## Fuels

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<tr>
<td>ASTM D2158; GPA 2140</td>
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</tbody>
</table>

For information on additional testing methods for fuels:
- Cloud Point and Pour Point of Petroleum Oils
  - please refer to pages 124-125
- Oxidation Stability of Distillate Fuel Oil (Accelerated Method)
  - please refer to pages 112-114
- Please refer to the Viscosity, Flash Point and General Tests Sections
- Additional test methods are available upon request
  - please call or write for information
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 ageing 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 or solid block heating baths
- Oxidation pressure vessel incorporates burst disk assembly

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

For product specifications and ordering information:

- Oxidation Pressure Vessel page 76
- Oxidation Baths page 77
- Pressure Measurement Equipment pages 78-79
- Accessories page 77

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 page 77 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

For Oxidata™ specifications and ordering information refer to pages 78-79.
Oxidation Baths

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

Liquid Baths—Two different models, both equipped with low liquid-level controllers in accordance with the latest ASTM specifications. Two-unit 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 four-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 4-6 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.

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; DIN 51780, 51798; FTM 791-3352, 791-3354; ISO 7536

Maximum Temperature:
- 2 Unit Liquid Bath: boiling water
- 4-6 Unit Liquid Bath: 250°F (121°C)
- 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 method call for a liquid bath medium.

<table>
<thead>
<tr>
<th>Type</th>
<th>Catalog No.</th>
<th>Electrical Requirements</th>
<th>Heater Range</th>
<th>Dimensions lxwxh, in.(cm)</th>
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<tr>
<td>Water</td>
<td>K10400</td>
<td>115V 50/60Hz 17.3A</td>
<td>0-2000W</td>
<td>22x14x24/ (56x36x62)</td>
</tr>
<tr>
<td></td>
<td>K10402</td>
<td>220-240V 50/60Hz 9.0A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>K10404</td>
<td>220-240V 50/60Hz 18.1A</td>
<td>0-3000W</td>
<td>30x14x28/ (76x36x71)</td>
</tr>
<tr>
<td></td>
<td>K10401</td>
<td>115V 50/60Hz 12A</td>
<td>0-1300W</td>
<td>16x20x17/ (41x51x43)</td>
</tr>
<tr>
<td></td>
<td>K10491</td>
<td>220-240V 50/60Hz 6A</td>
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</tr>
<tr>
<td></td>
<td>K10403</td>
<td>115V 50/60Hz 22A</td>
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<td>20x20x17/ (51x51x43)</td>
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<td></td>
<td>K10493</td>
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For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.
Oxidata™ Pressure Measurement Systems

• Electronic pressure measurement systems exclusively designed for ASTM oxidation test methods
• Powerful Oxidata™ software for Windows® and Windows 95® 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® or Windows 95® 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 four baths 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® and Windows 95® environments

Included Accessories (for the pressure measurement systems)
Transducers (connects directly to pressure vessel)
Data acquisition card
Multiplexer
Oxidata™ software
RTD probe assembly (1)
Connecting cables and hardware

Computer Requirements
Processor: 486 or higher
Memory (RAM): 8MB or higher
Speed: 66 MHz or higher
Windows® 3.1 or better, Windows 95®
Disk Space: 1.6MB
**Ordering Information**

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™ Pressurement Measurement System for Fuels Oxidation

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<th>Catalog No.</th>
<th>Description</th>
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<tr>
<td>K10504</td>
<td>2-Unit System, 115V 60Hz</td>
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<tr>
<td>K10594</td>
<td>2-Unit System, 220-24V 50/60Hz</td>
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<td>K10505</td>
<td>4-Unit System, 115V 60Hz</td>
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<tr>
<td>K10595</td>
<td>4-Unit System, 220-24V 50/60Hz</td>
</tr>
<tr>
<td>K10506</td>
<td>6-Unit System, 115V 60Hz</td>
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<td>K10596</td>
<td>6-Unit System, 220-24V 50/60Hz</td>
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### Accessories

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<td>K10504-0-1</td>
<td>Transducer</td>
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<tr>
<td>K70519</td>
<td>RTD Kit, for monitoring the temperature of an additional bath</td>
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**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 D673. Range 0-200psi. Suitable for oxygen service.

**Oxidata™ Pressure Measurement system**—Please see the next page for complete product and ordering information on this product.

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**Ordering Information**

**Mechanical Recorders**

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<th>Description</th>
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<tr>
<td>K10570</td>
<td>One-Pen Recorder</td>
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<tr>
<td>K10580</td>
<td>Two-Pen Recorder</td>
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**Pressure Gauge for Aviation Fuel Tests**

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<th>Description</th>
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<tr>
<td>K10590</td>
<td>Pressure Gauge</td>
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</table>
Test Method
Gum formed during fuel storage can deposit on induction system surfaces, intake valves, stems and guides. To test for gum content, a 50mL sample is evaporated in an aluminum block bath for a specified period under controlled conditions of temperature and flow of air (aviation and motor gasolines) or steam (aircraft turbine fuel).

Existent Gum Test Apparatus
Evaporates aircraft turbine fuel and motor and aviation gasoline samples under controlled conditions in accordance with ASTM specifications. Consists of a high temperature evaporation bath with 100mL test beakers and, for aircraft turbine fuels, a steam generator and steam superheater.

Evaporation Baths
- Conforming to ASTM D381 and related specifications
- Choice of three-unit and six-unit models
- Available with built-in steam superheater
- Microprocessor programmable high accuracy temperature control
- Built-in pressure regulators and air flowmeters

Electrically heated baths for determining existent gum in aircraft turbine fuels by steam-jet evaporation and in motor and aviation gasolines by air-jet evaporation. Fully insulated, aluminum block design assures safe, efficient high temperature operation. Equipped with air/steam pressure regulator with gauge and a flowmeter for adjusting air flow per ASTM specifications. Stainless steel jets deliver air or steam flow to the test wells through removable brass conical adapters. Microprocessor PID control provides quick temperature stabilization without overshoot, and the bath is protected by an overtemperature control circuit that interrupts power should bath temperature exceed a programmed cut-off point. Dual LED displays provide actual and setpoint temperature values in °C/°F format. Communications software (RS232, etc.), ramp-to-set and other enhanced features are available as extra cost options. Contact your Koehler representative for information.

Model K33800 with Built-in Superheater—Six-unit bath with a built-in thermostatically controlled superheater which delivers dried steam to the bath inlet for steam-jet method testing of aircraft turbine fuels. Has digital-indicating solid state bath temperature control with digital setpoint and display.

Model K33700—Six-unit bath without built-in superheater. Controls are housed in a separate cabinet connected to the bath by multi-conductor cable.

Model K33780—Three-unit bath without built-in superheater. Controls are housed in the bath cabinet.

Specifications
Conforms to the specifications of: ASTM D381; IP 131; ISO 6246; DIN 51784; FTM 791-3302
Testing Capacity:
K33800 and K33700: 6 sample beakers
K33780 and K33781: 3 sample beakers
Maximum Temperature: 475°F (246°C)
Temperature Control Stability: ±1°F (±0.5°C)
Bath Configuration: machined aluminum block with multiple cartridge heaters
Heater Range:
K33800 and K33700: 220-240V 50/60Hz, Single Phase, 13.6A
K33780 and K33781: 220-240V 50/60Hz, Single Phase, 6.8A
Superheater: (Model K33800 only)
Solid state thermoregulator (0-550°F) Heater Range: 0-1500W

Included Accessories
Conical Brass Adapters for air/steam jets

Dimensions
K33800: 32 1/2x20x20 (83x51x51)
K33780: 32 1/11x11x19 (83x28x48)
K33700: Bath: 28x20x16 (71x51x41)
Control Cabinet: 9x8x6½ (23x20x17)

Net Weight:
K33800: 154 lbs (70kg)
K33780: 80 lbs (36.6kg)
K33700: 120 lbs (54.4kg)

Shipping Information
K33800: Shipping Weight: 313 lbs (142kg)
Dimensions: 17.2 Cu. ft.
K33780: Shipping Weight: 140 lbs (63.5kg)
Dimensions: 8.3 Cu. ft.
K33700: Shipping Weight: 271 lbs (123kg)
Dimensions: 13.7 Cu. ft.
Steam Generator

- For steam-jet method testing of aircraft turbine fuels
- Meets output requirements of three-unit and six-unit evaporation baths
- Electrically heated for clean, efficient operation and ease of installation
- Meets applicable ASME, NEC standards; UL listed, CSA approved

Electrically heated boiler provides instantaneous and reserve steam capacity for steam-jet evaporation tests. Easy to install and operate; electrical heating eliminates the need for on-site fuel combustion. Requires only a water feed source and electrical hook-up. Ruggedly constructed, with long life industrial grade copper sheath heating element. Includes a full range of safety features: automatic water level control and low water cut-off; steam safety valve; high-limit pressure cut-out with manual reset; steam pressure gauge.

Specifications
Output: 51.2 lbs steam/hr. 212°F
Bhp Rating: 1.73
kW Rating: 17

Dimensions lwh,in.(cm)
20x28x36 (51x71x91)
Net Weight: 185 lbs (83.9kg)

Shipping Information
Shipping Weight: 200 lbs (91kg)
Dimensions: 18 Cu. ft.

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Steam Boiler,</th>
<th>Order Qty</th>
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</thead>
<tbody>
<tr>
<td>K33850/208601</td>
<td>208V 60Hz, Single Phase, 86.5A</td>
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<tr>
<td>K33850/208603</td>
<td>208V 60Hz, Three Phase, 48A</td>
<td>1</td>
</tr>
<tr>
<td>K33850/240601</td>
<td>220-240V 60Hz, Single Phase, 71A</td>
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<tr>
<td>K33850/240603</td>
<td>240V 60Hz, Three Phase, 42A</td>
<td>6</td>
</tr>
<tr>
<td>K33850/380603</td>
<td>380V 60Hz, Three Phase, 36.5A</td>
<td>6</td>
</tr>
</tbody>
</table>

Ordering Information
For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.

Test Apparatus for Steam Jet Method

<table>
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<tr>
<th>Catalog No.</th>
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<tbody>
<tr>
<td>K33800</td>
<td>Existent Gum Evaporation Bath</td>
</tr>
<tr>
<td>K33850</td>
<td>Steam Boiler</td>
</tr>
<tr>
<td>(or K33850/208603, K33850/240601)</td>
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</tr>
<tr>
<td>K33710</td>
<td>Sample Beaker</td>
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<tr>
<td>(or 332-002-017)</td>
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</tr>
<tr>
<td>250-000-03F</td>
<td>ASTM 3F Thermometer</td>
</tr>
<tr>
<td>250-000-03C</td>
<td>ASTM 3C Thermometer</td>
</tr>
</tbody>
</table>

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.
**Assessing Distillate Fuel Storage Stability by Oxygen Overpressure**

**Test Method**

Used for assessing potential storage stability of middle distillate fuels, including fuels with or without stabilizer additives, and freshly refined or previously stored fuels. The sample is aged in a pressurized vessel at constant temperature for 16 hours and, after cooling, the total amount of insoluble products is determined gravimetrically.

**Pressure Vessel**

- Conforms to the specification of ASTM D5304
- Four unit and six unit models

Stainless steel pressure vessels accommodate multiple sample containers for determining storage stability of fuels by the oxygen overpressure method. Vessels meet all applicable ASME and ASTM safety requirements for construction and working pressure and maximum operating temperature and are equipped with pressure safety valves factory present at 200psi (1,332kPa). Included with each model are a collapsible glassware rack that installs and removes easily for cleaning, oxygen inlet and outlet valves with quick disconnect fittings and charging hose, pressure gauge and wide-mouth closure with viton O-ring seal.

**Ordering Information**

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Description</th>
<th>Order Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>K10600</td>
<td>Pressure Vessel, 4 Unit</td>
<td>1</td>
</tr>
<tr>
<td>K10601</td>
<td>Pressure Vessel, 6 Unit</td>
<td>1</td>
</tr>
</tbody>
</table>

**Accessories**

- K10540 Sample Container with lid

**Specifications**

Conforms to the specifications of:
- ASTM D5304

Capacity: Four or six sample containers

Construction: 316 stainless steel, in accordance with ASME specifications

Working Pressure at 90˚C: Exceeds ASTM requirements

Safety Relief Valve Setting: 200psi (1,332kPa)

Pressure Gauge: 0-200psi

**Included Accessories**

- Glassware rack, hinged, for four or six sample containers
- Charging Hole with pressure tight crimp and quick disconnect

**Dimensions:**

- K10600: 81⁄2” high by 91⁄2” round
- Net Weight: 14 lbs (6.4kg)
- K10601: 151⁄2” high by 91⁄2” round
- Net Weight: 17 lbs (8kg)

**Shipping Information:**

- K10600:
  - Shipping Weight: 17 lbs (8kg)
  - Dimensions: 2.6 Cu. Ft.
- K10601:
  - Shipping Weight: 22 lbs (10kg)
Copper Strip Corrosion by Liquefied Petroleum (LP) Gases

Test Method
Tests the corrosiveness of LPG to copper by immersion of a polished test strip in the sample inside a test cylinder at elevated temperature. After one hour the test strip is removed and compared against the ASTM Copper Strip Corrosion Standards.

LPG Copper Strip Corrosion Test Apparatus
• Conforms to ASTM D1838 and related specifications
• Four-sample testing capability
Consists of LPG Corrosion Test Cylinders, Water Bath, Copper Strips, Polishing Materials and the ASTM Copper Strip Corrosion Test Standards.

LPG Corrosion Test Cylinders—Stainless steel cylinder with ¼” needle valves for purging and admitting LPG samples. Dip tube with hook suspends copper strip in sample. Knurled, threaded cap with O-ring gasket hand tightens to a positive seal. Withstands hydrostatic test pressure of 1000 psig (6895kPa).

LPG Corrosion Test Water Bath—Thermostatically controlled water bath submerges four LPG Corrosion Test Cylinders in an upright position. Controls temperature at 100 ±1°F (37.8 ±0.5°C) per ASTM specifications. Soxhlet reflux condenser and constant water level device maintain proper working depth. Polished stainless steel double-wall construction. Fully insulated.

Ordering Information

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Description</th>
<th>Order Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>K40000</td>
<td>LPG Corrosion Test Cylinder</td>
<td>4</td>
</tr>
<tr>
<td>K39900</td>
<td>LPG Corrosion Test Water Bath, 115V 50/60Hz</td>
<td>1</td>
</tr>
<tr>
<td>K39990</td>
<td>LPG Corrosion Test Water Bath, 220-240V 50/60Hz</td>
<td>1</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Description</th>
<th>Order Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>K40200</td>
<td>Copper Strip for LPG</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>12.5x1.5-3.0x75mm with 3.2mm hole per ASTM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>specifications</td>
<td></td>
</tr>
<tr>
<td>K40100</td>
<td>Connecting Tubing</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sulfur-free plastic-lined tubing for connection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>of test cylinder valve to sample source.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>With ¼” stainless steel and aluminum connectors.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24” long</td>
<td></td>
</tr>
<tr>
<td>K25100</td>
<td>ASTM Copper Strip Corrosion Test Standards</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Colored reproductions of tarnished strips</td>
<td></td>
</tr>
<tr>
<td></td>
<td>encased in a plastic plaque.</td>
<td></td>
</tr>
<tr>
<td>380-240-001</td>
<td>Silicone Carbide Paper, 240-grit</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>For polishing copper strips prior to testing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pack of 50 sheets</td>
<td></td>
</tr>
<tr>
<td>380-150-000</td>
<td>Silicone Carbide Grain, 150-grit</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>For final polishing of copper strips prior to</td>
<td></td>
</tr>
<tr>
<td></td>
<td>testing. 1 lb package</td>
<td></td>
</tr>
<tr>
<td>K25000</td>
<td>Polishing Vise</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Holds copper strip firmly in place without</td>
<td></td>
</tr>
<tr>
<td></td>
<td>marring the edges. Stainless steel, mounted on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a composition base</td>
<td></td>
</tr>
<tr>
<td>K25090</td>
<td>Multi-Strip Polishing Vise</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Similar to K25000 but capable of holding four</td>
<td></td>
</tr>
<tr>
<td></td>
<td>strips at a time</td>
<td></td>
</tr>
<tr>
<td>250-000-12F</td>
<td>ASTM 12F Thermometer. Range: –5 to +215°F</td>
<td>1</td>
</tr>
<tr>
<td>250-000-12C</td>
<td>ASTM 12C Thermometer. Range: –20 to +102°C</td>
<td>1</td>
</tr>
</tbody>
</table>

Specifications
Conforms to the specifications of:
ASTM D1838; GPA 2140; ISO 6251

Water Bath Specifications:
• Capacity: four (4) LPG Corrosion Test Cylinders
• Maximum Temperature: 221°F (105°C)
• Temperature Control Stability: ±1°F (±0.5°C)
• Heater Range: 0-750W
• Bath Medium: 3.8 gal (14.4L) Water

Electrical Requirements:
• 115V 50/60Hz, Single Phase, 6.5A
• 220-240V 50/60Hz, Single Phase, 3.4A

Dimensions (lxwxh, in.(cm))
• 12x10x24 (30x25x61)
• Net Weight: 19 lbs (8.6kg)

Shipping Information
• Shipping Weight: 27 lbs (12.2kg)
• Dimensions: 5.3 Cu. ft.

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.
Copper Corrosion from Petroleum Products

Test Method
The Copper Strip Tarnish Test assesses the relative degree of corrosivity of petroleum products, including aviation fuels, automotive gasoline, natural gasoline, solvents, kerosene, diesel fuel, distillate fuel oil, lubricating oil and other products. A polished copper strip is immersed in 30mL of sample at elevated temperature. After the test period, the strip is examined for evidence of corrosion and a classification number from 1-4 is assigned based on a comparison with the ASTM Copper Strip Corrosion Standards. For aviation fuels and natural gasoline the sample tube is placed inside a stainless steel bomb during testing.

Test Bomb Baths
Thermostatically controlled water bath immerses Copper Strip Corrosion Test Bombs at the required depth per ASTM specifications. Use for testing aviation gasoline, aviation turbine fuel and natural gasoline. Fully insulated, double-wall stainless steel construction. Soxhlet reflux condenser and constant water level device maintain proper working depth. Choice of four-bomb and eight-bomb models. Optional removable test tube rack converts four-bomb model for testing of products not requiring corrosion bomb.

Specifications: Conforms to the specifications of: ASTM D130; FSPT DT-28-65; IP 154; ISO 2160; DIN 51759; FTM 791-5325
Testing Capacity:
K25310/K25319*: four (4) copper strip corrosion test bombs
K25320/K25329: eight (8) copper strip corrosion test bombs
* or sixteen (16) test tubes with optional test rack
(Catalog No. K25309) installed
Maximum Temperature: 221°F (105°C)
Temperature Control Stability: ±1°F (± 0.5°C)
Heater Range: 0-750W
Bath Medium: 5 gal (18.9L) water
Electrical Requirements: 115V 60Hz, Single Phase, 7.5A
220-240V 50/60Hz, Single Phase, 4A

Included Accessories
Rubber Stoppers for bomb openings (4)

Dimensions: l x w x h, in.(cm)
4-bomb model: 12x10x21 (30x25x53)
8-bomb model: 16x111⁄2x21 (41x29x54)
Net Weight:
4-bomb model: 181⁄2 lbs (8.4kg)
8-bomb model: 24 lbs (10.9kg)

Shipping Information
Shipping Weight:
4-bomb model: 41 lbs (18.6kg)
8-bomb model: 45 lbs (20.4kg)
Dimensions:
4-bomb model: 5.3 Cu. ft.
8-bomb model: 5.5 Cu. ft.

Ordering Information
Catalog No.
K25310 Bath for Copper Strip Corrosion Test Bombs, 4-Unit, 115V 50/60Hz
K25319 Bath for Copper Strip Corrosion Test Bombs, 4-Unit, 220-240V 50/60Hz
K25320 Bath for Copper Strip Corrosion Test Bombs, 8-Unit, 115V 50/60Hz
K25329 Bath for Copper Strip Corrosion Test Bombs, 8-unit, 220-240V 50/60Hz
K25309 Optional Test Tube Rack for 4-Bomb Bath

Test Tube Bath
Constant temperature bath immerses 16 test tubes for copper strip tarnish tests of products not requiring a test bomb, including: diesel fuel, fuel oil, automotive gasoline, Stoddard solvent, kerosene and lubricating oil. Microprocessor temperature controller has °C/°F switchable digital setpoint and display. Operator and equipment are protected by an overtemperature control circuit which automatically interrupts power to the unit should bath temperature exceed a programmed cut-off point. Communications software (RS232, etc.), ramp-to-set and other enhanced features are available as extra cost options. Contact your Koehler representative for information. Welded stainless steel double-wall construction with built-in support rack. Fully insulated.

Specifications
Conforms to the specifications of:
ASTM D130, D6074, D6158; FSPT DT-28-65; IP 154; ISO 2160; DIN 51759; FTM 791-5325
Capacity: 16 test tubes
Maximum Temperature: 190°C (374°F)
Temperature Control Stability: ±1°C (±2°F)
Heater Range: 0-750W
Bath Medium: 5 gal (18.9L) water or high temperature heater transfer fluid
Electrical Requirements: 115V 50/60Hz, Single Phase, 7.5A
220-240V 50/60Hz, Single Phase, 4A

Dimensions: l x w x h, in.(cm)
151⁄2x121⁄2x14 (39x32x36)
Net Weight: 27 lbs (12.2kg)

Shipping Information
Shipping Weight: 45 lbs (20.4kg)
Dimensions: 12.8 Cu. ft.

Ordering Information
Catalog No.
K25330 Copper Strip Test Tube Bath, 115V 50/60Hz
K25339 Copper Strip Test Tube Bath, 220-240V 50/60Hz
K25312 Vented Cork (16)
Copper Corrosion from Petroleum Products

Copper Strip Corrosion Test Bomb

- For aviation fuels and natural gasoline

Precision machined stainless steel bomb inserts in copper corrosion bath for testing aviation fuels and natural gasoline. Withstands test pressure of 100psi (689kPa) per specifications. Threaded cap with O-ring gasket and knurled circumference tightens by hand to a positive seal. A 1⁄8" groove in the bomb threads permits safe, gradual release of pressure when opening the bomb.

Specifications

Conforms to the specifications of:
- ASTM D130, D6074, D6158; IP 154; ISO 2160; DIN 51759; FTM 791-5325

Net Weight: 1 lb (.45kg)

Shipping Information:

Shipping Weight: 2 lbs (.91kg)

Test Apparatus for Aviation Fuels and Natural Gasoline

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Order Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>K25310</td>
<td>Bath for Copper Strip Corrosion Test Bombs, 115V</td>
</tr>
<tr>
<td>K25319</td>
<td>Bath for Copper Strip Corrosion Test Bombs, 220-240V</td>
</tr>
<tr>
<td>K25200</td>
<td>Copper Strip Corrosion Test Bomb</td>
</tr>
<tr>
<td>K25080</td>
<td>Copper Strips</td>
</tr>
<tr>
<td>332-004-004</td>
<td>Test Tube</td>
</tr>
<tr>
<td>332-004-002</td>
<td>Viewing Test Tube</td>
</tr>
<tr>
<td>K25100</td>
<td>ASTM Copper Strip Corrosion Standard</td>
</tr>
<tr>
<td>380-240-001</td>
<td>Silicone Carbide Paper, 240-grit</td>
</tr>
<tr>
<td>380-150-001</td>
<td>Silicone Carbide Paper, 150-grit</td>
</tr>
<tr>
<td>380-150-000</td>
<td>Silicone Carbide Grain, 150-grit</td>
</tr>
<tr>
<td>K25000</td>
<td>Polishing Vise</td>
</tr>
<tr>
<td>250-000-12F</td>
<td>ASTM 12F Thermometer</td>
</tr>
<tr>
<td>250-000-12C</td>
<td>ASTM 12C Thermometer</td>
</tr>
</tbody>
</table>

Silver Corrosion Test

Please refer to page 91 for information.

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.

Ordering Information

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K25200</td>
<td>Copper Strip Corrosion Test Bomb</td>
</tr>
<tr>
<td>K25080</td>
<td>Copper Test Strips</td>
</tr>
<tr>
<td>332-004-004</td>
<td>Test Tube</td>
</tr>
<tr>
<td>332-004-002</td>
<td>Viewing Test Tube</td>
</tr>
<tr>
<td>K25100</td>
<td>ASTM Copper Strip Corrosion Standards</td>
</tr>
<tr>
<td>380-150-001</td>
<td>Silicone Carbide Paper, 150-grit</td>
</tr>
<tr>
<td>380-240-001</td>
<td>Silicone Carbide Paper, 240-grit</td>
</tr>
<tr>
<td>380-150-000</td>
<td>Silicone Carbide Grain, 150-grit</td>
</tr>
<tr>
<td>K25000</td>
<td>Polishing Vise</td>
</tr>
<tr>
<td>K25090</td>
<td>Multi-Strip Polishing Vise</td>
</tr>
<tr>
<td>250-000-12F</td>
<td>ASTM 12F Thermometer</td>
</tr>
</tbody>
</table>
| K25200 Copper Strip Corrosion Bomb with K25100 and K25080
Vapor Pressure of Petroleum Products (Reid Method) and Liquefied Petroleum Gases (LPG Method)

Test Method
Vapor pressure is a critical factor in the handling and performance of liquid petroleum and liquefied petroleum gas (LPG) products. The vapor pressure of automotive gasolines is subject to governmental regulation for pollution control purposes.

Reid Vapor Pressure Cylinders

- Conform to ASTM D323, D1267 and related specifications
- One-opening and two-opening types
Polished stainless steel test cylinders for vapor pressure tests of liquid petroleum products, volatile crude oil and liquefied petroleum gas (LPG). Consists of upper chamber and lower chamber in required 4:1 volume ratio. O-ring gaskets provide tight seal between chambers and at gauge coupling. One-opening type is for gasoline and other products having a Reid Vapor Pressure below 26psi (180kPa). Two-opening type is for liquid products having a Reid Vapor Pressure above 26psi (ASTM D323) and for LPG (ASTM D1267). Lower chamber of two-opening apparatus includes straight-through ball valve and ¼" needle valve. For LPG testing, order two-opening type apparatus and accessory bleeder valve assembly.

Specifications:
Conforms to the specifications of: ASTM D323, D1267; GPA 2140; IP 69, 161; ISO 3007, 4256; DIN 51616, 51754; FTM 791-1201
Hydrostatic Test (two-opening type): Withstands 1000psi (6894kPa) gauge hydrostatic pressure per ASTM D1267 specifications

Included Accessories
Threaded ¼" Gauge Coupling
O-ring Seals (2)

Shipping Information
Shipping Weight: 7 lbs (3.2kg)

Reid Vapor Pressure Gauges
- Conforming to ASTM D323, D1267 and related specifications
- Dual psi/kPa scale on a 4½" diameter dial
- Accurate to within 0.5% of scale range
- Micrometer adjustable pointer
Ruggedly constructed Bourdon type gauge designed especially for the Reid Vapor Pressure test. Heavy duty rotary brushed stainless steel movement. Lightweight aluminum case with corrosion-resistant finish and heavy duty brass non-sparking handle. Includes blow-out disc and ¼" NPT male thread connection.

Ordering Information

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K11500</td>
<td>Reid Vapor Pressure Cylinder, One-Opening Type</td>
</tr>
<tr>
<td>K11201</td>
<td>Reid Vapor Pressure Cylinder Two-Opening Type</td>
</tr>
<tr>
<td>K11202</td>
<td>Bleeder Valve Assembly for LPG tests with K11201 test cylinder</td>
</tr>
</tbody>
</table>

Reid Vapor Pressure Gauges

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Range psi/kPa</th>
<th>Figure Intervals psi/kPa</th>
<th>Interval Graduations psi/kPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>311-005-002</td>
<td>0-5psi*</td>
<td>0.5psi*</td>
<td>0.05psi*</td>
</tr>
<tr>
<td>311-015-002</td>
<td>0-15/0-100</td>
<td>1.0/10</td>
<td>0.1/1.0</td>
</tr>
<tr>
<td>311-030-002</td>
<td>0-30/0-200</td>
<td>5.0/20</td>
<td>0.5/2.0</td>
</tr>
<tr>
<td>311-060-002</td>
<td>0-60/400</td>
<td>5.0/50</td>
<td>0.2/2.5</td>
</tr>
<tr>
<td>311-100-002</td>
<td>0-100/700</td>
<td>10/50</td>
<td>0.5/2.5</td>
</tr>
<tr>
<td>311-250-001</td>
<td>0-250/1750</td>
<td>25/100</td>
<td>1.0/20</td>
</tr>
<tr>
<td>311-600-003</td>
<td>0-600/4200</td>
<td>50/250</td>
<td>2.0/25</td>
</tr>
</tbody>
</table>

*0-5psi gauge does not have a kPa scale.
4 Unit Reid Vapor Pressure Bath

- Conforms to ASTM D323, D1267 and related specifications
- Free standing or flush-mount benchtop installation
- Microprocessor programmable high accuracy temperature control
- Constant temperature water bath designed for Reid Vapor Pressure determinations of liquid petroleum products and liquefied petroleum gases (LPG). Immerses vapor pressure apparatus at the proper depth per ASTM specifications. Controls bath temperature with ±0.2°F (±0.1°C) precision. Microprocessor PID control provides quick temperature stabilization without overshoot, and the bath is protected by an overtemperature control circuit that interrupts power should bath temperature exceed a programmed cut-off point. Dual LED displays provide actual and setpoint temperature values in °C/°F format. Communications software (RS232, etc.), ramp-to-set and other enhanced features are available as extra cost options. Contact your Koehler representative for information. Double-wall construction with fiberglass insulated stainless steel tank. A sturdy 1” (25mm) flange permits flush-mount benchtop installation for easy access to the bath interior. Built-in holders suspend test cylinders at the required depth. Equipped with overflow stand pipe/drain.

Specifications
Conforms to the specifications of:
ASTM D323, D1267; GPA 2140; IP 69, 161; ISO 3007, 4256;
DIN 51616, 51754; FTM 791-1201
Capacity: 1 to 4 vapor pressure apparatus,
one-opening or two-opening type
Temperature Control Stability: ±0.2°F (±0.1°C)
Maximum Temperature: 212°F (100°C)
Bath Medium:
13.7gal (51.9L) water
Electrical Requirements:
115V 50/60Hz, Single Phase, 18.8A
220-240V 50/60Hz, Single Phase, 9.4A

Dimensions lwxh.in.(cm)
15x15x36 (38.1x38.1x91.5)
Net Weight: 67 lbs (30.4kg)

Shipping Information
Shipping Weight: 105 lbs (47.7kg)
Dimensions: 14 Cu. ft.

Ordering Information
<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Description</th>
<th>Order Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>K11450</td>
<td>Reid Vapor Pressure Bath, 4-Unit, 115V 50/60Hz</td>
<td>1</td>
</tr>
<tr>
<td>K11459</td>
<td>Reid Vapor Pressure Bath, 4-Unit, 220-240V 50/60Hz</td>
<td></td>
</tr>
</tbody>
</table>

Photo, thermometers, and additional accessories for Vapor Pressure testing appear on page 88.

21-Unit Reid Vapor Pressure Bath

- Conforms to ASTM D323, 1267 and related specifications
- Digital electronic temperature control
- Automatic water level control maintains proper immersion depth
- Constant temperature water bath immerses twenty-one test cylinders for vapor pressure tests on liquid products and liquefied petroleum gas (LPG). Electronic level control automatically maintains the proper immersion depth per ASTM specifications. Heating system employs a 6kW stainless steel heat exchanger with a heavy duty circulating pump to provide rapid heat-up, even heat distribution and ease of servicing. Convenient digital setpoint and display permits rapid selection of any bath liquid temperature within the operating range. A built-in overtemperature limit control protects against accidental overheating. Bath interior and internal components are constructed of heavy gauge stainless steel. Control panel is shielded by a hinged acrylic cover. Includes sturdy angle-iron base with corrosion resistant polyurethane finish. Order pressure gauges and cylinders separately.

Specifications
Conforms to the specifications of: ASTM D323, D1267; GPA 2140;
IP 69, 161; ISO 3007, 4256; DIN 51616, 51754; FTM 791-1201
Testing Capacity: 21 vapor pressure test cylinders
Temperature Range: 212°F (100°C)
Temperature Control Stability: ±0.2°F (±0.1°C)
Heater Range: 0-6000W
Bath Medium:
58 gal (219.5L) water
Electrical Requirements:
220-240V 50Hz, Single Phase, 28A
220-240V 60Hz, Single Phase, 28A

Dimensions lwxh.in.(cm)
Overall: 48x22x36 (122x56x91)

Ordering Information
<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K11415</td>
<td>Reid Vapor Pressure Bath, 21-Unit, 220-240V 50Hz</td>
</tr>
<tr>
<td>K11416</td>
<td>Reid Vapor Pressure Bath, 21-Unit, 220-240V 60Hz</td>
</tr>
</tbody>
</table>
Vapor Pressure of Petroleum Products and LP Gases

**Test Method**
Detects the formation of wax crystals in burner fuels, diesel fuels and turbine engine fuels at low temperatures. The sample is cooled at a specified rate while being agitated. The temperature at which wax first appears is the wax appearance point.

**Wax Appearance Point Apparatus**
- Conforms to ASTM D3117 specifications
For detection of separated solids in burner fuels, diesel fuels and turbine engine fuels. Similar to K29700 Freezing Point Apparatus. Includes jacketed sample tube, motorized stirrer assembly, outer vacuum flask, clamps and stand.

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>250-000-18F</td>
<td>ASTM 18F Thermometer</td>
</tr>
<tr>
<td>250-000-18C</td>
<td>ASTM 18C Thermometer</td>
</tr>
<tr>
<td>250-000-65F</td>
<td>ASTM 65F Thermometer</td>
</tr>
<tr>
<td>250-000-65C</td>
<td>ASTM 65C Thermometer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>K11810</th>
<th>Transfer Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Consists of threaded brass cap, delivery tube and sampling tube. Use for removing liquid from the sample container in accordance with ASTM specifications</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>371-000-002</th>
<th>Mercury Manometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduated in cm (1mm div.) and inches (0.1&quot; div.). For checking pressure gauge reading of up to 15psi</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>K112B-1-0-12</th>
<th>Manometer Adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attaches to pressure gauge for checking with mercury manometer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AS568-210</th>
<th>O-ring Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>For coupling between air and gas chambers on K11500 and K11201 vapor pressure bombs</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AS568-113</th>
<th>O-ring Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>For gauge and bleeder valve assembly connections on K11500 and K11201 vapor pressure bombs</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>K40100</th>
<th>Flexible Tubing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfur-free plastic lined tubing with ¼” stainless steel and aluminum connectors. For charging LPG test cylinder</td>
<td></td>
</tr>
</tbody>
</table>

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.

**Test apparatus for liquid products (ASTM D323) requires:**
- Test Cylinders, one or two-opening type
- Pressure Gauges
- Constant Temperature Bath
- Bath Thermometer
- Transfer Connection
- Manometer
- Manometer Adapter

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.

**Test apparatus for liquefied petroleum gases (ASTM D1267) requires:**
- Test Cylinders, two-opening type
- Bleeder Valve Assemblies
- Pressure Gauges
- Constant Temperature Bath
- Bath Thermometer
- Flexible Tubing

---

**Wax Appearance Point of Distillate Fuels**

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Ordering Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>K29760</td>
<td>Wax Appearance Point Apparatus, 115V 60Hz</td>
</tr>
<tr>
<td>K29768</td>
<td>Wax Appearance Point Apparatus, 220-240V 50Hz</td>
</tr>
<tr>
<td>K29769</td>
<td>Wax Appearance Point Apparatus, 220-240V 60Hz</td>
</tr>
<tr>
<td>250-000-06F</td>
<td>ASTM 6F Thermometer. Range: −112 to +70°F</td>
</tr>
<tr>
<td>250-000-06C</td>
<td>ASTM 6C Thermometer. Range: −80 to +20°C</td>
</tr>
</tbody>
</table>

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.
Freezing Point of Aviation Fuels

Test Method
Determines the temperature below which solid hydrocarbon crystals form in aviation fuels. The sample is cooled with continuous stirring in a Dewar-type sample tube until crystals appear.

New Refrigerated Freezing Point Bath

- Improved design with enhanced performance and safety features
- Operating range to –100°F (–73°C)
- Microprocessor PID digital temperature control
- Dual digital displays show setpoint and actual bath temperature
- Selectable temperature scale – Fahrenheit or Celsius
- Conforms to ASTM D2386 and related specifications

Redesigned constant temperature bath for freezing point determinations on fuel samples at temperatures as low as –100°F (–73°C). Accommodates K29700 Freezing Point Apparatus and accessory stirrer. Microprocessor PID circuitry provides precise, reliable temperature control within ASTM specified tolerances. Simple push button controls and dual digital displays permit easy setting and monitoring of bath temperature. Bath medium is contained in a clear, evacuated Dewar flask, and glare-free fluorescent backlighting provides excellent visibility when working with the freezing point samples. Air-cooled hermetic compressors provide efficient operation with the use of CFC-free refrigerants. Temperature control uniformity is assured by means of a motorized stirrer which provides complete circulation without turbulence. Cabinet construction is polyester-epoxy finished steel with a chemical-resistant composite top surface. Working (top) surface includes port and mounting plate for K29700 Freezing Point Apparatus and accessory stirrer. Bath rests on adjustable leveling feet.

Specifications
Conforms to the specifications of:
ASTM D2386; IP 16; ISO 3013: DIN 51421: FTM 791-1411

Temperature Range: Ambient to –100°F (–73°C)
Temperature Control Accuracy and Uniformity: Exceeds ASTM requirements throughout the operating range
Display: 0.1°C/°F resolution

Electrical Requirements:
115V, 60Hz, Single Phase, 18.3A
220-240V, 50Hz, Single Phase, 10.0A
220-240V, 60Hz, Single Phase, 10.0A

Dimensions lxwxh, in.(cm)
35x26x31 (89x66x78½)

Net Weight: 259 lbs (117½ kg)

Shipping Information
Shipping Weight: 373 lbs (169½ kg)
Dimensions: 23½ cu. ft.

Ordering Information

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Economic Classification</th>
<th>Order Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>K29790</td>
<td>Refrigerated Freezing Point Bath</td>
<td>1</td>
</tr>
<tr>
<td>K29795</td>
<td>Refrigerated Freezing Point Bath</td>
<td>1</td>
</tr>
<tr>
<td>K29796</td>
<td>Refrigerated Freezing Point Bath</td>
<td>1</td>
</tr>
<tr>
<td>K29700</td>
<td>Freezing Point Apparatus, ASTM D2386</td>
<td>1</td>
</tr>
<tr>
<td>K29750-1-7</td>
<td>Stirrer Motor, 115V 60Hz</td>
<td>1</td>
</tr>
<tr>
<td>K29758-0-7</td>
<td>Stirrer Motor, 220-240V 50Hz</td>
<td>1</td>
</tr>
<tr>
<td>K29759-1-7</td>
<td>Stirrer Motor, 220-240V 60Hz</td>
<td>1</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Description</th>
<th>Order Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>250-000-114C</td>
<td>ASTM 114C Thermometer, Range: –80 to +20°C</td>
<td>1</td>
</tr>
<tr>
<td>K29720</td>
<td>Moistureproof Collar, Type A</td>
<td>1</td>
</tr>
<tr>
<td>K29721</td>
<td>Moistureproof Collar, Type B</td>
<td>1</td>
</tr>
</tbody>
</table>

Please inquire about our Automated Freezing Point Test Equipment by contacting Koehler’s Customer Service.

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.
Smoke Point of Kerosene and Aviation Turbine Fuel

Test Method
Smoke point is an indicator of the combustion qualities of aviation turbine fuels and kerosene. The fuel sample is burned in the Smoke Point Lamp, and the maximum flame height obtainable without smoking is measured.

Smoke Point Lamp
- Conforms to ASTM D1322 and related specifications

Burns fuel samples under controlled conditions for smoke point determinations of aviation turbine fuels and similar products. Consists of brass lamp body with chimney; gallery; 0-50mm black glass scale with white markings; brass plated door with curved glass window; candle socket; and plated brass candle with wick tube and air vent. Mounted on a cast iron base with aluminum support rod.

Ordering Information

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Description</th>
<th>Order Qty</th>
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<tbody>
<tr>
<td>K27000</td>
<td>Smoke Point Lamp</td>
<td>1</td>
</tr>
<tr>
<td>K27021</td>
<td>Extracted Cotton Wicks</td>
<td></td>
</tr>
<tr>
<td>K27020</td>
<td>Cotton Wicks, pack of 12</td>
<td>1</td>
</tr>
<tr>
<td>K27050</td>
<td>Sighting Device</td>
<td>1</td>
</tr>
<tr>
<td>K27060</td>
<td>Wick Insertion Tool</td>
<td>1</td>
</tr>
<tr>
<td>K27065</td>
<td>Wick Trimmer</td>
<td>1</td>
</tr>
<tr>
<td>K27010</td>
<td>Interchangeable Candle</td>
<td></td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K27021</td>
<td>Extracted Cotton Wicks</td>
</tr>
<tr>
<td></td>
<td>Prepared in accordance with ASTM D1322 (7.2) requirements.</td>
</tr>
<tr>
<td></td>
<td>Packed in a sealed tube with desiccant.</td>
</tr>
<tr>
<td></td>
<td>Case of 12</td>
</tr>
<tr>
<td>K27020</td>
<td>Cotton Wicks, pack of 12</td>
</tr>
<tr>
<td>K27050</td>
<td>Sighting Device</td>
</tr>
<tr>
<td></td>
<td>Installs on chimney of Smoke Point Lamp.</td>
</tr>
<tr>
<td></td>
<td>Eliminates parallax</td>
</tr>
<tr>
<td>K27060</td>
<td>Wick Insertion Tool</td>
</tr>
<tr>
<td></td>
<td>Facilitates insertion of cotton wick into wick tube</td>
</tr>
<tr>
<td>K27065</td>
<td>Wick Trimmer</td>
</tr>
<tr>
<td></td>
<td>Use together with K27060 Insertion Tool</td>
</tr>
<tr>
<td></td>
<td>to place wick at the correct height in the wick tube, free of twists and frayed ends.</td>
</tr>
</tbody>
</table>

Specifications

Conforms to the specifications of:
- ASTM D1322; ISO 3014; IP 57; DIN 51406; FTM 791-2107

Included Accessories
Cotton Wicks, non-extracted (6)

Dimensions

<table>
<thead>
<tr>
<th>dia.xh, in. (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7x18½ (18x47)</td>
</tr>
</tbody>
</table>

Net Weight: 10 lbs (4.5kg)

Shipping Information

Shipping Weight: 16 lbs (7.3kg)
Dimensions: 5 Cu. ft.
Silver Corrosion by Aviation Turbine Fuels

Test Method
Tests the corrosiveness of aviation turbine fuels towards silver. A polished silver strip is immersed in a fuel sample at elevated temperature. After a specified test period, the strip is removed from the sample, washed and evaluated for corrosion.

Water Bath for Silver Corrosion
- Conforms to IP 227 specifications
- Six sample capability

Fully insulated, thermostatically controlled water bath with constant water level device. Use together with K25370 Bath Conversion Kit to immerse six 350mL test tubes for silver strip corrosion tests. Stainless steel, double-wall construction.

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Description</th>
<th>Order Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>K25310</td>
<td>Water Bath, 115V 50/60Hz</td>
<td>1</td>
</tr>
<tr>
<td>K25319</td>
<td>Water Bath, 220-240V 50/60Hz</td>
<td>1</td>
</tr>
<tr>
<td>K25370</td>
<td>Bath Conversion Kit for IP 227</td>
<td>1</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K25360</td>
<td>Glassware Set for IP 227</td>
</tr>
<tr>
<td>K25280</td>
<td>Silver Test Strip</td>
</tr>
<tr>
<td>K25282</td>
<td>ASTM D3241-IP 323 Color Standard</td>
</tr>
<tr>
<td>250-000-12C</td>
<td>ASTM 12C Thermometer</td>
</tr>
<tr>
<td>K25000</td>
<td>Polishing Vise</td>
</tr>
<tr>
<td>380-240-001</td>
<td>Silicone Carbide Paper, 240-grit</td>
</tr>
<tr>
<td>380-150-001</td>
<td>Silicone Carbide Paper, 150-grit</td>
</tr>
<tr>
<td>380-150-000</td>
<td>Silicone Carbide Grain, 150-grit</td>
</tr>
</tbody>
</table>

Specifications
Conforms to the specifications of:
- IP 227; ASTM D130, D6074, D6158; FSPDT-28-65; IP 154; ISO 2160; DIN51759; FTM 791-5325
- Testing Capacity: 6 samples for silver strip corrosion testing
- Maximum Temperature: 221°F (105°C)
- Temperature Control Stability: ±1°F (±0.5°C)
- Heater Range: 0-750W
- Bath Medium: 5 gal (18.9L) water
- Electrical Requirements:
  - 115V 50/60Hz, Single Phase, 7.5A
  - 220-240V 50/60Hz, Single Phase, 4A

Shipping Information
Shipping Weight: 41 lbs (18.6kg)

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.
Antirust Properties of Petroleum Products Pipeline Cargoes

Test Method

Used to control corrosion in product pipelines caused by moisture condensed from gasoline and distillate fuels. Antirust properties are determined by immersing a polished steel test specimen in a stirred mixture of the sample and distilled water held at constant temperature.

Rust Preventing Characteristics Oil Bath

• Conforms to NACE TM-01-72, ASTM D665* and D3603* specifications
• Accommodates six sample beakers
• Microprocessor temperature control with digital display and overtemperature protection

Six-place constant temperature bath with stirrers for rust preventing characteristics tests. Stirs sample-water mixtures at 1000rpm and controls temperature with ±0.5°C (±1°F) stability. Immerses test beakers at the proper depth per NACE specifications. Microprocessor temperature control has °C/°F switchable digital setpoint and display. Operator and equipment are protected by an overtemperature control circuit which automatically interrupts power to the unit should bath temperature exceed a programmed cut-off point. Stainless steel stirrer paddles are driven at 1000rpm by an improved pulley drive-roller bearing arrangement. Paddles move to a raised position for placement of sample beakers in the bath. Stainless steel bath includes perforated support shelf for beakers and cover plate. Long lasting polyester drive belt improves reliability. Drive train components are protected by a removable steel guard. All exterior surfaces have stainless steel or chemical resistant polyurethane enamel finishes.

* To order this equipment for ASTM and equivalent test methods, please turn to page 120.

Specifications

Conforms to the specifications of:
- NACE TM-01-72; ASTM D665*, D6158, D3603*
- IP 135; ISO 7120; DIN 51585; FTM 791-4011

Testing Capacity: Six (6) 400mL sample beakers
Maximum Temperature: 104°C (220°F)
Temperature Control Stability: ±0.5°C (±1°F)
Heater Range: 0-1500W
Drive Motor: explosion proof ball bearing type.
Bath Medium: 11 gal (41.6L) white technical oil

Electrical Requirements:
- 115V 60Hz, Single Phase: 13.0A
- 220-240V 50Hz, Single Phase: 6.8A
- 220-240V 60Hz, Single Phase: 6.8A

Included Accessories

Steel Test Specimens (6)
Type 2 Plastic Specimen Holders (6)
Plastic Beaker Covers (6)

Dimensions (lxwxh, in., cm)
32 ½ x 14 ¼ x 27 (83 x 36 x 69)
Net Weight: 79 lbs (35.8 kg)

Shipping Information

Shipping Weight: 150 lbs (68.0 kg)
Dimensions: 16.2 Cu. ft.

This equipment has been modified for safe operation when testing volatile petroleum products in accordance with NACE Standard Test Method TM-01-72.

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.

K30160NACE Rust Preventing Characteristics Bath

Ordering Information

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Order Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>K30160NACE</td>
<td>Rust Preventing Characteristics Oil Bath, 115V 60Hz</td>
</tr>
<tr>
<td>K30165NACE</td>
<td>Rust Preventing Characteristics Oil Bath, 220-240V 50Hz</td>
</tr>
<tr>
<td>K30166NACE</td>
<td>Rust Preventing Characteristics Oil Bath, 220-240V 60Hz</td>
</tr>
</tbody>
</table>

Accessories

332-002-007 Test Beaker, 400mL, for NACE TM-01-72 | 6 |
250-000-09F ASTM 9F Thermometer Range: 20 to 230°F | 7 |
250-000-09C ASTM 9C Thermometer Range: –5 to +110°C | 1 |
K30130 Chuck for polishing test specimens Includes locknut and shaft for mounting on accessory drive motor | 1 |
K30150 Drive Motor Drives K30130 Chuck. Mounted on base. 115V 60Hz | 1 |
380-100-001 Silicone Carbide Paper, 100 grit For preliminary grinding and final polishing of test specimens. Pack of 50 | 1 |

Test Specimens

K30110 Steel Test Specimens for ASTM D665/ NACE TM-01-72, Machined to ASTM/NACE specifications. Without holder | 1 |
K30100 Test Specimen with Type 2 PMMA Holder for ASTM D665/NACE TM-01-72 | 1 |
K30101 Test Specimen with Type 2 PTFE Holder | 1 |
**Test Method**
Determines the low temperature flow characteristics of automotive diesel fuels and gas oils, including samples with flow improving additives, by measuring the temperature at which the sample ceases to flow through a wire mesh filter under standard test conditions.

**Cold Filter Plugging Point Test Equipment**
- Conforms to ASTM D6371, IP 309 and DIN 51428 specifications
- Choice of mechanically refrigerated or dry ice cooled bath

Consists of Cold Filter Plugging Point Apparatus, Vacuum System and Cooling Bath.

**Cold Filter Plugging Point Apparatus**–Includes Pyrex™ test jar with graduation, brass jacket with plastic support ring, plastic stopper, plastic insulating ring and spacer, pipette and brass filter unit with stainless steel fine wire mesh screen.

**Vacuum System**–Connects to Cold Filter Plugging Point Apparatus to draw sample through filter screen. Consists of U-tube Manometer (without mercury), three-way stopcock, air vent tube, cork stopper with elbows, and large glass bottle. Vacuum pump is not included.

**Cooling Baths**–Choice of mechanically refrigerated or dry-ice cooled baths. Mechanically refrigerated model utilizes a cascade hermetic cooling system to attain temperatures as low as −90°F (−68°C). Cold Filter Plugging Point Apparatus inserts in composition top plate of bath. Insulated stainless steel tank and polished stainless steel cabinet.

Dry-ice model includes insulated copper interior and steel exterior with corrosion resistant polyurethane enamel finish. Composition top plate suspends Cold Filter Plugging Point Apparatus in freezing mixture at the required depth. Handles on exterior permit easy emptying of freezing mixture. Supplied with thermometer holder.

Please inquire about our automated Cold Filter Plugging Point Test Equipment by contacting Koehler’s Customer Service.

**Specifications**
Conforms to the specifications of:
ASTM D6371; IP 309; DIN 51428

**Electrical Requirements:**
Mechanically Refrigerated Baths
115V 60Hz, Single Phase, 6A
220-240V 50Hz, Single Phase, 3A

**Dimensions** in.(cm):
- Refrigerated Model (lxwxh): 26x25x22 (66x64x56)
- Dry-Ice Model (dia.xh): 12x12 (30x30)

* Cooling Bath

**Shipping Information**
Shipping Weight:
- Refrigerated Model: 195 lbs (88.5kg)
- Dry-Ice Model: 19 lbs (8.6kg)

**Dimensions:**
- Refrigerated Model: 9.9 Qu. ft.
- Dry-Ice Model: 2.6 Qu. ft.

---

**Ordering Information**

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Order Qty</th>
</tr>
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<tbody>
<tr>
<td>Cold Filter Plugging Point Apparatus</td>
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<tr>
<td>K45900</td>
<td>Cold Filter Plugging Point Apparatus</td>
</tr>
<tr>
<td>Vacuum System</td>
<td>1</td>
</tr>
<tr>
<td>K45920</td>
<td>Vacuum System</td>
</tr>
<tr>
<td>Cooling Bath</td>
<td>1</td>
</tr>
<tr>
<td>K45950</td>
<td>Mechanically Refrigerated Cold Filter Plugging Point Bath, 115V 60Hz</td>
</tr>
<tr>
<td>K45995</td>
<td>Mechanically Refrigerated Cold Filter Plugging Point Bath, 220-240V 50Hz</td>
</tr>
<tr>
<td>K45910</td>
<td>Cooling Bath</td>
</tr>
<tr>
<td>250-000-05C</td>
<td>ASTM 5C Thermometer</td>
</tr>
<tr>
<td>Range: −38 to +50°C</td>
<td>1</td>
</tr>
<tr>
<td>250-000-06C</td>
<td>ASTM 6C Thermometer</td>
</tr>
<tr>
<td>Range: −80 to +20°C</td>
<td></td>
</tr>
</tbody>
</table>

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.
Test Method
Determines the Pump Octane Number (AKI), Research Octane Number (RON), and Motor Octane Number (MON) of unleaded gasolines.

Portable Octane Analyzer
- Test results equivalent to ASTM D2699 and D2700 specifications for CFR engines
- Measures all grades of unleaded gasoline
- Displays results in 20 seconds
- Directly measures octane number for ((R+M)/2, RON and MON
- Includes RS-232 output, built-in printer and LCD display
- Results traceable to official knock engine laboratory

Measure octane number via near-infrared (NIR) transmission spectroscopy utilizing 14 near-infrared emitting diodes with narrow bandpass filters, a silicon detector system, and a fully integrated microprocessor. Simple octane number determination requires three easy steps: sampling a background signal, acquiring two absorption spectra of the gas sample, and then acquiring a second background signal. Analyzer is pre-calibrated for unleaded gasoline and ethanol-blended fuels, and can be calibrated for up to eight additional fuel types.

The analyzer is small, lightweight, and operates on "AA" batteries or AC. Before each reading, the unit standardizes itself to assure accuracy. The octane number is printed with time and date on the built-in printer. All data can be downloaded via the RS232 port to an external computer.

Specifications
Accuracy and repeatability equivalent to ASTM approved CFR engines (ASTM D2699, D2700)
Sample Holder: Sealed, cubical glass container (75mm optical path length)
Sample Volume: 8 Ounces (approx. 225 mL)
Precalibrated for Unleaded Gasoline & ethanol-blended fuels. (Unit can be calibrated for up to 8 additional fuel types)
Battery operated (6 AA batteries)

Included Accessories
- IBM Compatible Software
- RS232 Cable
- Aluminum Carrying Case
- 5 Rolls of paper
- 3 Sample Holders
- Light Cover
- 6 AA Batteries
- 6 Sample Holder Labels

Dimensions l x w x h, in. (cm)
13⅜ x 4½ x 2⅔ (34 x 11⅜ x 6½)

Net Weight: 12 lbs (5½ kg)

Shipping Information
23 x 17 x 8½ (58½ x 43¼ x 22)
Shipping weight: 25 lbs (11½ kg)

Ordering Information
Catalog No. Order Qty.
K88600 Portable Octane Analyzer 1

K88601 Printer Paper, 10 Rolls
K88602 Additional Fuel Calibration
K88603 Sample Holder (additional)
K88604 Sample Holder (Box of 12)
K88605 Light Shield
K88606 RS232 Cable
K88607 Aluminum Sample Carrying Case w/12 Sample Holders
K88608 Sample Holder Lids, 12
K88609 Sample Holder Labels, 6
K88610 25 Sample Memory

Hydrocarbon Types in Liquid Petroleum Products

Test Method
Determines saturates, olefins and aromatics in petroleum fractions that distill below 315˚C.

Fluorescent Indicator Absorption Apparatus
- Conforms to ASTM D1319 specifications
- A complete system for analyzing a single or up to six samples simultaneously.
- System is complete with upper six position air pressure manifold with independently operated gauges, pressure regulators and ball O-ring joints for connection to six standard FIA columns mounted with clamps onto a vibrating bar attached to main frame. Bottom of standard FIA column includes a delrin connector for easy attachment of standard 3mm OD disposable analyzer tubes which have a lower delrin end fitting to retain the silica gel. The complete unit also includes 1mL syringe with 4" needle, two gel bottles for pouring silica gel, extra O-rings, stainless steel ball and socket joint clamps and two mounting brackets with screws for stabilizing chassis.

Ordering Information
Catalog No. Description
K41500 Fluorescent Indicator Absorption Apparatus, 115V
K41590 Fluorescent Indicator Absorption Apparatus, 230V
Density/ Relative Density of Light Hydrocarbons by Pressure Thermohydrometer

Test Method
Density and relative density measurements of light hydrocarbons, including LPG, are used for transportation, storage and regulatory purposes. The measurement is made by floating a thermohydrometer in a sample that has been introduced into a pressure cylinder.

Pressure Hydrometer Cylinder
• Conforms to ASTM D1657 and related specifications
• Built-in safety relief valve

Transparent plastic cylinder mounted between machined aluminum end plates and surrounded by stainless steel safety guard. Use together with ASTM 310H Thermohydrometer to determine density or relative density of LPG and light hydrocarbons. Equipped with inlet, outlet and vapor vent valves for admitting sample and purging cylinder. End plates have positive sealing Buna-N O-rings and are joined by sturdy steel support rods. Top plate detaches easily without tools for insertion or removal of thermohydrometer. Safety relief valve prevents unsafe pressure build-up inside cylinder. Mounted on a finished steel base.

Specifications
Conforms to the specifications of:
ASTM D1657, GPA 2140;
IP 235, IS0 3993

Safety relief valve: 200psi (1.4MPa)

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Pressure Hydrometer Cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td>K26150</td>
<td></td>
</tr>
</tbody>
</table>

Accessories
251-000-001  | ASTM 101H Thermohydrometer  |
Nominal Relative Density Range: 0.500 to 0.650  
Standard Temperature, °F: 60/60  
Temperature Range, °F: 30 to 90

251-000-004  | ASTM 310H Thermohydrometer  |
Density Range kg/m³: 500-650  
Standard Temperature, °C: 15  
Temperature Range, °C: 0 to 35

Constant Temperature Water Bath
• Conforms to ASTM D1657 and related specifications
• Mechanically refrigerated for convenient sub-ambient temperature operation

Immerses two Pressure Hydrometer Cylinders at 60°F (15°C) for density and relative density determinations of LPG and other light hydrocarbons. Mechanically refrigerated cooling system maintains sub-ambient temperature. Thermistor activated solid state temperature controller and 750W copper immersion heater maintain bath temperature with ±0.5°F (±0.2°C) stability. A 1/2 hp ball bearing stirrer circulates the bath medium to assure temperature uniformity. Stainless steel tank is fiberglass insulated. Equipped with overflow standpipe/drain. Steel exterior has a durable polyurethane enamel finish.

Specifications
Conforms to the specifications of: ASTM D1657; IP 235; IS0 3993
Controller Sensitivity: ±0.5°F (±0.2°C)
Capacity: two (2) K26150 cylinders

Electrical Requirements:
115V 60Hz, Single Phase, 12.5A  
220-240V 50 or 60Hz, Single Phase, 6.4A

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Constant Temperature Water Bath</th>
</tr>
</thead>
<tbody>
<tr>
<td>K25900</td>
<td>115V 60Hz</td>
</tr>
<tr>
<td>K25990</td>
<td>220-240V 60Hz</td>
</tr>
<tr>
<td>K25995</td>
<td>220-240V 50Hz</td>
</tr>
</tbody>
</table>

Accessories
250-000-12F  | ASTM 12F Thermometer. Range -5 to +215°F |
250-000-12C  | ASTM 12C Thermometer. Range -20 to +102°C |

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.
Propane Dryness Test - Cobalt Bromide Method

Test Method
Provides an indication of the dryness of Commercial Propane and Propane HD5 by colorimetric indication on a pass/fail basis.

Propane Dryness Tester
• Conforms to GPA 2140 specifications
Tests for moisture in propane or other LPG vapors by exposing the sample to a cobalt bromide indicator at specified pressures. Pass/fail results are based upon color changes, if any, as specified by GPA 2140. Apparatus consists of a cobaltous bromide indicator with visible glass tube, 0-100psi pressure gauge, needle valve to regulate gas flow, threaded connector for attachment to propane container and copper cooling coil which immerses in accessory cooling jar. Includes twelve (12) cotton indicator plugs impregnated with cobalt bromide.

Shipping Information
Shipping Weight: 2 lbs (.91kg)

Ordering Information
Catalog No. K40300 Cobalt Bromide Test Apparatus
K40310 Cobalt Bromide Plugs
Cotton wool impregnated with cobaltous bromide and mounted in a plastic tube. Package of one dozen.
332-001-005 Pyrex™ Cooling Jar 117mm dia.x 229mm h

Volatility and Residues in Liquefied Petroleum (LP) Gases

Volatility of Liquefied Petroleum (LP) Gases
Residues in Liquefied Petroleum (LP) Gases

Test Method
The volatility of liquefied petroleum (LP) gases is determined by allowing a precooled sample to weather under specified conditions and observing the temperature when 95% has evaporated. Residues in LP gases are determined by weathering of a precooled sample and determination of the volume remaining at 100°F (37.8°C).

Precooling Apparatus
• Conforms to ASTM and GPA specifications
Consists of brass cooling vessel with built-in 20 ft. (6m) copper cooling coil. Includes compression fittings and 1/8” needle valve at the downstream end.

Ordering Information
Catalog No. K48100 Precooling Apparatus

For NIST traceable certified thermometers, please refer to the ASTM Thermometer section on pages 180 through 187.
Additional Accessories

Additional equipment, materials and/or reagents are required to perform some of the test procedures in the preceding pages. Please refer to the applicable test method for further information, or contact Koehler for assistance.

**Oxidation Stability of Gasoline (Induction Period Method)** .............................................  Pages 76-79
ASTM D525; IP 40; DIN 51780; FTM 791-3352
- Corrosion Resistant Steel Forceps
- Oven
- Distilled Water
- Chromic Acid
- Toluene
- Acetone
- Oxygen

**Oxidation Stability of Aviation Fuels (Potential Residue Method)** .............................. Pages 76-79
ASTM D673; IP 138; DIN 51799; FTM 791-3354
- Drying Oven
- Filtering Crucible
- Oxygen
- Toluene
- Distilled Water
- Acetone

**Existent Gum in Fuels by Jet Evaporation** ......................... Page 80-81
ASTM D381; IP 131; ISO 6246; DIN 51784; FTM 791-3302
- Analytical Balance
- Desiccator
- Filtering Funnel, Sintered Glass
- n-Hexane
- Air Supply (for Air-Intake Method)
- Toluene
- Acetone
- Graduated Cylinder
- Chromic Acid
- Distilled Water
- Oven

**Copper Corrosion From Petroleum Products by the Copper Strip Tamish Test** ................ Pages 84-85
ASTM D130; FSPT DT-28-65; IP 154; ISO 2160; DIN 51759; FTM 791-5325
- Filter Paper
- Cotton Wool
- Isooctane
- Stainless Steel Forceps
- Stoddard Solvent

**Vapor Pressure of Petroleum Products (Reid Method)** ............................ Pages 86-88
ASTM D323, D1267; GPA 2140; IP 69, 161; ISO 3007, 4256; DIN 51616, 51754; FTM 791-1201
- Dead-Weight Tester
- Petroleum Naphta
- Acetone
- Propane
- Butane

**Wax Appearance Point of Distillate Fuels** ........................................ Page 88
ASTM D2388; IP 16; ISO 3013; DIN 51421; FTM 791-1411
- Ethanol
- Methanol
- Solid Carbon Dioxide
- Liquid Nitrogen

**Freezing Point of Aviation Fuels** .................................................. Page 89
ASTM D3817
- Isopropanol
- Solid Carbon Dioxide
- Liquid Nitrogen
- Acetone
- Isopropanol

**Silver Corrosion by Aviation Turbine Fuels** ......................... Page 91
IP227; ASTM D130; FSPT DT-28-65; IP 154; ISO 2160, DIN 51759; FTM 791-5325
- Isooctane
- Ashless Filter Paper
- Stainless Steel Forceps
- Cotton Wool

**Antirust Properties of Petroleum Products Pipeline Cargoes** ...................... Page 92
NACE TM-0172
- Naphtha or Acetone
- Chromic Acid

**Cold Filter Plugging Point of Distillate Fuels** ....................... Page 93
IP 309 and DIN 51428
- Heptane
- Lintless Filter Paper
- Vacuum Pump