**Shell Morlina S4 B 460**

**Advanced Bearing & Circulating Oils**

Shell Morlina S4 B oils are high performance synthetic bearing and circulation lubricants, based on high performance base fluids. They offer outstanding lubrication performance under severe operating conditions, including improved energy efficiency and long service life even in severe operating conditions.

### Performance, Features & Benefits

- **Long oil life - maintenance saving**
  
The use of highly stable synthetic base oils in conjunction with a robust rust and oxidation inhibitor package helps provide excellent oxidation and thermal stability. This provides Shell Morlina S4 B with extending maintenance capability compared to conventional oils.

  In addition it resists the formation of harmful products of oxidation at high operating temperatures, to help maintain system cleanliness and therefore reliability of the equipment.

- **Excellent wear and corrosion protection**
  
  Shell Morlina S4 B has been formulated to provide excellent anti-wear performance and provides high levels of wear protection for plain and rolling element bearings and moderately loaded gearboxes, compared to mineral oil-based products. This helps provide superior gear and bearing component life.

  In addition it also provides outstanding rust and corrosion protection of all metal surfaces.

- **Enhancing system efficiency**
  
  Shell Morlina S4 B can help improve the efficiency of lubrication in bearing and circulating systems. The superior low temperature performance and reduced change in viscosity with increase in temperature in comparison to mineral oil-based products provides better lubrication at low start-up temperatures and the opportunity for energy savings through reduced pumping and flow losses during normal operating conditions.

  Rapid water shedding and air release properties further enhance the efficiency of the lubrication system by helping maintain critical oil films between loaded components.

### Main Applications

- **Severe operating conditions**
  
  Shell Morlina S4 B is recommended for systems including moderately loaded gearboxes, operating under severe conditions such as low or high temperatures or with wide temperature variations.

- **Lubricated for life systems**
  
  The long oil life of Shell Morlina S4 B makes it suitable for use in certain "lubricated-for-life" systems.

- **Bearing and circulating oil systems**
  
  Suitable for use in systems containing plain or rolling element bearings, including those highly loaded bearings found in such as those found in cement or quarrying applications.

### Specifications, Approvals & Recommendations

- **Alfa Laval Group D gearbox applications**
- **Aerzen Maschinenfabrik GmbH Blower Applications**
- **Baltimore Aircoil Gear Boxes**
- **Cincinnati Machine Various P applications**
- **David Brown Table H applications**
- **Emerson Power Transmission**
- **GEA Westfalia Separator GmbH**
- **Renold Gears (various applications)**
- **Sharpe E-series worm gear reducers**
- **W Insmith (Peerless-W Insmith Inc) worm gear reducer**
- **ISO 12925-1 Type CKS specification**
For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk, or the OEM Approvals website.

**Compatibility & Miscibility**

- **Seal & Paint Compatibility**
  Shell Morlina S4 B is compatible with all seal materials and paints normally specified for use with mineral oils.

**Typical Physical Characteristics**

<table>
<thead>
<tr>
<th>Properties</th>
<th>Method</th>
<th>Shell Morlina S4 B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity Grade</td>
<td>ISO 3448</td>
<td>460</td>
</tr>
<tr>
<td>Kinematic Viscosity @40°C</td>
<td>mm²/s</td>
<td>ISO 3104 460</td>
</tr>
<tr>
<td>Kinematic Viscosity @100°C</td>
<td>mm²/s</td>
<td>ISO 3104 45.5</td>
</tr>
<tr>
<td>Viscosity Index (VI)</td>
<td>ISO 2909</td>
<td>155</td>
</tr>
<tr>
<td>Flash Point</td>
<td>°C</td>
<td>ISO 2592 (COC) 274</td>
</tr>
<tr>
<td>Pour Point</td>
<td>°C</td>
<td>ISO 3016 -42</td>
</tr>
<tr>
<td>Density @15°C</td>
<td>kg/m³</td>
<td>ISO 12185 855</td>
</tr>
<tr>
<td>Emulsion Test</td>
<td>mins</td>
<td>ASTM D 1401 30</td>
</tr>
<tr>
<td>Foam Test, Seq II</td>
<td>ml foam @0/10 mins</td>
<td>ASTM D 892 0/0</td>
</tr>
<tr>
<td>FZG Load Carrying Test</td>
<td>failure load stage</td>
<td>DIN 51354-2 A/B 3/90</td>
</tr>
</tbody>
</table>

These characteristics are typical of current production. Whilst 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 authorised collection point. Do not discharge into drains, soil or water.

**Additional Information**

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