

# SHELL DIALA<sup>®</sup> OIL AX

Electrical insulating oil

# **Product Description**

**Shell DIALA®** Oil AX meets standard specifications required by both ANSI/ASTM D 3487 and NEMA TR-P8-1975 for domestic electrical oil applications. These two specifications of electrical oils, Type I and Type II, are covered in these specifications. Type I oil is intended for use where normal oxidation resistance is required. Shell DIALA® Oil AX is a Type II oil and is for more severe service applications requiring greater oxidation resistance Shell DIALA® Oil AX has high electrical resistance and is thermally and oxidatively stable.

## Applications

• intended for use in transformers, circuit breakers, oil-filled switches and in X-ray equipment

Features and Benefits

- proven product reliability
- excellent physical, chemical, and electrical properties

### Approvals and Recommendations

- ANSI/ASTM D 3487
- NEMA TR-P8-1975
- U.S. Government Military Specification VV-I-530A and Amendment 2 for Class I and Class II fluids (Type I and Type II, respectively); supersedes the Department of the Navy specification OS-1023
- NATO symbol S-756, British Standard BS 148:1972

Table 1/ Physical Properties of Shell DIALA® Oil AX					
	Test	ANSI/ASTM/NEMA	DIALA AX Oil		
	Method	Limits - Type I and II	Typical Values		
Code Number			68690		
Aniline Point, °C	D 611	63-84	74		
Color	D 1500	0.5 max	<0.5		
Flash Point, °C	D 92	145 min	156		
Interfacial Tension, dynes/cm @ 25°C	D 971	40 min	47		
Pour Point, °C	D 97	-40 min	-47		
Specific Gravity, 15/15°C	D 1298	0.91 max	0.885		
Viscosity:	D 445/ D				
	88				
$@ 0^{\circ}C, cSt/SUS$		76.0/350 max	62.3/288		
@ 40°C, cSt/SUS		12.0/66 max	9.1/55.8		
@ 100°C, cSt/SUS		3.0/36 max	2.31/33.9		
Visual Examination	D 1524	Clear & Bright	Clear & Bright		

Table 2/ Electrical Properties of Shell DIALA® Oil AX					
	Test ANSI/ASTM/NEMA		DIALA AX Oil		
	Method	Limits - Type I and II	Typical Values		
Dielectrical Breakdown Voltage					
@ 60 Hz, Disc electrodes, kV	D 877	30 min	> 35		
@ 60 Hz, VDE electrodes, kV	D 1816 <sup>(1)</sup>				
0.040 - inch (1.02 mm) gap		28 min	> 28		
0.080 - inch (2.03 mm) gap		56 min	> 56		
Dielectric Breakdown Voltage Impulse					
@ 25°C, needle-to-sphere grounded	D 3300				
1-inch (25.4 mm) gap, kV		145 min	> 180		
Power Factor, 60 Hz:	D 924				
@ 25°C, %		0.05 max	0.003		
@ 100°C, %		0.30 max	0.06		
Gassing Tendency, µL/min	D 2300	+30 max	+12		
(1)					

<sup>(1)</sup>- New, filtered, dehydrated and degassed oil.

Table 3/ Chemical Properties of Shell DIALA® Oil AX					
	Test	Requirement	Typical Values		
	Method	Type II	DIALA AX		
Oxidation Inhibitor Content, %w	D 2668				
	or				
2,6-ditertiary butyl paracresol	D 1473	0.3 max	0.23		
Corrosive Sulfur	D 1275	Non-corrosive	Non-corrosive		
Water, ppm	D 1533	35 max	<30		
Neutralization No, mg KOH/g	D 974	0.03 max	< 0.01		
Oxidation Stability @ 72 hrs.	D 2440				
Sludge, %w		0.1 max	0.01		
TAN-C, mg KOH/g		0.3 max	0.01		
Oxidation Stability @ 164 hrs.	D 2440				
Sludge, wt%		0.2	0.01		
TAN-C, mg KOH/g		0.4	0.03		
Oxidation Stability					
Rotating Bomb, min.	D 2112	195 min	220		
PCB Content, ppm	D 4059	ND	ND		

N/A- Not Applicable

ND - Not Detectable, which is reported as <2 ppm.

#### **Storage Precautions**

The critical electrical properties of Shell DIALA® Oil AX compromised are easily by minute concentrations of contaminants. Typically encountered contaminants include moisture, particulates, fibers and surfactants. Therefore, it is imperative that electrical insulating oils be kept clean and dry. It is strongly recommended that storage containers be dedicated for electrical oil service and include air-tight seals. It is further recommended that electrical insulating oils be stored indoors in climate controlled environments.

#### Handling & Safety Information

For information on the safe handling and use of this product, refer to its Material Safety Data Sheet at http://www.shell-lubricants.com/msds/. If you are a Shell Distributor, please call 1+800-468-6457 for all of your service needs. All other customers, please call 1+800-840-5737 for all of your service needs. Information is also available on the World Wide Web: http://www.shell-lubricants.com/.