Shell Turbo Fluid DR 46

Fire resistant hydraulic and lubricating fluid for turbines

Shell Turbo Fluid DR 46 is a fire-resistant hydraulic and lubricating fluid based on Tri-Aryl Phosphates manufactured from carefully selected raw materials.

Performance, Features & Benefits

- **Excellent fire resistance**
  Shell Turbo Fluid DR 46 is inherently fire-resistant, offering high flash point, high fire point and high auto ignition temperature. It eliminates the risk of fire, potentially caused by mineral oil products.

- **Good oxidation stability**
  To provide long service life under normal operating conditions.

- **Good hydrolytic stability**
  Shell Turbo Fluid DR 46 is to a great extent able to withstand rapid decomposition of the Ester base fluid under the influence of moisture and water in the oil system.

- **Good demulsibility**
  To enable rapid separation from water for improved service intervals.

- **Good air release**
  Rapid air-release minimizes air entrapment in lubrication and governor control systems in order to ensure safe operation of the whole equipment.

- **Low foaming**
  Minimal tendency for foaming to provide proper lubrication and heat transfer.

Main Applications

- **Lubrication of steam and gas turbines**
  Shell Turbo Fluid DR 46 can be used as lubrication oil for main bearings in steam and gas turbines, generators and cooling pumps.

Specifications, Approvals & Recommendations

- **Hydraulic fluid**
  It can be used as hydraulic fluid in electrohydraulic governor control systems in steam and gas turbines.

- **Shell Turbo Fluid DR 46 is approved and/or exceeds the requirements of the major original equipment manufacturers such as General Electric (GE), Mitsubishi Hitachi Power Systems (MHPS), and Siemens, etc.**

- **Shell Turbo Fluid DR 46 appears in the FM Global (formally Factory Mutual) Approvals Guide against project identification number 3024866 as an approved fire resistant hydraulic fluid for turbine applications.**

  For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Compatibility & Miscibility

- **Compatibility - Packing, seals and hoses**
  The following materials are recommended for use with Shell Turbo Fluid DR 46: Butyl rubbers, Nylon, PTFE, VITON rubber (depending on operation temperature range).

- **Compatibility - Paintings**
  Attention must be paid to painted surfaces. Epoxy paints can be seen as resistant to Shell Turbo Fluid DR46.
Typical Physical Characteristics

<table>
<thead>
<tr>
<th>Properties</th>
<th>Method</th>
<th>Shell Turbo Fluid DR 46</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO Viscosity Grade</td>
<td>ISO 3448</td>
<td>46</td>
</tr>
<tr>
<td>Kinematic Viscosity @40°C</td>
<td>ISO 3104</td>
<td>43.4</td>
</tr>
<tr>
<td>Kinematic Viscosity @100°C</td>
<td>ISO 3104</td>
<td>5</td>
</tr>
<tr>
<td>Density @15°C</td>
<td>ISO 3675</td>
<td>1130</td>
</tr>
<tr>
<td>Flash Point (COC)</td>
<td>ISO 2592</td>
<td>270</td>
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<tr>
<td>Fire Point (COC)</td>
<td>ISO 2592</td>
<td>368</td>
</tr>
<tr>
<td>Auto ignition temperature</td>
<td>ISO 3104</td>
<td>43</td>
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<tr>
<td>Pour Point</td>
<td>ISO 3016</td>
<td>-20</td>
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<tr>
<td>Neutralization Number</td>
<td>ISO 6619</td>
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<tr>
<td>Water Content</td>
<td>ISO 6296</td>
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<tr>
<td>Cleanliness</td>
<td>ISO 4406</td>
<td>-15/12</td>
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<tr>
<td>Air Release, Minutes</td>
<td>ISO 9120</td>
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</tr>
</tbody>
</table>

These characteristics are typical of current production. While future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/
- Protect the Environment
  Take used oil to an authorized collection point. Do not discharge into drains, soil or water.

Additional Information

- Fluid Conditioning
  In order to ensure a long fluid life it is essential to keep the fluid clean and dry and to maintain a low level of acidity. Special advice for the treatment of the product in service can be requested from your supplier.

- Advice
  Advice on applications not covered here may be obtained from your Shell representative.