

FLASH POINT

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AUTOMATED FLASH POINT TESTERS



Automated Pensky-Martens Flash Point Tester

Automatic Abel Flash Point Tester

- Conforms to IP 170 and related specifications
- Simple automation routine for easy operation

The automated Abel flash point tester is used primarily to test flammable and combustible materials for shipping and safety regulations. The flash tester provides an increased temperature range of operation as compared with other testers, allowing greater flexibility in testing samples according to the Abel test method. The unit provides a test range to 110°C and can be extended to -30°C by any appropriate external chiller. The flash point tests are simply conducted by mounting the flash cup filled with sample into the test position and selecting a pre- or user-programmed test method. Automation routines provide accurate test results. A quick search method is available to determine the flash point of unknown samples. The dual detection system (thermal and ionization) allows for testing all types of products. Ignition by gas flame or electrical ignitor is included, along with safety cut-off devices. Test results are automatically corrected to standard pressure (101.3 kPa). The system is equipped with a differential Pt-100 RTD probe designed to duplicate the response time of a mercury-in-glass thermometer and with multiple sensors that continually monitor instrument function, displaying an error message if a problem is detected. Supervision software is included.

Temperature range of Flash Tester can be extended. Please contact Koehler Customer Service for additional information.

Specifications

Conforms to the specifications of:

IP 170; ISO 1523, 13736;
NF M 07-011; NF T 66-009

Electrical Requirements:

115V 60Hz, Single Phase
230V 50Hz, Single Phase

Dimensions l x w x h, in.(cm)

10.25 x 21 x 19.75 (26 x 5.53 x 50)

Net Weight:

44 lbs (20kg)

Auto Pensky-Martens Closed Cup Flash Point Tester

- Conforms to ASTM D93 and related specifications
- Dual flash point detection system (thermal and ionization) for measurement of samples containing water and/or silicone
- Gas or electric ignition
- Flash point operation range between 0 and 400°C
- Simple automation routine for easy operation
- Large viewing screen for observing test status at a distance from the unit
- Automatic barometric correction

The automated Pensky-Martens flash point tester accurately determines the lowest flash point temperature of fuels, lubricating oils, and homogenous liquids (ASTM D93 A), or liquids containing suspended solids as well as liquids that tend to form a surface film during testing (ASTM D93 B). Flash point tests are simply conducted by mounting the flash cup filled with sample into the test position and selecting a pre- or user-programmed test method. A quick search method allows for determination of flash points for unknown samples and a method for asphalts is also included. The automation routines provide accurate test results, even with users inexperienced in flash point test methods. The flash point test result is automatically corrected to standard pressure (101.3 kPa). The unit is equipped with a differential Pt-100 RTD probe designed to duplicate the response time of a mercury-in-glass thermometer as per ASTM D93-02a and E1-03a. The system features multiple sensors for continually monitoring of instrument function and displaying an error message if a problem is detected. The performance of the electrical ignitor is continuously checked, and the user is notified upon the need of replacement due to either damage or the end of its useful life. The system is easily interfaced with an external PC for operation and method updates. When performing a test, the system will display the stirring speed, temperature curve (also printed out), and current test status. The system alerts the user if the first application of the ignitor results in a flash or if no flash point is detected at the end of the test program. If a flash is not detected 30°C above the expected flash point or at 400°C, then the test is automatically aborted for safety. An easy connection to the air ventilation system or external water connection provides a quick cool down between test runs for operational efficiency.

Specifications

Conforms to the specifications of:

ASTM D93; IP 34; ISO 2719; DIN EN 22719;
NF M 07-019; JIS K2265

Electrical Requirements:

115V 60Hz 1000W
230V 50Hz 1000W

Dimensions l x w x h, in.(cm)

10.25 x 21 x 19.75 (26 x 5.53 x 50)

Net Weight:

44 lbs (20kg)

AUTOMATED FLASH POINT TESTERS

Automatic Tag Closed Cup Flash Point Tester

- Conforms to ASTM D56 and related specifications
- Simple automation routine for easy operation

The automated Tag Closed Cup flash point tester ensures the accuracy and precision required according to the ASTM D56 and related test methods. The test sample is heated at a prescribed rate of temperature increase throughout the standard temperature test range to 100°C. The flash point tests are simply conducted by mounting the flash cup filled with sample into the test position and selecting a pre-programmed test method or the search mode to determine an approximate flash point. The automation routines provide accurate test results. Ignition by gas flame or electrical ignitor is included, along with safety cut-off devices. The measurement range can be extended to -30°C by any appropriate external chiller. Supervision software is included.

Temperature range of Flash Tester can be extended. Please contact Koehler Customer Service for additional information.

Specifications

Conforms to the specifications of:
ASTM D56; IP 304
Electrical Requirements:
115V 60Hz, Single Phase
230V 50Hz, Single Phase

Dimensions l x w x h, in. (cm)
21 x 10.5 x 19.75 (53.5 x 26 x 50)
Net Weight:
44 lbs (20kg)



Automated Tag closed Cup Flash Point Tester

Automatic Cleveland Open Cup Flash Point Tester

- Conforms to ASTM D92 and related specifications
- Simple automation routine for easy operation
- Flash point operation between ambient and 400°C
- Gas or electric ignition

The automated Cleveland Open Cup flash point tester accurately determines flash and fire point temperatures of viscous petroleum products including oils and bitumens over an extended temperature range. When examining highly viscous specimens, a preheating time and temperature are set in order to liquefy the sample for testing. The surface skin from bituminous samples can be removed with a skimmer. The flash/fire point tests are simply conducted by mounting the flash cup filled with sample into the test position and selecting a pre-programmed test method or the search mode to determine an approximate flash point. The test results are automatically corrected to standard pressure (101.3 kPa). Equipped with a differential Pt-100 RTD probe, the system is designed to duplicate the response time of a mercury-in-glass thermometer. Multiple sensors continually monitor instrument function, displaying an error message if a problem is detected. The performance of the ionization sensor which detects the flash and fire points is continuously monitored, and the user is notified upon the need of replacement. If a flash is not detected 20°C above the expected flash point or at 420°C, then the test is automatically aborted for safety. The system is easily interfaced with an external PC for operation and method updates. When performing a test, the system will display the stirring speed, temperature curve (also printed out), and current test status. The system alerts the user if the first application of the ignitor results in a flash or if no flash point is detected at the end of the test program. If a flash is not detected 30°C above the expected flash point or at 400°C, then the test is automatically aborted for safety.

Specifications

Conforms to the specifications of:
ASTM D92; IP 36; ISO 2592
Electrical Requirements:
115V 60Hz 1000W
230V 50Hz 1000W

Dimensions l x w x h, in. (cm)
21 x 10.5 x 19.75 (53.5 x 26 x 50)
Net Weight:
44 lbs (20kg)

Ordering Information

Catalog No.	Description	Order Qty
Automatic Abel Flash Point Tester		
K87300	Automatic Abel Flash Point Tester, 115V 60Hz	1
K87390	Automatic Abel Flash Point Tester, 230V 50Hz	1
Automatic Pensky-Martens Closed Cup Flash Point Tester		
K87100	Automatic Pensky-Martens Closed Cup Flash Point Tester, 115V 60Hz	1
K87190	Automatic Pensky-Martens Closed Cup Flash Point Tester, 230V 50Hz	1
Automatic Tag Closed Cup Flash Point Tester		
K87700	Automatic Tag Closed Cup Flash Point Tester, 115V 60Hz	1
K87790	Automatic Tag Closed Cup Flash Point Tester, 230V 50Hz	1
Automatic Cleveland Open Cup Flash Point Tester		
K87400	Automatic Cleveland Open Cup Flash Point Tester, 115V 60Hz	1
K87490	Automatic Cleveland Open Cup Flash Point Tester, 230V Hz	1

FLASH POINT BY PENSKY-MARTENS CLOSED CUP TESTER



K16200 Pensky-Martens Flash Tester with K16220 Accessory Stirrer Motor

Specifications

Conforms to the specifications of:

ASTM D93; AASHTO T73-811; IP 34; ISO 2719; DIN 51758; FTM 791-1102; NF M 07-019

Electrical Requirements:

115V 50/60Hz, Single Phase, 6.5A
220-240V 50/60Hz, Single Phase, 3.4A

Included Accessories

Brass Test Cup with Handle
Thermometer Holder

Dimensions lwxhxh,in.(cm)

9½x8x22½ (24x20x57) with optional stirrer motor installed

Net Weight:

K16000: 21 lbs (9.5kg)
K16200/K16270: 24 lbs (10.9kg)

Shipping Information

Shipping Weight: 30 lbs (13.6kg)
Dimensions: 3.1 Cu. ft.

Please refer to page 32 about our automated Pensky-Martens Closed Cup Flash Point Tester or inquire by contacting Koehler Customer Service.

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

Test Method

For flash point determinations of fuels, lubricating oils, liquids containing suspended solids and liquids that tend to form a surface film during testing.

Pensky-Martens Closed Cup Flash Tester

- Conforms to ASTM D93 and related specifications
- Choice of electric or gas heating

Determines flash points of a wide range of products by a closed cup method with two option speed stirring of the sample. Extensively used in shipping and safety regulations for detection of contamination by volatile and flammable materials in fuel oils and lubricating oils, and for characterization of hazardous waste samples.

Smooth operating cover mechanism slides shutter open and applies test flame at the turn of a knob. Cover fits over brass test cup and includes pilot flame, test flame reference bead, built-in stirrer and plated brass thermometer ferrule.

Electrically heated model is equipped with a 750W nickel-chromium heater with stepless variable control for accurate, repeatable temperature rate of rise settings per specifications. Heater unit is enclosed in a stainless steel housing with cooling vents. Includes line cord receptacle and switch for accessory slow speed stirrer.

Gas heated model has a built-in nickel plated brass natural gas burner, or can be supplied with an artificial gas burner or liquid propane burner (specify when ordering). Both models are mounted on a sturdy cast iron base.

Ordering Information

Catalog No.		Order Qty
Pensky-Martens Closed Cup Flash Tester		
K16200	Electrically Heated Model, 115V 50/60Hz	1
K16270	Electrically Heated Model, 220-240V 50/60Hz	
K16000	Gas Heated Model	
Accessories		
K16220	Stirrer Motor, 115V 50/60Hz Slow speed gear motor rotates stirrer of Pensky-Martens Tester at 115rpm for Procedure A and at 250rpm for Procedure B. Includes adjustable support bracket and mounting rod. Installs in base of flash tester.	1
K16229	Stirrer Motor, 220-240V 50Hz	
250-000-09F	ASTM 9F Thermometer Range: 20 to 230°F	
250-000-09C	ASTM 9C Thermometer Range: -5 to +110°C	1
250-000-10F	ASTM 10F Thermometer Range: 200 to 700°F	
250-000-10C	ASTM 10C Thermometer Range: 90 to 370°C	1
K16010	Cover Assembly Complete assembly. Includes shutter, flame exposure device, stirrer and thermometer ferrule.	
K16020	Brass Test Cup With heat resistant handle.	

FLASH POINT BY TAG CLOSED TESTER

Test Method

For flash point determinations of liquids with a viscosity of below 5.5 centistokes (cSt) at 104°F (40°C) or below 9.5cSt at 77°F (25°C), and a flash point below 200°F (93°C) except cut-back asphalts, those liquids which tend to form a surface film under test conditions and materials which contain suspended solids.

Tag Closed Cup Flash Tester

- Conforms to ASTM D56 and related specifications
- Gas or electrical heating

Determines flash points of liquid products by the Tag Closed Cup method. Features stepless variable heat control with reference dial for accurate repeat setting of temperature rate of rise per specifications. Also available with gas burner instead of electric heater. Precision machined cover mechanism simultaneously opens slide shutter and applies test flame to sample at the turn of a knob. Includes liquid bath with constant level overflow, brass test cup, plated brass thermometer ferrules and test flame reference bead. Bath and cover mechanism are constructed of plated brass. Heater is enclosed in a cast aluminum base assembly.

Please refer to page 33 about our automated Tag Closed Cup Flash Point Tester or inquire by contacting Koehler Customer Service.



K14600 Tag Closed Cup Flash Tester

Ordering Information

Catalog No.		Order Qty
Tag Closed Cup Flash Tester		1
K14600	Electrically Heated Model, 115V 50/60Hz	
K14670	Electrically Heated Model, 220-240V 50/60Hz	
K14690	Gas Heated Model	
Accessories		
250-000-09F	ASTM 9F Thermometer Range: 20 to 230°F	2
250-000-09C	ASTM 9C Thermometer Range: -5 to +110°C	
250-000-57F	ASTM 57F Thermometer Range: -4 to +122°F	2
250-000-57C	ASTM 57C Thermometer Range: -20 to +50°C	
K14510	Cover Assembly Includes slide shutter burner and thermometer ferrules	
K14520	Brass Test Cup	

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

Specifications

Conforms to the specifications of:

ASTM D56; IP 304; FTM 791-1101

Electrical Requirements:

115V 50/60Hz, Single Phase, 1.3A

220-240V 50/60Hz, Single Phase, 0.6A

Included Accessories

Brass Test Cup

Cover Assembly (includes Slide Shutter, Burner and Thermometer Ferrules)

Dimensions l x w x h, *in. (cm)

5x5x16 (13x13x41)

*with thermometers inserted

Net Weight: 7 lbs (3.2kg)

Shipping Information

Shipping Weight: 8 lbs (3.6kg)

Dimensions: 0.76 Cu. ft.

FLASH AND FIRE POINTS BY CLEVELAND OPEN CUP



K13900 Cleveland Open Cup Flash Tester

Specifications

Conforms to the specifications of:

ASTM D92, D6074, D6158; AASHTO T48; ANS Z-11.6; IP 36; ISO 2592;
DIN 51376; FTM 791-1103, FTM 141-4294

Electrical Requirements:

115V 50/60Hz, Single Phase, 6.5A
220-240V, 50/60Hz, Single Phase, 3.4A

Included Accessories

Brass Test Cup

Dimensions lwxh,in.(cm)

10x5½x14 (25x14x36)

Net Weight: 8½ lbs (3.9kg)

Shipping Information

Shipping Weight: 12 lbs (5.4kg)

Dimensions: 1.5 Cu. ft.

Test Method

For flash and fire points of all petroleum products, except fuel oils and those having an open cup flash below 79°C (175°F).

Cleveland Open-Cup Flash Tester

- Conforms to ASTM D92 and related specifications
- For flash points above 79°C (175°F)

Determines flash and fire points by the Cleveland Open-Cup method. Consists of test flame applicator, brass test cup, thermometer support, heating plate and electric heater. Applicator is precisely aligned per specifications and pivots for test flame application at specified temperature intervals. Hinged thermometer support raises to facilitate placement and removal of test cup. Adjust flame size using built-in needle valve and comparison bead.

Equipped with a 1000W nickel-chromium heater with stepless variable heat control for accurate repeat setting of temperature rate of rise per specifications.

Heater unit is enclosed in a stainless steel housing with cooling vents. Test flame applicator and thermometer support are constructed of machined nickel plated brass.

Please refer to page 33 about our automated Cleveland Open Cup Flash Point Tester or inquire by contacting Koehler Customer Service.

Ordering Information

Catalog No.		Order Qty
Cleveland Open-Cup Flash Tester		1
K13900	Electrically Heated Model, 115V 50/60Hz	
K13990	Electrically Heated Model, 220-240V 50/60Hz	
Accessories		
250-000-11F	ASTM 11F Thermometer Range: 20 to 760°F	1
250-000-11C	ASTM 11C Thermometer Range: -6 to +400°C	
K14000	Cleveland Open Flash Cup Precision machined brass with heat resistant handle	

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

FLASH POINT BY TAG OPEN-CUP APPARATUS

Flash Point and Fire Point of Liquids by Tag Open-Cup Apparatus

Flash Point of Cutback Asphalt with Tag Open-Cup Apparatus

Test Method

For determination of flash and fire points of liquids at temperatures of up to 325°F (163°C) and flash points of cutback asphalts at temperatures of less than 200°F (93°C).

Tag Open-Cup Flash Tester

- Conforms to ASTM D1310, D3143 specifications
- Choice of gas or electrically heated

Determines Tag Open-Cup flash point of liquid products and cutback asphalts. Includes sample test cup, plated brass liquid bath with constant level overflow, pivoting ignition taper with pilot light and reference bead, pivoting thermometer holder, heater and cast aluminum base.

Electrically heated model is equipped with stepless variable heat control for accurate control of temperature rate of rise per specifications. Also available with gas or burner.



K15600 Tag Open-Cup Flash Tester

Ordering Information

Catalog No.		Order Qty
Tag Open-Cup Flash Tester		
K15600	Electrically Heated Model, 115V 50/60Hz	1
K15670	Electrically Heated Model, 220-240V 50/60Hz	
K15690	Gas Heated Model	
Accessories		
250-000-33F	ASTM 33F Thermometer Range: -36.5 to +107.5°F	1
250-000-33C	ASTM 33C Thermometer Range: -38 to +42°C	1
250-000-09F	ASTM 9F Thermometer Range: 20 to 230°F	1
250-000-09C	ASTM 9C Thermometer Range: -5 to +110°C	
250-000-35F	ASTM 35F Thermometer Range: 194 to 338°F	
250-000-35C	ASTM 35C Thermometer Range 90 to 170°C	1
K15610	Levelling Device For proper adjustment of sample level in test cup. Meets ASTM specifications. Polished aluminum	
K15620	Draft Shield	1
K15520	Sample Cup	

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

Specifications

Conforms to the specifications of:
ASTM D1310, D3143
Electrical Requirements:
115V 50/60Hz, Single Phase, 13A
220-240V 50/60Hz, Single Phase, 0.6A

Included Accessories

Pyrex™ Sample Cup

Dimensions l x w x h, *in. (cm)

10x7x17 (25x18x43)
*with thermometer inserted
Net Weight: 7½ lbs (3.4kg)

Shipping Information

Shipping Weight: 9½ lbs (4.3kg)
Dimensions: 1.3 Cu. ft.

FLASH POINT AND SUSTAINED BURNING OF LIQUIDS



K16500 Rapid Flash Tester, Closed Cup

Flash Point of Liquids by Small Scale Closed Cup Apparatus

Flash Point by Small Scale Closed Tester

Sustained Burning of Liquid Mixtures by Setaflash Tester (Open-Cup)

Test Method

Verifies the flash point or the sustained burning qualities of small samples in the range of -30°C to $+300^{\circ}\text{C}$.

Rapid Flash Tester

- Conforms to ASTM D3278, D3828, D4206; DOT CFR 49-173.115; IATA; ISO 9038 and related specifications
- One minute test with a 2mL sample
- Simple to operate

Rapid Tester[®] provides rapid determinations of flash point or sustained burning qualities by using a small sample. A flash/no flash test result is achieved in one minute for flash points below 212°F (100°C) with a 2mL sample. Ideally suited for quality assurance and environmental compliance testing as well as actual flash point for paints, fragrances, hydrocarbons and other liquids. Open cup models are used for determining sustained burning qualities characteristics of mixtures of flammable and nonflammable liquids or liquids with widely different flash points when assessing flammability characteristics. Features convenient semi-automatic operation for flash/no flash tests. Set the test temperature on the digital display and inject a 2mL or 4mL sample into the sample cup. The tester quickly stabilizes itself at the desired value, permitting the test flame to be applied and the result to be observed by the operator. Unit also performs conventional determinations of actual flash temperature by the small scale closed tester method.

Two models are offered: the Closed Cup Model is for routine flash point tests in the range from -30 to $+300^{\circ}\text{C}$ (-22 to $+572^{\circ}\text{F}$); the Open-Cup Model is for sustained burning tests in the range from ambient to 212°F (100°C). Both models include automatic temperature control with $^{\circ}\text{C}/^{\circ}\text{F}$ selector switch, syringe, electronic timer, integral NIST traceable thermometer, and an external fuel cylinder valve for connection to a customer-supplied fuel cylinder or other fuel source.

Specifications

Conforms to the specifications of:

ASTM D3278, D3828, D4206; IP 303; ISO 3679, ISO 3680, ISO 9038; DOT CFR 49-173.115; IATA

Included Accessories

Thermometer, range 32 to 572°F (0 to 300°C)

Syringe

Dimensions: lwxh,in.(cm)

$15 \times 23.4 \times 6.3$ ($38.1 \times 8.6 \times 16.2$)

Net Weight: 10 lbs (4.6kg)

Shipping Information

Shipping Weight: 16 lbs (7.26kg)

Dimensions: 2.3 Cu. ft.

Ordering Information

Catalog No.

K16500	Rapid Flash Tester, Closed Cup, 115V Aluminum Test Cup/Brass Lid & Shutter
K16591	Rapid Flash Tester, Closed Cup, 220-240V Aluminum Test Cup/Brass Lid & Shutter
K16502	Rapid Flash Tester, Closed Cup, 115V Stainless Steel Test Cup, Lid & Shutter
K16592	Rapid Tester, Closed Cup, 220-240V Stainless Steel Test Cup, Lid & Shutter
K16503	Rapid Flash Tester, Open-Cup, 115V Aluminum Test Cup
K16593	Rapid Flash Tester, Open-Cup, 220-240V Aluminum Test Cup
K16504	Rapid Flash Tester, Open-Cup, 115V Stainless Steel Test Cup
K16594	Rapid Flash Tester, Open-Cup, 220-240V Stainless Steel Test Cup

Accessories

K16506	Fuel Cylinder Valve
K16507	Heat Transfer Compound for thermometer
K16508	Metal Cooling Block to facilitate cooling of the sample cup between tests
K16509	Refrigerant Charged Cooling Block to hold cooling mixture for subambient testing
K16510	Syringe 2mL/4mL
K16511	Thermometer, range 32 to 572°F / 0 to 300°C
K16512	Thermometer, range 32 to 230°F
K16513	Thermometer, range 212 to 572°F
K16514	Thermometer, range 0 to 110°C
K16515	Thermometer, range 100 to 300°C
K16516	Thermometer, range -36 to $+105^{\circ}\text{F}$
K16517	Thermometer, range -38 to $+40^{\circ}\text{C}$

AUTOIGNITION TEMPERATURE OF LIQUID CHEMICALS

Test Method

Determines the lowest temperature at which the vapors of a liquid or solid chemical sample will self-ignite under prescribed laboratory conditions. The temperatures at which 'cool flame' and 'hot flame' ignitions occur, as evidenced by sudden temperature increases in the sample flask, are measured and recorded, and the delay time between introduction of the sample and ignition is timed.

Autoignition Apparatus

- Conforms to ASTM E659 specifications
- Digital furnace temperature control
- Digital flask temperature display

Modified crucible furnace with digital thermocouple readout of flask temperature at prescribed points per ASTM specifications. Linearized analog output permits connection to a strip chart recorder or datalogging instrument. Furnace provides rapid response and $\pm 1^\circ\text{C}$ stability throughout the operating range of 200 to 1200°C. Cylindrical heating chamber provides excellent radial temperature uniformity. Furnace cover has ports for flask exterior thermocouples, and a borosilicate glass thermocouple tube is provided to assure correct positioning of the gas temperature thermocouple inside the test flask. Thermocouples plug directly into the furnace control unit for quick disconnection when removing the flask. A hinged holder in the cover facilitates handling of the test flask. Adjustable mirror permits safe viewing of the flask interior during testing. Control panel has temperature controls and digital thermocouple readout with four-position selector switch.

Specifications

Conforms to the specifications of:
 ASTM E659
 Temperature Range: 200 to 1200°C
 Temperature Control: digital setpoint solid state controller accurate to within $\pm 1^\circ\text{C}$
 Flask Temperature Display: 0-1200°C, with four position selector switch
 Electrical Requirements: 220-240V 50/60Hz, Single Phase, 7.7A

Included Accessories

Test Flask, 500mL
 Thermocouples (4)

Dimensions l x w x h, in. (cm)

Furnace: 15x15x22 (38x38x56)
 Control Cabinet: 22x10x14 (56x25x36)
 Net Weight: 72 lbs (32.8kg)

Shipping Information

Shipping Weight: 98 lbs (44.5kg)
 Dimensions: 16.3 Cu. ft.

Special apparatus for performing the Autoignition Test according to the ASTM D2155 test method is available. Please contact Koehler Customer Service for additional and ordering information.



K47000 Autoignition Apparatus

Ordering Information		Accessories (Con't)	
Catalog No.	Order Qty	Catalog No.	Order Qty
K47000	Autoignition Apparatus, 220-240V 50/60Hz	1	
Accessories		374-115-001	Hot Air Gun For purging product gases between tests 115V 50/60Hz
362-001-000	Syringe, 1mL	1	
K470-0-1-14	Needle, 6", stainless steel	1	
308-115-001	Recorder, 115V 50/60Hz Records signal from the internal gas thermocouple in strip chart form.	1	
308-230-006	Recorder, 220-240V 50/60Hz	1	
		374-230-001	Hot Air Gun, 220-240 50/60Hz
		332-003-007	Test Flask, 500mL

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.

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ASTM D93, AASHTO T73-811, IP 34, ISO 2719, DIN 51758, FTM 791-1102

Propane
Toluene
Acetone
Calcium Chloride
Barometer

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ASTM D56, IP 304, FTM 791-1101

Ethylene Glycol
Propane
Barometer
Water

Flash and Fire Points by Cleveland Open-Cup.....Pages 33, 36

ASTM D92, AASHTO T48, ANS Z-11.6. IP 36, ISO 2592, DIN 51376,
FTM 791-1103, FTM 141-4294

Barometer

Flash Point of Cutback Asphalt with Tag Open-Cup ApparatusPage 33

ASTM D3143

Ethylene Glycol
Distilled Water

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ASTM D1310

Flasks, 500mL (2)
Distilled Water
Solid Carbon Dioxide
Acetone
n-Heptane
p-Xylenol
Isopropanol
Diethylene Glycol

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ASTM E659

Laboratory Balance
Powder Funnel