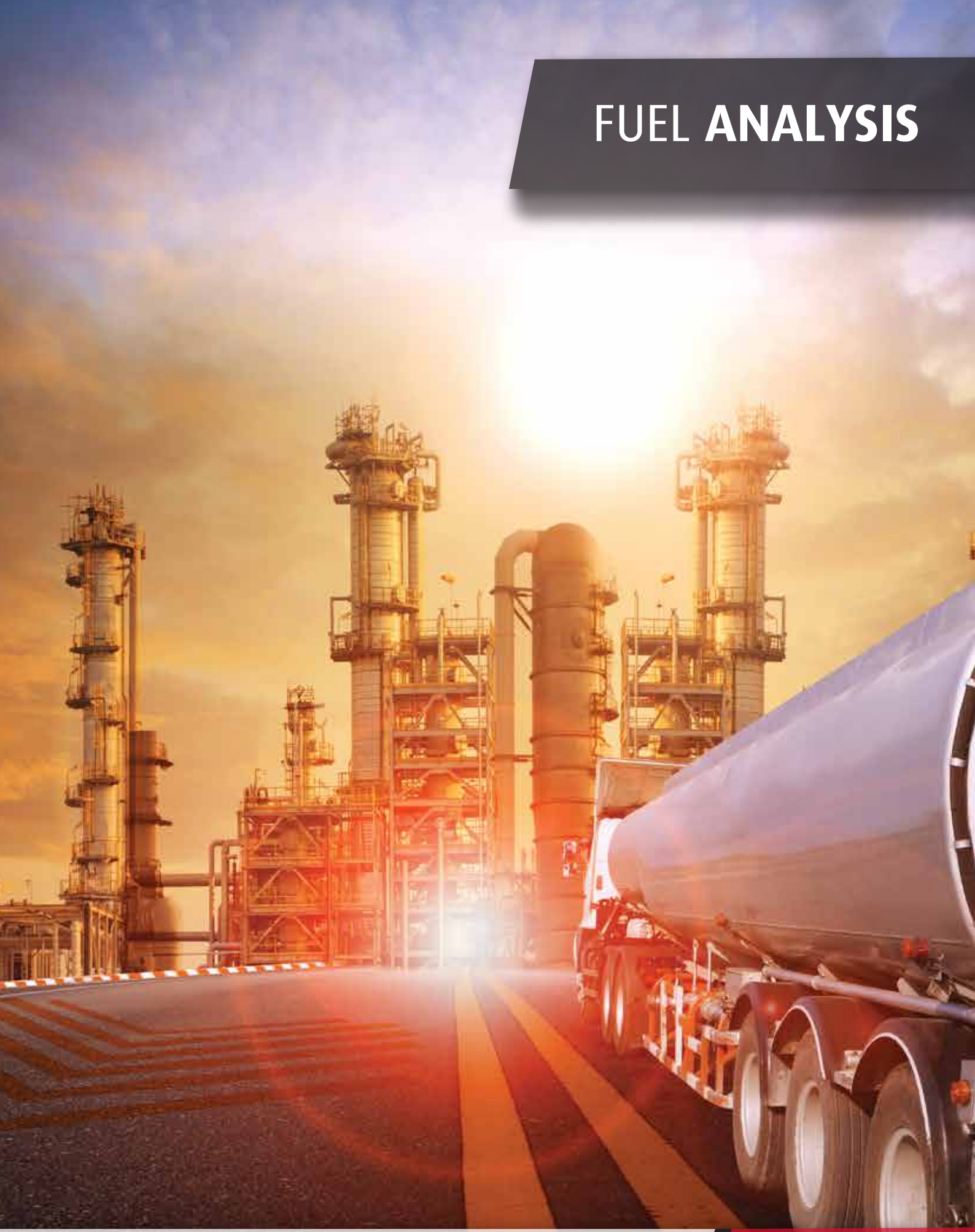
FUEL **ANALYSIS**



WEAR® CHECK
Condition Monitoring Specialists

Oil & Fuel Analysis | Reliability Solutions |
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Fuel Analysis

WearCheck's fuel analysis kit has been designed to help customers determine whether their fuel meets SANS requirements. SANS 342:2016 is the specification for South African diesel, and SANS 1598:2006 is the specification for unleaded petrol.

WearCheck is an ISO 9001 and 14 001-certified company. The testing laboratory has ISO 17025 accreditation.

A fair proportion of diesel engine failures can be directly traced back to the quality of the fuel which was in use. Fuel contamination, degradation or adulteration can have serious consequences in terms of blocked filters, stuck or worn injectors, poor spray patterns and atomisation.

Diesel Tests
- Distillation (ASTM D86)
- Density at 20°C (ASTM D7042)
- Viscosity at 40°C (ASTM D7042)
- Flashpoint (ASTM D93)
- Total contamination (IP440)
- Water content (ASTM D6304)
- Sulphur content (ASTM D4294)
- Cetane index (ASTM D976)

Petrol Tests
- Distillation (ASTM D86)
- Colour and appearance (In-house)
- Density at 20°C (ASTM D974)
- Lead (Pb) content (In-house)

Additional Tests: Bacterial and fungal growth, Total Acid Number (TAN). Testing in accordance with ASTM to SANS specifications.

Significance of these tests:

Flashpoint

The flashpoint of diesel is the minimum temperature at which the fuel will ignite on application of an ignition source. Flashpoint varies inversely with the fuel's volatility. This helps identify petrol adulteration.

Viscosity

Viscosity is a measure of a fluid's resistance to flow. It therefore affects injector lubrication and fuel atomisation. Fuels with low viscosity may not provide sufficient lubrication for the precision fit of fuel injection pumps or injector plungers, resulting in increased wear or leakage. High viscosity fuels, on the other hand, will increase gear-train, cam and follower wear on the fuel pump assembly due to the higher injection pressures. Diesel fuels with high viscosity also tend to form larger droplets on injection, causing poor combustion and increased smoke and emissions. Fuels that do not meet viscosity requirements lead to loss of performance.

Sulphur

Diesel with higher sulphur content produces more exhaust particulate emissions than diesel with a lower sulphur content, which has major environmental implications. Local and international regulatory bodies have lowered the allowable percentage of sulphur in diesel to 0.05%. This may change in the near future to 0.005% as we strive to become more environmentally friendly. Most diesel vehicles function optimally with 0.005% sulphur content diesel. Using diesel with higher sulphur content can lead to failures of the emission control systems and/or corrosion of the cylinder liner and piston due to the formation of sulphuric acid.

Distillation

Distillation measures the temperature range over which a fuel turns to vapour. Volatility is one of the primary methods which distinguishes various fuels from one another. It also gives an indication of the fuel's ability to start the engine, its power, fuel economy, emissions and deposit formation.

Density

This is a measure of the specific gravity of the fuel. It essentially determines the energy content. The denser the fuel, the more power the engine can generate and vice versa.

Cetane Number (index)

The Cetane number is a measure of the ignition quality of the diesel. It represents the time delay between injection and ignition. If the Cetane number is too high, the fuel will ignite too close to the injector. This forms a fuel-rich region whilst the rest of the chamber has a weak fuel to air ratio. Incomplete combustion and soot formation will be the result. Low Cetane fuels cause knock, difficult starting, rougher running and increased exhaust emissions.

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