

Feedback

THE PANOLIN MAGAZINE – ISSUE 01/2017

Responsibility for the environment
Good news from our customers

And the Oscar goes to PANOLIN



Silvan Lämmle, CEO PANOLIN AG

Daniel Zimmermann, CEO PANOLIN International Inc.

Patrick Lämmle, Chairman of the Board PANOLIN International Inc.

Dear Readers, many thanks for the positive comments on our last edition of «Feedback». In this issue, we take another look behind the scenes at PANOLIN to show you the many different locations where our products are in use. Among them are dense forests, fast-flowing river beds and a race track inside one of the world's fastest motorbikes. Our journey takes us beyond Switzerland's borders to Finland in Northern Europe, where large-scale projects are under way throughout Scandinavia. We also cast a glance at the Douro Valley in Portugal, famous for its red wines and the best Port wine in the world, and now also for one of the world's most modern pumped storage power stations.

A few days ago, the excitement was palpable, not only in management but also among our specialists working in our laboratories. Why? The new Fluid Test from Bosch Rexroth is to providers of hydraulic fluids what the Oscar is to the film industry. As the former test methods no longer satisfied the demands of the industry, Bosch Rexroth, the world's largest producer of pumps and pump components, designed its own test method and with it has basically set a new standard. Hydraulic fluid is the element that links all the hydraulic components together and therefore needs to be selected with great care. The quality and purity of

the hydraulic fluid play a decisive role in the operating safety, economic efficiency and service life of the system. The Bosch Rexroth test of PANOLIN HLP SYNTH 32 shows that our product meets even the strictest demands of the industry. The test results were excellent and the rigorous requirements of the RDE 90235 standard were met in full. Moreover, PANOLIN HLP SYNTH 32 is the first rapidly biodegradable hydraulic oil to have received the Fluid Rating from Bosch Rexroth. This demonstrates once again that our hydraulic fluids hold an outstanding global position among environmentally friendly hydraulic oils. «And the Oscar goes to PANOLIN».

We visited the main production plant in Madetswil and talked to production manager Sarah Mohr-Lämmle to give you an insight into the manufacturing process behind the 730 different types of high-performance PANOLIN lubricants that come in no fewer than 3,650 variants. The continuous growth of the PANOLIN Group calls for additional resources. This is the reason why Patrick Lämmle, previously the CEO of PANOLIN International Inc., decided to give up his job as CEO and take on a new position within the company. Daniel Zimmermann took command of the helm as CEO of PANOLIN International Inc. at the beginning of the year. Daniel Zimmermann is a well-known face at PANOLIN. He worked as a member of the PANOLIN sales team no less than 34 years ago. He then went on to complete his technical and commercial education at various technology and construction enterprises. Following additional professional education in the fields of marketing and management, he focused his concentration on these areas and spent the next 20 years working at management level for national and international corporations. WELCOME BACK, Dani! Even after 30 years, Patrick Lämmle will of course concentrate on the company's international business. He will contribute his wealth of experience towards the strategic development of PANOLIN in his function as a member of the Board of Directors. Exciting times. We look forward to receiving your feedback on our latest edition of «Feedback».

Best regards,

Silvan Lämmle, Daniel Zimmermann, Patrick Lämmle



Imprint

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Oceans without rules or laws

The maritime organization IMO regulates the economic issues affecting merchant shipping, ocean pollution and safety at sea. Its 171 members recently agreed on stricter limit values. But the money and spirit required to enforce them are lacking. Moreover, international treaties concerning the environment and climate are not applicable to merchant shipping. Of the 800 million liters of crude oil that spilled into the Gulf of Mexico during the «Deepwater Horizon» accident in 2010, 30 million are still located on the seabed are entering the food chain. The USA has taken action and is today one of the few countries that rigorously enforces regulations. The environmental protection regulations applicable to maritime vessels entering US waters were tightened at the end of 2013. The «Vessel General Permit» states that only rapidly biodegradable oils may be used at interfaces where oil can enter the water. PANOLIN has developed biodegradable lubricants for the past 30 years and counts among the market leaders in the field. Its GREENMARINE products degrade biologically in

a very short period of time (30 to 60 days). But there is still a lot to do: pesticides, herbicides, artificial fertilizers, waste water, oil and plastic particles are turning the oceans into waste dumps. 675 tonnes of garbage are dumped into the sea every hour. Today, an enormous expanse of waste known as the «Great Pacific Garbage Patch» floats through the North Pacific Gyre. Fertilizers rich in nitrogen enter the oceans where they boost the growth of algae and deplete the water of oxygen. 400 of these death zones are known to be devoid of life. But consumer pressure is on the rise. The environmental label «Blue Angel», for instance, not only distinguishes 12,000 environmentally friendly products (among them PANOLIN), but also ships that are built and operated in an environmentally friendly manner. A growing number of enterprises are listening to their customers' concerns and have adopted environmental protection as a part of their corporate DNA. You can find some examples on the following pages. These companies do not need regulation. They know that we only have one Planet Earth.



50% of all oxygen comes from the oceans

Like our planet's land masses, the oceans are home to photosynthesizing plants and bacteria. They produce as much oxygen and bind the same amount of carbon dioxide as all the plants on dry land.



90% of transport is maritime

More than 90% of global trade is conducted via the 90,000 merchant ships that sail the seas. The lion's share goes to: crude oil and oil-based products (33%), coal (11%), iron ore (10%) and grain (4%).



Oceans turn over 1,200 billion euro every year

Maritime enterprises generate a global turnover of 1,200 billion euro every year. Around 800 million people make a living either directly or indirectly from fishing.

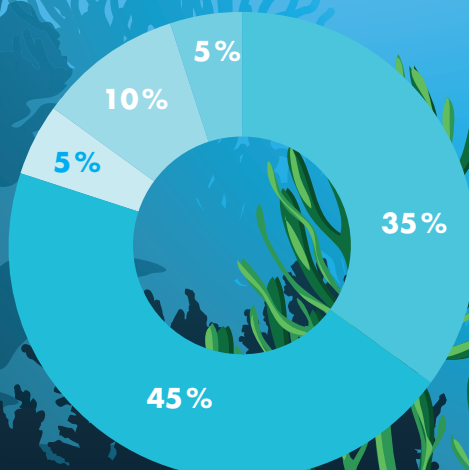


110 million tonnes of food from the sea

The sea is a source of life! Every year, it provides us with 110 million tonnes of food. Fish is a major component of nutrition in many areas around the globe. We humans get 25% of our food from the oceans.

Oil pollution

- 45% Waste water, atmosphere, oil rigs
- 35% Shipping
- 10% Tanker accidents
- 5% Natural sources
- 5% Not defined in detail



Focus: PANOLIN produces 730 high-performance lubricants in 3,650 variants at its modern lubricant manufacturing plant in Madetswil.

«The demands placed on lubricants will continue to increase»

Although Madetswil makes a rural impression at first glance, its location is very central. Zurich, Winterthur and the international airport at Zurich-Kloten are all reachable in just a short time. «Customers who come to visit us love the beauty of our landscape,» explains Sarah Mohr-Lämmle, CEO PANOLIN Production AG. «It is a privilege to work in such amazing surroundings,» explains Mohr-Lämmle: «It keeps our sights set on why we need to protect our environment.» The Zurich-based company demonstrates its philosophy of a sustainable corporate culture not only at the PANOLIN headquarters in Madetswil, but also in the use of its products at world-famous installations such as the new giant flood gates of the Panama Canal, the London Eye ferris wheel or Switzerland's Rhaetian Railway. They

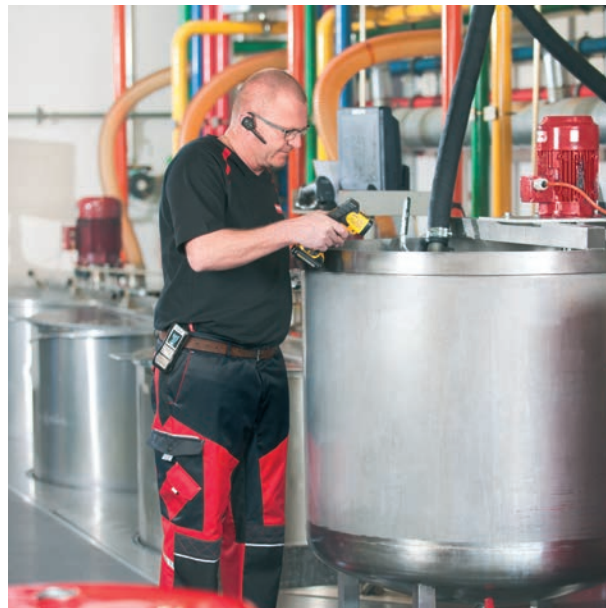
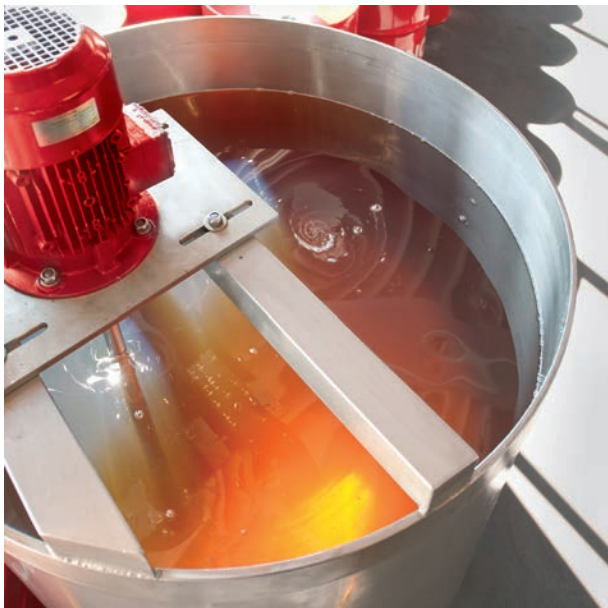
all bank on the rapidly biodegradable lubricants manufactured in Madetswil by PANOLIN. The latest test by Bosch-Rexroth shows that these products not only fulfill the strictest environmental requirements, but also pass every stress test with flying colors. «PANOLIN HLP SYNTH 32 is the first rapidly biodegradable hydraulic oil to receive the new Fluid rating from Bosch-Rexroth,» says a proud Sarah Mohr-Lämmle during a tour of the production facility.

Global breakthrough

The huge PANOLIN success with biodegradable products began back in the 1980s, when a Swiss construction entrepreneur called PANOLIN on the phone and asked for «clean oil». «The customer was carrying out excavation work at Lake Neuchatel and had to deal with one com-







«The technological and regulatory requirements in the area of environmental protection are tightening continuously»

Sarah Mohr-Lämmle

CEO PANOLIN Production AG

plaint after another,» explains Christian Lämmle, President of the Board at PANOLIN Holding AG, who has joined the factory tour. «The reason was that the hydraulic oil from the excavators kept on polluting the water.» The process of developing a «clean hydraulic oil» commenced at the laboratory in Madetswil, where the chemists worked doggedly until they were able to present PANOLIN HLP SYNTH, the first biodegradable lubricant, to the world. «It was our global breakthrough and the first of many innovations from Madetswil,» explains Christian Lämmle. Lämmle looks back on exciting times: «Ever since then, our experts have been in close contact with machine manufacturers and customers as the demands on performance continue to increase.» «That is why we need to continuously develop

new generations of lubricants, whereby each one offers better protection for hydraulic systems than before,» adds Mohr-Lämmle to her father's explanation. The development path of a new product starts with listening to the customer, defining the objectives and developing the formulations. «The PANOLIN Tec Center invests thousands of hours in research and development and exhaustive testing,» explains Lämmle in the control room of the production plant. «The challenge lies in finding the perfect mix of base oils and additives that extend the service life of the oil, deliver outstanding system efficiency, increase productivity, avoid wear and tear, disperse undesirable heat and remove wear particles to reduce the need for maintenance,» explains Lämmle.

Total Quality Management

Four new, huge base tanks with a volume of 180 cubic meters were recently installed in Madetswil. «We are continuously expanding our manufacturing facility to keep production at the forefront of technological developments,» explains Sarah Mohr-Lämmle. The PANOLIN supply program consists of 730 active lubricant products in 3,650 variants. She continues: «Every day, we face the task of managing extremely complex and dynamic production and material management processes. We have to take many variable factors into consideration: mixing ratios, the quality of raw materials, product shelf-life and process parameters.»

The products are manufactured using base oils and additives in computer-controlled mixing installations. The giant, insulated storage tanks in Madetswil hold many thousands of liters of raw materials and are continuously kept at a raised temperature. «We develop and manufacture high-performance lubricants in one of Europe's most modern lubricating oil factories,» says Mohr-Lämmle. «Our quality and environmental management system is certified. Our own strict corporate quality standards are future-oriented and take every process into account.» The first step lies in the careful selection of raw materials. «They are subject to a tight incoming inspection at the laboratory on delivery.» «Dedicated tanks are reserved for each raw material to prevent raw materials from mixing right from the start,» explains Mohr-Lämmle. «The base oils and additives are fed through separate lines into blending stations, where they are combined and blended according to recipe.» Each blending station can hold 5,000 kg of base oils and additives. The oils are blended with up to 12 additives and



stirred in the blending station for a number of hours until ready for filling. The last step in the production process is a comprehensive release test of the finished product in the laboratory. What are the future challenges facing production? Sarah Mohr Lämmle says: «The technical and regulatory requirements in the field of environmental protection, resource conservation, REACH legislation and machinery directives are tightening continuously and are accompanied by rising cost pressure,» and goes on to explain: «The consequence is a growing demand for high-performance lubricants with increasing product specialization and customization. And then there's the customers' demand for ever more flexible delivery services.»





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PANOLIN HLP SYNTH 46

Menzi Muck: to this machine, no embankment is too steep, no ground too soft, no task too difficult.

The Swiss Champion from Kriessern

A rendezvous with a world champion who banks on PANOLIN. It takes place in Rheintal, St. Gallen. Menzi Muck in Kriessern manufactures spider excavators. Anyone wanting to move something in difficult or steep terrain drives a Menzi Muck – excavators with spider-like legs that adjust to every conceivable angle of an incline. «He starts where others stop» is a well-known company slogan. «We offer Swiss quality and guarantee the robustness and stability of our machines even under the most arduous conditions,» says company boss Hansjörg Lipp.

What characterizes a «Swiss Champion»? This question was addressed by consultancy company PWC. Technologically leading products and a focus on their continuous improvement are characteristics of a champion. «They see innovation management as a core operating activity,» wrote PWC in the study «Swiss Champions 2016». And they all bank on the same success factors: strong entrepreneurial personalities, resistance to crises, global positioning, innovation and a focus on a market niche and the customer. One of these Swiss Champions: Menzi Muck. The world's first ever model of the Menzi-Muck walking excavator was presented in 1966. «Little Muck» from the fairy tale of the same name served as the name-giver. «Muck is the little oddball who can do anything,» says Lipp. «The machine has been improved and honed ever since. Various product lines have been created in this way over the past 51 years,» Lipp adds.

«Our excavators can also use the boom to move independently. This type of movement is referred to as walking,» explains Lipp. «Together with the adjustable chassis, it enables walking excavators to move through difficult and steep terrain better than conventional excavators,» says Lipp. «This makes our products extremely versatile

and powerful tools in the construction industry.» The Menzi Muck also demonstrates its versatility in the field of water management. It is capable of working in streams and rivers with depths of up to two meters. Menzi Muck is deployed as a «steep slope harvester» in forestry management and is also to be found on railways. All in all, more than 6,000 Menzi Mucks have been sold over the past 51 years. The current M Series was launched on the market in 2013. The latest and lightest type of the series, the M2, was launched in 2016. More than 100 excavators leave the production plant every year. Menzi Muck also exports to North America and Asia in addition to Europe.

What does the Menzi Muck of the future look like? «The excavators have become ever more agile, stronger and powerful. How the machines are operated has also changed. The latest models are controlled via multifunctional joysticks. Remote controlled machines with 3D excavator control or 'Virtual Reality' are a topic of research as our machines also work in very dangerous areas,» says Lipp.

Innovative products and customer focus: these are not the only areas where Menzi Muck and PANOLIN share the same philosophy. Hansjörg Lipp laughs: «Yes, that's the way it is. After all, our specifications are a challenge to any partner. Our products develop much higher lifting and tearing forces with up to twice as much hydraulic pressure in comparison to conventional excavators. And they usually work in environmentally critical environments. The hydraulic oil therefore not only needs to be biodegradable, but must also meet the highest technical demands.» PANOLIN have always surpassed these requirements. «And we enjoy the benefits of PANOLIN's perfect service, as we have done for decades,» explains Lipp. «A partnership that works at every level.»

Havator: whether crane logistics, heavy load transports or industrial assembly, the Finnish company expanded to become one of the largest and most important players in Northern Europe.

«We pursue a rigorous «Safety First» approach with regard to safety and the environment»

Under the guidance of CEO Christoffer Landtman, the 600 employees of the Finnish Havator Group generate a turnover of 110 million euro per year. Its main fields of activity are crane logistics, heavy load transports and industrial assembly across an area ranging from Finland to the Baltic states, as far as Russia. Havator has 32 subsidiaries in Finland, Sweden, Norway and the Baltic states. The company provides services to clients operating in the construction and manufacturing industries, oil refining, energy production, wind farms, mining and infrastructure projects.

Havator's strength as a provider of load lifting and special transport services is based on versatile modern machines, explains Lars Hagstrand, Regional Manager West. «We always use the latest technology in our equipment and machines,» says Hagstrand. Havator has a large pool of different hydraulic cranes including its flagship, a giant Demag CC 6800 lattice boom crawler crane with an impressive nominal lifting capacity of 1,250 tonnes. The other end of the Havator crane fleet is populated by 'smaller' crane vehicles. «Dozens of our 30 to 50 tonne mobile cranes are at work every day on construction sites for private homes and large buildings.» The company invested in 60 new machines in 2016/17 alone.

In 2016, the enterprise that had been a family undertaking until 2006 celebrated its 60th anniversary. The past 15 years in particular have seen Havator grow into one of the largest and most important players in its segment in Northern Europe. Its turnover increased from 30 to 100 million euro in just a few years. «Achieving this sort of growth calls for new ways of thinking,» explains the CEO during the celebrations. The CapMan Buyout IX Fund invested in Havator in 2010, marking an important step for the com-

pany. Having CapMan on board gave Havator access to more resources to make new acquisitions. Havator acquired companies of different sizes in various industry segments and countries and opened new offices. «Transforming this wide variety of activities into a smooth-running whole was a challenge,» says Jussi Yli-Niemi, who took over responsibility as CEO from 2006 to 2017, at the anniversary celebrations.

«Today we are a united enterprise, regardless of whether we are talking about lifting platforms, special transports or installations in Sweden, Finland, Norway or the Baltic countries. This approach to thinking and acting is the successful way of creating synergies in our sectors,» explains Christoffer Landtman. It is thanks to this strategy that Havator is able to successfully complete very large projects and offer a comprehensive range of services from planning to implementation. Polar Lift AS, a Havator subsidiary, is also a successful operator and nowadays a significant provider of harbor crane services in the Barents Sea region. Headquartered in Finland, Havator has adopted a rigorous 'Safety First' approach; not only with regard to health and safety, but also in view of the environment. «We use state-of-the-art, environmentally friendly equipment to prevent the occurrence of accidents. It is the reason we use biodegradable PANOLIN products in cranes with lifting capacities of up to 400 tonnes to assure compliance with the strict Scandinavian environmental standards; it is an essential requirement when working in cities and on behalf of the government,» explains Lars Hagstrand. «PANOLIN HLP SYNTH is approved in accordance with 'Swedish Standard SS 155434' of the Swedish National Testing and Research Institute. Additionally, the products are long-lasting and fulfill every high performance requirement,» says Hagstrand.

A large yellow crawler crane is the central focus, positioned on a dark, muddy ground. It is lifting a large, circular, metallic component, possibly a tank or a large pipe, which is suspended by cables. The crane's lattice boom extends high into the dark night sky. To the left, a large, multi-story industrial building with a reddish-brown facade is visible, illuminated by bright lights that create a strong lens flare. In the background, another crane is visible, and the ground is cluttered with various industrial materials and equipment. Two workers in high-visibility vests are standing in the lower right corner, providing a sense of scale to the massive machinery.

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HSM Switzerland: a high quality standard, comprehensive service and pronounced customer orientation are major aspects of the corporate philosophy.

«More than 1,000 HSM machines are equipped with PANOLIN»

Switzerland's forests are home to around 535 million trees with each one averaging around 100 years of age. That equates to 66 trees per citizen. Some 2,000 forestry firms with 6,000 employees manage Switzerland's forests; a further 7,000 work in the wood processing industry. Around 5 million cubic meters of timber with a value of 400 million Swiss francs are harvested every year. Two thirds of these are coniferous, or softwood, and one third is deciduous, or hardwood. The gross added value lies at 4.5 billion Swiss francs per year. Additionally, 150,000 Christmas trees are harvested each year. An impressive HSM 904 ZL stands ready for delivery at the entrance to the headquarters of HSM Switzerland in Holziken in the canton of Aargau. The large 4-wheeled log-hauler is designed for use in the forest under the toughest conditions. «Large, yellow and versatile.» These attributes are true of most HSM products. The abbreviation «HSM» stands for Hohenloher Spezial-Maschinenbau, a specialist machine construction company based near Stuttgart, Germany. HSM Switzerland was established in 2009 by the two Swiss entrepreneurs Elmar von Rotz and MichaelENZler together with the current managing director of HSM Germany, Prince Felix zu Hohenlohe. The company employs a workforce of thirteen, one of whom is an apprentice.

HSM Switzerland is the successor to vehicle company von Rotz Fahrzeuge und Maschinen AG. The latter has represented HSM in Switzerland since 1986 and developed the Swiss market. Today, HSM is the Swiss market leader and one of the development centers of the HSM Group. The HFR 504 forest caterpillar, for instance, was developed and built in Holziken. MichaelENZler, managing director

of HSM Switzerland, explains that the two companies cooperate closely in the field of development. «The Swiss market holds a special significance for HSM, as forestry management here by definition has to cope with tough terrain and calls for first-class service alongside adapted forest management technology.»

How did HSM become the market leader in Switzerland?ENZler explains the recipe behind the success of HSM Switzerland during a tour of the modern plant: «We not only market high-quality products, we also place great value on providing a perfect service.» Short reaction times, decades of experience and a huge replacement parts warehouse form the basis for minimum downtimes. «We offer an all-round service thanks to our workshop in Holziken, our service partners and a mobile workshop,» explainsENZler. A good team spirit is just as important as a pronounced customer orientation, he adds. Partnerships like the one with PANOLIN are another key factor. «HSM vehicles have been equipped with rapidly biodegradable hydraulic oils from PANOLIN since 1998.» According to Prince Felix zu Hohenlohe, around 90 per cent of shipped HSM vehicles, which today equates to more than 1,000 HSM machines, work with biodegradable hydraulic oils from PANOLIN. «We have gathered a wealth of positive experience over the years.» Performance and reliability are mainstays of successful forestry machine development, explainsENZler. They ensure that the invested machine capital can generate a high output with minimum downtimes. Unproductive times for repair and maintenance need to be kept as low as possible. «We bank on PANOLIN to make sure that happens,» saysENZler and points to a machine on the courtyard with a large PANOLIN sticker on the driver's cab.

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PANOLIN HLP SYNTH 32



Energias de Portugal SA: the 12 billion Euro corporation has a focus on hydropower and supplies energy to 10 million customers.

«We rigorously protect this natural treasure»

The world has an appetite for energy. Demand is expected to double by the year 2050. Developing new, ecologically compatible energy sources is a necessity. It is the reason behind the growth in the global market for pumped storage power stations. More than 100 new installations with an output of 74 gigawatts will be built by 2020 at a cost of around 56 billion euro. The main reason behind the boom is the increasing proportion of electric energy produced using renewable energy. Pumped storage power stations are constructed as intermediate storage facilities for electric energy. Energias de Portugal SA, or EDP for short, is a leading Portuguese corporation headquartered in Lisbon and one of Europe's largest suppliers of energy. EDP plays a leading role in the production and supply of energy around the world and intends to expand further still. Today, EDP is active in 14 countries with 9.8 million electricity customers and 1.3 million gas customers; it employs close to 12,000 people worldwide and generates a turnover of around 16 billion euro. As per the end of 2016, EDP had a capacity of 26 GW at its disposal and produced 60.2 TWh of energy, 70% of which came from renewable sources.

The corporation also produces electric power in Spain, the USA, Mexico, Canada, Brazil, France, Belgium, Italy, Poland and Romania and is currently developing offshore wind projects in Great Britain and France. Additionally, EDP operates photovoltaic installations in Portugal, Romania and the USA. Over recent years, EDP has implemented the largest hydro power plant in the EU, installing 2.2GW in Portugal, and Baixo Sabor is one of these gigantic new

hydropower stations. It is situated in northern Portugal on the lower course of the River Sabor, a tributary of the River Douro. 400,000 m³ of concrete were poured into the construction of the two barrages that were completed in 2016 with an upriver reservoir of 1100 hm³.

EDP not only produces environmentally friendly energy, it also pursues a clear philosophy when it comes to production. Its directives, known internally as SIGAS (Integrated System of Management of Environment and Safety), are applicable to every project. One aspect is ascertaining which operating areas are compatible with biodegradable products. The new plant in the Douro Valley was equipped with pump turbines, generator motors and control technology provided by the Austrian Andritz Hydro corporation that recommended the use of biodegradable hydraulic oil PANOLIN HLP SYNTH 32 in the new plant, explains EDP. «Numerous references came with the biodegradable product and its technical and safety-relevant specifications fulfill all our requirements. Hence the acceptance of the recommendation from Andritz.» The huge installation (Feiticeiro/ downstream and Baixo Sabor/upstream) was connected to the grid in two stages in April 2015 and February 2016. There have been no problems so far. When we asked about the importance of environmental protection to the company, EDP gave a clear response: «We have been producing the EDP Sustainability Report for many years. But there is an easier way of finding out. Visit the Douro Valley, enjoy the food, our Douro wines and Port and you will soon realize why we take such care of our environment. It is a natural treasure that we rigorously protect.»

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PANOLIN HLP SYNTH 32



RDE 90235: PANOLIN confirms outstanding position in the biodegradable hydraulic oils segment.



RDE 90235: PANOLIN proves worldwide outstanding position

Yet again, we have proven that our biodegradable products such as PANOLIN HLP SYNTH 32 also meet the highest industry requirements,» says Patrick Lämmle, Chairman of the Board of Directors of PANOLIN International Inc. «The Bosch Rexroth test results were excellent, the rigorous requirements of the RDE 90235 were met without a doubt,» comments Lämmle. «PANOLIN HLP SYNTH is the first rapidly biodegradable hydraulic oil to obtain the Fluid Rating (ISO 15380 in combination with RFT-APU-CL test),» explains Lämmle. «HLP SYNTH 32 has proven its worldwide prominent position amongst eco-friendly hydraulic oils.» HLP SYNTH was the first hydraulic oil to receive the 'Blue Angel' environmental award 20 years ago and has been approved by numerous manufacturers. «Its inclusion in the Bosch Rexroth list means that HLP SYNTH now also bears the label of what is currently the most rigorous OEM test on the market.» Recent years have seen a sharp increase in the requirements to be met by hydraulic oils. Growing power density – the result of higher working pressures, motor speeds, oil circulation cycles and temperatures – has driven the development of hydraulic systems forward, imposing more demanding requirements on the hydraulic liquids used in these systems. These liquids have a decisive impact on the friction characteristics of the hydraulic components, amongst other things.

The ongoing technical development of high-performance hydraulic systems and suitability of new hydraulic media and additives are only partially reflected in the tests used to date. Whereas in the 1970s, specific power density was approx. 4 to 5 KW/kg pump weight, that figure, at over 8 KW/kg, had almost doubled by 2010. Today's hydraulic fluids must be carefully engineered to cope with these developments, i.e. smaller pump units with a higher output and a range of other efficiency-improving modifications to

the hydraulic system. «Mineral oils in the DIN 51524 T.3 category and eco-friendly lubricants in the ISO 15380 category naturally have to pass a pump test to meet the requirements of these standards, but those tests are a minimum requirement only,» explains Lämmle. Indeed, more than one hydraulic fluid fails in new-generation hydraulic systems because it no longer meets the requirements (increased pressure, shorter circulation times, smaller reservoirs and shorter rest times), comments Lämmle. Which is why, in recent years, Bosch Rexroth has come up with a neutral evaluation procedure designed to realistically reflect current requirements.

Hydraulic fluids that successfully complete this procedure are featured in the Bosch Rexroth Fluid Rating List. This new, scientifically standardized evaluation procedure is designed to test the fluid characteristics and interaction with key components, i.e. pump and engine, in realistic operating conditions. Amongst other things, the test includes verification of the liquid technical ratings for accuracy and standard conformity. An application-oriented pump and engine test, plus a specific seal test, put the liquids through their paces in demanding conditions and varying cycles over several hundred operating hours, at both high temperatures and low viscosity. Conventional tests were previously conducted at 350 bar, the new test imposes up to 500 bar. Hence, the quality of the hydraulic oil has an ever more important impact on the service life and dependability of hydraulic systems. «This proves that we continue to set the industry standard in the field of rapidly biodegradable hydraulic oils. Users of HLP SYNTH have the peace of mind of knowing that these oils reduce the maintenance and downtime costs of their machinery and plant whilst increasing operating reliability, thereby delivering a significant reduction in total operating costs,» explains Lämmle.

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**Ducati Zurich:** where the heart of the red legend from Borgo Panigale beats.

# «We have found the ideal partner in PANOLIN»

**T**he motorcycling season 2017 will already have started by the time you read these lines. The motorcycle segment has a turnover of 1.1 billion Swiss francs and employs a workforce of 6,500 in little Switzerland alone. The industry achieves half of its turnover with the sale of new motorcycles, scooters and used bikes. Service, spare parts, tires, accessories and clothing account for the other half. Ducati (established in 1926) is to the world of motorcycling what Ferrari is to the world of cars: a legend. Ramsy Hayek does not disagree as we stand next to his Ducati Multistrada Enduro, which he regularly rides on the roads of Europe. Hayek is managing director of Switzerland's largest Ducati dealership, Ducati Zurich in Dietlikon. All the models that get not only motorbike fans excited are on display in the generous showroom: Superbike Panigale, Diavel and XDiavel, Superleggera and Supersport, Multistrada, Hypermotard, various Monsters and naturally all the Scrambler models.

«Our shop represents every bit of the philosophy and passion behind the famous brand. Fortunately, Ducati has extended its model range over recent years and now offers less expensive models such as the Scramblers,» explains Hayek in the dedicated Scrambler sales room. «The strategy of the Italian motorcycle manufacturer is paying off. We have cultivated new market segments,» says Hayek. The showroom contains the entire Ducati model range as well as special editions for trying out for size and taking for a test run. «We offer everything from the world of Ducati,» says Hayek with a smile. Ducati Zurich also has the largest range of original Ducati clothing and merchan-

dising in Switzerland. In addition to stylish components, the Zurich team headed by Hayek sets great store by technical advice. Ducati Zurich probably has the most modern and competent workshop for Ducati models in Switzerland. «Not only do we use original Ducati-certified tools and test equipment, our workshop team routinely participates in training programs at the Ducati parent plant in Bologna. It is the only way we can meet the strict demands placed on service and repair.»

Where do Ducati Zurich and PANOLIN work together? The answer is simple: «We carried out a comparison test with our experts at the workshop, testing only lubricants that meet our high requirements. PANOLIN products were the obvious choice,» explains Hayek. In contrast to cars, the oil circuit in a motorcycle also runs through the gearbox and the oil bath clutch. «The demands on the material are immense. Engine oil has to lubricate metal surfaces moving on one another, reduce friction and prevent premature mechanical wear and tear,» explains Hayek. The right viscosity and a continuous lubricating film of engine oil must always be guaranteed. Engine oil should not age much, produce no foam and protect from corrosion, he adds. «We achieved very good results with the 4-stroke multi-purpose oil PANOLIN SYNTH 15W-50.» Customers with more sports-oriented ambitions get PANOLIN RACE 10W-50 in their machines. «We have found the ideal partner for the lubricant segment in PANOLIN.»

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Web pages: www.ducatzh.ch, www.swiss-ducatiday.ch



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