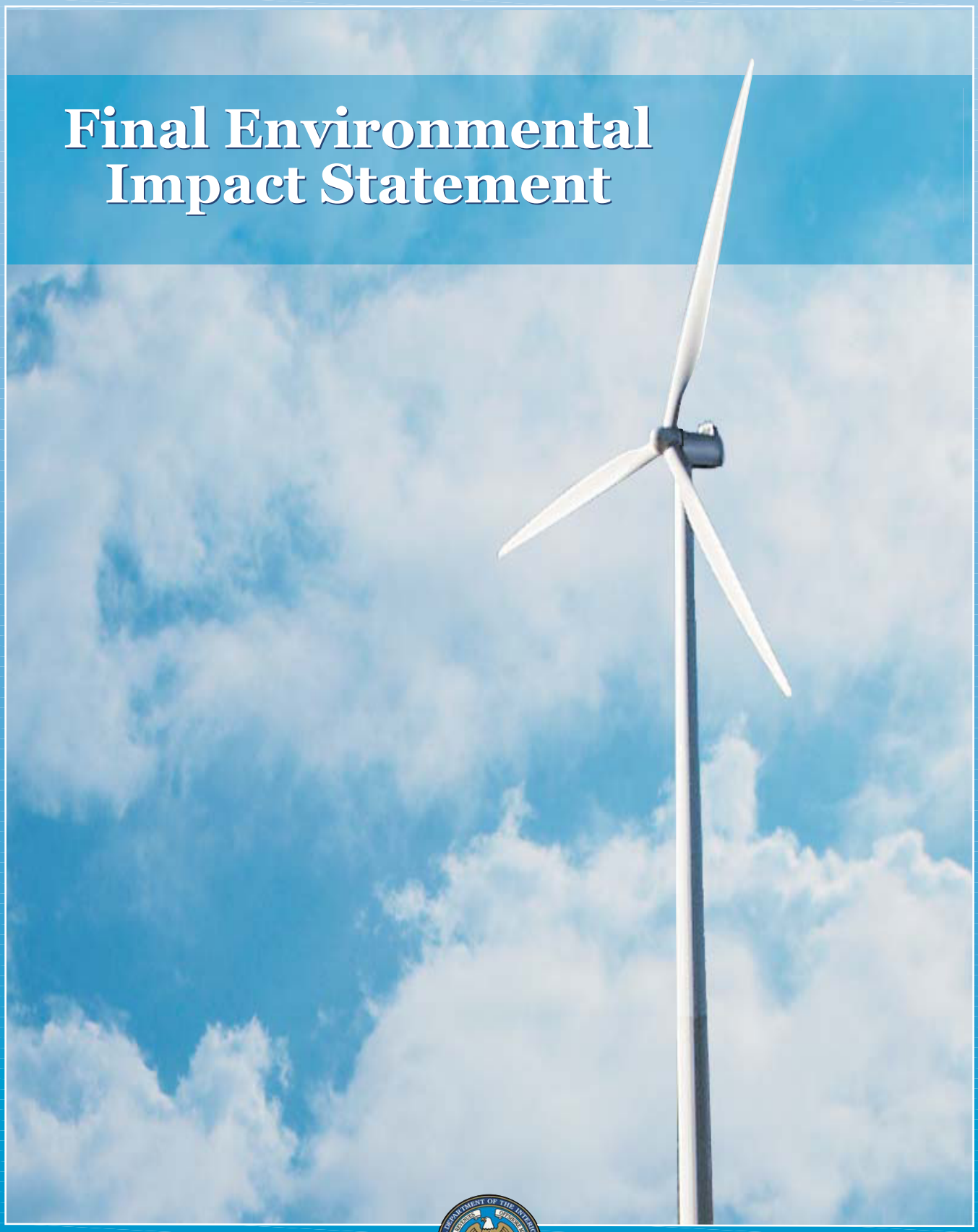
MMS EIS-EA
OCS Publication No. 2008-040

# CAPE WIND ENERGY PROJECT

## Final Environmental Impact Statement



January 2009
Volume 3 of 3

U.S. Department of the Interior
Minerals Management Service

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## Final Environmental Impact Statement

***MMS*** U.S. Department of the Interior
Minerals Management Service

**January 2009**
**Volume 3 of 3**

## VOLUME 2



## VOLUME 3

# Appendix E

# Material Safety Data Sheets

# Transformer Oil

# SHELL DIALA® 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 Method | ANSI/ASTM/NEMA Limits - Type I and II | DIALA AX Oil 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:<br><br>@ 0°C, cSt/SUS<br>@ 40°C, cSt/SUS<br>@ 100°C, cSt/SUS | D 445/ D 88 | <br><br>76.0/350 max<br>12.0/66 max<br>3.0/36 max | <br><br>62.3/288<br>9.1/55.8<br>2.31/33.9 |
| Visual Examination | D 1524 | Clear & Bright | Clear & Bright |

**April, 2005**

**Table 2/ Electrical Properties of Shell DIALA® Oil AX**

| | Test Method | ANSI/ASTM/NEMA Limits - Type I and II | DIALA AX Oil Typical Values |
|---|---|---|---|
| Dielectrical Breakdown Voltage | | | |
| @ 60 Hz, Disc electrodes, kV | D 877 | 30 min | > 35 |
| @ 60 Hz, VDE electrodes, kV | D 1816 (1) | | |
| 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)- New, filtered, dehydrated and degassed oil.

**Table 3/ Chemical Properties of Shell DIALA® Oil AX**

| | Test Method | Requirement Type II | Typical Values DIALA AX |
|---|---|---|---|
| Oxidation Inhibitor Content, %w | | | |
| 2,6-ditertiary butyl paracresol | D 2668 or 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 **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.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/.**

**April, 2005**

# MATERIAL SAFETY DATA SHEET

**Review Date:** 05/23/2003

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT: DIALA® Oil AX**

**MSDS NUMBER:** 60030E - 14
**PRODUCT CODE(S):** 68690, 68702, 69702

**MANUFACTURER**
SOPUS Products
P.O. Box 4427
Houston, TX. 77210-4427

**TELEPHONE NUMBERS**
**Spill Information:** (877) 242-7400
**Health Information:** (877) 504-9351
**MSDS Assistance Number:** (877) 276-7285

## SECTION 2 PRODUCT/INGREDIENTS

| INGREDIENTS | CAS# | CONCENTRATION |
|---|---|---|
| Dielectric Oil | | |
| Highly refined petroleum oils | Mixture | 100 %volume |

## SECTION 3 HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW**
**Health Hazards:** May be harmful or fatal if swallowed. Do not induce vomiting. May cause aspiration pneumonitis.
**Physical Hazards:** No known physical hazards.
**NFPA Rating (Health, Fire, Reactivity):** 0, 1, 0
Hazard Rating: Least - 0 Slight - 1 Moderate - 2 High - 3 Extreme - 4

**Inhalation:**
Inhalation of vapors (generated at high temperatures only) or oil mist may cause mild irritation of the nose, throat, and respiratory tract.

**Eye Irritation:**
Lubricating oils are generally considered no more than minimally irritating to the eyes.

**Skin Contact:**
Lubricating oils are generally considered no more than minimally irritating to the skin. Prolonged and repeated contact may result in defatting and drying of the skin that may cause various skin disorders such as dermatitis, folliculitis or oil acne.

**Ingestion:**
This material may be harmful or fatal if swallowed. Ingestion may result in vomiting; aspiration (breathing) of vomitus into lungs must be avoided as even small quantities may result in aspiration pneumonitis.

**Signs and Symptoms:**
Irritation as noted above. Aspiration pneumonitis may be evidenced by coughing, labored breathing and cyanosis (bluish skin); in severe cases death may occur.

**Aggravated Medical Conditions:**
Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.

**For additional health information, refer to section 11.**

## SECTION 4 FIRST AID MEASURES

**Inhalation:**
Remove victim to fresh air and provide oxygen if breathing is difficult. Get medical attention.

**Skin:**
Remove contaminated clothing and shoes and wipe excess from skin. Flush skin with water, then wash with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned.

**Eye:**
Flush with water. If irritation occurs, get medical attention.

**Ingestion:**
Do NOT induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into lungs. Get medical attention.

## SECTION 5 FIRE FIGHTING MEASURES

**Flash Point [Method]:** >300 ºF/>148.89 ºC [ Cleveland Open Cup]

**Extinguishing Media:**
This material is non-flammable. Material will float and can be re-ignited on surface of water. Use water fog, 'alcohol foam', dry chemical or carbon dioxide (CO2) to extinguish flames. Do not use a direct stream of water.

**Fire Fighting Instructions:**
Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots), including a positive pressure, NIOSH approved, self-contained breathing apparatus. This material is non-flammable.

**Unusual Fire Hazards:**
Material may ignite when preheated.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

**Protective Measures:**
May burn although not readily ignitable.

Wear appropriate personal protective equipment when cleaning up spills. Refer to Section 8.

**Spill Management:**

FOR LARGE SPILLS: Remove with vacuum truck or pump to storage/salvage vessels.

FOR SMALL SPILLS: Soak up residue with an absorbent such as clay, sand or other suitable material. Place in non-leaking container and seal tightly for proper disposal.

**Reporting:**
CERCLA: Product is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) petroleum exclusion. Releases to air, land, or water are not reportable under CERCLA (Superfund).

CWA: This product is an oil as defined under Section 311 of EPA's Clean Water Act (CWA). Spills into or leading to surface waters that cause a sheen must be reported to the National Response Center, 1-800-424-8802.

## SECTION 7 HANDLING AND STORAGE

**Precautionary Measures:**
Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet. Launder contaminated clothing before reuse. Properly dispose of contaminated leather articles such as shoes or belts that cannot be decontaminated. Avoid heat, open flames, including pilot lights, and strong oxidizing agents. Use explosion-proof ventilation to prevent vapor accumulation. Ground all handling equipment to prevent sparking.

**Storage:**
Do not store in open or unlabeled containers. Store in a cool, dry place with adequate ventilation. Keep away from open flames and high temperatures.

**Container Warnings:**
Keep containers closed when not in use. Containers, even those that have been emptied, can contain explosive vapors. Do not cut, drill, grind, weld or perform similar operations on or near containers.

## SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

| Chemical | Limit | TWA | STEL | Ceiling | Notation |
|---|---|---|---|---|---|
| Oil mist, mineral | ACGIH TLV | 5 mg/m3 | 10 mg/m3 | | |
| Oil mist, mineral | OSHA PEL | 5 mg/m3 | | | |

### Exposure Controls

Provide adequate ventilation to control airborne concentrations below the exposure guidelines/limits.

### Personal Protection

Personal protective equipment (PPE) selections vary based on potential exposure conditions such as handling practices, concentration and ventilation. Information on the selection of eye, skin and respiratory protection for use with this material is provided below.

**Eye Protection:**
Chemical Goggles, or Safety glasses with side shields

**Skin Protection:**
Use protective clothing which is chemically resistant to this material. Selection of protective clothing depends on potential exposure conditions and may include gloves, boots, suits and other items. The selection(s) should take into account such factors as job task, type of exposure and durability requirements.

Published literature, test data and/or glove and clothing manufacturers indicate the best protection is provided by:
Neoprene, or Nitrile Rubber

**Respiratory Protection:**
If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, an approved respirator must be worn. Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134.

Types of respirator(s) to be considered in the selection process include:
For Mist: Air Purifying, R or P style NIOSH approved respirator.
For Vapors: Air Purifying, R or P style prefilter & organic cartridge, NIOSH approved respirator. Self-contained breathing apparatus for use in environments with unknown concentrations or emergency situations.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

**Substance Chemical Family:** Petroleum Hydrocarbon

| | | | |
|---|---|---|---|
| **Boiling Point** | > 400 ºF | **Dielectric Strength** | 20 KV - 40 KV |
| **Flash Point** | > 300 ºF [Cleveland Open Cup] | **Pour Point** | < -40 ºF |
| **Specific Gravity** | 0.88 - 0.89 | **Viscosity** | < 20 cSt @ 40 ºC |

## SECTION 10 REACTIVITY AND STABILITY

**Stability:**
Material is stable under normal conditions.

**Conditions to Avoid:**
Avoid heat and open flames.

**Materials to Avoid:**
Avoid contact with strong oxidizing agents.

**Hazardous Decomposition Products:**

Thermal decomposition products are highly dependent on combustion conditions. A complex mixture of airborne solids, liquids and gases will evolve when this material undergoes pyrolysis or combustion. Carbon Monoxide, Carbon Dioxideand other unidentified organic compounds may be formed upon combustion.

## SECTION 11 TOXICOLOGICAL INFORMATION

**Acute Toxicity**

| TEST | Result | OSHA Classification | Material Tested |
|---|---|---|---|
| Dermal LD50 | >2 g/kg(Rabbit) | Non-Toxic | Based on components(s) |
| Oral LD50 | >5 g/kg(Rat) | Non-Toxic | Based on components(s) |

**Carcinogenicity Classification**

| Chemical Name | NTP | IARC | ACGIH | OSHA |
|---|---|---|---|---|
| Dielectric Oil | No | Not Reviewed by IARC | No | No |

## SECTION 12 ECOLOGICAL INFORMATION

**Environmental Impact Summary:**
There is no ecological data available for this product. However, this product is an oil. It is persistent and does not readily biodegrade. However, it does not bioaccumulate.

## SECTION 13 DISPOSAL CONSIDERATIONS

**RCRA Information:**

Under RCRA, it is the responsibility of the user of the material to determine, at the time of the disposal, whether the material meets RCRA criteria for hazardous waste. This is because material uses, transformations, mixtures, processes, etc. may affect the classification. Refer to the latest EPA, state and local regulations regarding proper disposal.

## SECTION 14 TRANSPORT INFORMATION

**US Department of Transportation Classification**
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

**Oil:** This product is an oil under 49CFR (DOT) Part 130. If shipped by rail or highway in a tank with a capacity of 3500 gallons or more, it is subject to these requirements. Mixtures or solutions containing 10% or more of this product may also be subject to this rule.

**International Air Transport Association**
Not regulated under IATA rules.

**International Maritime Organization Classification**
Not regulated under International Maritime Organization rules.

## SECTION 15 REGULATORY INFORMATION

**Federal Regulatory Status**

**OSHA Classification:**
Product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200, because it carries the occupational exposure limit for mineral oil mist.

**Ozone Depleting Substances (40 CFR 82 Clean Air Act):**
This material does not contain nor was it directly manufactured with any Class I or Class II ozone depleting substances.

**Superfund Amendment & Reauthorization Act (SARA) Title III:**

There are no components in this product on the SARA 302 list.

**SARA Hazard Categories (311/312):**

| Immediate Health | Delayed Health | Fire | Pressure | Reactivity |
|---|---|---|---|---|
| NO | NO | NO | NO | NO |

**SARA Toxic Release Inventory (TRI) (313):**
There are no components in this product on the SARA 313 list.

**Toxic Substances Control Act (TSCA) Status:**
All component(s) of this material is(are) listed on the EPA/TSCA Inventory of Chemical Substances.

**Other Chemical Inventories:**
Component(s) of this material is (are) listed on the Australian AICS, Canadian DSL, Chinese Inventory, European EINECS, Korean Inventory, Philippines PICCS,

**State Regulation**

This material is not regulated by California Prop 65, New Jersey Right-to-Know Chemical List or Pennsylvania Right-To-Know Chemical List. However for details on your regulation requirements you should contact the appropriate agency in your state.

## SECTION 16 OTHER INFORMATION

**Revision#:** 14
**Review Date:** 05/23/2003
**Revision Date:** 05/23/2003
**Revisions since last change (discussion):** This Material Safety Data Sheet (MSDS) has been newly reviewed to fully comply with the guidance contained in the ANSI MSDS standard (ANSI Z400.1-1998). We encourage you to take the opportunity to read the MSDS and review the information contained therein.

## SECTION 17 LABEL INFORMATION

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT. THIS LABEL COMPLIES WITH THE REQUIREMENTS OF THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) FOR USE IN THE WORKPLACE. THIS LABEL IS NOT INTENDED TO BE USED WITH PACKAGING INTENDED FOR SALE TO CONSUMERS AND MAY NOT CONFORM WITH THE REQUIREMENTS OF THE CONSUMER PRODUCT SAFETY ACT OR OTHER RELATED REGULATORY REQUIREMENTS.

**PRODUCT CODE(S):** 68690, 68702, 69702

**DIALA® Oil AX**

**CAUTION!**

**ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE. PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE OIL ACNE OR DERMATITIS.**

**Precautionary Measures:**
Avoid prolonged or repeated contact with eyes, skin and clothing. Do not take internally. Wash thoroughly after handling.

## FIRST AID

**Inhalation:** Remove victim to fresh air and provide oxygen if breathing is difficult. Get medical attention.
**Skin Contact:** Remove contaminated clothing and shoes and wipe excess from skin. Flush skin with water, then wash with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned.
**Eye Contact:** Flush with water. If irritation occurs, get medical attention.
**Ingestion:** Do NOT induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into lungs. Get medical attention.

## FIRE

**In case of fire,** Use water fog, 'alcohol foam', dry chemical or carbon dioxide (CO2) to extinguish flames. Do not use a direct stream of water. Material will float and can be re-ignited on surface of water.

## SPILL OR LEAK

Dike and contain spill.
FOR LARGE SPILLS: Remove with vacuum truck or pump to storage/salvage vessels.

FOR SMALL SPILLS: Soak up residue with an absorbent such as clay, sand or other suitable material. Place in non-leaking container and seal tightly for proper disposal.

CONTAINS: Highly refined petroleum oils, Mixture

**NFPA Rating (Health, Fire, Reactivity):** 0, 1, 0

## TRANSPORTATION

**US Department of Transportation Classification**
**This material is not subject to DOT regulations under 49 CFR Parts 171-180.**

**Oil:** This product is an oil under 49CFR (DOT) Part 130. If shipped by rail or highway in a tank with a capacity of 3500 gallons or more, it is subject to these requirements. Mixtures or solutions containing 10% or more of this product may also be subject to this rule.

**CAUTION:** Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flames or heat. Keep container closed and drum bungs in place.

**Name and Address**

SOPUS Products
P.O. Box 4427
Houston, TX 77210-4427

| ADMINISTRATIVE INFORMATION | |
|---|---|
| **MANUFACTURER ADDRESS:** | SOPUS Products, P.O. Box 4427, Houston, TX. 77210-4427 |

THE INFORMATION CONTAINED IN THIS DATA SHEET IS BASED ON THE DATA AVAILABLE TO US AT THIS TIME, AND IS BELIEVED TO BE ACCURATE BASED UPON THAT : IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT, FOR PURPOSE OF HAZARD COMMUNICATION. IT IS NOT INTENDED TO CONSTITUTE PRODUCT PERFORMANCE INFORMATION, AND NO EXPRESS OR IMPLIED WARRANTY OF ANY KIND IS MADE WITH RESPECT TO THE PRODUCT, UNDERLYING DATA OR THE INFORMATION CONTAINED HEREIN. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE, AND ARE ENCOURAGED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

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44136-10558-100R-04/21/2005

# DIEKAN 400 TRANSFORMER OIL

## (Uninhibited Transformer Oil)

**DIEKAN 400 TRANSFORMER OIL** is an uninhibited naphthenic mineral oil that meets important electrical industry standards. It meets the requirements of Type I ASTM D-3487 fluid specifications. It exhibits high dielectric strength.

It contains no PCBs.

**DIEKAN 400 TRANSFORMER OIL** is recommended for use in electrical equipment such as distribution and substation transformers, circuit breakers, oil filled capacitors, switches, tap changers, and electrical reclosures. It may also be used in applications requiring a low viscosity naphthenic mineral oil.

## TYPICAL CHARACTERISTICS

| | |
|---|---|
| Product Code | 15261 |
| API Gravity | 26.4 |
| Specific Gravity (ASTM D-1298) | 0.896 |
| Viscosity (ASTM D-445): | |
| cSt @ 40°C | 10.9 |
| cSt @ 100°C | 2.54 |
| SUS @ 100°F | 65 |
| SUS @ 210°F | 35 |
| Flash Point (ASTM D-92) °F (°C) | 300 (149) |
| Pour Point (ASTM D-97) °F (°C) | -80 (-62) |
| Color (ASTM D-1500) | L0.5 |
| Dielectric Strength, kV (ASTM D-877)..30 minimum | 40 |
| Aniline Point (ASTM D-611) °F (°C) | 165 (74) |
| Dielectric Breakdown: 60 Hz, Disc Electrodes, kV (ASTM D-877) | 38 |
| KV 1.02 mm gap (ASTM D 1816)...20 minimum | 30 |
| KV 2.03 mm gap (ASTM D 1816)...35 minimum | 60 |
| Voltage Impulse, 1" gap, kV (ASTM D-3300)...145 minimum | 150 |
| Power Factor (ASTM D-924): @ 25°C, % | 0.002 |
| @100°C, % | 0.070 |
| Water Content, ppm (ASTM D-1533) | 21 |
| Neutralization Number (ASTM D-974) mg KOH/g | 0.014 |
| Rotating Bomb Oxidation Test, minutes (ASTM D-2112) | 378 |
| Oxidation Stability (ASTM D-2440): 72 hour test - % Sludge | 0.1 |
| - Acid Number | 0.1 |
| 164 hour test - % Sludge | 0.1 |
| - Acid Number | 0.1 |
| Corrosive Sulfur Test (ASTM D-1275) | No Corrosion |
| Interfacial Tension, Dynes/cm (ASTM D-971)..40 minimum | 42 |
| Gassing Tendency, uL/min (ASTM D-2300): Procedure B | 2.5 |
| PCB Content (ASTM D-4059) | None detectable |

The above data is subject to usual manufacturing variation. For more information and availability, call 1-800-442-LUBE.
5/30/02

400 Chisholm Place, Suite 418
Plano, Texas 75075

**Telephone: (469)-241-0950 Telecopier: (469)-241-0956**

# MATERIAL SAFETY DATA SHEET

**EMERGENCY OVERVIEW**
This slippery liquid has a mild odor. No significant immediate hazards for emergency response are known.

**NFPA RATING: HEALTH: 1 FLAMMABILITY: 1 REACTIVITY: 0**

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**GENERIC NAME:** LUBRICATING OIL **ISSUE DATE:** **February 21, 2006**

**THIS LUBRICANTS USA PRODUCT IS:** **DIEKAN 400 TRANSFORMER OIL**

**CAS NUMBER:** Mixture
**SYNONYMS / GENERAL NAMES:** Transformer oil
**24 HOUR EMERGENCY TELEPHONE:** (CHEMTREC) 1-800-424-9300
**TECHNICAL INFORMATION:** 1-800-442-5823

## 2. COMPOSITION / INFORMATION ON INGREDIENTS / HAZARDOUS INGREDIENTS

| COMPONENTS | CAS NO. | % | HAZARD DATA |
|---|---|---|---|
| Highly-refined paraffinic petroleum oils * | 64742-46-7<br>64742-53-6 | 100 | * |

*** Not limited to but include these CAS numbers. Hazard data on this petroleum oil is Oral LD 50 >5000, Dermal LD 50 >2000**

**HAZARDOUS INGREDIENTS:** NONE

**HAZARDOUS PER 29 CFR 1916.1200:** NO

## 3. HAZARDOUS IDENTIFICATION

| | |
|---|---|
| **ROUTES OF ENTRY:** | Skin contact |
| **TARGET ORGANS:** | Skin |
| **IRRITANCY:** | This product can cause mild, transient, eye irritation with short-term contact with liquids or sprays. |
| **REPRODUCTIVE EFFECTS:** | N/A |
| **CANCER INFORMATION:** | This product does not contain any components at concentrations above 0.1% that are considered carcinogenic by OSHA, IARC, or NTP. |

## 4. FIRST AID MEASURES

| | |
|---|---|
| **EYES:** | Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, redness or pain persists. |
| **DERMAL:** | Remove contaminated shoes and clothing, wipe off excess material. Wash exposed skin with soap and water. Seek medical attention if tissue appears damaged or if irritation persists. Thoroughly clean contaminated clothing before reuse. Discard contaminated leather goods. |
| **INGESTION:** | Do not induce vomiting unless directed to by a physician. Do not give anything to drink unless directed to by a physician. Never give anything by mouth to a person who is not fully conscious. Seek medical attention immediately. |

| | |
|---|---|
| **INHALATION:** | Move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If breathing is difficult, a qualified individual should administer 100 percent humidified oxygen. Seek medical attention immediately. Keep the affected individual warm and at rest. |
| **INJECTION:** | Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention. |

## 5. FIRE FIGHTING MEASURES

**FLASH POINT, °C( °F):** >146°C (295°F)
**FLAMMABLE LIMITS (% BY VOLUME):** **LOWER:** NO DATA **UPPER:** NO DATA
**EXTINGUISHING MEDIA:** Use dry chemical, foam, carbon dioxide or water fog.
**SPECIAL FIRE FIGHTING PROCEDURES:** N/A
**AUTOIGNITION TEMPERATURE:** N/A
**EXPLOSION DATA:** N/A
**NFPA RATING:** **HEALTH:** 1 **FLAMMABILITY:** 1 **REACTIVITY** 0

## 6. ACCIDENTAL RELEASE MEASURES

**SPILL PROCEDURES:** Do not touch damaged containers or spilled material unless wearing appropriate protective equipment. Slipping hazard—**do not walk through** spilled material. Stop leak if you can do so without risk. For small spills, absorb or cover with dry earth, sand, or other inert non-combustible absorbent material and place into waste containers for later disposal. Contain large spills to maximize product recovery or disposal. Prevent entry into waterways or sewers. In urban area, cleanup spills as soon as possible. In natural environments, seek cleanup advice from specialists to minimize physical habitat damage. This material will float on water. Absorbent pads and similar materials can be used. Comply with all laws and regulations.

**Ecotoxicity** Ecological effects testing has not been conducted on this material. Discharges are expected to cause only localized and non-persistent environmental damage.

**Environmental fate** An environmental fate analysis has not been conducted on this specific product. However, plants and animals may experience harmful or fatal effects when coated with petroleum-based products. Petroleum-based (mineral) lube oils will normally float on water. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area. As a result, this oil layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway can result in a loss of marine life or create an anaerobic environment

## 7. HANDLING AND STORAGE

**HANDLING & STORAGE PROCEDURES:** Avoid water contamination and extreme temperatures to minimize product degradation. Keep container closed. Do not store with strong oxidizing agents. Do not store at temperatures above 120°F or in direct sunlight for extended periods of time.

Empty containers may contain product resides that can ignite with explosive force. Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to flames, sparks, heat or other potential ignition sources. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

| | |
|---|---|
| **ENGINEERING CONTROLS:** | Provide exhaust ventilation or other engineering controls to keep the airborne concentration of mists and/or vapors below the recommended exposure limits. An eye wash station and safety shower should be located near the workstation. |
| **GLOVES PROTECTION:** | Use gloves constructed of chemical resistant materials such as neoprene or heavy nitrile rubber if frequent or prolonged contact is expected. Use heat protective gloves when handling product at elevated temperatures. |
| **EYE PROTECTION:** | Safety glasses equipped with side shields should be adequate protection under most conditions of use. Wear goggles and/or face shield if splashing or spraying is likely. |

| | |
|---|---|
| | especially if material is heated above 125° F (or 51° C). Have suitable eye washwater available. |
| **RESPIRATORY PROTECTION:** | Vaporization or misting is not expected at ambient temperatures. Therefore, the need for respiratory protection is not anticipated under normal use conditions and with adequate ventilation. If elevated airborne concentrations above applicable workplace exposure levels are anticipated, a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter should be used. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134). |
| **CLOTHING RECOMMENDATION:** | Avoid prolonged and/or repeated skin contact, especially after this product has been used. If splashing or spraying is expected chemical-resistant (Tyvek®, nitrile or neoprene) clothing should be worn. This might include long-sleeves, apron, slicker suit, boots and additional facial protection. If general contact occurs, promptly remove soaked clothing and take a shower. |
| **OTHER COMMENTS:** | Use good personal hygiene practices. Wash hands and other exposed skin areas with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners. Since standards/control limits have not been established for this product, the exposure limits shown below are suggested as minimum control guidelines. |
| **Occupational exposure guidelines for highly-refined petroleum lubricant oils** | Applicable workplace exposure levels<br><br>TWA: 5 STEL; 10 ($mg/M^3$) from ACGIH (TLV)<br>TWA: 5 ($mg/M^3$) from OSHA (PEL)<br>TWA: 5 STEL; 10 ($mg/M^3$) from NIOSH |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **APPEARANCE:** | Nearly colorless liquid |
| **ODOR:** | Mild petroleum odor |
| **pH:** | N/A |
| **VAPOR PRESSURE, mm Hg (25°C):** | <0.0001 |
| **VAPOR DENSITY:** | 17+ (Air =1) |
| **MELTING POINT:** | Not available (pour point –40 C, -40 F) |
| **BOILING POINT, 760 mm Hg, °C:** | >300 F |
| **SOLUBILITY IN WATER:** | Insoluble in cold water. |
| **SPECIFIC GRAVITY:** | 0.90 (Water = 1) |
| **EVAPORATION RATE:** | N/A |
| **VISCOSITY 40°C (100°C)** | 11 cSt @ 40° C (2.5 cSt @ 100°C) |
| **MOLECULAR WEIGHT:** | N/A |
| **PERCENT VOLATILE:** | Negligible volatility |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **STABILITY:** | Stable |
| **INCOMPATIBILITY:** | Strong oxidizers |
| **POLYMERIZATION:** | Not expected to occur |
| **THERMAL DECOMPOSITION:** | $CO_2$, CO, smoke, fumes and unburned hydrocarbons |

## 11. TOXICOLOGICAL INFORMATION

| | |
|---|---|
| **EYE IRRITATION:** | This product can cause mild, transient, eye irritation with short-term contact with liquid or sprays. |
| **DERMAL IRRITATION:** | This material can cause mild, transient skin irritation with short-term exposure. |
| **INHALATION TOXICITY:** | No significant adverse health effects are expected to occur upon short-term exposure to this product. Aspiration of liquid into the lungs can cause severe lung damage or death. |
| **INGESTION IRRITATION:** | If swallowed, no significant adverse health effects are anticipated. Ingestion can cause mild irritation to the digestive tract or cause a laxative effect. |

| | |
|---|---|
| **INJECTION SENSITATION:** | Injection under the skin, in muscle, or into the blood stream can cause irritation, inflammation, swelling, fever, and systemic effects and mild central nervous system depression. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention. |

| | |
|---|---|
| **CHRONIC EXPOSURE SYMPTOMS** | Prolonged or repeated contact may cause skin rashes. |
| **OTHER REMARKS** | LD50 and LC 50 NOT AVAILABLE. |

## 12. HEALTH INFORMATION

**HMIS CODE: HEALTH: 1 FIRE: 1 REACTIVITY: 0**

| | | | |
|---|---|---|---|
| No | **HIGHLY TOXIC** | No | **SENSITIZER** |
| No | **TOXIC** | No | **REPRODUCTIVE EFFECTS** |
| No | **CORROSIVE** | No | **MUTAGEN** |
| No | **IRRITANT** | | |

## 13. DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL:** It is the responsibility of the user to determine if the material is a hazardous waste at the time of disposal. Determine compliance status with all applicable requirements prior to disposal.

## 14. TRANSPORT INFORMATION

**DOT (DEPARTMENT OF TRANSPORTATION)**

| | |
|---|---|
| **PROPER SHIPPING NAME:** | Petroleum lubricating oil. |
| **HAZARD CLASS:** | 49 CFR (DOT) Part 130. Controlled material (United States). |
| **HAZARD IDENTIFICATION NUMBER:** | N/A |
| **DOT PLACARD:** | N/A |
| **COMPATIBILITY CATEGORY:** | N/A |

## 15. REGULATORY INFORMATION

**SARA SECTION 313 - TOXIC CHEMICALS:**
This product does not contain toxic chemicals under SARA Section 313 and 40 CFR Part 372.

**SARA SECTION 311 - HAZARD CATEGORIES:**
This product may meet one or more of the criteria for the hazard categories defined in 40 CFR Part 370 as established be Sections 311 and 312 of SARA as indicated below:

| | | | |
|---|---|---|---|
| NO | **IMMEDIATE (ACUTE) HEALTH HAZARD** | NO | **SUDDEN RELEASE OF PRESSURE HAZARD** |
| NO | **DELAYED (CHRONIC) HEALTH HAZARD** | NO | **REACTIVE HAZARD** |
| NO | **FIRE HAZARD** | | |

**SARA SECTION 302 - EXTREMELY HAZARDOUS WASTE:**
This product is not known to contain any components in concentrations greater than one percent that are listed as Extremely Hazardous Substances in 40 CFR Part 355 pursuant to the requirements of Section 302(a) of SARA.

**CLEAN WATER ACT (CWA):**
Under the CWA, discharges of crude oil and petroleum products to surface water without proper Federal and State permits must be reported immediately to the National Response Center at (800) 424-8802.

**CERCLA HAZARDOUS SUBSTANCES:**
As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof, which is not otherwise specifically listed or designated as a hazardous substance.

**U.S. TSCA INVENTORY**
All components of this material are on the U.S. TSCA Inventory or are not required to be listed on the U.S.

TSCA Inventory

**CALIFORNIA PROPOSITION 65**
This product is not known to contain any components for which the State of California has found to cause cancer, birth defects or other reproductive harm.

**NEW JERSEY RIGHT-TO-KNOW LABEL**
Petroleum oil.

**ADDITIONAL REGULATORY REMARKS**
Volatile Organic compounds (VOC). This product is exempt from VOC reporting under the California Clean Air Act. Section 94510 exempts organic compounds that either have a vapor pressure of <0.1 mm Hg @ 20 Dec C or have more than 12 carbon atoms.

## 16. OTHER INFORMATION

The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport, or otherwise be exposed to this product. This information was prepared for the guidance of plant engineering, operations and management and for persons working with or handling this product. Lubricants USA believes this information to be reliable and up to date as of the date of publication, but makes no warranty that it is.

| | | | | | |
|---|---|---|---|---|---|
| **NFPA HAZARD RATING** | least - 0 | slight - 1 | moderate - 2 | high - 3 | extreme - 4 |
| **HMIS HEALTH RATING** | least - 0 | slight - 1 | moderate - 2 | high - 3 | extreme - 4 |

AP = approximately EQ = equal > = greater than < = less than NA = not applicable
ND = no data NE = not established

ACGIH = American Conference of Governmental Industrial Hygienists
AIHA = American Industrial Hygiene Association
CERCLA = Comprehensive Environmental Response, Compensation and Liability Act (1980)
EPA = Environmental Protection Agency
HMIS = Hazardous Materials Information System
IARC = International Agency for Research on Cancer
NFPA = National Fire Protection Association
NIOSH = National Institute of Occupational Safety and Health
NLGI = National Lubricating Grease Institute
NPCA = National Paint and Coating Manufacturers Association
NTP = National Toxicology Program
OSHA = Occupational Safety and Health Administration
RQ = Reportable quantity
SARA = Superfund Amendments and Reauthorization Act (1986)
TSCA = Toxic Substance Control Act

# DIEKAN 410 TRANSFORMER OIL

**DIEKAN 410 TRANSFORMER OIL** is an inhibited naphthenic mineral oil that meets important electrical industry standards. It meets the requirements of Type II ASTM D-3487 fluid and NEMA TR-P8-1975 specifications. It exhibits high dielectric strength and contains antioxidants to improve service life for operation under severe conditions. It contains no PCBs.

**DIEKAN 410 TRANSFORMER OIL** is recommended for use in electrical equipment such as distribution and substation transformers, circuit breakers, oil filled capacitors, switches, tap changers, and electrical reclosures. It may also be used in applications requiring a low viscosity naphthenic mineral oil.

## TYPICAL CHARACTERISTICS

| | |
|---|---|
| Product Code | 15262 |
| API Gravity | 26.4 |
| Specific Gravity (ASTM D-1298) | 0.8959 |
| Viscosity (ASTM D-445): | |
| cSt @ 40°C | 10.9 |
| cSt @ 100°C | 2.54 |
| SUS @ 100°F | 65 |
| SUS @ 210°F | 35 |
| Flash Point (ASTM D-92) °F (°C) | 300 (149) |
| Pour Point (ASTM D-97) °F (°C) | -80 (-62) |
| Color (ASTM D-1500) | L0.5 |
| Dielectric Strength, kV (ASTM D-877) | 40 |
| Aniline Point (ASTM D-611) °F (°C) | 165 (74) |
| Dielectric Breakdown: 60 Hz, Disc Electrodes, kV (ASTM D-877) | 38 |
| Voltage Impulse, 1" gap, kV (ASTM D-3300) | 173 |
| Power Factor (ASTM D-924): @ 25°C, % | 0.002 |
| @100°C, % | 0.070 |
| Antioxidant Content, wt% (ASTM D-1473) | 0.15 |
| Water Content, ppm (ASTM D-1533) | 21 |
| Neutralization Number (ASTM D-974) mg KOH/g | 0.014 |
| Rotating Bomb Oxidation Test, minutes (ASTM D-2112) | 378 |
| Oxidation Stability (ASTM D-2440): 72 hour test - % Sludge | 0.1 |
| - Acid Number | 0.1 |
| 164 hour test - % Sludge | 0.1 |
| - Acid Number | 0.1 |
| Corrosive Sulfur Test (ASTM D-1275) | No Corrosion |
| Interfacial Tension, Dynes/cm (ASTM D-971) | 42 |
| Gassing Tendency, uL/min (ASTM D-2300): Procedure A | 15 |
| Procedure B | 30 |
| PCB Content (ASTM D-4059) | None detectable |

The above data is subject to usual manufacturing variation. For more information and availability, call 1-800-442-LUBE.
10/09/01

400 Chisholm Place, Suite 418
Plano, Texas 75075

**Telephone: (469)-241-0950 Telecopier: (469)-241-0956**

# MATERIAL SAFETY DATA SHEET

**EMERGENCY OVERVIEW**
This slippery liquid has a mild odor. No significant immediate hazards for emergency response are known.

**NFPA RATING: HEALTH: 1 FLAMMABILITY: 1 REACTIVITY: 0**

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**GENERIC NAME:** LUBRICATING OIL **ISSUE DATE:** **February 21, 2006**

**THIS LUBRICANTS USA PRODUCT IS:** **DIEKAN 410 TRANSFORMER OIL**

**CAS NUMBER:** Mixture
**SYNONYMS / GENERAL NAMES:** Transformer oil
**24 HOUR EMERGENCY TELEPHONE:** (CHEMTREC) 1-800-424-9300
**TECHNICAL INFORMATION:** 1-800-442-5823

## 2. COMPOSITION / INFORMATION ON INGREDIENTS / HAZARDOUS INGREDIENTS

| COMPONENTS | CAS NO. | % | HAZARD DATA |
|---|---|---|---|
| 1) Highly-refined paraffinic petroleum oils * | 64742-46-7<br>64742-53-6 | >99 | * |
| 2) Butylated hydroxy toluene | Mixture | <1 | |

*** Not limited to but include these CAS numbers. Hazard data on this petroleum oil is Oral LD 50 >5000, Dermal LD 50 >2000**

**HAZARDOUS INGREDIENTS:** NONE
**HAZARDOUS PER 29 CFR 1916.1200:** NO

## 3. HAZARDOUS IDENTIFICATION

| | |
|---|---|
| **ROUTES OF ENTRY:** | Skin contact |
| **TARGET ORGANS:** | Skin |
| **IRRITANCY:** | This product can cause mild, transient, eye irritation with short-term contact with liquids or sprays. |
| **REPRODUCTIVE EFFECTS:** | N/A |
| **CANCER INFORMATION:** | This product does not contain any components at concentrations above 0.1% that are considered carcinogenic by OSHA, IARC, or NTP. |

## 4. FIRST AID MEASURES

| | |
|---|---|
| **EYES:** | Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, redness or pain persists. |
| **DERMAL:** | Remove contaminated shoes and clothing, wipe off excess material. Wash exposed skin with soap and water. Seek medical attention if tissue appears damaged or if irritation persists. Thoroughly clean contaminated clothing before reuse. Discard contaminated leather goods. |
| **INGESTION:** | Do not induce vomiting unless directed to by a physician. Do not give anything to drink |

| | |
|---|---|
| | unless directed to by a physician. Never give anything by mouth to a person who is not fully conscious. Seek medical attention immediately. |
| **INHALATION:** | Move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If breathing is difficult, a qualified individual should administer 100 percent humidified oxygen. Seek medical attention immediately. Keep the affected individual warm and at rest. |
| **INJECTION:** | Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention. |

## 5. FIRE FIGHTING MEASURES

| | |
|---|---|
| **FLASH POINT, °C( °F):** | >146°C (295°F) |
| **FLAMMABLE LIMITS (% BY VOLUME):** | **LOWER:** NO DATA **UPPER:** NO DATA |
| **EXTINGUISHING MEDIA:** | Use dry chemical, foam, carbon dioxide or water fog. |
| **SPECIAL FIRE FIGHTING PROCEDURES:** | N/A |
| **AUTOIGNITION TEMPERATURE:** | N/A |
| **EXPLOSION DATA:** | N/A |
| **NFPA RATING:** | **HEALTH:** 1 **FLAMMABILITY:** 1 **REACTIVITY** 0 |

## 6. ACCIDENTAL RELEASE MEASURES

**SPILL PROCEDURES:**

Do not touch damaged containers or spilled material unless wearing appropriate protective equipment. Slipping hazard—**do not walk through** spilled material. Stop leak if you can do so without risk. For small spills, absorb or cover with dry earth, sand, or other inert non-combustible absorbent material and place into waste containers for later disposal. Contain large spills to maximize product recovery or disposal. Prevent entry into waterways or sewers. In urban area, cleanup spills as soon as possible. In natural environments, seek cleanup advice from specialists to minimize physical habitat damage. This material will float on water. Absorbent pads and similar materials can be used. Comply with all laws and regulations.

**Ecotoxicity**

Ecological effects testing has not been conducted on this material. Discharges are expected to cause only localized and non-persistent environmental damage.

**Environmental fate**

An environmental fate analysis has not been conducted on this specific product. However, plants and animals may experience harmful or fatal effects when coated with petroleum-based products. Petroleum-based (mineral) lube oils will normally float on water. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area. As a result, this oil layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway can result in a loss of marine life or create an anaerobic environment

## 7. HANDLING AND STORAGE

**HANDLING & STORAGE PROCEDURES:**

Avoid water contamination and extreme temperatures to minimize product degradation. Keep container closed. Do not store with strong oxidizing agents. Do not store at temperatures above 120°F or in direct sunlight for extended periods of time.

Empty containers may contain product resides that can ignite with explosive force. Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to flames, sparks, heat or other potential ignition sources. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

| | |
|---|---|
| **ENGINEERING CONTROLS:** | Provide exhaust ventilation or other engineering controls to keep the airborne concentration of mists and/or vapors below the recommended exposure limits. An eye wash station and safety shower should be located near the workstation. |
| **GLOVES PROTECTION:** | Use gloves constructed of chemical resistant materials such as neoprene or heavy nitrile rubber if frequent or prolonged contact is expected. Use heat protective |

| | |
|---|---|
| | gloves when handling product at elevated temperatures. |
| **EYE PROTECTION:** | Safety glasses equipped with side shields should be adequate protection under most conditions of use. Wear goggles and/or face shield if splashing or spraying is likely, especially if material is heated above 125° F (or 51° C). Have suitable eye washwater available. |
| **RESPIRATORY PROTECTION:** | Vaporization or misting is not expected at ambient temperatures. Therefore, the need for respiratory protection is not anticipated under normal use conditions and with adequate ventilation. If elevated airborne concentrations above applicable workplace exposure levels are anticipated, a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter should be used. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134). |
| **CLOTHING RECOMMENDATION:** | Avoid prolonged and/or repeated skin contact, especially after this product has been used. If splashing or spraying is expected chemical-resistant (Tyvek®, nitrile or neoprene) clothing should be worn. This might include long-sleeves, apron, slicker suit, boots and additional facial protection. If general contact occurs, promptly remove soaked clothing and take a shower. |
| **OTHER COMMENTS:** | Use good personal hygiene practices. Wash hands and other exposed skin areas with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners. Since standards/control limits have not been established for this product, the exposure limits shown below are suggested as minimum control guidelines. |
| **Occupational exposure guidelines for highly-refined petroleum lubricant oils** | Applicable workplace exposure levels<br><br>TWA: 5 STEL; 10 ($mg/M^3$) from ACGIH (TLV)<br>TWA: 5 ($mg/M^3$) from OSHA (PEL)<br>TWA: 5 STEL; 10 ($mg/M^3$) from NIOSH |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **APPEARANCE:** | Nearly colorless liquid |
| **ODOR:** | Mild petroleum odor |
| **pH:** | N/A |
| **VAPOR PRESSURE, mm Hg (25°C):** | <0.0001 |
| **VAPOR DENSITY:** | 17+ (Air =1) |
| **MELTING POINT:** | Not available (pour point –40 C, -40 F) |
| **BOILING POINT, 760 mm Hg, °C:** | >300 F |
| **SOLUBILITY IN WATER:** | Insoluble in cold water. |
| **SPECIFIC GRAVITY:** | 0.90 (Water = 1) |
| **EVAPORATION RATE:** | N/A |
| **VISCOSITY 40°C (100°C)** | 11 cSt @ 40° C (2.5 cSt @ 100°C) |
| **MOLECULAR WEIGHT:** | N/A |
| **PERCENT VOLATILE:** | Negligible volatility |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **STABILITY:** | Stable |
| **INCOMPATIBILITY:** | Strong oxidizers |
| **POLYMERIZATION:** | Not expected to occur |
| **THERMAL DECOMPOSITION:** | $CO_2$, CO, smoke, fumes and unburned hydrocarbons |

## 11. TOXICOLOGICAL INFORMATION

| | |
|---|---|
| **EYE IRRITATION:** | This product can cause mild, transient, eye irritation with short-term contact with liquid or sprays. |
| **DERMAL IRRITATION:** | This material can cause mild, transient skin irritation with short-term exposure. |
| **INHALATION TOXICITY:** | No significant adverse health effects are expected to occur upon short-term exposure to this product. Aspiration of liquid into the |

| | |
|---|---|
| | lungs can cause severe lung damage or death. |
| **INGESTION IRRITATION:** | If swallowed, no significant adverse health effects are anticipated. Ingestion can cause mild irritation to the digestive tract or cause a laxative effect. |
| **INJECTION SENSITATION:** | Injection under the skin, in muscle, or into the blood stream can cause irritation, inflammation, swelling, fever, and systemic effects and mild central nervous system depression. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention. |

| | |
|---|---|
| **CHRONIC EXPOSURE SYMPTOMS** | Prolonged or repeated contact may cause skin rashes. |
| **OTHER REMARKS** | LD50 and LC 50 NOT AVAILABLE. |

## 12. HEALTH INFORMATION

| **HMIS CODE:** | **HEALTH:** | 1 | **FIRE:** | 1 | **REACTIVITY:** | 0 |
|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| No | **HIGHLY TOXIC** | No | **SENSITIZER** |
| No | **TOXIC** | No | **REPRODUCTIVE EFFECTS** |
| No | **CORROSIVE** | No | **MUTAGEN** |
| No | **IRRITANT** | | |

## 13. DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL:** It is the responsibility of the user to determine if the material is a hazardous waste at the time of disposal. Determine compliance status with all applicable requirements prior to disposal.

## 14. TRANSPORT INFORMATION

**DOT (DEPARTMENT OF TRANSPORTATION)**

| | |
|---|---|
| **PROPER SHIPPING NAME:** | Petroleum lubricating oil. |
| **HAZARD CLASS:** | 49 CFR (DOT) Part 130. Controlled material (United States). |
| **HAZARD IDENTIFICATION NUMBER:** | N/A |
| **DOT PLACARD:** | N/A |
| **COMPATIBILITY CATEGORY:** | N/A |

## 15. REGULATORY INFORMATION

**SARA SECTION 313 - TOXIC CHEMICALS:**
This product does not contain toxic chemicals under SARA Section 313 and 40 CFR Part 372.

**SARA SECTION 311 - HAZARD CATEGORIES:**
This product may meet one or more of the criteria for the hazard categories defined in 40 CFR Part 370 as established be Sections 311 and 312 of SARA as indicated below:

| | | | |
|---|---|---|---|
| NO | **IMMEDIATE (ACUTE) HEALTH HAZARD** | NO | **SUDDEN RELEASE OF PRESSURE HAZARD** |
| NO | **DELAYED (CHRONIC) HEALTH HAZARD** | NO | **REACTIVE HAZARD** |
| NO | **FIRE HAZARD** | | |

**SARA SECTION 302 - EXTREMELY HAZARDOUS WASTE:**
This product is not known to contain any components in concentrations greater than one percent that are listed as Extremely Hazardous Substances in 40 CFR Part 355 pursuant to the requirements of Section 302(a) of SARA.

**CLEAN WATER ACT (CWA):**
Under the CWA, discharges of crude oil and petroleum products to surface water without proper Federal and State permits must be reported immediately to the National Response Center at (800) 424-8802.

**CERCLA HAZARDOUS SUBSTANCES:**

Product Code(s) 15262 Source Codes Cal

As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof, which is not otherwise specifically listed or designated as a hazardous substance.

**U.S. TSCA INVENTORY**
All components of this material are on the U.S. TSCA Inventory or are not required to be listed on the U.S. TSCA Inventory

**CALIFORNIA PROPOSITION 65**
This product is not known to contain any components for which the State of California has found to cause cancer, birth defects or other reproductive harm.

**NEW JERSEY RIGHT-TO-KNOW LABEL**
Petroleum oil.

**ADDITIONAL REGULATORY REMARKS**
Volatile Organic compounds (VOC). This product is exempt from VOC reporting under the California Clean Air Act. Section 94510 exempts organic compounds that either have a vapor pressure of <0.1 mm Hg @ 20 Dec C or have more than 12 carbon atoms.

## 16. OTHER INFORMATION

The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport, or otherwise be exposed to this product. This information was prepared for the guidance of plant engineering, operations and management and for persons working with or handling this product. Lubricants USA believes this information to be reliable and up to date as of the date of publication, but makes no warranty that it is.

| | | | | | |
|---|---|---|---|---|---|
| **NFPA HAZARD RATING** | least - 0 | slight - 1 | moderate - 2 | high - 3 | extreme - 4 |
| **HMIS HEALTH RATING** | least - 0 | slight - 1 | moderate - 2 | high - 3 | extreme - 4 |

AP = approximately EQ = equal > = greater than < = less than NA = not applicable
ND = no data NE = not established

ACGIH = American Conference of Governmental Industrial Hygienists
AIHA = American Industrial Hygiene Association
CERCLA = Comprehensive Environmental Response, Compensation and Liability Act (1980)
EPA = Environmental Protection Agency
HMIS = Hazardous Materials Information System
IARC = International Agency for Research on Cancer
NFPA = National Fire Protection Association
NIOSH = National Institute of Occupational Safety and Health
NLGI = National Lubricating Grease Institute
NPCA = National Paint and Coating Manufacturers Association
NTP = National Toxicology Program
OSHA = Occupational Safety and Health Administration
RQ = Reportable quantity
SARA = Superfund Amendments and Reauthorization Act (1986)
TSCA = Toxic Substance Control Act

# TRANSVOLT TRANSFORMER OIL

**TRANSVOLT TRANSFORMER OIL** is a fully inhibited insulating oil that provides excellent resistance to oxidation for all types of electrical service in electrical equipment. It is especially recommended for use in electrical equipment that is nitrogen blanketed, such as distribution and substation transformers.

For service in an electrical transformer, an oil is required to serve as both an insulating and a cooling medium. To satisfy these requirements, it must:

- Have a low viscosity
- Have a high dielectric strength
- Have a high flash point
- Be free of acid, alkali, and corrosive sulphur
- Resist oxidation and sludging
- Have a low pour point
- Be compatible with materials used in transformer construction

**TRANSVOLT TRANSFORMER OIL** possesses these properties. Also to be used in oil-filled capacitors, circuit breakers, switches, reactors and other equipment.

# TRANSVOLT TRANSFORMER OIL

| TYPICAL ANALYSIS | |
|---|---|
| | |
| **PRODUCT NO.** | **825** |
| Viscosity @ 40C, cSt | 10.9 |
| Viscosity @ 100C, cSt | 2.5 |
| Viscosity @ 100F, SUS | 65 |
| Viscosity @ 210F, SUS | 35 |
| Viscosity Index | 30 |
| Flash Point, F | 300 |
| Pour Point, F | -80 |
| API Gravity | 26.4 |
| COLOR ASTM | 0.5 |
| Aniline Pt., F | 161 |
| Dielectric Strength, KV | 40 |

# External Coating for WTGs and ESP

# Interzone 954

Modified Epoxy

International Protective Coatings

WORLD WIDE PRODUCT RANGE

**PRODUCT DESCRIPTION**

A two component, low VOC, high solids, modified epoxy barrier coat designed to give long term protection in a single coat application. Will continue to cure when immersed in water and has excellent cathodic disbondment resistance.

**INTENDED USES**

Primarily designed for use in offshore splashzone maintenance, where its continued cure under immersed conditions make it ideal for coping with tidal movements and surges. May be applied to reoxidised and slightly damp surfaces. Interzone 954 has also found extensive use in a number of other corrosive environments including pulp and paper plants, chemical plants, jetties and sluice gates.

As part of a non-slip deck system in conjunction with appropriate aggregate.

**PRACTICAL INFORMATION FOR INTERZONE 954**

| | |
|---|---|
| **Colour** | Range available via the Chromascan system |
| **Gloss Level** | Gloss |
| **Volume Solids** | 85% ± 3% (depends on colour) |
| **Typical Thickness** | 250-500 microns (10-20 mils) dry equivalent to<br>294-588 microns (11.8-23.5 mils) wet |
| **Theoretical Coverage** | 1.70 m²/litre at 500 microns d.f.t and stated volume solids<br>68 sq.ft/US gallon at 20 mils d.f.t and stated volume solids |
| **Practical Coverage** | Allow appropriate loss factors |
| **Method of Application** | Airless Spray, Air Spray, Brush, Roller |

**Drying Time**

| | | | Overcoating Interval with recommended topcoats | |
|---|---|---|---|---|
| **Temperature** | **Touch Dry** | **Hard Dry** | *Minimum* | *Maximum* |
| 10°C (50°F) | 14 hours | 24 hours | 24 hours | 14 days[1] |
| 15°C (59°F) | 10 hours | 18 hours | 18 hours | 10 days[1] |
| 25°C (77°F) | 4 hours | 8 hours | 8 hours | 7 days[1] |
| 40°C (104°F) | 90 minutes | 3 hours | 3 hours | 5 days[1] |

[1] Maximum overcoating intervals are shorter when using polysiloxane topcoats. Consult International Protective Coatings for further details.

**REGULATORY DATA**

| | | | |
|---|---|---|---|
| **Flash Point** | Base (Part A)<br>30°C (86°F) | C/A (Part B)<br>44°C (111°F) | Mixed<br>33°C (91°F) |
| **Product Weight** | 1.8 kg/l (14.6 lb/gal) | | |
| **VOC** | 130 g/l (1.08 lb/gal) | UK - PG6/23(04), Appendix 3 | |
| | 2.12 lb/gal (255 g/l) | USA - EPA Method 24 | |
| | 249 g/l, 162 g/kg | EU Solvent Emissions Directive (Council Directive 1999/13/EC) | |

See Product Characteristics section for further details

# Interzone 954

## Modified Epoxy

**SURFACE PREPARATION**

The performance of this product will depend upon the degree of surface preparation. The surface to be coated must be clean and free from contamination. Prior to paint application all surfaces should be assessed and treated in accordance with ISO 8504:2000.

Accumulated dirt and soluble salts must be removed. Dry bristle brushing will normally be adequate for accumulated dirt. Soluble salts should be removed by fresh water washing.

Oil or grease should be removed in accordance with SSPC-SP1 solvent cleaning.

**Abrasive Blast Cleaning**

Abrasive blast clean to Sa2½ (ISO 8501-1:1988) or SSPC-SP6. If oxidation has occurred between blasting and application of Interzone 954, the surface should be reblasted to the specified visual standard.

Surface defects revealed by the blast cleaning process, should be ground, filled, or treated in the appropriate manner.

A surface profile of 50-75 microns (2-3 mils) is recommended.

**Ultra High Pressure Hydroblasting / Abrasive Wet Blasting**

May be applied to surfaces prepared to Sa2 (ISO 8501-1:1988) or SSPC-SP6 which have flash rusted to no worse than Grade HB2½M (refer to International Hydroblasting Standards). It is also possible to apply to damp surfaces in some circumstances. Further information is available from International Protective Coatings.

**Aged Coatings**

Interzone 954 is suitable for overcoating some sound intact aged coatings. To ensure compatibility, application and evaluation of a test patch is required.

**APPLICATION**

**Mixing**

Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed it must be used within the working pot life specified.

(1) Agitate Base (Part A) with a power agitator.

(2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.

**Mix Ratio**

4 part(s) : 1 part(s) by volume

**Working Pot Life**

| 10°C (50°F) | 15°C (59°F) | 25°C (77°F) | 40°C (104°F) |
|---|---|---|---|
| 3 hours | 2 hours | 90 minutes | 45 minutes |

| | | |
|---|---|---|
| **Airless Spray** | Recommended | Tip Range 0.53-0.66 mm (21-26 thou)<br>Total output fluid pressure at spray tip not less than 176 kg/cm² (2503 p.s.i.) |
| **Air Spray (Pressure Pot)** | Recommended | Gun DeVilbiss MBC or JGA<br>Air Cap 62<br>Fluid Tip AC |
| **Brush** | Suitable | Typically 100-150 microns (4.0-6.0 mils) can be achieved |
| **Roller** | Suitable | Typically 75-125 microns (3.0-5.0 mils) can be achieved |
| **Thinner** | International GTA220 (or International GTA415) | Do not thin more than allowed by local environmental legislation |
| **Cleaner** | International GTA822 or International GTA415 | |

**Work Stoppages**

Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA822. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units.

**Clean Up**

Clean all equipment immediately after use with International GTA822. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays.

All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.

# Interzone 954
## Modified Epoxy

**PRODUCT CHARACTERISTICS**

Maximum film build in one coat is best attained by airless spray. When applying by methods other than airless spray, the required film build is unlikely to be achieved. Application by air spray may require a multiple cross spray pattern to attain maximum film build. Low or high temperatures may require specific application techniques to achieve maximum film build.

When applying Interzone 954 by brush or roller, it may be necessary to apply multiple coats to achieve the total specified system dry film thickness.

Surface temperature must always be a minimum of 3°C (5°F) above dew point.

Do not apply at steel temperatures below 4°C (39°F).

When applying Interzone 954 in confined spaces ensure adequate ventilation.

In special cases where overcoating is required and curing has been at low temperatures and high relative humidities, ensure no amine bloom is present prior to application of subsequent topcoats.

Condensation occurring during or immediately after application may result in a matt finish and an inferior film.

Premature exposure to ponding water will cause a colour change, especially in dark colours.

In common with all epoxies Interzone 954 will chalk and discolour on exterior exposure. However, these phenomena are not detrimental to anti-corrosive performance.

Where a durable cosmetic finish with good gloss and colour retention is required overcoat with recommended topcoats.

When applied between tides on jetties, piling etc., Interzone 954 can be immersed within 30 minutes. This will lead to whitening of dark colours but will not affect ultimate anti-corrosive performance.

For use in atmospheric service a minimum dry film thickness of 350 microns (14 mils) is required in one coat when applied direct to steel, for water immersion a minimum of 450 microns (18 mils) dry film thickness is recommended. In each case protection can be achieved in a single coat application by airless spray.

Interzone 954 can be used as a non-skid deck system by modification with addition of GMA132 (crushed flint) aggregate. Application should then be to a suitably primed surface. Typical thicknesses will be between 500-1,000 microns (20-40 mils). Preferred application is by a suitable large tip hopper gun (e.g. Sagola 429 or Air texture gun fitted with a 5-10 mm nozzle). Trowel or roller can be used for small areas. Alternatively, a broadcast method of application can be used. Consult International Protective Coatings for further details.

Interzone 954 is compatible with sacrificial and impressed current cathodic protection systems.

Note: VOC values quoted are based on maximum possible for the product taking into account variations due to colour differences and normal manufacturing tolerances.

Low molecular weight reactive additives, which will form part of the film during normal ambient cure conditions, will also affect VOC values determined using EPA Method 24.

**SYSTEMS COMPATIBILITY**

Interzone 954 will generally be applied to bare steel prepared by dry abrasive blasting, wet abrasive blasting or ultra high pressure hydroblasting.

The following primers are recommended for Interzone 954:

| | |
|---|---|
| Intercure 200 | Intergard 269 (for underwater use) |
| Intercure 200HS | Interline 982 (for underwater use) |
| Intergard 251 | |
| Interzinc 315 | |
| Interzinc 52 | |
| Interzone 1000 | |

The following topcoats are recommended for Interzone 954:

| | |
|---|---|
| Interfine 629HS | Intersleek 167 |
| Interfine 878 | Interthane 870 |
| Interfine 979 | Interthane 990 |
| Intergard 740 | Interzone 954 |

For other suitable primers/topcoats, consult International Protective Coatings.

# Interzone 954
Modified Epoxy

**ADDITIONAL INFORMATION**

Further information regarding industry standards, terms and abbreviations used in this data sheet can be found in the following documents available at www.international-pc.com:

- Definitions & Abbreviations
- Surface Preparation
- Paint Application
- Theoretical & Practical Coverage

Individual copies of these information sections are available upon request.

**SAFETY PRECAUTIONS**

This product is intended for use only by professional applicators in industrial situations in accordance with the advice given on this sheet, the Material Safety Data Sheet and the container(s), and should not be used without reference to the Material Safety Data Sheet (MSDS) which International Protective Coatings has provided to its customers.

All work involving the application and use of this product should be performed in compliance with all relevant national, Health, Safety & Environmental standards and regulations.

In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation.

If in doubt regarding the suitability of use of this product, consult International Protective Coatings for further advice.

| | | | |
|---|---|---|---|
| **PACK SIZE** | 20 Litre unit | Interzone 954 Base | 16 litres in a 20 litre container |
| | | Interzone 954 Curing Agent | 4 litres in a 5 litre container |
| | 5 Gallon unit | Interzone 954 Base | 4 gallons in a 5 gallon container |
| | | Interzone 954 Curing Agent | 1 gallon in a 1 gallon container |
| | For availability of other pack sizes, contact International Protective Coatings. | | |
| **SHIPPING WEIGHT** | U.N. Shipping No. 1263 | | |
| | 20 Litre unit | 30.4 kg (67 lb) Base (Part A) | |
| | | 4.6 kg (10.1 lb) Curing Agent (Part B) | |
| | 5 Gallon unit | 25.6 kg (56.4 lb) Base (Part A) | |
| | | 5.2 kg (11.5 lb) Curing Agent (Part B) | |
| **STORAGE** | Shelf Life | 12 months minimum at 25°C (77°F). Subject to re-inspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition. | |





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