Vacuum Excellent Oil

Synthetic EP air compressor oils based on PAO, for turbo, screw, vane and piston compressors; High-performance synthetic, PAO-based hydraulic fluids

Description

Compressed air has become a major form of energy and the reliable generation of compressed air is vital. Operators require compressors to function perfectly over and beyond entire service intervals.

The Vacuum Excellent Oil UNISYN OL series was developed to meet the increased requirements of compressor manufacturers on the service life of compressor oils. Due to the function of compressors, intensive swirling of the cooling oil and air occurs. At high compression temperatures, the oils are subjected to a strong oxidative attack that accelerates ageing. The selection of special synthetic base oils and additive systems makes long, interruption-free operation possible. To ensure optimum performance of the oil separator, the air release properties and low foaming are characteristic for screw and turbo compressor oils. Vacuum Excellent Oil UNISYN OL 32, 46 and 68 offer extra-long service life, and they fulfill the requirements mentioned above as well as the requirements according to DIN 51506 VDL.

The most important functions of lubricating and cooling oils in screw compressors are:
* Cooling the compressed air
* Bearing lubrication
* Sealing the chambers
* Corrosion protection
* Preventing the formation of deposits.

Vacuum Excellent Oil UNIYSYN OL 32, 46 and 68 have especially been developed for the use in oil injected screw compressors and in turbo compressors.

Vacuum Excellent Oil 100 and 150 are recommended in particular for long-term use in piston and rotary compressors that must meet the

Advantages

- **Excellent viscosity-temperature behaviour (high natural viscosity index), shear-stable**
- **Excellent oxidation stability**
- **Low evaporation losses**
- **Excellent wear protection (EP/AW!)**
- **Excellent FE8 performance**
- **Good demulsifying properties**
- **Excellent corrosion protection**
- **Good compatibility with elastomers**
- **Low foaming / good air release**
- **Suitable for high-temperature applications**
- **Synthetic hydraulic fluids, excellent low temperature flowability**
- **Exceed DIN 51506 – VDL**
- **For extra-long service life in screw compressors > 9,000h***

** At a discharge temperature of 85 °C*

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strict requirements for low residue formation according to DIN 51506 VDL.

Vacuum Excellent Oil fluids can also be used as hydraulic fluids according to DIN 51524.

Application

Vacuum Excellent Oil products are recommended for use in flooded or oil injection screw-type air compressors and turbo compressors (ISO VG 32, 46, 68) and for piston and rotary vane compressors (ISO VG 100, 150).

Vacuum Excellent Oil products should always be used if mineral oil-based products are found to display insufficient thermal stability (resistance to ageing) or poor viscosity-temperature behaviour. Compared to mineral oil-based oils, Vacuum Excellent Oil products foam less, offer better demulsification and have superior air release properties.

The use of Edmac Vacuum Excellent Oil products is especially recommended in unfavourable conditions and at high temperatures in which other oils fail because they allow coke to form, thus leading to unacceptably short oil life. These oils are also recommended for compressors which are subject to extreme loads.

Compared to mineral oil products, the life of Edmac Vacuum Excellent Oil products is considerably longer, operational reliability is much improved and breakdowns are effectively reduced (service intervals can be extended). Using Edmac Vacuum Excellent Oil
32, 46, 68 in screw compressors the service life of the oil filling can be increased up to more than 9,000h.

Edmac Vacuum Excellent Oil products can also be used as hydraulic fluids, especially with good low-temperature behaviour.

Specifications

ISO 6743-3:
L-DAA, L-DAB (reciprocating compressors)
L-DAG, L-DAH, L-DAJ (rotating compressors)
DIN 51506: VDL
DIN 51524-2: HLP, DIN 51524-3: HVLP

Excellent Viscosity-Temperature Behaviour (High natural viscosity index)

Edmac Vacuum Excellent Oil products display good "natural" viscosity-temperature behaviour. Compared to equiviscous mineral oils, the start-up viscosity of such oils at low temperatures is significantly less. This also ensures the fastest possible oil feed to bearings. Furthermore, compared to mineral oil-based products of the same ISO-VG, the viscosity of Edmac Vacuum Excellent Oil products at operating temperatures is higher. This ensures that an optimal lubricating film (higher viscosity) is always formed. Even at high loads and after long periods of use, no shearing losses (drop in VI) occur.

Excellent Oxidation Stability

When running, the lubricating oil in screw compressors comes into close contact with the oxygen in the air. Oxidation is accelerated by the large volumes of air along with the relatively large surfaces on the inside of such compressors. The temperature peaks encountered in screw compressors also subject the lubricating oil to thermal stress. The use of Vacuum Excellent Oil products, especially at high temperatures (caused by high pressures), avoids the formation of ageing by-products and coke.

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Moreover, they hinder the formation of corrosive oxidation by-products as well as rubbery or lacquer-like deposits. Vacuum Excellent Oil oils reduce breakdowns and maintenance work, increase the life of filters and improve the performance of compressors. The outstanding oxidation resistance of the base oils used which is boosted by special oxidation inhibitors avoids the formation of ageing by-products, coke and other products which detrimentally affect performance. These features also significantly increase the life of the oil.

Low Evaporation Losses

Mineral oil-based lubricants, especially at high operating temperatures, tend to evaporate their highly volatile components causing the viscosity to increase and oil mist pollution of the compressed air. The very low evaporation losses of the synthetic base oils used for Vacuum Excellent Oil products largely eliminate such problems.

Excellent Wear Protection (EP)

The heat which is generated at high compressor outlet pressures often causes the oil film between the rotor flanks to become so thin that metal-to-metal contact takes place and thus wear. Vacuum Excellent Oil products contain special AW/EP additives which enable a protective film to be formed even at extreme pressures. This minimizes bearing and rotor wear and thus significantly increases the operational reliability of the compressor. Vacuum Excellent Oil 68 was tested in the FE8 test rig, with excellent results.

Excellent Performance in Hydraulic Equipment

Vacuum Excellent Oil products offer excellent wear protection in hydraulic equipment. RWTÜV Germany - a well-known independent institute - has done the Vickers Vane Pump Test with Vacuum Excellent Oil 46, with excellent results. Extreme wear protection guarantees a long lifetime of the components.

Good Demulsifying Properties

Water can get into compressors through condensation. Such moisture can accelerate the ageing of the oil. Furthermore, water in compressors can lead to bearing failure and to negative reactions. And on top of that, water can wash out the water-soluble additives in the oil which again reduces lubricity. Condensation can also occur in compressors which are used intermittently or which are rarely run at full power. Moisture in the oil can create sludge or stable water-in-oil emulsions which can block oil passages, causing partial seizures. Any moisture which gets mixed with Vacuum Excellent Oil separates-out and can be drained. This reduces the problems associated with the formation of emulsions which have to be disposed-of as special waste. All these features help reduce costs.

Excellent Corrosion Protection for Steel and Nonferrous Metals

DIN ISO 7120 examines the corrosion protection properties of an oil and distilled water on a steel test panel. In this test, Vacuum Excellent Oil products caused no corrosion throughout the duration of the test. The same excellent results also apply to nonferrous metals (DIN EN ISO 2160). Practically, this means that all machine components remain well protected against corrosion.

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Typical Properties:

Product name		**32**	**46**	**68**	**100**	**150**	
Properties	**Unit**						**Test method**
ISO VG		32	46	68	100	150	DIN 51519
Colour index		0	0	0	0	0.5	DIN ISO 2049
Kinematic viscosity at – 20 °C at 0 °C at 40 °C at 100 °C	 mm^2/s mm^2/s mm^2/s mm^2/s	 1200 260 32 6.1	 2000 400 46 7.9	 3500 660 68 10.6	 6000 1000 100 14.4	 10000 1650 150 19.6	DIN EN ISO 3104
Viscosity index		138	141	146	149	150	DIN ISO 2909
Density at 15 °C	kg/m^3	838	841	845	848	852	DIN 51757
Flashpoint, COC	°C	240	260	260	260	250	DIN ISO 2592
Pourpoint	°C	< -60	< -60	-54	-54	-47	DIN ISO 3016
Copper corrosion	degree of corrosion			1-100 A3			DIN EN ISO 2160
Steel/ferrous corrosion protection properties	degree of corrosion	0-A 0-B	0-A 0-B	0-A 0-B	0-A 0-B	0-A 0-B	DIN ISO 7120
Neutralization number	mgKOH/g	0.2	0.2	0.2	0.2	0.55	ISO 6618
Water content	% mass			not detectable			DIN ISO 3733
Demulsification at 54 °C	min	10	10	15	-	-	DIN ISO 6614
Demulsification at 82 °C	min	-	-	-	10	5	DIN ISO 6614
Air release at 50 °C	min	1	2	5	-	-	DIN ISO 9120
Air release at 75 °C	min	-	-	-	3	5	DIN ISO 9120
Foaming, Seq. I: 24 °C Seq. II: 93.5 °C Seq. III: 24 °C after 93.5 °C	 ml ml ml	 0/0 0/0 0/0	 0/0 0/0 0/0	 0/0 0/0 0/0	 0/0 5/0 0/0	 0/0 5/0 0/0	ASTM D 892

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Properties	**Unit**						**Test method**
ISO VG		32	46	68	100	150	DIN 51519
Sulphate ash	% mass	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	DIN 51575
Rotary vane pump test * 250 h, 140 bar max. pressure							DIN 51389-2
weight loss ring	mg	pass	11	pass	not determined	not determined	
weight loss vane	mg	pass	7	pass			
Ageing stability:							
Increase CCR after ageing	%	0.02	0.02	0.02	0.02	-	DIN 51352-1
CCR after ageing with Fe_2O_3	%	0.15	0.15	0.4	0.6	-	DIN 51352-2
VKA shear stability, four-ball-test: relative shear loss (viscosity reduction, V_{40} and V_{100}) after 20 h	%	shear-stable					DIN 51350-6
FZG mechanical gear test rig	failure load stage	> 12	> 12	> 12	> 12	> 12	DIN ISO 14635-1
FE8 roller test, C 7.5/80-80 Wear of the roller elements	mg	type test: 7.8 (ISO VG 68) / 12 (VG 150)					DIN 51819-3
Effect on SRE-NBR 28/PX (= NBR 1) seal material acc. to ISO 13226, 100 °C / 7 days,							DIN ISO 1817
relative volume change	%	+ 2.5	+ 2.3	+ 2	+ 2	+ 3.7	
change in Shore A hardness	shore	+ 1	+ 1	+ 1	+ 1	- 2	

* RWTÜV report is available for Vacuum Excellent Oil 46

VACCUM EXCELLENT OIL

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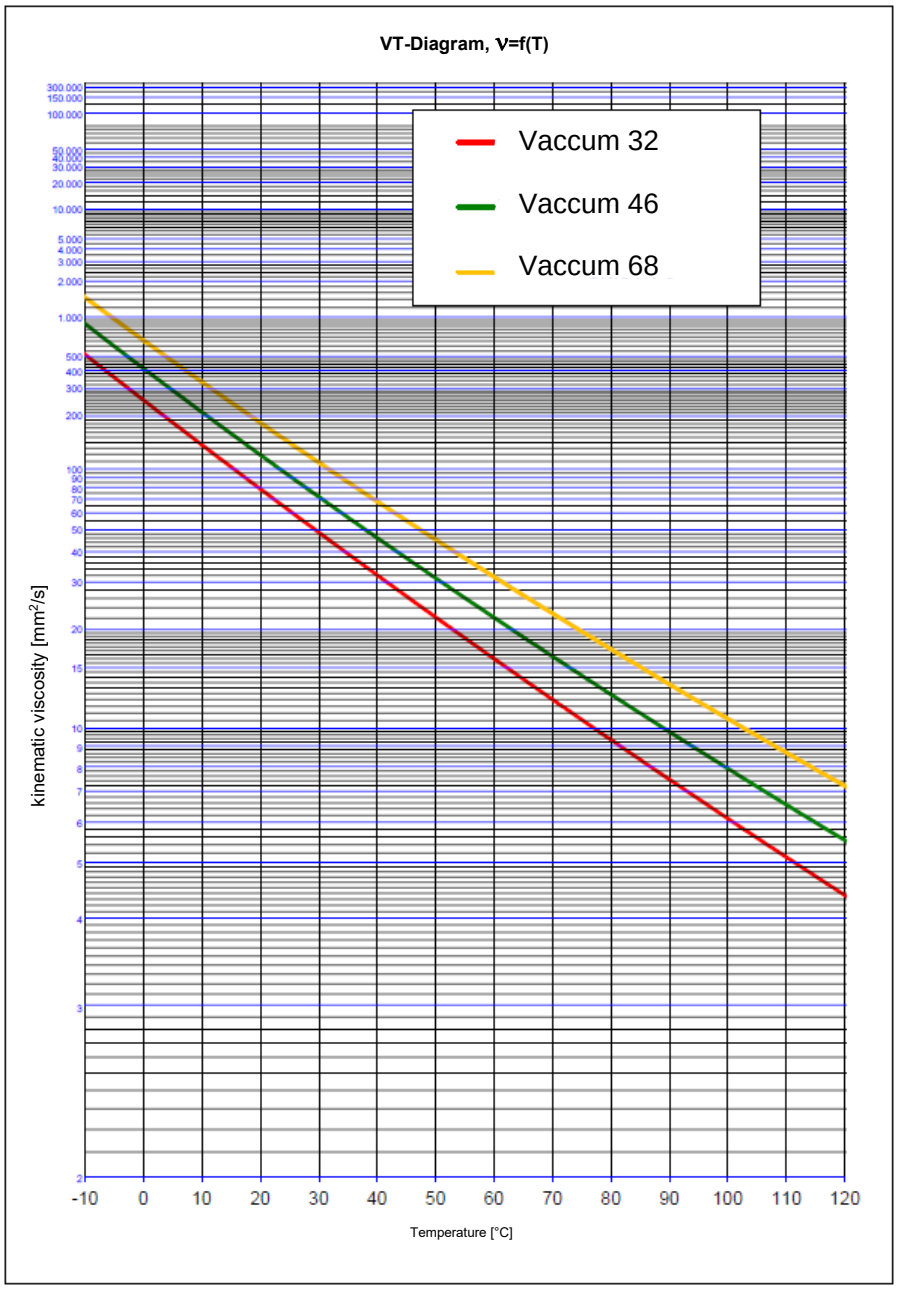

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kinematic viscosity [mm_2/s]

VT-Diagram, ν=f(T)