



# ELF TURBO MAX

*“Unleaded competition fuel for turbo-charged 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 TURBO MAX** is an unleaded fuel for turbo-charged 4-stroke engines, designed to extract the maximum power from engines.
- Complies with FIA Annex J regulations.
- Optimised within the limits of FIA regulations, **ELF TURBO MAX** has optimum anti-knocking, air/fuel mixture cooling and combustion speed properties.
- The specific formulation of **ELF TURBO MAX** lowers the octane indexes displayed to comply with FIA regulations (to the upper limit of Annex J) but maintains the octane read by the engine. As a result, it provides better anti-knock resistance than other competition fuels with the same octane indexes.
- Particularly suited for turbo-charged 4-stroke engines used in:
  - Group A & Group N
  - WRC & Rallycross
  - Acceleration
  - Hill climb races

## Characteristics

		Typical data	FIA/Annex J regulations
OCTANE NUMBER	RON	101.7	95 to 102
	MON	88.5	85 to 90
DENSITY	kg/l at 15°C	0.779	0.720 to 0.785
OXYGEN	% m/m	3.6	3.7 max
AIR/FUEL RATIO		13.60	
VAPOUR PRESSURE	Bar at 37.8°C	0.630	0.900
DISTILLATION (°C)	FBP (°C)	138	225 max
	% vol. at 70°C	34	10 to 47



*“Unleaded competition fuel for turbo-compressed 4-stroke engine”*

	% vol. at 100°C	51	30 to 70
<b>SULPHUR</b>	mg/kg	<30	<50
<b>LEAD</b>	g/litre	<0.001	0.013 max
<b>BENZENE</b>	% vol.	0.1	1

## Properties

Fuel characteristics	→	Technical gains	→	Engine benefits
Composition reducing <b>displayed octane indexes</b> without losing <b>octane read by the engine</b>	→	Excellent resistance to <b>knocking</b> for controlled combustion	→	Exceptional reliability in severe application  Permits choice of optimised ignition timing for more power
<b>Oxygen content</b> set to upper regulatory limit	→	Natural <b>booster</b> effect  High latent heat of evaporation helps <b>cool</b> mix before combustion  Greater <b>filling capacity</b> through air/fuel mixture cooling	→	Spontaneous power gain (without special tuning)  Power gains after optimisation of ignition advance  Excellent engine response in transient phase
Strong <b>density</b> (upper regulatory limit)	→	Strong energy content of fuel	→	Significant improvement of filling compared to traditional fuel
Selection of <b>best compounds</b> in <b>oxygenated</b> and <b>olefin</b> families	→	<b>High combustion speed</b> for optimised cycle yield	→	Better engine speeds
Very low <b>benzene</b> and <b>sulphur</b> content	→	Harmless	→	No special precautions for use  ELF TURBO MAX respects both the environment and health



*“Unleaded competition fuel for turbo-compressed 4-stroke engine”*

## Recommendation

- **ELF TURBO MAX** provides significant gains in power and reliability, even with no fine-tuning.
- To get the full benefit of this product, the engine mapping must be optimised (Air/Fuel ratio, ignition sequence).
- For specific use with turbo-charged engines, ELF also proposes the leaded fuel **ELF TURBO BOOST** for competitions with no technical regulatory constraints and the unleaded fuel **ELF TURBO EVO** complying with FIA Annex J regulations.

## Storage

To preserve its original properties and comply with the Health and Safety rules pertaining to fuels, **ELF TURBO MAX** 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/m<sup>3</sup>), this is the density of one litre (or 1000 litres) of fuel.

A fuel's density increases as its temperature drops.