

OXIDATION STABILITY OF GASOLINE AND AVIATION FUELS

Oxidation Stability of Gasoline (Induction Period Method)

Oxidation Stability of Aviation Fuels (Potential Residue Method)

Test Method

Provides an indication of the tendency of gasoline and aviation fuels to form gum in storage. The sample is oxidized inside a stainless steel pressure vessel initially charged with oxygen at 100psi (689kPa) and heated in a boiling water bath. The amount of time required for a specified drop in pressure (gasoline) or the amount of gum and precipitate formed after a specific aging period (aviation fuels) is determined.

Oxidation Stability Test Apparatus

- Conforms to ASTM D525, D873, ISO 7536 and related specifications
- Oxidata® Pressure Measurement System
- Available in two, four or six-unit configurations
- Choice of water/liquid or solid block heating baths
- Oxidation pressure vessel incorporates burst disk assembly

Consists of Oxidation Pressure Vessel, Pressure Measurement Equipment, Oxidation Bath and Accessories.

Ordering Information

Oxidation Pressure Vessel
Oxidation Baths
Pressure Measurement Equipment
Accessories

page 80
pages 81-82
pages 83-84
pages 81-82



K10500 Oxidation Pressure Vessel

Oxidation Pressure Vessel

Precision machined stainless steel pressure vessel includes threaded body; lid; stem with filler rod and mounting flange; needle valve for purging, pressurizing and exhausting pressure vessel with oxygen; and burst disk assembly. Pressure vessel interior and inside of stem have a high polish to facilitate cleaning and prevent corrosion. Stainless steel burst disk ruptures at 223psi (1537kPa) to prevent unsafe pressure build-up inside pressure vessel. Octagonal sections on the pressure vessel and lid permit tight closure with wrench. Includes buna-N gaskets. See Accessories on pages 81-82 for available rupture disk assembly retrofit for existing pressure vessels. Can also be used as a pressure vessel in ASTM D5304 "Standard Test Method for Assessing Distillate Fuel Storage Stability by Oxygen Overpressure".

Ordering Information

Catalog No.
K10500 Oxidation Pressure Vessel



Oxidata® Pressure Measurement System

For Oxidata® specifications and ordering information refer to pages 83-84.

OXIDATION STABILITY OF GASOLINE AND AVIATION FUELS

Solid Block Oxidation Baths

- Solid block baths conforming to ASTM and related specifications. Constant temperature baths for heating K10500 Oxidation Pressure Vessels in accordance with ASTM specifications.

Solid Block Baths—Insulated aluminum block baths available in two or four-unit capacity. Baths feature microprocessor temperature control with built-in overtemperature protection and dual LED displays for setpoint and actual temperature values in °C/°F format. The solid block design offers operating advantages over the boiling water bath, and meets temperature control and other requirements of ASTM and related methods. It should be noted, however, that many applicable specifications for this test method call for a liquid bath medium. Housed in an insulated steel cabinet with chemical-resistant polyurethane enamel finish. Includes lids for pressure vessel ports. Order thermometer separately.

Communications software (RS232, etc.) ramp-to-set and other enhanced features are available on the solid block and 4-6 place liquid baths as extra cost options. Contact your Koehler representative for information.

Specifications

Conforms to the specifications of: ASTM D525, D873; IP 40, IP 138; ISO 7536; DIN 51780, 51799; FTM 791-3352, 791-3354; NF M 07-012, 07-013

Maximum Temperature:
Solid Block Baths: 250°F (121°C)

Solid block baths meet temperature control and other requirements of ASTM and related methods. While the aluminum block design offers operating advantages over the standard boiling water bath, it should be noted that many applicable specifications for this test call for a liquid bath medium. Please refer to the test method for the specific requirements.



K10491 Solid Block Oxidation Bath

Ordering Information

Ordering Information					
Type	Catalog No.		Electrical Requirements C €	Heater Range	Dimensions lwxh, in. (cm)
Solid Block	K10401	2 vessels	115V 60Hz 12A	0-1300W	15x10x17 (38x25x43)
	K10491		220-240V 50/60Hz 6A		
	K10403	4 vessels	115V 60Hz 22A	0-2500W	
	K10493		220-240V 50/60Hz 11A		

Software compatible, inquire with Koehler Customer Service.

Ordering Information	
Catalog No.	Accessories
K10540	Glass Sample Container and Cover with pour out spout
K10540/C	Glass Sample Container Cover Only
K10510	Gasket. Replacement composition gasket for K10500 Oxidation Pressure Vessel
K10551	Pressure Line. For pressurizing Oxidation Pressure Vessel. 6 ft. (1.83m) long, with quick release coupling for needle valve on pressure vessel and threaded fitting for oxygen tank
K10556	Oxygen Manifold Pressure Relief System Connects to oxygen source to prevent overcharging of vessel. Equipped with relief valve to vent at 125psi and 300 series stainless steel 150psi burst disk assembly. Constructed from 300 series stainless steel. Cleaned for oxygen service
K10520	Wrench. For tightening seal on Oxidation Pressure Vessel
K10530	Table Socket. Installs in benchtop to aid in tightening seal on Oxidation Pressure Vessel
K10560	Bronze Tubing For connecting pressure recorder to vessel. Flexible seamless helical tubing with protective armor braid and connections. 5 ft (1.52m) long
K10525	Burst Disk Assembly Retrofit kit for Oxidation Pressure Vessel without burst disk assembly
250-000-22F	ASTM 22F Thermometer Range: 204 to 218°F
250-000-22C	ASTM 22C Thermometer Range: 95 to 103°C

OXIDATION STABILITY OF GASOLINE AND AVIATION FUELS



K10404 Liquid Oxidation Bath with K10500 Pressure Vessels

Water/Liquid Oxidation Baths

- Water/liquid baths conforming to ASTM and related specifications. Constant temperature baths for heating K10500 Oxidation Pressure Vessels in accordance with ASTM specifications.

Water/Liquid Baths—Two different models, both equipped with low liquid-level controllers in accordance with the latest ASTM specifications. Two-unit analog controlled water bath can be flush mounted in a table top if desired, and is equipped with an overflow standpipe/drain to maintain the proper depth when the pressure vessels are inserted, and a plated brass reflux condenser to minimize evaporation loss.

The six unit model can be used with water or oil as a bath medium, and has microprocessor temperature control that provides quick temperature stabilization without overshoot. Dual LED displays provide setpoint and actual temperature values in °C/°F format. A built-in overtemperature control circuit interrupts power should the bath temperature exceed a programmed cut-off point. Both models feature double-wall insulated construction with stainless steel tanks, support racks, and port covers. Order thermometer separately. *The 6 unit model can be ordered with interchangeable racks for performing the ASTM D942, ASTM D323 and D1298 test methods—please contact your Koehler representative for additional information.*

Communications software (RS232, etc.) ramp-to-set and other enhanced features are available on the solid block and 4-6 place liquid baths as extra cost options. Contact your Koehler representative for information.

Specifications

Conforms to the specifications of: ASTM D525, D873; IP 40, IP 138; ISO 7536; DIN 51780, 51799; FTM 791-3352, 791-3354; NF M 07-012, 07-013

Maximum Temperature:

- 2 Unit Water/Liquid Bath: boiling water
- 6 Unit Water/Liquid Bath: 250°F (121°C)

Solid block baths meet temperature control and other requirements of ASTM and related methods. While the aluminum block design offers operating advantages over the standard boiling water bath, it should be noted that many applicable specifications for this test call for a liquid bath medium. Please refer to the test method for the specific requirements.

Ordering Information

Type	Catalog No.	Electrical Requirements	Heater Range	Dimensions (l x w x h, in. (cm))
Water/Liquid	K10400 Analog	2	115V 60Hz 17.3A	24x14x24 (61x36x61)
	K10402 Analog	vessels	220-240V 50/60Hz 9.0A	
	K10404 Digital	6	220-240V 50/60Hz 18.1A	24x14x29½ (61x36x75)

Ordering Information

Catalog No.

Accessories

K10540	Glass Sample Container and Cover with pour out spout
K10540/C	Glass Sample Container Cover Only
K10510	Gasket. Replacement composition gasket for K10500 Oxidation Pressure Vessel
K10551	Pressure Line. For pressurizing Oxidation Pressure Vessel. 6 ft. (1.83m) long, with quick release coupling for needle valve on pressure vessel and threaded fitting for oxygen tank
K10556	Oxygen Manifold Pressure Relief System Connects to oxygen source to prevent overcharging of vessel. Equipped with relief valve to vent at 125psi and 300 series stainless steel 150psi burst disk assembly. Constructed from 300 series stainless steel. Cleaned for oxygen service
K10520	Wrench. For tightening seal on Oxidation Pressure Vessel
K10530	Table Socket. Installs in benchtop to aid in tightening seal on Oxidation Pressure Vessel
K10560	Bronze Tubing For connecting pressure recorder to vessel. Flexible seamless helical tubing with protective armor braid and connections. 5 ft (1.52m) long
K10525	Burst Disk Assembly Retrofit kit for Oxidation Pressure Vessel without burst disk assembly
250-000-22F	ASTM 22F Thermometer Range: 204 to 218°F
250-000-22C	ASTM 22C Thermometer Range: 95 to 103°C

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 184 through 191.

OXIDATION STABILITY OF GASOLINE AND AVIATION FUELS

Oxidata® Pressure Measurement Systems

- Electronic pressure measurement systems exclusively designed for ASTM oxidation test methods
- Powerful Oxidata® software for Windows® environments
- Monitors up to twelve pressure and four temperature channels
- Automatic end-point detection
- Real-time average bath temperature display
- Can be installed to most manufacturer's fuels oxidation test apparatus

Complete electronic measurement systems for plotting pressure versus time and temperature in oxidation testing of fuels. Each system includes transducers, multiplexer, data acquisition card, software, and mounting and connecting hardware. Systems are available in two, three and four pressure vessel configurations, and additional channels can be added for up to a total of twelve pressure and four temperature channels.

Koehler's pressure measurement systems for fuels oxidation testing features Oxidata®, a high accuracy pressure measurement software package designed exclusively for ASTM oxidation test methods. Designed to run in a Windows® 2000 or Windows XP environment, Oxidata® monitors up to twelve samples simultaneously, with graphical or tabular display of results. Each channel can be independently configured for any of the applicable ASTM standard test methods without compromising the independence or accuracy of the other channels. Independent start and stop times and user programmable end points add even greater flexibility.

The software plots your data on screen on line, real time, and automatically saves your data on disk or to the hard drive during the test to prevent loss of valuable data. Multiple display options include the ability to view the status of all twelve pressure channels on screen simultaneously and then click on any one channel for a graph display; or to view four channels in graphical format simultaneously. Powerful program features allow you to change axes, have colored plot lines and zoom in on a specific plot sector to view data in greater detail.



Oxidata® software automatically detects the break point and induction period.



Oxidata® Features and Specifications

- On line, real time monitoring of up to twelve samples simultaneously – results plot directly to the screen for instant monitoring or printout of results
- Automatic detection and reporting of break point and induction period
- Invalid test indication when a pressure leak is detected
- Menu options for fuels oxidation testing and other ASTM oxidation tests
- Programmable automatic end point detection with graphical and tabular representation
- Each channel can be configured and operated independently with different start/stop times and different ASTM test methods
- Zoom in feature allows for magnification of any plot sector on any channel for a more detailed study
- Monitors and reports temperatures of as many as twelve pressure vessels simultaneously using accessory RTD's, and calculates and displays average temperature for each bath
- Exports data to spreadsheet programs such as Microsoft Excel®, Lotus 1-2-3® etc.
- Temperature and pressure calibration capability
- Data is saved directly to the disk or hard drive during testing to prevent loss of valuable data
- Operates in Windows® 2000 and Windows XP environments

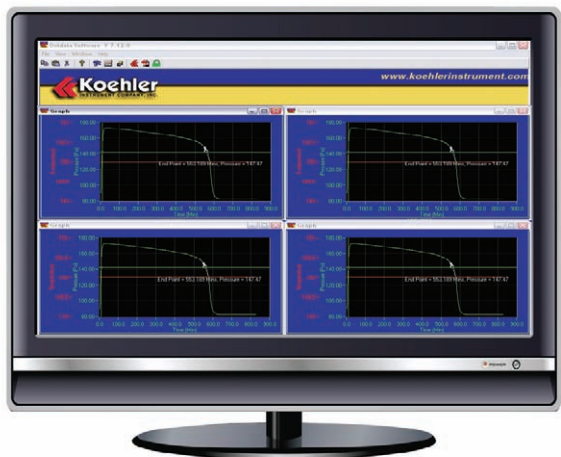
Included Accessories (for the pressure measurement systems)

- Transducers (connects directly to pressure vessel)
- USB interface
- Multiplexer
- Oxidata® software
- RTD probe assembly (1)
- Connecting cables and hardware

Computer Requirements

- Processor: Intel® Pentium II or similar (minimum)
- Memory (RAM): 256MB or higher
- Speed: 500 MHz or higher
- Windows® 2000 or higher
- Disk Space: 15 MB free space (minimum)
- Communications Port: One USB port
- Other Software: Microsoft® Excel (97 or above)
- One RS232 port for temperature controller (optional)

OXIDATION STABILITY OF GASOLINE AND AVIATION FUELS



Real-time plot screens display pressure versus time for up to twelve samples simultaneously (four different test methods shown).

Ordering Information

Catalog No.

The ordering information below is for installation to existing Koehler equipment. For other makes of equipment, a few basic hardware items may also be required – please contact your Koehler representative for assistance.

Oxidata® Pressure Measurement System for Fuels Oxidation C €

K10504-XP	2-Unit System, 115V 60Hz
K10594-XP	2-Unit System, 220-240V 50/60Hz
K10505-XP	4-Unit System, 115V 60Hz
K10595-XP	4-Unit System, 220-240V 50/60Hz
K10506-XP	6-Unit System, 115V 60Hz
K10596-XP	6-Unit System, 220-240V 50/60Hz

Accessories

K10504-0-1	Transducer
K70519	RTD Kit, for monitoring the temperature of an additional bath

Mechanical Pressure Measuring and Recording Equipment

- One-pen or two-pen mechanical recorders
- Pressure gauge for aviation fuel tests

Mechanical Recorders—Spring-wound circular chart recorder measures pressure inside oxidation pressure vessel for break point and induction period determinations on gasoline. Housed in a steel case suitable for wall mounting. Order accessory bronze tubing for connection to oxidation pressure vessel. Suitable for oxygen service. Includes 100 24-hour charts.

Pressure Gauge for Aviation Fuel Tests—Suitable for testing of aviation fuels according to ASTM D873. Range 0-200psi. Suitable for oxygen service.

Ordering Information

Catalog No.

Mechanical Recorders

K10570	One-Pen Recorder
K10580	Two-Pen Recorder

Pressure Gauge for Aviation Fuel Tests

K10590	Pressure Gauge
---------------	----------------

Accessories

308-000-005	Recorder Charts Pack of 100
308-001-02R	Recorder Cartridge Pen, Red (for use with K10570 Recorder)
308-001-02B	Recorder Cartridge Pen, Blue (for use with K10570 and K10580 Recorders)
308-001-L2R	Recorder Cartridge Pen, Long Red (for use with K10580 Recorder)