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HOW CAN YOU SAVE BOTH TIME AND COST WITH OIL ANALYSIS

How oil suppliers can strengthen their relationships with fleets

Current figures in Turkish lubricant exports

Importance of oil analysis in transformers

TÜRKİYE'DE KİMYA SEKTÖRÜNÜN TEMEL YAPI TAŞI: İKMİB

THE CORNERSTONE OF CHEMICAL INDUSTRY IN TURKEY: İKMİB



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the potential





Editor's Letter



Lubricant consumption in Turkey increased by more than 11 percent, and we ended the year with an increase in lubricant exports

We are starting the first issue of 2022 with SGS. Oil analysis provides many benefits in every sense. Regular oil analyzes provide information about the condition of both the oil and the machine. Thus, oil changes can be planned at optimum intervals, oil-related failures can be prevented, any malfunction occurring in the machine can be detected, possible risks can be predicted. All of these provide time and cost advantages. It is even more important for hard-to-reach equipment such as wind turbines or machinery used in offshore operations.

Lubricant consumption in Turkey increased by more than 11 percent, and we ended the year with an increase in lubricant exports. Spindle oil, light neutral, heavy neutral, bright stock, waste oils, and prepared additives had the highest increase rate in Turkey's exports last year.

For fleets with high lubricant consumption, the technical characteristics of the oil they use are of great importance. By choosing the right lubricant, significant fuel savings can be achieved and engine failures can be minimized. Lubrizol emphasizes that fleets do not pay enough attention to FA-4 certified

lubricants and lists the benefits that can be gained if this mindset is changed.

Prepared to publish a new standard on bacterial growth in turbine oils, ASTM aims to guide plant managers, engineers and operators with this new standard. This informative standard describes what can be done to prevent microbial growth.

Our columnist Umut Arslan draws attention to the importance of oil analysis in transformers. He shares valuable information on how oil analysis can help operators solve problems more easily.

I hope you enjoy reading.

CANSU TUNCER
cansu.tuncer@vizyonas.com

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MANAGEMENT

Publisher

On behalf of Vizyon Dergi Yayıncılık İletişim Pazarlama A.Ş.
Selçuk AKAT

Editorial Board

Prof. Dr. Filiz Karaosmanoğlu
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Att. Vahit Kaya

Editor

Cansu Tuncer

Advertising and Marketing

Sanem Uçar

Design

Melis Gönen

Printing

Sarsılmaz Basım & Yayımlar
Tel: +90- 212 289 07 49-50

For subscription: abone@vizyonas.com
For advertising: reklam@vizyonas.com

Contact

Hacımimi Mah. Kemeraltı Cad.
Balkan Han No: 15/4 34425
Karaköy/ İstanbul/ Turkey
Tel: +90- 212 252 08 40
Fax: +90- 212 252 81 51
www.lubricant-world.com

PRODUCTION

WAVE MEDYA

Group Publishing Director

Mustafa Özkan

Publishing Director

Gamze Biber

Sr. Art Director

Cüneyt Mert

Digital Media Specialist

Aydın Şavur

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31 March - 2 April

2022

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analysis**





Proposed standard will outline microbe contamination in turbine oil systems

ASTM International's committee on petroleum products, liquid fuels, and lubricants (D02) is developing a proposed standard that will provide an overview of microbial contamination in turbine oil systems. Power generation facility managers, engineers, and operators will be the primary users of the proposed standard (WK42670). According to ASTM International member Fred Passman, the proposed standard will give users a basic, understandable background of microbiology fundamentals and information that will help with condition monitoring and root cause analysis efforts. "Microbes can contaminate turbine oil systems and cause various problems including accelerated turbine oil failure, premature filter plugging, and system corrosion," says Passman, president, Biodeterioration Control Associates. "The proposed standard will explain the problems to which microbes contribute, reviews test methods that can be used to detect microbes in turbine oil systems, and provides general guidance on how to reduce microbial

contamination and damage risks." The presence of water in the oil triggers the growth of bacteria. Water testing is important in minimizing the risk of possible undetected turbine oil oxidation and rust formation. Equipment corrosion often results in the formation of iron oxide particles, which can cause failure and abrasive wear to bearings. Excess water can also change an oil's viscosity, increasing or decreasing it depending on the conditions.

The presence of water in turbine oil in hot storage tanks can cause bacterial growth to spread, contaminating system filters, small-diameter measuring instruments, and line extensions of transducers. Therefore, it is important to minimize the amount of water and take necessary steps to prevent possible contamination. This effort directly relates to the United Nations Sustainable Development Goals #7 on affordable and clean energy and #9 on industry, innovation, and infrastructure.

Personnel changes at Lanxess

There are several personnel changes at the specialty chemicals company Lanxess. Martin Saewe (55) will become the new head of the Group's initiative for e-mobility and circular economy on April 1, 2022. Saewe is currently head of the Lubricants Additives Business (LAB) business unit. Martin Saewe succeeds Philipp Junge (45), who has led the Group initiative since its launch in August 2020 and has successfully driven Lanxess' strategy and projects around e-mobility and circular economy. Philipp Junge will leave Lanxess at his own request effective March 31, 2022, to pursue new challenges outside the company.

The new head of the Lubricants Additives Business will be Neelanjan Banerjee (48) as of July 1, 2022. He has been Head of India region, country representative for Lanxess in India and managing director of Lanxess India Private Limited since August 2018. On the same date, Namitesh Roy Choudhury (63), currently head of the Production, Technology, Safety and Environment group function for India, will take over as country head for LANXESS in India and as managing director of LANXESS India Private Limited from Banerjee.

LANXESS WANTS TO INCREASE NUMBER OF WOMEN IN MANAGEMENT

Lanxess wants to further promote gender diversity: By 2030, the specialty chemicals company aims to increase the proportion of women in management positions worldwide to 30 percent.

At the end of 2020, around 23 percent of these positions were held by women. All Lanxess executives are obliged to pursue this new goal.

To promote the professional and personal development of women, Lanxess supports young executives with individual mentoring and coaching offers. In addition, the specialty chemicals company is setting concrete targets for staffing its global talent programs: At least 30 percent of participants are to be female. In recruiting, Lanxess works with events tailored specifically to women. In addition, development and training opportunities are designed to be attractive to women. The company is also continuously expanding its offerings for balancing work and family life.





Scuderia AlphaTauri announce Ravenol as official lubricant partner

Scuderia AlphaTauri announced a multi-year deal with Ravenol as Official Lubricant Partner. German-based Ravensberger Schmierstoffvertrieb GmbH is well-known for developing high-performance products for the automotive sector and is an established name in the motorsport industry. Through their large portfolio including lubricants, hydraulic oils, greases and other industrial supplies they will be able to support the team in various areas from factory to flag.

The Ravenol logo will be displayed on the nose of the new AT03, as well as on the driver's overalls and team kit. "It is a pleasure to welcome Ravenol to our team", Franz Tost commented. "It is often overlooked that we, as a Formula 1 team, are not only racing our cars on track but also producing the individual components of these high-tech machines. We operate our own machine shop here in Italy and use a variety of industrial products, this means we rely on the know-how of a strong partner and Ravenol is able to supply us with a wide range of products to help us extract the maximum performance." Martin Huning, Motorsport Director of Ravensberger Schmierstoffvertrieb GmbH, said:

"We are looking forward to working together with Scuderia AlphaTauri and supplying them with products for the upcoming season. For us, motorsport is the perfect platform to develop our products and show their benefits in the most demanding conditions. Furthermore, it underlines our global presence, with operations in over 100 markets. Ravenol is the brand name of the Ravensberger Schmierstoffvertrieb GmbH which was founded in 1946 in Werther, Germany by Hans Triebel. Ravenol produce and market high-quality lubricants that are well known on the international market for their innovative technology "Made in Germany". In their advanced on-site laboratories, products are developed to the highest standards of the major automotive manufacturers and to comply with current and future regulations.

The product portfolio incorporates a wide range of lubricants and cleaning products, including car and truck engine oils, racing oils, gear oils for automatic and manual transmissions and drive axles, as well as agricultural machinery products, hydraulic oils, industrial oils, specialty fats, high performance lubricants, car care products, cleaners, winter chemicals and engine coolant (anti-freeze).



New high viscosity base oil.

NYNAS® T 600 is the latest addition to our base oil portfolio. Clear and bright, NYNAS T 600 is a highly refined naphthenic oil with a viscosity of approximately 600 cSt at 40°C, and further extends the range of solutions which Nynas offers the grease and lubricant industry. NYNAS T 600 naphthenic base oil can also be used in combination with paraffinic oils to increase viscosity, improve low temperature performance, and enhance additive solubility as a result of its excellent solvency.

For more information visit www.nynas.com or contact your local Nynas sales office.

APPLICATIONS

NYNAS T 600 is suitable for all applications where high viscosity and appearance are critical. The new base oil performs very well in lubricating greases, where it improves process economies with a reduction of Lithium soap up to 50%. The base oil is also suitable for use in several industrial lubricant formulations, such as gear oil, metal rolling and forming.

FEATURES

In addition to its high viscosity, NYNAS T 600 offers several advantages over paraffinic oils, including excellent low-temperature properties and unrivalled solvency power.

AVAILABILITY

Committed to providing consistent and high-quality naphthenic oils worldwide, Nynas is making NYNAS T 600 available on a global scale through its outstanding supply and distribution network.





PETROYAĞ

Started the new year with two awards

Petroyağ Lubricants was granted an award at the 63rd International Safety Awards organized by the British Safety Council

Providing industrial enterprises with sales, consultancy and after-sales services for their lubricant needs since 1993, Petroyağ started the year 2022 with two new awards. Making investments and taking important steps in line with its goals, Petroyağ has adopted the Zero Waste mission with the awareness of protecting the environment. It took action to fulfill the necessary conditions within the scope of the "Zero Waste" project, which aims to prevent waste, use resources more efficiently, minimize waste generation and, in case of waste, collect it at the source and ensure its recycling. Petroyağ established the necessary waste management system

as part of the Zero Waste system and took the necessary steps to protect our future and leave a clean environment for future generations. By this means, the company was entitled to receive the Zero Waste Certificate. Standing out with its awareness of environmental protection as well as its sensitivity to occupational health and safety, Petroyağ received an award at the International Safety Awards, which recognize organizations that have demonstrated commitment to occupational health and safety. At the 63rd International Safety Awards organized by the British Safety Council, the efforts of more than 100 organizations from Turkey were evaluated and as a result Petroyağ was awarded a prize.

Ünal Soysal, Chairman of the Board of Directors of Petroyağ, said, "We are very happy with the success of our efforts that we have been carrying out since our establishment and that we have continued uninterruptedly during the pandemic. We are also proud to have successfully represented our country in this prestigious organization where more than 100 institutions from Turkey were evaluated and only 15 were awarded."

PETROL OFISI

Started the New Year with a new system

With the AtılKurt Project, which is the most important stage of the holistic digitalization journey, Petrol Ofisi changed its Enterprise Resource Planning-Enterprise Operating System in record time and switched to SAP S/4HANA

Petrol Ofisi maintained its projects during the pandemic period without slowing down. Having achieved new successes in every field and started production by collaborating with a global brand during this difficult period, Petrol Ofisi has made another breakthrough to go down in its company history. With the AtılKurt Project, Petrol Ofisi changed its Enterprise Resource Planning – Enterprise Operating System in record time and switched to SAP S/4HANA. The project exhibited its difference from other

transformation projects by commissioning a wide scope of activities such as purchasing, logistics, warehousing, sales, finance, planning, reporting and human resources in just one year. In the AtılKurt Project, the S/4HANA software, which is the most up-to-date version of SAP's industrial solution proposals, was based on the Model Company solution proposal designed specifically for the Oil & Gas sector supply and sales activities. In this context, more than 20 modules and nearly 50 satellite systems are integrated, where all operational and financial processes in the fuel, LPG and lubricant trade are managed end-to-end. After 13 months of meticulous preparation, planning, and testing, followed by the transition to the new system, this transformation, which is the most important stage of Petrol Ofisi's holistic digitalization, was carried out smoothly in the first minutes of 2022. AtılKurt Project was realized by the special project team and related employees of Petrol Ofisi, under the consultancy of GoLive and Detayssoft, and under the guidance of SAP. AtılKurt project is among the leading transformation projects with its scope and size.





Current figures in Turkish lubricant exports

Exports in the industry of mineral oils and mineral fuels in December 2021 was \$632 billion



Turkey exported a total of \$632 million in December 2021 according to the export figures of the mineral oils and mineral fuels sector prepared every month by IKMIB using the TIM Export Database and Trademap data.

As per the HS Code, the top 10 product groups and export figures in the export of lubricants are as follows: The product groups with the highest increase in exports in the January-December 2021 period compared to previous

year are: 271019990011 – Spindle Oil, Light Neutral, Heavy Neutral, Bright Stock; 271099000000 – Other Waste Oils; 381129001000 – Prepared Additives for Mineral Oils/Similar Lubricating Oils – Other; 271019750000 – Lubricating Oils – Other; 271019750000 – Lubricating Oils, Other Oils-Those to Be Chemically Changed by Another Process, 270900900000 – Other (Untreated) Oils Obtained From Petroleum Oils and Bitumen Minerals; 381121009000 – Prepared Additives Containing Petroleum Oils/Oils Obtained From Bitumen Minerals.

HS CODE - DEFINITION	December 2020 (\$)	December 2021 (\$)	Diff. (%)
271019810000 - Engine oils, compressor oils, turbine oils	12.203.553,98	18.336.512,55	50,3
271019990011 – Spindle oil, light neutral, heavy neutral, bright stock	435	4.954.031,00	1138757
271019830000 – Hydraulic oils	1593883,06	3.611.785,86	126,6
271019870000 – Gear and reducer oils	2139519,15	2.717.556,61	27
271019990025 – Other lubricating oils	2880648,64	2.645.100,80	-8,2
271099000000 – Other waste oils	-	1.194.697,26	-
340399000000 – Preparations for lubricating machines, devices and vehicles - other	1052883,57	948.337,66	-9,9
271019850000 - White oils, liquid paraffin	143.479,69	442.179,84	208,2
271019910000 - Metalworking fluids, mold release oils, anti-wear oils	360.950,55	294.328,72	-18,5
381121001000 – Prepared additives for mineral oils/similar lubricating oils – containing petroleum oils	57.802,16	94.451,50	63,4

Source: Istanbul Chemicals and Chemical Products' Exporters Association



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ERHAN AYDIN SGS Turkey-Iraq Industry and Environment Department Manager

How can you save both time and cost with oil analysis

With used oil analysis, it is possible to prevent equipment failures, predict possible cost items, act more efficiently in purchasing and supply planning, and facilitate processes. Erhan Aydın, SGS Turkey-Iraq Industry and Environment Department Manager, explains how all this can be done

CAN YOU TELL US ABOUT THE SCOPE OF ACTIVITY OF SGS TURKEY?

SGS is the world's leading verification, inspection, testing and certification company. Founded in Switzerland in 1878, SGS has been operating in Turkey since 1933. SGS Turkey continues to serve to support the quality, safety and integrity of the Turkish economy in the fields of Agriculture, Food and Lifestyle, Consumer Products and Retail, Environment, Health and Safety, Government and Institutions, TransitNet, Industry, Oil, Gas and Chemicals, Mining and Certification. Thanks to our broad service network, we provide services in every corner of the country, and we have offices and laboratories with high-tech equipment in İstanbul, Kocaeli, İzmir, İskenderun, Tekirdag, Aliaga, Ankara, Zonguldak, Mersin, Basra and Erbil.

WHICH SERVICES DO YOU PROVIDE WITH USED OIL ANALYSIS?

Used oil analyzes detect changes in the concentration of metals and other impurities that build up in lubricants, providing an early warning of potential problems with



your machinery. Analysis of used lubricants, greases and hydraulic fluids provides you with fast and accurate information about the condition of your transformers, diesel and gas engines, wind turbines, electric generator, gearboxes, compressors, hydraulic systems and other critical machinery, while it also gives very important details about the condition of the oil. Effective monitoring of your lubricant enables the maintenance of expensive equipment to be efficiently planned in advance to avoid the risk of damage and unforeseen disruptions. The SGS OCM Oil Analysis Laboratory brings together the latest technologies for the analysis of lubricants, greases and hydraulic fluids, with expert chemists performing the analysis and engineers providing interpretation services. By examining both the physical and the chemical properties of the product, detailed information about the condition of the equipment or oil is obtained. Through the interpretation of the analysis results, necessary information is provided as to whether your machines are working efficiently and whether corrective actions are needed before major problems occur.

CAN YOU ELABORATE ON THE OIL ANALYZES ON AN INDUSTRIAL BASIS?

Let's start with transformer oil analysis from the energy industry. While transformers should produce energy uninterruptedly, they should also be maintained periodically and should not pose a danger to the environment. With our wide range of accredited tests, we can determine the condition of the oil and transformer components by

detecting the combustible gases and pollution levels in the oil through physical and chemical analysis results of the oil, and we can diagnose toxic compounds such as PCBs, which pose a great danger to the health of the maintenance professionals working in the field and to the environment. We are the only laboratory with the widest accreditation in transformer oil analysis in our country.

Gas and steam turbines are high-cost equipment which work with high volumes of oil and under severe operating conditions. With routine turbine oil analysis, it is difficult to determine the varnish formed due to the degradation of the oil in the system, the amount of antioxidants in the oil and how long this oil will resist oxidation. Therefore, in addition to these routine turbine oil analyzes, we have varnishing and oxidation tests, which are among our advanced accredited tests that we strongly recommend to be performed at 6-month and 12-month intervals. Using these test results, we warn the field personnel and ensure that tons of oil continues to operate without any problems, with recommendations that will respond to the root cause. In the marine industry, we offer totally different solutions to our customers. As you know, ships have vital equipment such as propeller shafts, diesel generators, main engine, cranes and gearboxes. These analyzes must be carried out before sailing, and it is important to closely monitor these analyzes at the port of destination. In case of a malfunction, it can cause serious financial, moral and prestige losses. Acting with the awareness of this, we offer the opportunity to





perform your analyzes under the same service conditions in the nearest SGS laboratory, depending on the location abroad. In this way, we make it easier to compare the condition of the equipment with the values after the arrival, inform the relevant laboratory before the analysis, and follow the trend with analysis results to keep it under control. In the mining industry, it is important to monitor the condition of the oil used in heavy-duty vehicles such as trucks and buckets as their equipment such as engines, differentials and gearboxes operate under harsh conditions. Since logistics, time and cost balances are of great importance in any downtime, it is important to monitor it with periodic oil analyzes. Likewise, for companies with vehicle fleets, taking the relevant vehicle into maintenance and/or changing its oil among hundreds of vehicles with just one oil analysis contributes to significant cost and maintenance time savings.

Lubricant analysis should be performed every 150 and 300 hours in recycling facilities, especially for garbage and biogas facilities. Severe environmental conditions (high silane and sulfur gases) can cause the oil to oxidize and deteriorate rapidly, and as a result, it can cause serious costly failures in the equipment at the point where the oil cannot perform as expected. Whether the conditions in the field are under control or not, and the condition of machines is made predictable by the result of oil analysis.

To sum up, as SGS OCM Laboratory, we:

Provide savings. Periodic oily analysis can provide an answer to the question of how long the lubricant can be used in the equipment. By analyzing the remaining useful life of the oil, we determine whether the problem is caused by the oil, environmental factors or a potential failure, and ensure that

the end user uses the oil for the optimum period of time. As a result, we support both reducing oil waste for a sustainable environment and saving on oil change costs.

Deliver solutions. Based on the oil analysis results, we draw a roadmap with our extensive oil information library and expert interpretation team by blending the root cause analysis of the problem with the characteristics of the oil with the wear and contamination values. In this way, we support maintenance professionals in answering the questions of whether to take any action with regard to oil or the equipment or take a precaution against environmental conditions by scheduling a downtime, give ideas about the actions that can be taken and act together in solving the problem. Thus, we prevent the chaos that may occur in the field due to any malfunction, and at the same time, with planned maintenance, we help the team in the affected field to take the relevant action without causing any threat in terms of occupational safety.

Add value. We offer you the opportunity to follow up all your analysis results in the past 10 years and provide information about the past history of the oil and equipment via the Sofia application (<https://sofia.sgs.com/>) on your desktop or mobile devices. In this way, we facilitate the planning of the supply and/or back-up of the malfunctioning equipment. At the same time, we provide the opportunity to register new equipment/sample with the QR code you will create in the system and print labels for your samples. Thus, you prevent any wrong registration of the sample while informing the laboratory from which field the sample will come from. We also provide the option to design the analysis result report format as requested by the customer and receive the analysis report with its own logo.





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- Professional support about the state of you oil with the expertise of our diagnostic engineers

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SGS OCM YAĞ ANALİZ LABORATUVARI
Yavuz Sultan Selim Cad. 118. Sokak. No: 29
Dilovası Kocaeli Turkey
p +90 262 754 17 81 **e** ocmlab.turkey@sgs.com
w www.sgs.com.tr

WHEN YOU NEED TO BE SURE

SGS

How oil suppliers can strengthen their relationships with fleets

Cutting-edge lubricant technology can offer big benefits for all stakeholders in the value chain. Here's how to make the most of it and build stronger relationships with your customers

MATT RUDD
Director, Consumer & Market Insights
Lubrizol

In 2016, the heavy-duty engine oil industry saw one of the biggest fundamental shifts in its history. The American Petroleum Institute (API) introduced for the first time a split performance category in the form of API CK-4 and API FA-4—the latter a low-viscosity solution designed to deliver enhanced fuel economy benefits in new-model engines. Five years later, the average heavy-duty engine oil user may yet express some hesitation over adoption of FA-4 solutions. In 2022, FA-4 certified lubricants have 1.4% market share, while the vast majority of the market utilizes higher-viscosity CK-4 formulations, according to data from Kline & Company. Low adoption rates—and in some instances a lack of awareness—of FA-4 lubricants mean that both fleets and their oil suppliers are leaving some mutual benefits on the table. But there is a strong case to be made for adoption—and oil suppliers who are willing and able to translate the benefits of FA-4 solutions may stand to strengthen critical customer relationships and reap benefits into the future. Here's how:



A SHIFT IN THINKING

Throughout the industry's history, end users have made it clear that engine protection is a top priority when it comes to their heavy-duty engine oil selections. This largely remains the case today, and with good reason. Repair and maintenance costs have consistently made up between 8 percent to 10 percent of a fleet's average marginal cost per mile over the past decade, according to the American Transportation Research Institute (ATRI). An engine oil that fails to protect a diesel engine has a chain of consequences that can have major cost impacts for fleet owners and operators. If a truck breaks down due to some engine-related failure that a lubricant may have prevented, a shipment the truck is carrying has been delayed.

The fleet manager must arrange a roadside fix or a tow, which can be a significant cost on its own. And finally, a key asset is sidelined and unprofitable while those repairs are performed. For the oil marketers and distributors, this



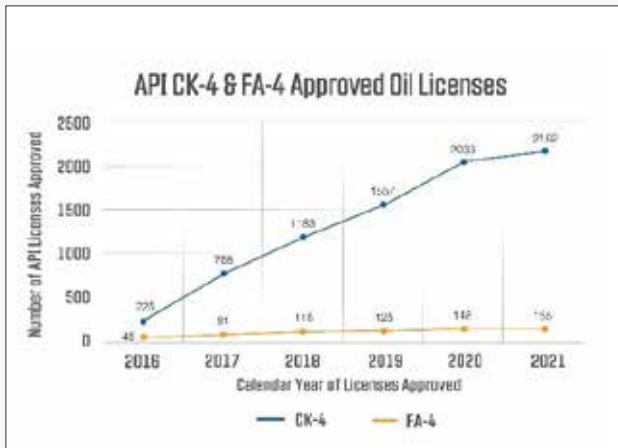
may seem like the only story a customer wants to hear, and it has long been the most reliable way to market heavy-duty lubricants. But FA-4 and lower-viscosity lubricants offer something equally compelling: A significant impact on a fleet's bottom line via fuel economy gains.

TRANSLATING THE VALUE

According to ATRI, fuel cost is 18.71 percent of fleet's average cost per mile for 2020—a higher percentage than maintenance and repair, and a prime target for reduced spending. A fleet owner's selection of engine oil can make an impact here. Oil suppliers have an opportunity to guide customers toward making a higher-value choice that can bring significant benefit to their operations. The challenge lies in how to translate the value in a meaningful way. Consider again that 71.4 percent of heavy-duty diesel lubricants sold in the North American market are API CK-4 15W-40—these figures indicate that fleets, in general, adhere to the traditional industry wisdom holding that higher-

viscosity lubricants better protect engines than their lower-viscosity counterparts. But by virtue of the API specification process, this wisdom is simply untrue—all viscosity grades certified under CK-4, and all FA-4 certified lubricants, must demonstrate the same protective performance characteristics.

By sticking with higher viscosities, fleets are leaving money on the table. According to "Trucking Efficiency Confidence Report: Low-Viscosity Engine Lubricants," a joint report from the North American Council for Freight Efficiency and Carbon War Room, the benefits are clearly shown: "Class 8 over-the-road fleets can realistically expect fuel savings in the range of 0.5 percent to 1.5 percent by switching from 15W-40 to 5W/10W-30 CK-4 engine oil." Shifting to FA-4 certified lubricants where applicable can bring even further benefits. "The savings from switching to the fuel-efficient FA-4 variant ... can be expected to add a further 0.4 percent to 0.7 percent of increased fuel efficiency," according to the report.



BUILDING A PARTNERSHIP AND KEEPING YOUR CUSTOMERS ON THE CUTTING EDGE

Consider also that fleets are generally becoming more sophisticated in how they build new efficiencies into their business. For example, the increasingly widespread use of telematics has offered fleet owners and operators much deeper insight into their operations and their profitability, and the methods by which they can make improvements. It's not just large fleets, either—smaller, regional fleets are becoming forward-thinking in order to maintain a competitive edge. Oil marketers, then, can offer forward-thinking fleets a way to boost their advantage by steering them toward innovative lubricant technology like FA-4. Identifying fleet customers

who are more progressive and who want to be early adopters and market leaders can be a good first step to starting the conversation.

Finally, modern hardware continues to advance. Lubricant technologies like FA-4 are only the beginning of what we will see in the heavy-duty trucking space in the not-too-distant future, especially as older trucks age out of the broader truck population. Fleets who make the switch today, instead of waiting to catch up with the rest of the market, may stand to reap the benefits before their competitors and they are likely to place greater value in their relationship with their oil supplier who helped them get there.



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Importance of oil analysis in transformers

We witness that significant increase in global energy costs make companies increase their investments in predictive maintenance in order to achieve their sustainability goals. I am happy to see that technologies such as lubricant analysis, vibration, thermal analysis have become a key part of the maintenance plans in the field. After the energy is produced, the transmission phase should continue smoothly. Therefore, it is important to perform oil analysis, evaluate the results and take quick action when necessary within the scope of predictive maintenance of vital power transformers/reactors.

Transformer oil has many important tasks such as providing insulation, preventing sludge, cooling of internal equipment, and providing dielectric strength. Failure to perform one or more of these tasks may lead to situations that will affect vital outcomes such as downtime or fire as a result of malfunctions. It is possible to detect and eliminate these problems early. Transformer oil analyzes are collected in 3 groups as: routine, complementary and advanced tests. Limits are defined according to the power of the transformer, and the analyzes are evaluated according to IEC 60422 and I.S EN 60599 methods.

- **Group 1:** Routine tests such as appearance and color, breakdown stress, water content, acidity, dissipation factor and resistivity, inhibitor level, provide general information for monitoring the physical condition of the oil. It gives

an idea about the degree of aging of the oil or guides in determining the factors that cause aging.

- **Group 2:** It is applied as complementary to Group 1 routine tests to analyze the impact of contamination on the oil after determining the level of contamination by sludge formation, particle test and inner surface stress tests. The cleaner the oil and the lower the contamination levels, the more smoothly the transformer oil will perform its dielectric duties.
- **Group 3:** With advanced tests such as dissolved gas analysis and furan analysis, potential overheating, arcing, flashing, low/high temperature discharges can be detected inside the transformer, and thus potential fire and explosion risks can be predicted. The degree of deterioration of the insulation paper in the transformer can be determined and carcinogenic toxic components that threaten the environment and the personnel health can be detected via PCB analysis, which is one of the most important analyzes.

In this way, along with the periodic transformer oil analysis, it is possible to monitor the condition of the oil, while checking whether the current operating state of the transformer is safe, detecting any fault signal and correcting it with a planned stop before it gets worse. As a result, you can minimize your labor, production and cost losses and ensure the continuity of your operations without any problem.



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Engine oil user guide



VISCOSITY GRADE:

is the main feature of an engine oil and is important for product selection

Signification of grades



xx refers to viscosity when cold
(measured at different temperatures)

The lower the viscosity when cold, the more fluid the oil is at low temperatures and the more easily it can be pumped.

For example, a 0W-20 or 5W-30 oil will make start-ups easier and will protect engines during trips to cold regions. These high technology “fluid” oils will meet the requirements of recent engines.

yy refers to viscosity when hot
(measured at 100 °C)

The higher the viscosity when hot, the more viscous the oil is.

For example, a 15W-40 or 20W-50 oil has been developed for use in hot countries, and their “viscous” nature makes them suitable for older engines.

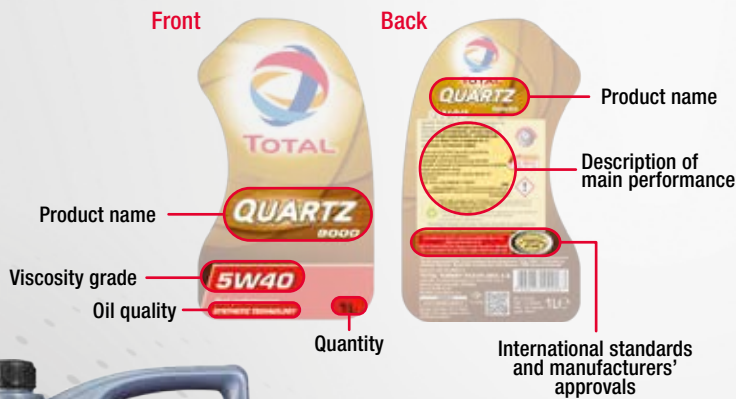


POINTS TO REMEMBER

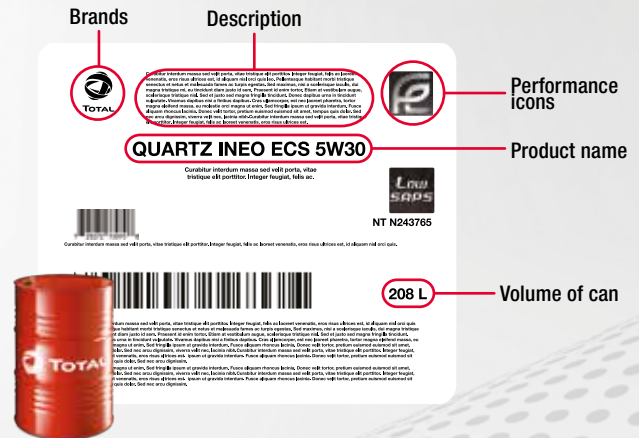
New-generation engine oils and those currently being developed by TOTAL are of increasingly fluid grades: 0W-20, 5W-20, 0W-30 and 0W-16.

How to read a product label for product selection?

Small packaging:



Large packaging:





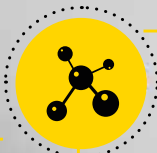
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