ELF MOTO 4 HP ECO

ELF MOTO 4 HP ECO is a specific motorcycle lubricant reinforced with synthetic base oils. The new generation formulation incorporates an **anti-clutch slippage** technology and higher performance in terms of lubrication (superior friction properties). This middle-line product is positioned to be an **economical and high technicity quality**.

USE

Motorcycle application	ELF MOTO 4 HP ECO is recommended for all **4-stroke motorcycles**.
Recommendation	This lubricant meets both the severe requirements of **urban traffic** (thermal shock, high clutch loading factors) and **long-distance trips** (touring or tourism).
Suggestions for use	ELF MOTO 4 HP ECO is totally compatible with **catalytic converters**. The **oil change intervals** recommended by manufacturers and the minimum **viscosity** conditions must be complied with. This lubricant is compatible with **unleaded fuel**.

SPECIFICATIONS

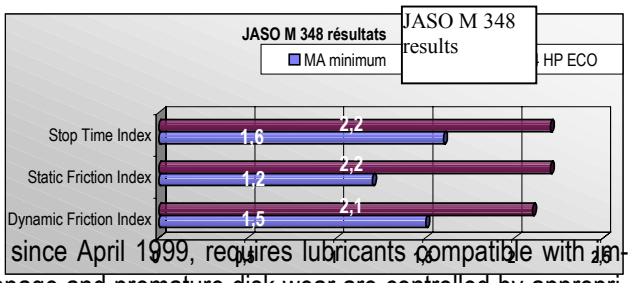
Synthetic-fortified	ELF MOTO 4 HP ECO is a lubricant **highly reinforced in synthetic base oils** to maintain hydrodynamic lubrication and superior engine cleanliness.
10W-40 Viscosity Superior-friction-properties	ELF MOTO 4 HP ECO offers specific reactivity to **temperature variations**. The maximum fluidity at low temperature provides better pumping capacity and fast increase in oil pressure.
JASO MA Anti-clutch-slippage	This lubricant meets the **JASO MA** (*Japanese Automobile Standards Association)* specification for 4-stroke immersed clutch motorcycle engines. The high friction factor ensures anti-clutch slippage and reduces wear.
API SG	ELF MOTO 4 HP ECO is in conformity with the **API SG** (*American Petroleum Institute*) level required by international motorcycle manufacturers.

CUSTOMER BENEFITS

Control of viscosity according to temperature	**Temperature variations** in metallurgy between -25°C (cold start) and +330°C (on top rings) call for suitable lubricant viscosity. The additives improving the viscosity index must thicken the oil at high temperature and provide for its low temperature fluidity. The appropriate film of oil is produced by control of viscosity as a function of temperature using appropriate components. (Viscosity Index Improvers).
Test Cold Cranking Simulator ASTM D 5293	The 10W-40 viscosity of ELF MOTO 4 HP ECO offers superior performance in terms of lubrication. The result obtained during a cold cranking simulation demonstrates the fluidity and pumping capacity (3170 mPa-s) at low temperature (see graph). ELF MOTO 4 HP ECO allows the oil pressure to build up quickly and reduces friction between the moving parts of the engine.
Piston ring tightness and lubricant anti-oxidant capability	**Piston rings ensure tightness** on combustion. The forming of deposits in the ring grooves reduces their flexibility. The blow-by of hot gases from the combustion chamber to the crankshaft occurs, leading to a loss of compression and therefore of power. Reaction between oil and air and blow-by gases at high temperature causes the **oxidization of the oil**, facilitated because of the presence of metals or chemical compounds working as catalyzers or oxidants. The acid contaminates resulting from this reaction destroy metal surfaces by corrosion and the formation of rust. The life duration of a lubricant depends a great deal on its resistance to oxidization. On average, the oxidization rate doubles every 10°C from 120°C.
Oxidization test '1517' Duration 144 hours at 170°C Laboratory test	This test is representative of what happens in an oil housing in which oxidization is catalyzed because of the presence of fine suspended metal particles. ELF MOTO 4 HP ECO contains neutralizing anti-oxidant additives that slow down the oxidization reaction in progress. The oil stays fluid and changes little in terms of acidity. Under severe oxidization test conditions for 144 hours at 170°C with violent air inlet (10 l / h of air), ELF MOTO 4 HP ECO produced the following results: Viscosity variation –0.13%, TAN evolution: more than 2.6 points. ELF MOTO 4 HP ECO remains fluid and efficient. A competing oil was severely oxidized during this test leading to total degradation with bulking of the oil.
Oil consumption	Oil consumption depends on the design of the engine, the conditions of use and the physical properties of the lubricant. A low flash point, improved volatility (loss by evaporation) and the exchange of gases through the rings cause non-standard oil consumption.
API SG, sequence III E 64 hours Engine test	Oil consumption remains modest. During III E sequence testing on oil consumption for 64 hours, 2.55 liters of ELF MOTO 4 HP ECO were consumed.

Anti-clutch slippage and disk protection

The base oils, through their molecular structures, product a consistent film of oil between the clutch disks. Adapting the friction coefficient to mechanical requirements prevents **clutch disk slip and wear**.



JASO M 348 test
SAE 2 machine
1000 cycles

The JASO MA specification, since April 1999, requires lubricants compatible with immersed clutches. Clutch slippage and premature disk wear are controlled by appropriate friction coefficients. ELF MOTO 4 HP ECO exceeds the level required by JASO MA.

Product positioning

The ELF MOTO 4 HP ECO product is in the **middle of the range**. Other physical-chemical performance levels and more sophisticated products are available in the ELF motorcycles range.

ELF MOTO 4 HP ECO PROFILES	REFERENCE
Anti-clutch slippage power	✻✻✻✻✻
Wear-seizing safety margin	✻✻✻✻
Engine power efficiency	✻✻✻✻
Extreme pressure properties	✻✻✻✻
Base oil lubrication	✻✻✻✻✻
Selected additivation	✻✻✻✻
Anti-oxidant, -corrosion, -rust power	✻✻✻✻
Dispersion, detergence	✻✻✻✻
Resistance to thermal shock	✻✻✻✻✻
Catalyzer converter compatibility	✻✻✻✻

Scale graded from ✻ to ✻✻✻✻✻✻

CHARACTERISTICS

PHYSICAL-CHEMICAL PROPERTIES	ELF MOTO 4 HP ECO	
Density at 15 °C (ASTM 1298)	0.8705	g/cm³
OC flash point (ASTM D 92)	232	°C
Kinematic viscosity at 40 °C (ASTM D 445)	89.10	mm²/s
Kinematic viscosity at 100 °C (ASTM D 445)	13.4	mm²/s
Viscosity index (ASTM D 2270)	152	
Sulfated ash content (ASTM D 878)	0.87	% weight
Pour point (ASTM D97)	-36	°C
AFAQ ISO 9001 CERTIFICATION number 1993/900c		

The characteristics in this table are averages given for information only.