

TECHNICAL DELIVERY SPECIFICATION

II Technical Equipment Instructions

TA06 Cooling Lubricating Technology

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1 Scope of Application

The technical instructions described here apply specifically to the cooling lubricating technology of the machine/machine system. They supplement the instructions listed in document I General Information of the Technical Delivery Specification of ZF Friedrichshafen AG and alongside these, are valid for all ZF plants.

2 General Requirements

2.1 Approved list

Only components, assemblies, devices and process materials appearing in the approved list may be used.

2.2 Accessibility

All components, assemblies and devices must be accessible for maintenance and repair work and may not be concealed by pipes or hoses or any other components/assemblies.

2.3 Minimal quantity lubrication / Dry machining

The option of minimal quantity lubrication machining and/or machining without cooling lubricant (dry machining) shall be discussed with the Customer.

2.4 Tightness

The machine/machine system must not leak any and be resistant to cooling lubricant.

2.5 Other requirements

Separate pumps are to be used for coolant, high pressure and flushing.

The machine/machine system's interior and exterior must be flushed so that no machining residues are left in the cooling lubricant system. The cooling lubricant must completely drain from the machine/machine system interior.

When the cooling lubricant drains, there must be no backup of the medium or creation of foam.

3 Normative References

As a basic principle, the agreements listed in document I General Information regarding normative references apply.

An informative overview on the country-specific laws, guidelines and standards can be found in the Appendix (Chapter 9) of this document.

4 Cooling Lubricant Systems

4.1 Individual systems

4.1.1 General requirements

The cooling lubricant system must include protection from dry operation and a level monitor. Additional monitoring equipment must be coordinated with the Customer.

Band filter systems or backflushing filters must be used.

For water-based cooling lubricants, a settling zone with evacuation system shall be provided for flooding leak oil.

4.1.2 Cooling lubricant reservoirs

Cooling lubricant reservoirs must be sealed from contaminants. A medium return from the feed and drain units into the cooling lubricant reservoir is not permitted.

The cooling lubricant reservoir's size must be at least three to five times the pump capacity.

Cooling lubricant reservoirs must comply with VDI 3035.

4.1.3 Filling

It must be possible to fill the cooling lubricant system with cooling lubricant while the machine/machine system is being operated.

4.2 Central units

If a central cooling lubricant system or a central cooling lubricant supply should be provided, the details must be discussed with the Customer.

4.3 Cooling system

In accordance with the agreements reached with the Customer.

5 Filters

The cooling lubricant system filters must last for at least three months under the machine's operating conditions. At the same time, the cooling lubricant must be kept clean according to specification/operating conditions.

Filters must be accessible and the filter inserts replaceable without disassembling other components/assemblies.

It must be possible to clean the filters quickly. Automatic cleaning systems may also be used.

A filter must be placed in supply lines upstream of coolers and heat exchangers.

6 Valves

When the main switch is turned off, the media supply and removal line must be interrupted by e. g. automatically closing valves.

When the workpiece is changed manually, a solenoid valve must automatically interrupt the cooling lubricant feed.

The solenoid valve model and its activation must comply with the Federal Water Act (WHG). Pressure blows in the pipeline system are not permitted.

7 Other Assemblies

The interior of the dividers, turrets, headstocks, measuring systems or other assemblies that are integrated in the cooling lubricant system or in other surrounding media systems must be charged with positive pressure (sealing air).

8 Piping and Hose Lines

Cooling lubricant transport lines must be black pipe or made of S-235 JR (St 37). The pipeline must be labeled according to DIN 2403/2404 (type of medium, direction of flow).

8.1 Flush line

A rinsing hose R 1/2" with rinsing gun must be provided to clean the surface of components and assemblies in the machine/machine system interior with cooling lubricant instead of compressed air.

9 Appendix: Other Applicable Documents

9.1 German requirements

Re 4.1.2 Cooling lubricant reservoirs

VDI 3035	Requirements for machine tools, production facilities and peripheral equipment when working with cooling lubricants
DIN 2403	Identification of pipelines according to the fluid conveyed
DIN 2404	Identification Color Code for Heating System Pipelines

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