

Cetane index, density, aromatics, saturates, and hydrogen in jet fuel



Fast and straightforward determination
by near-infrared spectroscopy

A dedicated solution for quality control of jet fuel

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Metrohm offers a turnkey solution for quality control of jet fuel by near-infrared spectroscopy (NIRS). Based on a dedicated spectral database and a pre-calibration model, this solution enables manufacturers of jet fuel to reduce the cost of their daily routine analysis while improving the quality of their product.

Jet fuel is a product frequently used in civil and military aviation. At the end of the production process, various quality parameters need to be determined to ensure that the product meets the standards for use in aviation. Those parameters include **Cetane Index (CI or CETI), American Petroleum Institute (API) gravity, aromatics, hydrogen and saturates content, density, flash and freeze point, viscosity and different boiling points (T10, T20, T50)**. These parameters are still often determined in the laboratory by time consuming chemical and physical analysis involving complex sample preparation and sometimes expensive equipment.

NIRS on the other hand requires neither chemicals nor sample preparation, it can even be used by non-chemists, and provides results in less than a minute. Furthermore, multiple chemical and physical parameters can be determined simultaneously with a single measurement. **The combined benefits of this technology make NIRS the ideal solution for a large number of daily QA/QC measurements or continuous process analysis in the petrochemical industry.**



Easy-to-use

- Turnkey solution
- Measure at the push of a button
- No expertise required



Fast

- No sample preparation
- Analysis results within one minute
- More than 15 minutes time saving compared to reference methods



Cost minimizing

- No solvents, no reagents
- No waste disposal
- Instant results from first day



Clean

- Non-destructive, chemical-free method
- Minimum of impact on health and environment

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Turnkey solution for jet fuel analysis

The Metrohm solution for jet fuel analysis comes with ready-to-use pre-calibration models for the determination of Cetane Index (CI or CETI), American Petroleum Institute gravity (API), aromatics, hydrogen and saturates content, density, flash and freeze point, viscosity or boiling points (T10, T20, T50). Thanks to these pre-calibrations, the Metrohm solution can be used as a starter model without any method development.

Reliable results from day one

The robust pre-calibration model allows precise and accurate determination different physical and chemical quality parameters of jet fuel with excellent reproducibility. The performance of the pre-calibration can be improved even further, if a smaller calibration range is selected or if it is augmented with customer specific samples.



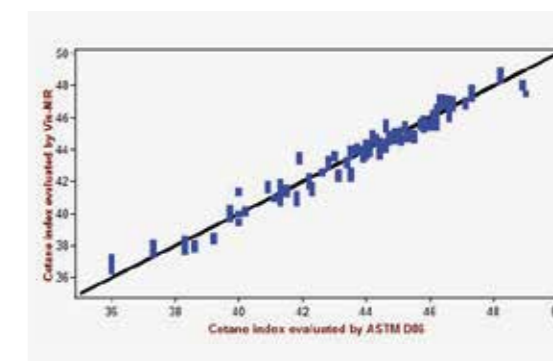
File name	Parameter	Range	SECV	R ²
CETI	Cetane Index	36–50	0.90	0.907
API	API gravity	38–48 °	0.56	0.931
ARO	Aromatics	10–25 %	1.0 %	0.851
T10	T10	158–200 °C	3.74	0.833
T20	T20	165–205 °C	2.66	0.909
T50	T50	180–220 °C	3.19	0.876
DENS	Density	0.78–0.83 g/cm ³	0.003	0.936
FLAS	Flash Point	38–65 °C	2.55	0.873
FREZ	Freeze Point	-65–(-40)°C	2.10	0.850
HYDR	Hydrogen	13.2–14.2 %	0.0522	0.936
SATU	Saturates	75–90 %	0.8051	0.910
VI20	Viscosity at 20 °C in cSt	3–7 cSt	0.19	0.937

Straightforward and intuitive operation

Metrohm instruments for Vis-NIR are controlled by Vision Air software. Vision Air provides two environments tailored to users' needs: **Vision Air Routine** enables secure daily operation by routine users, while **Vision Air Manager** allows experienced and authorized users to control data and perform instrument configurations. For daily quality control of jet fuel, measurements can be performed with two simple clicks.

Customized service and support

Metrohm supports users by updating the default pre-calibration on demand with customer specific samples. This improves the performance of the method and/or extends it to new applications. Such updates are easily performed in the Vision Air Manager network mode. When using Vision Air Network, all instruments within a global custo-



mer network can be synchronized at the push of button. Customer specific calibrations can be easily developed for the determination of additional quality parameters of jet fuel, e.g. **water content, pour point, benzene content and others**.

Ordering information

6.6072.307 NIRS pre-calibration for jet fuel analysis

Requires hardware

2.921.1410 NIRS XDS RapidLiquid Analyzer

Comprised of:

1.921.0010 NIRS XDS Monochromator
1.921.0410 NIRS XDS RapidLiquid Module
6.7400.000 NIRS XDS accessory kit
8.921.8005EN Manual for NIRS XDS RapidLiquid Analyzer

Requires software

6.607.2201 Vision Air 2.0

Optional software

6.607.2204 Vision Air 2.0 Server
6.607.2206 Vision Air 2.0 Network

Requires certified standards

6.7450.040 NIRS transmission wavelength calibration standard

Optional certified standards

6.7450.050 NIRS transmission standard, set of 6 (for the regulated environment)
6.7450.060 NIRS transmission wavelength verification standard

Sampling accessories

6.7402.000 NIRS disposable glass vials, 8 mm (250 pcs.)
6.7403.000 NIRS XDS spacer for disposable glass vials, 8 mm

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