



ELF PERFO 105

“Unleaded competition fuel for naturally aspirated and turbocharged 4-stroke engines”



Our formulae use pure bases to guarantee naturally stable, long-lasting properties, consistent from one production batch to another. This search for constant and optimum quality ensures you obtain leading edge performance.

“This is the gasoline of the ELF competition range that has the best octanes technically possible for an unleaded fuel.”

Uses

- **ELF PERFO 105** is an unleaded gasoline with the highest octane ratings of any unleaded fuel.
- ELF Research has combined its expertise with the will to push engines and technology beyond known limits, to develop an exception fuel: **ELF PERFO 105**.
- By selecting compounds with outstanding resistance to knocking, **ELF PERFO 105** permits engines to run in ranges hitherto inaccessible to other unleaded fuels. Supercharging pressures and compression rates can be extended to the engine's mechanical limits.
- **ELF PERFO 105** is an unleaded fuel **that does not conform to official regulations**.
- Adapted everywhere naturally aspirated and turbocharged 4-stroke engines are used:
 - Circuits
 - Rallies
 - Acceleration
 - Hill climbing
 - Dragster

Characteristics

		Standard data
OCTANE NUMBERS	RON	113
	MON	98
DENSITY	kg/l at 15°C	0.740
AIR FUEL RATIO		12.1
OXYGEN	% m/m	16.3
VAPOUR PRESSURE	Bar at 37.8°C	0.475
DISTILLATION (°C)	% vol. at 70°C	40.8
	% vol. at 100°C	100

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SULPHUR	mg/kg	<10
LEAD CONTENT	g/litre	<0.005

Properties

Fuel characteristics	→	Technical advantages	→	Engine benefits
Exceptional oxygenated compound content	→	<p>Effect of natural supercharging</p> <p>High latent vaporisation heat favouring mixture cooling before combustion</p> <p>Increased volume filling by charge cooling</p>	→	<p>Spontaneous power gains (without specific tuning) over the whole range.</p> <p>Increased power by optimisation before ignition.</p> <p>Excellent engine response in transient phase.</p>
Unique RON and MON for unleaded fuel	→	<p>Compression rates and supercharging pressure can be increased to the mechanical limits of the engine</p>	→	<p>Maximum torque and power for high torque and exceptionally charged engines.</p>
Very low benzene and sulphur contents	→	Harmless	→	<p>No special precautions for use</p> <p>ELF PERFO 105 respects both health and the environment.</p>

Recommendations

- Engine mapping and the compression rate must be optimised (Air/Fuel ratio, ignition sequence) to obtain full benefit from **ELF PERFO 105**.

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- **ELF PERFO 105** fuel is fully compatible with naturally aspirated, turbocharged and 2-stroke engines.

Storage

To preserve its original properties and comply with the Health and Safety rules pertaining to fuels, **ELF PERFO 105** must be handled and stored away from sunlight and bad weather and properly resealed in its drum after each use, to avoid loss of the lightest particles.

Glossary

RON & MON: RON & MON characterise resistance to knocking (see definition) of a fuel used in a spark-ignition engine. RON is representative of the operation of an engine running under cold and low speed conditions, while MON is representative of an engine running under warm and high speed conditions.

For competition use, MON is commonly used to describe a fuel's anti-knocking capacity.

Higher octane levels allow engines to run more efficiently under severe, high speed conditions (high rotation speed, high compression ratio).

KNOCKING: Knocking is the result of non controlled fuel combustion in the engine. Sometimes revealed by a characteristic 'pinking' noise, these detonation phenomena often damage the engine.

There are two ways to prevent knocking: tuning the ignition timing and/or using a fuel with better anti-knocking characteristics (RON/MON and combustion speed).

CHARGE COOLING: The amount of energy needed to vaporise fuel depends on the latent vaporisation heat. This phenomenon leads to cooling the intake air which in turn generates internal supercharging.

COMBUSTION SPEED: It characterizes the fuel's reactivity in the combustion process. The higher the combustion speed, the more effective it is, and the greater the power produced by the engine, via a better cycle yield.

OXYGEN CONTENT: Oxygenated compounds naturally contain high levels of octane and generally improve engine filling capacities thanks to the cooling effect on the admitted air flow (see definition). Others also have remarkable combustion speeds.

DENSITY (or dimensional weight): Usually measured at 15°C and under 1 bar, given in kg/litre (or in kg/m³), this is the density of one litre (or 1000 litres) of fuel.
A fuel's density increases as its temperature drops.

VAPOUR PRESSURE: Usually measured at 37.8°C (Reid vapour pressure), by bar (or Pascals), with its distillation curve, this dimension characterises a fuel's capacity to evaporate. This

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property comes into play when the petrol is mixed with the air intake and for cold engine starts. If the vapour pressure is too high, it can cause 'vapour lock'.

AIR/FUEL RATIO (stoichiometric ratio): This ratio characterises the respective fuel and combustive (air intake) quantities necessary for theoretically ideal combustion. In practice, the engine tuner will usually ensure that the air/fuel ratio corresponds to a value between 1.10 and 1.20, or the theoretical value in relation to the real value.