



SHORT CATALOGUE

PETROLEUM TESTING INSTRUMENTS

A WIDE RANGE  
OF ANALYSIS FOR :

**PETROLEUM**  
LUBRICANTS

**PETROCHEMICALS**  
**BITUMEN**

ETC ...

**H**aving been established for close to 50 years now in the field of Manufacture of glassware and petroleum testing instruments, NORMALAB is proud to launch a new type and design of instrument finalized by its new subsidiary **NORMALAB TECHNOLOGIES** : the automatic distillation unit is the 1<sup>st</sup> one as well as the automatic penetrometer.

These analyzers are accompanied by many types of instruments for Petroleum laboratory you will find in this new leaflet.

For many years now, we provide glassware and equipment to various petroleum laboratories all over the world as well as on site service and training.

Our strategy is to continue to be present through our distributor's network and with a strengthened service. Our team is always available for demonstration, advice, information we can provide due to the fact we work with partners established worldwide.

In addition to our wide range of production, we just sign new contracts for France and/or Africa with well-known petroleum equipment manufacturers which allow us to complete our offer.

Furthermore, our technical service is frequently trained on our full range and is available with a hotline for technical questions. We organize every year training and commercial sessions for our distributors in France.

ACHEMA, PITCON, ARABLAB are so many opportunities to meet you. We would like to develop more opportunities to increase our partnership. Our people are available each time to study new way of developing proximity with you.

● ● ● **AVAILABILITY,  
CONVIVIALITY, SERVICE ARE  
THE DAILY BASIS OF OUR  
FUTURE PARTNERSHIP.**



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*The flash point of a flammable liquid is the lowest temperature at which it can form an ignitable mixture in air. A slightly higher temperature, the fire point, is defined as the temperature at which the vapour continues to burn for at least 5 seconds after being ignited.*

*To cover different types of samples and needs, Normalab proposes a full range of analyzers; closed cup, or open cup. Your product's properties are also different, so we have a solution according to your volatility, composition and viscosity. Our equipments are designed for working with a large temperature range, preheating, with or without adjustable stirring, and are fitted with double detection system.*

*Closed cup testers normally give lower values for the flash point than Open cup (typically 5-10°C).*

## Pensky Martens flash point tester - Closed cup as per ASTM D 93 - EN 22719 - ISO 2719 - IP 34 - IP 304

### 1 NPM 440 - AUTOMATIC VERSION (P/N 40300)

The NPM 440 provides an operating range between 0°C and 400°C. A large screen allows supervising the test process at distance. 5 preset standard methods and 2 other quick search methods. Easy modification of parameters thanks to a user-friendly software. Apparatus with dual detection system: thermal and ionization. Complete apparatus delivered with ticket printer and Supervisor software.

### 2 NPM 221 - HALF AUTOMATED VERSION (P/N 942619)

The NPM 220 series offers electric heating, automatic stirring and easy flame control in an economical version. The heating rate is programmed and the role of the operator is limited to the flame presentation and flash detection. NPM 220 performs method A or B at choice. NPM 221 performs both methods.

### 3 NPM 131 - MANUAL VERSION (P/N 942616)

The new economical version NPM 130 series offers electric heating, automatic stirring and easy control of the flame. NPM 131 performs both A and B methods. The NPM 130 model is designed at choice : for methods A (p/n 942614) or B (p/n 942615).

## TAG flash point tester - Closed cup as per ASTM D 56

### 4 NTA 440 - AUTOMATIC VERSION (P/N 40600)

This test method covers the determination of the flash point by Tag closed testers, of liquids with a viscosity below 9,5 cSt at 25°C and having a flash point below 93°C. The NTA 440 model, fully automatic tester, is equipped with ticket printer, cup and cover, cup support, Pt 100 probe, detection cable and gas tubing.

## ABEL flash point tester - Closed cup as per ISO 13736 - IP 170 - AFNOR M07011

### 5 NAB 440 - AUTOMATIC VERSION (P/N 41300)

Automatic Abel can be supervised at distance thanks to a large graphic display. 3 preset standard methods, and 1 quick search method. Apparatus with a dual detection system-thermal and ionization. The user-friendly software allows memorising of the previous 200 test results. NAB 440 can be connected to an external cryo-thermostat and it can operate between -30°C and +110°C. NAB 440 is delivered with ticket printer and software.

### 6 NAB 110 - MANUAL INSTRUMENT

Manual ABEL Flash Point allowing to work as per the traditional standard method with dry ice or with a cryostat (at choice).

**Cleveland flash point tester - Open cup (COC) as per ASTM D 92 - ISO 2592 - IP 36 - EN 22592**

**7 NCL 440 - AUTOMATIC VERSION (P/N 40400)**

NCL 440 flash point open cup, with 2 lights. Operating range between ambient temperature to +400 °C.

Testing process supervised at distance thanks to a large graphic display. The flash point and the fire point are detected automatically. Connection to a network with plug RS232C. The last 200 results are in memory. NCL 440 delivered with ticket printer and friendly Supervisor software.

**Option: 6-cup automatic sampler. (P/N 40440)**

**8 NCL 220 - HALF AUTOMATED VERSION (P/N 942610)**

The new model NCL 220 is a half automated COC. It features an electronic temperature regulation for automatic heating slope, a digital readout and an easy access to the calibration parameters.

**9 NCL 120 - MANUAL INSTRUMENT (P/N 942611)**

The NCL 121 enables the determination of flash and fire points. The instrument is fitted with electric heater, power adjustable by energy regulator on the front panel. Pilot and test flame adjustable in height by needle.

**Flash point tester by small scale closed cup as per ISO 3679 - NFT 30051 - similar to ASTM D3828**

**10 NPV 310 - AUTOMATIC VERSION GAS (P/N 942691)  
AUTOMATIC VERSION GAS & ELECTRIC (P/N 942692)**

New designed model NPV 310 - Flash point at equilibrium with automatic heating slope. automatic detection by thermocouple and possibility to run the method manually or to set an automatic heating rate.

Temperature range -30 to +300 °C. Cryostat on option.

**11 NPV 221 - HALF AUTOMATED VERSION (P/N 942689)**

New designed model NPV 221 - Flash point at equilibrium for paint, varnish, laque, solvent, cosmetics, perfume, distillate and various petroleum products. Uses only 2 ml sample. Automatic flame presentation and flash detection by thermocouple. Temperature range -30 to +300 °C. Cryostat on option.

**LUCHAIRE Flash Point tester as per NFT 60103**

**12 NLU 440 - AUTOMATIC VERSION (P/N 40200)**

The NLU 440 performs Luchoire flash Point automatically from ambient to 400 °C. The sample is heated at a rate of 2 to 3 °C per min. Detection is made by ionization ring. Apart from sample preparation, the analysis is monitored by the computer. Maintenance features are available from the software. Data storage: 200 results.

**13 NLU 210 - HALF AUTOMATED VERSION (P/N 9426222)**

NLU 210 offers an economical alternative to the automatic Luchoire tester. Detection and flame presentation are monitored by the operator. NLU 210 includes an automatic heating slope at standardized rate and digital temperature reading.

**14 NLU 110 - MANUAL INSTRUMENT (P/N 9426221)**

NLU 110 offers an economical alternative to the automatic and half automated versions of Luchoire tester. Detection and flame presentation are monitored by the operator.





**i** Volatility is a measure of the tendency of a substance to vaporize. It has also been defined as a measure of how readily a substance vaporizes. Most often the term is used to describe a liquid's tendency to evaporate. The higher the vapor pressure of a liquid at a given temperature is, the higher the volatility and the lower the normal boiling point of the liquid is.

*Distillation is a method of separating mixtures based on differences in their volatilities in a boiling liquid mixture. Distillation is a unit operation, or a physical separation process, and not a chemical reaction.*

*Test of volatility are really important to specify and qualify your products. For this reason we developed necessary equipments to perform these analyses.*

## Distillation of petroleum products at atmospheric pressure as per ASTM D 86 - D 850 - D 1078 - ISO 3405 - DIN 51751 - IP 123 - IP 195 - GOST B

### 1 NDI 450 - AUTOMATIC VERSION (P/N 60502-60503)

NDI 450 is dedicated to the distillation of various petroleum products including Natural, motor and aviation gasolines, aviation turbine fuels, special boiling point spirits, naphthas, white spirit, kerosene, gas oils, distillate fuel oils. The Unit is a stand alone one, operable through integrated touchscreen and Windows based software. NDI 450 offers an incredible storage capacity with over 1000 tests and as much program files. Result comparison and analysis is made easy by direct reading on its large screen or through results exportation (LIMS, EMAIL, PDF, DOC and XLS files type) NDI 450 offers also 3 USB, 1 Ethernet & 1 RS232C connections.

### 2 NDI CLASSIC - HALF AUTOMATED VERSION (P/N 942228)

NDI 110 & NDI 210 complete the range of distillation units. NDI 210 includes an analog condenser bath regulator (digital on request) for a more comfortable operation. Equipments are delivered with glassware and basic accessories to run ASTM D 86.

### NDI BASIC - MANUAL VERSION (P/N 941228)

## Distillation of petroleum products at reduced pressure as per ASTM D 1160 - ISO 6616

### 3 V DIST CLASSIC - HALF-AUTOMATED INSTRUMENT (P/N 9411280)

Ready-to-use. Computerised control of both temperature and pressure (between 1 and 50 mm Hg). Sample identification and distillation data automatically recorded & printed. The operator is protected by a sliding transparent panel and moving roof.

## Reid vapour pressure bath as per ASTM D 323 - ISO 3007 - D 1657 - D 1838 - ISO 6351 - D 1267 - ISO 4256

### 4 CWB CLASSIC (P/N 941432)

Reid vapour pressure bath for 3 vessels. Electronic temperature controller with digital reading & setting between 10 & 50 °C. Apparatus with adjustable stirring device, cooling coil, constant level device, & drain cock. Reference 941434: same as 941432 but 5-vessel capacity.

## AUTOMATIC INSTRUMENT ON REQUEST

# COLD FLOW PROPERTIES



## Cloud & Pour Points of Petroleum Products as per ASTM D 97 - D 2500 - IP 15 - IP 219 - ISO 3015 - ISO 3016

### 5 NTE 450 - AUTOMATIC VERSION (P/N 60300)

The NTE 450 allows automated determination of the cloud and pour point of petroleum products.

The device is fully automated and monitored by a user-friendly software accessible by a color touch screen.

This attractive instrument mimics the standard method with an intuitive software which allows to have visualisation of the different cooling steps (detection every 3°C or 1°C), and a storage capacity of 200 results. The pour point detection is done by ultrasonic sensor and the cloud point detection by optical fibre.

### 6 CPP CLASSIC - HALF AUTOMATED INSTRUMENT WITH INTERNAL COOLING VERSION (P/N 941592)

CPP test cabinet, mechanically refrigerated by CFC free Gas. 4 compartments (0, -18, -33, -51°C), each with 4 sleeves. Delivered with useful glassware and thermometers.

### 7 CPP BASIC - MANUAL INSTRUMENT WITH EXTERNAL COOLING VERSION (P/N 941584)

Manual CPP Bath with 5 positions, cryostat connection or dry ice cooling.

## Cold Filter plugging point (CFPP) as per ISO EN 116 - IP 309 - ASTM D 6371

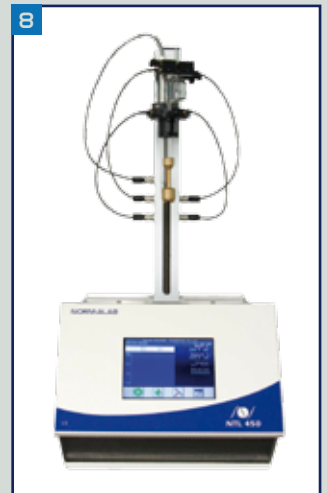
### 8 NTL 450 (P/N 60200)

The NTL 450 allows determination of Cold Filter plugging Point of Diesels and Heating fuels. The device is fully automated and monitored by a user-friendly software accessible by a colour touch screen. Vacuum regulation is included.

This is an attractive instrument enabling easy visualisation of the different cooling steps, of the sucking up & release time, possibility to use a linear cooling slope. The storage capacity is 200 results. Chiller on request.

## Freezing point as per ASTM D 2386 - ISO 3013 - IP 16 - DIN 51421 - NFM 07048

## MANUAL OR AUTOMATIC INSTRUMENTS ON REQUEST



*i Cold flow properties could be defined by several tests under prescribed cooling condition. You could look for Cold filter plugging point (CFPP), Cloud Point (CP), Pour Point (PP), or Freezing Point (FP).*

*CFPP is highest temperature, at which a given volume of fuel fails to pass through a standardized filtration device in a specified time.*

*CP is the temperature at which dissolved solids are no longer completely soluble, precipitating as a second phase giving the fluid a cloudy appearance.*

*PP is the lowest temperature at which it will pour or flow. It is a rough indication of the lowest temperature at which oil is readily pumpable.*

*FP is considered as the temperature of the reverse change from liquid to solid.*

*Normalab offers a full range of analyzers to define and qualify the cold behaviors of your products.*



*i* From raw crude oil to final product there are several steps. All along this product transformation process Normalab may propose equipments able to qualify the cleanliness of your samples.

On crude oil our NSB 210 (Salt-in-crude analyser) allows to determine the Chloride content which is capital information for refining process. Our NMC (Micro carbon residue testers) also automate the characterization carbon content.

For final products we supply solution to qualify the contamination of your samples: amount of naphtha through precipitation number, estimation of hydrocarbon content thank to aniline point, relative degree of corrosivity due to sulphur compounds, asphaltenes content after extraction and other information for quality control including colour.

## ASTM Color of Petroleum Products (ASTM Color Scale) as per ASTM D 1500 - ISO 2049 - IP 196 - NFT 60104 - DIN 51578

### 1 AF 650 - MANUAL VERSION (P/N 24415)

The colorimeter AF 650 model with a 16-filter colorimetric scale from 0,5 to 8,0 units. It is a 3-field instrument for visually determining the ASTM colour of samples by direct comparison with coloured glass standards. The instrument is delivered with 3 glass sample jars and a calibration certificate for the filters

## AUTOMATIC INSTRUMENTS ON REQUEST

## Detection of Copper Corrosion from Petroleum Product as per ASTM D 130 - IP 154 - NFM 07015 - ISO 2160 - DIN 51811

### 2 NTB CLASSIC (P/N 23007)

Thermostatic Bath with temperature range from ambient to 250°C, Temperature stability  $\pm 0.02$ . Bath is conform ASTM D130, ASTM D4048, EN/ISO 2160, DIN 51811, P154, IP112 and equipped with a cover with six holes for six test stations. Each hole comes with a lid and hook for suspending a copper corrosion vessel.

## Aniline Point Tester as per ASTM D 611 - IP 2 - NFM 07021 - ISO 2977

### 3 NAE 440 - AUTOMATIC VERSION (P/N 40500)

The NAE 440 Aniline point tester is the first twin tester available on the market using the dry bath concept.

The U-tube method described in ASTM D 611 standard detects the point of miscibility regardless of the colour of the sample. The NAE 440 can also be used as a manual tester. The NAE operates within a range of -10 °C to +150 °C.



## Automatic Blending Units for octane and cetane reference fuel (Blending) as per ASTM D 2699 - D 2700

### 4 NABLEND 88XX (P/N 52100 - 52200 - 52300)

The NABLEND series automates the blending procedure for reference and check fuels used for octane and cetane number measurements according to ASTM D2699, ASTM D2700 and ASTM D613. Printing and traceability of results according to quality control requirements, high accuracy in results and time saving. 3 versions available with:

- 3 fluid channels, for blending octane reference and check fuels according ASTM D2699 and D2700 composed of three blending components: iso-octane, normal heptane and toluene. (P/N 52100)
- 5 fluid channels, for blending octane and cetane reference and check fuels according ASTM D613, ASTM D2699 and ASTM D2700 composed of three blending components: iso-octane, normal heptane and toluene for octane and two blending components: nCetane, AMN or HMN, or U and T components for cetane. (P/N 52200)
- 6 fluid channels, for blending octane and cetane reference and check fuels according ASTM D613, ASTM D2699 and ASTM D2700 composed of four blending components: iso-octane, normal heptane, 80/20 blend and toluene for octane and two blending components: nCetane, AMN or HMN, or U and T components for cetane. (P/N 52300)

## Detection of conductivity as per ASTM D 2624

### 5 CONDUCTIVITY METER - (P/N 23628)

A portable conductivity meter that checks and measures the conductivity and assists in determination of the need for additional additive doping. Our conductivity meter comprises a submersible sensor with pre-amplifier.

## Asphaltenes Content in petroleum products as per IP 143

### 6 ASPHAN O2 - HALF AUTOMATED VERSION (P/N 24472)

ASPHAN O2 Asphaltenes extractor improves the characteristics of the methods: Quick and accurate test, minor operator's intervention, apparatus completely sealed (no toxic emissions), increased repeatability and reproducibility

## Oxidation characteristics (TOST) as per ASTM D 943 - D 2274 - D 2893 - IP 157 - DIN 51587

### 7 TOST CLASSIC ( P/N 9416260)

The 9416260 bath is a 8-place unit delivered without flowmeter nor glassware. User can select suitable accessories according to his needs and get a custom-instrument. Glassware and option list available upon request.

## Existent gum in fuels by jet evaporation as per ASTM D 381 - IP 131 - ISO 6246

### 8 AIR JET VERSION (P/N 941302)

#### STEAM-JET AND AIR JET VERSION (P/N 941303)

P/N 941303: existent gum in fuels by steam-jet and air-jet evaporation. Exclusive triple digital controllers for: air temperature (155 +/- 0,5 °C), steam temperature (232 +/-2 °C), & both air & steam flows (1000 mL/s +/- 15 %).

P/N 941302: existent gum in fuels by air-jet evaporation only.

P/N 941301 Air Calibration kit for 941302 and 941303.



*i* Before their final delivery, samples need to be stored. The conductivity measurement helps you to control safety conditions during transfer operation. This storage could engender modifications of your sample. For this reason we design analyzers to check their stability properties like evaluation of gum formation, oxidation stability, and real cleanliness by filter plugging test. Thanks to our NABLEND, you will prepare your reference fuels for Octane and Cetane numbers determination with traceability in the quickest way.



**Induction Period & Potential Gums as per ASTM D 525 - D 873 - IP 40 - 138 - 142 - ISO 7536 - AFNOR M07013**

**9 NPI 440 - 2 STATIONS (P/N 40900)**

**10 NPI 442 - 4 STATIONS (P/N 40925)**

The NPI 440 offers graphic screen, updated electronics, and friendly software. 2 models available: NPI 440 liquid bath version (2 stations), NPI 442 solid bath version (4 stations). Temperature range from ambient to 120 °C. Last 200 results stored. Vessels to be ordered separately (at choice for 2 or 4 stations). RS232C output for PC connection and transmission of data.

**Determination of carbon residue (Micro method) Micro Conradson Residue & Ash Tester as per ASTM D 4530 - D 482 - D 189 - IP 398 - ISO 10370 & 6615 - DIN 51551**

**11 NMC 440 - AUTOMATIC VERSION (P/N 41023)**

NMC 440 provides 2 pre-set methods and 18 other ones of your own with 4 segments each. Very friendly and easy to use apparatus in accordance with standards. This apparatus gives the detailed test report and the calculated carbon residue. NMC 440 is supplied with 3 different holders, RS232C connection, ticket printer.

**Micro Conradson Residue as per ASTM D 4530 - D 189 - IP 398 - ISO 10370 & 6615 - DIN 51551**

**12 NMC 210 - ECO VERSION (P/N 941670)**

NMC 210 is an economical version of NMC 440 for performing MCRT analysis. Quick start of test, temperature and nitrogen control are automatic and in accordance with the method. Temperature accuracy: 1 °C. Max furnace temperature: 550 °C.

**FBT determination (Filter Blocking Tendency) as per ASTM D 2068 - IP 387**

**13 NBF 242 AUTOMATIC PORTABLE VERSION (P/N 41800)**

**NBF 240 AUTOMATIC BENCH TOP VERSION (P/N 41801)**

The NBF 240 automatically determines gas oil and fuel FBT (in accordance with the above mentioned standards). Pressure/flow curve automatically printed. The instrument features a pump system, a pressure sensor, 2 beakers, an automatic follow up system, and a liquid crystal screen. 2 models: portable and bench top.

**Oil test centrifuge as per ASTM D 91 & D 893 & D 1796 & D96 & D4007 & D 2709 & D 2711 ISO NF 3734/ISO NF 9030 - DIN 51793 & D 2273**

**14 NCP TECH (P/N 29408)**

NCP Tech with heating up to 70°C as per ASTM D91, D96, D893, D1796, D2709, D27011, D4007, fitted with electronic temperature control. Automatic lid locking, touch screen and friendly software to setup programs. Safe and reliable.

**Salt-in-crude analyser as per ASTM D 3230 - IP 265**

**15 NSB 210 - MANUAL VERSION (P/N 942287)**

The NSB 210 offers digital readout of both current and voltage of easy checking. Continuous adjustment of test voltage between 0 & 300 VAC. Very easy to operate through single selection switch for calibration, standby and measurement.

## Foaming characteristics of lubricating oils as per ASTM D 892 - IP 146 - ISO 6242

### 1 FOAM 2 CLASSIC (P/N 941643) FOAM 1 CLASSIC (P/N 941640)

Instrument performs 2 tests at 24 °C and 93.5 °C. With 2 heat resistant glass jars (with temperature controller), 2 flowmeters, 2 cylinders (100 ml), immersion heater, stirring system air delivery tubing and thermometer. Cold bath has built-in coils.

### 2 NDW TECH (P/N 941645)

This new accessory allows to clean and dry your stone diffusers or your stainless steel diffusers according to the method ASTM D892. It is easy to use, safety. You can choose the number of cycles and the cleaning time.

### 3 FOAM HT CLASSIC (P/N 9416432)

Same as above bath but for test at max. 150 °C. Sequences I, II, III and IV in one bath.

## Dielectric breakdown voltage of insulating fluids as per ASTM D 877- ISO NF EN 60156 - IP 295 - NFC 27221

### OTS 60 AF - AUTOMATIC VERSION (P/N 23797)

### 4 OTS 60 PB - PORTABLE VERSION (P/N 27196)

The OTS range is a complete range of tester for dielectric breakdown voltage. These devices are fully automatic units that reduce the operator's tasks of preparing and loading the oil sample into the test chamber and initiating the required test sequence.

## Air Release Value (Impinger method) as per ASTM D 3427 - IP 313 - DIN 51381

### 5 ARV CLASSIC (P/N 941688)

Apparatus including test rig, thermostatic circulator, necessary tubing, glass plunger. Analytical balance with special link for plunger hanging, with RS232C connection.

## Water separability of petroleum oils and synthetic fluids as per ASTM D 1401 - ISO 6614

### 6 DEM CLASSIC (P/N 942545)

7-place unit (2 places for sample preheating only). Electronic temperature controller between ambient and 95 °C +/- 0.1 °C, with digital display and setting. Electronic stirring speed controller. Easy movable stirring head. Auto-memorization of the various parameters recorded. Illuminated and manually turning base plate (330x330x70 mm) on option.

## Oxidation stability by Rotating Cylinder as per ASTM D 2112 & D 2272

### 7 OTB CLASSIC - HALF AUTOMATED VERSION (P/N 9416298)

Oil thermostatic bath for 2 cylinders. Rotating speed 100 rpm +/- 5, Temperature up to 150 °C +/- 0.2 °C. List of accessories and consumables to comply with the methods.



*i* A lubricant is a substance introduced between two moving surfaces to reduce the friction between them, improving efficiency and reducing wear. One of applications for lubricants, in the form of motor oil, is to protect the internal combustion engines in motor vehicles and powered equipment.

Typically lubricants contain 90 % base oil and less than 10 % additives. Additives deliver reduced friction and wear, increased viscosity, improved viscosity index, resistance to corrosion and oxidation, aging or contamination, etc.

Lubricants are also added to some fuels. Sulfur impurities in fuels also provide some lubrication properties, which have to be taken in account when switching to a low-sulfur diesel; biodiesel is a popular diesel fuel additive providing additional lubricity.



**Penetration value as per ASTM D 5 - D 217 - D 937 - D 1321 - D 1403 - AFNOR T 60119 & T 60132 - ISO 2131 - ISO 2137 - DIN 52010 - DIN 51579 - IP 49**

**1 NPN TECH - AUTOMATIC VERSION (P/N 942734)**

Compact instrument using the latest technologies. Interactive software allowing time penetration programming between 0 & 999 min. 4 mobile head positions can be memorized. Features auto-electronic detection of depth penetration with USB connection for data acquisition or connection to a ticket printer.

**NPT 210 - COOLING SYSTEM (P/N 29409)**

Automatic dry bath / Built in with Peltier's elements allowing to cool from 0°C to ambient and to heat from ambient to 100°C / Excellent homogeneity and stability / Fully auto / Digital control / Including adaptors for different sample size containers.

**2 PENETROMETER - MANUAL VERSION (P/N 941731)**

Manual penetrometer including a large table on levelling feet with spirit level, a manual release mechanism and a dial indicator in 0.01 mm. Outfit comprising needle, holder, sample containers & 50 g weight to be ordered separately.



**Softening point tester (Ring and Ball Method) as per ASTM D 36 - EN 1427 - ISO 4625 - DIN 52011 - IP 58**

**3 NBA 440 - AUTOMATIC VERSION (P/N 40100)**

The NBA 440 benefits from the latest technology improvements, it can be looked out a distance thanks to a large graphic display. Heating element is highly protected and resists to water overflow. 4 pre-set programmable methods are provided. Apparatus with RS232C connection, ticket printer and friendly software.

**Test method for ductility of bituminous materials as per ASTM D 113 - IP 32 - DIN 52013**

**4 DM 150 CLASSIC - MANUAL INSTRUMENT (P/N 9418642)**

The DM 150 CLASSIC supplied complete with a set of 3 moulds and 3 surface plates for mould assembly as described in the standard. The speed can be adjusted and digitally displayed on the control panel from 1 to 149 mm/min by 0.1 step. Maximum elongation length is 1500 mm.



### Mechanical grease worker as per ASTM D 217

#### 5 GWM CLASSIC - AUTOMATED VERSION (P/N 9417582)

Machine with rate of 60 +/- 10 strokes per min with mini length of 67 mm. Equipped with presetting counter and digital display. Fitted with dial thermometer standardised at 25 °C. Standard brass plate perforated with 51 holes of ¼ inch diameter.

### Characteristics of oil content of petroleum waxes as per ASTM D 721 & D 3235 - ISO 2908 - IP 158 - DIN 51571

#### 6 OCW CLASSIC - MANUAL VERSION (P/N 941795)

Complete apparatus with cooling bath, 3 filter sticks, air pressure regulator and evaporation assembly, 4 weighing bottles and one thermometer.

### Rotating Cylinder Ageing Test: RCAT as per CEN ISO EN 15323

#### 7 NRC 210 (P/N 941878)

Standard tests such as RTFOT adequately and satisfactorily simulate ageing in construction. The standard test conditions adopted with RCAT are: 500 g of binder, over heated up to 85 °C, oxygen flow rate of 4.5 L per h, and a rotation speed of 1 rev./ min. At predetermined intervals, 25 to 30 g of binder is sampled for characterization tests.

### Effect of heat and air on a moving film of asphalt as per ASTM D 2872 (Rolling thin film oven test-RTFOT)

#### 8 RTFOT CLASSIC (P/N 941877)

Double walled convection oven, door with a viewing window, air plenum as described in ASTM D2872, electronic temperature regulator with digital display setting, and factory calibrated flowmeter. Equipped with air jet. Apparatus supplied with 8 glass containers and 1 thermometer ASTM 13C.

### Determination of particle polarity of bitumen emulsions as per ISO EN 1430 - ASTM in progress

#### 9 NEB 110 (P/N 941890)

The NEB 110 allows the determination of the sign of the electric charge carried by particles in ionic emulsions.

A direct or rectified current is passed through a bitumen emulsion between 2 parallel electrodes.



*i* Bitumen is a mixture of organic liquids that are highly viscous, black, sticky, entirely soluble in carbon disulfide, and composed primarily of highly condensed polycyclic aromatic hydrocarbons. Bitumen used in the Industry for construction, road and paving, roofing and waterproofing. Bitumen is basically a sticky, tar-like form of petroleum which is so thick and heavy that it must be heated or diluted before it will flow. Its composition is usually modified in a different way for every application. It is thus critical to characterize it in terms of viscosity, hardness, and evaluate its properties through ageing.

Waxes may be natural secretions of plants or animals, artificially produced by purification from natural petroleum or completely synthetic. Some artificial materials such as silicone wax that exhibit similar properties are also described as wax or waxy.



## Automatic viscometer washer for tubes ASTM D 445

### 1 VTW CLASSIC (P/N 18450)

Viscometer washer supplied with 6 nozzle stoppers. This apparatus allows external and internal washing of all current types of viscometer tubes. Viscometer tubes are suspended in solvent vapor at its boiling temperature.

## MANUAL INSTRUMENTS AVAILABLE

Saybolt as per ASTM D 88 (P/N 27238) - Engler as per ASTM D 1665 (P/N 27235) - Redwood as per IP 70 (P/N 27241)

### 2 SAYBOLT, ENGLER AND REDWOOD VISCOSITY

Each tester of this series includes an electric heating, automatic control of the temperature with digital display, stirring motor for water circulation. They do not determine absolute viscosity but an empirical flow test complying with the methods requirements.

## Manual viscosity bath as per ASTM D 445

### 3 NVB CLASSIC (P/N 23207)

Viscosity bath, conform ASTM D445, with a temperature range from ambient to +230 °C. Temperature stability is  $\pm 0.01$  K.

The bath volume is 40 liters and has a opening of 260 x 240 mm. There are 7 openings for holding viscometers. A cooling coil to work below ambient temperature is integrated. A bath drain is included.

*The viscosity of a lubricating oil can be considered as its most important physical property. It must be monitored and controlled carefully because of its impact on the oil and the oil's impact on equipment life and reliability. Basically, the viscosity can be defined as the property of a liquid characterizing its internal friction or resistivity to flow. Physics defines several types of viscosity and separate two families between Newtonian and non Newtonian fluids. There are mainly two related measures of fluid viscosity:*

- dynamic (or absolute) viscosity
- kinematic viscosity.

*The knowledge of viscosity is needed to adjust and define the required temperatures for storage, pumping or injection of fluids and is also critical to check if an oil can provide adequate lubrication.*

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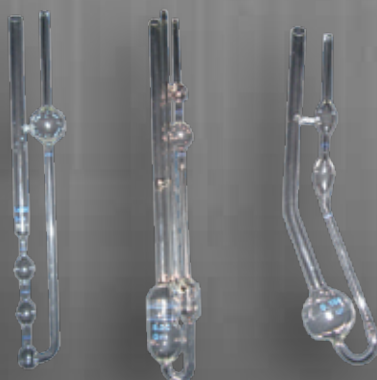
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