



SHELL DIALA[®] OILS A & AX

Electrical insulating oil

Product Description

Shell DIALA[®] Oils A & AX meet standard specifications required by both ANSI/ASTM D 3487 and NEMA TR-P8-1975 for domestic electrical oil applications. These products have high electrical resistance and are thermally and oxidatively stable.

Two oils, designated Type I and Type II, are covered in these specifications. Type I oil is intended for use where normal oxidation resistance is required. Type II oil is for more severe service applications requiring greater oxidation resistance.

Applications

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

Features and Benefits

- proven product reliability
- manufactured under stringent quality control procedures
- excellent physical, chemical, and electrical properties
- two domestic refinery sources (Texas and California)

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 A/AX Oils

| | Test Method | ANSI/ASTM/NEMA Limits - Type I and II | DIALA A/AX Oils Typical Values |
|--------------------------------------|-------------|---------------------------------------|--------------------------------|
| 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°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 A/AX Oils

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

(1)- New, filtered, dehydrated and degassed oil.

Table 3/ Chemical Properties of Shell DIALA A/AX Oils

| | Test Method | Requirement | | Typical Values | |
|--|------------------------|---------------|----------|----------------|----------|
| | | Type I | Type II | DIALA A | DIALA AX |
| Oxidation Inhibitor Content, %w 2,6-ditertiary butyl paracresol | D 2668 or D 1473 | 0.08 max | 0.3 max | None | 0.23 |
| Corrosive Sulfur | D 1275 | Non-Corrosive | | Non-Corrosive | |
| Water, ppm | D 1533 | 35 max | 35 max | <30 | <30 |
| Neutralization No, mg KOH/g | D 974 | 0.03 max | 0.03 max | <0.01 | <0.01 |
| Oxidation Stability @ 72 hrs. Sludge, %w TAN-C, mg KOH/g | D 2440 | 0.15 max | 0.1 max | 0.08 | 0.01 |
| | | 0.5 max | 0.3 max | 0.33 | 0.01 |
| Oxidation Stability @ 164 hrs. Sludge, wt% TAN-C, mg KOH/g | D 2440 | 0.3 | 0.2 | 0.10 | 0.01 |
| | | 0.6 | 0.4 | 0.30 | 0.03 |
| Oxidation Stability Rotating Bomb, min. | D 2112 | N/A | 195 min | N/A | 220 |
| PCB Content, ppm | D 4059 | ND | ND | ND | ND |

N/A- Not Applicable

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

Storage Precautions

The critical electrical properties of **Diala Oils** are easily compromised 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.equivashellmsds.com>. For more information and availability, call **1+800-782-7852** or visit the World Wide Web: <http://www.shell-lubricants.com/>.