



Zubora®

Water-miscible cooling lubricants



Zeller+Gmelin
Mineralöle • Druckfarben • Chemie

Zubora - water-miscible cooling lubricants

Our water-miscible cooling lubricants Zubora meet the highest machining demands and contribute convincingly to more efficient, cost effective and clean production.

We offer you advice in matters of lubricating and machining technology, laboratory supervision of the products deployed and waste disposal. 20% of the staff in Eislingen is working in the R+D department.

Zeller+Gmelin is certified according to **DIN EN ISO 9001:2008** and **DIN EN ISO 14001:2004**.







































































Cooling lubricants for the highest demands:

- A wide range of water-miscible, high performance and state-of-the-art cooling lubricants
- Suited for application with almost all materials and machining processes
- Special products for the most demanding machining operations such as reaming, deep hole drilling or thread cutting
- Optimised foaming behaviour, through adaptation to different grades of water hardness
- Zubora products have excellent lubricating properties and provide excellent protection against wear and corrosion
- The products grant due to their emulsion stability a long service life
- The requirements of preventive health and safety protection are met
- Due to the absence of secondary amines, there is no risk of nitrosamine formation
- Certificate on skin compatibility available
- Our products comply with TRGS 611

Refer to the following tables for our extensive selection of Zubora water-miscible cooling lubricants. Please contact us for further products and special requirements. Our staff will gladly assist you with technical advice on applications.

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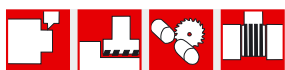
Product Item no.	Processes	Materials										Recommended water hardness of preparation water	Mineral oil content	Concentration for use	pH value with concentration	Refractometer correction factor
		Cast iron	Steel	High tensile steels	Aluminium *	Non-ferrous metals*										
Zubora Series 10																
Zubora 10 H Plus 20990	  						> 12° dH	45%	3 – 7%	5% 9,1	1,1					
Long-term stable cooling lubricant for up to medium heavy machining operations, for universal use. Also very suitable for grinding. Also available without formaldehyde releasing substances - Zubora 15 H Plus .																
Zubora 10 H Extra 22911	   						> 12° dH	35%	5 – 10%	5% 9,1	1,1					
Long-term stable high performance cooling lubricant with a high proportion of polar additives. For use in the most demanding machining operations. Many material groups, from normal to most difficult steels/special materials, as well as grey, spheroidal and malleable cast iron and aluminium materials can be machined with Zubora 10 H Extra, with considerable improvement to the tool life and at high cutting speeds.																
Zubora 10 H Ultra 23370	   						> 12° dH	35%	5 – 10%	5% 9,1	1,1					
Long-term stable high performance cooling lubricant with a high proportion of polar additives and additional EP agents. Can be used for the most demanding machining operations on many material groups, ranging from normal to very hard steels.																
Zubora 10 M Spezial 21810	   						7 – 12° dH	45%	3 – 10%	5% 9,0	1,0					
Long-term stable and high performance cooling lubricant with effective polar additives for medium to heavy machining. Particularly poor in foam when used with medium water hardness.																
Zubora 10 M Extra 21900	   						7 – 12° dH	35%	5 – 10%	5% 9,1	1,1					
Long-term stable high performance cooling lubricant with a high proportion of polar additives for highly demanding machining processes. Particularly poor in foam when used with medium hardness water.																
Zubora 10 S Plus 29130	  						4 – 8° dH	40%	3 – 7%	5% 9,1	1,1					
Semi-synthetic, universal cooling lubricant with long-term stability for up to moderate machining operations. Also very well-suited for grinding.																
Zubora 10 S Extra 29140	   						4 – 8° dH	30%	5 – 10%	5% 9,2	1,1					
Semi-synthetic, universal cooling lubricant with long-term stability and high percentage of polar additives. Can be used for difficult cutting operations. With the Zubora 10 S Extra, you can process virtually any material with significantly extended tool lifetimes and cutting speeds.																

 light machining	 medium machining	 heavy machining	 sawing	 grinding	 strongly recommended	 conditionally recommended	 recommendation after consultation	* We recommend tolerance tests beforehand if used on particularly sensitive alloys
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Product Item no.	Processes	Materials									
		Cast iron	Steel	High tensile steels	Aluminium *	Non-ferrous metals*	Recommended water hardness of preparation water	Mineral oil content	Concentration for use	pH value with concentration	Refractometer correction factor

Zubora Series 20

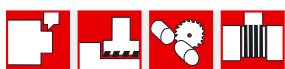
Zubora 20 H Extra 26100



●	●	●	●	●	> 12° dH	40%	5 – 10%	5% 9,3	1,1
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Long-term stable high performance cooling lubricant with high proportion of polar additives for highly demanding machining operations on all steel types and aluminium. Even difficult machining processes such as deep hole drilling, reaming, thread cutting, etc. are easily performed. Contains primary amines with high boiling point. The product is particularly poor in foam, even when using at high concentrations.

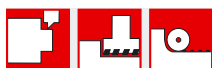
Zubora 20 H Ultra 29420



●	●	●	●	●	> 12° dH	30%	5 – 10%	5% 9,0	1,1
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Semi-synthetic, high-performance cooling lubricant with long-term stability for difficult machining operations on virtually any material. Very well-suited for aluminium alloys with high silicon content. Also very well-suited for sub-contractors with varying processes. Even heavy machining operations like deep hole drilling, reaming, thread forming, etc. can be easily managed. EP additives cause a significant lifetime extension of the tools and allow work at high cutting speeds.

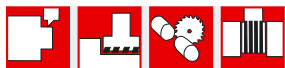
Zubora 20 M Plus 21260



●	●	●	●	●	7 – 12° dH	45%	3 – 7%	5% 9,0	1,0
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Long-term stable cooling lubricant for up to medium heavy machining operations, for universal use. Contains primary amines with high boiling point. Particularly poor in foam when used with medium water hardness. Also available without formaldehyde releasing substances - **Zubora 25 M Plus**.

Zubora 20 M Ultra 28950



●	●	●	●	●	4 – 12° dH	30%	5 – 10%	5% 9,0	1,2
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Semi-synthetic, high-performance cooling lubricant with long-term stability for difficult machining operations on virtually any material. Very well-suited for aluminium alloys with high silicon content. Also very well-suited for sub-contractors with varying processes. Even heavy machining operations like deep hole drilling, reaming, thread forming, etc. can be easily managed. With higher-boiling point primary amines. Also available without formaldehyde releasing substances - **Zubora 25 M Ultra**.

Zubora 20 S Plus 21760



●	●	●	●	●	4 – 7° dH	40%	3 – 7%	5% 9,1	1,0
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Long-term stable cooling lubricant for up to medium heavy machining operations, for universal use. For use also with internal and external round grinding and for topless grinding of tempered steel. Contains primary amines with high boiling point. Particularly poor in foam when used with soft water.



* We recommend tolerance tests beforehand if used on particularly sensitive alloys



light
machining



medium
machining



heavy
machining



sawing



grinding



strongly
recommended



conditionally
recommended




























recommendation
after consultation


















Materials

Product Item no.	Processes	Cast iron	Steel	High tensile steels	Aluminium *	Non-ferrous metals *	Recommended water hardness of preparation water	Mineral oil content	Concentration for use	pH value with concentration	Refractometer correction factor
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Zubora Series 30 (boron- and amine-free, without formaldehyde releasing substances)









Zubora 30 Plus 21650	  						4° – 20° dH	45%	4 – 7%	5% 9,0	1,1
Amine-free cooling lubricant for general machining and grinding, for universal use. Excellent surface quality with aluminium and non-ferrous metals. Special components, also used in the cosmetics industry, ensure high emulsion stability.											
Zubora 30 Spezial 90241	  						4° – 20° dH	40%	5 – 10%	5% 9,1	1,0
Amine-free high performance cooling lubricant with polar additives for medium to heavy machining processes. Especially suitable for machining of aluminium (reaming, thread cutting) and non-ferrous metals. Special components, also used in the cosmetics industry, ensure high emulsion stability.											
Zubora 30 Extra 21620	   						4° – 20° dH	35%	5 – 10%	5% 8,9	1,0
Amine-free cooling lubricant with high proportion of polar additives. Can be used for the most demanding machining processes, such as reaming, thread cutting, grooving, sawing, etc. Special components, also used in the cosmetics industry, ensure high emulsion stability.											

Zubora Series 50 (boron-free/amine-containing)

Zubora 50 H Plus 29060	  						> 12° dH	30%	4 – 7%	5% 9,3	1,1
Long-term stable cooling lubricant for up to medium heavy machining operations, for universal use. Especially suited for machining of non-ferrous metals, because selected raw materials can greatly reduce copper release. Can also be used in subsequent solvent-based cleaning processes.											
Zubora 50 H Extra 27110	   						> 12° dH	30%	5 – 10%	5% 9,2	1,0
Long-term stable high performance cooling lubricant with a high proportion of polar additives for the most demanding machining operations. Can also be used in subsequent solvent-based cleaning processes.											

Zubora Series 1000 (fully synthetic)

Zubora 1000 H Ultra 24590	   						< 12° dH	0%	8 – 10%	5% 9,1	1,2
Long-term stable high performance cooling lubricant based on synthetic esters. The new combination of active agents imparts long service life and high emulsion stability to the product. The synthetic base component optimises the wetting properties and improves the cooling and lubricating effects. Can be used with many materials for the most demanding machining processes. Also highly suited for aluminium and its alloys. Contains primary amines with high boiling point. Also available boron and formaldehyde free – Zubora 5000 H Ultra .											
Zubora 1000 M Ultra 23510	   						7 – 12° dH	0%	8 – 10%	5% 9,1	1,2
Description as for Zubora 1000 H Ultra. Particularly low-foaming when used with medium water hardness.											

								* We recommend tolerance tests beforehand if used on particularly sensitive alloys
light machining	medium machining	heavy machining	sawing	grinding	strongly recommended	conditionally recommended	recommendation after consultation	

Materials

Product
Item no.

Processes

Cast iron

Steel

High tensile
steels

Aluminium *

Non-ferrous metals*

Recommended
water hardness of
preparation water

Mineral oil
content

Concentration
for use

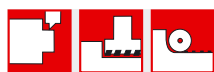
pH value with
concentration

Refractometer
correction factor

New !

Zubora 65 Series – a series that keeps its promises!

**Zubora
65 H Plus
28890**



> 12° dH

10%

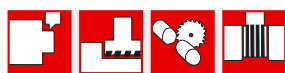
3 – 7%

5%
9,5

1,7

Boron-free, semi-synthetic high performance cooling lubricant which can be used in any application. Mixed with water, the product results in a finely dispersed emulsion. Suitable for mild to moderate machining operations, also very well suited for grinding. Due to a special formulation, Zubora 65 H plus is particularly bio-stable. The product is free of bactericides. Also available pre-preserved without formaldehyde – **Zubora 60 H Plus**.

**Zubora
65 H Extra
28870**



> 12° dH

5%

5 – 10%

5%
9,6

1,7

Semi-synthetic, boron-free, high performance cooling lubricant which can be used in any application. Mixed with water, the product results in a finely dispersed emulsion. Thanks to the selection of highly effective additives, Zubora 65 H is suitable for difficult machining processes. Due to a special formulation, Zubora 65 H Extra is particularly bio-stable. The innovative additive package results in a significant lifetime extension of the tools and allows work at high cutting speeds. The product is free of bactericides. Also available pre-preserved without formaldehyde – **Zubora 60 H Extra**.

The products Zubora 65 H Plus and Zubora 65 H Extra are also available for soft water.

**Zubora
65 H Ultra
28660**



> 12° dH

20%

5 – 10%

5%
9,6

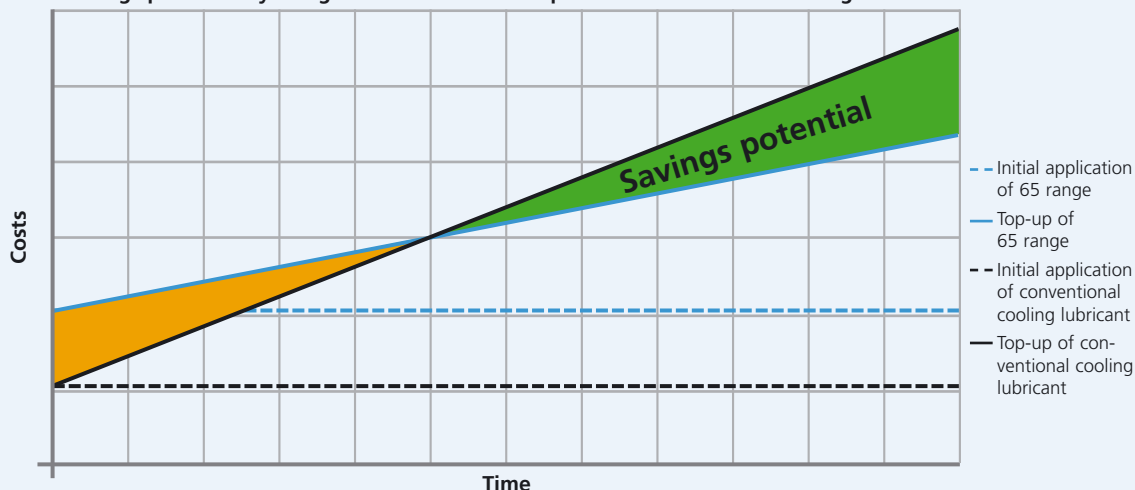
1,3

Boron-free, semi-synthetic, high performance cooling lubricant which can be used in any application. Mixed with water, the product results in a finely dispersed emulsion. Thanks to the addition of highly effective EP additives, Zubora 65 H Ultra is suitable for difficult machining processes. EP additives result in a significant lifetime extension of the tools and allow work at high cutting speeds. This ensures high process security even in very difficult machining operations. The product is free of bactericides. Also available pre-preserved without formaldehyde – **Zubora 60 H Ultra**.

Advantages:

- Very long lifetime thanks to innovative additive package
- Low refill concentration (between 0.5 - 1.0 %)
- Excellent for sub-contractors with varying materials and processes
- Particularly low foaming and high machine cleanliness
- Boron-free, bactericide-free
- Stable at high pressure

Savings potential by using Zubora 65 series compared to conventional cooling lubricant



* We recommend tolerance tests beforehand if used on particularly sensitive alloys



light
machining



medium
machining



heavy
machining



sawing



grinding



strongly
recommended



conditionally
recommended



recommendation
after consultation

Product Item no.	Processes	Materials								Recommended water hardness of preparation water	Mineral oil content	Concentration for use	pH value with concentration	Refractometer correction factor
		Cast iron	Steel	High tensile steels	Aluminium *	Non-ferrous metals *								

Synthetic grinding products

**Zubora
TDD
98101**



4° – > 20° dH

0%

3%

3%
9,1

2,1

Long-term stable, synthetic and water soluble cooling lubricant for the production of clear coolant solutions especially for grinding. Also suitable for light machining. The product provides particularly high corrosion protection and can be used with soft, medium and hard water up to 20° dH and more. Particularly poor foaming properties facilitate observation of the grinding process.

**Zubora
TKS
90000**



4° – > 20° dH

0%

2,5 – 7%

3%
9,1

1,4

Synthetic, water soluble cooling lubricant, especially for grinding. Particularly suitable when followed up by CHC or solvent degreasing (cleaning). The product provides particularly high corrosion protection and can be used with soft, medium and hard water up to 20° dH and more. Particularly poor foaming properties facilitate observation of the grinding process. Also available without formaldehyde releasing substances - **Zubora TKG**.

**Zubora
TXS
26650**



4° – > 20° dH

0%

5 – 10%

3%
9,1

1,4

Synthetic, clear water soluble cooling lubricant for grinding processes and also for up to medium heavy machining. Highly suited for profile or deep grinding of alloyed stainless steels. The product provides particularly high corrosion protection and can be used with soft, medium and hard water up to 20° dH and more. Also suitable with solvent-based cleaning (de-greasing) afterwards. Particularly poor foaming properties facilitate observation of the grinding process. Also available without formaldehyde releasing substances - **Zubora TXG**.

**Zubora
TEP
SN 30550**



> 12° dH

0%

4 – 10%

3%
9,6

1,7

Boron and formaldehyde free, fully synthetic cooling lubricant with long-term stability. Thanks to the selection of highly effective EP/AW additives, Zubora TEP is also suitable for difficult machining processes. The product is suitable for processing steel, cast iron and aluminium. Zubora TEP is also suitable for processing sensitive alloys, such as AL 2024 and AL 7075. The product is distinguished by its high machine cleanliness, as well as its excellent creeping properties. A clear reduction in burn-up can be achieved whilst melting down chips. Free of glycols.

**Zubora
THS
96020**



4° – > 20° dH

0%

2,5 – 5%

3%
9,1

1,5

Amine-free synthetic and water soluble cooling lubricant suitable for grinding of hard metals, with special inhibition of cobalt release. The product is suited for soft, medium and hard water up to 20° dH and more. Particularly poor foaming properties facilitate observation of the grinding process. Also available without formaldehyde releasing substances - **Zubora THG**.

Zubora auxiliary products

**Zubora
Systemcleaner
25610**

Cleaning and care

–

0%

1 – 2%

1%
10,3

–

For cleaning of circulation systems containing water-miscible cooling lubricants. Add 1 % to 2 % Zubora Systemcleaner to the emulsion before starting the last working shift and leave for 24 hours. It is recommended to rinse the circulation system using from 0.5 % to 1.5 % emulsion before changing and making a new preparation.

Other Zubora auxiliary products such as defoaming agents, preservation agents, corrosion inhibitors etc. are available on laboratory recommendation or on enquiry!

 light machining	 medium machining	 heavy machining	 sawing	 grinding	 strongly recommended	 conditionally recommended	 recommendation after consultation	* We recommend tolerance tests beforehand if used on particularly sensitive alloys
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Awards/References

Awards



**June 2003 / June 2005 /
March 2010 / July 2013:**
Received the Supplier Award for
the **best lubricant supplier** of
the Bosch group.



Reference list

Behr
Benteler
Bosch
Bosch-Rexroth
Continental AG
Continental Automotive
Daimler AG
DMG Mori Seiki

Emag
Leiber
Metabo
Tognum
Oerlikon
Ronald
Schütz
ZF Lenksysteme

Multicor dewatering fluids

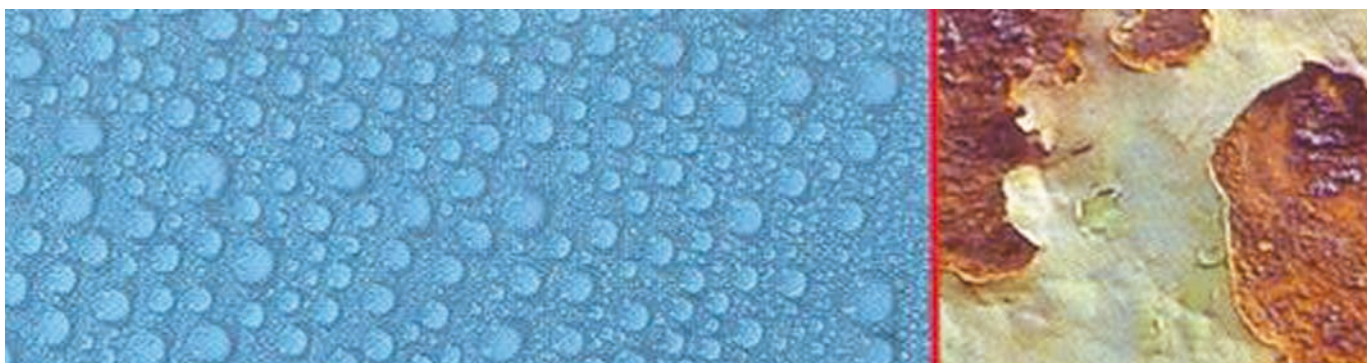
Solvent-based corrosion inhibitor with excellent water-repellent properties, e.g. after processing with water-miscible cooling lubricants, the treatment of components after galvanic surface treatment, aqueous cleaning or surface finishing.

Multicor dewatering fluids form thin, protective films highly effective against corrosion during internal storage

or transport of the treated workpieces. Degreasing prior to further processing is typically not necessary.

Multicor dewatering fluids can also be applied by spraying or brushing. The effectiveness of the water-repellent properties, however, can only be achieved by immersion.

Multicor Dewatering fluids					
Product Item no.	Application/ Properties	Flash point	Protective film Type and strength	Duration of storage Interior storage	Duration of storage Outdoor storage
Multicor DW 2 Plus 20770	Dewatering fluid covers parts with a very thin film, high resistance to corrosion, easy to remove. Suitable for seawater climates. Suitable for casting preservation.	44 °C	slightly oily 2-3µm	5 – 8 months	3 – 6 months
Multicor DW 3 20960	Same application as DW2 Plus, but higher flash point.	62 °C	slightly oily 2-3µm	4 – 6 months	2 – 3 months
Multicor DW 3 Plus 20900	Thin, light sprayable dewatering fluid, high creep capability, for example for ticket machines, signal systems, door locks.	71 °C	slightly oily 2-3µm	5 – 8 months	3 – 6 months
Multicor DW 3 Spezial Light 97000	Dewatering fluid for wet mass production and small parts. For in-house warehousing and transport within Europe, very little odour. Suitable for casting preservation	62 °C	slightly oily 1,5-2µm	6 – 12 months	3 – 6 months
Multicor DW 3 Extra Light 90500	Dewatering fluid with intensive water displacement, high corrosion resistance for mass production and small items, very low odour.	62 °C	waxy 0,5-1µm	6 – 12 months	3 – 6 months
Multicor DW 3 Ultra 94080	Dewatering fluid with high corrosion resistance, for mass production and small parts.	62 °C	slightly oily 3 µm	8 – 16 months	5 – 8 months

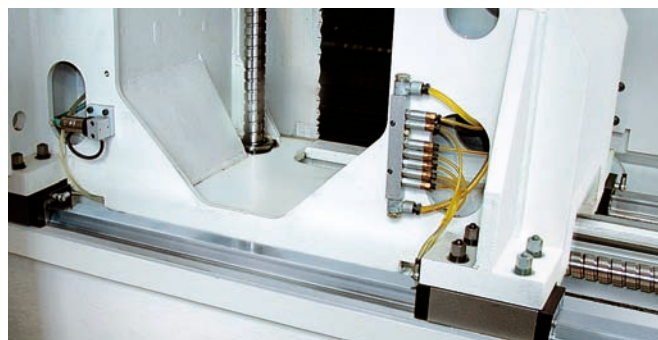


Lubrication of machine tools

To fully ensure the precision of modern machine tools, it is necessary to guarantee perfect compatibility between water-miscible cooling lubricants and slideway oil.

We offer you the optimal combination, using our high performance Zubora cooling lubricants together with our Divinol T - EP slideway oils. The excellent demulsibility of our guideway and slideway oils and their high film strength and adhesion protect against stick-slip effects and associated machining problems. Due to the coordinated addition of additives to track oil and cooling lubricant, black spots (groove image) are largely prevented.

We recommend using our EP low viscosity greases Divinol Lithogrease 00 and Divinol Lithogrease 000 for use on greased linear systems with roller, ball or needle bearings (linear guides).



Guideway and slideway oils

Product Item no.	Description	Density 15 °C kg/m ³ DIN 51757	Viscosity 40 °C mm ² /sec DIN 51562	Flash point °C DIN ISO 2592	Pour point °C DIN ISO 3016
Divinol T 3 EP ISO 32 95980	Special lubricants for guides and slideways in machine tools, designed to demulsify, in acc. with DIN 51502 CGLP Based on the high alloying degree, these lubricants can also be used for lubricating bearings and gearboxes and as hydraulic oil	870	32	> 200	-12
Divinol T 6 EP ISO 68 81911		880	68	> 200	-10
Divinol T 8 EP ISO 100 22960		880	100	> 200	-10
Divinol T 12 EP ISO 220 81930		890	220	> 200	-10

EP-low viscosity greases

Product	Description	NLGI class	Thickener/ base oil	Application temperature	Dropping point	Base oil viscosity
Divinol Lithogrease 00	Water resistant, partly synthetic, EP alloyed low viscosity grease for lubrication of rollers in machine tool linear systems	00	Lithium complex soap/ mineral oil/ polyalphaolefin	-30 °C to +150 °C	180 °C	200 mm ² /s/40 °C
Divinol Lithogrease 000*		000		-30 °C to +140 °C	170 °C	380 mm ² /s/40 °C
Divinol Lithogrease 000/150*	Complies with DIN 51826: GP 00 N-30 or GP 000 N-30 in acc. with ISO/DIS 6743-9: ISO-L-XCDHB 00 or ISO-L-XCDHB 000	000		-30 °C to +140 °C	170 °C	150 mm ² /s/40 °C

* Approval of machine manufacturers as well as central lubrication system manufacturers is available.

Zeller+Gmelin Fluidmanagement

If requested, our daughter company ZG Fluidmanagement can offer a complete range of services for the cooling lubricant. These services encompass professional advice on the following areas:

- Implementation and application of cooling lubricants and operations logistics
- Process optimization by reducing running costs
- Selection of the necessary equipment for optimal lubricant application
- Environment protection/Waste prevention
- On-site training of operating personnel

We also provide further services in accordance with the legal directives for safety and health protection when handling cooling lubricants:

- Supervision and checking of water-mixed cooling lubricants by our own specialist personnel
- Analyses and documentation on-site or in the Zeller+Gmelin laboratory by means of an EDP supported Fluid Control System
- Work safety support
- Cleaning and maintenance of cooling lubricants used with the goal of extending the lifetime of the tools

Reference list

BMW
Bosch
Continental
Emag
Hilite
Leiber Group
Schuler
Siemens

This is only a sample from our wide-ranging service portfolio, provided by Zeller+Gmelin Fluidmanagement. The technical representatives can provide more detailed information about the entire offer in order to achieve cost reductions by implementing the appropriate measures.



EDP supported Fluid Control System



Cleaning and service vehicle



Zeller+Gmelin GmbH & Co. KG is a medium-sized, independent chemical company with headquarters in Eislingen, Germany. The company employs over 850 employees worldwide. Of the 480 workers employed at the headquarters in Eislingen, approximately 20% work in research and development. This shows that Zeller+Gmelin is not only a manufacturer and supplier, but also an important development partner for the lubricant industry. After decades of specialization, there are now over 800 high performance lubricants in our product portfolio, which are divided into the following areas:

Machining

- Water-miscible and non-water-miscible cooling lubricants for metalworking
- Corrosion inhibitors

Forming

- Punching and deep drawing agents
- Wire drawing agents
- Cold mass forming products

Industrial lubricants

- High performance industrial greases
- Gear oils and hydraulic fluids
- Slide and guideway oils

Special lubricants

- Lubricants for the textile industry
- Separating agents for the wood and metal industry
- Lubricants for powder metallurgy

We are there for you in over 100 countries worldwide!



Zeller+Gmelin
Mineralöle · Druckfarben · Chemie

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