Color	0.5 (max)	1.0		D1500
Moisture Content	35 (max)	25 (max)	ppm	D1533
Specific Gravity	0.91 (max)		15/15°C	D1298
Interfacial Tension	40 @ 25°C	35 @ 25°C	dynes/cm	D971
Neutralization Number	0.03 (max)	0.015	mg KOH/g of oil	D974
Kinematic Viscosity @ 40°C @ 100°C	≤ 12 ≤ 3		mm ² /sec (cSt) mm ² /sec (cSt)	D445 D445
Flash Point	145°C (min)		°C	D92
Pour Point	-40°C (min)		°C	D97

Table 3. Other Characteristics (Not Required by Standard)

Characteristic	Value (from vendor)	Value (in new equipment)	Units of Measure	ASTM Reference
Thermal Conductivity	0.0003		cal/cm/sec/°C	D2717
Specific Heat	0.44 @ 20°C		gm-cal/gm	D2766
Coefficient of Expansion	0.0007		mL/°C/mL	D1903



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