

NO. 96/47 | JULY 2012 | [www.motorex.com](http://www.motorex.com)

# MAGAZINE



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### Tornos MultiSwiss 6x14

More innovation thanks to ORTHO NF-X.



# HIS LONG-TERM TUNING SOLUTION? WORKING WITH PARTNERS HE CAN ALWAYS COUNT ON.

MATTEO & GREENER

Sébastien Buemi, Formula 1 racing driver



## WHY DO YOU THINK HE SWEARS BY US?

Sébastien Buemi has achieved goals that others can only dream of. His career started early in life and really took off when he won the European Karting Championship. In record time he became a contender in the BMW junior racing formula, and soon afterwards in the Formula 3 Euro Series and GP2 Series. His success quickly landed him on the Formula 1 track, the ultimate of racing contests, and today he is part of the world champion team. MOTOREX has stood behind this young talent since the start, and will continue to support him in future. Find out more about how long-term partnerships with MOTOREX can help you get where you want to go in a broad range of areas: [www.motorex.com](http://www.motorex.com)



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## IT'S ALL ABOUT WHAT YOU CAN DO

Dear readers

"Big is beautiful!" – At least, that's what the advertising industry would have us believe. More, bigger, stronger, etc. is always better. But experience teaches us just the opposite. Bigger often means carrying dead weight around, and ultimately being unable to act, but only to react. MOTOREX is in the fortunate position of being able to shape its own future. This is true both of the markets where we operate and of the products that we develop and market.

In the last issue of MOTOREX Magazine we had the pleasure of introducing the newly established MOTOREX NORDIC AB in Sweden. Like Switzerland, Sweden is a diversified country with high quality expectations. This requires specialized staff capable of accommodating customer demands. MOTOREX's "Swiss model" of focusing on the specialist field of lubricant technology by offering tailored product lines such as the FARMER LINE, CONSTRUCTION LINE, etc. is a perfect fit for the Swedish market.

In this issue we present our impressions from our first appearance at the MaskinExpo trade show in Stockholm. The size of our investment in laboratory equipment shows that customer demands are always the focus of attention at MOTOREX. In our Inside section we present an innovative solution in the form of our X-ray fluorescence device. Our article about the pioneer of alpine mechanization, Thomas Schilter, is sure to evoke fond memories among his large community of fans throughout Europe.

I wish you pleasant reading!

Robert Konvalina, General Manager  
MOTOREX NORDIC AB

# MOTOREX IN THE NEWS

## MOTOREX DRIVER OF 2012

He loves computer and console games and can be a bit of a show-off behind the wheel of a virtual car. Grenchen garage owner Roger Hegelbach and his best friend regularly hone their speed and reaction times. The practice paid off for the owner of Mitsubishi dealer City Garage at the most recent Geneva Motor Show: His top lap time of 01:29:79 on the MOTOREX racing simulator earned him the first prize in the promo game competition, a weekend with his family at the Europapark theme park. Congratulations, and have fun at Europapark!



(Left to right:) Stefan Sury (MOTOREX Automotive Head of Sales) presents the prize to Roger Hegelbach (owner, City Garage) together with Martin Brechbühl (MOTOREX Area Manager).



Photo: Fotolia/I. Bartussek

## GREASE 5100 FOR COOL APPLICATIONS

The new GREASE 5100, which is suitable for extremely low temperatures down to  $-50^{\circ}\text{C}$ , is a special petroleum-based calcium grease. Its sophisticated composition prevents thickening even in extreme cold, reducing starting resistance in electric motors and similar devices. It also features high shear stability, water resistance and adhesive properties and gives effective protection against corrosion. These properties make it ideal for applications such as rail switching motors, garage doors and awnings.



## LONDON-SYDNEY CHARITY RIDE

Seen from Europe, Darren Higginson and his four friends are riding straight to the opposite side of the world, to Australia. To Sydney via China, to be precise. The adventurous British bikers plan to put some 22,000 kilometers behind them on "light" factory KTM 690 R Enduros. They set out from London on their tour in aid of the fight against can-

cer on July 1. Darren and David, both passionate videographers, are shooting exciting video clips along the way. Once the adventurers return, they'll upload them to Youtube® for everyone to see. MOTOREX is supporting the team as technical partner. For continually updated information and impressions, see "Continental Drift" on Facebook®.





## MOTOREX PIT STOP IN LIGNIÈRES

MOTOREX has long been part of the action in Lignières. The company placed its first advertising hoardings along the legendary racetrack in Canton Neuchâtel thirty years ago. Following the purchase and comprehensive renovation of the facility by the TCS, its subsidiary Test & Training TCS now operates a popular program of safety and sport training for all vehicle categories. The track above the Bielersee/Lac de Bienne also regularly hosts vehicle tests, new model presentations and importer events. MOTOREX has expanded its presence as technical partner to Test & Training and set up a multifunctional "pit stop" in the main building. See you soon in Lignières! [www.test-und-trainingtcs.ch](http://www.test-und-trainingtcs.ch)

## NEW MOTOREX IMAGE MOVIE

At MOTOREX, our customers and their technical applications are always at the center of our attention. In our new company video, our customers finally get the chance to provide a very interesting look into the exciting world of MOTOREX lubricant technology. Along with plenty of the latest facts about the nearly century-old Swiss family company, the main role is played by people and the benefits they enjoy from over 7,500 MOTOREX products. The video is available on the MOTOREX website and on Youtube® and Facebook®. We look forward to hearing what you think! [www.facebook.com/motorexoil](http://www.facebook.com/motorexoil)



## RUST OFF: SAY GOODBYE TO FLASH RUST

Fixed truck and railroad car super-structures are especially vulnerable to flash rust, burnt-in brake dust, soot and oily contamination. With MOTOREX RUST OFF, these stubborn spots come off in a flash. A special anti-corrosion additive provides long-lasting protection for metal surfaces while keeping the cleaner from drying too quickly. Depending on the application, RUST OFF concentrate should be diluted with water at a ratio of 1:1 to 1:5. RUST OFF is free of VOCs and rapidly biodegradable. The MOTOREX patent recipe for clean road and rail containers!



## IVM ELECTS RONALD KABELLA

The German Motorcycle Industry Association (IVM e.V.) represents manufacturers and importers of motorcycles and scooters, motorcycle accessories and gear. The IVM's 52 member companies make up over 95 percent of the German motorcycle market. The IVM's latest general assembly was held at Touratech in Niedereschach, where it elected Ronald Kabella, MOTOREX's Head of Power Sports, to its four-member board to represent its sustaining members. Kabella, himself a passionate motorcyclist, has been intimately involved with the ins and outs of the industry for over 20 years. He was nominated by his predecessor in office, Ullrich Holzhausen. [www.ivm-ev.de](http://www.ivm-ev.de)





MOTOREX celebrated its first Swedish trade show appearance at MaskinExpo in fine weather at the end of May with a striking display area and many attractions.

# HJÄRTLIGT VÄLKOMNA TILL MASKINEXPO!

*Welcome to MaskinExpo! Scandinavia's largest trade show for construction and forestry equipment took place in Stockholm from May 24 to 26 on a site covering more than 36 square kilometers. A perfect occasion for presenting the recently founded MOTOREX NORDIC AB to the show's 27,000 visitors.*

Exhibiting at a trade show is an excellent way to rub elbows with the public. It's a perfect opportunity to talk face-to-face to specialists from different industries and find out more about their current concerns and interests. With a prominent dome marquee and other highlights on 100 square meters of exhibit space, MOTOREX NORDIC AB was a highly visible presence at the show in Stockholm.

## HANDS-ON ACTION

STOXA – Stockholm Outdoor Exhibition Area – lies only ten minutes from Stockholm's Arlanda Airport. This year's MaskinExpo attracted 545 exhibitors. The 36

square kilometer, park-like exhibition area is not only impressive in its dimensions, its unique and diverse landscaping is also fascinating. Four lakes, woods and gentle hills framed the exhibition of the latest machines and equipment. The venue even afforded opportunities to use the machinery in practice – visitors got the chance to do a little excavating, gravel shifting, lumber sawing and much more. What better way to get a feel for a piece of equipment than to try it out yourself?

## THE HUSABERG GP MACHINE

The entire MOTOREX NORDIC team was at the booth for the three days of the exhibition. Edi Fischer (BUCHER





Much admired: this World Championship racing bike built by MOTOREX partner HUSABERG is ridden by Joakim Ljunggrens.



A Swiss delegation lent support to the highly motivated MOTOREX NORDIC AB team. Right to left: Edi Fischer (CEO, BUCHER MOTOREX group), Leif Reimelid (Sales Director), Thomas Grymark (Marketing/Customer Service) and Robert Konvalina (General Manager).



Visitors had an opportunity to try out various pieces of construction equipment on the spot. MOTOREX presented the perfect solution for construction and forestry equipment at the exhibition in the form of its rapidly biodegradable OEKOSYNT HEES hydraulic fluid.



MASKINEXPO

MOTOREX group), Robert Konvalina (MOTOREX NORDIC AB General Manager) and Pierre Fontannaz (Event Manager) also came from Switzerland to lend their support. An extremely diverse assortment of over 7,500 lubricant products left no visitor with any doubts that MOTOREX does its job with the utmost professionalism and is a valuable partner to the construction industry in Sweden.

A further highlight for visitors to admire was Swedish world champion Joakim Ljunggrens' Husaberg Enduro motorcycle. MOTOREX also held a drawing for VIP tickets with overnight accommo-

dation for the Swedish Enduro world championship race in Karlsborg on August 25 and 26 (see preview on page 21).

#### KNOW-HOW FROM THE LUBRICATION PRO

MOTOREX has long had a presence on the Swedish market through distributors. Having our own branch and logistics center now allows us to serve additional new customer segments. The MOTOREX NORDIC AB team will successively develop and expand the market. The strong response at MaskinExpo shows that Swedish building contractors are happy to be able to use MOTOREX products, services and expertise. ●

Photo: Komatsu/Kuhn Schweiz AG



# INNER VALUES PAY OFF

*Inner values are especially important when it comes to lubricants. What at first seems to be the cheapest hydraulic fluid often turns out to be the costliest once quality is considered. MOTOREX COREX HV multigrade hydraulic oils combine a large number of advantages that definitely pay off.*



This brass sliding block, one of several in a multi-piston pump, has sustained damage due to excess water in the hydraulic fluid (cavitation due to insufficient additives).

No other mechanical system bears such extreme loads as a hydraulic system. Moreover, the trend in modern systems is for ever smaller hydraulic components to sustain vastly increased system pressure, requiring top performance at all times. Operators with a long-term mindset use top-quality multigrade hydraulic fluids from the MOTOREX COREX HV line in their hydraulic systems.

## IT'S ALL ABOUT THE ADDITIVES

When it comes to composition and quantity of additives, many hydraulic fluids have the minimum needed to meet the manufacturer's specifications – and it shows in their seemingly low price. Operators who prefer a modern way of working – conserving fuel and resources and minimizing equipment wear – use a COREX HV (high-viscosity) hydraulic oil with multigrade characteristics. COREX HV is

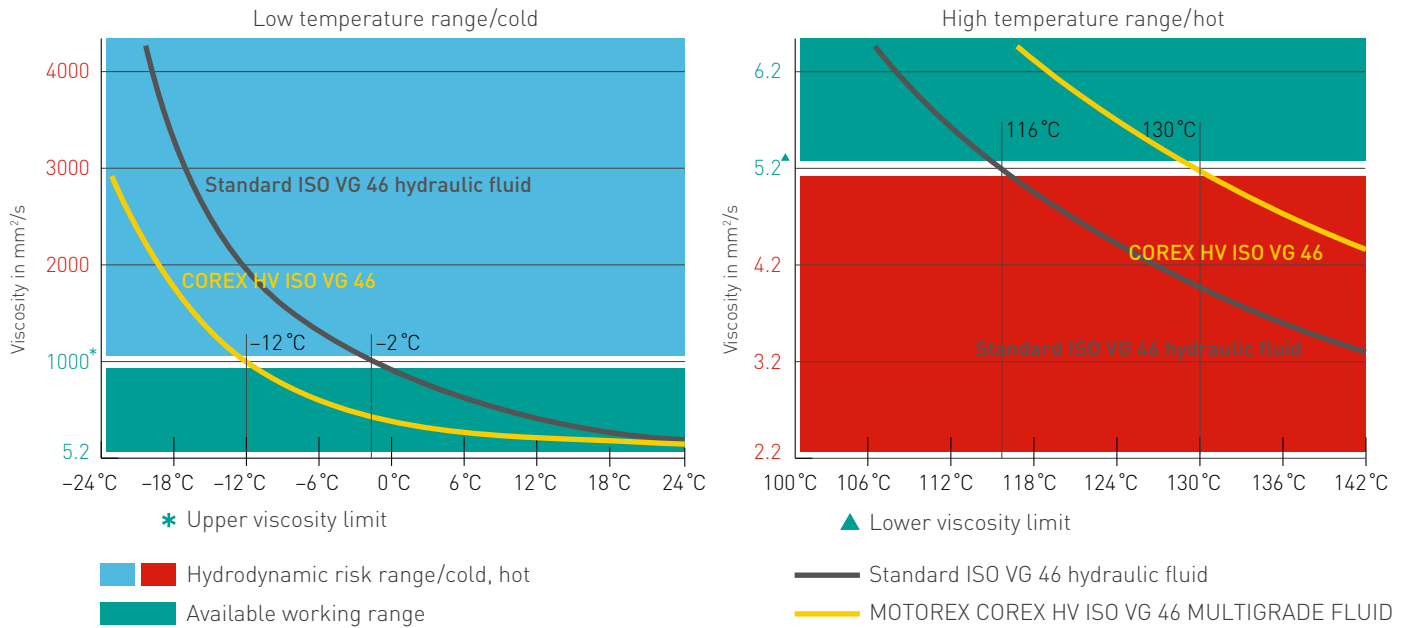
built on a solid foundation of selected paraffin-based base oils and a high-performance bundle of additives. Viscosity index (VI) enhancers with extreme shear stability ensure a high viscosity index (see chart on page 9) and hence a flat viscosity-temperature curve. This measurably reduces penetration time, which in turn lowers wear and fuel consumption. The multigrade characteristic, along with the all-important protection against wear at high temperatures, keeps working even during long, heavy-duty service (stay-in-grade performance). Moreover, COREX HV fluids provide solid protection against oxidation and are compatible with all non-ferrous metals.

## HYDRAULIC BREAKDOWNS ARE COSTLY

Hydraulic components on work machinery and hydrostatic drives are everywhere these days. This makes



## COMPARISON OF VISCOSITY CHARACTERISTICS



The chart shows a comparison between a monograde standard hydraulic fluid (gray) and a multigrade COREX HV ISO VG 46 fluid (yellow). It clearly shows that MOTOREX COREX HV ISO VG 46 enters the specified viscosity range earlier in cold temperatures (at -12°C) and remains in it for longer in hot temperatures (+14°C).

hydraulic breakdowns due to excessive wear or extreme temperatures all the more aggravating. Single-grade hydraulic oils, which are difficult to pump at below-zero temperatures, not only cause burst hoses but can also damage costly hydraulic components such as pumps, valves, etc. During heavy use, single-grade hydraulic fluids heat up disproportionately. The oil becomes too thin and performance declines as wear grows more severe. The cost of damage from wear or of breakdowns soon adds up. Thus from a pure bookkeeping perspective, switching to a multigrade hydraulic fluid with adequate additives is entirely profitable.

### OPTIMIZED EFFECTIVENESS

COREX HV's exceptionally stable molecular structure and high shear stability also have a positive impact on pump efficiency. Thanks to its flat viscosity-temperature curve, pumps always operate in the optimum range. Special high-tech additives are designed to fine-tune the hydraulic fluid's properties, creating a perfect seal in the pump. This reduces pump leakage and enhances the efficiency of the entire hydraulic system. The benefits are especially clear with hydro-

static drives such as those used in municipal equipment when starting under a load. Axial piston pumps in these drive systems work with especially high pressures of up to 400 bar!

### FRUGALITY DONE RIGHT

Operators who use a COREX HV hydraulic fluid in place of a standard single-grade oil are not only being thrifty where it counts, but also protecting the environment by

- reducing fuel consumption
- reducing emissions
- reducing wear
- reducing downtime due to breakdowns
- reducing performance losses in the system

A very interesting, if challenging, topic (see also p. 17). The specialists from Technical Customer Service and your MOTOREX partner will be happy to provide qualified answers for all your needs. ●

Extreme temperatures and pressures really put hydraulic pumps to the test.



Photo: Bosch-Rexroth



SCHWEIZERISCHE EIDGENOSSENSCHAFT  
EIDGENÖSSISCHES AMT FÜR GEISTIGES EIGENTUM

Gesuch eingereicht:

31. Oktober 1959

Patent eingetragen:

Patentschrift veröffentlicht: 15. Dezember 1959

## HAUPTPATENT

Gebrüder Schilter, Stans (Nidwalden)  
Selbstfahrendes Lastfahrzeug

Thomas Schilter, Stans (Nidwalden), ist als Erfindung anerkannt worden

Photos: public domain/M. Gemperte/H. Wyss



Off the road, the Schilter TR 1500, like many of its brethren from the Stans manufacturing plant, was a true jack-of-all-trades. Its versatility won the hearts of Switzerland's alpine farmers.

# SCHILTER'S CLEVER MOUNTAINEERS

*Over 110 employees, full order books, innovative engineering and annual output of 1,000 vehicles – a few facts and figures from the heyday of Schilter Maschinenfabrik & Co. in the late 1960s. Even today these legendary vehicles are treasured workhorses of mountain agriculture. Some 6,500 Schilters are still believed to exist, witnesses to the revolutionary mechanization of the mountains driven forward by the manufacturer from central Switzerland.*



Thomas Schilter (1930–1999)

There is no question that the genetic makeup of father Alois Schilter (1885–1956) included a healthy measure of mechanical and engineering talent. He was trained in the then-newfangled trade of electrician just as electrification was getting started, an occupation that later brought him to central Switzerland together with

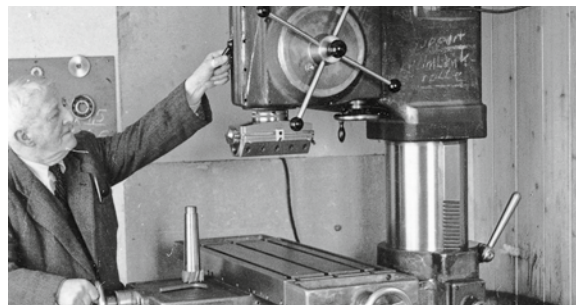
his wife. A gifted tinkerer, he patented a refrigerator and warming cupboard as early as 1928. His large family – he had three daughters and six sons – faced a hard struggle during the Great Depression between World Wars I and II. In the late 1940s the family settled in Stans with the help of son Josef.







Alpine farmers were quick to adopt the Schilter Junior into their families. It was thrifty, handled challenging terrain with aplomb and was child's play to operate.



Father Alois Schilter was responsible for the electrical outfitting of Schilter machine tools.



Shortly after the original Schilter was patented, Thomas Schilter was already testing an all-wheel-drive version in the spring of 1959.

### THOMAS SCHILTER, VISIONARY

Born in 1930, Thomas was the family's second-youngest child. He took a keen interest in his father's activities in his small home workshop and could often be found there. It was he who one day brought an old one-cylinder engine home from school. Unfortunately, when he tried to start the engine on the parlor floor, it ignited with a bang and broke in two, spilling motor oil across the floor to the great (dis-)pleasure of his mother Lydia. Young Thomas's technical observations and bold assertions puzzled his teachers more than once.

Following his apprenticeship as a machinist and basic military training, he founded the Schilter Brothers Mechanical Workshop in Stans with brother Josef (1916–1998) in 1952. Along with father Alois, the youngest brother Karl Schilter (1933–2005) became the fourth family member to join the business two years later. In addition to various repair services, Thomas oversaw production of the great BF 50 boring mill.

Initially intended for in-house use, it was soon available to order, and a coordinate-guided version was even developed. The company was gaining momentum.

### IDEAS FALL ON FERTILE GROUND

Thomas Schilter was always drawn to vehicles. The predominance of agriculture in the local area prompted the 28-year-old to propose an idea for a self-propelled transporter vehicle for mountain agriculture to his brothers.

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*"In 20 years the Americans will be driving a car around on the moon." T. Schilter, 1944*

---

A rear-wheel drive prototype was built and successfully tested. It was an uncomplicated, easily repaired vehicle with low maintenance requirements. With its nine-horsepower, one-cylinder gasoline engine, young Schilter sought to replace the single-axle motor mowers with drive-axle trailers that were in widespread use at







The Schilter LT 2 forage wagon picks up clippings before they reach the front axle. This is a huge benefit in terms of feed cleanliness.



Schilter introduced the first UT ("universal tractor") with all-wheel drive at the DLG trade show in 1972. The design concept is still in use today.



Only three of the large Schilter Safety Tractor, ST 11000 A, were ever built. It boasted 110 horsepower and could be purchased from a starting price of CHF 68,800 in 1975.



the time. The Schilter brothers' invention was awarded patent no. 342094 in Berne in February 1959. Just a few months later Thomas Schilter was testing another vehicle, the first four-wheel drive tractor for hauling. It featured a specially developed steering drive axle, likewise patented. The key elements in the transporter's success included four equal-sized wheels and an ideal weight distribution. It was later dubbed the Schilter LT 1 in series production.

#### MORE SPACE, STAFF AND MODELS

The development of the original Schilter also marked a new stage in Thomas Schilter's business career. In the fall of 1959, ground was broken for a new factory and residential quarters on Stansstadterstrasse. Thomas (CEO) and his brothers Karl (sales) and Josef Schilter

300 vehicles. But production was just getting started. In response to constant pressure for new product development, the range of models broadened steadily while the factory grew with the addition of the South Hall (1964), the new Plant 1 (1969) and Plant 2 (1971) in Galgenried.

#### WITH THE JUNIOR'S HELP AND MORE

Thomas Schilter had a good sense of the real needs of alpine farmers, and his inventions opened the way to mechanization in the mountains. The Schilter LT1, the Junior, the TR 1000, TR 1500, TR 2000 and the TR 3000 all contributed significantly to making the farmers' arduous labors easier. In 1967 the company also began to build forestry equipment and agricultural implements. The versatile Schilter was simply an ideal basis for nearly any application.

### *Constant improvement and innovation made Schilter what it was*

(workshop/production) were literally overwhelmed with inquiries and orders. Against their will they were forced to outsource many tasks. A carefully planned dealer network was built throughout Switzerland and initial contacts established in neighboring countries. By 1964 the company had 43 workers and was building

#### THE UNIVERSAL TRACTOR

The quest for perfection through constant engineering innovation culminated in 1972 with the company's new flagship product, the UT 7200. UT stood for "universal tractor" – a tractor with four-wheel drive and steering, able to handle steep slopes and drive tools simultaneously at front and rear with power take-off shafts. For example, it could power a mower in front while towing a forage wagon behind. It drew an enthusiastic response at various trade shows, and the UT series helped







A large community of fans has grown around the Schilter brand.  
Photo from the 4<sup>th</sup> Schilter gathering in 2003, Küssnacht am Rigi.

Many Schilter owners still use their vehicles every day. Ueli Bühler, manager of the spare parts warehouse at Ducrey AG, still has a stock of most parts!

Schilter build on its earlier successes and export vehicles as far afield as Scandinavia.

### DARK CLOUDS MASS OVER SCHILTER

With the company's explosive growth, products began to enter series production too soon. The first oil crisis (1973–1974) struck just as the resulting quality problems were making themselves felt. At the same time the entire agricultural sector was being shaken up. The result was a collapse in the market. With the company highly leveraged, the bank took charge. Nidwaldner Kantonalbank took full control of Schilter effective May 1, 1975. It was the start of difficult times for the company founder and his brothers Josef and Karl. The low-cost Schilter ST ("safety tractor") was presented at the Olma trade fair in 1975 in a bid to save the company, but even it was unable to turn the situation around. In January 1976, Thomas Schilter left the company to go his own way.

### SCHILTER – STILL A WORK OF GENIUS TODAY

Producing agricultural vehicles profitably is truly a great challenge. But Thomas Schilter's brilliant ideas have survived to the present day. Not only did Thomas Schilter continue to build vehicles with his own small team, various engineers also worked eagerly to build on the mountain pioneer's ideas. Starting in 1992, the new "Schiltrac" vehicles officially entered production at the

Barmettler company in Buochs, where they underwent extensive ongoing development. The Schiltrac 92 F, likely the best, most technologically sophisticated successor to the Schilter, is still available for purchase today!

In addition to the 6,500 or so vehicles extant in Switzerland, a growing community of fans and an increasing number of restored vintage Schilters at home and abroad are indicative of the enthusiasm that still exists for the Schilter brand. There has been a Swiss Schilter Club since 1997, and Ducrey AG in Küssnacht am Rigi is an experienced Schilter specialist with a large stock of spare parts and extensive expertise. The achievements of Thomas Schilter and his family live on, as well they should. •

Further interesting information can be found (mainly in German) at the following links:

- **A book about Thomas Schilter**  
[www.fm-modellbau.ch](http://www.fm-modellbau.ch)
- **Schilter Club Switzerland**  
[www.schilterclub.ch](http://www.schilterclub.ch)
- **Parts & repairs**  
[www.schilterersatzteile.ch](http://www.schilterersatzteile.ch)
- **Schiltrac vehicle manufacturing**  
[www.schiltrac.ch](http://www.schiltrac.ch)
- **Schilter/Motrac exhibition**  
[www.verkehrshaus.ch](http://www.verkehrshaus.ch)



[verkehrshaus.ch](http://verkehrshaus.ch)

July 28 through August 5 at the  
Swiss Museum of Transport, Lucerne



Photo: Schiltrac, Buochs



Just one example of sophisticated forestry equipment requiring perfect maintenance: a state-of-the-art Gremon 1350 VT forwarder during servicing.

## READY FOR THE FOREST?

*Although timber is now harvested year-round, forestry equipment is still often serviced in spring and summer. As Werner Stoll, a specialist in agricultural machinery from Wilchingen, knows well, “a machine can only operate reliably and efficiently if it’s properly maintained and regularly lubricated.” We peer over his shoulder in the shop.*

Finding the right moment to perform maintenance on forestry equipment is no easy matter. Many customers are thankful if the equipment dealer takes the initiative of reminding them why maintenance work should be carried out before the high season. It goes without saying that flexibility and especially knowledge of specific machines (application, age, special equipment, etc.) are in high demand.

### MAINTENANCE BY THE BOOK

For complex machines such as harvesters, forwarders and skidders, several days should often

be allowed for major maintenance. Generally two mechanics work on the machine at the same time. Sometimes the operator helps too, since knowing how to work on the machine can be very useful for fixing breakdowns, making adjustments, etc. Werner Stoll and his team use MOTOREX FARMER LINE products for maintenance on all machines. They appreciate having a single supplier for all lubricants and care products. This saves time and guarantees compatibility among the products they use. “That way I know there’ll be no arguments,” says Stoll, who among other things oversees examinations



for graduating apprentice agricultural equipment mechanics.

### A COMPELLING SOLUTION: OEKOSYNT HEES

Rapidly biodegradable OEKOSYNT HEES hydraulic fluid is perfect for heavy-duty forestry equipment. Stoll has been around since the development of the first biological hydraulic fluids in the late 1980s until today and is a true believer in the benefits of OEKOSYNT HEES. An oil sample is sent to the MOTOREX lab for analysis every time a piece of equipment undergoes major maintenance. Sample analysis is part of MOTOREX's service package and is also available in export markets such as Austria and Sweden. The forwarder in the photo has filters in its hydraulic fluid circuit that are capable of eliminating the finest particles of down to five microns (0.005 mm) in size. "With hydraulic fluid, we rely completely on the MOTOREX lab analysis. By changing the fluid at the right time, we not only help the business owner save money but also protect the environment," says Stoll with a touch of pride. In the machine in the photo, the fluid in the loading crane was drained to change the hoses. The remainder, a good 140 liters, can go back to work thanks to a positive lab finding and regular filter changes after every 5,000 hours of operation!

### MAKING MAINTENANCE VISIBLE

After a machine undergoes maintenance, the customer should be able to see immediately that it has been serviced. A thorough cleaning also makes it easier to identify hidden damage. Once the machine's exterior has been washed and dried, barium-free ROSTSCHUTZOEL GRÜN 186 is ideal for corrosion-proofing. It not only makes the equipment shine, but also protects it for months against oxidation. Careful cleaning and care of the operator's cab is especially important. Squeaking door and hood hinges are no way to greet the customer. Proven care and cleaning products, many available in practical spray form, make it easy to freshen up any material in a jiffy. Cosmetic detailing following maintenance or on used machines and vehicles puts your professionalism right before your customers' eyes.

Do you have any questions? Feel free to contact your MOTOREX partner or the Technical Customer Service. Our experts have a great deal of experience and have been working with agricultural machinery dealers and importers for years. ●



Visibly enthusiastic: Werner Stoll uses MOTOREX laboratory services and turns them deftly to competitive advantage.



The operator's duty: regular lubrication. Here GREASE 190 is being applied to the joint of a loading crane grab.



It's often the details that create a good impression after maintenance or on a piece of used equipment.



Cleaning the backup camera: a little windshield washer fluid and a few minutes' work are enough to ensure a clear rear view.



Now that it has been serviced, this gleaming forwarder also looks well maintained.

The X-ray fluorescence device is used to detect wavelengths corresponding to specific elements and quickly and precisely identify elemental contents and trace elements such as wear particles.



## ELEMENTAL ANALYSIS USING X-RAY FLUORESCENCE

*MOTOREX's high quality standards are not limited to its products. They also extend to its many services. Along with our Technical Customer Service department, our lab services are a key part of the value we provide for our customers. Our new X-ray fluorescence device offers even more precision and speed.*

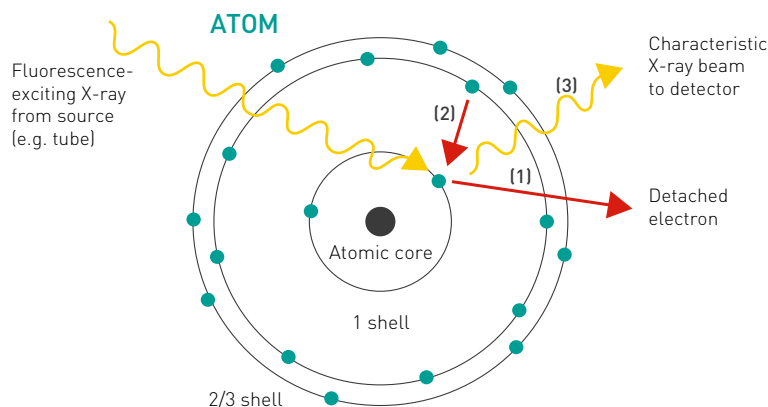
The MOTOREX laboratories in Langenthal are capable of carrying out some 120 different types of analysis. The specialists who work there perform an average of 20,000 precise, information-rich analyses per year using state-of-the-art equipment.

### HOW THE XFA METHOD WORKS

X-ray fluorescence analysis (XFA) is a technique used in materials testing. It is one of the commonest methods of qualitatively and quantitatively analyzing sample

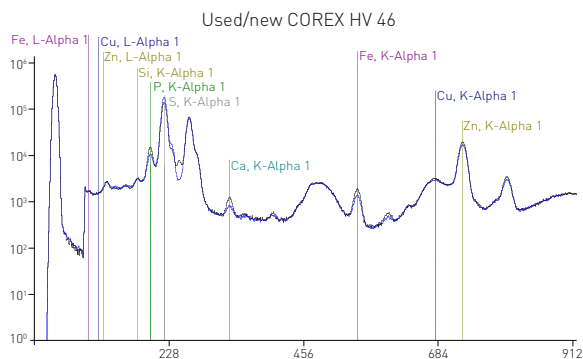
composition. Its range of application is extremely broad, comprising lubricants, additives, metals, glass, ceramics, etc. The sample is not destroyed during measurement. The method is capable of detecting traces as small as one microgram. Proper device calibration is crucial.

To perform an analysis, four grams of a medium (e.g. hydraulic fluid) is placed in a plastic sampler and positioned in the test device. The material sample is then excited by polychromatic X-rays, gamma rays or ion beams, knocking electrons (1) near the atomic nucleus out of their atom's inner shell. This allows electrons (2) from higher energy levels to drop down. The energy this releases is discharged in the form of fluorescent radiation (3) that is specific to a given element. The fluorescent radiation can then be analyzed using a radiation detector. X-ray fluorescence analysis can be used to identify and determine the concentration of many elements. It is especially useful in detecting slight contamination, for example by heavy metals.





## XLABPRO SPECTRUM VIEWER



A comparison of two COREX HV hydraulic fluid samples via X-ray fluorescence analysis provides a wealth of information.

## RAPID ANALYSIS

With the new X-ray fluorescence device, the time needed to perform a comprehensive elemental analysis on the device itself is roughly eight minutes. Besides pure scientific analyses, the instrument's rapid yet precise operation also yields compelling benefits when analyzing samples from customers. The customer receives analytical results that deliver important information for their operations in a very short time.

## A TYPICAL ANALYSIS

The XFA device was used in the MOTOREX lab to test the elements found in multigrade high-performance COREX HV ISO VG 46 hydraulic oil. For hydraulic fluids, the relevant examination methods are combined in a set of tests. The following excerpt represents only a portion of the full set of analyses. A fresh oil sample A (new oil) is compared with a customer sample B (used oil) taken from a wheel loader after about 2000 hours of operation. The analysis spectrum provides the following information:

- Elemental content such as additives and their concentration
- Abraded elements (metals) for analysis of wear and any damage
- Contamination (condensates)
- Blends (other oils)
- Raw material contents for production

## EVALUATION

Z	Symbol	Element	New COREX HV46 (A)	Used COREX HV46 (B)
			Concentration	Concentration
12	Mg	Magnesium	0.00091%	0.0070%
14	Si	Silicon	0.00504%	0.00751%
15	P	Phosphorus	0.03098%	0.05063%
16	S	Sulfur	0.3309%	0.2498%
17	Cl	Chlorine	0.00041%	0.00479%
19	K	Potassium	0.00022%	0.00022%
20	Ca	Calcium	0.00395%	0.00887%
22	Ti	Titanium	0.00051%	0.00051%
26	Fe	Iron	0.00051%	0.00167%
27	Co	Cobalt	0.00004%	0.00030%
29	Cu	Copper	0.00010%	0.00074%
30	Zn	Zinc	0.04037%	0.04598%
42	Mo	Molybdenum	0.00030%	0.00008%
47	Ag	Silver	0.00051%	0.00051%
49	In	Indium	0.00051%	0.00051%
56	Ba	Barium	0.00015%	0.00030%
74	W	Tungsten	0.00020%	0.00020%
82	Pb	Lead	0.00020%	0.00020%
83	Bi	Bismuth	0.00020%	0.00020%
-	-	Total	0.41%	0.38%

Relevant increase  
Relevant decrease

Above is an XFA image showing the new and used COREX HV oil as a graphic chart. In the used COREX HV, we can observe (evaluation) a decline in additive elements, suggesting that it has been blended with low-alloy oil. There is also a spike for iron, arising from wear during use. The overall oil analysis is based on evaluation of the XFA spectra and a number of further test results. The analysis can be used to determine whether the oil can remain in service or needs to be changed.

Yesterday – today – tomorrow: MOTOREX laboratory services are an important part of every MOTOREX product, providing a clear added benefit for customers. •



Rapid and precise elemental analyses of incoming raw materials, finished products and customers' samples save time and enhance productivity.



The tool holder on the Tornos MultiSwiss 6×14 is now pierced to guide machining fluid precisely to the critical spot between the tool cutting edge and the workpiece.

## CUTTING OIL AS ENGINEERING FACTOR FOR GREATER INNOVATION

*Technology company Tornos has launched one innovative product after another, most recently surprising customers with its revolutionary MultiSwiss 6×14. For years now MOTOREX has been involved from the planning stage of new product development, lending its expertise as lubrication specialist. Tornos development engineers are quick to acknowledge that the cutting oil used is an engineering factor in its own right.*

Creative R&D teams are expected to incorporate innovative technologies into new products reliably and economically. With pioneering MOTOREX products, Tornos enjoys the broadest available range of development options in the realm of lubrication technology.

### A PRIME EXAMPLE: TORNOS MULTISWISS 6×14

The new product range skillfully combines single and multi-spindle turning machines. The MultiSwiss, for example, has six sliding headstocks and uses a torque motor for indexing the spindle drums. This makes it fast, capable of reaching cycle times nearly as high as cam-controlled multi-spindle turning machines. The cutting oil performs every lubrication function throughout the machine, including:

- Cooling the machine, tool and workpiece
- Lubrication and pressure regulation between the cutting edge and workpiece
- Hydrodynamic lubrication of the hydrostatic head-stock bearings with ultrafine-filtered (5 µ) cutting oil
- Flushing swarf and abrasive residue from the machine to the integrated tape filter (50 µ) and then to the microfilters (5 µ)
- Protecting all oil-wetted components from corrosion

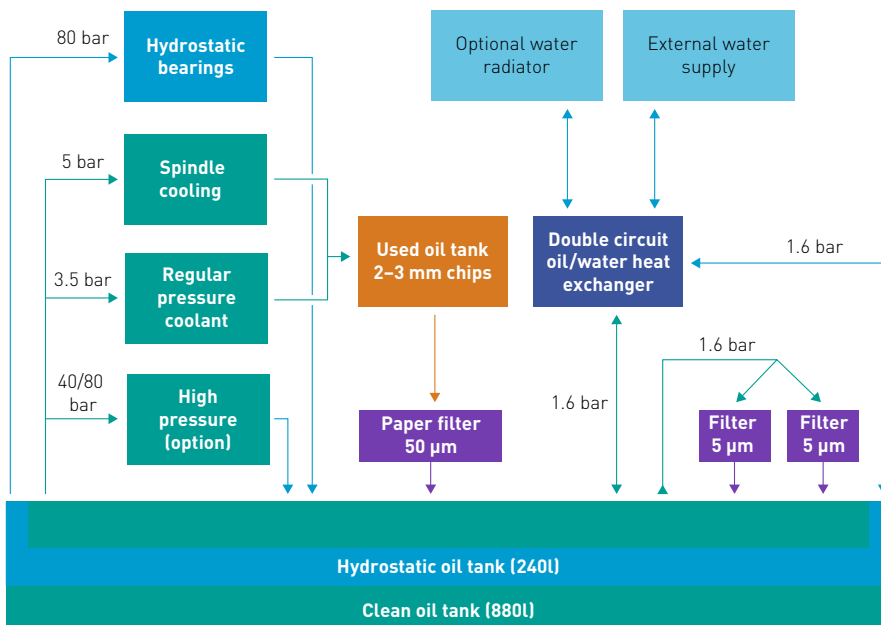
### A FIRST: HYDROSTATIC BUSHINGS

The hydrostatic bushings for the 6 headstocks are a world first. With very powerful synchronous motors, the headstocks are spun up from zero to 8,000 rpm in



## MULTISWISS 6x14

Fluid Circle Diagram using MOTOREX ORTHO NF-X ISO VG 15



There are no fewer than 1,120 liters of cutting oil circulating inside the new MultiSwiss 6x14. The oil circuit is complex and includes several filters. In addition, the entire machine is thermally stabilized using a powerful cooler/heat exchanger unit.



The heart of the machine: the machining area with its 6 sliding headstocks. Its multi-tool design makes it possible to mount up to 18 different tools simultaneously.



An integrated tape filter processes the cutting oil, generally at 50 µ, and an additional approximately 240 liter tank supplies the hydrostatic bearings with ORTHO NF-X, micro-filtered at 5µ.

less than one second, giving the machine unparalleled start-up performance. In addition to its own C-axis, this type of headstock also has its own Z-axis, which is guided by hydrostatic bearings. This achieves a pronounced damping effect, significantly extending tool life and improving surface finish. It is precisely this aspect that makes MOTOREX ORTHO NF-X a key success factor in implementing the new technology in series production. The hydrodynamic characteristics required for the cutting oil to function reliably as a sort of liquid bearing at 80 bar pressure and up to 8,000 rpm speak for themselves. Because reliability is the top priority at Tornos, the newly developed product was successfully tested in extreme conditions (40 million cycles) in all imaginable circumstances.

### MULTITALENTED ORTHO NF-X

Practically all new products at Tornos' development department are filled with ORTHO NF-X high-performance universal cutting oil from MOTOREX. In SWISSCUT ORTHO NF-X, MOTOREX has developed a single chlorine- and heavy metal-free machining fluid that is capable of flawlessly working not only stainless and implant steels, but also non-ferrous metals and aluminium. This is an absolute first in

modern manufacturing technology and gives the R&D team maximum scope.

### STATE-OF-THE-ART SOLUTION

The fact that MultiSwiss 6x14 combines all lubrication functions in a single fluid is a logistical convenience, but there is also another, much more important reason. Current good manufacturing practice (GMP) guidelines require all processes to be documented and reproducible. Consequently, manufacturers of products such as medical devices prefer to use a single machining fluid wherever possible. MOTOREX ORTHO NF-X meets this requirement. ●

### MORE SCOPE FOR INNOVATION



"For the past three years or so, we have only been using ORTHO NF-X at our Research and Development department in Moutier. Through ongoing collaboration with MOTOREX, we have been able to go significantly further than before in the area of lubrication and cooling. This was especially true during development of the MultiSwiss 6x14."

Patrick Pellicanno – Specialist in machining design and set-up, Tornos SA, Moutier

Photos: Salzburg AG, St. Wolfgang



## UP WITH HIGH-TEMPERATURE STEAM CYLINDER OIL

*Steam locomotives are a popular attraction and a sure way to create nostalgic moments. The Schafbergbahn on Lake Wolfgang in Austria's Salzkammergut is no exception. Its steam engines are all lubricated with HIGH-TEMPERATURE STEAM CYLINDER OIL from MOTOREX.*

The Schafbergbahn, a cog railway with a one-meter track gauge, opened in 1893. Starting at St. Wolfgang in Austria's Salzkammergut, the 5.85-kilometer line ascends 1.188 meters to the prominent Schafberg mountain in about 45 minutes. The upper station is 1.730 meters above sea level. The line is not electrified and is mainly operated by four modern oil-fired steam engines built from 1992 onwards and numbered Z 11 through Z 14. The same type of locomotive, incidentally, is also used on the Brienz-Rothorn-Bahn/Bernese Oberland, Switzerland. Fully laden, one train (locomotive plus two front-hitched cars seating 50 passengers each) weighs 34 tonnes. It is driven by a two-cylinder superheated steam engine with slide valve gear and an output of approximately 450 hp. One trip up the mountain consumes 130 liters of diesel and vaporizes 1200 liters of water.

### STEAM TEMPERATURES OF UP TO 280 °C

Lubricating steam engine cylinders requires special, unalloyed mineral oils with high thermal stability. The

oil is extremely viscous when cold (ISO VG 1500!) and begins to flow freely only when the engine is running and the steam heats it. The temperature of normal steam can exceed 100 °C, that of saturated steam is 150–200 °C, and superheated steam significantly exceeds temperatures of 200 °C. Even under these conditions, MOTOREX HIGH-TEMPERATURE STEAM CYLINDER OIL reliably lubricates cylinders, valves and rods in any situation. It also boasts low residue formation and evaporation.

### FOR RUNNING AND SLIDING SURFACES

A mechanical Vogel grease lubrication pump forces the HIGH-TEMPERATURE STEAM CYLINDER OIL from a two-kilo tank via force pilot operated lubricant dispensers through high-pressure lines to the lubrication points, supplying all parts that come in contact with steam, such as the valve chest and piston chamber as well as the piston and valve stem bearings. It is in service not only on the way up the mountain, but also when coming back down, when no steam is used and the cylinders are used to suck in and compress ambient air. Injecting a little water keeps the temperature from exceeding 280 °C. This mechanism is known as a Riggensbach counter-pressure brake, in which the cylinders and pistons function as compressors. Here too the right lubricant properties are essential for keeping the running and sliding surfaces perfectly lubricated under load.



Good to see: the supply tank, mounted right next to the grease lubrication pump (in photo at right on top).

For the past ten years the Schafbergbahn has been using MOTOREX HIGH-TEMPERATURE STEAM CYLINDER OIL with outstanding results. [www.schafbergbahn.at](http://www.schafbergbahn.at) •





*After Chile, Argentina, Spain, Portugal and Italy, the next Grand Prix in the Enduro World Championship (EWC) will be held in Karlsborg, Sweden. Named the HUSABERG Grand Prix in honor of the Swedish motorbike manufacturer's 20th anniversary, it will be taking place on August 25 and 26.*

## PREVIEW HUSABERG GRAND PRIX IN KARLSBORG

The Enduro World Championship and its eight qualifying rounds are hugely popular with off-road motorcycling fans, especially those in Scandinavia. MOTOREX is the official lubrication technology partner to the Championship's organizer and has a highly visible presence at all events. The Karlsborg Grand Prix will be an occasion for double celebrations in Sweden: in honor of HUSABERG's 20<sup>th</sup> anniversary, the Grand Prix has been named after the Swedish motorbike manufacturer and an accompanying festival program is planned. This is obviously the perfect opportunity for MOTOREX to further raise its brand profile in Sweden.

### HUSABERG: 100% ENDURO

Founded by Thomas Gustavson, Husaberg Motor AB originally focused on manufacturing Enduro and Supermoto bikes with single-cylinder, four-stroke engines. The machines enjoyed the reputation of having particularly good frames that were ideally suited to off-road conditions in Scandinavia. The company's first model, the FE 501, won the Enduro European Championships the year it was launched! In 1995 HUSABERG was acquired by the Austrian motorbike producer KTM, and production was transferred to KTM headquarters in Mattighofen, Austria, in 2003. However, the motorsports department is still based in Sweden. In model year 2011, HUSABERG launched its first-ever two-stroke engined bikes.

### PARTNERSHIP WITH MOTOREX

HUSABERG benefits from MOTOREX's successful partnership with KTM in the form of race-proven lubricants and expertise. As a result, all HUSABERG bikes are fac-

tory-filled and assembled with MOTOREX products. The official HUSABERG factory team of four riders – Joakim Ljunggren (Sweden, starting number 3), Pierre-Alexandre Renet (France, starting number 4), Oriol Mena (Spain, starting number 5) and Mathias Bellino (France, starting number 6) – also relies on MOTOREX. All four riders will be competing for World Championship points at the HUSABERG Grand Prix in Karlsborg.

### CONGRATULATIONS

MOTOREX is particularly looking forward to hosting Mr Jonas Zetterman from "Industrihydraulik, Västerås" at the Swedish Grand Prix. This VIP guest won first prize in the competition run by MOTOREX at MaskinExpo in Stockholm. The prize is a visit to the HUSABERG Grand Prix with accommodation and a fascinating behind-the-scenes look at the Enduro World Championship and the HUSABERG factory team.

For all the latest news from the EWC, visit the Championship's website at [www.enduro-abc.com](http://www.enduro-abc.com) •



Joakim Ljunggren's skilful riding and good results have made the talented Swede a huge hit with his home crowd.



Photo: J. Edmunds/KTM

## COOL IDEAS

For years TBS Sport Promotion in Berne has offered a range of services in the fields of tennis, inline skating, conditioning and cross-training. The focus is on exercise, fun, and last but not least on the great feeling you get from playing hard. It's hard to imagine playing tennis without these handy mobile

## SKILLFUL SERVICE WITH JOKER

ball carts that keep 200 tennis balls in easy reach. They're everywhere at TBS's annual youth tennis camps, where the athletic Céline is one of the regulars. One of many cool aspects here is the not-quite-traditional way of servicing the ball

cart. The fine red sand used on tennis courts, with three millimeter or even smaller grains, doesn't just get into shoes and socks, but some-

times also clogs the cart's metal wheels. No problem, though: with MOTOREX JOKER universal spray, Céline scores big here too! ●



Photo: TBS Sport Promotion GmbH, Berne

Perfect service requires not just talent and training, but also the right products: Céline (11) helps her instructor Michi Ruf fix the ball cart.

# DID YOU KNOW THAT...



The impressive headquarters of J&L Exploitation SARL in Casablanca, Morocco.

MOTOREX recently signed a very active importer in Morocco in J&L Exploitation SARL. The idea of importing high-quality lubricants from Switzerland to the North African country came from Serge Luy, a Swiss national who became aware of MOTOREX through frequent positive feedback from Europe and notable racing triumphs. Rapidly expanding mobility, modern power plants, extreme climatic condi-

tions and new industrial applications demand proper lubrication, even in Morocco. Still young, the company is based in Casablanca, from whence it is systematically developing the market. It has already successfully solved more than one tricky lubrication challenge. Morocco is the Maghreb country closest to Europe, making it an important gateway to the continent of Africa. ●

## OTTOREX







### MOTOREX CAP

100% cotton, anthracite with green sandwich stripe and logo on visor. MOTOREX logo on adjuster at rear. Metal buckle.

Article-No: 450791



### MOTOREX XL UMBRELLA

Extra-large auto-open umbrella with comfortable foam handle and aluminum shaft. Silver-green with logo. Diameter: approx 120 cm.

Article-No: 450340



# HE LEAVES NOTHING TO CHANCE BECAUSE NOBODY WINS BY CHANCE.

MATTER & GREUTNER



Tom Lüthi, world-class Moto2 rider.

## WHY DO YOU THINK HE SWEARS BY US?

When you're riding up front and aiming to win, you can leave nothing to chance. Race-winning performance on the track is only possible when everything is right. Tom Lüthi, world-class Moto2 rider and multiple GP winner, demands the highest quality down to the tiniest detail. "The guy at the head of the pack is the guy who can – and does – ride really fast: the guy who can focus on that and only that." Total lack of compromise – it's something MOTOREX also stands for. And why we are precisely the right partner for Tom Lüthi. Find out more about how our oils are helping companies from a wide range of industries reap success: [www.motorex.ch](http://www.motorex.ch)

