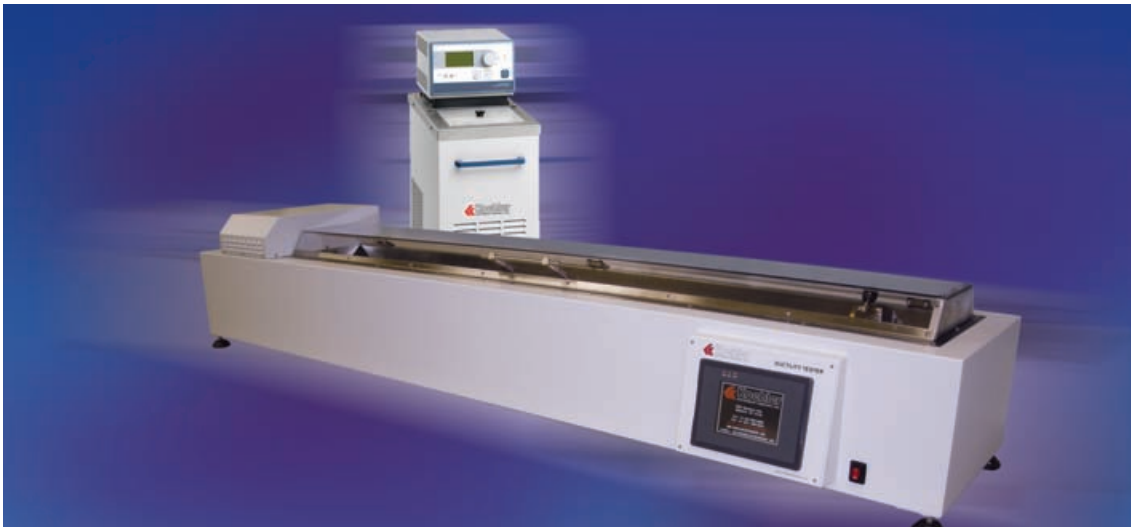
Bitumens and Waxes

For information on additional testing methods for bitumens and waxes:

–Saybolt Color of Petroleum Waxes–please refer to pages 44, 46-47

–Water in Petroleum Products and Bituminous Materials by Distillation –please refer to pages 56-57

–Please refer to the Viscosity, Penetration, Flash Point and General Test Equipment Sections



Ductility and Elastic Recovery of Bituminous Materials

K80060 Constant Temperature Ductility Machine with Circulator

Test Method

Determines the ductility of a bituminous material by measuring the distancein which a sample will elongate before breaking when two ends of a briquetspecimen of the test material are pulled apart at a specified speed and temperature. Elastic Recovery is determined by pulling the briquet specimen to a specified distance at a specified speed and temperature. The briquet is then cut and the distance in which it takes for the two halves to reconnect is used to determine the elastic recovery of the test sample.

Semi-Automatic Ductility Testing Machine

- Conforms to ASTM D113, D6084 and related specifications
- Standard and Constant Temperature Models available
- Capable of testing up to 3 samples simultaneously
- 6" LCD Touch Screen Control Panel
- Pre-programmed with Ductility, Recovery, and Custom test methods
- Maximum travel length of 150 cm
- Variable traction speed from 0.25 to 7.0 cm/min
- Constant Temperature model equipped with Lexan Cover for enhanced temperature stability

Semi-Automatic Ductility Testing Machine designed explicitly for testing the ductility and elastic recovery of bituminous materials. Features a 6" LCD touch screen control panel. This integrated touch screen allows the user to choose between the ductility or recovery test methods. The custom menu allows for the input of desired speed and time parameters. During testing, the distance traveled by the specimen is displayed and a simple touch of the screen can record the distance traveled upon breakage of the briquet. A motor jogging feature permits locking of the sample carriage without additional movement after briquet sample is loaded into the machine.

Included Accessories

Standard Model:
Standard Mold (3)
Base Plate

Constant Temperature Model:
Circulation Bath
Remote Temp. Probe, 10 ft. length
Connection Tubing
Standard Mold (3)
Base Plate
Lexan Cover

Dimensions lxwxh,in.(cm)

Standard Model:
86¼x19x16 (219.1 x 48.3 x 40.6)
Net Weight: 200 lbs (91.7kg)

Constant Temperature Model:
86¼x19x16 (219.1 x 48.3 x 40.6)
Net Weight: 217 lbs (98.5 kg)

Circulation Bath:
15¾x8¼x22½ (219.1 x 48.3 x 40.6)
Net Weight: 50 lbs (22.7 kg)

Electrical Requirements CE

115V 60Hz
220-240V 50Hz
220-240V 60Hz

Shipping Information

Standard Model:
Shipping Weight: 350 lbs (159kg)
Dimensions: 92¾x 25¼x 23¼" (235.6 x 64.1 x 59.1cm)
Constant Temperature Model:
Shipping Weight: 368 lbs (167kg)
Dimensions: 92¾x 25¼x 23¼" (235.6 x 64.1 x 59.1cm)
Circulation Bath:
Shipping Weight: 74 lbs (34kg)
Dimensions: 22 x 10½ x 26½" (55.9 x 26.7 x 67.3 cm)

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, D5892, D6084, P226; IP 32, 516; DIN 52013, EN 13398; NF T 66-006; AASHTO T 51, T 301; JIS K2207; ANS A37.11; Federal Specification SS-R-406C; USDA Method 5 (BUL 12-16)
Capacity: 3 molds with samples
Maximum Travel Length: 150 cm
Standard Traction Speed: 5 cm/min
Variable Traction Speed: 0.25 to 7.0 cm/min
Timer: 1-999 min

Ordering Information

Catalog No.	
K80050	Semi-Automatic Standard Ductility Testing Machine, 115V/220-240V 50/60Hz
K80060	Semi-Automatic Constant Temperature Ductility Testing Machine, 115V 60Hz
K80068	Semi-Automatic Constant Temperature Ductility Testing Machine, 220-240V 60Hz
K80069	Semi-Automatic Constant Temperature Ductility Testing Machine, 220-240V 50Hz

Accessories

K80012	Standard Mold
K80041	Recovery Mold
K80013	Base Plate
250-000-63F	ASTM 63F Thermometer, Range: 18 to 89°F
250-000-63C	ASTM 63C Thermometer, Range: -8 to 32°C
K80050-SFW	Semi-Automatic Ductility Software

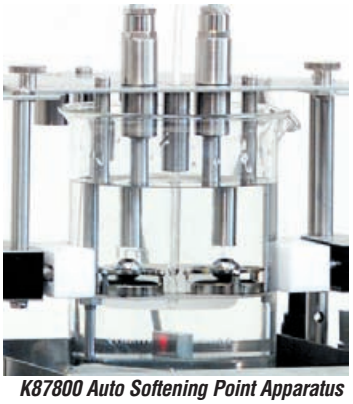
Automatic Softening Point of Bitumen (Ring and Ball Apparatus)

Test Method

Determines the Softening Point of Bitumen in the range from 30 to 157°C (86 to 315°F) using the ring and ball apparatus immersed in distilled water (30 to 80°C), USP glycerine (above 80 to 157°C), or ethylene glycol (30 to 110°C).

Automatic Softening Point Apparatus

- Conforms to ASTM D36 and related test specifications
- Optical detectors for automatic measurement of softening point
- Data Storage: 200 Results
- Quick access to calibration parameters
- Auto diagnostic
- Four programmable preset test methods available
- Controllable heating rate and stirring speeds
- Preheating cycle
- Cooling by fan at the end of the test
- Waterproof heating element



K87800 Auto Softening Point Apparatus

Specifications

Conforms to the specifications of:
ASTM D36; AFNOR T66-008; EN 1427; ISO 4625; NF EN 1427; IP 58; DIN 52011

Included Accessories

Printer
Glass Beaker (2)
Shouldered Rings (10)
Load Balls (10)
Craddle
Pt 100 Probe
Detection Cable
Stirrer
RS232C Output

Electrical Requirements CE

115V 60Hz
230V 50Hz

Dimensions wxdxh,in.(cm)

Adapter: 10¼x21x20 (26x53.5x50)

Shipping Information

Shipping Weight: 44 lbs (20 kg)

Ordering Information

Catalog No.	
K87800	Automatic Softening Point Apparatus, 115V 60Hz
K87890	Automatic Softening Point Apparatus, 230V 50Hz

Accessories

K87800-1	Glass Beaker
K87800-2	Straight Rings, Pack of 10
K87800-3	Shouldered Rings, Pack of 10
K87800-4	Conical Rings, Pack of 10
K87800-5	Detection Lamp
K87800-6	Ring & Ball Cradle
K87800-7	PT 100 Probe
K87800-8	Heating Element, 1000W
K87800-9	Roll of Printer Paper
K87800-10	Load Ball, Pack of 10

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

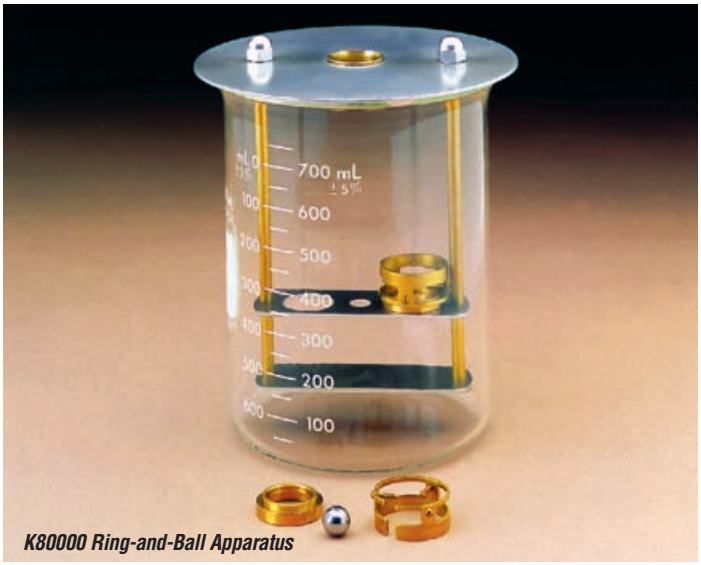
Test Method

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.



K80000 Ring-and-Ball Apparatus

Ordering Information

Catalog No.		Order Qty
K80000	Softening Point Apparatus	1
	Accessories	
K42000	Powertrol Heater 1000W 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 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	

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)

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 Consists of test tubes, cylinder, bungs and thistle tunnel	1
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.

Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)

Test Method

For accelerated aging (oxidation) of asphalt binders by means of pressurized air and elevated temperature. This is intended to simulate the type of changes which occur in asphalt binders during in-service oxidative aging but may not accurately simulate the relative rates of aging. It is intended for use with residue from Test Method D2872 (RTFOT) which is designed to simulate plant aging.

Pressure Aging Vessel (PAV)

The Pressure Aging Vessel (PAV) is used to simulate in service oxidative aging of asphalt binder according to procedures developed by the Strategic Highway Research Program (SHRP). The K88100 is fully compliant with the most recent ASTM and AASHTO standards for these tests. The complete PAV system consists of an ASME-code stainless steel pressure vessel in a stainless steel cabinet with encased band heaters, a precision sample holder for simultaneous testing of ten specimens, a set of ten TFOT specimen trays, a pressure controller, temperature controller, pressure and temperature measurement devices, temperature recorder, and a specimen loading and unloading tool.

The K88100 PAV takes the hassle out of running and documenting asphalt binder aging operations. Three easy, non-complicated steps produce accurate and reliable results. Just press the "heat" button, inset specimens when prompted and press the "Age" button and let the PAV do the rest. Custom status screens guide the user step-by-step through the entire process. Each display screen (preheat start-up, preheat ready, aging heat up, aging pressurized, and aging complete) is simple and direct, with detailed process and status information. The final output screen, when the test is complete, shows the current vessel pressure, as well as minimum and maximum temperatures achieved during the test procedure. Process data (temperature and pressure) is continually stored at regular intervals in the programmable logic controller (PLC) that controls and monitors the process.

The K88100 features a compact, bench top design with integral pressure vessel. Its rotating vessel lid with rounded support block provides easy opening and closing. A built-in timer accumulates and records out-of-range time (out of range time for the PAV is typically less than 10 minutes during a 20-hour test). Minimum and maximum temperature data is recorded and is displayed at the end of each test.

Specifications

Conforms to the specifications of:
ASTM D6521; AASHTO R28
Operating Pressure: 2.10 ± 0.05 MPa (304 psi)
Temperature Range: 90°C to 110°C (194°F to 230°F)
Temperature Control Resolution: ± 0.1°C
Test Temperature Uniformity: ± 0.5°C
Time to Set point: 3 hours from ambient
Return to Set point: 120 min. after preheating and lading of specimens
Pressure Vessel: ASME code section VIII, division 1; 1992 A 93
Maximum Pressure: 325 psi (2.24 MPa) at 120°C (250°F)
Pressure Safety Release: 325 psi (2.24 MPa)

Ordering Information

Catalog No.	
K88100	Pressure Aging Vessel, 230V 50/60Hz

Accessories

K88100-1	UPS Battery Backup System
K88100-2	PAV Verification Kit
K88100-3	PAV O-Ring
K88100-4	CGA Adapter
K88100-5	High Pressure Hose
K88100-6	Specimen Pans Set (Pk / 10)

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

Dual purpose oven for loss of heat test and thin film test for bitumen and asphaltic materials. Interior chamber of stainless steel and stored powder painter steel exterior. Double glazed window in door for viewing test chamber.

Side mounted controls comprise microprocessor digital control, independent overheat thermostat, main switch and indicator lamps. Two rotating platforms supplied to perform both the tests.

Specifications

Conforms to the specifications of:
ASTM D6, D1754; Specification E145, Type 1B; AASHTO T47, T179, BS2000
Temperature Range: to 356˚F (180˚C)
Pre-set at 163˚C ± 1˚C
Electrical Requirements: CE
110V 60Hz
220V 50Hz

Dimensions

Internal Chamber Dimension 38cm(H) x 52cm(W) x 46cm(D)
External Dimension 57cm(H) x 87cm(W) x 63cm(D)
(External Dimension does not include motor or handle)
Net Weight: 44kg

K45850 Loss on Heat / Thin Film Oven

Ordering Information

Catalog No.		Order Qty
K45850	Loss on Heat/Thin Film Oven for D6, D1754 110V, 60Hz	1
K45859	Loss on Heat/Thin Film Oven for D6, D1754 220V, 50Hz	

Accessories

388-001-003	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 (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°C ±0.5°C; vertical circular carriage to mechanically rotate the samples at 15 ±0.2rpm; 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; AASHTO T240

Included Accessories

Glass Sample Container (8)
ASTM 13C Thermometer

Dimensions lxwxh,in.(cm)

40x36x26 (101.6x91.44x66.04)
Net Weight: 310 lbs (141kg)

Shipping Information

Shipping Weight: 380 lbs (173kg)
Dimensions: 7.96 Cu. ft.

Electrical Requirements CE

220-240V 60Hz
220-240V 50Hz

K88000 Rolling Thin Film Oven

Ordering Information

Catalog No.		Order Qty
K88000	Rolling Thin Film Oven, 220-240V 60Hz	1
K88001	Rolling Thin Film Oven, 220-240V 50Hz	
	Accessories	
K88000-1	Glass Sample Container	8
K88000-2	Cooling Rack	
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)

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	

K30500 Float Test Apparatus

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

Residue & 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 AASHT0 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.

Ordering Information		
Catalog No.		**Order Qty**
K31900	Aluminum Alloy Still	1
	Accessories	
K31910	Ring Burner, 5" (12.7cm) dia	1
K31956	Connection Apparatus Includes Borosilicate Glass 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	

K31900 Metal Still

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

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: CE
Wax Coating Device: 115V 60Hz, Single Phase, 1.7A
220-240V 5060Hz, Single Phase, .9A
Type A Blocking Plate: 115V 60Hz, Single Phase, 2.1A
220-240V 50/60Hz, Single Phase, 1.1A or
Type B Blocking Plate: 115V 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 lxwxh,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		1
K17100	Wax Coating Device, 115V 60Hz	
K17190	Wax Coating Device, 220-240V 50/60Hz	
Blocking Plates		1
K17200	Type A Blocking Plate, 115V 60Hz	
K17290	Type A Blocking Plate, 220-240V 50/60Hz	
K17300	Type B Blocking Plate. 115V 60Hz	
K17390	Type B Blocking Plate. 220-240V 50/60Hz	
Digital Thermometer		1
K29310	Digital Thermometer, 115V 60Hz	
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		2
Use with Type B Blocking Plate only.		
250-000-09F	ASTM 9F Thermometer Range: 20 to 230°F	
250-000-09C	ASTM 9C Thermometer Range: –5 to +110°C	

Koehler INSTRUMENT COMPANY, INC.

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.

Ordering Information

Catalog No.		Order Qty
K17600	Oil-Solvent Extractables Content Apparatus, 115V 60Hz	1
K17690	Oil-Solvent Extractables Content Apparatus, 220-240V 50/60Hz	
	Accessories	
K17605	Mechanically Refrigerated Cooling Bath, 115V 60Hz, Ambient to -35°C	
K17695	Mechanically Refrigerated Cooling Bath, 220-240V 50/60Hz, Ambient to -35°C	
332-004-009	Test Tube, 25x170mm	4
250-000-71F	ASTM 71 F Thermometer Range: –35 to +70°F	1

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

Specifications

Conforms to the specifications of:
ASTM D721, D3235; IP 158; ISO 2908; DIN 51571, 51572; FTM 791-5431
Electrical Requirements: CE
115V 60Hz, Single Phase, 0.8A
220-240V 50/60Hz, Single Phase, 0.4A

Included Accessories

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

Dimensions lxwxh,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.

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 170

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

Softening Point of Bitumen (Ring-and-Ball Apparatus) ..... Page 171-172

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 173

IP 80

Acetone
Solid Carbon Dioxide

Effect of Heat and Air on Asphaltic Materials ..... Page 174

ASTM D1754

Laboratory Oven with Rotating Shelf
Analytical Balance

Float Test for Bituminous Materials ..... Page 176

ASTM D139; AASHTO T50 and ANS A37.2

Spatula

Residue and Oil Distillate in Emulsified Asphalts by Distillation ..... Page 176

ASTM D244 and AASHTO T59

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

Blocking and Picking Points of Petroleum Wax ..... Page 177

ASTM D1465; TAPPI T652

Trimming Board
Analytical Balance
Paper Cereal Glassine

Melting Point of Petroleum Wax (Cooling Curve) ..... Page 178

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 179

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