Flash-Point with Closed Cup - Abel Method - ABA 4 (automatic)

ISO 1516, ISO 1523, ISO 3679, ISO 3680, ISO 13736, DIN 51755-1, DIN 53213 (obs.), DIN 55680 (obs.), EN 456 (obs.), EN 924, IP 113 (obs.), IP 170, IP 304-1 (obs.), IP 304-2 (obs.), IP 491, IP 492, NF M07-011 (obs.), NF M07-036, NF T60-616 (obs.), NF T60-617 (obs.), NF T66-009, BS 3442-2 (obs.), BS 6664-3 (obs.), BS 6664-4 (obs.)

Product group(s): Flash Point

User group(s): Fuel, Paint, Solvent, Varnish

Scope:

The Abel-Method describes the determination of the closed-cup flash-point of petroleum products and other liquids having flash-points between -30 °C and +70 °C.

The Equilibrium-Method describes the determination of the closed-cup flash/no flash temperature of paints, varnishes, paint binders, solvents, adhesives, petroleum & related products between -30 °C and +110 °C.

The Abel-Pensky-Method describes the determination of the closed-cup flash-point of petroleum products and other combustible liquids having flash-points between -30 °C and +65 °C.

Extended Measuring Range
up to +110 °C for greater versatility. Allows users to go beyond the conventional scope of the Abel method.

Economical Standard Version
for the operating span +10 °C to +110 °C with fan-cooled Peltier elements. This avoids messy tubing on the laboratory bench and minimizes cooling water usage.

Low Temperature Version
for an operating span of -30 °C to +110 °C. Requires limited tap water (lowest achievable temperature -20 °C) or a small coolant circulator.

Barometric Pressure Correction
by a built-in pressure sensor to measure the pressure directly at the ABA 4.

User Definable Test Programs
to make customized test methods.

Equilibrium-Simulation Mode

Search Mode
saves time, when a flash-point of a sample to be tested is not known.

Rapid Heating Mode
for samples with a high flash-point. The sample is first heated with boosted power and then the heating rate is automatically reduced to the standardized rate when approaching the critical testing phase.

Compact Design
occupies a bench-top area of only 23 cm wide and 47 cm in depth. Effectively using the work bench depth and not wasting its valuable length. A serious consideration when the ABA 4 is placed in a fume hood.

Easy to operate:
Insert the filled test cup, complete with the lid and shutter assembly, plug-in the multi-detector and shift the multi-function-head - ONE TWIST into its test position.

All electrical connections and the coupling of the stirring motor are carried out automatically.

Pressing a key selects the suitable test method from a list of programmed standards or one of the self defined USER-programs.

Or simply recall one of the stored test runs from the program library.

Even better: ABACon software allows remote control of the ABA 4 and test data storage capability on a PC.

Two igniter systems: gas flame and electrical igniter are both included.

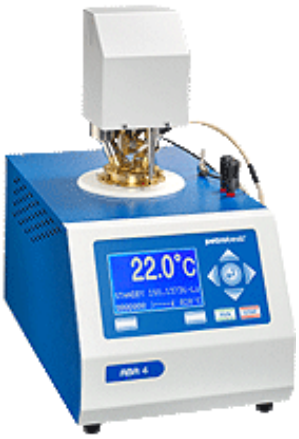
The performance of the electrical igniter is permanently checked, which results in better reproducibility and a longer life of the igniter. This control also signals when the igniter is to be changed, possibly due to excessive aging or damage.

If the gas flame is used, a sensor watches the ignition flame and causes an automatic relighting or stops the test, if this should not be possible.

Outside Flame Sensor for samples having no conventional flash-point (e.g. due to flame inhibiting components) but burn outside the test cup.

Probe Verification Program checks the proper function of the temperature probe and allows a bias adjustment, using a special accessory kit.

- **automatic Barometric Pressure Correction**
- **2 User Definable Test Programs**
- **Equilibrium-Simulation Mode**
- **Peltier element system (only for air cooled version)**
- **Rapid Heating Mode**
- **swivel-around Multi-Function-Head - ONE TWIST**
- **integrated Flame Sensor**
- **Software Windows compatible**



Flash-Point Abel Test Equipment

to be composed of:

- Flash-Point Tester - ABA 4 (air cooled or liquid cooled)
- Circulation Cooler
- Hose-Set

Technical Data

Temperature Range:	+10 to +110 °C (air cooled) -30 to +110 °C (liquid cooled)
Programs:	(according to international standards) 2x ISO-Standards 2x Rapid-Heating 2x Search Run 2x Equilibrium 2x Rapid-Test Simulation 2x User Defined (Abel-Pensky Meth. preset)
Ignition Type:	gas and electric (included)
Stirring Speed:	0 and 100 rpm (adjustable)
Sensing System:	differential-thermocouple
Barometric Pressure Sensor:	Automatic Barometric Pressure Correction
Safety:	overheat protection automatic shut-off
Hardware Clock:	Included
Interface:	RS232 for printer RS232 for computer download
Gas Connection:	for propane/butane or natural gas (max. 0.05 bar)
Display:	selection of °C or °F high x wide: 56 x 90 mm digit size: 25 mm
Dimensions:	Width 230 mm Depth 470 mm Height 460 mm Weight 8 kg, net
Power Consumption:	approx. 180 Watts
Power Supply:	230/115 V, 50/60 Hz (selectable)

Main Unit

12-0501 **ABA 4 - Automatic Flash-Point Tester**
Abel Method (air cooled)

Abel Method:
IP 170 (BS 3442-2) - ISO 13 736 (NF M07-011)

Abel Bitumen Method:
NF T66-009 (IP 113)

with further accessories for:
Rapid Equilibrium-Simulation:
ISO 3679 (BS 6664-4, EN 456, NF T60-616) -
ISO 3680 (BS 6664-3, DIN 55 680, NF T60-617)

Abel-Pensky Method:
DIN 51 755-1 - NF M07-036 (DIN 53 213)

Consisting of:
high-grade stainless steel housing with two-color powder coating, touch-key panel with large LC-display (visible in up to 10 m distance), swivel-mounted Multi-Function-Head - ONE-TWIST, stirrer drive, two RS232-interfaces for data printer and computer connection, different test-programs, data-transfer and software upgrading through bi-directional interface, Peltier element system, automatic barometric pressure control (correction), automatic overheat protection, power controlled/monitored electric igniter, gas igniter with auto-relighting and safety shut-off, re-cooling fan

PC-Software "ABACon" (Windows®):
for easy handling and storing of data as well as transfer of program from the PC-Memory into the ABA 4. Easy to read tableau. Results can be stored in the memory. Numerous programs can easily be set, copied from the memory and modified. Permanent indication of test status. Due to the most comfortable properties of this software to display and modify actual and future test sequences, it is most recommendable for samples of permanently changing characteristics.

Supplied with:
1 cup "ABA"
1 cover "ABA"
1 multi-detector "ABA"
1 gas igniter
1 electric igniter
1 stopper
1 tong for cup
1 tray for cup and multi-detector
10 stirrer couplings
1 PC-software "ABACon"

Temperature Range: +10 to +110 °C (+50 to +230 °F)

Power supply: 115/230 V, 50/60 Hz, 180 W, EU-plug

12-0502 **ABA 4 - Automatic Flash-Point Tester, Abel Method (air cooled)**

Like 12-0501 but:
Power supply: 115/230 V, 50/60 Hz, US-plug

12-0503 **ABA 4 - Automatic Flash-Point Tester, Abel Method (liquid cooled)**

Abel Method:
ISO 13 736 (NF M07-011) - IP 170 (BS 3442-2)

Equilibrium Method:
ISO 1516 - ISO 1523 - EN 924 - IP 491 - (IP 304-2) -
IP 492 (IP 304-1)

with further accessories for:
Abel-Pensky Method:
DIN 51 755-1 - NF M07-036 (DIN 53 213)

Consisting of:
see 12-0501 (air cooled), but with cooler connections for external liquid cooling.

Software (Windows®): see 12-0501 (air cooled)

Supplied with: see 12-0501 (air cooled)

Note: Circulation cooler (e.g. 25-0382) is required.

Temperature Range: -30 to +110 °C (-22 to +230 °F)

Power supply : 230 V, 50/60 Hz, EU-plug

12-0504 **ABA 4 - Automatic Flash-Point Tester, Abel Method (liquid cooled)**

Like 12-0503 but:
Power supply : 115 V, 60 Hz, US-plug

Options & Accessories

25-0382 **Circulation Cooler (for external cooling)**
with insulated hose

For cooling of instruments without circulation pump (e.g. Peltier-cooling).

Consisting of:
Cooler with tank, digital display, pump and liquid level indication.

Supplied with: 1 insulated hose-set (Ø 8 mm, 2x 2m)

Note: Insulated hose-set (25-0228) is recommended

Technical Data:
Working range: -20 to +40 °C (+5 to +32 °C at ambient temp.)
Display / Resolution: digital / 0.1 °C

Control: digital
Cooling capacity: 300 W at +15 °C
Pump-Pressure capacity: 12 l/min, 200 mbar
Pump-Suction capacity: 12 l/min, 100 mbar
Volume: 1.4 l
Sockets for: Pt-100
Dimensions / Weight: 23 x 36 x 38 cm (WxDxH), 23 kg
Power supply: 230 V, 50/60 Hz, 3.5 A, EU-plug

25-0228 **Hose-Set**
insulated (Ø 8 mm, 2 x 2 m, incl. fittings)

12-0518 **Insulating Hood as ice protection**

to protect the cover and shutter assembly from icing.
Recommended for low temperature flash-point tests,
made of Styrofoam®.

12-0520 **Calibration Set "ABA"**
Consisting of:
1 calibration cover,
1 thermometer IP 74C,
1 thermometer IP 2C

12-1762 **Calibration-Adapter for Pt-100 in multi-detector**

12-1508 **Draft Deflector (recommended for gas ignition tests)**

12-1509 **Stand to hold 12 multi-detectors**

12-1763 **Storage Box for spare parts and tools**

50-9023 **MTVM - Reference Liquid (Kerosene)**
with certificate (ISO 9001), 500 ml
range: approx. +35°C to +60°C

12-0571 **PC-Software "ABApro" (Windows®)**
to extend the "Con"-functions and allow the direct data export to Excel® (not included).

Further possibilities:
the connection of up to 4 units on 1 PC.

Note: For each unit a separate "Pro"-software is to be ordered.

25-0282 **Serial Printer**

with tractor for continuous paper to record data like test results, duration of test, etc.

Supplied with: 1 data transmission cable

Technical Data:
Line spacing: 80 characters per line on 24 cm wide paper
Dimensions: 34 x 29 x 15 cm (WxDxH)
Weight: 4.5 kg
Power supply: 220/240 V, 50/60 Hz

12-1514 **Rapidflash Simulation Set**

Consisting of:
1 rapidflash cup, 1 rapidflash cover, 1 stopper, 1 syringe and
1 multi-detector

Note! Flash-point results of rapidflash simulation may deviate from standard results.

12-1515 **Rapidflash Cup**

12-1516 **Rapidflash Cover, with shuttler assembly**

12-1518 **Syringe for sample introduction, 10 ml**

12-0577 **Multi-Detector "pAB/pTA"**
for milli-tests or rapidflash-tests, with flash-point detector and temperature probe

12-0574	**Milli Cover "pAB" with shutter assembly** Note! Flash-point results of milli test inserts may deviate from standard results.
12-0575	**Milli Cup "pAB"** for sample quantity between 2 ... 15 ml, ideal 7 ml
12-0577	**Multi-Detector "pAB/pTA"** for milli-tests or rapidflash-tests, with flash-point detector and temperature probe

12-1512	**Cover "Abel-Pensky" for older AP standards** with shutter assembly for standard cup "ABA" (without stirrer)
12-0510	**Standard Test Insert "ABA" (incl. in ABA 4)** Consisting of: 1 cup and 1 cover, 1 multi-detector

Spare Parts

12-0511	**Standard Cup "ABA", 79 ml**
12-0512	**Standard Cover "ABA" with shutter assembly**
12-0513	**Standard Multi-Detector "ABA"** with flash-point detector (thermocouple) and temperature probe

12-0778	**Electric Igniter with connector cable and plugs**
12-0509	**Gas Igniter with 25 cm hose**
12-0514	**Safety Detector** to control gas igniter and external inflammation
12-0600	**Tray for cup and multi-detector** Note! Available as an option for all units built before 05/2004.
12-0790	**Tong for safe handling of hot handleless test cups**
12-1507	**Stirrer Couplings , pack of 10**
12-0791	**Stopper, brass (Ø 18 mm)** to close the thermometer or multi-detector opening of the cover before use

Order Guideline

Minimum equipment:	1x 12-0501 or 1x 12-0503, 1x 25-0382, 1x 25-0228
Spares (approx. 1 year):	1 each: 12-0778, 12-0513, 12-1507
Additional requirements:	gas supply, PC recommended