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MADENİ YAĞ DÜNYASI
LUBRICANT WORLD

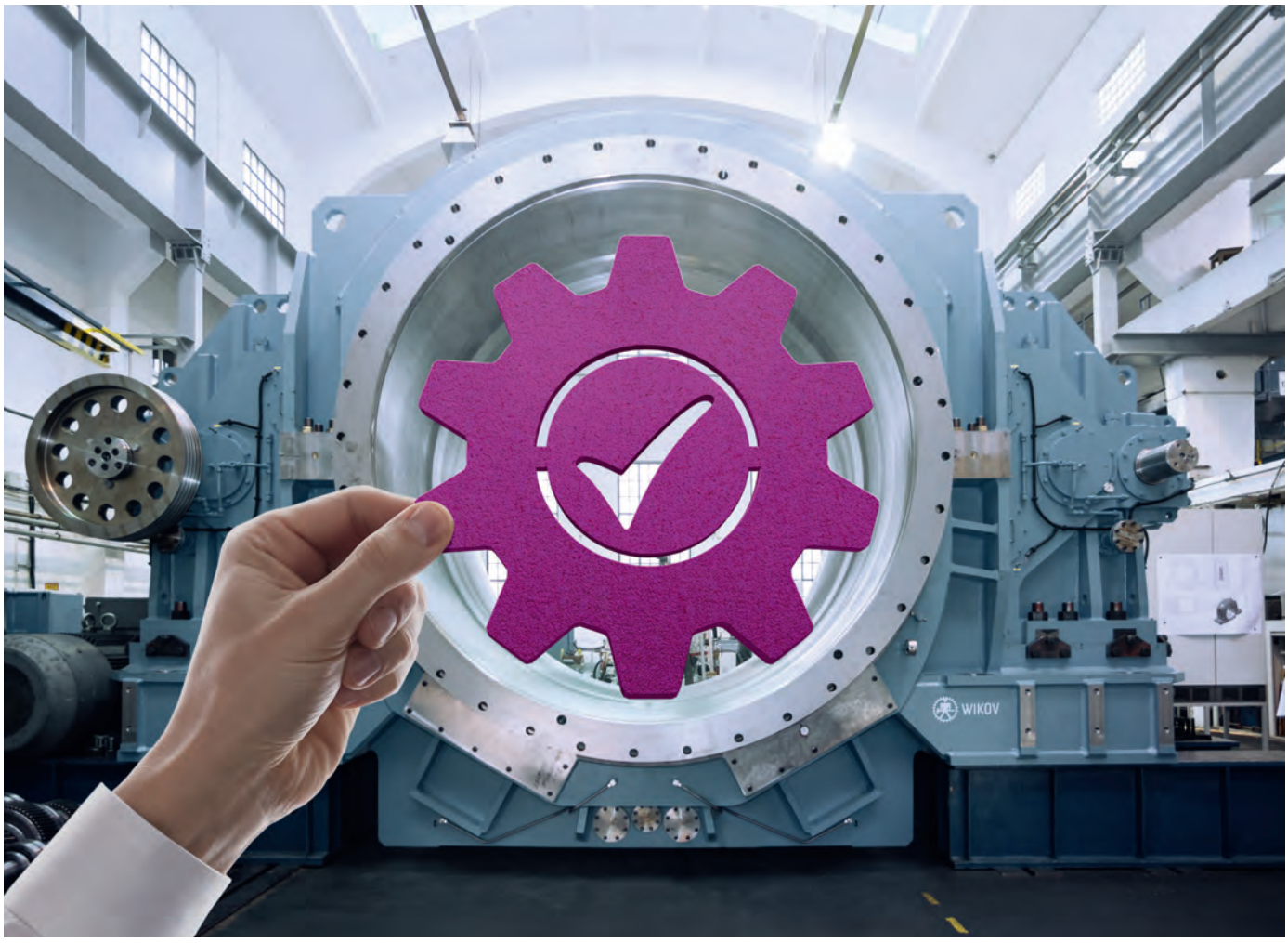
One in every two vehicles uses Total*

*As per the Automotive Manufacturers Association data

"We continue to develop our product range with R&D works"

Nynas: A balancing act

Alpet Lubricants develops special products for the iron and steel industry



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Editor's Letter

There are good developments in the Turkish lubricants industry! Turkey continues to increase its export of mineral fuels and mineral oils. Turkey's total exports in this field exceeded USD 523 million. Although the domestic lubricants sector has contracted recently, we believe that the trend will change in a short time.

Adco, the sole distributor of Evonik Oil Additives in Turkey, was awarded long-term service award by Evonik upon exceeding 40 years of service. Since 1977, Adco is representing Evonik Oil Additives in Turkey and it is one of Turkey's most important suppliers of petroleum products and specialty chemicals.

Opet opened a new lubricant blending plant in Izmir, Turkey. The plant, the construction of which was completed in May, started trial production in July. Many officials from Opet Petrolcülük and Fuchs Petrolub SA attended the opening ceremony held on September 3. This new plant will increase Turkey's lubricant production capacity and give a new impulse to the sector.

We have Total on our cover in this issue. Total Turkey Marketing, operating in the field of production and marketing of lubricants in Turkey for 29 years, supplied first fill lubricants and antrifreeze for 4 million out of approximately 7.5 million vehicles manufactured in Turkey in the last 5 years. According to the cumulative manufacturing data for the 2014-2018 period of Automotive Manufacturers Association (OSD), Total lubricants or antifreeze were used in one out of every two vehicles manufactured in Turkey.

Turkey Edition

We interviewed Atilla Başulaş, Alpet Lubricants Technical Support Manager, about calcium sulfonate complex greases. This grease type is known for many years abroad but it has recently been introduced in Turkey. We learned about Alpet's grease production and their R&D activities. Calcium sulfonate complex greases, which are one of the products that best meet the demanding conditions and needs of the iron and steel sector, an important sector for Turkey, are introduced to the Turkish industry.

With this issue, we will attend the Global Lubricants Week in Moscow, the Bitumen Industry Summit in London, the ICIS 16th Middle Eastern Base Oils and Lubricants Conference in Dubai and the 52nd GOMA Lubricant and Base Oils in Zagreb. We will also attend the KazAgro/KazFarm exhibition in Nur-Sultan, Kazakhstan.

Enjoy reading.

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Opet Fuchs opens new plant in Izmir, Turkey

NYCO increased its flagship products' shelf life

NYCO announces the shelf life and re-test dates of some lubricating oils and greases have been modified to bring solutions to our customers to reduce waste and inventory costs, and more importantly to provide our customers more sustainable products.

In fact, laboratory testing of samples packaged and stored in different type of containers and conditions showed that the products' characteristics and performances remain satisfactory after a prolonged time of storage:

Turbonycoil 600 – a synthetic aviation turbine oil approved against MIL-PRF-23699 Class STD, SAE AS-5780 Class SPC, DCSEA 299/A and Def Stan 91-101: Shelf life in sealed cans is extended from 6 to 10 years; re-test after 4 years is no longer necessary and therefore the re-test date is removed from the documentation.

Turbonycoil 3516 – a mineral aviation turbine oil for aircraft engine fuel control system approved against MIL-PRF-6081E and AIR 3516/A: Shelf life is extended from 6 to 10 years for any containers; re-test after 4 years is no longer necessary and therefore the re-test date is removed from the documentation.

Nyco Grease GN 148 – a multi-purpose synthetic aviation grease approved against BMS 3-33C, AIMS-09-06-002 and MIL-PRF-23827 – and **Nyco Grease GN 3058** – a synthetic aviation grease for wheel bearings approved against SAE AMS-3058 and AIMS-09-06-003: Shelf life of all containers is 6 years; re-test after 3 years is no longer necessary and therefore the re-test date is removed from the documentation.

9 Years of Leadership*

*Source: PETDER (Petroleum Industry Association) total lubricants and chemicals data for 2010-2018

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Petrol Ofisi

Evonik invests in capacity expansion for oil additives

Evonik, a leading provider of oil additives, is increasing its production capabilities for Polyalkylmethacrylate (PAMA)-based viscosity modifiers to meet rising demand.

The increase of its production capabilities will be realized through plant expansion projects and debottlenecking operations. Evonik has a global production footprint, with plants in Europe (Darmstadt and Weiterstadt, Germany; Lauterbourg, France), Asia (Singapore; Shanghai, China), and North America (Mobile, AL; Houston, TX; Morrisburg, Ontario). The completion of the projects will expand the company's annual PAMA capacity by 15 percent. Half of this capacity increase is already implemented; the remainder is scheduled for completion in 2021.

The expanded production capacity is associated with Evonik's efforts to consistently grow its oil additives business for specialty applications.

"Increasing our production capacity shows our commitment to providing the lubricants industry with technology that significantly contributes to efficiency gains for our customers serving the automotive and industrial markets," said Doris Schmidt, Senior Vice President of Oil Additives Business Line at Evonik Resource Efficiency Segment.

Evonik's DRIVON™ and NUFLUX™ technologies improve fuel and energy efficiency in engine oils, driveline fluids and gear oils. Industrial and off-highway equipment achieve fuel and energy savings and increased productivity with DYNAVIS® technology for hydraulic fluids.

The oil additives business also specializes in high-performance additives and technologies for fuels and refinery products. Evonik's VISCOPLEX® Cold Flow Improvers (CFIs) provide outstanding flow properties for biofuels in any region or season. VISCOPLEX® Crude Oil Paraffin Inhibitors (COPIs) maintain oil flow by modifying the size and shape of the wax crystals within the oil, dispersing them and preventing them from adhering to pipeline or transporting vessel surfaces.

Evonik's 4th Distributor Days held with the theme “efficiency and growth”

4th Distributor Days of Evonik Oil Additives Business Line was held in Germany on 2–4 September this year. Following Frankfurt in 2016, Krakow in 2017 and Milan in 2018, the meeting was held for the fourth time this year in Darmstadt, where the company's head office is located. Evonik Oil Additives channel partners from Europe, Middle East, Africa and South Americas attended the meeting. The theme of this year's Distributor Days was ''efficiency and growth''.

Current activities were shared, group workshops were held and presentations were made during this 3-day meeting, which brought together 50 participants from 13 different channel partners. The program also included a group visit to Evonik's plant in Weiterstadt. Here, information was shared about the plant and production processes.

One of the most important items on the agenda of the meeting was the introduction of the new channel management concept and the Evonik Online Order Management Portal.

At the end of the meeting, companies that have been operating as Evonik distributors for many years received long term service awards. As the company with the longest term of service, Adco from Turkey received an award for 40 years. Adco is followed by Lucas Lee of South Africa for 30 years, Chitas of Argentina for 25 years, Brenntag of Germany for 20 years, Bargos of Serbia for 15 years, AZIK of Pakistan and Alchemy of Egypt for 15 years.

Groupe Renault, BP & Castrol deepen their strategic partnership

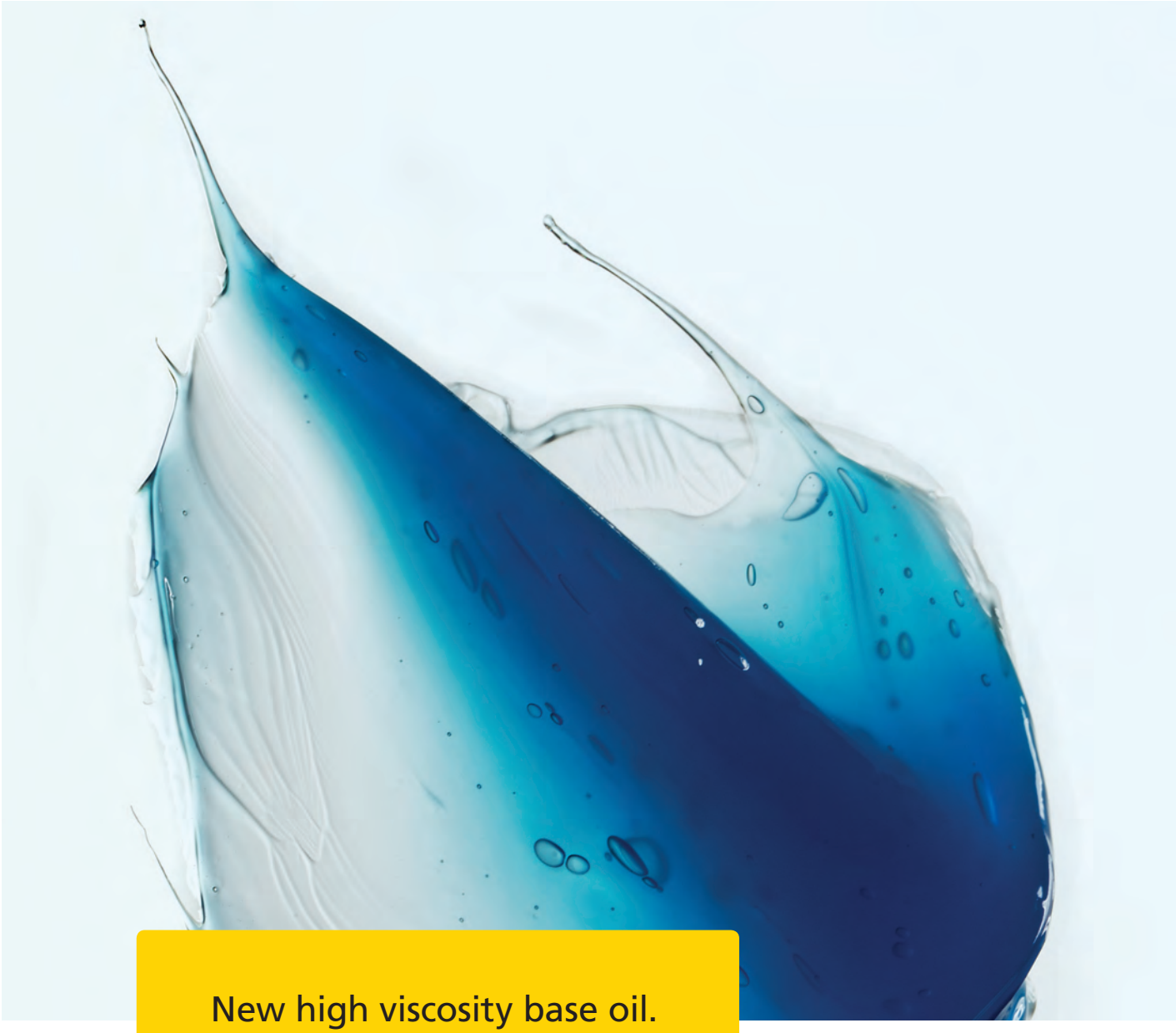
Groupe Renault and BP with its global lubricant business Castrol have decided to enlarge their strategic partnership from 1 January 2020, building upon the successful collaboration which began in 2017 through a Formula 1 partnership.

BP and Castrol are extending their partnership with Renault F1 Team until 2024, providing advanced fuels and engine oil, gear and hydraulic oils, greases and brake fluid, as well as supplying a range of high-performance industrial lubricants to the Team's technical centres in Enstone for the chassis and in Viry-Châtillon for the engine. BP and Castrol play a key role in supporting Renault F1 Team as the new Formula 1 regulations come into effect in 2021.

Groupe Renault has selected Castrol as its aftersales' global service fill engine oil lubricants partner from 1 January 2020. A new Renault Castrol jointly branded product range will be sold to Renault dealers and Renault drivers will benefit from the successful cooperation initiated through the Formula 1 partnership. Groupe Renault and Castrol, both leading brands with advanced technologies, will combine their expertise to continue delivering improved service to Renault customers.

This strong technical partnership in service fill and Formula 1 will enable the partners to push technological boundaries both on and off the track. With Castrol, one of the world's leading lubricants brands, Groupe Renault will build a strong partnership that will enable Renault customers and dealers to enjoy the best service and products while contributing strongly to our Formula 1 ambitions.

BP and Castrol are delivering advanced lubricants that can reduce emissions today and have the technology to develop breakthroughs for the transport of tomorrow. Groupe Renault and BP's strong and growing partnership will enable both companies to combine the excellent skills and knowledge across both organizations to explore the opportunities in this rapidly evolving market.



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 specialty naphthenic oils worldwide, Nynas is making NYNAS T 600 available on a global scale through its outstanding supply and distribution network.

NYNAS

Turkish chemical sector aims for $ 20 billion in exports

Adil Pelister, Chairman of the Board of the Istanbul Chemicals and Chemical Products Exporters Association (IKMIB), who attended the "August 2019 Export Figures Press Briefing" meeting held in Sivas in the 100th anniversary of the Sivas Congress, declared that August exports of the chemical sector reached 1.63 billion USD.

The chemical sector, which is one of the five priority sectors in the Trade Master Plan announced by Ruhsar Pekcan, Minister of Trade, has a strategic importance for Turkey. "Our chemical sector makes an important contribution to Turkey's growth as the second sector that exports the most," said IKMIB Chairman Adil Pelister. He noted that they continue to work non-stop in order to increase the exports of the chemical sector by 15 percent to 20 billion USD.

The Netherlands is the most exported country in August

The Netherlands was the most exported country in August. Respectively Italy, Iraq, Egypt, Saudi Arabia, Germany, USA, Spain, United Kingdom and Iran were the top ten countries following the Netherlands in August.

Chemical exports to the Netherlands in August 2019 reached 166 million 149 thousand dollars. "Mineral fuels, mineral oils and products" ranked first among the products exported to the Netherlands in August.

Adil Pelister

"Mineral fuels, mineral oils and products" is the top sub-sector in exports

Mineral fuels, mineral oils and products took the first place among the sub-sectors in chemical exports of August with 523 million 263 thousand 533 dollars. There was an increase of 75.25 percent in August 2019, compared to the same period of the previous year.

The "mineral fuels, mineral oils and products" product group got ahead of the "plastics and products" product group with August export figures and ranked first among the sub-sectors.

Evonik awards Adco for 40+ years of service as a business partner

Adco, founded in 1977, offers its customers high-quality products as the sole representative of Evonik Oil Additives in Turkey since its foundation. Evonik management awarded Adco, which acts as an Evonik distributor in Turkey, Bulgaria, Azerbaijan and TRNC for many years. The Adco team, which participated in Evonik Oil Additives Distributor Days that took place on September 2-4 in Germany, Darmstadt this year, was very pleased with this surprise award.

The award was presented to Selçuk Akat, General Manager of Adco, by Dr. Can Turhan, Business Manager for Evonik Oil Additives in Africa, Middle East, Turkey and Bulgaria, and Thilo Krapfl, Customer Relations Director EMEA at Evonik.

"We are honored to serve our customers in Turkey and other countries in the field of petroleum additives and chemicals since 1977. Thanks to our culture and capacity to do business with international companies and large-scale firms, we are able to maintain long-term relations with our partners. For 42 years, we act as the Turkey representative of Evonik Oil Additives, one of the world's leading companies in this sector. I am grateful and thankful to the entire Adco team that made Adco continue its operations consistently and successfully, and to the Evonik team that has always been there for us throughout these years," said Selçuk Akat.

Adco was founded by Sait Akat in 1977 as a supplier of specialty chemicals and high performance lubricants for the oil industry. Offering services to Turkey and to its customers in the CIS, Caucasus, Central Asia, Middle East and North Africa, has a wide range of products for every need from the very first stage of oil extraction to the final stage of consumption.

Opet Fuchs opens new plant in Izmir, Turkey

Opet Fuchs, one of the leading brands in the lubricant industry, has started operation at its new plant in Aliağa, Izmir, Turkey. Realized with an investment of EUR 24 million, the Aliağa Lube Oil Blending Plant was opened on September 3, 2019 with a ceremony attended by Fikret Öztürk, Chairman of the Board of Opet Petrolcülük A.Ş., Yağız Eyüboğlu, President of Koç Holding Energy Group, Stefan Fuchs, Chairman of the Board of Fuchs Petrolub SE, Opet Petrolcülük A.Ş. Board Members Nurten Öztürk, Ufuk Öztürk and Filiz Öztürk, and Ralph Rheinboldt, Member of the Board of Fuchs Petrolub SE, Alf Untersteller, Vice President of Fuchs Petrolub SE, Cüneyt Ağca, General Manager of Opet Petrolcülük A.Ş., and Murat Seyhan, General Manager of Opet Fuchs.

Fikret Öztürk, Chairman of the Board of Opet Petrolcülük A.Ş. said, "We have succeeded to carry such a challenging and risky business forward in our country thanks to our partners Koç Holding and Fuchs Petrolub SE. With this new state-of-the-art plant, which we is the outcome of the efforts of the dynamic Opet Fuchs team, new achievements are waiting for us both at home and abroad."

Yağız Eyüboğlu, President of Koç Holding Energy Group, said that the new plant is the result of 17 years of successful cooperation between Koç Holding and Opet Petrolcülük. "This new plant will be the backbone of our strategic change. It will give a new impulse to the sector with its doubled capacity and renewed product structure. Together with our new plant and our partners, we have once again underlined our trust in the sector and our country," said Eyüboğlu.

Stefan Fuchs, Chairman of the Board of Fuchs Petrolub SE, said: "Today we have a dream come true. I am very happy and proud to be here to celebrate this important day. Our partnership, which started in 2005, achieves success in harmony. I would like to take this opportunity to thank the Öztürk Family, Koç Group, Opet and Opet Fuchs employees."

In his opening speech, Murat Seyhan, General Manager of Opet Fuchs, said: "We completed our factory in May 2019 and the trial production started in July. This plant, which we realized with the aim of meeting the changing needs of consumers, is one of the most technological lubricant plant in Turkey and the nearby geography. We raised the standards while increasing our production capacity."

Annual lubricant production capacity of 60 thousand tons in one shift

Opet Fuchs' new plant in Izmir was established built on a total area of 55 thousand square meters to manufacture a wide range of products including engine oils, industrial oils and special products. The plant has a production capacity of 60 thousand tons per year in a single shift, and is equipped with the most advanced process technologies such as drum decanting systems, piggable product transfer pipelines and automatic piggable manifold.

The products produced in highly automated bottles, drum and tin filling lines are palletized with the help of robots. The automatic packing machine further increases the production rate. Barrel and IBC filling lines are designed to reach high capacity. Warehouse stock management automation was commissioned to ensure flawless shipment quality in the warehouse where in-rack sprinklers are used to minimize fire-related risks. Approximately 300 km of energy and process cables were used in the construction to ensure a high level of automation in the plant, which consists of five main sections: administrative building, production building, warehouse building, tank area and utilities. The fire protection system of the new Opet Fuchs lubricant production plant was designed in accordance with the Turkish National Regulation on the Fire Protection of Buildings and NFPA standards.

R&D laboratory is equipped with the latest technology

The Research and Development Laboratory, which provides services with the state-of-the-art laboratory materials and equipment in an area of 300 square meters, has the capacity to run more than 100 test methods with over 45 new technology testing devices. Product prototype studies and verifications are carried out in the laboratory where new product designs and developments are realized upon customer requests.

Quality Control Laboratory has the highest number of accredited test methods in the sector in Turkey

The Quality Control Laboratory contributes to customer satisfaction, one of the company's primary goals. The ISO 17025 accredited Quality Control Laboratory tests the used oils in order to track the equipment and lubricant performance levels. The laboratory has the highest number of Türkak test approvals in the sector.

Tüpraş becomes the top Turkish industrial organization in HORIZON 2020

Tüpraş became the most successful Turkish industrial organization within the scope of HORIZON 2020, which is the most important research and innovation program in Europe and the world's highest budget grant program, which was established by the EU to support scientific and applied research, development and innovation projects. With its 11 R&D projects in HORIZON 2020 Program, Tüpraş received 5.86 million Euros.

İbrahim Yelmenoğlu, General Manager of Tüpraş, pointed out that participating in the program is an important means for the development of new technologies and access to advanced technologies in cooperation with specialized persons and institutions. ''This success is a result of the right strategic steps we have taken towards the future within the scope of our R&D activities. At Tüpraş, we prioritize new technologies focused on efficiency, environment and digitization. The competent research team, advanced laboratory infrastructure and effective internal and inter-institutional cooperation lie behind our success, which is the result of intensive work,'' says Yelmenoğlu.

Projects of Tüpraş supported under the HORIZON 2020 Grant Program:

- **SafeAST:** Continuous Structural Condition Tank Integrity Monitoring of Above Ground Storage Tanks (2015-2017)
- **iPerm:** Guided Wave Monitoring Tool (2016-2019)
- **INTEGROIL:** Demonstration of a Decision Support System for a Novel Integrated Solution Aimed at Water Reuse in the Oil&Gas Industry (2016-2019)
- **FUDIPO:** Future Directions of Production Planning and Optimized Energy and Process Industries (2016-2020)
- **Indus3Es:** Industrial Energy and Environment Efficiency (2015-2019)
- **BIZEOLCAT:** Bifunctional Zeolite Based Catalysts and Innovative Process for Sustainable Hydrocarbon Transformation (2019-2023)
- **BAMBOO:** Boosting New Approaches for Flexibility Management by Optimizing Process Off-Gas and Waste Use (2018-2022)
- **MOF4AIR:** Metal Organic Frameworks for Carbon Dioxide Adsorption Processes in Power Production and Energy Intensive Industries (2019-2023)
- **COZMOS:** Efficient CO2 Conversion over Multisite Zeolite-Metal Nanocatalysts to Fuels and Olefins (2019-2023)
- **FACT-LOG:** Energy-Aware Factory Analytics for Process Industries (2019-2023)
- **MACBETH:** Membranes and Catalysts beyond Economic and Technological Hurdles (2019-2024)


İbrahim Yelmenoğlu

Troychem DMCC

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Quality DOT = Driving Safety !!

Troychem DMCC	ADDITIV CHEMIE LUERS GmbH	BRB	temix Oleo products from renewable sources
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Grease Additives	PPD & VII & PAMA	Engine Oil Additives	TMP-TO & Poly-Esters
Solvents	Sodium Sulfonates	Performance Additives	Glycerine
Chemicals	EP & AW Additives	Viscosity Modifiers (OCP)	Distilled Fatty Acids
Petrochemicals	Corrossion Inhibitors	Calcium Sulfonates (TBN)	Fire-Residence Hydraulic Oils
	Tackiness Agents	ATF & UTTO Additives	

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BASF to establish an innovation center in Turkey

BASF Turkey will establish an innovation center in order to contribute more effectively to the current and future success of its customers. The foundation of BASF Turkey Innovation Center was laid in Teknopark Istanbul on June 13, and the center is scheduled to be operational in the first quarter of 2020.

BASF, dating back 154 years in the world and 139 years in Turkey commercially and having a production history of 50 years in Turkey, attaches great importance to innovation since day one. BASF, which has R&D Centers in approximately 70 locations around the world, has more than 11 thousand employees in this field. BASF has invested around 2 billion euros in R&D activities in 2018 alone, and obtained 900 new patents.

The application laboratories of BASF, which provides chemical products and solutions to many industrial sectors in Turkey, will be gathered under the roof of BASF Innovation Center with the addition of new laboratories. The center, which will be operational in the Teknopark Istanbul campus, will allow BASF to develop customized solutions for local customers, taking into consideration the characteristics of Turkey's geography.

At the groundbreaking ceremony of the center planned to be operational in the first quarter of 2020, Rami Atikoğlu, General Manager of BASF Turkey, said: "At the Innovation Center, we together with our customers will provide customized solutions for them. This center is a proof of our trust in both our country and our business partners."

Under the roof of BASF Turkey Innovation Center, there will be works and activities for new solutions, developments and works tailored to the needs of customers in the fields of Nutrition, Agricultural Solutions, Residential Care and Industrial Cleaning, Personal Care and Hygiene, Paint, Engineering Plastics and Polyurethanes and Automotive Refinish.

BASF also aims to contribute to the university-industry cooperation with universities, academicians and students by gaining the R&D center status in Turkey through this Innovation Center.

BASF Innovation Center building, for which approximately 3500 sqm of land has been allocated by Teknopark Istanbul, will consist of laboratories, office and seminar area and will have Leed Gold Certificate when completed.

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One in every two vehicles uses Total

According to the Automotive Manufacturers Association data, Total lubricants or antifreeze are used in one out of every two vehicles manufactured in Turkey. The company, operating in Turkey for many years, continues to increase its market share.

Total Turkey Marketing, operating in the field of production and marketing of lubricants in Turkey for 29 years, supplied first fill lubricants and antrifreeze for 4 million out of approximately 7.5 million vehicles manufactured in Turkey in the last 5 years. According to the cumulative manufacturing data for the 2014-2018 period of Automotive Manufacturers Association (OSD), Total lubricants or antifreeze were used in one out of every two vehicles manufactured in Turkey.

First fill lubricants are very important for vehicles since they can affect the overall life and long-term efficiency of the vehicle. Total develops its first fill lubricants through R&D works and cooperation with vehicle manufacturers.

Total Turkey Marketing, a 100 percent subsidiary of Total group, carries out its operations in the field of lubricants in Turkey with its 130 employees. According to the Q4 2018 data in PETDER Report, the company has a market share of more than 10 percent, and it has a strong sales and distribution network that supplies products to the automotive, industry and marine transport segments both directly and through its distributors.

Total has nearly tripled its market share in the last two decades, and increased its sales volume by 4 times. Total, preferred by global automotive manufacturers, produces 95 percent of the products for the Turkish market in its Izmir plant. Stating that nearly 400 products are produced in Menemen, Izmir at the highest international and local standards, officials underline that the lubricant blending plant's capacity is approximately 50,000 tons per year.

Over half a million tons of domestic production

Cengiz Hisarcıklılar, Commercial Director of Total Turkey Marketing, underlined that Total has produced 565 thousand tons of lubricants in its plant in Menemen, Izmir in the last 15 years in Turkey. Pointing out that more than half of this production consists of automotive products, Hisarcıklılar stated that they also provide customers with high quality services with their wide range of state-of-the-art products for industrial and marine purposes.

"Our success is not a coincidence"

"Total is one of the 4 largest energy companies in the world and has the experience of both Total and ELF brands in the field of lubricants. We have advanced technology lubricants and antifreeze for every area in which we operate. We hold a strong position and have a high market share not only in first fill lubricants but also in the authorized and private services channel. We have developed all our products with the knowledge and experience we have gained from our many years of collaboration with original vehicle manufacturers (OEMs). For this reason, the use of Total lubricants or antifreeze in one out of every two vehicles produced in Turkey is not a coincidence and we are proud of this achievement," Cengiz Hisarcıklılar said.

"We continue to develop our product range with R&D works"

Petrol Ofisi carries out important studies in the industrial field and performs extensive research and development activities to expand its product range to meet every demand. We asked Sezgin Gürsu, Lubricants Director of Petrol Ofisi, to tell us about their latest grease.

We would like to get to know Sezgin Gürsu, Lubricants Director of Petrol Ofisi, which is the leader of Turkey's lubricants and chemicals market.

After graduating from Istanbul Boys' High School, I received my Bachelor's degree in Mechanical Engineering from Bogazici University and my Master's degree in Mechanical Engineering from the University of Miami in the USA. I started my professional career as a Research Assistant in the Clean Energy Research Institute at the University of Miami in 1989. Then, I started working as

Project Engineer in the Supply Coordination Group at Koç Holding in 1991. I switched to Mobil Oil Turkey in 1992 and undertook managerial responsibilities at different positions, respectively sales, purchasing and production. I continued managerial duties at various positions after the merger of Exxon and Mobil in 2001.

I joined the Petrol Ofisi family as Lubricants Sales Manager in 2007. I worked as Director of Commercial Fuel Sales and Lubricants and Director of Retail. I've been holding the position of Director of Petrol Ofisi Lubricants since April 1, 2018.

As Petrol Ofisi, you carry out very important works in the industrial field. Would you please explain your industrial product range in general?

Petrol Ofisi, which has been serving Turkey's industry and leading the sector in which it operates since its foundation, supports manufacturers with its Industrial lubricants, years of knowledge, technological infrastructure, and pre-sales and post-sales technical services. In this field, it has a wide range of products, including greases, turbine oils, hydraulic system oils, compressor oils, closed and open system gear oils, and metal cutting and forming oils, which is sufficient to meet all the needs.

In addition, POTEM (Petrol Ofisi Technology Centre), which is the best-equipped technology centre in Turkey, does not only develop standard products, but also produces solutions for special needs and works hard to reduce Turkey's foreign dependency. In this sense, POTEM especially accelerated its development works for reducing maintenance costs and focused on products that may bring significant solutions in this regard.

Using the right product is very important, especially in the heavy industry. In the tests, Petrol Ofisi was proven successful in this sense thanks to its new grease, Ultra-Tech CSI 146. Would you please give us detailed information on this product? What kind of technology was used when manufacturing this product?

In the industrial field, the priorities of industrialists who make significant investments in production facilities include 'the long-term high-performance operation of this investment and the protection of its equipment.' We are always in touch with our customers. Their feedbacks and requests are valuable for us. So, as Petrol Ofisi, we are aware of the added value created by these facilities as well as the needs and priorities of our customers. Therefore, we keep our grease portfolio, which has an important place in maintenance activities, up-to-date in line with needs.

The way you bring together the inputs in the grease production is as important as the selection of these inputs. The calcium sulfonate complex soap structure that we use in Ultra-Tech CSI 146 is a technology that is open for development. On the way to the end product, the choices and processes such as base oil, penetration, and cooling affect the quality of the product directly. We see actual technological improvements here.

What are the benefits of Ultra-Tech CSI 146?

Ultra-Tech CSI 146 offers high protection against excessive pressure and abrasion with its calcium sulfonate complex structure developed with gelation technology. With its Molybdenum disulphide content, it provides effective protection against shock loads and reduces the risk of breakdown by adhering to bearings for a longer time in case the grease supply to the equipment is interrupted. It provides longer protection for water-cooled rollers and bearings thanks to its adherence resistance to water. It does not form carbons at very high temperatures and prevents blockages in lines. By creating a barrier against contaminants such as dust, dirt, and oxide layer, it maximizes equipment protection and extends the life of rollers and bearings. With all these features, it contributes to the optimization of maintenance costs.

Which sectors does this product target?

Ultra-Tech CSI 146 is most commonly used for the equipment in the heavy industry such as the iron and steel, cement and paper industries, as well as the mobile equipment used in mining.

A balancing act

Dwindling Group I capacity spells problems for lubricant producers relying on bright stock and heavy neutrals for their products. Can naphthenics help balance supply and demand?

"Bright stock and heavy neutrals are the collateral damage of the ongoing shift in the paraffinic pool due to the rationalization of Group I production. Capacities of 550 ktpa for bright stock and 2 million tpa for heavy neutrals are at stake over the period 2016–2021," says Gaia Franzolin, Marketing Manager of Nynas Naphthenics.

The production shift away from Group I is likely to lead to shortages for both grades. Faced with such disruption, the market will have to find ways of balancing supply and demand, and options include everything from reformulation to lighter lubricant grades to replacing bright stock and heavy neutrals with alternative base stocks.

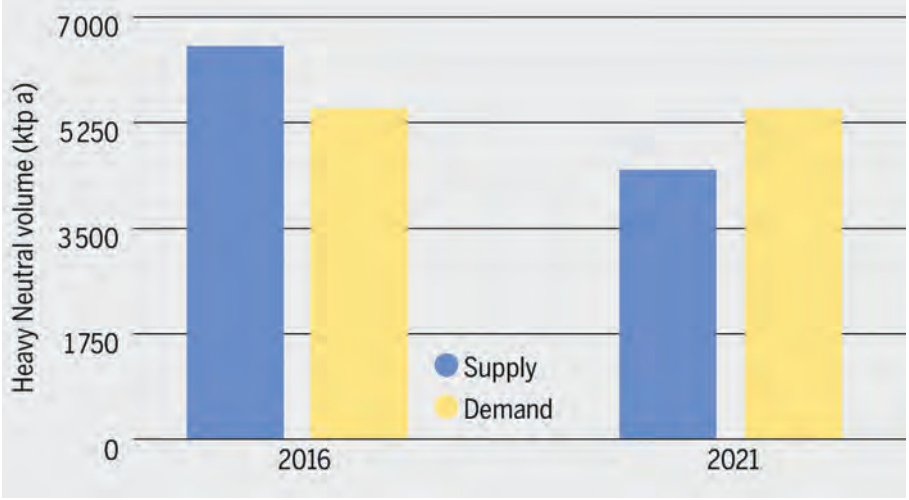
"The technical requirements of each application will determine which option is the most viable. In some cases, reformulation to lighter grades is possible," she explains.

However, reformulation can turn out to be very costly, and the use of lighter lubricants might not always be ideal in terms of performance. To find replacements for bright stock, lubricant blenders might consider using either synthetic fluids or heavy naphthenic oils.

"Heavy naphthenics offer excellent solvency, which is an important feature in the formulation of

industrial lubricants. Also, heavy naphthenic oils are the only non-synthetic alternative to bright stock, and although they have a lower viscosity index than paraffinic oils, in several industrial applications the temperature variation is not wide enough to justify the need for a high viscosity index," says Gaia Franzolin.

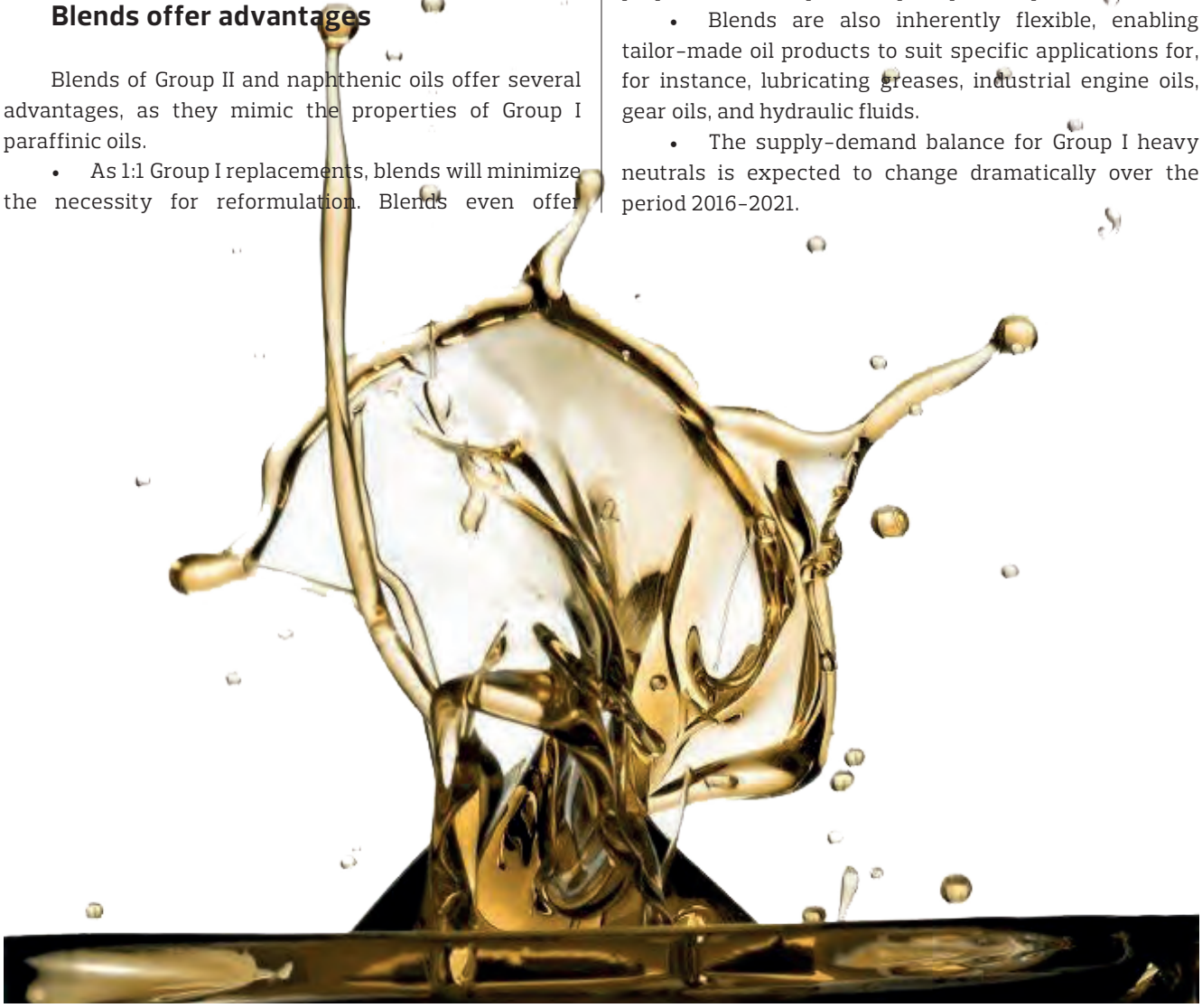
To replace Group I heavy neutrals will be equally tricky. When solvency is required, naphthenic heavy neutrals are the best option. In applications where a high viscosity index is important, Group II heavy neutrals should be preferred. A third option is to blend these two alternative base stocks.



Blends offer advantages

Blends of Group II and naphthenic oils offer several advantages, as they mimic the properties of Group I paraffinic oils.

- As 1:1 Group I replacements, blends will minimize the necessity for reformulation. Blends even offer advantages over the Group I heavy neutrals they are replacing, having better oxidation stability and response to antioxidants along with excellent low temperature properties and response to pour point depressants.
- Blends are also inherently flexible, enabling tailor-made oil products to suit specific applications for, for instance, lubricating greases, industrial engine oils, gear oils, and hydraulic fluids.
- The supply-demand balance for Group I heavy neutrals is expected to change dramatically over the period 2016-2021.



Alpet Lubricants develops special products for the iron and steel industry

Alpet Lubricants develops special projects and conducts product studies for the iron and steel industry, which is among the most important industries of Turkey. The company aims to make a difference in the sector with its calcium sulfonate complex greases. Atilla Başulaş, Lubricants Technical Support Manager, shared detailed information about the company's grease production and R&D activities.

We'd love to get to know you. Can you tell us about yourself?

I graduated from Boğaziçi University, Department of Chemistry. I started my lubricant career in 2002 with technical sales in the metal products sector. After working as regional technical manager in several companies, I became a part of Alpet Lubricants as Business Development and Technical Affairs Manager in December 2016. I am

currently taking office as Technical Support Manager for Lubricants. With the support of our R&D and Quality Control Laboratories, we as the entire department believe that it is very important to increase our process knowledge by visiting our customers and to develop products that are specific to their processes and that will meet their needs. When we adopt this manner of work, it is much faster to detect the problem and develop solutions through R&D.

In your opinion, what are the features that make the iron and steel industry different from other industries?

The iron and steel industry has a significant place for both our country and lubricant manufacturers. The contribution of this industry to the national economy is very high and Turkey hosts some of the largest manufacturers of the world. The manufacturers have technical staff consisting of operators and engineers with a high level of education and experience. Many steelmakers have lubricant quality control laboratories equipped with advanced technology in their own premises. Therefore, they can check the oil both in the working environment and in laboratory tests and monitor the cost and performance of lubricants. They closely follow the latest developments in lubricants sector and can identify the needs in their processes and can make pinpoint requests. This awareness and accurate information transfer increases the variety and quality of the oils used in the iron and steel industry. In this industry, many different kinds of products are used, such as polyurea greases, barium complex greases, calcium sulfonate complex greases, water and ester based fire resistant hydraulic oils, circulating oils, steel mold release oils, hydraulic fluids, skid oils, etc. One of our primary goals is to develop the most accurate solutions for the needs of the iron and steel industry by increasing our knowledge about the processes in different companies.

How do you carry out the R&D activities related to greases?

The Technology Center was established in 2009 with a high investment cost and it is further improved with regular investments in parallel with the developments in the world. R&D and Quality Control departments carry out tests by a competent team and more than 100 international, national and internal methods, over 50 of which are within the scope of Türkak Accreditation. There may be cases where standard test methods do not fully meet the expectations of the field. In such cases, R&D and Quality Control departments undergo revisions in our own internal methods or standard methods and put our products to different tests. For example, before we put our calcium sulfonate complex greases on the market, we conducted several hours of tests to understand the situations our customers might experience during use. In many iron and steel companies, we observed the properties of our calcium sulfonate complex greases such as surface adhesion, water and oxidation resistance, soot formation and stability. We conducted studies with R&D to make changes in the formulations of our products using the information we obtained through field tests. Here, R&D is a must both for the formulation and the mode of production. Greases are formed by chemical reactions, thus the mode of production is as important as the formulation to create the desired product. I also want to point out that being able to carry out all this process within the company and to develop products that meet the needs of iron and steel manufacturers is a good source of motivation for us and our R&D employees. Technical teams actively working in the field provide input for R&D studies and support the development of products to meet the needs of the sector.

How do you produce grease as Alpet Lubricants, how did you start?

After it was decided to produce our own grease portfolio, which was procured from foreign manufacturers until 2014, all related units set to work. Detailed market research was conducted to determine the products and needs. We participated in many international conferences and workshops organized by ELGI (European Lubricating Grease Institute). We met with many experts and companies experienced in this area, and attended trainings in many countries such as Germany, UK and India. We reviewed the literature and practices around the world through published articles. Prior to large-scale industrial manufacturing, we made productions in pilot reactors. We went through many phases such as reaction efficiency, suitability of raw materials to the formulation, cooling-heating rates, effects of different performance additives, and reliability of quality control tests. The products were sent to different laboratories for testing both in Turkey and abroad. Our company has been working on greases for more than 5 years. In our facility, we have been able to produce all the greases that will not threaten our customer's health within the scope of the REACH regulation. As a national company, we attach importance to quality and maximum benefit that we can offer to our customers with our products and services by trying to raise our customers' awareness.

What is the importance of calcium sulfonate complex greases and how does it differ from other greases?

Calcium sulfonate complex grease, which has been used in the United States since the 1980s, is a type of grease that has just started to be used in our country. We are working on raising the awareness of our customers about this and developing products. Some part of calcium sulfonate greases is being imported, but we are able to produce these products here and we are happy to provide these imported products to the Turkish market as a national company.

Calcium sulfonate grease is a type of grease that maintains its protection efficiency up to 200 °C and physically passes from the semi-fluid phase to liquid phase over 300 °C, although its low temperature features vary according to the base oil type. Sometimes the drop point of a product can be interpreted as its maximum operating temperature, and this suggests that there may be problems during operation. When used above the

recommended operating temperature, lubrication feature of grease minimizes and even the oil film deteriorates and wears. Subsequent overheating on the surface caused by insufficient lubrication accelerates the oxidation and heavy carbon residues which we call soot formation remain in the system.

Grease preference should be evaluated in many parameters. External conditions such as internal-external diameter, rotation speed of the bearing, maximum temperature level at which the bearings reach, exposure to water and moisture are very important. Unless greases, which can operate at very high temperatures and are suitable for sudden temperature increases, are used in steel mills, soot formation may occur in the grease. In rolling mills, the water used to cool the bearings will cause the grease to dissolve and drain away, depending on the strength of the seals in the system.

Calcium sulfonate complex greases and calcium sulfonate greases are technically similar. However, complex greases go through various acid reactions. As calcium sulfonate greases have higher sulfonate content than complex types, ash content which forms as a result of burning is higher. In this respect, calcium sulfonate complex grease technology will provide less ash residue. Technically, calcium sulfonate greases show better water resistance and pumpability than calcium sulfonate complex greases, but with today's technology, water resistance can be brought to similar levels with various polymer additions. As it is an adjustable condition, water resistance and adhesion properties of each manufacturer's product are not the same. For the determination of these values, according to ASTM D 4049 test method, "Water Sweep" results are an important method to observe the water resistance level of grease.

Calcium sulfonate complex greases can be used in systems where water, moisture, temperature (within the recommended limits), surface adhesion are important and where high load resistance is required. Organic greases that do not allow ash formation are recommended for steel mills. They can be preferred in bearings in rolling mills, construction machinery buckets working in water, certain parts of ships under water, palletizing machines in feed factories, low temperature compressor conveyor bearings, vibrating construction machines, marble quarries, and stone crushing machines.

According to the data of many of our customers, it has been observed that the use of calcium sulfonate complex greases reduces consumption compared to lithium complex grease at the NLGI 1.5 level. This data was evaluated on the basis of extending pumping periods, taking into account the consumption quantities.

Why Alpet Industrial?

Alpet Lubricants, which is one of the energy group companies of Altınbaş Holding, is an organization operating in the field of lubricants business. Since its establishment, it has been producing lubricants and complementary chemicals that meet the needs of the automotive sector in particular. In 2016, the brand 'Alpet Industrial' was established under the roof of Alpet Lubricants. It is positioned as a private brand with a portfolio consisting of products that work on the basis of components rather than additive packages, and that specifically address the industry.

As Alpet Industrial -a national company with advanced technological opportunities- we set off with the aim of contributing to the production increase that is essential for Turkey's economic development. Underlining that our focus is on the industry, we are working to facilitate the work of manufacturers and to support our customers with an authorized technical team.

What are the trends and the most preferred tests in grease analyses?

We think that being able to conduct successful works in the R&D department depends on correct needs determination, a good analysis and a good project design in every respect. You must have the technological competence to identify the product properties that the customers get good results, to produce this product within your own premises and even to further improve it. It is also very important that the products you produce have a standardization and stability. We carry out intensive and rigorous tests in the process of delivering the products with the same formula and same quality to our customers. Thanks to our significant investment in the field of greases, we are able to perform almost all tests in our own laboratory, without depending on other sources. We are also at a different stage in terms of export of analysis services. We conduct tests for different European countries within the scope of accreditation. We get offers especially for greases analyses and projects from countries such as Greece, Germany, Romania and Belgium, and we provide reports. At home, many end users prefer our lab to find an answer to their questions about greases.

Will you have any other projects for the iron and steel industry?

We are always in contact with the authorities at different levels from the iron and steel industry. First of all, we evaluate the status of existing products and continuously work for the development of the products when needed. In particular, we continue our projects that will decrease consumption and has high added value. We have achieved to decrease consumption and bring the performance level to the expected level.

In addition to calcium sulfonate complex greases, we have special projects on special reduction oils with increased LWI values (Load Wear Index) and fire resistant hydraulic oils. We continue our studies not only for the iron and steel industry but also for other industries. One of our most recent projects is food-compatible greases, in which we have made considerable progress.

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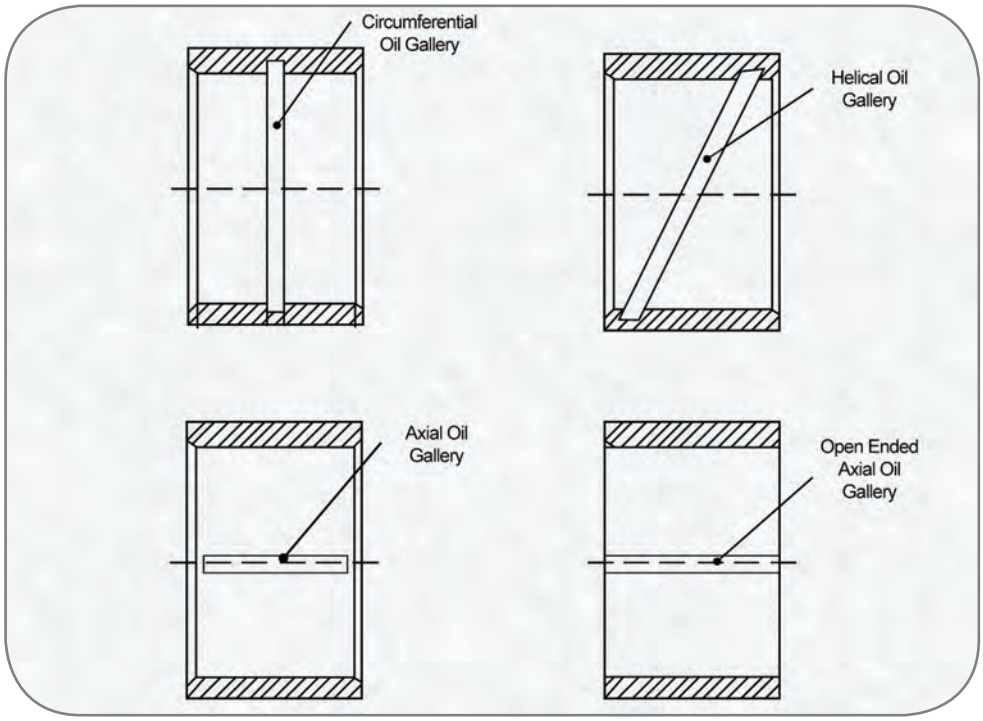

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Journal bearing design criteria – III
Oil galleries

The main purpose of lubrication is to form an oil film between the two surfaces, which has sufficient thickness and is resistant to operating conditions. It aims to transform the mechanical friction that causes loss of energy into internal friction that occurs in the movement of oil particles in the oil film. This oil film layer can separate the shaft and bearing from each other and prevent the contact of the rough parts on their surfaces. If such an oil film is formed between the two surfaces, the friction here will be reduced to the friction between the oil layers. All lubricant particles will spread on metal surfaces and adhere to shaft and bearing surfaces with a performance dependent on the type, chemical structure and additives of the lubricant.

One of the factors affecting the formation of this oil film is the oil inlet and the oil gallery. One or multiple oils are supplied to bearings. The oil inlet opening must be in the appropriate geometric form (usually circular) and size; because the oil inlet must be sufficient not to prevent the flow of oil. For this purpose, the oil inlets are generally designed in the form of countersinks and have suitable roundings. In order to facilitate the formation of an oil wedge between the surfaces of the bearing and to provide a better distribution of the oil within the bearing, usually a number of oil galleries are opened by metal-cutting method. Oil galleries are also available in circumferential, helical, axial and open ended axial forms according to ISO 4378. In practice, the most commonly used types are circumferential and axial oil galleries.

Another purpose of oil galleries is to provide an oil chamber in the bearing and adequate oil flow for adequate cooling effect. It is possible to cool a hot bearing by using a simple shaped oil gallery to increase the oil flow. An axial oil gallery in the no-load part of the bearing is usually sufficient for the transfer of unidirectional loads. With this oil gallery, it is possible to achieve three times more oil flow in a bearing construction where there is only one oil hole. For loads with variable directions, circumferential oil gallery is a more suitable construction. However, the circumferential oil gallery also divides the bearing into two smaller bearings. This may reduce the total load carrying capacity of the bearing. In principle, it is more convenient to design the bearing so that the oil inlet and oil galleries are located in an area where there is no hydrodynamic pressure. By doing this, better oil flow will be achieved. Otherwise, the hydrodynamic oil pressure distribution will be significantly impaired, which reduces the load capacity of the bearing.

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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 W- yy

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.

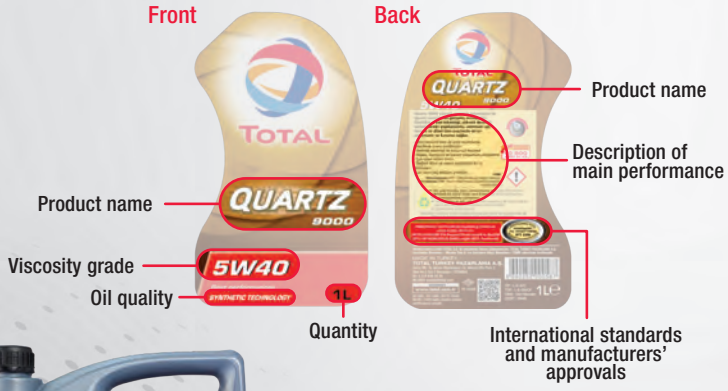
For example, a 15W-40 or 20W-50 oil has been developed for use in hot countries, and their "viscous" nature makes them suitable for older engines.

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:



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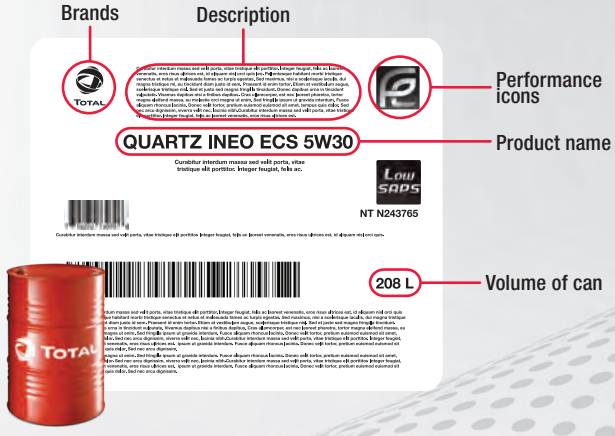

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