General care and maintenance for cooling lubricants (CL)
Notes on water-soluble cooling lubricants (CL)

**CL requirements**
- The cooling lubricant being used must meet the requirements stipulated by TRGS 611.
- No corrosion of seals, elastomers and machine paintwork.
- Corrosion protection for use in accordance with regulations.
- Good filtering and separation capabilities.
- Minimal formation of foam, rapid degassing.
- Optimised capabilities for separating lubricating and leakage oil.
- Resistant against bacteria and fungus.
- Free of aggressive and harmful additives.

**Application**
- Observe safety data sheet for the cooling lubricant!
- Apply in accordance with regulations from the coolant manufacturer. The mixing water should be of drinking-water quality. When refilling and topping up the cooling lubricant, always fill via a dosing and mixing device.
- Supervise handling of cooling lubricants for employees, e.g. see trade association regulations BGR143.

**Care and monitoring**
- Check condition of the CL at the intervals specified in the CL test schedule.
- Synthetic cooling lubricants do not usually provide effective corrosion protection.

> Check that the synthetic CL has good corrosion prevention qualities to prevent damage to the CL unit. (Pre-specified concentration! Low levels of salt! Sufficient corrosion prevention inhibitors!).

- Hydraulic oils in machine tools must not be deterging (water-resistant).
- Do not introduce any chemicals, waste material, colour or impurities into the cooling lubricant.
- Avoid adding foreign oils. Remove oil floating on the surface.
- Keep the temperature of the CL as far below 25°C as possible.
- Keep CL moving constantly (cyclic circulation, also recommended when machine not in operation).
- Check CL regularly and add preserving agent later if necessary.
- Drain used cooling lubricants from the unit immediately and dispose of! Danger to people, the environment and the unit! Clean the unit thoroughly using mechanical means.
- Keep work areas as dry as possible (e.g. eliminate puddles of fluid under floor gratings).
Environmental protection, water pollution prevention

- Observe local regulations (VAwS) for handling water-polluting materials when operating, decommissioning or disassembling the unit or parts thereof!

Cleaning the coolant reservoirs

- Cleaning intervals depend to a large extent on type of processing, material, coolant and operating hours, which is why a generally applicable cleaning intervals cannot be specified. As a guide value, a cleaning interval of about 6 months is recommended.
## Cooling lubricant maintenance plan

<table>
<thead>
<tr>
<th>Parameter to be monitored</th>
<th>Interval</th>
<th>Test methods</th>
<th>Measures / Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 General check</strong> (perceivable changes)</td>
<td>Daily</td>
<td>Poor appearance, bad smell, oil does not emulsify (floats on surface) Deposits in the system and on workpieces (e.g. sediment, adhesive, gel formations)</td>
<td>Pinpoint and eliminate causes (organic impurities, cigarette butts, etc.); Separate oil, circulate or ventilate CL; check filters. Check concentration content Prevent foreign substances from entering. Optimise cleaning procedure Replace KSS, treat unit with system cleaner before replacing</td>
</tr>
<tr>
<td><strong>2 Temperature</strong> Specified value: &lt; 25° C</td>
<td>Daily</td>
<td>Thermometer</td>
<td>Increase CL volume, cool CL.</td>
</tr>
<tr>
<td><strong>3 pH-value</strong> Specified value: 8.5-9.5 pH Deviations only on consultation with Knoll</td>
<td>Weekly</td>
<td>Check pH-value with pH test paper or electrometrically in accordance with DIN 51369</td>
<td>In the event of a pH-value decrease &gt; 0.5 compared to specified value: —&gt; check the concentration, add concentrate if necessary. If the concentration is correct, it can be assumed that the pH-value is falling because of high bacteria levels —&gt; add stabilisers. If the pH-value falls below 8 —&gt; clean unit and fill with fresh emulsion.</td>
</tr>
<tr>
<td><strong>4 Nitrate content</strong> in water used Specified value: &lt; 25 mg/l as far as is possible maximum 50 mg/l</td>
<td>When refilling and topping up</td>
<td>Test stick / analysis by water plant</td>
<td>Use water from public water supply or mix in demineralised water or water with a low nitrate content.</td>
</tr>
<tr>
<td><strong>5 Nitrite content</strong> Specified value: max. 20 mg/l</td>
<td>Weekly</td>
<td>Test stick method or in accordance with DIN 38405 Part 10</td>
<td>If 20 mg/l is exceeded: replace CL in full or in part or use suitable tested inhibiting additives or measure nitrosamine levels (NDELA”) in the CL and in the air: If &gt; 5 mg/kg NDELA” in CL —&gt; replace CL, clean CL circuit and disinfect, pinpoint nitrite source.</td>
</tr>
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<td>6 Concentration</td>
<td>Weekly</td>
<td>Manual refractometer or express laboratory available from manufacturer</td>
<td>Add concentrate and water. Excessive concentrations have an irritant effect and can cause skin diseases. <strong>Note:</strong> Synthetic cooling lubricants do not usually provide effective corrosion protection. <strong>Important:</strong> Check that synthetic CL has good corrosion prevention qualities to prevent damage to the CL unit. (Pre-specified concentration! Low levels of salt! Sufficient corrosion prevention inhibitors!)</td>
</tr>
<tr>
<td>7 Germ count*</td>
<td>Weekly</td>
<td>Test strips (dip slide)</td>
<td>A status description of the CL with regard to microbial levels should be based on known parameters (perceivable changes, decrease of pH-value, concentration, nitrite content).</td>
</tr>
<tr>
<td>8 Conductivity*</td>
<td>Fortnightly</td>
<td>Conductivity measuring device</td>
<td>Sharp increases in conductivity indicate an increase in conductive minerals and thus a deterioration of the CL quality. Conductivity measurements are temperature-dependent.</td>
</tr>
</tbody>
</table>

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The measurements as per nos. 2-6 are specified in accordance with TRGS 611 (technical regulations for dangerous materials 611). The measured results must be documented.

* = The measurements as per nos. 7 and 8 are used to supplement the status profile of the CL.

*1= N-nitrosodiethanolamine

Source of the specified limit values: TRGS 611

Different country-specific or regional requirements and laws must be taken into consideration.