Anton Paar

Oxidation Stability

Instruments for the Analysis of Petroleum Products

What is Oxidation Stability?

Oxidation stability describes the resistance of a material towards oxygen, which is a basic requirement to guarantee failure-free operation and is an integral part of petrochemical product specification. Aging of petrochemical products can occur both during storage and use. Hydroperoxides are the initial reaction products, which – followed by a series of subsequent reactions – give rise to aldehydes, acids and polymers. Ultimately, these oxidation products are responsible for an acidity increase leading to rusting and corrosion, oil thickening leading to loss of viscosity control, and appearance of insoluble materials leading to friction and blockage.

Oxidation stability testers use accelerated oxidation conditions to artificially age a sample and simulate long storage and use periods in a very short time. Typical parameters used to accelerate aging conditions are elevated temperatures, high oxygen concentrations and high pressure.

PetroOxy
Oxidation Stability Tester

PetroOxy is a fast, safe and user-friendly alternative to traditional fuel stability test methods. It measures the induction period, which can be used as an indication of the oxidation and storage stability. Compared to other oxidation and storage stability test methods, PetroOxy requires only a small sample volume of 5 mL to give exact test results in a short period of time. Moreover, PetroOxy is the only system applicable for a wide range of fuels including gasoline, diesel, biodiesel and blends.

Standard Methods

Gasoline:
ASTM D7525

Diesel, biodiesel (FAME), blends:
ASTM D7545, EN 16091, IP 595

OBA 1
Oxidation Stability Tester

The semi-automatic OBA 1 is used to determine the oxidation stability (induction period) and the tendency to form gum (potential residue) under accelerated oxidation conditions. OBA 1 is suitable for oxidation stability applications on gasoline and aviation fuel.

Standard Methods

Induction period of gasoline:
ASTM D525, ISO 7536, IP 40, JIS K 2287, FTM 791-3352

Potential residue of aviation fuels:
ASTM D873, JIS K 2276, FTM 791-3354, IP 138

TOST & TOO
Oxidation Stability Tester

The modular TOST & TOO tester is used to describe the oxidation stability and corrosiveness properties of fuel or oil in order to predict field storage and engine behavior as well as corrosion tendency towards metals. It is suitable for various mineral oils such as steam turbine oils and distillate fuel oils.

Standard Methods

ASTM D943, ASTM D2274, ASTM D4310, ASTM D7462, ISO 12205, ISO 4263-1, ISO 4263-2, ISO 4263-3, DIN 51587, FTM 791-5308, IP 157, IP 388, JIS C 2101, JIS K 2514

Solutions from Anton Paar

PetroOxy

Benefits at a Glance

- All-in-one system for gasoline, diesel (B0), FAME/ biodiesel (B100) and diesel/FAME blends (B0 to B100)
- Excellent reproducibility and repeatability
- Short test time
- Maximized user safety
- No sample preparation necessary

OBA 1

Benefits at a Glance

- Digital PA 5-OBA programmable manometers
- Pressure-certified oxidation vessels
- 4 test places for parallel testing
- PC software for data handling
- No sample preparation necessary

TOST & TOO

Benefits at a Glance

- Modular
- Standardized glassware sets for different applications
- 4 test places for parallel testing

PetroOxy

The all-in-one solution for oxidation stability of fuels

Time-saving:
Fastest Test Method

Oxygen connection

- Automatic charging and releasing of oxygen – inlet oxygen pressure of up to 8 bar

Test cell

- Chemically inert gold-plated test cell
- Small sample volume of only 5 mL required
- Fast and easy cleaning
- Automatic re-cooling by Peltier elements

PetroOxy
Oxidation Stability Tester

This patented Rapid Small Scale Oxidation Test (RSSOT) provides a complete oxidation stability analysis of petroleum products automatically in a very short test time.

PetroOxy is suitable for the stability determination of liquid fuels (gasoline, diesel, biodiesel, FAME and blends).

Benefits at a Glance

- All-in-one system for gasoline, diesel (B0), FAME/biodiesel (B100) and diesel/FAME blends (B0 to B100)
- Excellent reproducibility and repeatability
- Short test time
- Maximized user safety
- No sample preparation necessary

Standard Methods

Gasoline: ASTM D7525
Diesel, biodiesel (FAME), blends: ASTM D7545, EN 16091, IP 595

Technical Specifications	
Application range	Up to 200 °C
Re-cooling	Fan and active Peltier, automatic
Sample volume	Typically 5 mL
Test cell	Gold-plated
Pressure range	Up to 1800 kPa
Oxygen supply	800 kPa (maximum input)
Detection	Pt100 temperature sensor
Internal memory	20 test results, 16,000 data sets
Safety	Screw cap cover, safety and insulation hood, over-temperature shut-off
Display	Pressure, temperature, pressure curve
Interface	RS232
Power supply	115 V/230 V, 50 Hz/60 Hz, 500 W
Dimensions	240 mm x 400 mm x 260 mm (W x D x H)
Weight	11 kg

OBA 1

Oxidation Stability Tester

The semi-automatic OBA 1 is used to determine the oxidation stability (induction period) and the tendency to form gum (potential residue) under accelerated oxidation conditions.

OBA 1 is suitable for oxidation stability applications on gasoline and aviation fuel.

Benefits at a Glance

- Digital PA 5-OBA programmable manometers
- Pressure-certified oxidation vessels
- 4 test places for parallel testing
- PC software for data handling

Convenient Operation

- The PA 5-OBA is a programmable manometer with a digital display and pressure connection. It automatically determines the induction period and checks the leakage stability of the oxidation vessel before starting the test automatically.
- Data can be transferred from the manometer to your you PC via an USB interface (cable included)
- The included PC software "PetroNet Standard" allows to monitor the numerical and graphical data on the screen.
- Convenient temperature reading with Pt1000 temperature sensor (optional) and correction of the induction period according to the used method

Customized User Flexibility

- Available with a liquid bath or dry-heat bath
- Dongle to unlock the PA 5 Professional module of the PetroNet Standard software to allow full access to the programmable parameters of the PA 5 manometers (optional)
- PA 5 manometer pressure calibrator (optional)
- Dry-heat bath calibration set (optional)
- Certified manometers available with manufacturer's calibration certificate or official (DKD) calibration certificate (optional)
- Tool set to simplify the pressure vessel opening and closing procedure (optional)
- Support shelf for test vessel (optional)

Standard Methods

Induction period of gasoline:
ASTM D525, ISO 7536, JIS K 2287, FTM 791-3352, IP 40
Potential residue of aviation fuels:
ASTM D873, JIS K 2276, FTM 791-3354, IP 138

Technical Specifications		
Configuration	OBA 1	OBA 1/T
Application range	Up to 200 °C	Up to 120 °C
Tempering	Liquid bath, 45 L	Dry-heat bath
Test places	4	
Pressure range measurement	0 bar to 14 bar or 1400 kPa or 203 psi	
Resolution displayed	1 mbar or 0.1 °C	
Internal memory	57,000 data sets	
Oxidation vessel	Stainless steel, certified for 40 bar, static pressure at 100 °C	
Interface	USB	
Power supply	115 V, 50 Hz/60 Hz, 1000 W or 230 V, 50 Hz/60 Hz, 2000 W	115 V, 50 Hz/60 Hz, 900 W or 230 V, 50 Hz/60 Hz, 2300 W
Dimensions (W x D x H)	430 mm x 430 mm x 900 mm	900 mm x 600 mm x 900 mm
Weight	31 kg	66 kg

TOST & TOO

Oxidation Stability Tester

The modular TOST & TOO tester is used to describe the oxidation stability and corrosiveness properties of fuel or oil in order to predict field storage and engine behavior as well as corrosion tendency towards metals.

It is suitable for various mineral oils such as steam turbine and distillate fuel oils.

Benefits at a Glance

- Modular
- Standardized glassware sets for different applications
- 4 test places for parallel testing

Convenient Operation

- Digital thermostat with multi-display and acoustic alarm signal
- Certified flow meter unit comprising 4 flow meters with needle valve
- 4 openings with lid for glassware
- Tubing for air and cooling water

Customized User Flexibility

- Vacuum filtration assembly suitable for ASTM D2274, IP 388, ASTM D7462, ISO 12205 (optional)
- Various accessories like metal test specimens, thermometers, catalysts, etc. (optional)

Standard Methods

ASTM D943, ASTM D2274, ASTM D4310, ASTM D7462, ISO 12205, ISO 4263-1, ISO 4263-2, ISO 4263-3, JIS C 2101, JIS K 2514, DIN 51587, FTM 791-5308, IP 157, IP 388

Technical Specifications	
Application range	Ambient to 175 °C
Flow meter	4 flow meters (0.4 L/h to 6 L/h)
Bath opening	4 x Ø 51 mm
Safety	Overheat protection, automatic shut-off
Volume	33 liters
Interface	RS232
Power supply	115 V, 50 Hz/60 Hz, 1000 W or 230 V, 50 Hz/60 Hz, 2000 W
Dimensions	280 mm x 430 mm x 650 mm (W x D x H)
Weight	30 kg

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