**OILS, FUEL: 1-D**

**CAUTIONARY RESPONSE INFORMATION**

### Common Synonyms
- Diesel oil (light)

### Oily liquid
- Yellow-brown
- Lube or fuel oil odor

**Fire**
- Combustible: Extinguish with dry chemical, foam or carbon dioxide.
- May be explosive in fire.

**Exposure**
- Liquid: Iritating to skin and eyes.
- Harmful if swallowed: Remove contaminated clothing and shoes.
- Do not inhale: Flush affected areas with plenty of water.

**Water Pollution**
- Dangerous to aquatic life in high concentrations.
- Fouling to shoreline.

**1. CORRECTIVE RESPONSE ACTIONS**
- Stop discharge
- Contain: Collection Systems: Stormwater
- Chemical and Physical Treatment: Burn, Absorb
- Clean shore line
- Salvage wastewater

**2. CHEMICAL DESIGNATIONS**
- CAS Registry No.: 68334-30-5
- NAERG Guide No.: 128
- Standard Industrial Trade Classification: 33440

**3. HEALTH HAZARDS**

### 3.1 Personal Protective Equipment
- Protective gloves; goggles or face shield.

### 3.2 Symptoms Following Exposure
- Inhalation: Causes headache and slight dizziness. Ingestion: Causes nausea, vomiting, and cramping; depression of central nervous system ranging from mild headache to anesthesia, coma, and death; pulmonary irritation secondary to inhalation of solvent; signs of kidney and liver damage may be delayed. Aspiration: Causes severe lung irritation with foaming, gagging, dyspnea, substernal distress, and rapidly developing pulmonary edema; acute onset of central nervous system excitement followed by depression.

### 3.3 Treatment of Exposure
- Inhalation: Do not induce vomiting; seek medical attention. Aspiration: Enforce bed rest; administer oxygen. Eyes: Wash with copious quantity of water. Skin: Remove solvent by wiping and wash with soap and water.

### 3.4 TLV-TWA
- Notice of intended change: 100 mg/m³

### 3.5 TLV-STEL
- Not listed.

### 3.6 TLV-Ceiling: Not listed

### 3.7 Toxicity by Ingestion
- Grade 1: LD₅₀ = 5-15 mg/kg

### 3.8 Toxicity by Inhalation
- Currently not available.

**4. FIRE HAZARDS**

### 4.1 Flash Point
- 100°F C.C.

### 4.2 Flammable Limits in Air
- 1.3 to 6.6%

### 4.3 Fire Extinguishing Agents
- Dry chemical, foam, or carbon dioxide

### 4.4 Fire Extinguishing Agents Not to Be Used
- Water may be ineffective.

### 4.5 Special Hazards of Combustion Products
- Not pertinent.

### 4.6 Behavior in Fire
- Not pertinent.

### 4.7 Auto Ignition Temperature
- 359–425°F

### 4.8 Electrical Hazards
- Not pertinent.

### 4.9 Burning Rate: 4 mm/min.

### 4.10 Explosive Flame Temperature
- Currently not available

### 4.11 Stoichiometric Air to Fuel Ratio
- Not pertinent.

### 4.12 Flammability Grade
- 3

### 4.13 Combustion Molar Ratio (Reactant to Product): Not pertinent

### 4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

**5. CHEMICAL REACTIVITY**

### 5.1 Reactivity with Water
- No reaction.

### 5.2 Reactivity with Common Materials
- No reaction.

### 5.3 Stability During Transport
- Stable.

### 5.4 Neutralizing Agents for Acids and Caustics
- Not pertinent.

### 5.5 Polymerization
- Not pertinent.

### 5.6 Inhibitor of Polymerization
- Not pertinent.

**6. WATER POLLUTION**

### 6.1 Aquatic Toxicity
- 204 mg/l/4 hr (mallard)

### 6.2 Waterfowl Toxicity
- 20 mg/kg LD₅₀ (mallard)

### 6.3 Biological Oxygen Demand (BOD)
- Currently not available.

### 6.4 Food Chain Concentration Potential
- None.

### 6.5 GESAMP Hazard Profile: Not listed

**7. SHIPPING INFORMATION**

### 7.1 Grades of Purity
- Diesel fuel 1-D (ASTM)

### 7.2 Storage Temperature
- Ambient

### 7.3 Inert Atmosphere
- No requirement.

### 7.4 Ventings
- Open (flame arrester)

### 7.5 IMO Pollution Category
- Currently not available

### 7.6 Ship Type
- Currently not available

### 7.7 Barge Hull Type
- Currently not available

**8. HAZARD CLASSIFICATIONS**

### 8.1 49 CFR Class: Combustible liquid

### 8.2 49 CFR Group: Not pertinent

### 8.3 49 CFR Package Number: Not listed

### 8.4 Marine Pollutant
- Not pertinent.

### 8.5 NFPA Hazard Classification:
- Category Classification
  - Health Hazard (Blue): Not pertinent
  - Flammability (Red): 2
  - Instability (Yellow): Not pertinent

### 8.6 EPA Reportable Quantity: Not listed.

### 8.7 EPA Pollution Category: Not listed.

### 8.8 RODA Waste Number: Not listed.

### 8.9 EPA FWPCA List: Not listed

**9. PHYSICAL & CHEMICAL PROPERTIES**

### 9.1 Physical State at 15°C and 1 atm: Liquid

### 9.2 Molecular Weight: Not pertinent

### 9.3 Boiling Point at 1 atm: 380–560°F

### 9.4 Freezing Point: –30°F = –34°C = 240°F

### 9.5 Critical Temperature: Not pertinent

### 9.6 Critical Pressure: Not pertinent

### 9.7 Specific Gravity: 0.81–0.85 at 15°C (liquid)

### 9.8 Liquid Surface Tension: 23–32 dynes/cm = 0.023–0.032 N/m at 20°C

### 9.9 Liquid Water Interface Tension: 47–49 dynes/cm = 0.047–0.054 N/m at 20°C

### 9.10 Vapor (Gas) Specific Gravity: Not pertinent

### 9.11 Ratio of Specific Heats of Vapor (Gas)
- Not pertinent

### 9.12 Latent Heat of Vaporization: 110 Btu/lb = 60 cal/g = 2.5 x 10² J/kg

### 9.13 Heat of Combustion: –18,540 Btu/lb = –10,300 cal/g = –431.24 x 10² J/kg

### 9.14 Heat of Decomposition: Not pertinent

### 9.15 Heat of Solution: Not pertinent

### 9.16 Heat of Polymerization: Not pertinent

### 9.17 Heat of Fusion: Currently not available

### 9.18 Limiting Values
- Currently not available

### 9.19 Void Vapor Pressure: Currently not available

**NOTES**
# Oils, Fuel: 1-D

### 9.20 Saturated Liquid Density

<table>
<thead>
<tr>
<th>Temperature (degrees F)</th>
<th>Pounds per cubic foot</th>
<th>Temperature (degrees F)</th>
<th>British thermal unit per pound-F</th>
<th>Temperature (degrees F)</th>
<th>British thermal unit inch per hour-square foot-F</th>
<th>Temperature (degrees F)</th>
<th>Centipoise</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>51.630</td>
<td>70</td>
<td>0.469</td>
<td>50</td>
<td>0.964</td>
<td>-10</td>
<td>6.685</td>
</tr>
<tr>
<td>36</td>
<td>51.360</td>
<td>75</td>
<td>0.471</td>
<td>60</td>
<td>0.964</td>
<td>-25</td>
<td>5.482</td>
</tr>
<tr>
<td>38</td>
<td>51.290</td>
<td>80</td>
<td>0.474</td>
<td>70</td>
<td>0.964</td>
<td>-40</td>
<td>4.686</td>
</tr>
<tr>
<td>40</td>
<td>51.220</td>
<td>85</td>
<td>0.476</td>
<td>80</td>
<td>0.964</td>
<td>-55</td>
<td>4.101</td>
</tr>
<tr>
<td>42</td>
<td>51.150</td>
<td>90</td>
<td>0.479</td>
<td>90</td>
<td>0.964</td>
<td>-75</td>
<td>3.739</td>
</tr>
<tr>
<td>46</td>
<td>51.010</td>
<td>100</td>
<td>0.484</td>
<td>110</td>
<td>0.964</td>
<td>-100</td>
<td>3.416</td>
</tr>
<tr>
<td>48</td>
<td>50.940</td>
<td>105</td>
<td>0.486</td>
<td>120</td>
<td>0.964</td>
<td>-125</td>
<td>3.127</td>
</tr>
<tr>
<td>50</td>
<td>50.870</td>
<td>110</td>
<td>0.489</td>
<td>130</td>
<td>0.964</td>
<td>-150</td>
<td>2.867</td>
</tr>
<tr>
<td>52</td>
<td>50.800</td>
<td>115</td>
<td>0.491</td>
<td>140</td>
<td>0.964</td>
<td>-180</td>
<td>2.634</td>
</tr>
<tr>
<td>54</td>
<td>50.740</td>
<td>120</td>
<td>0.494</td>
<td>150</td>
<td>0.964</td>
<td>-210</td>
<td>2.424</td>
</tr>
<tr>
<td>56</td>
<td>50.670</td>
<td>125</td>
<td>0.496</td>
<td>160</td>
<td>0.964</td>
<td>-250</td>
<td>2.235</td>
</tr>
<tr>
<td>58</td>
<td>50.600</td>
<td>130</td>
<td>0.499</td>
<td>170</td>
<td>0.964</td>
<td>-300</td>
<td>2.064</td>
</tr>
<tr>
<td>60</td>
<td>50.530</td>
<td>135</td>
<td>0.501</td>
<td>180</td>
<td>0.964</td>
<td>-350</td>
<td>1.899</td>
</tr>
<tr>
<td>62</td>
<td>50.460</td>
<td>140</td>
<td>0.504</td>
<td>190</td>
<td>0.964</td>
<td>-400</td>
<td>1.768</td>
</tr>
<tr>
<td>64</td>
<td>50.390</td>
<td>145</td>
<td>0.506</td>
<td>200</td>
<td>0.964</td>
<td>-450</td>
<td>1.641</td>
</tr>
<tr>
<td>66</td>
<td>50.320</td>
<td>150</td>
<td>0.509</td>
<td></td>
<td>0.964</td>
<td>-500</td>
<td>1.525</td>
</tr>
<tr>
<td>68</td>
<td>50.250</td>
<td>155</td>
<td>0.511</td>
<td></td>
<td>0.964</td>
<td>-550</td>
<td>1.419</td>
</tr>
<tr>
<td>70</td>
<td>50.180</td>
<td>160</td>
<td>0.514</td>
<td></td>
<td>0.964</td>
<td>-600</td>
<td>1.322</td>
</tr>
<tr>
<td>72</td>
<td>50.110</td>
<td>165</td>
<td>0.516</td>
<td></td>
<td>0.964</td>
<td>-650</td>
<td>1.233</td>
</tr>
<tr>
<td>74</td>
<td>50.040</td>
<td>170</td>
<td>0.519</td>
<td></td>
<td>0.964</td>
<td>-700</td>
<td>1.152</td>
</tr>
<tr>
<td>76</td>
<td>49.970</td>
<td>175</td>
<td>0.521</td>
<td></td>
<td>0.964</td>
<td>-750</td>
<td>1.079</td>
</tr>
<tr>
<td>78</td>
<td>49.900</td>
<td>180</td>
<td>0.524</td>
<td></td>
<td>0.964</td>
<td>-800</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>49.830</td>
<td>185</td>
<td>0.526</td>
<td></td>
<td>0.964</td>
<td>-850</td>
<td></td>
</tr>
<tr>
<td>82</td>
<td>49.760</td>
<td>190</td>
<td>0.529</td>
<td></td>
<td>0.964</td>
<td>-900</td>
<td></td>
</tr>
<tr>
<td>84</td>
<td>49.690</td>
<td>195</td>
<td>0.531</td>
<td></td>
<td>0.964</td>
<td>-950</td>
<td></td>
</tr>
</tbody>
</table>

### 9.21 Liquid Heat Capacity

### 9.22 Liquid Thermal Conductivity

### 9.23 Liquid Viscosity

### 9.24 Solubility in Water

<table>
<thead>
<tr>
<th>Temperature (degrees F)</th>
<th>Pounds per 100 pounds of water</th>
<th>Temperature (degrees F)</th>
<th>Pounds per square inch</th>
<th>Temperature (degrees F)</th>
<th>Pounds per cubic foot</th>
<th>Temperature (degrees F)</th>
<th>Centipoise</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>70</td>
<td>0.041</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>60</td>
<td>0.056</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>50</td>
<td>0.075</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>40</td>
<td>0.095</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>30</td>
<td>0.130</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>20</td>
<td>0.168</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>10</td>
<td>0.217</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>0</td>
<td>0.277</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>150</td>
<td>0.350</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>160</td>
<td>0.440</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>170</td>
<td>0.546</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>180</td>
<td>0.677</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>190</td>
<td>0.835</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>1.021</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>210</td>
<td>1.241</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>220</td>
<td>1.500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>230</td>
<td>1.802</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>240</td>
<td>2.154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>250</td>
<td>2.562</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>260</td>
<td>3.031</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>270</td>
<td>3.573</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>280</td>
<td>4.182</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>290</td>
<td>4.896</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>300</td>
<td>5.895</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 9.25 Saturated Vapor Pressure

### 9.26 Saturated Vapor Density

### 9.27 Ideal Gas Heat Capacity

**JUNE 1999**