



Divinol industrial oils

Gear oils and hydraulic fluids • guide and slideway oils

Divinol industrial oils

Wherever wheels turn, surfaces are pressed against each other or forces have to be transmitted, lubricants need to be used to reduce start-up resistance and friction forces and protect against wear. Modern high performance machines are especially demanding in this respect. They require very careful selection of lubricants in the interest of maintaining precision, performance, equipment value and economy of operation.

Divinol industrial oils are high-quality hydraulic, gear and machine oils that have been specially designed to fulfill the requirements of modern machines and maintain their performance and precision. Our company is certified in accordance with DIN EN ISO 9001:2008 and DIN EN ISO 14001:2009 and thus ensures consistently high quality standards of the manufactured products. At the same time, we offer on-site consultation and laboratory monitoring as well as help with questions concerning disposal.

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Divinol hydraulic oils

Designation	Item number	Viscosity/40 °C DIN 51562 mm ² /s (cSt)	Flash point DIN ISO 2592 °C	Pour point DIN ISO 3016 °C
Divinol HLP ISO 10	20530	10	165	< -30
Divinol HLP ISO 22	48850	22	195	< -21
Divinol HLP ISO 32	48861	32	200	< -15
Divinol HLP ISO 46	48870	46	210	< -15
Divinol HLP ISO 68	48880	68	220	< -15
Divinol HLP ISO 100	48890	100	225	< -15

Application and properties High-pressure HLP hydraulic oils in accordance with DIN 51524-2 with high ageing resistance, excellent corrosion protection and wear-protecting properties, **zinc-bearing**, for all hydraulic devices. For stationary hydraulic systems.

Divinol HVI ISO 15	48830	15	130	< -39
Divinol HVI ISO 32	48840	32	180	< -30
Divinol HVI ISO 46	48820	46	185	< -27
Divinol HVI ISO 68	48740	68	185	< -24

Application and properties High-pressure HVLP hydraulic oils as per DIN 51524-3 with high viscosity index for large areas of application, **zinc-bearing**, especially well-suited for hydraulic units subjected to extreme variations in operating temperature (e.g. mobile hydraulic units).

					Brugger value N/mm ²
Divinol HLP ISO 46 MWB	23070	46	210	< -24	35
Divinol HLP ISO 68 MWB	23080	68	230	< -24	35

Application and properties **Zinc-free**, high-pressure HLP hydraulic oil in accordance with DIN 51524-2, particularly finely filtered, very high purity, high loading capacity as per Brugger (Brugger value > 30 N/mm²), **approved by Müller-Weingarten**.



Divinol hydraulic oils

Designation	Item number	Viscosity/40 °C DIN 51562 mm ² /s (cSt)	Flash point DIN ISO 2592 °C	Pour point DIN ISO 3016 °C
Divinol DHG ISO 10	84301	10	150	< -30
Divinol DHG ISO 22	84310	22	165	< -30
Divinol DHG ISO 32	84330	32	190	< -30
Divinol DHG ISO 46	84350	46	210	< -24
Divinol DHG ISO 68	84370	68	230	< -24
Divinol DHG ISO 100	84390	100	230	< -15
Divinol DHG ISO 150	84411	150	220	< -15

Application and properties

Detergent dispersant HLP-D hydraulic oils according to DIN 51524-2, **zinc-bearing**. Preferred for use in hydraulic units where there is a risk of the formation of condensation water or the penetration of water-based cooling lubricants, (e.g. as used with machine tools). Also well-suited for mobile and stationary hydraulic systems with hydrostatic drive.



Divinol industrial gear oils

Designation	Item number	Viscosity/40 °C DIN 51562 mm ² /s (cSt)	Flash point DIN ISO 2592 °C	Pour point DIN ISO 3016 °C
Divinol ICL ISO 32	27440	32	180	< -12
Divinol ICL ISO 46	27450	46	180	< -12
Divinol ICL ISO 68	25030	68	180	< -12
Divinol ICL ISO 100	25040	100	210	< -15
Divinol ICL ISO 150	24630	150	210	< -15
Divinol ICL ISO 220	25060	220	210	< -12
Divinol ICL ISO 320	25070	320	210	< -12
Divinol ICL ISO 460	21750	460	210	< -9
Divinol ICL ISO 680	90940	680	210	< -3

Application and properties

Industrial high-pressure CLP gear oils in accordance with DIN 51517-3 with additives to reduce friction and wear, **silicon- and zinc-free**, very high pressure absorption capacity. Meets the requirements of AISE 224, AGMA 9005-E02 and David Brown S1.53.101 (E). For use in highly-stressed industrial gearboxes using circulating lubrication and dip bath gearboxes with spur pinions and bevel gear and worm gears. FZG test in accordance with DIN 51354/2: damage load level > 12.

Divinol MCL ISO 68	81950	68	200	< -12
Divinol MCL ISO 320	81970	320	210	< -12
Divinol MCL ISO 460	96490	460	210	< -12

Application and properties

High-pressure industrial CLP gear oils in accordance with DIN 51517-3 with solid lubricant additives (**molybdenum disulphide** MoS₂), **silicon- and zinc-free**, very high pressure absorption capacity. Meet the requirements of AISE 224, AGMA 9005-E02 and David Brown S1.53.101 (E). Can be used for gear wheels and worm gears with high surface pressures or frequent overloading, also for impact and thermal loadings as well as for sliding bearings with oscillating movements. FZG test in accordance with DIN 51354/2: damage load level > 12.



Divinol multipurpose oils

Designation	Item number	Viscosity/40 °C DIN 51562 mm ² /s (cSt)	Flash point DIN ISO 2592 °C	Pour point DIN ISO 3016 °C
Divinol GWA ISO 3	20001	3	120	< -15
Divinol GWA ISO 5	20010	5	130	< -21
Divinol GWA ISO 7	20020	7	140	< -24
Divinol GWA ISO 10	20030	10	165	< -30
Divinol GWA ISO 22	48760	22	180	< -21
Divinol GWA ISO 32	48770	32	205	< -18
Divinol GWA ISO 46	48812	46	215	< -15
Divinol GWA ISO 68	48780	68	220	< -15
Divinol GWA ISO 100	48790	100	220	< -15
Divinol GWA ISO 150	20050	150	225	< -9
Divinol GWA ISO 220	20060	220	230	< -9
Divinol GWA ISO 320	20070	320	230	< -9
Divinol GWA ISO 460	20080	460	250	< -9

Application and properties

Zinc-free, multipurpose oils for bearings, gears and hydraulics in accordance with DIN 51517-2. Divinol GWA ISO 10 to Divinol GWA ISO 150 also meet the HPL requirements as per DIN 51524-2.

Products of the Divinol GWA series are used in hydraulic and mechanical gearboxes, in roller bearings and slide bearings, in hydraulics, for lubricating spindles, etc.

Divinol compressor oils

Divinol VDL ISO 32	53611	32	230	< -15
Divinol VDL ISO 46	53621	46	230	< -15
Divinol VDL ISO 68	36240	68	240	< -15
Divinol VDL ISO 100	36220	100	240	< -21
Divinol VDL ISO 150	36230	150	240	< -21

Application and properties

Compressor oils for the lubrication of piston compressors and rotary piston compressors with high thermal loads for compressing temperatures of up to +220 °C. They correspond to DIN 51506 Group VCL / VDL or ISO DP 6521 category DAA-DAB-DAH-DA.

Divinol turbine oils

Divinol SVO ISO 32	53610	32	230	< -15
Divinol SVO ISO 46	53620	46	230	< -15
Divinol SVO ISO 68	36241	68	240	< -15
Divinol SVO ISO 100	36221	100	240	< -21

Application and properties

Turbine oils for use in screw air compressors as well as steam, gas and water turbines. Meet the requirements for lubricating oils according to DIN 51515-1 / L-TD and DIN 51515-2 / L-TG and ISO 6743-5 categories L-TGA / L-TGB / L-TSA / L-TGSB.

Divinol machine oils

Designation	Item number	Viscosity/40 °C DIN 51562 mm ² /s (cSt)	Flash point DIN ISO 2592 °C	Pour point DIN ISO 3016 °C
Divinol GW ISO 7	90640	7	140	< -21
Divinol GW ISO 10	90650	10	160	< -21
Divinol GW ISO 46	90560	46	205	< -15
Divinol GW ISO 100	90590	100	240	< -12
Divinol GW ISO 150	90600	150	270	< -9

Application and properties

Age-resistant lubricating oils without additives, with good viscosity-temperature behaviour. Lubricating oils C as per DIN 51517-1. Can be used for lubricating slide and roller bearings, gearboxes that are not heavily loaded, gearwheels, etc.

SO standard 6743-4 and -6 use the following identifying letters:
for HL = L-HL, for HLP = L-HM, for HVLP = L-HV, for C = L-HH,
for CL = L-CKB, for CLP = L-CKC

We would be glad to provide you with technical documents on request concerning other industrial oils such as guide and slideway oils, adhesive oils, technical white oils, heat transfer oils or about our entire range of industrial lubricants for cutting and non-cutting metalworking processes.

For detailed consultation regarding technical application, please contact our sales representatives.



Oil purity levels

Ever-increasing requirements regarding reliability, availability and economic efficiency of hydraulic and lubricating systems create demand for operating liquids or lubricants of constantly increasing purity.

There are different methods for classifying existing system cleanliness. ISO 4406:1999 is applied according to DIN 51524. Limit value according to DIN 21/19/16 ZG when bottling: 19/15/12. These test methods are only valid for hydraulic and lubricating oils.

Electronic particle counters as well as purity level monitors which function in accordance with the light barrier (surface determination) principle are used to determine oil purity levels. Microscopic analyses are also still performed via light microscope. The amount and size of the particles per 100 ml liquid are measured. Due to the determined values, the oil purity level of the respective medium can be seen in the following charts.

Oil cleanliness class according to ISO 4406:1999

Number of particles per 100 ml						Code	
-		> 5 μm		> 15 μm			
> 4 $\mu\text{m(c)}$		> 6 $\mu\text{m(c)}$		> 14 $\mu\text{m(c)}$			
from	to	from	to	from	to		
4 000 000	8 000 000	500 000	1 000 000	64 000	130 000	23 /	20 / 17
2 000 000	4 000 000	250 000	500 000	32 000	64 000	22 /	19 / 16
1 000 000	2 000 000	130 000	250 000	16 000	32 000	21 /	18 / 15
500 000	1 000 000	64 000	130 000	8 000	16 000	20 /	17 / 14
250 000	500 000	32 000	64 000	4 000	8 000	19 /	16 / 13
130 000	250 000	16 000	32 000	2 000	4 000	18 /	15 / 12
64 000	130 000	8 000	16 000	1 000	2 000	17 /	14 / 11
32 000	64 000	4 000	8 000	500	1 000	16 /	13 / 10
16 000	32 000	2 000	4 000	250	500	15 /	12 / 9
8 000	16 000	1 000	2 000	130	250	14 /	11 / 8
4 000	8 000	500	1 000	64	130	13 /	10 / 7
2 000	4 000	250	500	32	64	12 /	9 / 6
1 000	2 000	130	250	16	32	11 /	8 / 5
500	1 000	64	130	8	16	10 /	7 / 4

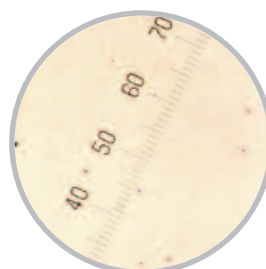
¹⁾ 3-digit code only when using an automatic particle counter (APC)

Filters for measuring oil cleanliness:

Oil purity class as per ISO 4406 (1999) is specified as a composite number such as 17/15/12.

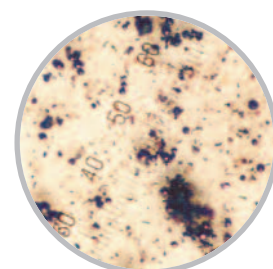
The first number refers to the particles > 4 μm , the number in the middle to particles > 6 μm and the last number to particles > 14 μm .

Filling at ZG



19/15/12

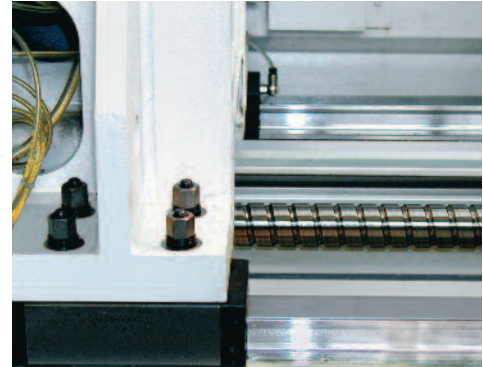
DIN specification



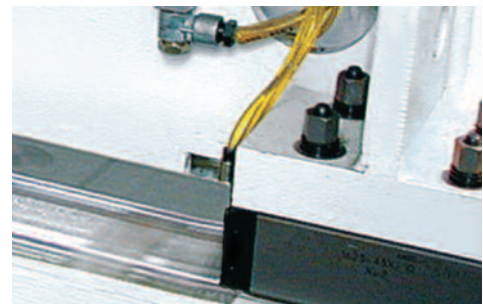
21/19/16

Guide and slideway oils

Divinol guide and slideway oils have been specially designed for the high demands on performance, precision and economy of operation in modern manufacturing technology. The consistently high quality of the lubricant components used, results in optimum operational reliability for the users. The guide and slideway oils from Zeller+Gmelin are invaluable contributions to more efficient and economical production. These high performance lubricants guarantee high reliability and positioning accuracy of the machine tool, especially if the machines are equipped with plastic-coated guideways.



Demulsifying guideway oils for use in emulsion-filled machine tools for the lubrication of metal and metal-plastic bearings on conventional slideways according to DIN 51502 CGLP. Special additives reduce the frictional forces during start-up and prevent the stick-slip effect at low sliding speeds.



High performance lubricants – demulsifying

Key figures	DIVINOL T3 EP ISO 32	DIVINOL T6 EP ISO 68	DIVINOL T8 EP ISO 100	DIVINOL T12 EP ISO 220	
Item number	95980	81911	22960	81930	
Viscosity at 40 °C [mm ² /sec]	32	68	100	220	DIN 51562
Flash point °C	> 200	> 200	> 200	> 200	DIN ISO 2592

These data are calculated average values. We reserve the right to deviations within the usual tolerances.

High performance lubricants – for oil-filled machine tools

Key figures	DIVINOL T6 KA ISO 68	DIVINOL T9 KA ISO 150	DIVINOL T12 KA ISO 220	
Item number	90050	21550	90070	
Viscosity at 40 °C [mm ² /sec]	68	150	220	DIN 51562
Flash point °C	> 200	> 200	> 200	DIN ISO 2592

These data are calculated average values. We reserve the right to deviations within the usual tolerances.

Guideway oils according to DIN 51502 CGLP for guides and slideways in oil-filled machine tools, can also be used in machines without separate oil circuits, for example, when machining oils and guideway oils are supplied from a container.

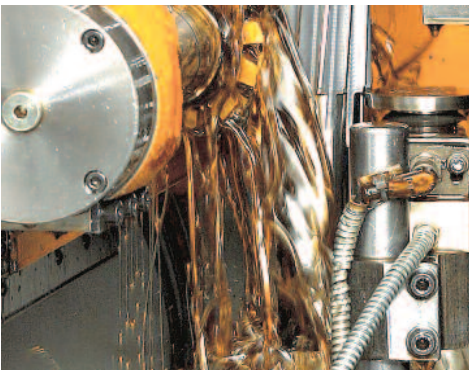
Complete solution for machine tools

Zubora - water-miscible cooling lubricants



Water-miscible, high performance cooling lubricants on the cutting edge of technology which satisfy the current legal provisions. Suitable for nearly all materials and machining operations. Can be used for a wide variety of water qualities - special soft or hard water products. Long lifetime due to high emulsion stability.

Multicut - non-water-miscible cooling lubricants



Wide range of cooling lubricants for a variety of applications and materials. Low-oil-mist and low-evaporation products; universal varieties or multipurpose oils. High performance machining oils based on the latest synthesis technology for difficult machining operations and grinding processes. Special products for precision processing.

Divinol Lithogrease 00/000 for lubricating rollers of linear slideways in machine tools



NLGI grades 00 and 000

Water-resistant, semi-synthetic, EP-alloyed fluid greases for the lubrication of gears with high mechanical and thermal loads. Ideal for the lubrication of rolling, spherical or needle-bearing linear systems in machine tools. Appropriate approvals are available.

Divinol Lithogrease 000 has a very favourable backflow behaviour.

Operating temperature range -30°C to $+140^{\circ}\text{C}$.

(Labeling as per DIN 51 826: GP 00/000 N-30, as per ISO 6743-9: ISO-L-XCDHB 00/000.)

Awards/References

July 2015 / July 2013 / March 2010 / June 2005 / June 2003:
Recipient of the **Supplier Award** as one of the best
lubricant suppliers of the Bosch group.



Reference list:

Allgaier Automotive GmbH
Automobiltechnik Dürbheim
Berthold Hermle AG
Bosch Rexroth AG
Decoma Exterior Systems GmbH
EMAG Salach
GKN Sinter Metals GmbH
GROZ-BECKERT KG
HMP Umformtechnik GmbH

MTU Friedrichshafen GmbH
Pacoma GmbH
ROBERT BOSCH GMBH
Schuler Pressen GmbH
SÜDRAD GmbH
Terrot GmbH
voestalpine Polynorm
voestalpine Stampotec GmbH



Zeller+Gmelin GmbH & Co. KG is a medium-sized, independent chemical company with headquarters in Eisingen, Germany. The company employs over 850 employees world-wide, of which 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 700 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
- Guide and slideway 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 world-wide!



Zeller+Gmelin
Lubricants · Chemicals · Printing inks

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