



RAVENOL Racing 4-T Motobike Line with USVO Technology



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13.04.2020

If you choose RAVENOL engine oils, you've made a safe choice for both yourself and your motorbike. As a full-range provider to the automotive sector, RAVENOL offers over 550 high-quality products to its discerning customers.

Premium products with the quality seal – MADE IN GERMANY

RAVENOL is one of the most renowned companies in the sector and stands out as a provider of the latest lubricant technologies developed based on close collaboration with leading vehicle and engine manufacturers. The company also stands out particularly for its research and development in motor racing – from karting right through to the elite class of Formula racing. In the company's state-of-the-art, in-house laboratory, these high-quality products are formulated to meet the most exacting quality requirements of the automotive industry and even to exceed the latest standards.

A global player with a sense for regional values

Founded approximately 75 years ago as a local family-run company, RAVENOL now markets its products in 90 countries and is known as a reliable supplier offering excellent service. We offer our customers an extensive range of lubricants and care products: Engine oils for passenger cars and trucks, racing oils, transmission oils for automatic and manual gearboxes and drive axles, agricultural machinery oils, hydraulic oils, industrial oils, special products, greases, high-performance lubricants, vehicle maintenance products, cleaners, winter chemicals and anti-freezes.

Your motorbike...

... requires a great deal of attention and sufficient care, in a different way than a car does. That's why RAVENOL offers an extensive product portfolio specifically for motorbikes and their particular requirements: from 4-T engine oils with the latest USVO technology to special multigrade transmission oils and spray oils, chain lubricants, carburettor cleaners through to care and cleaning products which are gentle on paintwork.

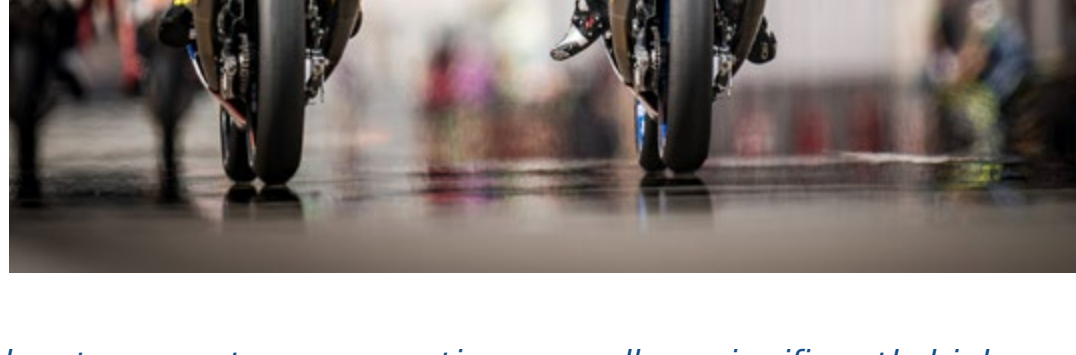
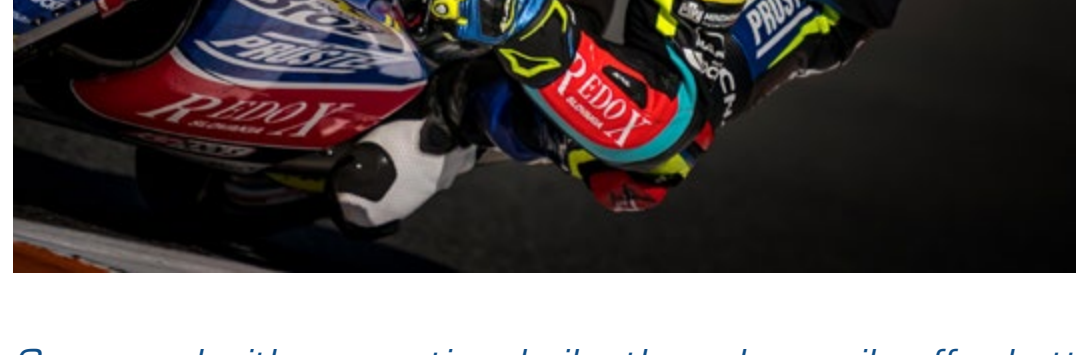
The high-performance engines of modern bikes often get twice the power out of the same cubic capacity compared with modern passenger car engines! Bikes can do this thanks to extremely high revolutions per minute!

The higher the rpm, the higher the operating temperatures. This means that in certain areas of the engine, at full throttle, temperatures of up to 350°C may be reached.

The oxidation value, i.e. the ageing of the oil, increases with rising temperatures! Above a temperature of 60°C, the service life of the oil reduces by 50% with every additional temperature increase of 10°C!

It's not only the high operating temperatures, but also the extreme engine performance that make the engine oil have to work harder to protect the engine components from wear and sludge formation while simultaneously guaranteeing perfect transmission and clutch performance.

The RAVENOL Racing 4-T Motobike series with USVO technology exclusively uses Group 4&5 synthetic base oils, so-called polyalphaolefins (PAO) and esters which have far superior characteristics when compared with conventional base oils.



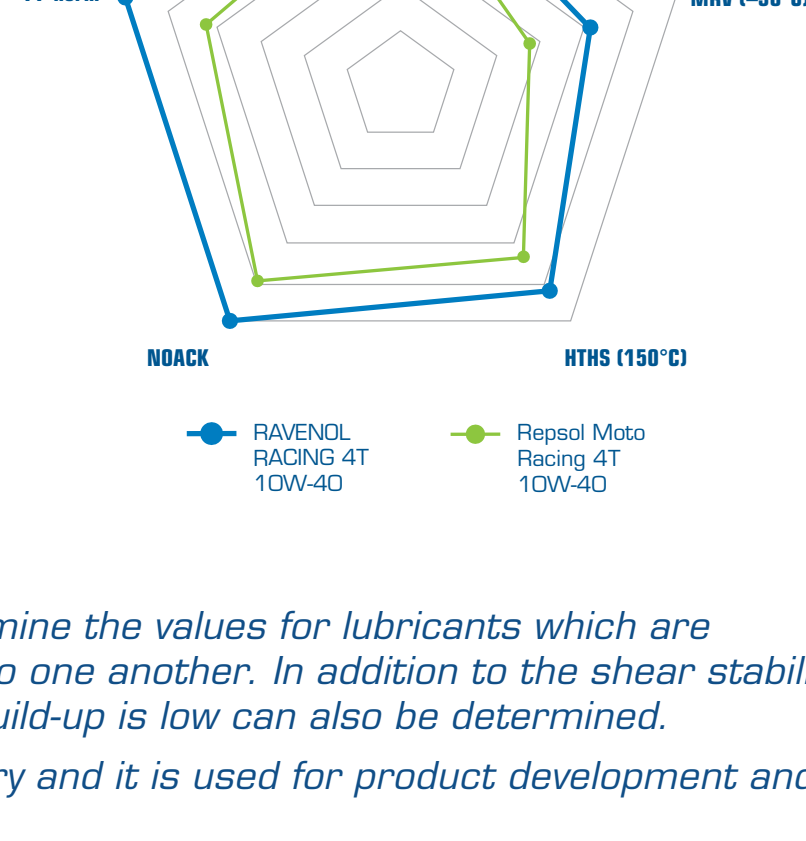
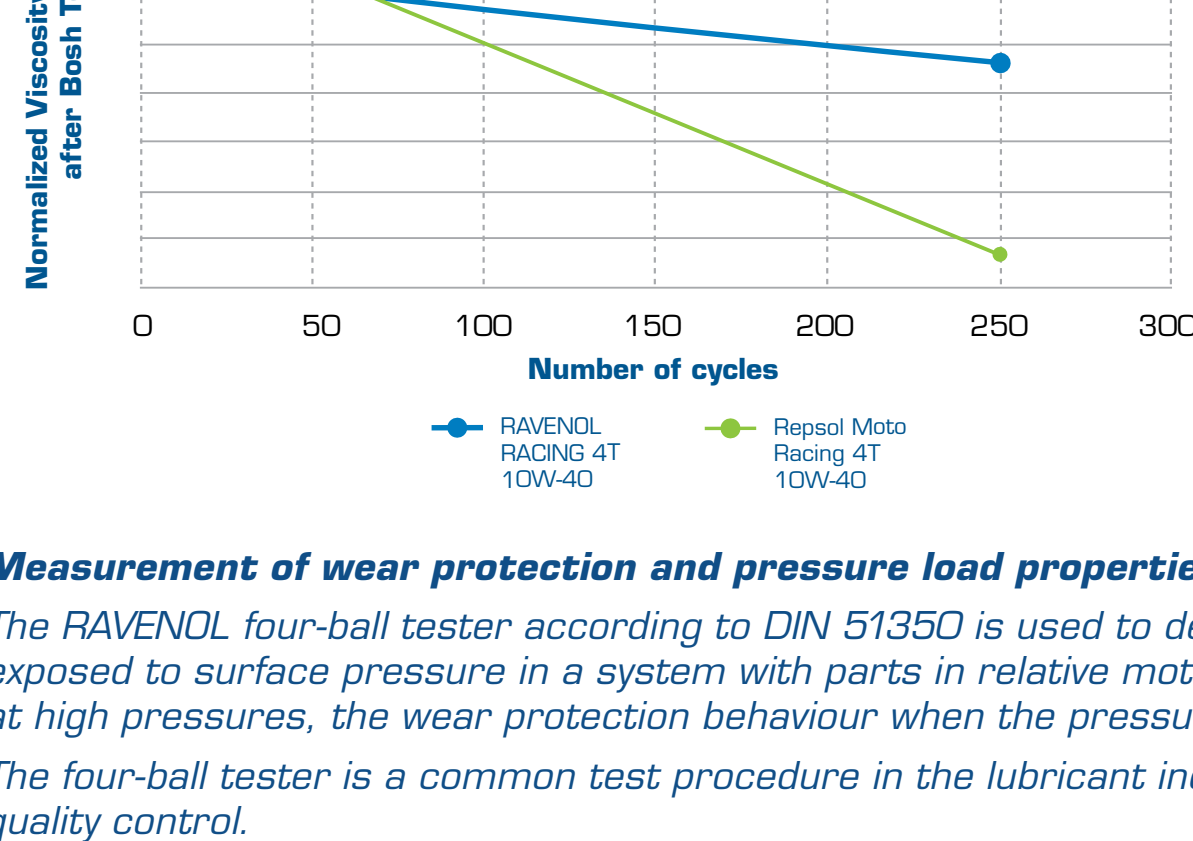
Compared with conventional oils, these base oils offer better low-temperature properties as well as significantly higher oxidation stability which becomes evident thanks to the extended oil-change intervals. Not only this, but these oils have greater shear stability, i.e. they retain their viscosity (flowability, or resistance to flow) better as they do not require the addition of viscosity improvers (polymers, plastics), which cause sludge formation in engines. The USVO technology also ensures that the oil film is extremely stable and has a very high pressure absorption capacity, which is reflected in its excellent wear protection properties and improved performance.

RAVENOL Racing 4-T Motobike products offer better engine protection due to reduced friction and sludge formation and longer oil-change intervals. They will ensure that your bike performs even better!

You can find a detailed explanation of the respective technical test parameters that explain the unbeatable performance of the Racing 4-T Motobike series in this newsletter!

The test results of the RAVENOL products and some well-known competitors are shown in the following table. The full presentation and all test results are available on request from your sales representative.

	Specs	Repsol Moto Racing 4T 10W-40	RAVENOL RACING 4T 10W-40
Viscosity at 100°C	12,5-16,3	13,98	15,23
Cold-Cranking Simulator (CCS) (-25°C)	max 7000	5790	6210
MRV (-30°C)	max 60000	15900	11700
HTHS (150°C)	min 3,5	4	4,87
NOACK	max 20	6	4,6
Flash Point	N.A.	224	242
Pour Point	N.A.	-36	-60
Sulfated Ash	max 1,2	0,72	0,85
Four-Ball method anti-wear properties	N.A.	0,5	0,34
Determination of the shear stability of polymer-containing oils using a diesel injector nozzle (30 cycles)	min 12	13,85	14,98
Determination of the shear stability of polymer-containing oils using a diesel injector nozzle (250 cycles)	N.A.	12,96	14,72
SSI 250 cycles		7,30	3,35
Oxidation Induction Time OIT temperature 210 °C	N.A.	31	40



Measurement of wear protection and pressure load properties

The RAVENOL four-ball tester according to DIN 51350 is used to determine the values for lubricants which are exposed to surface pressure in a system with parts in relative motion to one another. In addition to the shear stability at high pressures, the wear protection behaviour when the pressure build-up is low can also be determined.

The four-ball tester is a common test procedure in the lubricant industry and it is used for product development and quality control.

The four-ball system consists of three fixed balls of the same size (stationary balls) and one rotating ball (load ball). The lubricant being tested is then poured over the stationary balls until they are completely covered. Using a lever device and a staged regulation of the test weights, different loads are generated and the corresponding characteristic values for abrasion, friction and welding are determined.

The higher the welding force or the lower the wear values of an oil or grease, the better its wear protection when subjected to pressure load. RAVENOL Racing 4-T Motobike 10W-40 has achieved the best values by far out of all the products that have been tested.

Measurement of the low-temperature properties: how quickly is the oil distributed around the engine?

A Mini Rotary Viscosimeter is a device which can be used to measure how well an engine oil can be pumped at low temperatures and with a defined temperature profile. The result is stated in millipascal seconds (mPas) and is based on a temperature of -40°C here.

The lower the mPas value in this test procedure, the easier and therefore quicker it is for the engine oil to be pumped, and it can therefore lubricate the engine at low temperatures.

RAVENOL Racing 4-T Motobike 10W-40 has achieved the best values by far out of all the products that have been tested.

Measurement of the Mechanical Shear Stability: How well does the oil retain its viscosity?

Mechanical shear stability is the resistance of polymers to mechanical degradation under shear stress. It is dependent on the molecular weight (size of the molecule), the structure and the physical characteristics of the polymer additive.

The lower the value (difference compared with the first viscosity measurement), the better.

The SSI value is calculated according to the following formula:

$$SSI = 100 \times (V_0 - V_s) / V_0$$

SSI = Permanent Shear Stability Index, V_0 = viscosity of the unsheared oil

V_s = viscosity of the sheared oil



Kurt Orbahn (KO) Test

The main component of the test station is a diesel injector nozzle, through which oil is pumped at a pressure of 175 bar using a Bosch unit injector system. When flowing through the small opening in the injector nozzle, the mechanically unstable molecules of the polymer break up and the oil becomes more fluid.

Parameter	Unit	Value
Injector nozzle	-	Bosch DN 8 S2
Nozzle holder	-	Bosch KD 43 SA 53/15
Diesel injection fuel pump	-	Bosch PE 2A 90C 300/3S 2266
Electric motor	Kw / RPM	1.1 / 925±25
Dead volume	ml	20±5
Injector breaking pressure	bar	175
Flow rate	ml per minute	170±5
Power	V/Hz/Ph/HP	415/50/3/1.5

Measurement of the oxidation resistance of the oil: How well is the oil protected against ageing?

The Oxidation Induction Time Test (OIT) in accordance with ASTM D6186:2019, as conducted in a Pressure Differential Scanning Calorimeter (PDSC), is used to predict the thermooxidative performance of a lubricant. The samples are kept under pressure in an oxygen atmosphere at an elevated temperature, and the time period before the onset of degradation is measured (as indicated by the initiation of an exothermic process in the DSC gauge). OIT is a sensitive measure of the content of antioxidant additives or of base oils that are less susceptible to oxidation in the lubricant.

The longer the measured time period, the more resistant the formulation.



RAVENOL RACING 4-T MOTOBIKE

SAE 10W-40 | API SN | JASO MA2

Art. N.: 1171106

FULLY SYNTHETIC 4-STROKE MOTORCYCLE ENGINE OIL THAT WAS SPECIALLY DEVELOPED FOR RACING USE WITH USVO® & CLEANSYNT® TECHNOLOGY. IT IS DESIGNED 100% ON A PAO AND ESTER BASIS.



RAVENOL RACING 4-T MOTOBIKE

SAE 10W-50 | API SN | JASO MA2

Art. N.: 1171107

FULLY SYNTHETIC 4-STROKE MOTORCYCLE ENGINE OIL THAT WAS SPECIALLY DEVELOPED FOR RACING USE WITH USVO® & CLEANSYNT® TECHNOLOGY. IT IS DESIGNED 100% ON A PAO AND ESTER BASIS.



RAVENOL RACING 4-T MOTOBIKE

SAE 10W-60 | API SN | JASO MA2

Art. N.: 1171108

FULLY SYNTHETIC 4-STROKE MOTORCYCLE ENGINE OIL THAT WAS SPECIALLY DEVELOPED FOR RACING USE WITH USVO® & CLEANSYNT® TECHNOLOGY. IT IS DESIGNED 100% ON A PAO AND ESTER BASIS.



RAVENOL RACING 4-T MOTOBIKE

SAE 15W-50 | API SN | JASO MA2

Art. N.: 1171109

FULLY SYNTHETIC 4-STROKE MOTORCYCLE ENGINE OIL THAT WAS SPECIALLY DEVELOPED FOR RACING USE WITH USVO® & CLEANSYNT® TECHNOLOGY. IT IS DESIGNED 100% ON A PAO AND ESTER BASIS.



RAVENOL MOTOBike SYSTEM CLEANER SHOT

Art. N.: 1390401

FUEL ADDITIVE WITH HIGH LEVELS OF CLEANING AND ANTI-CORROSION ADDITIVES FOR ALL MOTORCYCLE GASOLINE INJECTION ENGINES, WHICH INCREASES THE PERFORMANCE OF THE ENGINE.



RAVENOL MOTOBike ENGINE CLEANER SHOT

Art. N.: 1390402

HIGHLY EFFECTIVE CLEANING CONCENTRATE FOR THE OIL CIRCUIT FOR EFFICIENT CLEANING OF ALL MOTORCYCLE ENGINES (WITH AND WITHOUT CATALYTIC CONVERTER)

RAVENOL

is one of the most dynamic and capable brands for premium lubricant products in the world. We offer the customer a wide range of lubricants and cleaning products, including car and truck engine oils, racing oils, gear oils for automatic and manual transmissions and drive axles, as well as agricultural machinery products, hydraulic oils, industrial oils, specialty fats, high performance lubricants, car care products, cleaners, winter chemicals and engine coolant (anti-freeze).



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