Introduction

Plurasafe Quenchant is a non-flammable polymeric quenchant manufactured by BASF. The product is comprised from an aqueous solution of polyalkylene glycol and a nitrite based corrosion inhibition system.

These are further diluted to a working concentration prior to use.

Advantages

• Eliminates fire risks due to the relatively high concentration of water

• Eliminates smoke, soot and oil quenchant residues, making a cleaner working environment and easier equipment maintenance.

• A high degree of flexibility since optimum quenching conditions for a specific material or component may be determined by control of concentration, bath temperature, and/or agitation.

• Minimises the replacement and control requirements common to PVA and soluble oil quenchants due to deterioration and/or oxidation.

• Minimises the residual stress, distortion and soft spotting associated with water quenching of aluminium based materials.

• Produces clean components ready for further processing – drag out losses are reduced compared to oil and no degreasing is necessary.

• The quenchant is fully soluble in water (below its cloud point) and easily mixed to the operating concentration.

• Good anti-corrosion properties, protecting the quenching system.

• Extended lifetime due to low levels of drag out and bath deterioration.
Physical properties

<table>
<thead>
<tr>
<th>Properties</th>
<th>Plurasafe Quenchant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density at 20 °C (kg/m³)</td>
<td>1098</td>
</tr>
<tr>
<td>Refractive index at 20 °C</td>
<td>1.41</td>
</tr>
<tr>
<td>Viscosity at 40 °C (mm²/sec)</td>
<td>450</td>
</tr>
<tr>
<td>Flash point</td>
<td>None</td>
</tr>
<tr>
<td>Fire point</td>
<td>None</td>
</tr>
<tr>
<td>Pour point</td>
<td>None</td>
</tr>
<tr>
<td>pH</td>
<td>Slightly alkaline</td>
</tr>
<tr>
<td>Cloud point</td>
<td>74 °C</td>
</tr>
</tbody>
</table>

Applications

Aluminium quenching

The solution heat treatment procedures for aluminium alloys, in either the cast, forged or wrought form, has traditionally incorporated a water quench. The use of Plurasafe Quenchant can minimise the residual stress, and therefore distortion levels, produced during the quenching phase of thermal treatment without sacrifice of mechanical or intergranular corrosion properties. Age-hardenning of the components then proceeds as for water quenched items irrespective of whether natural or artificial ageing procedures are used.

Ferrous quenching

For ferrous heat treatment Plurasafe Quenchant has been successfully used for the induction and flame hardening of components such as gears, shafts, steering racks and other items of variable geometry and steel composition. Plurasafe Quenchant has also found application during the quenching of a wide variety of component size/chemistry combinations from shaker, pit, integral quench or continuous furnaces employing either oxidising or protective atmospheres.

Note

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North America:
BASF Corporation
100 Park Avenue
Florham Park
NJ 07932
USA

South America:
BASF S/A
Av. das Nacöes Unidas 14171,
Morumbi
04794-000 Sao Paulo, SP
Brazil

Asia Pacific:
BASF East Asia Regional Headquarters Ltd.
45/F, Jardin House,
1Connaught Place, Central
Hong Kong

Europe:
BASF SE
Fuel and Lubricant Solutions
67056 Ludwigshafen
Germany
www.basf.com/lubes