



ELF ATMO RALLYE

“Unleaded competition fuel for naturally-aspirated 4-stroke engine”



Using pure bases, our formulas guarantee naturally stable, long-lasting properties, consistent from one production batch to another. This search for constant and optimum quality gives you first class performance, in conformity with official regulations.

Use

- **ELF ATMO RALLYE** unleaded fuel has been specially designed for naturally-aspirated 4-stroke engines.
- Complies with FIA Annex J regulations.
- Optimised within the limits of FIA regulations, **ELF ATMO RALLYE** gets maximum power from naturally-aspirated engines with a relatively low stroke volume, functioning at high speeds.
- Suited to any use of naturally-aspirated 4-stroke engines:
 - Circuit
 - Rally & Rallycross
 - Acceleration
 - Hill climb race

Characteristics

		Typical data	FIA/Annex J regulations
OCTANE NUMBER	RON	100	95 to 102
	MON	85.7	85 to 90
DENSITY	kg/l at 15°C	0.748	0.720 to 0.785
OXYGEN	% m/m	3.4	3.7 max
AIR/FUEL RATIO		13.9	
VAPOUR PRESSURE	Bar at 37.8°C	0.570	0.900 max
DISTILLATION (°C)	FBP °C	169	215 max
	% vol. at 70°C	42	10 to 47
	% vol. at 100°C	65	30 to 70
SULPHUR	mg/kg	<10	
BENZENE	% vol.	0.2	10



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LEAD	g/litre	<0.005	0.013 g/l max
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Properties

Fuel characteristics	→	Technical gains	→	Engine benefits
Oxygen content set to upper regulatory limit	→	Natural booster effect High latent heat of evaporation helps cool mix before combustion Greater filling capacity through air/fuel mixture cooling	→	Spontaneous power gains (without special tuning) over complete engine speed range Power gains after optimisation of ignition advance Excellent engine response in transient phase
Selection of best compounds in oxygenated and olefin families within regulatory limits	→	High combustion speed for optimised cycle yield	→	Knocking control for perfect mechanical resistance of moving parts Better engine speeds
Strong density	→	High energy content of fuel	→	Significant improvement in filling compared to traditional fuel
Very low benzene and sulphur content	→	Harmless	→	No special precautions for use ELF ATMO RALLYE respects both the environment and health



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Recommendation

- While high octane numbers provide the anti-knock properties in high-torque turbo-charged engines, resistance to knocking in naturally-aspirated engines functioning at high speed depends on the combustion speed, which must be as high as possible.
- **ELF ATMO RALLYE** provides significant gains in power and reliability, with no fine-tuning.
- To get the full benefit of this product, the engine mapping must be optimised (Air/Fuel ratio, ignition sequence).
- Specifically for use with turbo-charged engines, ELF also proposes the leaded fuel **ELF ATMO BOOST** and the unleaded fuel **PERFO RALLYE** for competitions outside official technical regulations.

Storage

To preserve its original properties and comply with the Health and Safety rules pertaining to fuels, **ELF ATMO RALLYE** 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: The RON & MON characterize the resistance to knocking (see definition) of a fuel used in a spark-ignition engine. The RON is representative of the functioning of an engine running in cold and low speed conditions, while the MON is representative of an engine running in warm and high speed conditions.

For competition use, the MON is commonly used to describe a fuel's anti-knocking capacity. Higher octane levels give the fuel greater capacity to allow the engine to function under severe conditions that raise speeds (high rotation speed, high compression ratio).

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.

AIR/FUEL RATIO (stoichiometric ratio): This ratio characterizes the respective fuel and combustive (air intake) quantities necessary for ideal combustion in theory. In practice, most of the time, the engine tuner will make sure that the air/fuel ratio corresponds to a value between 1.10 and 1.20, or the theoretical value in relation to the actual value.

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.



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KNOCKING: Knocking is the result of un-controlled combustion of the fuel in the engine. Sometimes revealed by a characteristic ‘pinking’ noise, these detonation phenomena are often damaging to 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).

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.