







# ZET CHEMIE®

Products and services for metalworking

-  Cooling lubricants
-  Cutting oils / grinding oils
-  Corrosion protection
-  Metal cleaners
-  Industrial lubricants
-  Service & accessories



Management System  
ISO 9001:2015  
[www.tuv.com](http://www.tuv.com)  
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## Hints on handling water-miscible cooling lubricants

### Cooling lubricant exchange

- Add 3-5% ZET system cleaner to the cooling lubricant circulation
- Allow to run in the process for approx. 48 hours
- Empty and clean the machine
- Dispose of the used mineral oil-based, halogen-free emulsion according to waste code 12 01 09

### Mixing

- Mixing water should be of drinking water quality
- Prepare the mixture using a mixing device; if preparing manually, always add the cooling lubricant concentrate to the water, not vice versa
- Use only clean preparation vessels

### Checking

- Measure the concentration **daily** using a refractometer
- Set the usage concentration according to the product data sheet
- Measure the pH value **weekly**
- Guiding value between pH 8.5 und 9.5, depending on the product
- Send a sample (250ml) **monthly** to the ZET-CHEMIE laboratory
- We will determine the current condition of the cooling lubricant



## Technical terms of the material safety data sheet

### Waste code number

A sorting concept for waste that consists of six numbers which characterise the waste.

For example

Emulsion	12 01 09
Used oil	13 02 05
Solvent	14 02 05

### CAS no. "Chemical Abstracts System"

An internationally recognised systematisation used to identify and evaluate chemical compounds and natural substances.

### Flashpoint

The flashpoint specifies the temperature at which, under defined conditions the air/oil vapour mixture above the surface of a heated oil flashes, when approaching an igniting flame (only flashes, not continues burning).

### Auto-ignition temperature

According to DIN 51794, the auto-ignition temperature is the lowest determined temperature of a flammable liquid at which, in a mixture with air, an ignition takes place without the action of a naked flame.

### Water hazard class

A number from 1 to 3 that expresses the hazard potential of a substance or a substance mixture.

WHC 1 slightly hazardous to water  
WHC 2 explicit hazardous to water  
WHC 3 very hazardous to water

Portfolio extract  
Cooling lubricants



Product

Description

ZET-cut 1310

LABEL-FREE

The product is suitable for the **general machining** of steel, non-ferrous and light metals. Mineral oil content approx. 56%

ZET-cut 4100

LABEL-FREE

DERMATOLOGICALLY TESTED

ZET-cut 4100 has proven itself as an all-rounder in the field of **boron and amine-free** cooling lubricants. Thanks to the selected raw materials the product is very skin-friendly. Mineral oil content approx. 45%

ZET-cut 9808

This product is used especially in the machining of non-ferrous metals and is characterized by **an effective inhibitor that prevents the deposition of copper ions**. Machines and parts remain free from disruptive depositions. Mineral oil content approx. 35%

ZET-cut 9800

DERMATOLOGICALLY TESTED

This boron-free cooling lubricant is characterised by good rinsing and **low formation of residues**. Suitable for the general machining of steel and aluminium alloys. Mineral oil content approx. 45%

ZET-cut 9705

Boron- and formaldehyde -free product for grinding **with outstanding rinsing effect**. Mineral oil content approx. 25%

ZET-cut 9200

DERMATOLOGICALLY TESTED

Finely dispersed high-performance emulsion for the heavy-duty machining of aluminum-alloys and steel. The product has a **very good biostability** due to a selected combination of amines. Mineral oil content approx. 25%

ZET-viscowas 43

DERMATOLOGICALLY TESTED

**Mineral oil-free machining** fluid with outstanding cooling and lubricating properties. This product is used for difficult machining operations on aluminium and stainless steels and is very skin-friendly due to its low pH. Mineral oil content 0%

ZET-cut 520

DERMATOLOGICALLY TESTED

Special solutions are required for the **grinding of hard metals**. ZET-cut 520 reliably prevents the release of cobalt from the hard metal compound. Mineral oil content 0%

ZET-cut 521

DERMATOLOGICALLY TESTED

ZET-cut 521 is used for all **common grinding operations** on steel and its alloys. The product is bio-stable and low-foaming. Mineral oil content 0%

Recommended areas of application

	Turning	Milling	Drilling	Thread cutting	Deep hole drilling	Grinding	Sawing	Non-ferrous metals	Aluminium	Steel	Stainless steel	Hard metal	free from boric acid	free from amines	free from Formaldehyde
	Application							Material				Properties			
ZET-cut 1310	++	++	++			+				++	+		<0,1%		++
ZET-cut 4100	++	++	++	++	+			++	++	++	++		++	++	++
ZET-cut 9808	++	++	++	+	+			++	+	++	++		++	++	++
ZET-cut 9800	++	++	++	++	+		++		++	++	++		++		++
ZET-cut 9705	+	+	+			++				++	++		++		++
ZET-cut 9200	++	++	++	++	++	+			++	++	++		++		++
ZET-viscowas 43	++	++	++	++	++	+	+		++	+	+		++		++
ZET-cut 520						++						++	++		++
ZET-cut 521						++			++	++			++		++

Portfolio extract  
Cutting oils / grinding oils

Product	Description
ZET-cut 6006 GTL	<b>Universally usable</b> cutting oil based on latest GTL base oil technology (gas-to-liquids) for light to medium-duty machining of non-ferrous metals, light metals and steel. The product is light-coloured, odourless and oil mist-reduced.
ZET-cut 620	<b>Very high-performance cutting oil</b> for the demanding machining of steel and its alloys. The product contains excellent wear-protection additives.
ZET-cut 630	<b>High-performance product for the machining</b> of hard and tough ferrous materials up to tempered steels. Difficult types of machining such as hobbing or thread cutting are also reliably mastered.
ZET-cut 6020 GTL	Through the use of the <b>latest base oil technology (gas-to-liquids)</b> , ZET-cut 6020 GTL is characterised by ultra-low oil-mist formation and evaporation losses, a high flashpoint and outstanding air separation capacity.
ZET-cut 6070 GTL <i>DERMATOLOGICALLY TESTED</i>	The product, which is likewise based on GTL oil, is <b>crystal-clear</b> and can be used for the machining of steels, non-ferrous metals and aluminium. An <b>expert's report on cytotoxicity</b> exists for this product (it is classified as non-cytotoxic).
ZET-cut 6040 GTL	The high-performance GTL-based cutting oil is suitable for machining as well as deep and tooth flank grinding of high-alloy steels. An <b>expert's report on cytotoxicity</b> exists for this product (it is classified as non-cytotoxic).
ZET-grind TT 200 <i>DERMATOLOGICALLY TESTED</i>	GTL-based grinding oil with low viscosity for hard metals.
ZET-cut 688	For <b>broaching and gear cutting of high-alloyed steels</b> or for heavy-duty machining work such as thread-forming.
ZET-cut 678	<b>Low-viscosity deep-drilling oil</b> for difficult machining work. Despite its low viscosity the product offers only very low evaporation losses. It is based on highly refined base oils.
ZET-stanz 57	Special lubricant <b>for the punching of metal plates</b> up to approx. 6 mm. The product evaporates without leaving residues. Parts can be painted over without cleaning.
ZET-cut MS 1054	<b>Minimum-quantity lubricant</b> on a fatty alcohol basis. Water-clear minimum-quantity lubricant for the machining of aluminium; leaves practically no oil film behind on parts.

Recommended areas of application

	Turning	Milling	Drilling	Thread cutting/forming	Deep hole drilling	Grinding	Sawing	Punching	Honing/lapping	Non-ferrous metals	Aluminium	Steel	Stainless steel
	Application									Material			
ZET-cut 6006 GTL	++	+	+							++	++	+	
ZET-cut 620	++	++	+							++	++	++	++
ZET-cut 630	++	++	++	++						+	++	++	++
ZET-cut 6020 GTL	++	++	++	++	++					+	++	++	++
ZET-cut 6070 GTL	++	++	++	++	+					++	++	++	++
ZET-cut 6040 GTL	++	++	++	++	+	+					++	++	++
ZET-grind TT 200						++				++	++	++	++
ZET-cut 688	+	+	+	++	++				++			++	++
ZET-cut 678	++	++	++		++				++	+	++	++	++
ZET-stanz 57								++		++	++	++	
ZET-cut MS 1054							++			++	++		

Portfolio extract  
Corrosion protection



Product	Description
ZET-corr 810	For <b>dewatering parts</b> that have been machined beforehand with water-miscible cooling lubricants. Leaves practically no film behind. Odourless and barium-free, flashpoint >62 °C
ZET-corr 812	For the <b>intermediate storage</b> of parts. Leaves behind an easily removable, oily, thin anti-corrosion film. Barium-free, flashpoint >62 °C
ZET-corr 814	<b>High-performance corrosion protection</b> for spraying or immersion. Leaves behind an oily to greasy film with a long-lasting effect. Barium-free, flashpoint >62°C
ZET-corr 815	Leaves behind a <b>highly active greasy anti-corrosion Im</b> with a long protection duration. Suitable for spraying and immersion. Barium-free, flashpoint >62°C
ZET-corr 818	This dewatering fluid leaves behind a very effective <b>micro-molecular anti-corrosion Im</b> . Long protection duration with a thin, easily removable film. Barium-free, flashpoint >62°C
ZET-corr 830	Anti-corrosion oil for oiling metal plates or parts. The product is free from <b>solvents and VOCs</b> . The remaining film is easily removable. Barium-free, flashpoint >100°C
ZET-corr 600E	<b>Water-emulsi able anti-corrosion concentrate</b> for all metals. Prepared as a 10% solution in water, ZET-corr 600E leaves behind an outstanding anti-corrosion film. Can also be used hot. Barium-free.
ZET-corr P1	<b>Thixotropic corrosion protection paste</b> with self-healing properties. For applications in which minimal draining behavior is required. It can replace hot-dip products and is also suitable for corrosion protection during overseas transport.
ZET-Rostschutzkonzentrat	For the <b>doping of anti-corrosion baths</b> in cleaning plants in the last tank. Barium-free, flashpoint >180°C
ZET-corr KS1	Anti-corrosion concentrate suitable for <b>pressure testers or cooling water circuits</b> . Usage approx. 1 - 2% of the water quantity in use.

Recommended areas of application

	Rarely Im formation	Oily/thin Im	Greasy Im	Waxy Im	Solvent-based	Solvent-free/emulsi able	Storage
	Application				Properties		
ZET-corr 810	++				++		approx. 2 week
ZET-corr 812		++			++		approx. 6 months
ZET-corr 814			++		++		approx. 8 months
ZET-corr 815				++	++		approx. 10 months
ZET-corr 818		++			++		approx. 12 months
ZET-corr 830		++				++	unlimited
ZET-corr 600 E*	++	++	++	++		++	concentration-dependent
ZET-corr P1			++				several years

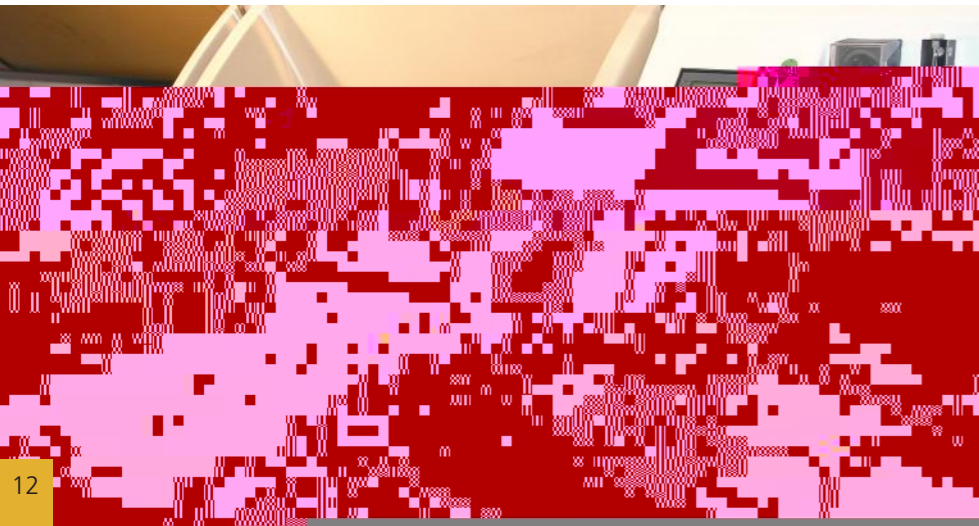
\* Film thickness is controlled by concentration



## Corrosion protection test

### Testing of the corrosion resistance of coated and uncoated components

- The corrosion resistance of a material or the anti-corrosion properties of a coating can be determined with the aid of a salt spray test.
- During the test, the test specimens are located in a chamber in which a 5% salt solution with a defined pH value is continuously nebulised at 35 °C. The mist precipitates on the test specimens.
- The normal test duration is 12 - 1000 hours. The test duration depends on the expected corrosion resistance of the material system under test.
- On completion of the test, the test specimens are rinsed off with deionised water in order to remove loose adhering corrosion products. The corrosive attack on the material is assessed visually or using a microscopic method.
- The corrosion resistance of a workpiece coated with an anti-corrosion agent is derived from the length of time that the test specimen survives in the test without the base metal corroding.
- We will also carry out the test on your original parts.



## Important hazard symbols according to GHS

Health hazard	Directive 67/548 EEC			CLP regulation (EU) No. 1272/2008		
	Hazard symbol	Hazard information	Hazard category	Pictograph	Hazard information	Hazard information
	Hazard description	Wording (classification category if necessary)	category (coding)	word	H-phrase	Wording
Acute toxicity	Harmful to health	Harmful to health if inhaled (vapours, gases, dusts, mists)				Harmful to health if inhaled
		Harmful to health in case of skin contact				Harmful to health in case of skin contact
Aspiration hazard	Harmful to health	Harmful to health if swallowed		Attention		Harmful to health if swallowed
		Vapours can cause sleepiness and drowsiness				Can cause sleepiness and drowsiness
Corrosive effect	Corrosive	Harmful to health: can damage the lungs if swallowed		Danger		Can be fatal if swallowed or inhaled
		Causes severe chemical burns				
Irritating to skin, eyes, respiratory tract	Irritating	Causes chemical burns		Danger		Causes severe skin burns and serious damage to the eyes
		Risk of serious eye injuries				Causes serious damage to the eyes
		Irritates the eyes		Danger		Causes serious irritation of the eyes
Sensitisation of respiratory tract, skin	Harmful to health	Irritates the skin				Causes severe irritation of the skin
		Irritates the respiratory tract		Attention		Can irritate the respiratory tract
		Sensitisation possible through inhalation		Danger		Can cause allergies, asthma-type symptoms or respiratory complaints if inhaled
Gamete mutagenicity	Corrosive	Sensitisation possible through skin contact		Attention		Can cause allergic skin reactions
		Can cause inheritable damage	Muta. cat. 1	Danger		Can cause genetic defects
Carcinogenicity	No symbol	Irreversible damage possible	Muta. cat. 2			Can presumably cause genetic defects
		Can cause cancer	Muta. cat. 3	Attention		Can presumably cause genetic defects
Reproductive toxicity	Harmful to health	Can cause cancer through inhalation	Muta. cat. 1	Danger		Can cause cancer
		Can cause cancer through inhalation	Muta. cat. 1	Danger		Can cause cancer if inhaled
		Suspected of being carcinogenic	Muta. cat. 3	Attention		Can presumably cause cancer
		Can negatively affect reproductive ability	Repr. cat. 1			Can negatively affect fertility
Specific target organ toxicity (single exposure)	(very) toxic	Can harm the child in the womb	Repr. cat. 1 or Repr. cat. 2	Danger		Can harm the child in the womb
		Can negatively affect reproductive ability, Can harm the child in the womb	Repr. cat. 2	Danger		Can negatively affect fertility, Can harm the child in the womb
		May possibly negatively affect reproductive ability	Repr. cat. 3	Attention		Can presumably negatively affect fertility
		May possibly harm the child in the womb	Repr. cat. 3	Attention		Can presumably harm the child in the womb
Specific target organ toxicity (single exposure)	Harmful to health	May possibly negatively affect reproductive ability, May possibly harm the child in the womb				Can presumably negatively affect fertility, Can presumably harm the child in the womb
		Can harm babies via their mother's milk		No pictograph		Can harm babies via their mother's milk
Specific target organ toxicity (single exposure)	Harmful to health	Serious risk of irreversible damage (in conjunction with R26, 27 and/or 28 as well as with R23, 24 and/or R25)		Danger		Damages the organ(s) (if inhaled/ swallowed/in case of skin contact)
		Irreversible damage possible (in conjunction with R20, 21 and/or 22)		Attention		May damage the organ(s) (if inhaled/ swallowed/in case of skin contact)

Portfolio extract  
Metal cleaners

Product	Description
ZET-clean 8-10	<b>Cold cleaner</b> for degreasing steel, aluminium and non-ferrous metals. Evaporates very quickly. <b>Flashpoint &lt;10 °C</b> , evaporation number 6
ZET-clean 25	<b>Chlorine-free cold cleaner</b> , low-aromatic, for degreasing steel, aluminium and non-ferrous metals. <b>Flashpoint &gt;29°C</b> , evaporation number 30
ZET-clean 56 S	<b>Isoparaf n-based, fast evaporating cleaner</b> for automatic metal cleaning machines. <b>Flashpoint &gt;56°C</b> , evaporation number 87
ZET-clean 57	<b>Isoparaf n-based cold cleaner</b> , odourless, for the general degreasing of metals. <b>Flashpoint &gt;62°C</b> , evaporation number 110
ZET-clean 78 BIO	<b>Biodegradable cold cleaner</b> , dissolves oil and grease well, water-miscible. <b>Flashpoint 17°C</b> , evaporation number 17
ZET-clean 82	This cleaner, which is based on modified alcohols, is especially suitable for use in <b>cleaning plants</b> and is characterised by a high solvent action, residue-free drying and toxicological harmlessness. <b>Flashpoint &gt;62°C</b>
ZET-cleaner 132/1	<b>Strong aqueous cleaner</b> that also removes burnt-on oil residues or persistent dirt such as polishing paste.
ZET-cleaner 1364	<b>Spray cleaner</b> for steel and aluminium alloys from 40 °C, low-foaming, very gentle on materials. Well suited for all types of spray degreasing machines.
ZET-cleaner 188	Universally usable, water-miscible cleaner for <b>general machine cleaning</b> and immersion degreasing, usable in ultrasonic baths.
ZET-corr 600 E	<b>Water-emulsible cleaning and anti-rust concentrate</b> , especially for metal and cast parts stored indoors. Corrosion protection from 2 - 24 months is achieved depending on the concentration used.

Recommended areas of application

	Solvent-based	Aqueous	Immersion	Spraying	Manually	Ultrasonic	Vapour degreasing	Steel	Non-ferrous metals	Aluminium	Corrosion protection	pH-Value (c=3%)	Usage temperature
	Properties		Application				Material			Characteristics			
ZET-clean 8-10	++		++		++			++	++	++			cold
ZET-clean 25	++		++		++			++	++	++			cold
ZET-clean 56 S	++		++	++	++		++	++	++	++			20-100°C
ZET-clean 57	++		++	++	++	++		++	++	++			20-100°C
ZET-clean 78 BIO	++				++			++	++	++			cold
ZET-clean 82	++		++			++	++						30-80°C
ZET-cleaner 132/1		++		++	++			++		++	++	13	35-80°C
ZET-cleaner 1364		++	++	++		++		++	+	++	++	9	35-80°C
ZET-cleaner 188		++	++		++	++		++	++	++	++	13	20-80°C
ZET-corr 600 E		++				++		++		++	++	7	20-80°C



## DIN designations for lubricants

Product	DIN designation	Remarks
<b>Circulating oil</b> <b>Hydraulic oil</b>	DIN 51524-1 HL	Good oxidation and anti-corrosion properties. Lubrication of mechanical and hydraulic systems subject to moderate to high loads.
<b>Hydraulic oil</b>	DIN 51524-2 HLP	As above, with extreme-pressure additive. For use at high temperatures and high pressures.
<b>Hydraulic oil</b>	DIN 51524-3 HVC	As before, with extra viscosity improver. For all hydrostatic systems with extreme pressures and very wide temperature ranges.
<b>Hydraulic oil</b>	DIN 51524-2 HLP-D	Like HLP classification, with extra detergent properties. For systems in which increased water absorption of the hydraulic oil is important.
<b>Bio-hydraulic oil</b>	HEES	Biodegradable oils on the basis of synthetic saturated esters.
<b>Machine oil</b>	L-AN	For simple lubrication points on machines.
<b>Circulating oil</b> <b>Gear oil</b>	DIN 51517-2 CL	Good oxidation and anti-corrosion properties. Lubrication of mechanical systems and bearings subject to moderate to high loads.
<b>Industrial gear oil</b>	DIN 51517-3 CLP	Like CL, but with extreme-pressure additive. For gears, bearings and couplings under high loads.
<b>Slideway and guideway oil</b>	DIN 51502 CGLP	Gear oils with adhesive additives. For slideway and guideway lubrication, very good anti-stick-slip property.
<b>Air compressor oil</b> <b>Compressor oil</b>	DIN 51506 VCL/VDL	Compressor oils for screw and piston compressors.

## Industrial lubricants

Product designation	Area of use
<b>HLP hydraulic oils</b>	These hydraulic oils are characterised by good demulsifying properties, high ageing stability and wear-protection properties. They according to DIN 51524 Part 2. Available in the viscosity range from ISO 2 - 150.
<b>HLP-D hydraulic oils</b>	Hydraulic oils according to DIN 51524 Part 2 with very good detergent/dispersal properties and wear protection. Available in the viscosity range from ISO 5 -150.
<b>HVC hydraulic oils</b>	For hydraulic systems in which minimal changes in viscosity are required with changing operating temperatures. The products according to DIN 51524 Part 3. Available in the viscosity range from ISO 15 - 68.
<b>CLP industrial gear oils</b>	High-performance gear oils for all areas of industry. The products according to DIN 51517 Part 3. The damage load stage is greater than 12. Available in the viscosity range from ISO 5 - 680.
<b>CGLP slideway/guideway oils</b>	Lubricants for guideways and guide rails that reliably prevent stick-slip. The mixing of cooling lubricants is avoided through good demulsifying properties. According to DIN 51502 CGLP. Available in the viscosity range from ISO 32 - 460.
<b>VDL compressor oil</b>	Compressor oils with low evaporation losses and high ageing stability according to DIN 51596 VDL. Used in piston and rotary compressors according to the manufacturer's instructions. Available in the viscosity range from ISO 68 - 150.
<b>Spindle oils</b>	Paraffin-based machine oils for the lubrication of spindles in machine tools. The products are oxidation-stable and water-white. Available in the viscosity range from ISO 2 - 32.
<b>Lubricating greases</b>	Multi-purpose greases, liquid greases, bearing greases, high-temperature greases, silicone greases in all NLGI classes and all container sizes from cartridges to drums.
<b>Specialities</b>	Food-safe lubricants, white oils, biodegradable lubricants, heat transfer oils, cylinder oils, chain oils, etc.

## Service

### Laboratory

In our fully equipped oil laboratory we

- develop custom products for you
- accompany lubricants analytically during their use
- carry out extensive incoming goods and quality checks

### Transport

Thanks to our own fleet of vehicles and in-house carrier

- deliver within 1 - 3 days
- take back your empty containers
- fill your machines on site

### Disposal

We dispose of the products delivered by us, such as

- emulsions with the waste codes 12 01 09
- cutting and grinding oils with the waste codes 13 02 05
- solvents with the waste codes 14 06 03

### Cooling lubricant service

Our specialists

- measure the cooling lubricant on your machine
- document the measured values
- make corrections if necessary



## Accessories

Product	Description
<b>Oil binder</b>	White granulate in two different granulations. Highly absorbent, incombustible, packed in 25-kg sacks.
<b>Refractometer, Dipslides</b>	for water-miscible cooling lubricants to measure the concentration, pH value, nitrite, copper, cobalt, etc.
<b>Mixing devices</b>	as attachment for drums to mix water-miscible cooling lubricants.
<b>Spray range</b>	Penetrating oil, fine conditioning oil, conditioning and anti-rust oil, metal degreaser, cutting oil EP spray, copper spray, release agent spray, silicone spray, grease spray with PTFE, PTFE dry lubricant, welding bead release agent, etc.
<b>Maintenance devices</b>	External oil separator, oil skimmer for extending the service lives of emulsions.
<b>Filter eece</b>	For paper belt filters for the filtration of water-miscible cooling lubricants and machining oils. Available in all qualities such as viscose, viscose-polyester, polyester and polypropylene.
<b>Skin care</b>	Care products for dealing with water-miscible cooling lubricants and machining oils.
<b>ZET-Fluidmanager</b>	Inline measurement technology <b>for monitoring of water-mixed cooling lubricants</b> . The most important parameters like concentration, pH value, conductivity and temperature are monitored. The option of automatic dosing depending on the measured concentration is also given.



<b>Cooling lubricant monitoring sheet</b> according to TRGS 611 - for machine:						
Cooling lubricant:				Concentration target value:		
Refractometer value:				pH target value:		
In use since:				Nitrite content target value:		
Week	Emulsion concentration %	pH-Value	Nitrite Value mg/l	Bacteriolog. measurement ordered	Special corrective measures	Remarks
1						
2						
3						
4						
5						
6						
7						
8						
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11						
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13						
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