

ZET CHEMIE®

Products and services for metalworking

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



Management
System
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www.tuv.com
ID 9105025655





Contacts

Switchboard:

Phone +49 7391 7008-30
 Fax +49 7391 7008-31
 sekretariat@zet-chemie.de

Management:

Philipp Zimmerhackl
 Phone +49 7391 7008-36
 p.zimmerhackl@zet-chemie.de

Jürgen Zimmerhackl
 Phone +49 7391 7008-37
 j.zimmerhackl@zet-chemie.de

Sales:

Michael Brandl
 Mobile +49 170 2742950
 m.brandl@zet-chemie.de

Marco Kriegisch
 Mobile +49 177 6851264
 m.kriegisch@zet-chemie.de

Jörg Hüther
 Mobile +49 170 4685282
 j.huether@zet-chemie.de

Jürgen Schindele
 Mobile +49 170 2462260
 j.schindele@zet-chemie.de

Ralf Schädel
 Mobile +49 152 08871501
 r.schaedel@zet-chemie.de

Hans-Peter Würthner
 Mobile +49 170 2650155
 hp.wuerthner@zet-chemie.de

Thomas Wild
 Mobile +49 177 5688307
 t.wild@zet-chemie.de

Application technology:

Helmut Baur
 Phone +49 7391 7008-47
 h.baur@zet-chemie.de

Materials planning:

Frank Mayer
 Phone +49 7391 7008-39
 Fax +49 7391 7008008-45
 f.mayer@zet-chemie.de

Patricia Guter
 Phone +49 7391 7008-46
 Fax +49 7391 7008008-45
 p.guter@zet-chemie.de

Quality management, Environmental management:

Yusuf Kocaöz
 Phone +49 7391 7008-56
 y.kocaoez@zet-chemie.de

Accounts:

Nicola Zimmerhackl
 Phone +49 7391 7008-33
 n.zimmerhackl@zet-chemie.de

Viktoria Bese
 Phone +49 7391 7008-53
 v.bese@zet-chemie.de

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Hints on handling water-miscible cooling lubricants

Cooling lubricant exchange

- Add 1-2% ZET system cleaner to the cooling lubricant circulation
- Allow to run in the process for approx. 24 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	The product is suitable for the general machining of steel, non-ferrous and light metals. Mineral oil content approx. 56%
ZET-cut 1380	Thanks to its outstanding rinsing effect and very good corrosion protection, ZET-cut 1380 is the ideal product for grinding. Mineral oil content approx. 20%
ZET-cut 4100	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 9800	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 9508	This product is used especially in the machining of non-ferrous metals and is characterised by an effective inhibitor that prevents the deposition of copper ions . Machines and parts remain free from disruptive depositions. Mineral oil content approx. 42%
ZET-cut 9300	Finely dispersed emulsion with very good anti-corrosion properties for the heavy-duty machining of aluminium alloys, steel and cast iron. Mineral oil content approx. 10%
ZET-viscowas 43	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	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	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 1380	+	+	+			++				++	++		<0,1%		++
ZET-cut 4100	++	++	++	++	+			++	++	++	++		++	++	++
ZET-cut 9800	++	++	++	++	+		++		++	++	++		++		++
ZET-cut 9508	++	++	++					++	++	++	++		++		++
ZET-cut 9300	++	++	++	++	++	+			++	++	++		++		++
ZET-viscowas 43	++	++	++	++	++	+	+		++	+	+		++		++
ZET-cut 520						++						++	++		++
ZET-cut 521						++				++	++		++		++

Portfolio extract
Cutting oils / grinding oils



Product	Description
ZET-cut 611	Universally usable cutting oil 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	Very high-performance cutting oil for the demanding machining of steel and its alloys. The product contains excellent wear-protection additives.
ZET-cut 630	High-performance product for the machining 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 latest base oil technology (gas-to-liquids) , 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	The product, which is likewise based on GTL oil, is crystal-clear and can be used for the machining of steels, non-ferrous metals and aluminium. An expert's report on cytotoxicity exists for this product (it is classified as non-cytotoxic).
ZET-cut 645 DK	A low-viscosity grinding oil on the basis of GTL base oil. ZET-cut 645 DK is characterised by very good rinsing capacity and outstanding heat dissipation. TRANSOR filter release available.
ZET-cut 688	For broaching and gear cutting of high-alloyed steels or for heavy-duty machining work such as thread-forming.
ZET-cut 678	Low-viscosity deep-drilling oil 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 for the punching of metal plates up to approx. 6 mm. The product evaporates without leaving residues. Parts can be painted over without cleaning.
ZET-cut MS 1054	Minimum-quantity lubricant 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 611	++	+	+							++	++	+	
ZET-cut 620	++	++	+							++	++	++	++
ZET-cut 630	++	++	++	++						+	++	++	++
ZET-cut 6020 GTL	++	++	++	++	++					+	++	++	++
ZET-cut 6070 GTL	++	++	++	++	+					++	++	++	++
ZET-cut 645 DK						++				++	++	++	++
ZET-cut 688	+	+	+	++	++				++			++	++
ZET-cut 678	++	++	++		++				++	+	++	++	++
ZET-stanz 57								++		++	++	++	
ZET-cut MS 1054							++			++	++		

Portfolio extract
Corrosion protection



Product

Description

ZET-corr 810

For **dewatering parts** 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 **intermediate storage** of parts. Leaves behind an easily removable, oily, thin anti-corrosion film. Barium-free, flashpoint >62 °C

ZET-corr 814

High-performance corrosion protection 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 **highly active greasy anti-corrosion film** 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 **micro-molecular anti-corrosion film**. 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 **solvents and VOCs**. The remaining film is easily removable. Barium-free, flashpoint >100°C

ZET-corr KS1

Anti-corrosion concentrate suitable for **pressure testers or cooling water circuits**. Usage approx. 1 - 2% of the water quantity in use.

ZET anti-rust concentrate

For the **doping of anti-corrosion baths** in cleaning plants in the last tank. Barium-free, flashpoint >62°C

ZET-corr 600E

Water-emulsifiable anti-corrosion concentrate 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.

Recommended areas of application

	Rarely film formation	Oily/thin film	Greasy film	Waxy film	Solvent-based	Solvent-free/emulsifiable	
	Application				Properties		Storage
ZET-corr 810	++				++		approx. 2 weeks
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 600 E*	++	++	++	++		++	concentration-dependent
ZET-corr 830		++				++	unlimited

* 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 class and category (coding)	Pictograph Signal word	Hazard information				
		Hazard description	R-phrases			Wording (classification category if necessary)	H-phrases	Wording		
Acute toxicity		R20	Harmful to health if inhaled (vapours, gases, dusts, mists)	Acute Tox. 4		H332	Harmful to health if inhaled			
		R21	Harmful to health in case of skin contact			H312	Harmful to health in case of skin contact			
		R22	Harmful to health if swallowed			H302	Harmful to health if swallowed			
	No symbol	R67	Vapours can cause sleepiness and drowsiness	STOT SE 3		H336	Can cause sleepiness and drowsiness			
Aspiration hazard		R65	Harmful to health: can damage the lungs if swallowed	Asp. Tox. 1		H304	Can be fatal if swallowed or inhaled			
Corrosive effect		R35	Causes severe chemical burns	Skin Corr. 1A		H314	Causes severe skin burns and serious damage to the eyes			
		R34	Causes chemical burns	Skin Corr. 1B						
Irritating to skin, eyes, respiratory tract		R41	Risk of serious eye injuries	Eye Dam. 1		H318	Causes serious damage to the eyes			
		R36	Irritates the eyes	Eye Irrit. 2						
		R38	Irritates the skin	Skin Irrit. 2					H319	Causes serious irritation of the eyes
		R37	Irritates the respiratory tract	STOT SE 3					H315	Causes severe irritation of the skin
Sensitisation of respiratory tract, skin		R42	Sensitisation possible through inhalation	Resp. Sens. 1		H334	Can cause allergies, asthma-type symptoms or respiratory complaints if inhaled			
				Resp. Sens. 1A						
				Resp. Sens. 1B						
		R43	Sensitisation possible through skin contact	Skin Sens. 1		H317	Can cause allergic skin reactions			
Skin Sens. 1A										
Skin Sens. 1B										
Gamete mutagenicity		R46	Can cause inheritable damage	Muta. cat. 1	Muta. 1A		H340	Can cause genetic defects		
				Muta. cat. 2	Muta. 1B					
		R68	Irreversible damage possible	Muta. cat. 3	Muta. 2					H341
Carcinogenicity		R45	Can cause cancer	Muta. cat. 1	Carc. 1A		H350	Can cause cancer		
		R49	Can cause cancer through inhalation	Muta. cat. 1	Carc. 1B					
		R40	Suspected of being carcinogenic	Muta. cat. 3	Carc. 2					H351
Reproductive toxicity		R60	Can negatively affect reproductive ability	Repr. cat. 1 or Repr. cat.2	Repr. 1A or Repr. 1B		H360F	Can negatively affect fertility		
		R61	Can harm the child in the womb				H360D	Can harm the child in the womb		
		R60-61	Can negatively affect reproductive ability. Can harm the child in the womb				H360FD	Can negatively affect fertility. Can harm the child in the womb		
		R62	May possibly negatively affect reproductive ability	Repr. cat. 3	Repr. 2		H361f	Can presumably negatively affect fertility		
		R63	May possibly harm the child in the womb				H361d	Can presumably harm the child in the womb		
		R62-63	May possibly negatively affect reproductive ability. May possibly harm the child in the womb				H361fd	Can presumably negatively affect fertility. Can presumably harm the child in the womb		
	No symbol	R64	Can harm babies via their mother's milk	Lact.	No pictograph		H362	Can harm babies via their mother's milk		
Specific target organ toxicity (single exposure)		R39	Serious risk of irreversible damage (in conjunction with R26, 27 and/or 28 as well as with R23, 24 and/or 25)	STOT SE 1		H370	Damages the organ(s) (if inhaled/ swallowed/in case of skin contact)			
			R68	Irreversible damage possible (in conjunction with R20, 21 and/or 22)				STOT SE 2		H371

Portfolio extract Metal cleaners

Product	Description
ZET-clean 8-10	Cold cleaner for degreasing steel, aluminium and non-ferrous metals. Evaporates very quickly. Flashpoint <10 °C , evaporation number 6
ZET-clean 25	Chlorine-free cold cleaner , low-aromatic, for degreasing steel, aluminium and non-ferrous metals. Flashpoint >29°C , evaporation number 30
ZET-clean 56 S	Isoparaffin-based, fast evaporating cleaner for automatic metal cleaning machines. Flashpoint >56°C , evaporation number 87
ZET-clean 57	Isoparaffin-based cold cleaner , odourless, for the general degreasing of metals. Flashpoint >62°C , evaporation number 110
ZET-clean 78 BIO	Biodegradable cold cleaner , dissolves oil and grease well, water-miscible. Flashpoint 17°C , evaporation number 17
ZET-clean 82	This cleaner, which is based on modified alcohols, is especially suitable for use in cleaning plants and is characterised by a high solvent action, residue-free drying and toxicological harmlessness. Flashpoint >62°C
ZET-cleaner 132/1	Strong aqueous cleaner that also removes burnt-on oil residues or persistent dirt such as polishing paste.
ZET-cleaner 1367	Spray cleaner 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 general machine cleaning and immersion degreasing, usable in ultrasonic baths.
ZET-corr 600 E	Water-emulsifiable cleaning and anti-rust concentrate , 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 1367		++	++	++		++		++	+	++	++	10	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
Circulating oil Hydraulic oil	DIN 51524-1 HL	Good oxidation and anti-corrosion properties. Lubrication of mechanical and hydraulic systems subject to moderate to high loads.
Hydraulic oil	DIN 51524-2 HLP	As above, with extreme-pressure additive. For use at high temperatures and high pressures.
Hydraulic oil	DIN 51524-3 HVLP	As before, with extra viscosity improver. For all hydrostatic systems with extreme pressures and very wide temperature ranges.
Hydraulic oil	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.
Bio-hydraulic oil	HEES	Biodegradable oils on the basis of synthetic saturated esters.
Machine oil	L-AN	For simple lubrication points on machines.
Circulating oil Gear oil	DIN 51517-2 CL	Good oxidation and anti-corrosion properties. Lubrication of mechanical systems and bearings subject to moderate to high loads.
Industrial gear oil	DIN 51517-3 CLP	Like CL, but with extreme-pressure additive. For gears, bearings and couplings under high loads.
Slideway and guideway oil	DIN 51502 CGLP	Gear oils with adhesive additives. For slideway and guideway lubrication, very good anti-stick-slip property.
Air compressor oil Compressor oil	DIN 51506 VCL/ VDL	Compressor oils for screw and piston compressors.

Industrial lubricants

Product designation	Area of use
HLP hydraulic oils	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.
HLP-D hydraulic oils	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.
HVLP hydraulic oils	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.
CLP industrial gear oils	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.
CGLP slideway/guideway oils	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.
VDL compressor oil	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.
Spindle oils	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.
Lubricating greases	Multi-purpose greases, liquid greases, bearing greases, high-temperature greases, silicone greases in all NLGI classes and all container sizes from cartridges to drums.
Specialities	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 we

- 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
Oil binder	White granulate in two different granulations. Highly absorbent, incombustible, packed in 25-kg sacks.
Refractometer, Dipslides	for water-miscible cooling lubricants to measure the concentration, pH value, nitrite, copper, cobalt, etc.
Mixing devices	as attachment for drums to mix water-miscible cooling lubricants.
Spray range	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.
Maintenance devices	External oil separator, oil skimmer for extending the service lives of emulsions.
Filter fleece	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.
Skin care	Care products for dealing with water-miscible cooling lubricants and machining oils.



Cooling lubricant monitoring sheet 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						
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