ELF WRF

"Unleaded Rally competition fuel"

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

- Developed specifically for Rally races under FIA regulations.
- **Complies** with FIA WRC (Annex J) regulations
- Particularly suited for naturally-aspirated and turbo-charged 4-stroke engines
- **ELF WRF** was the **official fuel** of the World Rally Championship (WRC) in 2002-2003 and the French Rally Championships from 2002 to 2004.

Characteristics

		Typical data	FIA regulations
OCTANE NUMBER	RON	101.4	95 to 102
	MON	89.4	85 to 90
DENSITY	kg/l at 15°C	0.763	0.720 to 0.785
OXYGEN	% m/m	2.5	3.7 max
AIR/FUEL RATIO		14.00	
VAPOUR PRESSURE	Bar at 37.8°C	0.480	0.900
DISTILLATION (°C)	% vol. at 70°C	20	10 to 47
	% vol. at 100°C	55	30 to 70
LEAD	g/litre	<0.001	0.013 max
SULPHUR	mg/kg	0.005	10 max

Properties

Fuel characteristics	→	Technical gains	→	Engine benefits
Octane indexes set to upper regulatory limit	→	Excellent **anti-knocking** for greater ignition advance and compression ratio Much **less damaging** knocking start for lower knock sensitivity (progressive) compared to fuels with the same octane indexes	→	**Maximum torque at low and high speeds** **Decrease in knocking safety margin on ignition sequence**
Oxygen content set to upper regulatory limit	→	Faster evaporation of fuel	→	**Better recovery**
Vapour pressure sufficient	→	Better fuel **evaporation** when cold	→	**Easy to start in all conditions**
Strong **density** (upper regulatory limit)	→	Strong energy content of fuel	→	**Significant improvement in filling compared to traditional fuel**
Adjusted chemical **composition**	→	**High combustion speed** for comfortable combustion control up to 15,000 rpm	→	**Better engine speeds**
Very low **benzene** and **sulphur** content	→	Harmless	→	**No special precautions for use** **ELF WRF respects both the environment and health**

Total absence of **alcohol** and **diolefins**	→	No incompatibility with fuel circuit materials	→	**No modification to make to fuel circuit parts**

Recommendations

- **ELF WRF** 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).

Storage

To preserve its original properties and comply with the Health and Safety rules pertaining to fuels, **ELF WRF** 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 condition, while the MON is representative of an engine running in warm and high speed condition.
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.

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 characterizes a fuel's capacity to evaporate. This 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'.