



Parts and More Compact Lubricants and Filters



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CONTENTS





ADVANTAGES	4
Original WIRTTGEN GROUP lubricants and filters	4

FACTS	6
Tasks of lubricants	6
Basics of lubricants	8
Additives	8
Viscosity	10
Standards and specifications	14
Lubricants at a glance	16
Engine oils	16
Coolants	17
Hydraulic oils	18
Gear oils	22
Lubricating greases	24
Tasks and basics of filtration	28
Filters at a glance	32
Air filters	32
Engine oil filters	36
Fuel prefilters and fuel filters	37
Hydraulic oil filters	38

APPLICATION	44
Component damage	44
Lubricant plans	46
Lubricant service	58

ORIGINAL WIRTGEN GROUP LUBRICANTS AND FILTERS



There are many variants of lubricants and filters. Ultimately, however, quality is the decisive criterion and makes the difference.

Filling or lubricating your machine with a lubricant which is specifically matched to your application, in combination with the appropriate filter, is critical for the service life of the operational parts in combustion engines, hydraulic components, gear units and bearings.

WIRTGEN GROUP lubricants meet these requirements perfectly and are optimised for your WIRTGEN GROUP machine.

**Genuine WIRTGEN GROUP lubricants and filters -
to maintain the value of your machine:**

- > Lubricants are compatible with their first filling
- > Optimised for your WIRTGEN GROUP machines
- > Ensure maximum machine life
- > Use for the entire machine pool
- > Comprehensive filter and maintenance packages which are matched to the respective machine type and contain all the required filters, lubricants and oils

The best choice for ensuring the effectiveness of your machine and reducing maintenance costs long-term.

**PARTS AND MORE COMPACT
LUBRICANTS AND FILTERS**

This brochure communicates basic knowledge of lubricants and filters. Information and tips that help you to optimally maintain your WIRTGEN GROUP machine for long-term operation.

ORIGINAL WIRTGEN GROUP TASKS OF LUBRICANTS

Lubricants have many different tasks in the WIRTGEN GROUP machines.

WIRTGEN GROUP ENGINE OILS

For a high-performance engine: Engine oils are lubricants that care for and take the strain off the engine. They prevent direct metal-on-metal contact, minimise friction and thus, effectively, engine wear. Engine oils contribute to sealing and cooling the pistons, thus promoting greater compression, which in turn ensures an improved engine performance.



WIRTGEN GROUP HYDRAULIC OILS

For efficient power transmission: Hydraulic oils serve as hydraulic fluids to ensure the hydraulic power from the pump is transferred with as little loss as possible to the engine or cylinder. They also lubricate the moving parts, protect them from corrosion and help to discharge contamination from the system. Hydraulic oils have to be resistant to ageing and pressure as well as have a high wetting and adhesive ability.

WIRTGEN GROUP GEAR OILS

To protect your gearbox and keep it running smoothly: Gear oils protect the gears from corrosion, neutralise acids that occur and prevent typical damage such as pitting (flaking) and galling (spot-type fusing with subsequent separation through mechanical load). In machine parts such as gear wheels, bearings, friction clutches or brakes they also guarantee excellent smooth-running characteristics. The lubricant has to withstand large fluctuations in temperature, high partial pressures, condensation, dust and abrasion elements.

WIRTGEN GROUP LUBRICATING GREASES

For reliable lubrication of your components: Lubricating greases are used for the permanent lubrication of roller bearings, plain and linear bearings, sliding surfaces, gear wheels and gear segments. Greasing ensures high corrosion protection and prevents age-related fatigue problems with the material. Greases have to remain soft and supple even at low temperatures. At the same time, they must not leak at high temperatures.

ORIGINAL WIRTGEN GROUP

BASICS OF LUBRICANTS

ADDITIVES

Lubricants are usually made up of two components: the actual **base oil** and the **additives** which influence or cause certain desired lubricant characteristics.

The term additive is used for oil-solvent substances added to the base oils. Additives are always added when the characteristics of the base oil are not sufficient for the required area of application, and to keep the finished products operational over as long a period as possible, even under maximum operational load.

We would like to present four important additives below: Please note that there are numerous other additives.

Detergent: Deposits in the form of paint and oil carbons in the piston area and other highly tempered components that result from the combustion process interfere with this to a significant extent. Detergents prevent or reduce these deposits and eliminate the acids which are produced during combustion.

Dispersant: Dispersants reduce or prevent sludge formation and deposit in the low temperature range.

VI improvers: VI improvers increase and spread an oil's viscosity and thus improve the viscosity-temperature behaviour. The use of VI improvers enables the production of multigrade engine oils.

Anti-foaming additive: Foam is created at the boundary line between oil and air if ascending air bubbles do not burst. Anti-foam additives alter surface tension. The air bubbles burst easier, and this reduces the foaming characteristics.

ADDITIVES FOR LESS WEAR AND MORE CORROSION PROTECTION

If mechanical components such as camshaft and valve or hydraulic valve lifter come into contact in the combustion engine, damage is often caused, particularly under high loads (pitting; in extreme cases the engine may gall). To prevent this damage, special additives form thin, glidant layers and thus effectively prevent undesirable friction between the components.

Substances such as water and oxygen that are produced during the combustion process or contained in fuel, significantly increase the risk of corrosion formation. This additive group forms dense, fur-like and water-repellent barriers on metal surfaces that protect the surfaces from corrosion.

There are numerous other additives besides the ones mentioned. We guarantee that you can purchase the oils with the additives you need for your WIRTGEN GROUP machines at any time.



ORIGINAL WIRTGEN GROUP BASICS OF LUBRICANTS

VISCOSITY

Motor and gear oils are never suitable for universal use. WIRTGEN GROUP machines require high-grade oils with optimum characteristics.

VISCOSITY AND VISCOSITY INDEX

Within the context of lubricant description, viscosity can be regarded as the property of a liquid to resist deformation (lubricant flow characteristic). The less fluid an oil is, the higher is its viscosity. Viscosity is a temperature-dependent parameter: If the temperature of the oil rises during the working process, viscosity falls at the same time. This change in viscosity varies from one oil to another. The range of variation is described using the viscosity index (VI). The higher the VI, the less change in viscosity occurs as oil temperature increases. So-called VI improvers (additives) allow this index to be influenced.

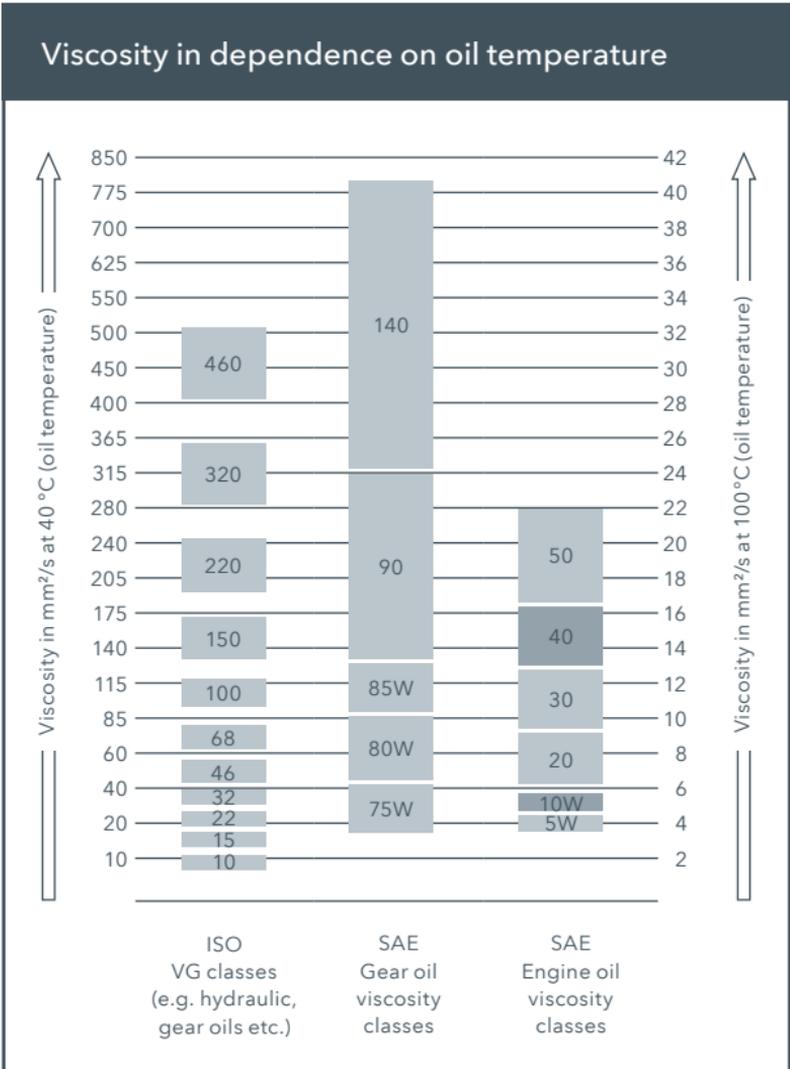
VISCOSITY AND OIL TEMPERATURE

The change in viscosity is directly dependent on the temperature. In this context, we talk about VT-behaviour (viscosity-temperature behaviour) of an oil. This change in viscosity in relation to the oil temperature has a logarithmic curve: As temperature drops, viscosity increases disproportionately.

The graph compares the viscosity in Centistoke (mm^2/s) of engine and gear oils at the reference temperatures 40°C and 100°C . In terms of their SAE specification (viscosity), engine



*High viscosity > less fluid > greater resistance
Low viscosity > thin fluid > lower resistance*



and gear oils can have the same values, yet with regard to other values (additives, manufacturers' standards etc.) they do not correspond with the respectively other oil. At an oil temperature of 40°C, the engine oil 10W-40 (cf. highlighted part of the graphic) has a viscosity of approx. 180 mm²/s, at 100°C a value of approx. 4 mm²/s.

ORIGINAL WIRTGEN GROUP

BASICS OF LUBRICANTS

VISCOSITY AND OUTDOOR TEMPERATURE

A constant viscosity as possible is desirable to ensure optimum lubrication over the whole temperature range. Engine oils with low viscosity ranges promote perfect engine operation all year round under all kinds of operating conditions: from cold starts in winter to working in regions with the hottest temperatures in summer.

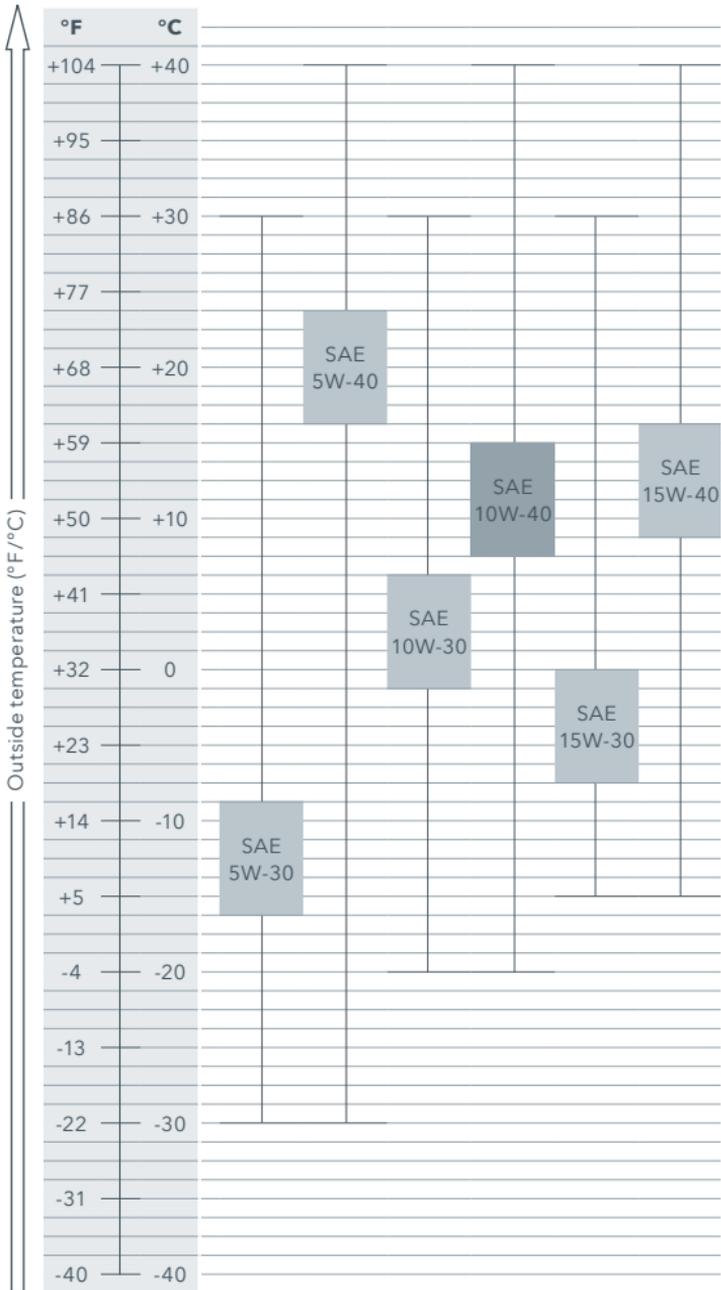
SAE CLASSIFICATION (SOCIETY OF AUTOMOTIVE ENGINEERS)

For many buyers, the SAE classification (for example 10W-40) is the decisive quality argument for their choice of the right engine oil. It must be remembered, however, that SAE viscosity classes do not represent performance demands made on the engine or gears, rather they simply specify the viscosity at standard reference temperatures.

The ambient temperature is decisive for the correct selection. If the temperature drops below the limit even briefly, the cold starting ability may be compromised. In the interest of minimising wear, the temperature should not be allowed to exceed the limit for an extended period.

This diagram shows a recommended application range of -20 °C to +40 °C for the engine oil with SEA classification 10W-40 (cf. highlighted part of the graphic). Please also compare the stipulations of the individual engine manufacturers laid out in the operating instructions for your machine.

Viscosity in dependence on outside temperature



ORIGINAL WIRTGEN GROUP

BASICS OF LUBRICANTS

OVERVIEW OF STANDARDS AND SPECIFICATIONS

Specifications are used to select the right lubricating oil. In order to map the additional lubricant requirements of different engines, there are, on the one hand, **inter-manufacturer specifications** or classifications of national and international organisations.

- > **ACEA** (**A**ssociation des **C**onstructeurs **E**uropéens d'**A**utomobiles; European Association of Vehicle Manufacturers)
- > **API** (**A**merican **P**etroleum **I**nstitute)

On the other hand, there are **releases of the engine manufacturers**

- > Caterpillar (e.g. CAT ECF-1, -2, -3)
- > Cummins (e.g. CES 20081/78/7/6/2/1)
- > Deutz (e.g. DQC IV-10 LA)
- > Mercedes Benz (MB 228.51)
- > MAN, VW, BMW ...

Refer to the instruction manual or our online service at www.partsandmore.net for information on which oil has to be used for your machine.



Whether a lubricant is suitable for or can be used for a circuit is determined by the manufacturer's standard and/or by the specification of ACEA and API.

The API specification is the standard valid for the American market. It is divided into three classifications:

- > API diesel engine classification
- > API petrol engine classification
- > API gear classification (see separate chapter)

The API standards are defined in the following way:

Organi- sation	Engine type (C = diesel engine; S = petrol engine)	Power rat- ing (e.g. I, I-4 PLUS, J)	No. of engine strokes (e.g. 4-stroke engine)
API-	C	I	-4

API specifications are assigned when the engine and gear lubricants have been subjected to four tests:

- > Increase in oil temperature during operation
- > Check on the length of oil change interval according to manufacturer's recommendations
- > Check on the efforts to achieve engine performance
- > Environment protection standards

The continuous testing and introduction of oils with current specifications can constantly extend the service intervals of WIRTGEN GROUP machines. This, at the same time, reduces maintenance expenditure.

This is only possible when the engine oil has a respective load capacity within this period without any adverse effect on the positive oil characteristics e.g. component lubrication.

ORIGINAL WIRTGEN GROUP LUBRICANTS AT A GLANCE

ENGINE OILS

To help you keep track of the multitude of specifications and manufacturer's releases, the WIRTGEN GROUP has compiled the suitable engine oils for you.

> **WIRTGEN GROUP Engine Oil 15W-40**

Mineral oil based multigrade engine oil: Use on markets in which fuel with a higher sulphur content is used (for example India, China, Africa, South America). Suitable for engines up to and including Tier 3 without exhaust aftertreatment.

> **WIRTGEN GROUP Engine Oil 10W-40**

Synthetic low-friction engine oil for the longest oil change intervals: Use on markets in which fuel with a higher sulphur content is used (for example India, China, Africa, South America). Suitable for engines up to and including Tier 3 without exhaust aftertreatment.

> **WIRTGEN GROUP Engine Oil Low SAPS 15W-40**

Mineral oil based engine oil with high-grade base oil: Complies with the viscosity requirements of all WIRTGEN GROUP machines with Cummins engines. Use on markets on which fuel with low sulphur content is used (for example Europe). Suitable for engines up to and including Tier 4 with exhaust aftertreatment.

> **WIRTGEN GROUP Engine Oil Low SAPS 10W-40**

Synthetic low-friction engine oil with a comprehensive performance range: Fuel savings of up to 1 % compared to a 15W-40 are possible. Use on markets on which fuel with low sulphur content is used (for example Europe). Suitable for engines up to and including Tier 4 with exhaust aftertreatment.

COOLANTS

Coolants are mixtures of substances which are used for heat dissipation and thus protect the components.

- > **WIRTGEN GROUP Antifreezing Compound**
WIRTGEN GROUP coolant for protection against corrosion, over-heating and frost (do not use for 09WR (WR 200i) or for KLEEMANN machines).
- > **WIRTGEN GROUP Antifreezing Compound MB**
WIRTGEN GROUP coolant for protection against corrosion, over-heating and frost for Mercedes Benz diesel engines installed in 09WR (WR 200i) machines.
- > **WIRTGEN GROUP Antifreezing Compound KLEEMANN**
WIRTGEN GROUP coolant for protection against corrosion, over-heating and frost for KLEEMANN machines.



ORIGINAL WIRTGEN GROUP LUBRICANTS AT A GLANCE

HYDRAULIC OILS

The hydraulic fluids most often used are based on mineral oil treated with respective additives. These oils are termed hydraulic oils. Hydraulic oil requirements are regulated in ISO 6743/4 under the codes **HL**, **HM** and **HV** (in Germany, the codes **HL**, **HLP**, **HVLP** are common in line with DIN 51524).

WIRTGEN GROUP HVLP oils contain additives which increase corrosion protection, ageing resistance, reduce galling wear in the mixed friction area and improve the viscosity temperature behaviour (higher viscosity index) and suppress foam formation.

- > **WIRTGEN GROUP Clutch Fluid HLP 32**
Hydraulic oil for use in KLEEMANN clutches: Suitable for low temperatures (subpolar zone).
- > **WIRTGEN GROUP Hydraulic Oil HVLP 32**
Multigrade hydraulic oil: Suitable for low temperatures (subpolar zone).
- > **WIRTGEN GROUP Hydraulic Oil HVLP 46**
Multigrade hydraulic oil: Suitable for moderate temperatures.
- > **WIRTGEN GROUP Hydraulic Oil HVLP 68**
Multigrade hydraulic oil: Suitable for high temperatures (subtropics, tropics).



BIO HYDRAULIC OILS

- > **WIRTGEN GROUP Bio Hydraulic Oil HVLP 46**
Biodegradable multigrade hydraulic oil: Suitable for moderate temperatures.
- > **WIRTGEN GROUP Bio Hydraulic Oil HVLP 68**
Biodegradable multigrade hydraulic oil: Suitable for high temperatures (subtropics, tropics). As a flame-resistant hydraulic oil it meets the requirements of the Emscher approval (MSHA) and is thus suitable for underground use.

ORIGINAL WIRTGEN GROUP LUBRICANTS AT A GLANCE

HYDRAULIC OILS

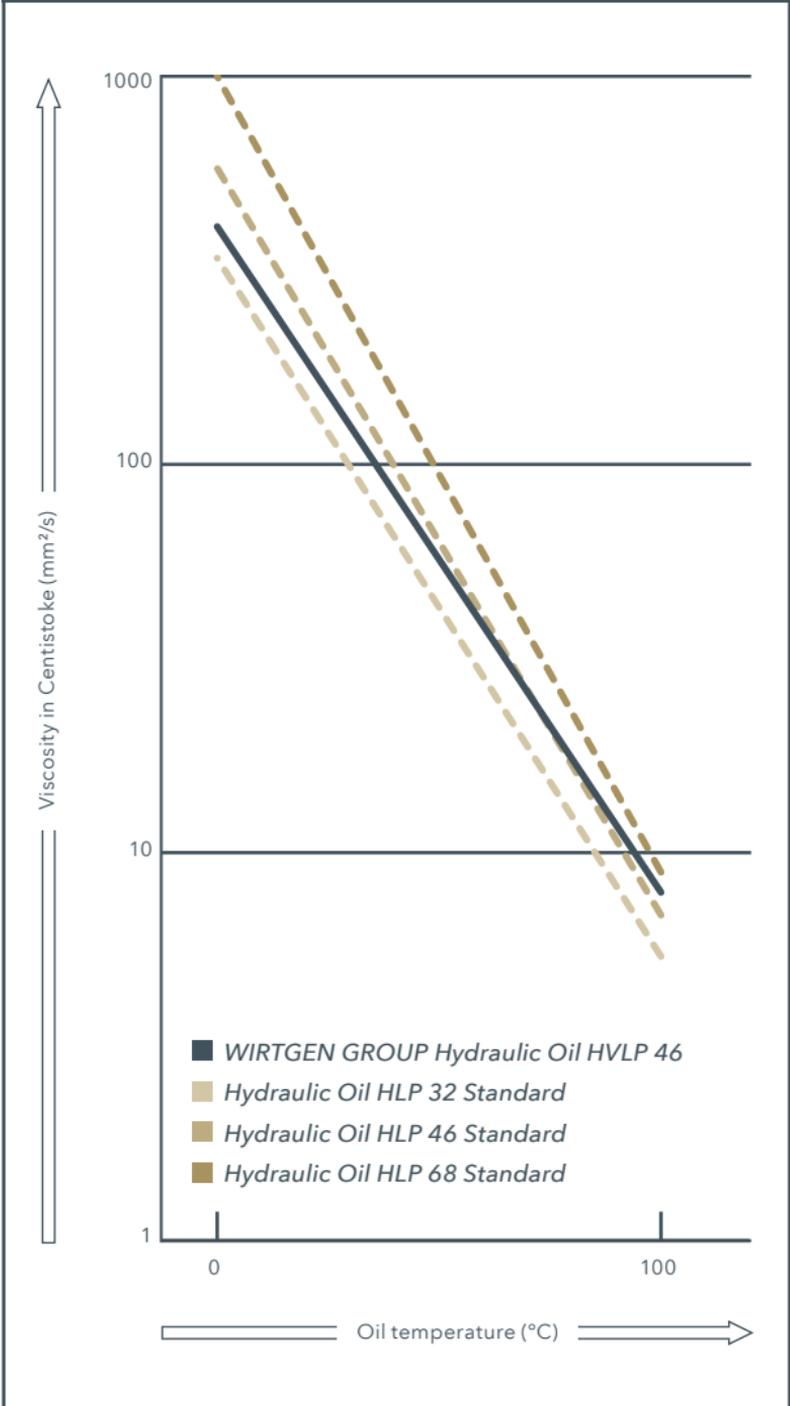
ISO (International Organization for Standardization) divides hydraulic oils into viscosity classes (see illustration of VG classes on page 11).

The characteristic curve for WIRTGEN GROUP multigrade hydraulic oil is much flatter, i.e. they are less temperature-prone. At an oil temperature of 100 °C, it can clearly be seen that the viscosity value is much more stable than mere HLP hydraulic oil. The WIRTGEN GROUP Hydraulic Oil HVLP 46 has a viscosity of 7.9. Standard hydraulic oil 6.9. The multi-grade oil is thus more viscous at high temperatures in comparison to a standard oil and improves the lubrication as a result.

The WIRTGEN GROUP has a special VG 100 hydraulic oil for higher outdoor temperatures such as those found in tropical regions. VG 32 hydraulic oils can also be purchased for regions with permanently low outdoor temperatures.



Viscosity-temperature diagram



ORIGINAL WIRTGEN GROUP LUBRICANTS AT A GLANCE

GEAR OILS

In contrast to the ACEA, the API also assigns standards for gear oils. The API-GL-5 (Gear Lubricant) is the standard that currently makes the most demanding requirements. The following is a list of the gear oils for the different applications.

> **WIRTGEN GROUP Gear Oil 85W-90**

Mineral oil based axle gear oil for WIRTGEN advance drives. Must not be used for WIRTGEN milling drum gearboxes (except 2500 SM, 4200 SM), HAMM vibratory bearings and drum drives as well as for VÖGELE pump splitter gearboxes and advance drives.

> **WIRTGEN GROUP Multi Gear Oil VG 150**

Mineral oil based industrial gear oil for KLEEMANN cone crushers. The EP additives (extreme pressure) ensure an extremely good wear protection. Recommended for use in KLEEMANN cone crushers MCO 9 EVO and MCO 11 PRO.

> **WIRTGEN GROUP Multi Gear Oil VG 220**

Mineral oil based industrial gear oil for KLEEMANN cone crushers. The EP additives (extreme pressure) ensure an extremely good wear protection.

> **WIRTGEN GROUP Special Gear Oil**

Special all-synthetic multigrade gear oil for VÖGELE pump distributor gear units and advance drives, HAMM vibratory bearings and KLEEMANN advance drives. It has a very good cold start performance and provides extremely good wear protection (for example for bearings, gear wheels) and is therefore above all suitable for high load applications.

- > **WIRTGEN GROUP Special Gear Oil Roller Drum Drive**
Special all-synthetic multi-grade gear oil for HAMM drum drives. It has a very good cold start performance and provides extremely good wear protection (for example for bearings, gear wheels) and is therefore above all suitable for high load applications.

- > **WIRTGEN GROUP High-Performance Gear Oil PGLP 150**
Exclusive all-synthetic gear oil designed for heavy-duty use in WIRTGEN milling drum gearboxes. The high wettability of the lubricant makes for good adhesion to gear wheels and thus ensures good protection from wear. Must not be used for HAMM vibratory bearings and drum drives.

- > **WIRTGEN GROUP High-Performance Gear Oil PGLP 220**
Exclusive all-synthetic gear oil designed for heavy-duty use in WIRTGEN milling drum gearboxes and KLEEMANN belt and bevel gearboxes. The high wettability of the lubricant makes for good adhesion to gear wheels and thus ensures good protection from wear. Must not be used for HAMM vibratory bearings and drum drives.

- > **WIRTGEN GROUP High-Performance Gear Oil PGLP 460**
Exclusive all-synthetic gear oil designed for heavy-duty use in WIRTGEN hot recyclers and S-Pack binding agent dosing units. The high wettability of the lubricant makes for good adhesion to gear wheels and thus ensures good protection from wear. Must not be used for HAMM vibratory bearings and drum drives.

ORIGINAL WIRTGEN GROUP LUBRICANTS AT A GLANCE

LUBRICATING GREASES

Lubricating greases are made from a base oil by adding so-called thickeners. In turn, thickeners are special soaps produced on the basis of the metals lithium, calcium, aluminium, barium or sodium.

Additives are also added to lubricating greases to protect the machine components from wear and corrosion.



The use of different additives causes great changes in lubricant characteristics. This explains the large number of lubricants available: The WIRTGEN GROUP offers you greases optimally matched to your machine.

Tasks and requirements for lubricating greases:

- > Lubrication: Permanent lubrication of roller bearings, plain and linear bearings, sliding surfaces, gear wheels, gear segments etc.
- > Low-temperature behaviour: Soft, supple, conveyable in central lubricating systems
- > High-temperature behaviour: Greases must not leak out
- > Coating compatibility in hinges etc.
- > Seal compatibility: Elastomers (polymers like rubber seals) must not become either brittle or soft
- > Ageing stability: Many bearings have lifetime lubrication

Please note: Greases with different thickeners must not be mixed since they dry out and reliable long-term component lubrication can no longer be guaranteed.



ORIGINAL WIRTGEN GROUP LUBRICANTS AT A GLANCE

LUBRICATING GREASES

- > **WIRTGEN GROUP Multipurpose Moly Grease**
Mineral oil based grease for lubricating bearings with heavy loads respectively impact loads in damp, unfavourable conditions. Suitable for lubrication points with mixed friction, rough surfaces, and as assembly grease (for example link pins, wheel bearings). Not suitable for ball bearings or polished surfaces.
Application temperature from -25 °C to +120 °C.
- > **WIRTGEN GROUP High-Performance Grease**
Mineral oil based lithium complex grease with good wear protection. For use, for example, on clutches and WIRTGEN remixers.
Wide application temperature range from -20 °C to +150 °C (multigrade grease).
- > **WIRTGEN GROUP Friction and Roller Bearing Grease**
High-performance polyurea grease with extreme pressure resistance and good wear protection. For lubrication of VÖGELE rolling bearings and sliding bearings with high thermal loads.
Wide application temperature range from -25 °C to +180 °C (multigrade grease).
- > **WIRTGEN GROUP Cone Moly Grease**
Highly viscous lithium complex grease for lubrication in KLEEMANN cone crushers. Molybdenum disulphide (MoS₂) grease. For slow-turning bearings and bolts with high loads. Not suitable for ball bearings or polished surfaces.
Application temperature from -20 °C to +150 °C.

- > **WIRTGEN GROUP High-Performance Grease KLEEMANN**
Grease for KLEEMANN screen mounts.
- > **WIRTGEN GROUP Drum Bearing Grease**
Exclusive grease for lubricating HAMM drum bearings.
Extremely resistant to temperature and pressure.
- > **WIRTGEN GROUP Drive Bearing Grease**
Special high-performance grease for use in HAMM drive bearings. Extremely resistant to pressure and water-repellent.
- > **WIRTGEN GROUP Telescoping Tube Grease**
Special high-performance grease based on silicone for use on VÖGELE telescoping tubes.
- > **WIRTGEN GROUP Low-Viscosity Grease**
Thermally stable, high-performance low-viscosity grease with exceptional wear-resistance properties for VÖGELE auger drives.
- > **WIRTGEN GROUP Quick-Change Toolholder Grease**
Lubricating grease for WIRTGEN quick-change toolholders.

ORIGINAL WIRTGEN GROUP TASKS AND BASICS OF FILTRATION

Filtration is a process in which substances are separated or cleaned.

The interaction of original WIRTGEN GROUP filter elements and lubricants prevents damage caused by contamination and, at the same time, increases machine availability.

WIRTGEN GROUP FILTER ELEMENTS PROMISE HIGH QUALITY

The filters used on construction machinery working under heavy-duty conditions in particular must be optimally adapted to the respective building site requirements, i.e. have been designed accordingly.

When WIRTGEN GROUP machines are converted to replica elements and supposed less expensive copies, experience shows that this often leads to considerable complications:

- > Poor purity levels
- > Reduced component protection
- > Shorter service life of machine components
- > Hazard for operational safety (machine downtime)
- > Limited availability
- > Increased life cycle costs

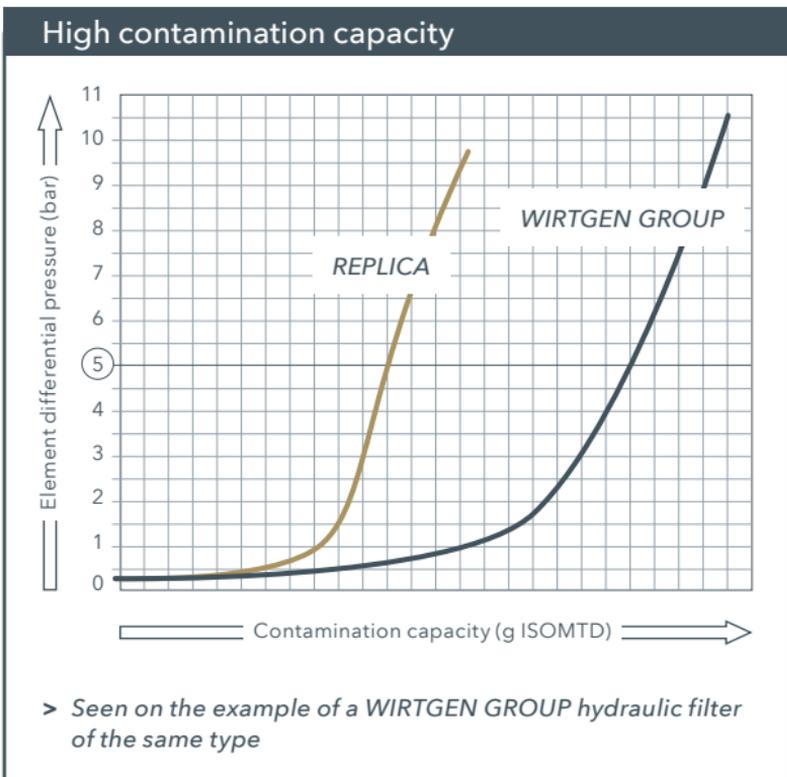


ORIGINAL WIRTGEN GROUP TASKS AND BASICS OF FILTRATION

WIRTGEN GROUP filters provide very good quality: From engine oil filter to air filter to fuel filter, they guarantee optimal values as the example below proves.

HIGH CONTAMINATION CAPACITY FOR LONG SERVICE LIVES AND LOW OPERATING COSTS

When the element is replaced (at an element differential pressure of 5 bar), the original WIRTGEN GROUP element has absorbed much more contamination.



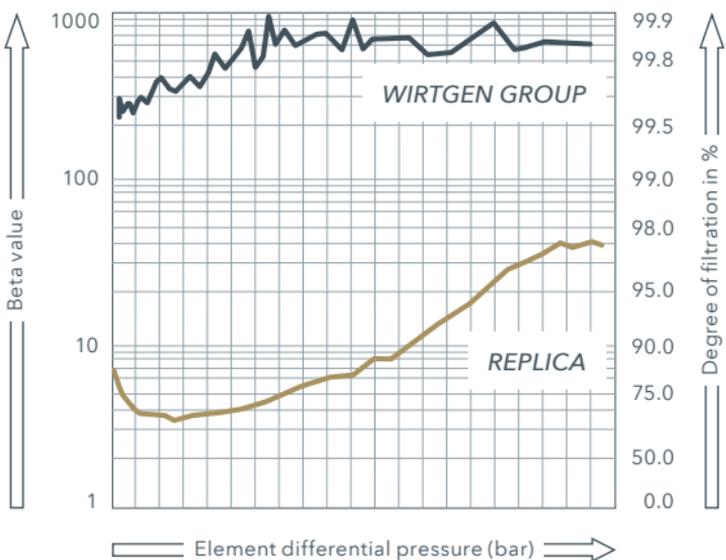
HIGH FILTRATION PERFORMANCE FOR RELIABLE COMPONENT PROTECTION AND HIGH OPERATIONAL SAFETY

The filtration performance of the original WIRTGEN GROUP elements is much higher than that of replica elements of lower quality.

With all filter types, the deciding factor is not only the contamination capacity, but also the pressure differences this results in. In the case of replica elements, the block-ages increase as the degree of contamination increases.

i

High filtration performance



> Seen on the example of a WIRTGEN GROUP hydraulic filter of the same type

ORIGINAL WIRTGEN GROUP FILTERS AT A GLANCE

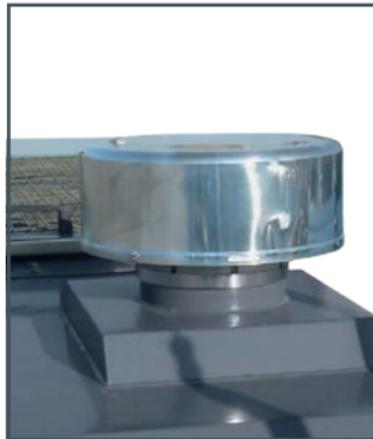
AIR FILTERS

Combustion engines require three substances to work safely: **air, oil** and **fuel**. There are three separate circuits for these three substances, each of which has to be equipped with a filter system.

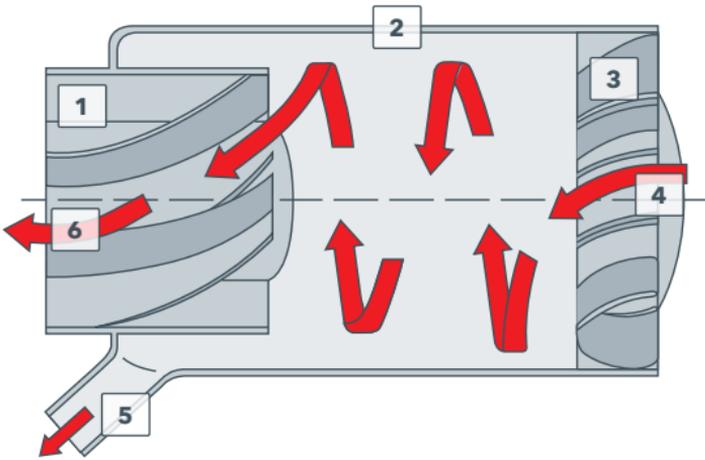
Air filters clean the air required for combustion, thus reducing the risk of damage to engine components. As with all filters, dirt particles may only be allowed to pass up to a certain size in the micrometre-range (μm) depending on the engine in order to prevent damage.

To reduce the load on the actual air filter, **prefilters** are usually installed upstream in WIRTGEN GROUP machines. The amount of air required by the engine is decisive for the choice of the right prefilter. Basically, two different systems can be used that fulfil the same purpose as far as the system is concerned: Prefilters with impeller and cyclone filters.

- > *Prefilter with impeller: A rotor (impeller) is driven by the combustion engine airflow. On account of the high speed of the impeller, the dirt particles are subject to a very high centrifugal force, which means even the tiniest of particles can be ejected to the outside through an opening in the housing.*



Cyclone filter



- 1 > Outlet unit for swirl recuperation
- 2 > Cyclone housing
- 3 > Inlet diffuser for swirl generation
- 4 > Soiled air from the environment
- 5 > Dust output
- 6 > Pre-cleaned air to the main air filter



> Cyclone filter: This prefilter makes the air suctioned in rotate in order to free it from the coarsest soiling.

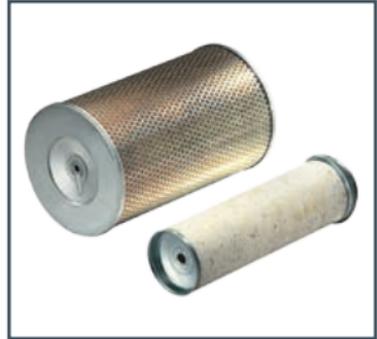
ORIGINAL WIRTGEN GROUP FILTERS AT A GLANCE

AIR FILTERS

The **dust collector**, which is attached to the main filter by metallic clips, allows simple regular emptying and cleaning to be carried out.

The **main air filter** is extremely sturdy thanks to its pleated design. It can effectively prevent packet assembling under unfavourable conditions. The filter is attached firmly to the seal seat through an axial tie rod welded in the housing. The efficiency of the main air filter depends to a decisive extent on its period of application. If air filter cartridges are replaced too soon, it means optimum capacity is not even achieved. The quality filters in WIRTGEN GROUP machines achieve their maximum efficiency after about 10 to 15% of their possible application time. In other words, filter cartridges should only be replaced when the filter has been cleaned several times and the vacuum indicator signal appears.

The **secondary filter** is a safety element that ensures large safety reserves with minimum pressure losses thanks to its fleece structure. It is only downstream from this element that optimally cleaned air enters the combustion engine.



The combustion air is thus routed through up to four filtering components including the prefilter. An effort that pays off, since WIRTGEN GROUP machines have to work perfectly under a wide range of different dustpolluted construction site conditions all over the world, which means each and every one of these elements has to be able to do its job with above-average efficiency.

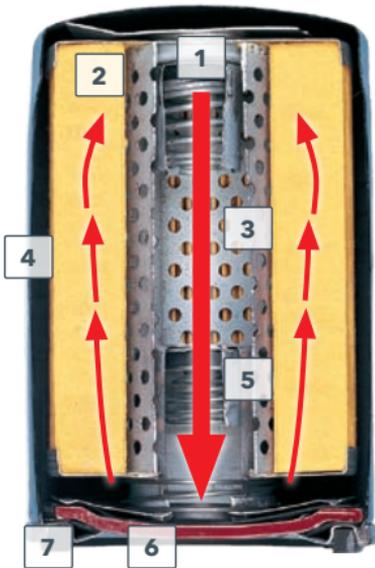


ORIGINAL WIRTGEN GROUP FILTERS AT A GLANCE

ENGINE OIL FILTERS

The engine oil, which lubricates and cleans valves and pistons, has to be cleaned reliably itself for this very reason. Heavily soiled oil causes significant damage to the engine. The service life of the oil itself and the engine can be extended considerably with the help of the engine oil filter.

Engine oil filter

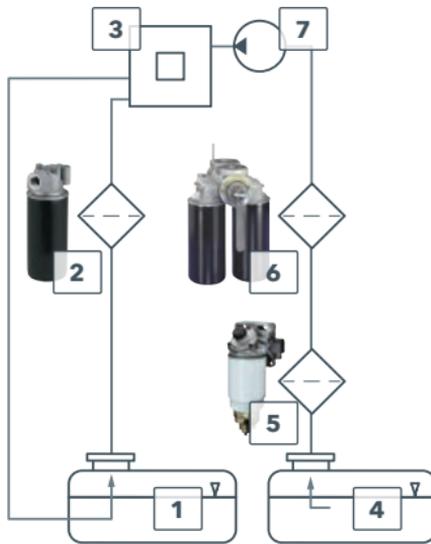


- 1 > Bypass valve
- 2 > Filter element
- 3 > Centre tube
- 4 > Filter housing

- 5 > Non-return valve clean side
- 6 > Non-return valve raw side
- 7 > Seal

FUEL PREFILTERS (WATER SEPARATOR) AND FUEL FILTERS

The demands made on fuel (diesel) are continually increasing on account of new engine technologies and emission limits. The fuel used for the combustion process has to be clean and free of contamination and water. For this reason, a water separator is located upstream from the actual fuel filter, which in turn filters the finer particles out of the diesel fuel before it enters the injection pump.

Engine oil and fuel circuit

1 > Engine oil

2 > Engine oil filter

3 > Engine

4 > Fuel

5 > Fuel prefilter

6 > Fuel main filter

7 > Injection pump

ORIGINAL WIRTGEN GROUP FILTERS AT A GLANCE

HYDRAULIC OIL FILTERS

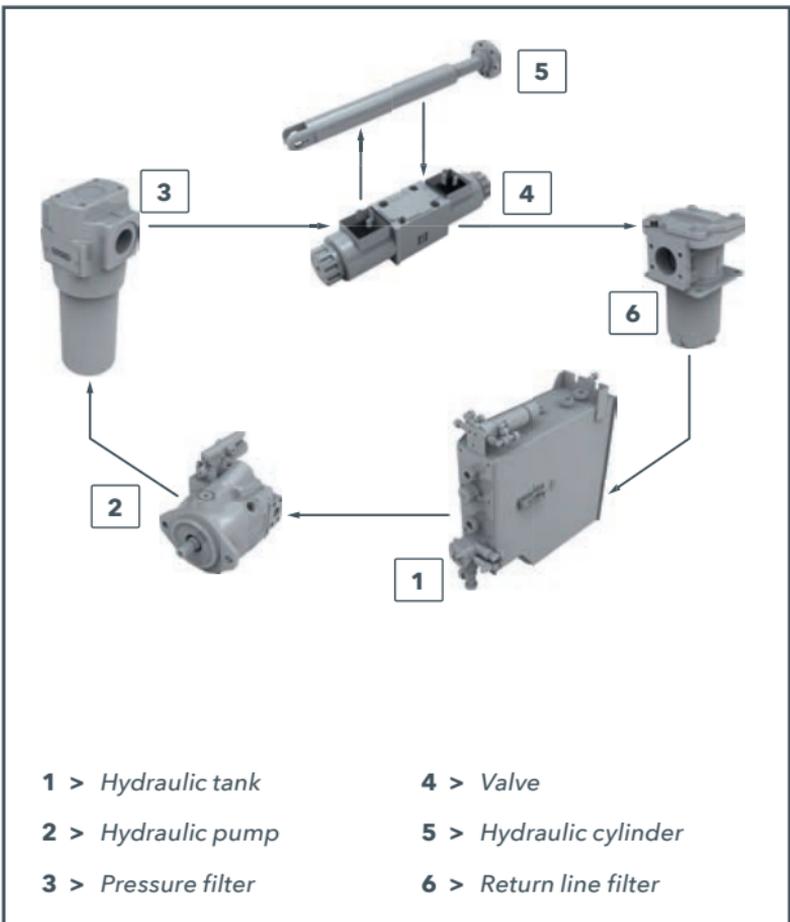
A distinction is made between filter types in hydraulic systems depending on their position and job within the system. The different demands made on hydraulic filters are reflected in different kinds of design. Six different filter types are explained below:

Suction filters have the job of protecting hydraulic pumps from coarse fluid contamination which can quickly lead to sudden pump failure during use.

On account of the high cavitation risk (vapour bubbles caused by vacuum peaks resulting in damages in the μm -range) at the pump, relatively coarse filter materials with a filtration grade of greater 25 μm are used. For this reason, suction filters are not suitable for guaranteeing the component protection necessary for economic operation of the system. Alongside the cavitation risk, the poorer cold-start behaviour is a further reason to replace this filter types by the more modern combined filter or charge pressure filter.

The **pressure filter** is directly downstream from the system pump (e.g. cylinder function pump, open circuit). It should always be fitted with a contamination indicator. This type of filter has been specially designed for system pressure and volume flow. One of its main jobs is to protect sensitive components (e.g. servo-valves).

Pressure filters not only have to withstand maximum pressure in the system, they have to absorb pressure peaks in the long term. Only inline filters without a bypass valve should be used upstream from highly sensitive hydraulic components. This is the position where the filter element has to stand up to the greatest differential pressure loads. Accordingly, the filter housing has to be designed in such a way that it can withstand maximum dynamic system pressure.



ORIGINAL WIRTGEN GROUP FILTERS AT A GLANCE

HYDRAULIC OIL FILTERS

The **return line filter** is located in the return line. As a line filter or tank attachment filter on the tank or filter installed in the tank, it filters the pressure fluid that flows out of the system back into the tank.

The maximum possible volume flow is decisive in the choice of the right filter size. This corresponds to the area ratio between the piston and piston rod in the hydraulic cylinder and can be larger than the volume flow produced by the pumps.

Foaming in the tank always occurs when the fluid outlet from the filter is above the fluid level (watch the level of hydraulic oil in the tank). This means care must be taken that the outlet is always under the fluid surface. This can be achieved by a pipe (tube) or a volume flow diffuser in the filter outlet.

Breather filters: Changes in temperature and the use of cylinders or pressure accumulators causes fluctuation in the oil level in tanks belonging to hydraulic systems.

The resulting difference in pressure to the surroundings has to be compensated by air exchange. This means dirt can get into the tank through the intake air. To ensure breather filters can prevent this efficiently, they should be fitted with the same filtration grade as the system filters used in the hydraulic circuit.



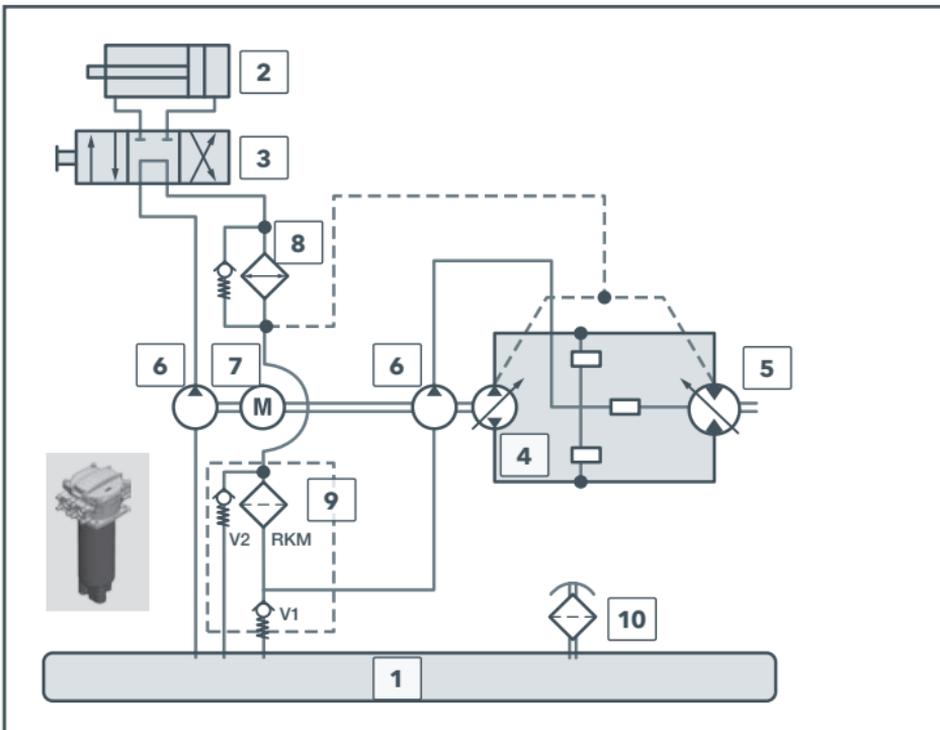
The **charge pressure filter** is directly at the outlet of the feed pump. It filters the hydraulic oil required before it is pumped into the circuit loop. Thus the hydraulic system is always supplied with the necessary quantity of oil.

ORIGINAL WIRTGEN GROUP FILTERS AT A GLANCE

HYDRAULIC OIL FILTERS

Combined filter (return-suction filter) are used in mobile units that are equipped with a working hydraulics system (hydraulic cylinder) and drive hydraulics. The advantage of this type of filter is that filtered oil with an excess pressure of about 0.5 bar is routed into the feed pump of the drive (position 6 in the diagram): This reduces the cavitation risk in the pump and makes excellent cold-start characteristics possible.

To maintain the preload of about 0.5 bar at the feed pump connection, a surplus of at least 10 % is required between return and intake quantity under all operating conditions. From a pressure of 2.5 bar, the oil is routed directly into the tank (no bypass to the closed loop) through a pressure relief valve (V2 in the diagram).



If the leak oil from the hydrostatic drive is routed through the filter in addition to the quantity from the open circuit, care must be taken that the permissible leak oil pressure at the filter is not exceeded in order to protect the radial shaft sealing rings (taking the pressure loss of the leak oil pipes, oil cooler and pressure relief valve into consideration).

The hydraulic filters presented are used for different applications within the individual plants belonging to the WIRTGEN GROUP. The types of filter best suited to the respective purpose of application are preferred.



- 1 > Tank
- 2 > Cylinder
- 3 > 4/3-way valve
- 4 > Adjustable hydraulic pump with two pumping directions (closed loop hydraulic system)
- 5 > Adjustable hydraulic motor with two directions of rotation (closed loop hydraulic system)
- 6 > Hydraulic pumps with one pumping direction (speeddependent)
- 7 > Combustion engine
- 8 > Cooler with bypass
- 9 > Combined filter
- 10 > Breather filter

ORIGINAL WIRTGEN GROUP COMPONENT DAMAGE

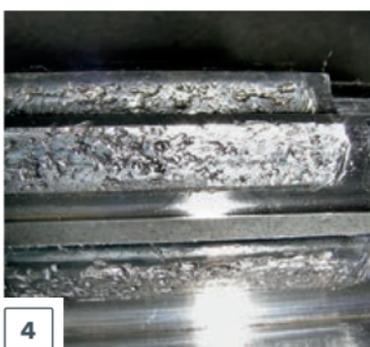
Machine components such as bearings, pistons or gears are subject to natural wear.

However, damage can also be caused by the choice of wrong lubricant or on account of poorly filtered combustion media (particles in the fuel, dust in the combustion air).

This risk can be reduced to a minimum by using the right lubricants and filters. In the case of the components shown here, the use of wrong lubricants and filter inserts has caused damage and breakdowns.

 Please check the specifications in your operating instructions before using the lubricants.

- 1** > Damaged inner bearing ring
- 2** > Damaged liner in the combustion engine
- 3** > Dirt deposits in the gears lead to increased wear and damage
- 4** > Gear wheel in rotary grinder gear with damage to the contact surface
- 5** > Corrosion and dirt deposits on a roller bearing



ORIGINAL WIRTGEN GROUP LUBRICANT PLANS

LUBRICANTS COLD MILLING MACHINES

Example: W 210i

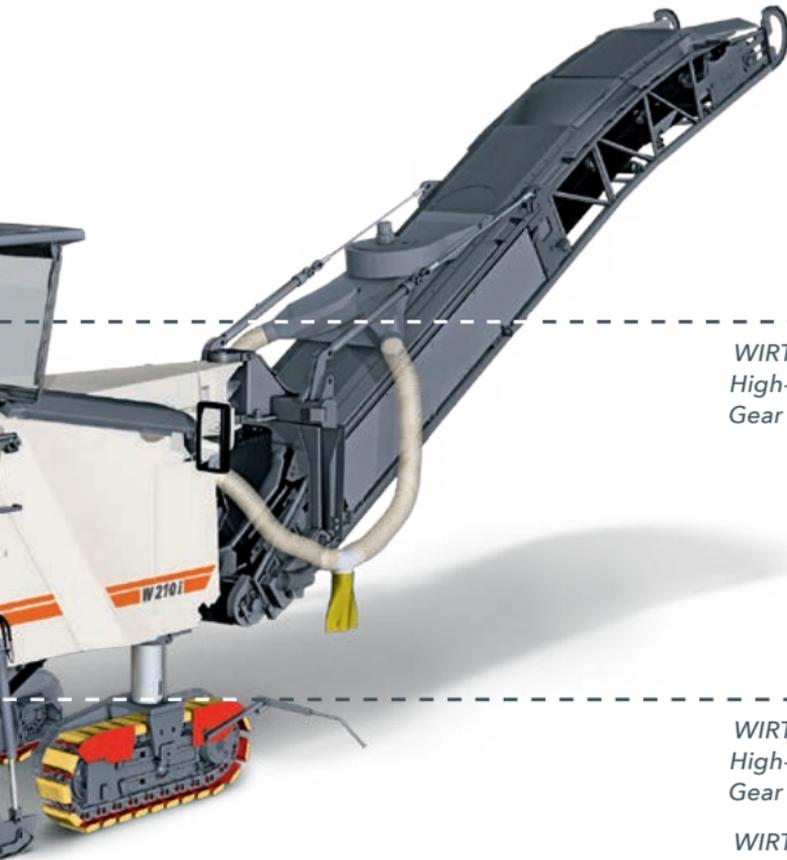


WIRTGEN GROUP
Hydraulic Oil HVLP 46

WIRTGEN GROUP
Gear Oil 85W-90
(Note: use
WIRTGEN GROUP
High-Performance
Gear Oil PGLP 220
for the models 1810,
1505)

WIRTGEN GROUP
Engine Oil
Low SAPS 15W-40

WIRTGEN GROUP
Antifreezing Compound



*WIRTGEN GROUP
High-Performance
Gear Oil PGLP 220*

*WIRTGEN GROUP
High-Performance
Gear Oil PGLP 220*

*WIRTGEN GROUP
Antifreezing Compound*

GENERAL LUBRICANTS:

WIRTGEN GROUP Multipurpose Moly Grease

MILLING DRUM CLUTCH:

WIRTGEN GROUP High-Performance Grease

Due to possible technical changes, please always compare with the information in the instruction manual.

ORIGINAL WIRTGEN GROUP LUBRICANT PLANS

LUBRICANTS SLIPFORM PAVERS

Example: SP 15i



WIRTGEN GROUP
Gear Oil 85W-90



*WIRTGEN GROUP
Gear Oil 85W-90*

*WIRTGEN GROUP
Hydraulic Oil HVLP 46*

*WIRTGEN GROUP
Antifreezing Compound*

*WIRTGEN GROUP
Engine Oil
Low SAPS 15W-40*

GENERAL LUBRICANTS:

WIRTGEN GROUP Multipurpose Moly Grease

Due to possible technical changes, please always compare with the information in the instruction manual.

ORIGINAL WIRTGEN GROUP LUBRICANT PLANS

LUBRICANTS COLD RECYCLING MACHINES

Example: WR 240i

WIRTGEN GROUP
Antifreezing Compound
(Note: use WIRTGEN GROUP Antifreezing Compound MB
for 09WR (WR 200i))

WIRTGEN GROUP
Engine Oil Low SAPS 15W-40
(Note: use WIRTGEN GROUP
Engine Oil Low SAPS 10W-40 for 09WR (WR 200i))



WIRTGEN GROUP
High-Performance Grease

WIRTGEN GROUP
Hydraulic Oil
HVLP 46

WIRTGEN GROUP
High-Performance
Gear Oil PGLP 150

WIRTGEN GROUP
Antifreezing Compound



WIRTGEN GROUP
Gear Oil 85W-90

GENERAL LUBRICANTS:

WIRTGEN GROUP Multipurpose Moly Grease

Due to possible technical changes, please always compare with the information in the instruction manual.

ORIGINAL WIRTGEN GROUP LUBRICANT PLANS

LUBRICANTS PAVERS

Example: SUPER 1900-3i

WIRTGEN GROUP
Hydraulic Oil HVLP 46



WIRTGEN GROUP
Special Gear Oil

WIRTGEN GROUP
Engine Oil Low SAPS 15W-40/10W-40

WIRTGEN GROUP
Antifreezing Compound

WIRTGEN GROUP
Friction and Roller Bearing Grease



Due to possible technical changes, please always compare with the information in the instruction manual.

ORIGINAL WIRTGEN GROUP LUBRICANT PLANS

LUBRICANTS ROLLERS

Example: HD+ 90i

WIRTGEN GROUP
Engine Oil Low SAPS 15W-40



WIRTGEN GROUP
Special Gear Oil



WIRTGEN GROUP
Antifreezing Compound

WIRTGEN GROUP
Hydraulic Oil HVLP 46

Due to possible technical changes, please always compare with the information in the instruction manual.

ORIGINAL WIRTGEN GROUP LUBRICANT PLANS

LUBRICANTS CRUSHERS

Example: MC 110Z EVO

WIRTGEN GROUP
High-Performance Gear Oil PGLP 220



WIRTGEN GROUP
Multipurpose Moly Grease

WIRTGEN GROUP
Special Gear Oil

WIRTGEN GROUP

Engine Oil 10W-40

(Note: in some cases WIRTGEN GROUP Engine Oil
Low SAPS 10W-40 is to be used)

WIRTGEN GROUP

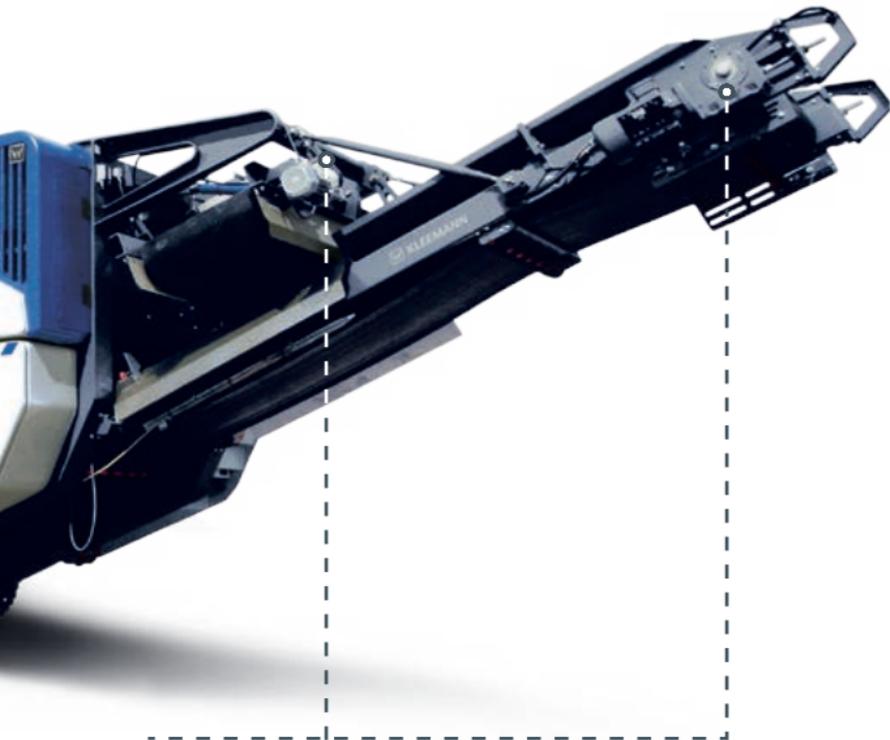
Clutch Fluid HLP 32

WIRTGEN GROUP

Hydraulic Oil HVLP 46

WIRTGEN GROUP

Antifreeze Compound KLEEMANN



WIRTGEN GROUP

High-Performance Gear Oil PGLP 220

Due to possible technical changes, please always compare with the information in the instruction manual.

ORIGINAL WIRTGEN GROUP LUBRICANT SERVICE

THE QUICK WAY TO GENUINE WIRTGEN GROUP LUBRICANTS AND FILTERS

You can benefit from our online service at www.partsandmore.net to find the perfect product for your machine. In just a few steps, you can, for instance, select suitable lubricants, filter and maintenance packages - clearly laid out and including all the relevant details.

You order - we deliver promptly. The ideal tool to support you efficiently in your daily work.

Information on ordering lubricants and filters can be found in the Parts and More catalogue and online under www.partsandmore.net.



OUR
SERVICE
FOR YOU

Always stay up-to-date, even on mobile devices, with our service tool for genuine WIRTGEN GROUP lubricants and filters at: www.partsandmore.net





WIRTGEN GROUP



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