



TESTING EQUIPMENT



Supplying Testing & Monitoring Instruments Since 1946

For over seventy years, Hoskin Scientific has been a supplier of testing and monitoring instrumentation to the Canadian market. With offices in Vancouver, Edmonton, Oakville and Montréal our customers are able to receive local sales and technical support in our three major departments.

Our Environmental Department provides solutions for monitoring and sampling biological and chemical parameters in the environment. Our team of environmental sales representatives and diverse product range guarantee that you will find the right products for your application. Specific areas include: water quality, water quantity, soil moisture, plant science, weather stations, indoor air quality, aquatic sampling, and oceanography.

Our Materials Testing Department offers testing equipment for soil, asphalt, petroleum, concrete and cement. Our qualified sales associates focus on providing a sophisticated range of testing equipment complying with the various test methods, ensuring that accurate and consistent test results are always obtained.

Our Instrumentation Department focuses on a wide range of products including optical camera systems, transducers and transmitters, data acquisitions and loggers, signal conditioners and indicators, automation sensors and measurement systems. We have technical sales associates that are trained in various areas and willing to help you with your instrumentation requirements.

RENTALS

We offer high quality, proven equipment that will provide the user with valuable data as well as numerous ways of retrieving, filtering and viewing that data. We carry a wide range of instrumentation, including: water quality, portable gas monitors, soil sampling instruments and more.

Rental Equipment:

- Single and multi-parameter instruments that can be setup for spot checks or extended deployment/data logging
- Water sampling instruments
- Water velocity and stream profiling instruments
- Soil sampling instruments
- Soil vapour sampling instruments
- Portable gas monitoring instruments

Customer satisfaction is our goal and we make an effort to ensure that all our customers are satisfied with their rental. All rental instruments are cleaned and calibrated before being sent to the user (please note that we also require equipment to be returned clean). If a rental instrument requires recalibration, please return the instrument to us and we will recalibrate at no charge. Any instrument not functioning properly can be exchanged at no cost.

Hoskin Scientific offers technical support over the phone and can also provide hands on demonstrations.

We are constantly expanding and looking for new equipment to add to the rental inventory and welcome all suggestions.

Check our website www.hoskin.ca for current offerings.

Daily, weekly and monthly rental rates available – please call for a quote.

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Digital Pentrometer
Ductility Machine

FLIR T200 INFRARED CAMERA

As a base model in the T-Series, the T200 includes many of the high-quality features of the T family. New and experienced thermographers will find the T200 to be a productive solution for conducting infrared surveys.



High Quality 200 x 150 IR Resolution
Thermal sensitivity of 100 mK (NETD)
Integral 1280 x 1024 visible light camera
Video lamp for quality visible images

3.5 inch touch-screen LCD

- Picture in Picture to show fusion images
- Interchangeable lens for greater versatility

Affordable T200

FLIR's new T200 infrared camera expands the choices available to thermographers and maintenance professionals who need a powerful solution at an affordable price.

The base model in the FLIR T-series, the T200 infrared camera is an upgradeable solution that can help you find electrical hot spots and faulty equipment. The camera is ideal for professionals looking for innovative ways to boost safety and productivity when conducting routine surveys of electrical systems, switchgear, and electrical components.

Higher models in the T-Series family add sensitivity and resolution features, as well as touch-screen, text, and voice annotation tools.

Easy and Versatile Solution

FLIR's T200 infrared camera weighs less than two pounds, making it a versatile camera for predictive maintenance. The camera's light weight and comfortable form is attributed to a small advanced IR detector and innovative battery design.

Investment Protection

The T200 camera is upgradeable so your investment in technology, software, and training is protected. Simply add higher-model T-Series features as your needs change and grow.

Entry-level and experienced thermographers will benefit from the ease of use and productivity features of the T200 camera.

Find Trouble Fast

The T200 camera's 100 mK thermal sensitivity helps you pinpoint trouble fast.

The camera delivers 200 x 150 IR resolution (30,000 pixels). That's one-third more detail than competing brands with 160 x 120 resolution.

Advanced Optics

The T200 comes with a 25° lens for normal views. An optional 45° lens is available for wide-angle images. And a 15° telephoto lens is available for long-range work. The T-series lenses are interchangeable and easily attach to the camera body. Tilting only the optic, allows intuitive and productive use of the camera for extended periods of time. This is a benefit to organizations that regularly conduct detailed electrical surveys.

Produce Sharp Images

Auto and manual focus features of the T200 allow a wide range of users to take advantage of the camera. This ensures everyone can take sharp thermal images and produce accurate temperature analysis and results. The camera's 2x digital zoom capability helps you zoom in to get close detail in a range of applications.

1.3 Mega Pixel Visible Light Camera

The T200 includes an integral visible light camera to add visual information to reports. On-camera Picture in Picture (PIP) image fusion capability is provided as well so users can see a scalable infrared light image super-imposed in a visible light image. A standard video-out port enables users to display images on a virtual reality Heads Up Device (HUD). This extends the use of the camera in tight spots and special applications.

T-Series cameras also connect to a standard offthe-shelf video display device for viewing of IR images by a large audience.

Information-Packed Radiometric Images

USB port connection enables convenient image downloading from the T200 to your PC. All the valuable information you collect in the field, such as temperature data, object parameters, and text/image information is saved with the IR image files you download to your PC. This simplifies data collection and allows for quick and efficient processing of information after your field work is done.

The T200 includes QuickReport analysis and reporting software. Optional Reporter software, a Microsoft[®] Word-based program - is available from FLIR for advanced analyses and report generation.

FLIR T250 INFRARED CAMERA

FLIR's new T250 infrared camera expands the choices available to thermographers and maintenance professionals who need to avoid costly downtime of electrical systems and equipm

High Quality 200 x 150 IR Resolution
Thermal sensitivity of 80 mK (NETD)
Integral 1280 x 1024 visible light camera
Video lamp for quality visible images

Interchangeable lens for greater versatility Picture in Picture to show fusion images Touch screen text, image marker, sketch, voice 3.5 inch touch-screen LCD

Easy and Versatile Solution

FLIR's T250 infrared camera weighs less than two pounds, making it a versatile camera for finding hot spots in electrical systems, components, and machinery. The camera's light weight and comfortable form is attributed to a small advanced IR detector and innovative battery design.

Investment Protection

The T250 is a mid-level camera in the T-Series lineup and is upgradeable so your investment in technology, software, and training is protected. Simply add higher-model T-Series features as your needs change and grow.

Entry-level and experienced thermographers will benefit from the ease of use and productivity features of the T250 camera.

Touch Screen Technology

The T250 camera adds higher resolution and includes touch screen features, which let you save text, sketches, and markers to your thermal images, directly on your camera at your work site. The on-screen sketch, marker, and text touch features help you increase productivity and enhance your reports.

Find Trouble Fast

The T250 camera's 80 mK thermal sensitivity helps you pinpoint trouble fast.

The camera delivers 200 x 150 IR resolution (30,000 pixels). That's one-third more detail than competing brands with 160 x 120 resolution.

Advanced Optics

The T250 comes with a 25° lens for normal views. An optional 45° lens is available for wide-angle images. And a 15° telephoto lens is available for long-range work. The T-series lenses are interchangeable and easily attach to the camera body. Tilting only the optic, allows intuitive and productive use of the camera for extended periods of time. This is a benefit to organizations that regularly conduct detailed electrical surveys.

Produce Sharp Images

Auto and manual focus features of the T250 allow a wide range of users to take advantage of the camera. This ensures everyone can take sharp thermal images and produce accurate temperature analysis and results. The camera's 2x digital zoom capability helps you zoom in to get close detail in a range of applications.

1.3 Mega Pixel Visible Light Camera

The T250 includes an integral visible light camera to add visual information to reports. On-camera Picture in Picture (PIP) image fusion capability is provided as well so users can see a scalable infrared light image super-imposed in a visible light image. A standard video-out port enables users to display images on a virtual reality Heads Up Device (HUD). This extends the use of the camera in tight spots and special applications.

T-Series cameras also connect to a standard off-theshelf video display device for viewing of IR images by a large audience.

Information-Packed Radiometric Images

USB port connection enables convenient image downloading from the T250 to your PC. All the valuable information you collect in the field, such as temperature data, object parameters, and text/image information is saved with the IR image files you download to your PC. This simplifies data collection and allows for quick and efficient processing of information after your field work is done.

The T250 includes QuickReport analysis and reporting software. Optional Reporter software, a Microsoft[®] Word-based program - is available from FLIR for advanced analyses and report generation.

Pavement Quality Indicator (PQI)

PQI 301

The Pavement Quality Indicator (PQI) produces fast, accurate and repeatable in-place density and temperature measurements of asphalt pavement. Instantaneous density and temperature readings help field personnel establish more effective roller patterns and ensure pavement densities are within targeted range. It quickly identifies tender zones and segregated areas, rapidly profiles densities in critical areas such as wheel paths, longitudinal joints, and unconfined edges, and evaluates pavement sections for coring. The PQI is particularly effective on projects that requiring rapid gathering of results for QC/QA analysis. The results are displayed within seconds. Up to 99 readings can be stored by station, location, date and time for later downloading to user's PC or laptop.

The PQI uses low level, low frequency, electrical impedance technology and is completely nonnuclear. It utilizes an innovative toroidal electrical sensing field created within the asphalt pavement to monitor changes in electrical impedance. Measuring depth is about 1 to 4" (25 to 100mm). Pavement densities in selectable pounds per cubic foot or kilograms per cubic meter are shown on the 4-line, backlit display. Readings of percent air voids are also possible. Accurate density measurements are obtained without the need for expensive nuclear gauge training and certification. There is no need to be concerned about radiation safety monitoring or cumbersome regulations. Warm-up time is not necessary and test results are nearly instantaneous. Significantly lighter weight makes prolonged use of the PQI more convenient for field personnel.



The PQI includes a 12-volt DC, 4.0 amp/hr NiMH battery. Battery recharge time is approximately 4 hours. Continuous operationaltime of fully charged battery is 13 hours. The PQI Test Block confirms internal electrical calibration, repeatability and checks for instrument drift. The Test Block can also perform a two-point calibration with asphalt cores. Includes fast charge 120VAC battery charger, 12VDC adapter and shipping case.

PQI 380

- Full color graphics driven user interface, 480x640 VGA touch screen display with LED backlight for easy visibility
- New Status Bar Feature, Displays GPS status, Data Save status, available battery voltage, low battery and date and time
- Rugged new case design made from .90" 5052 aluminum, powder-coated gloss black with orange reflective vinyl graphics increasing driver awareness to road workers at night
- New Data Management Feature, quickly access, download or delete your project data
- Ability to download files to the PQI via USB drive
- Fast, reliable, accurate and repeatable readings in real time, User friendly, in-process, cost effective tool for any crew member
- Non-Nuclear means No Badges or Licenses and No storage or transport concerns



Portable Skid Resistance Tester ASTM E303

Measures friction (skid resistance) on flat, cambered, or gradient road surfaces. Originally developed by the Transport and Road Research Laboratory of Great Britain.

- Compact, easily transported & used in the field
- Can be used in remote locations, independent of any vehicle
- Enclosed bearings & working parts for protection against wear and contamination
- Heavy-duty frame construction
- Adjustable feet on base

A pendulum arm, having a spring-loaded rubber slider on the pendulum foot. Device is placed on the portion of the road surface to be tested. It is then leveled, and the height of the center of suspension of the pendulum is adjusted to a fixed value which is read on a special gauge.

The pendulum is then released from its horizontal position, to swing down freely until the rubber slider contacts the test surface. As the slider

travels across the surface for a fixed distance, the pendulum is slowed and a frictionally-constrained pointer affixed to the pendulum arm measures the highest point in the pendulum arc. The position of the pointer is then read on a measuring arc graduated from 0 to 150. Pointer readings indicate the resistance to skidding of the test surface. Dimensions (include carrying case): 31" x 25.5" x 9" (787 x 648 x 229mm). Meets ASTM E303.

Shipping wt. 75 lbs. (34.0kg)

High-Low Detector (Rolling Straight Edge)

Used to measure planeness of pavement surfaces, such as highways, airport runways, bridge decks, etc. Requires only one operator to detect, register, and dye mark high and low areas that need to be ground down or filled.

- Easy-to-use
- One-person operation
- Vertical sweep vertical indicator

Operator has full view of variations which are magnified 16 times, on a vertical scale graduated in 1/8" (1mm) increments, so that magnified readings range up to 1/4" (6.4mm), high or low. The 16 ft. long model incorporates aluminum reinforcing riveted along both sides of the frame for added support and rigidity. Available in 3m, 3.7m, and 4.9m spa.



Core Drilling Systems

Standard Version :

- Includes 4120 (large base)
- Choice of Milwaukee 15 or 20 amp (clutch model) motor with meter box

Upgraded Version :

- Includes 4120-22 (large base)
- Vacuum-hold down assembly
- Amp. meter box and 20 amp Milwaukee (clutch model) motor

Angle Drilling thru 45°:

- Includes 4130 Dymo-Rig with large base
- Choice of 15 or 20 amp (clutch model) motor with meter box



Angle Drilling Base

Formula .400 Premium Core Bits		Pro II Core Bits		Pro I	
Part No.	Size	Part No.	Size	Part No.	Size
2250B4	2 1⁄4″	2250B2	2 1⁄4″	2250B1	2 1⁄4″
4250B4	4 1⁄4"	4250B2	4 1⁄4"	4250B1	4 1⁄4"
6250B4	6 ¼″	6250B2	6 ¼″	6250B1	6 ¼″

Note: Core bits shown will produce core samples of 2", 4" and 6" respectively. Other sizes also available

Asphalt Pavement Analyzer (APA)

The Asphalt Pavement Analyzer (APA) is a multifunctional Loaded Wheel Tester (LWT) used for evaluating permanent deformation (rutting), fatigue cracking and moisture susceptibility of both hot and cold asphalt mixes. Testing time for a complete permanent deformation evaluation is 2 hours and 15 minutes (8,000 cycles). The testing time for fatigue cracking evaluation is dependent upon the fatigue behavior of the mix being evaluated.

Permanent deformation (rutting) susceptibility of mixes is assessed by placing beam or cylindrical samples under repetitive wheel loads and measuring the amount of permanent deformation under the wheel path. The APA features an Automated Data Acquisition System, which obtains rutting measurements and displays these measurements in a numeric and graphical format. Five measurements can be taken during a single pass over a beam specimen and two measurements can be taken during a single pass over a cylindrical specimen.

The APA features controllable wheel load and contact pressure that are representative of actual field conditions. Each sample can be subjected to a different load level (up to 113 kg/250 lbs) resulting in Contact Pressures up to 200 psi (1378 kpa). Triplicate beam samples, or six cylindrical (gyratory, vibratory, marshall pills, roadway cores) samples in three specially designed sample molds can be tested under controllable temperature and in dry or submerged-in water environments.

Fatigue cracking resistance of asphalt concrete can be determined by subjecting beam samples to a repeated wheel load of controllable magnitude and contact pressure in a low temperature environment. Triplicate beam samples can be tested under dry or submerged-in water environments.

The Automated Data Acquisition System features a computer, monitor, and software for measuring rutting and fatigue. The software obtains all measurements and then plots them in a numeric and graphical format. The graphs display stroke vs. deformation (mm) and stroke vs. time.



Asphalt Pavement Analyzer Jr. (APA Jr.)

The APA-Jr. is a multifunctional loaded wheel tester that is used to evaluate both cold and hot-mix asphalt in a dry or submerged in water condition. The APA Jr. can test the following type samples:

Cylindrical

- Gyratory
- Marshall
- Hveem
- Roadway Cores
- Other Cylindrical Samples

Beam

- Vibratory
- Rolling Wheel
- Slabs
- Other Beam Samples

The APA-Jr. has two loaded wheels.

- APA Concave
- Hamburg-Type
- Solid Rubber
- APA Solid Steel

The APA-Jr. meets the provisions of the AASHTO TP63-06

Test Method For Determining The Rutting Susceptibility Of Hot Mix Asphalt. In addition to this, the APA Jr. meets the provisions that are required for the AASHTO T324-04 Test Method for Hamburg-Type Wheel Tracking Test.

The APA-Jr. is operated utilizing a PLC PC Based Control System. The operating system allows a user to perform all calibrations and functions directly with a Computer.





Asphalt Vibratory Compactor

The Asphalt Vibratory Compactor (AVC) forms rectangular and cylindrical specimens of asphalt mixes. The samples are then used in the Asphalt Pavement Analyzer to evaluate susceptibility to permanent deformation (rutting), fatigue cracking, and moisture damage of the mix. The photo at left shows specimens made by the AVC positioned and ready for testing in the Asphalt Pavement Analyzer. The AVC compacts these samples at the same amplitude, frequency, and relative weight that a contractor experiences with a vibratory compactor on the roadway. Steel molds are supplied for rectangular and cylindrical samples. After the samples are compacted, they are extracted with the help of an air cylinder. The unit's electronic controls (mounted on a pedestal operator stand) allow you to set a testing time and to control the specimen height. The unit's rigid steel frame includes noise absorbing isolators and supports.

PTI's Asphalt Vibratory Compactor (AVC) is capable of compacting samples that can be used for 4-point bending beam fatigue test(AASHTO T321-03)



Asphalt Laboratory Mixers

The Asphalt Laboratory Mixers (ALM) fill the need for an efficient mixing system in asphalt mix testing labs. PTI's Single and Double Pugmill Mixers simulate asphalt plant mixing and prepares consistently well-coated aggregate in about one minute of mixing time. The Single Pugmill can produce batches as small as 4500 grams (10 pounds) or as large as 16,000 grams (35 pounds). The Double Pugmill can produce batches as small as 9000 grams (20 pounds) or as large as 32,000 grams (70 pounds).

The Pugmills are capable of producing enough mix to form up to four Asphalt Pavement Analyzer beam samples. Finished mix is discharged through pneumatic-cylinderoperated slide gates into a 0.7 cubic foot receiver pan. Each chamber is made from 3/8-inch thick steel, and has a door for material introduction. The shaft/paddle assembly is easy to remove for cleaning. The electrically heated chambers maintain mix temperature and heated chamber walls resist mix buildup. The mixing chamber temperature can be selected and a digital display shows the current temperature. Short-Term aging can be accomplished, using an onboard AMP meter.





Laboratory Automatic Gradation Unit

Pavement Technology Inc. (PTI) Automatic Gradation Unit (AGU) is a particle size analyzer that conducts a complete sieve analysis automatically and transmits the accumulated data to a computer, where the data is saved in an Excel spread sheet for further manipulation and analysis. The AGU has a carousel (mounted below the weigh hopper) that is used as a material separator. The carousel can accommodate 8-containers (5-gallon buckets) that rotate underneath the discharge hopper. The buckets collect the aggregate. The AGU also has an Automated Loading System that allows a user to stage up to 7 samples (40-45lbs.) for gradation analysis or material separation.

A typical sieving run (typically 10 minutes or less) with the AGU classifies and weighs each sieve, then produces a printout that shows the weights of each sieve, percent retained, percent cumulative, and percent passing. The AGU can accommodate samples up to 40-45 lbs. on 18" x 24" (nominal) screens, and meets ASTM specifications for screen size to sample weight ratio.

The AGU allows a user to automate the entire sieve analysis process and incorporate electronic data transfer. This allows the user to test samples more frequently and with better repeatability so that operator error and labor are minimized. The AGU has vibratory motors that ramp through the optimum resonant frequency for each sieve size. With this unique ability, the AGU will quickly and efficiently grade sample batches of aggregate in less time than would normally be required by conventional shakers using manual weighing and recording techniques.



Gyratory Compactor

Gyratory Compactor gives consistent replication of the testing environment from test to test. Includes a Pentium-Based PC, calibration equipment and software at no additional cost. Compaction chamber is completely enclosed. Unit gives continuous height measurement of the specimen during compaction to within ±0.1mm.

Features :

- · Built-in power-assisted specimen extractor no hand pumping.
- Work area which allows user to charge the mold, compact the specimen and extract it without lifting the mold.
- External Angle of gyration is preset at 1.25", but is adjustable from 0.5" to 2.0"
- Consolidation pressure can be set from 200 to 1000 kPa and adjustable ram travel speed is factory set at 10mm/sec
- · Real-time display of data.
- User-friendly software programs for editing and test data acquisition.
- · See-through door and illuminated chamber allow observation of compaction.
- · Safety switch which stops gyration when guard door is open.
- Emergency stop button.
- · Quick, easy mold alignment.
- Interchangeable 100 mm and 150 mm molds.



Thermolyne NCAT Asphalt Content Furnace ASTM D 6307; AASHTO T 308

Asphalt binder ignition testing is an environmentally friendly and cost effective test method to determine asphalt content of paving mixtures and ensure high quality and economical asphalt product. The ignition method reduces testing time when compared to solvent extraction. A 1200 to 1800g sample of asphalt can be tested in 30-45 minutes with the NCAT Furnace. The unit can accommodate samples up to 5000g at extended testing times. The method also eliminates the cost of solvent, the secondary cost of solvent disposal and safety concerns when handling solvent in the lab.

The NCAT Asphalt Furnace has an internal electronic balance automatically monitoring the sample weight throughout the ignition process, saving valuable technician time and increasing productivity in the lab. Simply enter the sample weight and calibration factor for your particular mix design, place the sample in the furnace chamber and press "start." When the test cycle is complete, the system automatically ends the test and prints the results. A periodic "beep" alerts the technician that the test has ended. Pressing "stop" unlocks the chamber door and the sample can be removed and allowed to cool for gradation analysis.

The NCAT Furnace software allows selection of automatic or manual test modes. In the automatic mode, the software ends the test when the endpoint is detected, prints out the results and beeps. It continues to beep until "stop" is pressed to unlock the door, in accordance with AMRL specifications. In the manual mode, the unit beeps when the endpoint is detected, but continues to test until "stop" is pressed, unlocking the door and printing the



results. Positive or negative correction factors can be entered to correct for unique mix characteristics. Weight change due to sample and basket assembly temperature change is automatically compensated for each sample tested. The automatically detected endpoint of the test cycle is reached when weight loss from the sample is less than a user-established setpoint between 0.01% and 0.5% for three consecutive readings. Test results are computed as asphalt content per total weight of HMA sample or bitumen ratio per weight of dry aggregate to an accuracy of ±0.11%.

The furnace is pre-heated to a setpoint temperature within the range of 450° to 550°C (842° to 1022°F). The default setting is 538°C (1000°F). The hot mix asphalt sample is weighed and divided into two screened baskets on a tray assembly. This complete assembly is placed in the chamber on the furnace hearth tray. Once the door is closed and the test initiated, the door remains locked until completion for operator safety. During ignition and burn-out, released volatiles are further oxidized in a high-temperature afterburner with a patented ceramic filter heated to 750°C (1382°F). The exhausted air is directed to a louvered plenum and cooled by mixing with ambient air. The blower then directs the exhaust to the plenum exhaust port and through seamless exhaust tubing. This system has been shown to reduce process emissions by up to 95%. The furnace controller 24-hour/7-day timing function can be programmed to preheat the furnace to any time set by the operator. A secure, automatic door-locking system provides operator safety and insures test integrity during critical burn-off times. The modular, refractory embedded heating elements provide extended service life and easy, inexpensive replacement. An RS-232 port provides data interface with a personal computer for graphical data analysis.

Included with the NCAT furnace are the Electronic Balance, Hearth Tray, six replacement Fuses and an operation manual. The Starter Kit (APA-25) is required and includes the following: two Sample Basket Assemblies (APA-31), Transport Handle (APA-32), Aluminum Cool Down Plate (APA-34), Cool Down Safety Cage (APA-35), four rolls of Printer Paper (APA-33), Basket Brush and Motor Lubricant. For increased safety, the kit includes Head Gear with Face Shield, and Heat Resistant Gloves. Order additional APA-31 Sample Basket Assemblies for quicker sample preparation and more sample throughput.

The Standard model F85930 is supplied configured for a 240 volt, 27 amp, 1-phase power supply. This model may be reconfigured in the field for use with a 20 amp power supply. The model F85938 is configured for use with 208 volt 1-phase circuits only and draws approximately 28 amps. Maximum operating temperatures are 650° C (1202° F) for the chamber and 900° C (1652° F) for the ceramic filter. Chamber dimensions for all units are 14x14x14''(35.5x35.5x35.5 mm) WxDxH. Overall size is 21.75x26.63x40.5'' (54.3x65.1x102.9 mm) WxDxH. NCAT Furnaces are not supplied with power cords and must be hard-wired directly to a suitable electrical supply or supplied with a cord and plug by the user. Shipping data: 393 lb (178 kg); 21 Cu. Ft.

Marshall Stability Load Frame

The Marshall Stability Load Frame has a fixed loading speed at the specified 2" (50.8mm) per minute rate for Marshall testing. Loading rate is maintained at \pm 1% by the ¾ hp dc motor and controller.

These heavy-duty frames have 10,000 lbf (44.5kN) load capacity and are built for a lifetime of use in demanding laboratory environments. The sturdy cabinet is constructed of 14 gauge steel and painted with a durable enamel finish. A 6 ¼" (171.5mm) diameter lower platen is standard on all load frames. The load frames have a vertical clearance of 37.3" (947mm) and a horizontal clearance of 11.9" (302mm). Crosshead height is quickly and accurately changed using the self-centering adjusting nuts. The 1¼" (31.8 mm) diameter vertical coarse-threaded rods are plated for corrosion resistance. A flexible boot protects the precision loading screw from dust and dirt.

Load Frames must be ordered with either load rings with dial indicators, or digital dial readout system. The digital system includes load cells and linear displacement transducers to measure load and flow.

Overall dimensions of the load frames are 18x29x54.5 in (457x 737x1384mm), WxDxH.



Centrifuge Extractor ASTM D2172 (Method A)

For quantitative determination of bitumen content in paving mixtures, centrifuge extractor operation requires relatively short time. Sample is weighed, heated slightly until it starts crumbling, cooled, placed in rotor bowl and solvent is added. Centrifugal action forces liquid through a filter paper ring at bowl's periphery, and process is repeated until expelled solvent is clear color.

Aggregates are weighed and graded. Weight before and after extraction determines constituent proportions. All motorized units have accurate, dependable electronic solid state speed control; rotation speed adjusts up and down.

Electric brake stops rotation in less than 10 seconds. Explosion-proof motorized units offer same features along with greater safety. Hand-driven unit is ideal for field application or labs with light duty. Units are corrosion-resistant lightweight cast aluminum.

Includes 10 filter rings. Extra bowls recommended to speed multiple batching; order separately. Meets ASTM D2172 (Method A).



Filterless Centrifuge ASTM D 1856; AASHTO T164, T170

The American-made Continuous Flow Filterless Centrifuge is effective for recovery of mineral filler fines from bitumen-laden nonflammable solvents from asphalt mix extraction tests. Analysis is simplified and accuracy is improved by eliminating the filter. Solvent suspension is fed through a top funnel into a special aluminum beaker (included) rotating at 11,000 rpm. Under high centrifugal force, the liquid moves up the beaker wall and out through the overflow tubing while solids remain for easy removal. Continuous feeding of suspension is possible until the solids-retaining capacity of the beaker is reached.

No. 18 (1.0mm) and No. 200 (75um) sieves are included for fitting to the top of the inlet funnel if desired. A No. 230 (63um) sieve may be substituted for the No. 200; please specify. When using the sieves, the extraction process can be run by pre-dissolving the mix sample with solvent, then pouring into the sieves.

Rotating spindle and electric motor of the centrifuge are enclosed in a sturdy cast aluminum case. Overall dimensions are 20x15x33" (508x380x840mm), WxDxH. Shipping Data: 150lb (68kg).



Cannon CT-500/518 Constant Temperature Bath

The CANNON CT-500/518 baths maintain accurate temperature control of \pm 0.01°C within the range of 20°C to 100°C, providing the temperature sensitivity required by ASTM D 445 for kinematic viscosity measurements with glass capillary viscometers. Two electric heating elements inside the bath rapidly heat the medium to any desired temperature within the range. A cooling coil, when connected to tap water or a cooling system, permits operation below or slightly above ambient temperature.

Temperature Selection

A special selector switch on the front panel facilitates rapid setting of ten popular temperatures for kinematic viscosity determinations. Temperatures which may be selected with this switch are 20, 25, 30, 40, 50, 60, 70, 80, 90, and 100°C. After the switch has been set, the bath will equilibrate to within a fraction of one degree of the desired temperature. A fine tuning control then allows temperature adjustment to within ± 0.01 °C of the target temperature. By switching to the "variable" setting on the front panel, any temperature within the operating range can be obtained.

Description of Bath

A solid-state control circuit provides proportional control of temperature. The sensing element for the control circuit is a stainless steel-encased thermistor.



A motor-driven stirrer ensures a uniform temperature throughout the bath. The entire electrical control system is located in a convenient drawer, mounted on glides for easy access if adjustment or repair is

necessary. The CT-500 bath chamber is a cylindrical clear glass vessel 305 mm (12 inches) in diameter and 305 mm (12 inches) high. The CT-518 bath chamber is a full 457 mm (18 inches) high. A Teflon*-coated stainless steel baffle located in the center of the bath provides a plain reflective background to aid in viewing instruments. The top cover contains seven round holes 51 mm (2 inches) in diameter for insertion of viscometer holders, allowing up to seven viscosity measurements to be made simultaneously. Covers are supplied for capping unused holes. Two additional holes 10 mm (p-inch) in diameter, are provided for thermometers. Other hole configurations are available on special order. All wetted parts of the CT-500/518 Constant Temperature Baths are made of stainless steel, glass, or Teflon. The frame is fabricated from heavy aluminum and coated with a corrosion-resistant epoxy finish. Viscometers, holders, bath oil, and thermometers must be purchased separately.

Safety Features

A thermistor in the bath senses any over-temperature fault condition. If such a condition occurs, all power is removed from the bath until an operator resets the over-temperature limit circuit. A second safety feature cuts power to the bath heaters if the control thermistor is disconnected. Finally, operation of the bath is not possible unless it is filled with liquid to a safe operating level. A liquid-level sensor prevents the control circuit from heating the bath until a safe operating level is attained. The bath heaters are automatically turned off when the bath liquid drops below minimum safe level.

Cannon CT-1000 Constant Temperature Bath

The CANNON CT-1000 Constant Temperature Bath maintains the accurate control required by ASTM D 445 for kinematic viscosity measurements with glass capillary viscometers. Within the range of 20 to 100°C temperature is controlled to 0.01° C; above 100°C temperature is controlled to 0.03° C.

Setting Temperature

Ten of the most popular temperatures for kinematic viscosity measurement can be quickly set by rotating a special switch on the bath's front panel. This switch allows 20, 25, 30, 40, 50, 60, 80, 100, 135, and 150°C to be selected. After selection of the temperature, the bath will equilibrate within a fraction of one degree of the desired temperature. A fine tuning control then allows temperature adjustment to within 0.01°C of the target temperature. By switching to the "variable" setting on the front panel, any temperature within the operating range can be obtained.

Bath Features



The bath chamber is a cylindrical clear Pyrex^{*} vessel 300 mm (12 inches) in diameter x 300 mm (12 inches) high. A stainless steel baffle coated with white Teflon is located in the center of the bath to provide a good background for viewing viscometers. Two fluorescent lamps illuminate the interior of the bath brightly and uniformly, without glare.

Two heating elements inside the bath rapidly heat the bath medium to any temperature within the bath range. A stainless steel cooling coil is also incorporated. When connected to tap water or a recirculating water chiller, the cooling coil allows operation at temperatures slightly above or below ambient.

The top cover contains seven round holes 51 mm (2 inches) in diameter. Up to seven glass capillary viscometers (in holders) can be placed in the bath. Other hole configurations can be supplied on special order.

A solid-state control circuit equipped with a stainless steel-encased thermistor provides proportional control of temperature. A motor-driven stirrer ensures a uniform temperature throughout the bath.

All wetted parts of the bath are made of stainless steel, glass, or Teflon^{*}. The bath housing is fabricated from heavy aluminum and coated with a corrosion-resistant epoxy finish. Viscometers, holders, bath oil, and thermometers must be purchased separately.

Safety Features

There are multiple safety features. A thermistor in the bath senses any over-temperature fault condition. If such a condition occurs, all power is removed from the bath until an operator resets the over-temperature limit control circuit. A second safety feature cuts power to the heaters if the control thermistor is disconnected. A liquid-level sensor prevents the control circuit from heating the bath until a safe operating level is attained.

CT-1000HT Constant Temperature Bath

Precision temperature control to 200°C The CT-1000HT Constant Temperature Bath is identical to the CT-1000, except that the CT-1000HT can achieve a temperature range from 25°C to 200°C. The temperature selection dial includes quick-set options for 25, 40, 60, 80, 100, 135, 150, 165, 185, and 200°C Temperatures from 150 to 200°C can be controlled to 0.03°C (more precise than required by ASTM D 445 for high temperature viscometry).

K21410 SV3000/SV4000 Saybolt Viscosity Baths

Test Method

Determines the time required for 60mL of sample to flow through a calibrated orifice under precisely controlled conditions. Saybolt Universal Seconds (SUS) is the standard measurement for lubricants, insulating oils, and lighter fuel grades, and Saybolt Furol Seconds (SFS) is used for heavier oils and bitumens.

Features and Benefits

- Microprocessor control of temperature between ambient and 240°C (464°F)
- Four tube capacity
- Dual digital displays show setpoint and actual temperature
- Selectable temperature scale Fahrenheit or Celsius
- Automatic timing option for simplified, accurate measurement of efflux times
- Conforms to ASTM D88, D244, E102, and related specifications



Cannon DVR 1000 Series Digital Vacuum Regulators



The CANNON DVR 1000 Series Digital Vacuum Regulators are designed for precise measurement and control of vacuum at 300 mm Hg below atmospheric pressure. Unlike other vacuum regulators, the solid-state DVR-1000 and DVR-1500 models use no mercury.

The DVR meter displays the amount of vacuum in mm/Hg or one of nine other units of measurement selected using a keypad on the meter.

In asphalt laboratories the Digital Vacuum Regulator (DVR) may be used in conjunction with Cannon-Manning, Asphalt Institute, and Modified Koppers vacuum viscometers for measurement of highly viscous materials such as asphalt cement at $60^{\circ}C(140^{\circ}F)$ according to ASTM D 2171. The DVR is also useful in other laboratory systems where accurate measurement and control of vacuum is required.

Two basic versions of the DVR are available. The DVR-1500 is equipped with an internal vacuum pump and does not require an

external vacuum source. The DVR-1000 uses the customer's in-house vacuum system.

The internal set points for the instrument gauge are preset at CANNON to regulate vacuum at 300 ± 0.5 mm Hg below atmospheric pressure (the vacuum required by ASTM D 2171). These set points may be altered to fit the user's specific needs within the DVR's operating range of 28 to 410 mm Hg below atmospheric pressure.

Both the DVR-1000 and DVR-1500 are available in either horizontal or vertical configurations (the horizontal version will support the weight of a constant temperature bath like the CANNON CT-1000 or CT-2000).

Universal Penetrometer— H-1200

Direct-reading instrument for precision penetration measurements of bituminous materials, cement, petrolatum and waxes, as well as food, cosmetics and pharmaceutical products. Unit has 5" diameter indicator dial, graduated in 400 divisions of 0.1mm, corresponding to 40mm penetration. Zero preset to eliminate errors. Includes 47.5g plunger with 3.2mm hole, and two loading weights (50g and 100g). Overall dim. 10-1/2" x 13" x 22" (266.7 x 330.2 x 558.8mm). Meets ASTM D5, D217, D1168, D1191, D1321, D1403, D1831, D1855; AASHTO T49, T187 and others.



K95500 Digital Penetrometer

Penetration tests are performed on petroleum products to determine consistency and shear stability (lubricating greases) for design, quality control and identification purposes. A standard cone or needle is released from a penetrometer and allowed to drop freely into the sample for 5 seconds (or a different specified interval) at constant temperature. The depth of penetration of the cone or needle into the sample is measured in tenths of a millimeter by the penetrometer.

Features and Benefits

- Tests the consistency of lubricating greases, petroleum waxes, bitumens, pastes, creams and other solid to semi-solid products
- Automatically timed operator programmable penetration measurements
- Motorized placement of penetrator on sample surface
- Large LCD to display all functions
- RS232 port for data transfer
- Full measurement range of 0-620 in 1/10mm scale or 1/100mm scale
- Rechargeable battery or AC operation
- Large, removable base accommodates grease worker cups and other ASTM and non-standard sample containers
- · Complete selection of penetrometer cones, needles and accessories for petroleum products testing and for a wide range of other applications

(Real

Penetron

• Conforms to all ASTM, IP, ISO 9001 and related specifications for penetrometers

Humboldt Ductility Machine — H-1068X

The H-1068X is a three-speed machine designed for Standard and Force Ductility tests. The unit tests three briquets simultaneously and its DC, direct-drive motor maintains constant speed, entirely vibration-free. Speeds of 1/4, 1 or 5cm per minute are selected via lever shift on mechanical gear box.

A single brass lead screw mounted above water level prevents agitation of water and premature rupture of specimens. A traveling pointer adjusts to zero starting position and indicates exact position of carriage on a linear centimeter scale attached to trough's front edge. Maximum carriage travel (elongation) is 150cm with an automatic stop.

The Unit has a stainless steel interior with an overflow connection, and a baked enamel stainless steel-wrapped exterior. Gears are bronze or brass; all other parts are solid brass to prevent rusting. Finned stainless steel tubes beneath a false bottom provide efficient thermal transfer. Includes a 6' (183cm) cord, feed-through switch and 3-prong plug. Includes 3 standard H-1080 briquet molds with H-1090 plates.

Trough overall dimension: 11-3/4 x 74 x 6-3/8"H. H-1068PC Plastic Cover is recommended to maintain constant tank temperatures. Shipping wt. 350 lbs. (159 kg)



Clear Cover for Ductility Machine— H-1068PC

Temperature control cover made from clear Plexiglas. Can be used with all ductility machines. Shipping wt. 40 lbs (18kg)



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