

BITUMENS AND WAXES

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Ductility of Bituminous Materials



K80020 Constant Temperature Ductility Machine with Circulator

Test Method

Measures the distance of elongation of a bitumen sample when a briquet specimen is pulled apart at a specified speed and temperature.

Ductility Testing Machine

- Conforms to ASTM D113 and related specifications
- Constant temperature model with circulator
- Available force measuring adapter with digital indication

Standard Ductility Testing Machine—Three-speed apparatus pulls briquets of bituminous materials apart at a uniform speed while immersing them in water. As many as three specimens at a time can be tested at speeds of 0.25, 1 or 5cm per minute. A synchronous direct motor drive unit maintains constant speed without vibration. Drive unit rides on a bronze lead screw mounted above the water level to prevent agitation of water and premature rupture of specimens. A traveling pointer indicates the position of the carriage against a linear centimeter scale on the trough. Elongation capacity is 150cm, with automatic carriage stop. Polished stainless steel trough has overflow connection. Equipped with bronze gears and solid brass components to prevent rusting.

Constant Temperature Model—Similar to the standard Ductility Machine, but equipped with a solid state, thermostatically controlled bath and circulator to control temperature within $\pm 0.9^\circ\text{F}$ ($\pm 0.5^\circ\text{C}$) in the range of 35-90°F (1.7-32.2°C). Circulant water is directed through stainless steel tubes beneath a false bottom in the trough to provide efficient heat transfer. Supplied with three standard brass briquet molds and brass base plate. See page 171 for information on force measuring adapters and molds.

Ordering Information

Catalog No.	Description
K80010	Standard Ductility Testing Machine 115V 60Hz
K80015	Standard Ductility Testing Machine 220-240V 50Hz
K80020	Constant Temperature Ductility Machine 115V 60Hz
K80025	Constant Temperature Ductility Machine 220-240V 50Hz
K80011	Acrylic Cover For trough of Constant Temperature Model

Accessories

K80012	Standard Mold Includes interlocking brass clips and sides, per ASTM D113 and related specifications
K80013	Base Plate (Holds 3 Ductility Moulds) Brass construction. Accommodates three standard or force measurement molds
250-000-63F	ASTM 63F Thermometer Range: 18 to 89°F
250-000-63C	ASTM 63C Thermometer Range: -8 to +32°C

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

Specifications

Conforms to the specifications of: ASTM D113; P226; AASHTO T51; ANS A37.11; Federal Specification SS-R-406C; USDA Method 5 (BUL 12-16); DIN 52013

Testing Capacity

- Standard ductility measurement: 3 samples
- Force ductility measurement: 2 samples

Included Accessories

- Standard Mold (3)
- Base Plate

Dimensions lwxhxh,in.(cm)

- Test unit (trough): 74x11 $\frac{3}{4}$ x6 $\frac{1}{2}$ (188x30x17)
- Circulator unit*: 10x9x12 $\frac{1}{2}$ (25x23x32)
- *Constant Temperature Model only

Shipping Information

Shipping Weight:

- K80010/K80015: 200 lbs (91kg)
- K80020/K80025: 43 lbs (19.5kg)



K80012 Standard Ductility Mold

Bituminous Materials in Tension

Test Method

Evaluates the tensile properties of bituminous materials by measuring the force required to elongate a briquet specimen under controlled laboratory conditions.

Force Measuring Adapter

- Electronic force measurement with digital indication
- Analog output signal for computer interface

Measures the force exerted on a briquet specimen in a standard ductility machine. Use for evaluating the tensile properties of bituminous materials, including asphalt cements, asphalt emulsion residues, polymer modified asphalt cements, and polymer modified asphalt emulsion residues, and for measuring the stress relaxation properties of bituminous materials used in the roofing industry and in the pavement joint sealant industry. Installs easily in the standard or constant temperature ductility machine—no tools are required. Adapter incorporates a linear variable differential transformer (LVDT) to electronically measure the force exerted on the specimen. Stainless steel construction prevents rust and corrosion, and all electrical components are located outside of the water bath. Included digital indicator unit incorporates a power supply for the LVDT and a 0-2 VDC analog output signal for interfacing with a computer data acquisition system, strip chart recorder or datalogger.

Specifications

Conforms to the specifications of:
ASTM P226

Accuracy: ±0.01 pounds

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

Adapter: 5½ x 1¼ x 6 (14 x 4 x 15)

Digital Indicator Unit:
10 x 12 x 3 (25 x 30 x 8)

Included Accessories

Weight Holder for Calibration of
Adapter

Shipping Information

Shipping Weight: 20 lbs (9.1kg)
Dimensions: 3.4 Cu. ft.



K80041 Force Ductility Mold

Ordering Information

Catalog No.		Order Qty
K80040	Force Measuring Adapter, 115V 60Hz	2
K80045	Force Measuring Adapter, 220-240V 50Hz	
Accessories		
K80041	Force Ductility Mold Includes interlocking brass clips and sides per ASTM D-4/P226 specifications	2
K80013	Base Plate	2

Automatic Ductility of Bituminous Materials

Automatic Ductility Testing Apparatus

- Conforms to ASTM D113, P226 and related test specifications

The Automatic Tensile Stress Apparatus measures the ductility of bituminous materials immersed in water on up to three samples simultaneously. The instrument features a microprocessor-controlled drive unit with a stepping motor and feed rod providing a force of up to 200N, an elongation capacity of 150cm, a double-walled stainless steel tempering bath with circulation system, and a microprocessor-based control unit for setting test parameters and displaying measured test values such as traction speed, tensile force, and distance. An RS-232 interface provides test data export to an external printer, and a Ductility Windows® Software Package is available for data graphing, manipulation, and storage. For the determining the tensile properties of polymer-modified bitumens, an elastic recovery test method according to ASTM P226 is also available on the Automatic Tensile Stress Apparatus. *Order external circulator separately, please refer to pages 70-71 for additional information or contact Koehler Customer Service.*

Specifications

Conforms to the specifications of:
ASTM D113, P226; DIN 53013;
EN 13398; NF T 66-006

Included Accessories

Printer
Ductility Mould Holders (3)
Ductility Moulds (3)
Please specify test method when ordering.

Ordering Information

Catalog No.		
K84000	Automatic Ductility Testing Apparatus, 115V 50/60Hz	
K84090	Automatic Ductility Testing Apparatus, 230V 50/60Hz	
Accessories		
K84001	Ductility Windows® Software Package <i>Provides additional capability for instrument control and data manipulation.</i>	
K84002	Ductility Mould, Brass per ASTM D113	
K84003	Ductility Mould, Brass per ASTM P226	
K84008	Ductility Mould Holder	
K84009	Calibration Set	
250-000-63F	ASTM 63F Thermometer Range: 18 to 89°F	
250-000-63C	ASTM 63C Thermometer Range: -8 to +32°C	

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

Softening Point of Bitumen (Ring-and-Ball Apparatus)

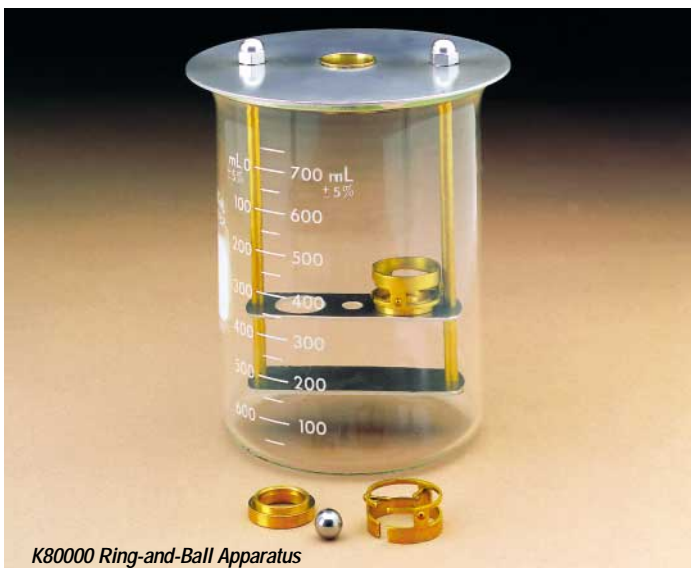
Test Method

The sample is cast in shouldered rings and heated at a controlled rate under the weight of a steel ball. The softening point is the temperature at which the bitumen disks soften and sag downward a specified distance.

Softening Point Apparatus

- Conforms to ASTM D36 and related specifications

Consists of 800mL beaker, 2 standard balls, shouldered rings, ball centering guides, ring holder, bottom plate and beaker cover with support rods. Order thermometer and heater separately.



Ordering Information

Catalog No.		Order Qty
K80000	Softening Point Apparatus	1
Accessories		
K42000	Powertrol Heater 750W heater with variable stepless control and porcelain refractory top plate with positioning well for beaker. Enclosed in a stainless steel housing with cooling vents, Shipping Weight: 8 lbs, 14 oz (3.6kg). 115V 50/60Hz	
K42090	Powertrol Heater, 220-240V 50/60Hz	1
250-000-15F	ASTM 15F Thermometer Range: 30 to 180°F	1
250-000-15C	ASTM 15C Thermometer Range: -2 to +80°C	1
250-000-16F	ASTM 16F Thermometer Range: 85 to 392°F	
250-000-16C	ASTM 16C Thermometer Range: 30 to 200°C	
K80001	Ring, Brass, shouldered ring conforming to ASTM specifications. Pack of 10	
K80002	Ball, Hardened steel, conforming to ASTM specifications. Pack of 10	
K80003	Ball-Centering Guide	

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

Specifications

Conforms to the specifications of:
ASTM D36, E28; AASHTO T53;
IP 58, 198; NF T 66-008

Shipping Information

Shipping Weight: 4 lbs (1.8kg)

Automatic Softening Point of Bitumen (Ring-and-Ball Apparatus)

Automatic Softening Point Apparatus

- Conforms to ASTM D36 and related test specifications
- Automatic load ball centering and application system
- Optical detectors for automatic measurement of softening point
- Overtemperature protection circuitry

The Automatic Softening Point Apparatus features a microprocessor-based controller, an automatic load ball applicator, two optical detectors, and two test positions for measuring the softening point of bitumens, waxes, and other solid to semi-solid products. The instrument maintains program sequences for both water and glycerin bath tests as well as a user-defined program. A low-mass heating device along with the microprocessor-controlled stirring device and Pt-100 sensor maintain the proper bath heating rate as prescribed by the test method. The dual independent optical detection system provides accurate and precise measurement of the softening point for up to two individual samples without operator intervention. The backlit LCD display shows the expected softening point as entered by the operator and the actual bath temperature during the test for both positions. The test results can be exported through the RS-232 interface. For added safety, the integrated safety device interrupts power if an overtemperature situation occurs.

Shipping Information

Shipping Weight: 42 lbs (19kg)
Dimensions: 4.9 Cu. ft.

Specifications

Conforms to the specifications of:
ASTM D36, E28; AASHTO T53;
IP 58; ISO 4625; DIN 52011;
NF T 66-008; EN 1427, 13179

Included Accessories

Glass Beaker
Ring and Ball Support
with Temperature Probe
Test Rings (10)
Load Balls (10)
Ball Application and Centering Guide



Ordering Information

Catalog No.		Order Qty
K83000	Automatic Softening Point Apparatus, 115V 50/60Hz	
K83090	Automatic Softening Point Apparatus, 230V 50/60Hz	
Accessories		
K83001	Shouldered Ring, pack of 10	
K83002	Load Ball, pack of 10	

Breaking Point of Bitumen, Fraass Method

Test Method

Determines the breaking point of solid and semi-solid bitumens. A thin steel plaque is coated with the sample and flexed in a bending apparatus at descending temperatures until cracks appear in the sample coating.

Breaking Point Apparatus

- Conforms to IP 80 specifications

Consists of two concentric borosilicate glass tubes with movable steel plate holders. A cone-and-peg mechanism moves the inner tube up and down relative to the outer tube, which varies the distance between the plate holders, causing the stainless steel test plate to be flexed. The inner tube accommodates a test thermometer. Supplied with 12 spring stainless steel plaques.

Ordering Information

Catalog No.		Order Qty
K28300	Bending Apparatus	1
K28310	Cooling Apparatus	1
	Consists of test tubes, cylinder, bungs and thistle tunnel	
K28320	Electric Hotplate, 115V 50/60Hz	1
K28321	Electric Hotplate, 220-240V 50/60Hz	
250-000-33C	ASTM 33C Thermometer. Range: -38 to + 42°C	1

Shipping Information

Shipping Weight: 20 lbs (9.1kg)
Dimensions: 2.5 Cu. ft.

Automatic Breaking Point of Bitumen, Fraass Method

Automatic Breaking Point Apparatus

- Conforms to IP 80 and related test specifications
- Allows user modification of test procedure for research or other applications
- Peltier cooling system
- Automatic clamp and adjusting of sample-coated steel plaque

The Automatic Breaking Point Apparatus tests bitumen samples according to the conventional Fraass Method and also allows the user to modify the testing procedure for research or other applications, such as determining the glass transition temperatures of various materials or performing a fatigue test. Utilizing Peltier cooling elements for the refrigeration of the test chamber, the unit requires only a light, auxiliary refrigerant for additional cooling down to -46°C (requires an external circulator) and avoids the use of a bulky and energy-consuming cryostat. The instrument features user-friendly operation. The sample-coated steel plaque is placed on the test support, and then the unit will automatically clamp and adjust the plaque and then determined whether the sample has been prepared properly in order to avoid any faulty measurements. In addition, a two-line alphanumeric display provides further instructions during a test.

In the Fraass Method routine, the instrument detects a distinct variation in the applied bending force or a typical deformation in the force/temperature curve. These striking force characteristics can even be recognized with difficult-to-measure materials such as polymer-modified bitumens, where ruptures of the sample coating cannot be observed visually. The initial bending force parameter indicates whether the sample has been prepared properly. For samples with a very low breaking point, a rapid cooling program cools the sample chamber at an initial accelerated rate and then decreased to the standard cooling rate during the actual test period. For samples where the estimated breaking point is unknown, the search mode program will determine an approximate breaking point by cooling the sample at a rate of 2°C/min and performing a bending test each minute. The instrument also offers the possibility to change and store test parameters, such as bending speed, cooling rate or bending intervals as separate user-defined programs. As an alternative to the Fraass Method, the Fatigue Method cools the sample to a specified temperature and then counts the number of repetitive bending strokes required to fatigue or crack the sample. This method requires the Breaking Point Windows® software for instrument operation and data evaluation, and the test results can be graphed in real-time.

Specifications

Conforms to the specifications of:
IP 80; DIN 52012; DIN EN 12593;
NF T 66-026; JIS K2207

Included Accessories

Steel Test Plaques, pack of 10
Cleaning Brush

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

13x13¼x23½ (33x35x60)
Net Weight: 26½ lbs (12kg)

Shipping Information

Shipping Weight: 33 lbs (15kg)
Dimensions: 5 Cu. ft.



K28495 Auto Breaking Point Apparatus

Ordering Information

Catalog No.	
K28495	Automatic Breaking Point Apparatus, 230V 50Hz
K28496	Automatic Breaking Point Apparatus, 230V 60Hz

Accessories

K28401	Breaking Point Windows® Software Package <i>Provides additional capability for instrument control and data manipulation. Needed to perform fatigue and glass transition temperature tests.</i>
K28402	Sample Preparation Apparatus <i>Used for coating test plaques with bitumens having a softening point below 100°C. For samples with softening points above 100°C, please contact Koehler Customer Service for information.</i>
K28404	Steel Test Plaques, pack of 10
K28405	Calibration Set

Loss on Heating of Oil and Asphaltic Compounds

Effect of Heat and Air on Asphaltic Materials (Thin Film Oven Test)

Test Method

Determines the effect on asphaltic materials of heating in an oven under prescribed conditions. The results are reported in terms of change in sample mass and/or changes in selected properties such as viscosity, penetration and ductility as evidenced by test data taken before and after the oven cycle.

Asphalt Oven

Rotating-shelf convection oven conforming to the performance requirements of Specification E 145 Type I, Grade B. Features include: insulated stainless steel double wall construction; viewing window with two panels of insulated glass separated by an air space to permit viewing of sample containers and thermometer; ventilation openings at the top and bottom for the entrance of air and the exit of heated air and vapors; and digital indicating thermostatic control. Revolving shelf is adjustable between 5 to 6rpm. Shelf dimensions conform to applicable ASTM specifications. Supplied with shelf for either ASTM D6 or ASTM D1754.

Specifications

Conforms to the specifications of:

ASTM D6, D1754; Specification E145, Type 1B

Sample capacity:

ASTM D6: 55mm x 39mm high, 50.0 ± 0.5gr

ASTM D1754: 140mm x 10mm 50.0 ± 0.5gr

Temperature Range: to 356°F (180°C)

Electrical Requirements:

230V, 50Hz, 7A

230V, 60Hz, 7A

Dimensions lwxhxh,in.(cm)

27x25x23 (70x65x58)

Net Weight: 121 lbs (55kg)

Shipping Information

Shipping Weight: 165 lbs (75kg)

Dimensions: 16 Cu. ft.

Ordering Information

Catalog No.		Order Qty
K45800	Asphalt Oven for ASTM D6, 230V 50Hz	
K45801	Asphalt Oven for ASTM D6, 240V 60Hz	1
K45802	Asphalt Oven for ASTM D1754, 230V 50Hz	
K45803	Asphalt Oven for ASTM D1754, 240V 60Hz	
Accessories		
K45800-1	Sample Container for ASTM D6	9
K17000	Thin Film Oven Pan, aluminum for D1754	4
K17090	Thin Film Oven Pan, stainless steel for D1754	4

Effect of Heat and Air on a Moving Film of Asphalt

Effect of Heat and Air on a Moving Film of Asphalt (Rolling Thin Film Oven Test)

Test Method

Determines the effect of heat and air on a moving film of asphalt to serve as an indicator of approximate change in properties during conventional hot-mixing. The results are reported in terms of the changes in selected properties such as viscosity, penetration and ductility brought about by the RTFO test, as evidenced by test data taken before and after the 75 minute oven cycle.

Rolling Thin Film Oven

- Conforms to the specifications of ASTM D2872

Double-walled electrically heated convection oven for rolling thin film oven tests on asphalts. Incorporates all required features per ASTM specifications, including: door with double-pane viewing window; symmetrical top and bottom vents; air plenum; squirrel cage-type 1725rpm fan; digital indicating thermostat to control oven temperature at $163^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$; vertical circular carriage to mechanically rotate the samples at $\pm 0.2\text{rpm}$; air jets to blow heated air into each sample bottle at its lowest point of travel; and a calibrated flowmeter to control air flow at 4000mL/min. An overtemperature cut-off circuit disconnects power to the unit in the event of control failure.

Specifications

Conforms to the specifications of: ASTM D2872

Included Accessories

Glass Sample Container (8)
ASTM 13C Thermometer

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

28x26x23 (71x66x58)
Net Weight: 223 lbs (101kg)

Shipping Information

Shipping Weight: 276 lbs (125kg)
Dimensions: 7.96 Cu. ft.



Ordering Information

Catalog No.		Order Qty
K88000	Rolling Thin Film Oven, 220-240V 50Hz	1
K88001	Rolling Thin Film Oven, 220-240V 60Hz	
Accessories		
K88000-1	Glass Sample Container	8
250-000-13C	ASTM 13C Thermometer Range: 155 to 170°C	1

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

Float Test for Bituminous Materials

Test Method

Provides a measure of the consistency of bituminous materials, including asphalts and tar products.

Float Test Apparatus

- Conforms to ASTM D139, AASHTO T50 and ANS A37.2 specifications

Consists of aluminum float and three brass collars for determining the consistency of bituminous materials and tar products.

Shipping Information

Shipping Weight: 3 lbs (1.4kg)



K30500 Float Test Apparatus

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

Ordering Information

Catalog No.		Order Qty
K30500	Float Test Apparatus	1

Accessories

K30510	Float, only	
K30520	Collar, only	
250-000-15F	ASTM 15F Thermometer Range: 30 to 180°F	1
250-000-15C	ASTM 15C Thermometer Range: -2 to +80°C	

Residue and Oil Distillate in Emulsified Asphalts by Distillation

Test Method

Determines residue and oil distillate in emulsified asphalt for research, quality control and specification acceptance purposes.

Residue and Oil Distillate Determination Apparatus

- Conforms to ASTM D244 and AASHTO T59 specifications

Consists of an aluminum alloy still with lid and clamp assembly, ring burner, connection apparatus, graduate cylinder and thermometers.

Shipping Information

K31900: Shipping Weight: 7 lbs (3.2kg)

Dimensions: 1.3 Cu. ft.

K31956: Shipping Weight: 18 lbs (8.2kg)

Dimensions: 2.8 Cu. ft.



K31900 Metal Still

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

Ordering Information

Catalog No.		Order Qty
K31900	Aluminum Alloy Still	1

Accessories

K31910	Ring Burner, 5" (12.7cm) dia	1
K31956	Connection Apparatus Includes Pyrex™ condenser with metal jacket, tin shield, clamps and stand	1
332-002-003	Graduated Cylinder, 100mL	1
250-000-07F	ASTM 7F Thermometer Range: 30 to 580°F	2
250-000-07C	ASTM 7C Thermometer Range: -2 to +300°C	

Blocking and Picking Points of Petroleum Wax

Test Method

Blocking point and picking point are indicators of the temperature above which surface film injury will occur when waxed surfaces come in contact with one another as on a roll of wax paper. Paper test specimens are coated with the wax sample, folded with the waxed surfaces together, and heated on a metal blocking plate having a measured temperature gradient. After a specified period, the specimens are removed and unfolded, and the points at which film disruption occurred are noted together with their corresponding temperatures.

Blocking and Picking Points Apparatus

- Conforms to ASTM D1465 and TAPPI T652 specifications
- Choice of Type A or Type B Blocking Plates

Applies wax samples to paper test specimens and creates a temperature gradient for determining blocking point and picking point temperatures.

Wax Coating Device—Coats paper with wax samples per ASTM specifications. Consists of an insulated electrically heated hot wax bath and a cooling water bath with doctor rods and paper roller. Variable auto transformer and 200W heater situated underneath the hot wax bath heat sample to a temperature above the melting point. Doctor rods connect to an external hot water supply to maintain proper temperature. Cooling bath has water inlet/outlet fittings, and each bath has a built-in paper guide.

Blocking Plates—Choice of Type A or Type B plates per ASTM specifications. Type A Aluminum Blocking Plate uses a strip heater and cooling coil on opposite ends of the block to create a temperature gradient. Six thermocouples along the length of the block input to accessory Digital Thermometer. Accommodates eight rows of paper test specimens.

Type B Aluminum Blocking Plate uses two thermostatically controlled baths to establish a temperature gradient, with the ends of the plate extending into the baths. Cold bath has a cooling coil and 100W immersion heater; hot bath has a 300W immersion heater. Thermoregulators and motor stirrers provide uniform temperature control in each bath. Ten thermocouples along the length of the block input to accessory Digital Thermometer. Accommodates six rows of test specimens.

Digital Thermometer—Ten-channel microprocessor based digital thermocouple thermometer with large LED display. Ten-position front panel rotary selector switch. Mounted in a heavy duty bench case.

Specifications

Conforms to the specifications of: ASTM D1465; TAPPI T652

Electrical Requirements:

- Wax Coating Device: 115V 50/60Hz, Single Phase, 1.7A
220-240V 50/60Hz, Single Phase, .9A
- Type A Blocking Plate: 115V 50/60Hz, Single Phase, 2.1A
220-240V 50/60Hz, Single Phase, 1.1A or
- Type B Blocking Plate: 115V 50/60Hz, Single Phase, 3.4A
220-240V 50/60Hz, Single Phase, 1.8A

Included Accessories

- Type A Blocking Plate:
 - Steel weights, 1x1x30" (8)
 - Sponge rubber pads (8)
 - IC thermocouples (6) or
- Type B Blocking Plate:
 - Steel weights, 1x1x6" (24)
 - Sponge rubber pads (8)
 - IC thermocouples (10)

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

- Wax Coating Device: 19x8x12 (48x20x30)
- Type A Blocking Plate: 38x12x2 (97x30x5)
- Type B Blocking Plate: 19x8x12 (48x20x30)

Shipping Information

- Shipping Weight:
 - Wax Coating Device: 44 lbs (20kg)
 - Type A Blocking Plate: 164 lbs (74.4kg)
 - Type B Blocking Plate: 183 lbs (83.0kg)

Dimensions:

- Wax Coating Device: 5.3 Cu. ft.
- Type A Blocking Plate: 4.1 Cu. ft.
- Type B Blocking Plate: 12.3 Cu. ft.

Ordering Information

Catalog No.		Order Qty
Wax Coating Device		
K17100	Wax Coating Device, 115V 50/60Hz	1
K17190	Wax Coating Device, 220-240V 50/60Hz	
Blocking Plates		
K17200	Type A Blocking Plate, 115V 50/60Hz	1
K17290	Type A Blocking Plate, 220-240V 50/60Hz	
K17300	Type B Blocking Plate. 115V 50/60Hz	
K17390	Type B Blocking Plate. 220-240V 50/60Hz	
Digital Thermometer		
K29310	Digital Thermometer, 115V 50/60Hz	1
K29319	Digital Thermometer, 220-240V 50/60Hz	
K17110	Test Paper, Cereal glassine, 30 lb basic weight. 3½" (8.9cm) wide x 6" (15.25cm) dia. roll on a 3" (7.6cm) dia. core.	1
Thermometers		
Use with Type B Blocking Plate only.		
250-000-09F	ASTM 9F Thermometer Range: 20 to 230°F	2
250-000-09C	ASTM 9C Thermometer Range: -5 to +110°C	

Melting Point of Petroleum Wax (Cooling Curve)



K17500 Wax Melting Point Apparatus

Test Method

Periodic temperature measurements are taken of a sample of molten wax as it is cooled in an air bath. When the wax solidifies, a plateau in the cooling curve occurs, indicating the melting point (cooling curve) of the sample.

Wax Melting Point Apparatus

- Conforms to ASTM D87 and related specifications

Cools molten wax samples in accordance with ASTM and related specifications. Consists of nickel-plated air and water bath assembly with removable cover. Supports test tube in a vertical position in the air bath.

Specifications

Conforms to the specifications of:

ASTM D87; IP 55; ISO 3841; DIN 51570; FTM 791-1402; NF T 60-114

Included Accessories

Test Tube, Thermometer Holders (2)

Dimensions dia.xh,in.(cm) 5½x7 (14x18)

Net Weight 4 lbs (1.8kg)

Shipping Information

Shipping Weight: 6 lbs (2.7kg)

Dimensions: 0.7 Cu. ft.

Ordering Information

Catalog No.		Order Qty
K17500	Wax Melting Point Apparatus	1
Accessories		
250-000-14F	ASTM 14F Thermometer Range: 100 to 180°F	2
250-000-14C	ASTM 14C Thermometer Range: 38 to 82°C	
K175-0-8	Test Tube, 25x100mm	

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

Oil Content and Solvent Extractables in Petroleum Waxes

Oil Content of Petroleum Waxes Solvent Extractables in Petroleum Waxes

Test Method

Oil content or solvent extractables in wax can affect key properties such as strength, hardness, melting point, etc. The sample is dissolved in methyl-ethyl ketone or a 50-50 mixture of methyl-ethyl ketone and toluene, cooled to precipitate the wax, and filtered. The oil content or solvent extractables content of the filtrate is then determined by evaporating the solvent and weighing the residue.

Oil-Solvent Extractables Content Apparatus

- Conforms to ASTM D721, D3235 and related specifications

Determines oil content or solvent extractables content in petroleum waxes in accordance with ASTM specifications. Includes Filter Stick Assembly; Cooling Bath; Air Pressure Regulator; and Evaporation Cabinet.

Filter Stick and Assembly—Filters petroleum wax samples per ASTM specifications. Consists of 10mm diameter sintered glass filter stick with air pressure inlet tube and delivery nozzle, and a 25x170mm test tube. Inserts in Cooling Bath.

Cooling Bath*—Accommodates three (3) 25x170mm test tubes for cooling samples and filter stick assemblies. Insulated stainless steel tank with finished steel exterior. Removable composition top plate has thermometer port, filling port and three 25.4mm (1") test tube ports. Fill tank with suitable cooling mixture.

Air Pressure Regulator—Controls air flow to the filter stick assembly at the required rate. Mercury bubbler-type, with 250mL glass cylinder, T-tube and rubber stopper.

Evaporation Cabinet—Thermostatically heated cabinet evaporates solvent from filtrate per specifications. Accommodates four weighing bottles. Delivers air stream vertically downward into bottles through glass jets. Manifold assembly is adjustable for positioning of jets at the correct height above the sample surface. Controls temperature at 35 ±1°C (95 ±2°F). Finished steel cabinet with composition front plate and hinged glass door.

Specifications

Conforms to the specifications of:
ASTM D721, D3235; IP 158; ISO 2908;
DIN 51571, 51572; FTM 791-5431

Electrical Requirements:
115V 50/60Hz, Single Phase, 0.8A
220-240 V 50/60Hz, Single Phase, 0.4A

Included Accessories

Weighing Bottles, 15mL (4)
Filter Stick Assembly (K17630)
Air Pressure Regulator (K17640)

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

Cooling Bath: 8x6x9 (20x15x23)
Evaporation Cabinet: 9x5x16 (23x13x41)
Net Weight:
Cooling Bath: 6 lbs (2.7kg)
Evaporation Cabinet: 7 lbs (3.2kg)

Shipping Information

Shipping Weight: 24 lbs (10.9kg)
Dimensions: 5 Cu. ft.

Ordering Information

Catalog No.		Order Qty
K17600	Oil-Solvent Extractables Content Apparatus, 115V 50/60Hz	1
K17690	Oil-Solvent Extractables Content Apparatus, 220-240V 50/60Hz	
Accessories		
332-004-004	Test Tube, 25x150mm	4
250-000-71F	ASTM 71 F Thermometer Range: -35 to +70°F	1

**A mechanically refrigerated cooling bath is available. Please call or write for information.*

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

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.

Ductility of Bituminous Materials Page 160

ASTM D113, D-4; AASHTO T51; ANS A37.11; Federal Specification SS-R-406C; USDA Method 51 (BUL 12-16); IP 32; DIN 52013

Glycerin	Dextrin, Talc or Kaolin
No. 50 300 μm Sieve	Spatula
150mL Beaker, Griffin Low-form	30mL Beaker, Griffin Low-form
Carbon Disulfide	Drying Oven
Celite Analytical Filter Aid (CAFA)	Watch Glasses
Evaporating Dish	Desiccator
Analytical Balance	Filtering Flask, with Crucible Adapter
Suction Pump	Bunsen Burner or Muffle Furnace
Filtering Crucible, Porcelain	

Bituminous Materials in Tension Page 161

ASTM D4

150mL Beaker, Griffin Low-form	30mL Beaker, Griffin Low-form
Carbon Disulfide	Drying Oven
Celite Analytical Filter Aid (CAFA)	Watch Glasses
Evaporating Dish	Desiccator
Analytical Balance	Filtering Flask, with Crucible Adapter
Suction Pump	Bunsen Burner or Muffle Furnace
Filtering Crucible, Porcelain	

Softening Point of Bitumen (Ring-and-Ball Apparatus) Page 162

ASTM D36, E28; AASHTO T53; IP 58, IP 198

Distilled Water
Ethylene Glycol
Silicone Oil or Grease
Dextrin or Talc
Spatula

Breaking Point of Bitumen Page 162

IP 80

Acetone
Solid Carbon Dioxide

Float Test for Bituminous Materials Page 163

ASTM D139; AASHTO T50 and ANS A37.2

Spatula

Residue and Oil Distillate in Emulsified Asphalts by Distillation Page 163

ASTM D244 and AASHTO T59

No. 50 300 μm Sieve
No. 20 850 μm Sieve
Condenser
Xylol

Effect of Heat and Air on Asphaltic Materials Page 164

ASTM D1754

Laboratory Oven with Rotating Shelf
Analytical Balance

Blocking and Picking Points of Petroleum Wax Page 168-169

ASTM D1465; TAPPI T652

Trimming Board
Analytical Balance
Paper Cereal Glassine

Melting Point of Petroleum Wax (Cooling Curve) Page 169

ASTM D87; TAPPI T630M-61; IP 55; ISO 3841; DIN 51570; FTM 791-1402

Heating Device

Oil Content of Petroleum Waxes Solvent Extractables in Petroleum Waxes Page 170

ASTM D721, D3235; TAPPI T636; IP 158; ISO 2908, DIN 51571, 51572; FTM 791-5431

Dropper Pipet, 15mL
Transfer Pipet, 15mL
Analytical Balance
Wire Stirrer
Methyl Ethyl Ketone
Toluene
Anhydrous Calcium Sulfate
Air Supply
Drying Oven
Kerosene
Cotton