HIDROTEX
HYDRAULIC OILS

BELGIN

BELGiN provides over 1000 different types of specific industrial lubricants under 32 main groups for the domestic and foreign production industry.

BELGiN also produces the high performance HIDROTEX Hydraulic oils in its modern plant, which operates under SGS ISO 9001 – TSE ISO 9001 quality system certificate and laboratory certificate in the scope of TS EN ISO/IEC 17025 standard. This plant boasts a production with the state-of-the-art technology as well as fully automatic, computer controlled operations, founded on 7800 m^2 closed area within 25000 m^2 open area at the Gebze Organized Industrial Site.

HIDROTEX Hydraulic Oils, being produced at different viscosities and performance levels, meet primarily the DIN 51524 norm and also other worldwide accepted norms, they are approved and certificated by various foreign and domestic CNC&workbench producers.

HIDROTEX Hydraulic oils produced at world standards, are used with success in steel-iron industry, heavy loaded equipments, workbenches and in many other industrial sectors.

HYDRAULIC OILS

→ GENERAL TECHNICAL INFORMATION

The function of hydraulic oil is to transfer mechanical power from one location to another location in a hydraulic system.

The following properties are expected from hydraulic oils depending on usage area.

- → Suitable viscosity
- → High viscosity index
- → Anti-wear properties
- → Filterability and Low particle count
- → Rust inhibition
- → Demulsibility from water
- → Air release and resistance to foaming
- → Oxidation stability
- → Pumpability in low temperature

HIDROTEX Hydraulic oils are produced by blending different mineral and synthetic base oils together with special additives in order to retain the above mentioned properties. After the quality control, they are filtered with low micron filtering system and filled in suitable packages. This filtration system keeps the number of suspended particles and contamination in the hydraulic oils at minimum. It is recommended to filter the hydraulic oils again before filling into the system.

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→ CLASSIFICATION OF HYDRAULIC OILS

Hydraulic oils can be classified according to their kinematic viscosities and performance levels.

ACCORDING TO KINEMATIC VISCOSITIES

When designing the hydraulic systems, the producers provide in their manuals the hydraulic oil viscosity to be used, taking into account the working temperature and system requirements. ISO VG viscosity classification is the most common classification used in the world for industrial applications. This classification gives hydraulic oil fluidity at 40°C in the units of mm^2/s or cSt and is placed in viscosity classes according to limit values which are shown in the table below. At the same time ISO VG classification is used for classification of sliding oils, gear oils and the other industrial oils. Please consult to Belgin Technical Support for other viscosity classifications.

ISO VG	Min. Kinematic Viscosity at 40°C (cSt)	Max. Kinematic Viscosity at 40°C (cSt)
2	1,98	2,42
10	9,00	11,00
15	13,50	16,50
22	19,80	24,20
32	28,80	35,20
37*	35,50	39,50
46	41,40	50,60
68	61,20	74,80
100	90,00	110,00
150	135,00	165,00
220	198,00	242,00

* This classification, exists only in Turkey.

ACCORDING TO PERFORMANCE LEVELS

Hydraulic oils are classified under 3 main groups depending on the usage area and base fluid.

Hydrocarbon Base Hydraulic Fluids

Classification according to DIN 51524

- H: Hydraulic oils containing only antioxidant additives.
- HL: Hydraulic oils containing antioxidant and rust inhibitor additives.
- HLP: Hydraulic oils containing antioxidant, rust inhibitor and anti-wear additives.
- HLP-D: Hydraulic oils containing antioxidant, rust inhibitor, anti-wear and detergent/dispersant additives.
- HVI: Hydraulic oils, containing antioxidant, rust inhibitor, anti-wear and viscosity, index improver additives.

Fire Resistant Hydraulic Fluids

- HFA AND HFB : Fire resistant hydraulic fluids miscible with water
- HFC : Polyglycol-water solution fire resistant hydraulic fluids
- HFDR : Water –free and phosphorus acide ester-based fire resistant hydraulic fluids
- HFDU : Biologically degradable phosphate ester-based fire resistant hydraulic fluids

Vegetable Base Environmental Hydraulics

Please consult to Belgin Technical Support for further information.

→ IMPORTANT NORMS IN HYDRAULIC OILS

Except the classification according to DIN 51524, there are other worldwide - accepted performance levels, which play an important role in the improved performance of hydraulic oils. These performance levels complete the missing or undeclared criteria in DIN 51524 PART II specification.

DENISON HF-O

In this test, designed by Denison Hydraulics Inc., the hydraulic oil works in a hybrid hydraulic system containing vane and piston pumps for 300 hours at 110°C. After 300 hours, 1% water is added into the system, and in the second phase the hydraulic oil runs for another 300 hours at 80°C. At the end of the test, the wear and visual appearances of all components are reported. Fluid viscosity, filterability times in dry and wet phases are also checked throughout the test. Hydraulic oils meeting this specification continue to protect the system even in the presence of water and do not plug filters.

CINCINNATI MACHINE P-68, P-69, P-70

Cincinnati Machine is a specification, which tests thermal stability of hydraulic oils. In this test, copper and steel bars are evaluated visually regarding the corrosive effect of the hydraulic oil aged by working for 168 hours at 135°C and the sludge content is also measured. The P-68, P-69 and P-70 approvals can be given to the ISO VG 32, ISO VG 68, ISO VG 46 viscosity class hydraulic oils, respectively.

EATON (VICKERS) M-2950-S

This test demonstrates the anti-wear performance of hydraulic oils in a vane pump called Vickers 35VQ-25. The hydraulic oil runs for 50 hours under operating temperature of 93°C and operating pressure of 3000 psi. At the end of test, wear in the hydraulic system is measured by weight loss. This test especially simulates the hydraulic systems in mobile equipments.

EATON (VICKERS) I-286-S3

This test is performed in Vickers V-104C vane pump, which is used mainly in industrial applications. Hydraulic oil runs for 250 hours under operating pressure of 2000 psi. At the end of the test, wear on the pump elements are measured by weight.

AFNOR NF-E 48603

It is a standard designated by French Standard Institutes. This standard and DIN 51524 standard are parallel with each other.

→ PERFORMANCE TESTS OF HYDRAULIC OILS

KINEMATIC VISCOSITY (ASTM D 445)

This test determines the resistance to flow of oil under gravity. Viscosity is measured at 40°C for industrial applications and at 100°C for automotive industry applications in the units of mm^2/s or cSt.

VISCOSITY INDEX (ASTM D 2270)

This test determines the variation in the kinematic viscosity of a fluid with temperature. For oils of similar kinematic viscosity, the higher the viscosity index, the smaller would be the decrease of the kinematic viscosity with increasing temperatures. As a result, leakages and power loss are minimized in the hydraulic systems.

POUR POINT (ASTM D 97)

This test determines the lowest temperature at which movement of the oil is observed. The pour point of oils provides an indication of the lowest temperature of its utility in certain applications.

FLASH POINT (ASTM D 92)

This test determines the flash and fire point of the oil. These values are important to provide work safety.

FOUR-BALL WEAR DIAMETER TEST (ASTM D 2266, ASTM D 4172)

This test method determines the anti-wear properties of lubricants in sliding contact. Wear diameters are measured by use of microscope.

→ PERFORMANCE TESTS OF HYDRAULIC OILS

WATER SEPARABILITY TEST (ASTM D 1401)

This test method covers measurement of the ability of oils to separate from water. The volumes of oil, water and emulsion separated at specified time are reported in mL.

TOTAL ACID NUMBER (ASTM D 974)

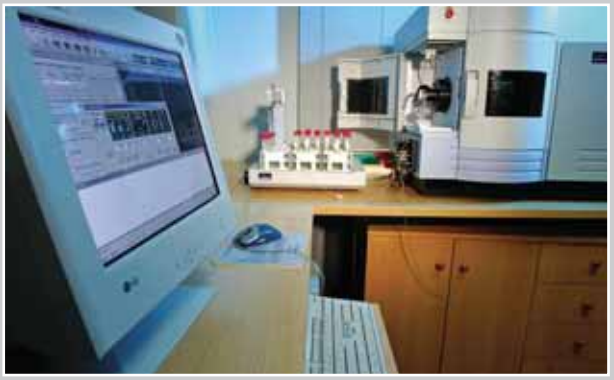
This test method covers the determination of acidic constituents in the oil.

PARTICLE COUNT AND DISTRIBUTION (NAS 1638)

This test determines particle count and distribution in the hydraulic oils.

CORROSION TEST (ASTM D 665)

This test determines the rust-preventing characteristic of hydraulic oil in the presence of water.



AIR RELEASE (ASTM D 3597)

This test method covers the ability of oils to release entrained air.

TOST OXIDATION TEST (ASTM D 943)

This test determines the oxidation stability, namely the expected life of oils.

FZG GEAR TEST (ASTM D 5182)

This test determines load-carrying capacity of oils.

COPPER CORROSION TEST (ASTM D 130)

This test determines degree of corrosivity of oils on the copper material.

HYDRAULIC OILS

HIDROTEX DTA SERIES

DTA SERIES are economical hydraulic oils, which are designed to satisfy of light-duty hydraulic equipment requirements, produced by blending high quality base oils with the anti-corrosion and anti-wear additives. DTA SERIES provide long life due to antioxidant additives. It does not foam unless there are mechanical problems in the system.

HIDROTEX BS SERIES

HIDROTEX BS SERIES are high performance hydraulic oils produced by blending high quality base oil with special additives and can meet heavy-duty hydraulic equipment requirements due to superior new additive technology. HIDROTEX BS SERIES exceed DIN 51524 PART II performance level and are approved by CINCINNATI MILACRON. They pass also DENISON HF-0 performance level, minimizing the wear in the hydraulic equipment. Even in case of entrance of condense water into the hydraulic system, it prevents corrosion, plugging of filters and prolongs filter life.
It does not foam due to the antifoam additives unless there are mechanical problems in the system. It can easily separate from water and has longer life compared to other ordinary hydraulic oils due to its special antioxidants.

HIDROTEX ZF SERIES

HIDROTEX ZF SERIES are zinc-free hydraulic oils which have high resistant to wear and high thermal stability, produced with high quality paraffinic base oils. It can be used in all kinds of hydraulic pumps with copper alloys due to copper corrosion inhibitors. It has a high oxidation, thermal and hydrolytic stability. In case of entrance condense water it prevents corrosion and easily separate from water. HIDROTEX ZF SERIES does not foam, thus does not cause cavitations. It does not cause heavy metal pollution in the environment.

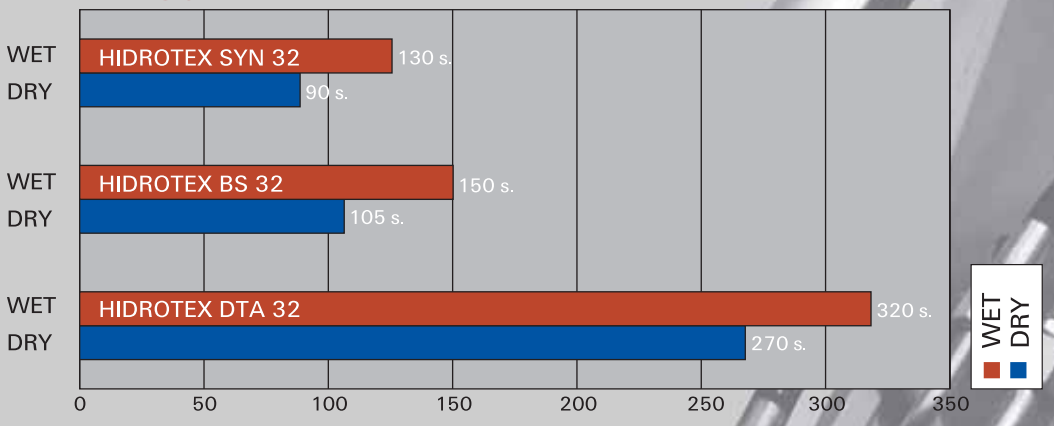
HIDROTEX BS SUPER SERIES

HIDROTEX BS SUPER SERIES are special hydraulic oils produced with refined base oils and are developed for hydraulic systems that cannot prevent the entrance of water or emulsion. When other hydraulic oils are contaminated with water or emulsion in the system must be discharged and hydraulic oils must be changed. These types of oils can absorb water up to 5% of total hydraulic oil volume. They prevent corrosion and wear of free water and avoid plugging of filters.

HIDROTEX HVI SUPER SERIES

HIDROTEX HVI SUPER SERIES are hydraulic oils, which are produced by blending highly refined base oils with viscosity index improver additives and latest technology additives. It must be used when the hydraulic system operating temperature is above 60°C or when the hydraulic system is working under low temperatures. HIDROTEX HVI SUPER minimizes the pressure drops and leakages due to the high viscosity index. When the HIDROTEX HVI SUPER performance is no enough, then HIDROTEX HVI EXTRA SERIES must be used in the system.

DENISON FILTERABILITY



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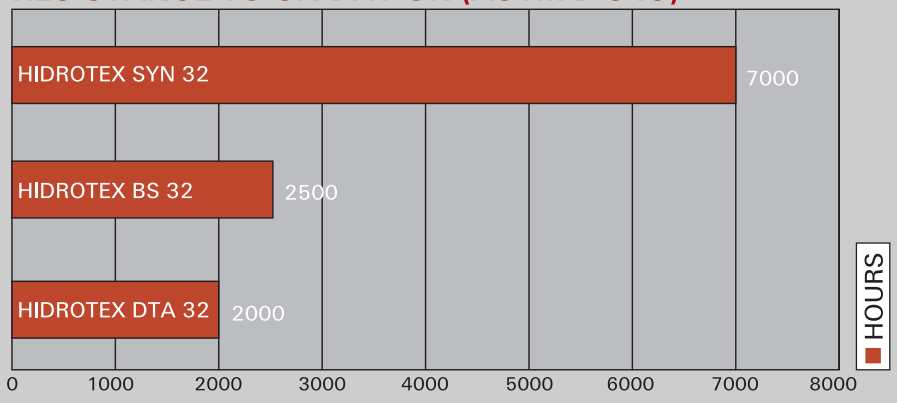
HYDRAULIC OILS

RESISTANCE TO OXIDATION (ASTM D 943)



HIDROTEX HVI EXTRA SERIES

HIDROTEX HVI EXTRA SERIES are ideal when HİDROTEX HVI SUPER SERIES performance is not enough in hydraulic systems where the viscosity losses due to increases in temperature are rather important or where the hydraulic system is working under very low temperatures. HIDROTEX HVI EXTRA SERIES are produced by blending highly refined base oils with viscosity index improver additives and latest additives technology. In case of entrance of condense water it prevents corrosion due to the superior corrosion preventative additives. It contains anti-wear additives minimizing wear on hydraulic elements.

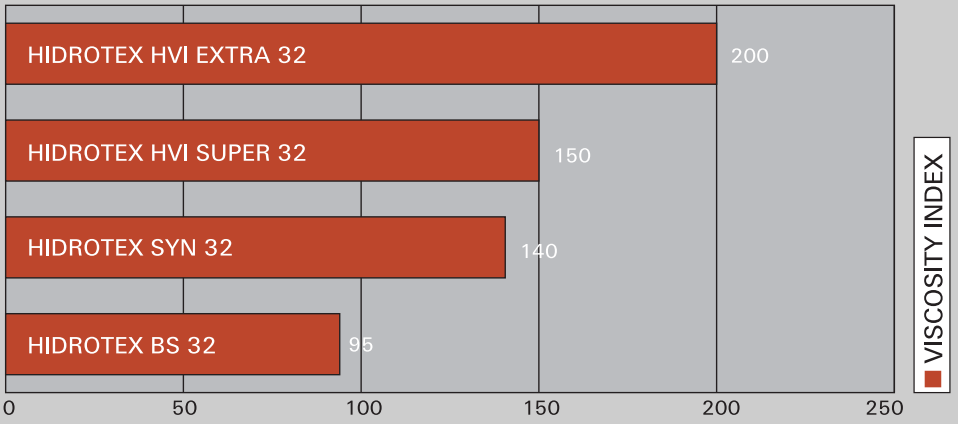
HIDROTEX SYN SERIES

HIDROTEX SYN SERIES are long-life hydraulic oils, which are produced by blending synthetic base oils and superior technology additives. They are recommended especially for performance-demanding hydraulic applications and also hydraulic applications operating at low temperatures. Due to its synthetic structure, they minimize viscosity reductions caused by increases of operating temperature. They are economical hydraulic oils looking at total cost, because they can be used about 7000 work hours unless water, emulsion or other contamination does not enter into the system. In case of entrance of condense water into the system, it prevents corrosion and does not plug filters. It contains anti-wear additives minimizing the wear on the hydraulic elements. It does not form any sludge due to the oxidation of oil, protects the hydraulic systems containing servo valves.

POLYOL ES-BASE HF SERIES

POLYOL ES-BASE HF OILS, are polyol ester-based, highly fire resistant environmental-friendly hydraulic fluids which do not contain any mineral oil. They are fire resistant hydraulic fluids and can work under very difficult conditions. Mineral oils can not be used in processes where casting, furnaces and liquid metal are present such as hydraulic die-casting and chilled casting machines, automatic injection molding machines, hydraulic forging presses, machines in the mining industry. Under such conditions, utilization of fire resistant hydraulic fluids is necessary.

RESISTANCE TO HEAT (ASTM D 2265)



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HYDRAULIC OILS

SUPERSAFE FLUID SERIES

SUPERSAFE FLUID OILS, are a fire resistant hydraulic fluid that can be used in hydraulic systems where high temperatures exist. They are used in systems in which high fire risk is present such as hot molding hydraulic systems, automatic plastic injection machines and tools, hydraulic presses, hot piece hydraulic conveyors, hydraulic systems of quarries and steel industry. Due to the high viscosity index value, they preserve fluidity and maintain the ability of lubrication at start-up at at low temperatures. These type of hydraulic fluids do not require a pre-heating process as mineral based hydraulic oils do.

HIDROTEX SC SERIES

HIDROTEX SC SERIES are hydraulic system cleaners based on refined mineral base oil.
HIDROTEX SC SERIES clean the dirt, stickiness and sludge in the hydraulic systems and workbenches while they are working fully operational. Therefore the production is not stopped for a through mechanical cleaning and there will be no time loss.
By choosing the appropriate viscosity grade of HIDROTEX SC SERIES, the hydraulic system is filled with it and worked for 150 hours while the system cleaner is cleaning the whole hydraulic system, the production can continue without interruption. At the end of 150 hours, the hydraulic system cleaner is poured out and system is filled the fresh oil. Emptied Hydraulic System cleaner can be kept in a container, so that the contamination, dirt and water settle out of the hydraulic system cleaner to be disposed. Settled HIDROTEX SC Series can be used three times for the hydraulic system cleaning. After that, the product can be used in light duty cutting and lubricating operations. Cleaning of contaminated hydraulic systems will have a positive affect on the performance and life of the freshly filled hydraulic oil.

PERFORMANCE	HIDROTEX DTA	*HIDROTEX BS	HIDROTEX ZF	HIDROTEX BS SUPER	HIDROTEX HVI SUPER	HIDROTEX HVI EXTRA	HIDROTEX SYN	HIDROTEX ZF	HIDROTEX SC
DIN 51524 PART I - H	✓	✓	✓	✓	✓	✓	✓	✓	✓
DIN 51524 PART II - HLP	✓	✓	✓		✓	✓	✓	✓	
DIN 51524 PART II - HLPD				✓					✓
DIN 51524 PART III - HVI					✓	✓	✓		
US STEEL 126/127	✓								
CINCINNATI MACHINE P-68, P-69, P-70		✓			✓	✓	✓		
EATON (VICKERS) M-2950-S		✓			✓	✓	✓		
EATON (VICKERS) I-286-S3		✓			✓	✓	✓		
AFNOR NF-E 48603	✓	✓	✓		✓	✓	✓		

*** Hidrotex BS Series are approved by Bosch Rextroth.**

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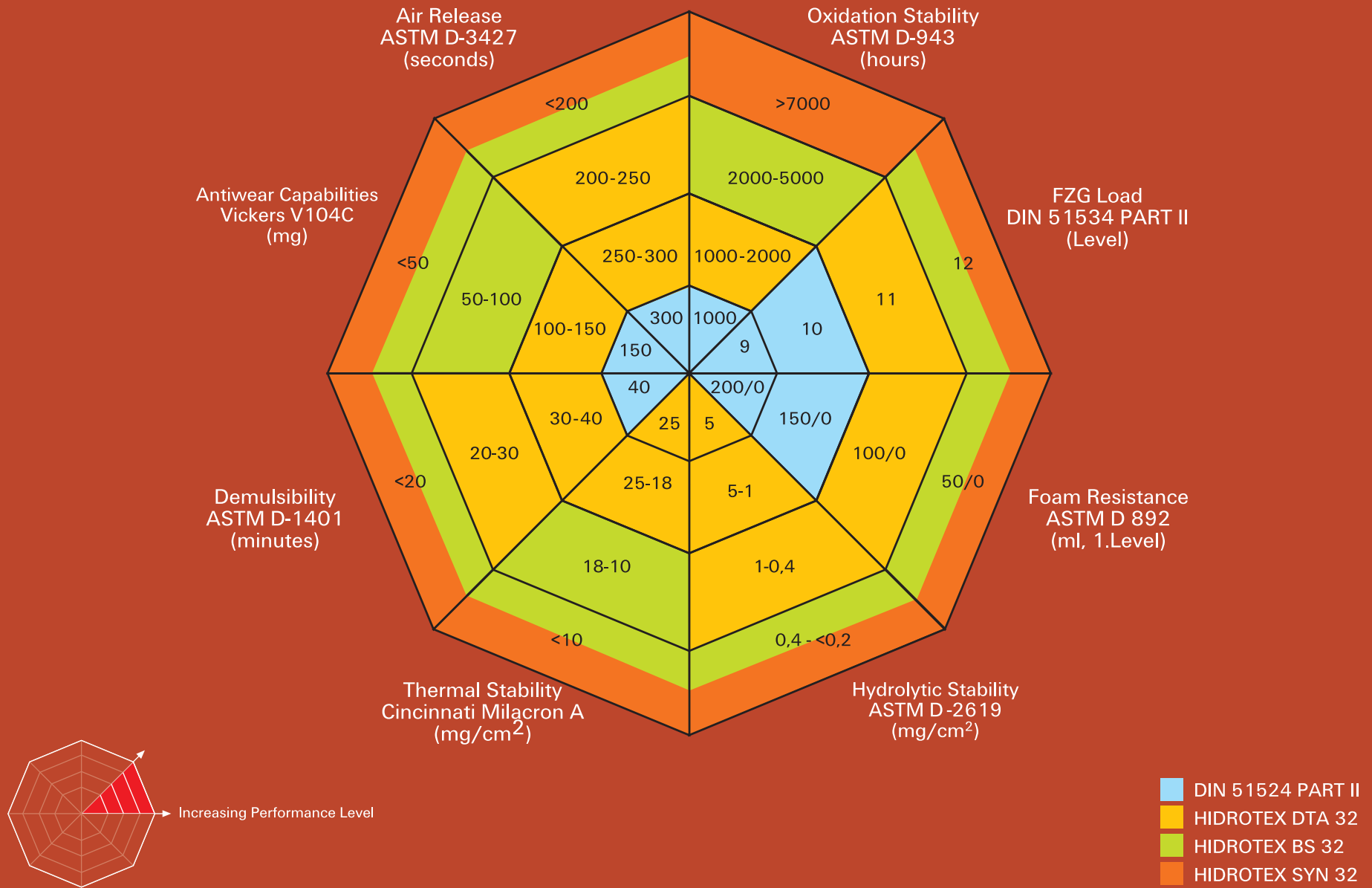
Air Release
ASTM D-3427
(seconds)
<200
200-250
250-300
300
150
40
Oxidation Stability
ASTM D-943
(hours)
>7000
2000-5000
1000-2000
1000
9
200/0
FZG Load
DIN 51534 PART II
(Level)
12
11
10
Foam Resistance
ASTM D 892
(ml, 1.Level)
50/0
100/0
150/0
Hydrolytic Stability
ASTM D-2619
(mg/cm²)
0,4 - <0,2
1-0,4
5-1
5
25
Thermal Stability
Cincinnati Milacron A
(mg/cm²)
<10
18-10
25-18
Demulsibility
ASTM D-1401
(minutes)
<20
20-30
30-40
Antiwear Capabilities
Vickers V104C
(mg)
<50
50-100
100-150
Increasing Performance Level
DIN 51524 PART II
HIDROTEX DTA 32
HIDROTEX BS 32
HIDROTEX SYN 32

PRODUCT RANGE

- GRINDING FLUIDS
- WATERSOLUBLE COOLING FLUIDS
- HYDRAULIC OILS
- GREASES
- NEAT CUTTING OILS
- HONING OILS
- QUENCHING OILS AND FLUIDS
- HEAT TRANSFER OILS
- CIRCULATION AND LUBRICATION OILS
- CORROSION PREVENTITIVE OILS
- NEAT FORMING AND DEEPDRAWING LUBRICANTS
- SOLUBLE FORMING AND DEEPDRAWING LUBRICANTS
- SLIDEWAY LUBRICANTS
- INDUSTRIAL GEAR LUBRICANTS
- OPENGEAR LUBRICANTS
- HOTFORMING AND FORGING LUBRICANTS
- VARIOUS LUBRICANTS
- CLEANERS
- MOTOR OILS
- TRANSMISSION OILS
- PROSES OILS
- TEXTILE LUBRICANTS
- BIOCIDES
- ELECTRO EROSION FLUIDS
- INJECTOR ADJUSTMENT FLUIDS
- SHOCKABSORBER OILS
- MOULD RELEASE LUBRICANTS
- COMPRESSOR LUBRICANTS
- MARINE OILS
- COMPLEMENTARY AUTOMOTIVE PRODUCTS
- CHAIN OILS

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