

petrotest®



RING & BALL TESTER

RKA 5



- Pmove™ Operation
- Large Color-Display
- Transparent Draft Deflector
- Attachable Keyboard
- Barcode-Scanner
- USB Interface

MANUFACTURER SINCE 1873

WWW.PETROTEST.COM



Scope of Application

To determine the temperature at which a substance attains a particular degree of softness.

Suitable for bitumen & bituminous binders, filler aggregates used in bituminous mixtures, binders for paints and varnishes and resins derived from naval stores.

Summary of Method

Two horizontal disks of a sample (cast in shouldered rings) are heated at a controlled rate in a liquid bath (up to 80°C in distilled water or silicone oil, above +80°C in glycerin or silicone oil) while each supports a steel ball.

The **softening-point** is reported as the mean of the temperatures at which the two disks soften enough to allow each ball to fall a distance of 25 mm.

Softening-Point - Ring & Ball Method - RKA 5 (automatic)

Bitumen and bituminous binders:

ASTM D 36 - AASHTO T 53

EN 1427 (DIN 52 011, NF T66-008)

IP 58

JIS K2207

Filler aggregates in bituminous mixtures:

EN 13179-1

Wilhelmi-Option:

DIN 1996-15

EN 1871-F

Resins:

ASTM E 28

Paints & Varnishes:

ISO 4625-1

BS 6782-6

Thermoplastic Adhesives:

EN 1238 (NF T76-106)



Petrotest® Ball Dispense & Centering Device (10-0840)
(convenient Petrotest® setup, included in standard delivery)



Standard Ball Centering Device (10-0841 & 2x 10-0052)
(a standard setup with centering guides, substitutional for 10-0840)

The **RKA 5** instrument features a microprocessor technology combined with a smart **jog-wheel** operation system. It maintains program sequences for all relevant test standards and bath liquids as well as for user defined test conditions.

An infrared radiator along with a controlled magnetic stirrer ensure the **optimum test conditions**, the four-wire Pt-100 and the laser-based ball detection probe guarantee **precise test results**.

A **draft deflector** stabilizes ambient and homogeneous heating conditions, the lifting traverse simplifies setup and handling of the test rack.

An optional automatical system leads and dispenses the balls to the specimens.

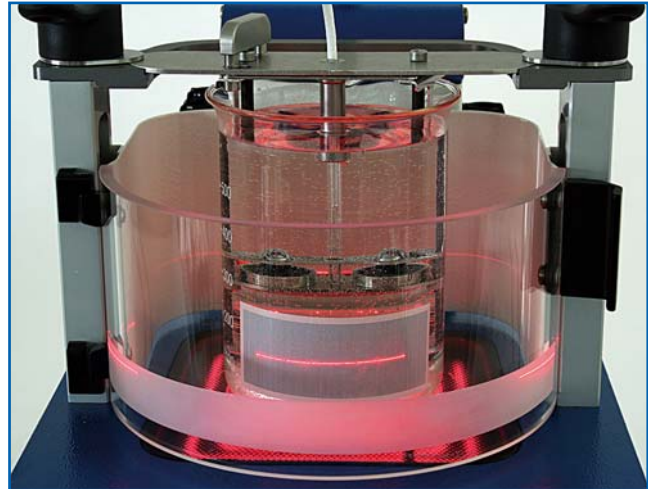
The test procedure is supported by intelligent software routines, at the end an **automated test assessment** is done.

Heat gradients are precisely recorded and are available as printouts. Test results can be stored in the instrument and / or transferred via **USB**.

Keyboard or barcode scanner options are available as input support.



Dispensed Balls



Laser-Scanner

Main Units

RKA 5 - Automatic Softening-Point Tester Ring and Ball Method

ASTM D 36 - AASHTO T 53 - EN 1427 (DIN 52 011, NF T66-008) - IP 58 - JIS K2207
EN 13 179-1

(With optional accessories for: EN-1871-F (DIN 1996-15) or referee tests acc. IP & NF)
Further for resins (ASTM E 28), paints and varnishes (ISO 4625-1 - BS 6782-6) and
thermoplastic adhesives (EN 1238 (NF T76-106))

Features:

- Pmove® - innovative operation platform
- large color display - visible from 10 m (30 ft.)
- easy Firmware-upload via USB
- compact ball detection system
- Ready-to-Go unit for two simultaneous tests

Consisting of:

CPU:

Up-to-date dual OMAP controller technology featuring a real-time DSP and a multimedia coprocessor, 4.7" full graphical color display, graphical menu guidance and intuitive user concept (Pmove®), help key (explanation of important device/ program features), Jog-Wheel operation (turn & push), large-area device status indicator (light ring), zooming temperature reading, device & data management via LAN, USB or RS232, extended statistical and database functionality, automatic assessment of results according to individual standards, printout on heat gradient conformity.

Electronic device features:

Automatic self check of sensors and system, multipoint calibration of temperature sensor (Pt-100), compact ball sensing system consisting of a precise 3D-adjustable laser scanner.

Mechanical device features:

Infrared radiator technology with temperature control, CERAN heat plate, standardized beaker with barcode imprint, test rack with slide bearing and single-hand fixation, Pt-100 gold plated four-wire system (also available with calibration certificate), test rings, load balls, centering guides, stirring wheel, holding tong, mechanical ball centering system, software controlled stirrer system, transparent draft deflector.

Supplied with:

- 10 rings (shouldered),
- 10 load balls, 1 gauge ball,
- 1 test rack with **mechanical ball centering unit** (standard type upon request),
- 1 glass-beaker bath (600ml) with barcode, 1 tongs (aluminum),
- 1 temperature probe (Pt-100) and 1 test tube (as Pt-100 tray),
- 1 magnetic stirrer (ring shape),
- 1 pouring plate (brass)

Note:

Accessories like electromagnetic ball & centering unit, external USB-keyboard, barcode scanner, printer (USB, serial), memory stick, bath liquid and optional test accessories are not included.

Technical Data:

- Test places : 2 (for simultaneous tests)
- Housing : stainless steel, two colored powder coating
- Interface : 1 serial RS232, 3 USB, 1 LAN (LIMS)
- Dimensions : 230 x 470 x 460 cm (WxDxH), Weight: 10 kg
- Power supply : 230 V, 50/60 Hz, EU-plug
- Power supply : 115 V, 50/60 Hz, US-plug

10-0800
10-0801



Selection of Program



Selection of Standard



Display of Results



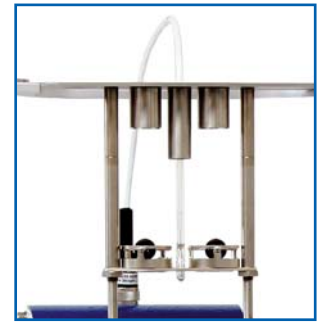
Options



RKA & 10-0851 & 25-0910 & 25-0920



Electromagnetic Ball Dispense
(comfortable Petrotest® setup)



Manual Standard Ball Dispense
(standard setup with centering guides)



Mechanical Petrotest® Ball Dispense
(very convenient Petrotest® setup)

Accessories



25-0930

- 25-0910 **Keyboard**, USB, 86 keys, illuminated
- 25-0920 **Barcode-Scanner**, USB
- 25-0919 **Memory Stick**, 2 GB, USB 2.0 (verified for Petrotest®-units)

- Impact Printer** for single sheet & continuous paper, serial
- 25-0282 Power supply : 220/240 V, 50/60 Hz
- 25-0283 Power supply : 110/130 V, 50/60 Hz

- 25-0900 **Laser Printer** (Mono) for single sheet, USB
- Power supply : 220/240 V, 50/60 Hz

- 25-0930 **Receipt Impact Printer** (POS) for paper rolls, serial
- Power supply : 120/230 V, (AC converter output 7 V)

Bath Liquid,

- 50-9160 silicone oil M50, 1 kg, water clear, heat resistant up to approx. +200 °C
- 51-9151 glycerin, 99% pure, 1 kg

- 10-0070 **Mortar** with pestle (acc. ISO 4625, ASTM E 28)

Service Kit RKA 5

Consisting of 1 each: reference plug 20°C & 180°C, scanner & ball gauge, visor, USB-memory stick, SD card, scraper, plastic cleaner and tool set (8 mm combination wrench, crosstip & 8 mm hex ball screwdrivers)



Service Kit 10-0868

Spare Parts

- 10-0049 **Rings**, shouldered, nickel-plated brass, pack of 10 (acc. ASTM, ISO, EN, IP, NF)

- 10-0805 **Load Balls**, blackened steel (Ø 9.5 mm, 3.5 g), pack of 10

- 10-0079 **Pouring Plate**, brass, U-shape (50 x 75 mm) to fill the rings

- 10-0840 **Test Rack "RKA 5-Dispensing Device"** with mechanical Petrotest® ball centering & dispensing device

- 10-0856 **Glass Beaker** (600 ml) with barcode (as bath)

- 50-5227 **Magnetic Stirrer Ring** (Ø 57 mm)

- 50-5317 **Tongs** for beaker (aluminum)

- 10-0849 **Temperature Probe** Pt-100

- 17-0158 **Test Tube**, borosilicate glass (to hold the ball dispenser or Pt-100)

- 10-0888 **Gauge-Ball RKA 5** for light barrier adjustment



50-5317



Test Rack with:
mechanical Petrotest® ball centering & dispense device (10-0840 and accessories)



Test Rack for use with:
- standard ball centering guides (10-0841, 2x 10-0052)
- in combination with electromagnetic ball dispensers & guides (10-0851)



10-0860
10-0864
Modified Test Rack with accessories similar to Wilhelmi Method (10-0860 & 10-0864)



10-0888

“Mechanical Ball Centering & Dispense Device” (included in the standard delivery)

10-0840 Test Rack “RKA 5-Dispensing Device” with mechanical Petrotest® ball centering & dispensing device

10-0805 Accessories
Load Balls, blackened steel (Ø 9.5 mm, 3.5 g), pack of 10

“Manual Ball Dispense” Option (to be ordered as replacement for the incl. 10-0840)

10-0841 Test Rack “RKA 5-Centering Guide” to be used with 2 ball centering guides

10-0049 Accessories
Rings, shouldered, nickel-plated brass, pack of 10

10-0052 Ball Centering Guide for shouldered rings

10-0805 Load Balls, blackened steel (Ø 9.5 mm, 3.5 g), pack of 10



10-0856 (& stirrer ring)

“Electromagnetic Ball Dispense” Option

10-0851 Test Rack Kit RKA 5 “Electromagnetic” for electromagnetic ball dispensing
Consisting of:
1 test rack for centering guides
2 electromagnetic ball dispensers
2 test tubes, as ball dispenser holder
2 ball centering guides

10-0052 Spare Parts
Ball Centering Guide
10-0841 Test Rack “RKA 5-Centering Guide” to be used with 2 ball centering guides & 2 ball dispensers
10-0850 Ball Dispenser, electromagnetic
17-0158 Test Tube, borosilicate glass (to hold the ball dispenser or Pt-100)



10-0052 & 10-0049

“Wilhelmi-Method” Option (for manual or automatic ball detection)

10-0860 Test Rack Kit RKA 5 “Wilhelmi - manual detection” (EN 1871 / DIN 1996-15) used for Mastix determination
Consisting of:
1 test rack
1 ring with bayonet lock
10 load balls (Ø 15 mm, 13.9 g)
1 magnetic ball dispenser
1 temperature probe Pt-100,
1 glass beaker (1000 ml)
1 pouring plate (50 x 75 mm)
1 Allen key (2 mm)

10-0075 Spare Parts
Ring (Wilhelmi) with bayonet lock
10-0877 Load Balls (Wilhelmi), blackened steel (Ø 15 mm, 13.9 g), pack of 10
10-0906 Glass Beaker (Wilhelmi) (1000 ml) with barcode (as bath)
10-0846 Temperature Probe (Wilhelmi) Pt-100 (fits 10-0860 only)
10-0865 Ball Dispenser (Wilhelmi), magnetic
17-0237 Allen Key (2 mm)



10-0079 & Rings

10-0864 Test Rack Extension RKA 5 “Wilhelmi - automatic detection” (similar to EN 1871 / DIN 1996-15) requires Test Kit 10-0860
Consisting of:
1 rod (50 mm)
1 bottom plate, perforated
2 distance pieces (25 mm)

10-0861 Test Rack “RKA 5-Wilhelmi” for manual ball detection



Load Balls
(for RKA5 instruments only)
(10-0805 & 10-0877)

Option “former referee tests acc. IP 58 & NF T66-008”

10-0048 Rings, tapered (former IP & NF), pack of 10

10-0051 Ball Centering Guide for tapered rings (former IP & NF)



10-0051 & 10-0048



Scope of Application

To determine the temperature at which a substance attains a particular degree of softness.

Suitable for bitumen & bituminous binders, filler aggregates used in bituminous mixtures, binders for paints and varnishes and resins derived from naval stores.

Summary of Method

Two horizontal disks of a sample (cast in shouldered rings) are heated at a controlled rate in a liquid bath (up to +80 °C in distilled water or silicone oil, above +80 °C in glycerin or silicone oil) while each supports a steel ball.

The **softening-point** is reported as the mean of the temperatures at which the two disks soften enough to allow each ball to fall a distance of 25 mm.

Softening-Point - Ring & Ball Method (manual)

Bitumen and bituminous binders:
ASTM D 36 - AASHTO T 53
EN 1427 (DIN 52 011, NF T66-008) - IP 58
JIS K2207

Filler aggregates in bituminous mixtures:
EN 13179-1

(Wilhelmi-Option: see next page)

Main Units

Manual Softening-Point Tester, Ring & Ball Method

ASTM D 36 - AASHTO T 53 - EN 1427 (DIN 52 011, NF T66-008) - IP 58 - JIS K2207
EN 13 179-1 (with optional accessories for referee tests acc. IP & NF)
Further for resins (ASTM E 28), paints and varnishes (ISO 4625-1 - BS 6782-6)

Features:

- 2 simultaneous tests
- electric heating
- electric stirrer

Consisting of:

electric heater (800 W) in stainless steel housing with electronic power regulator, 4 heater rods, electric stirrer and support for two test rings

Supplied with:

- 10 shouldered rings,
- 10 load balls,
- 2 ball centering guides,
- 2 thermometers (precision made, 1 x ASTM 15C, 1 x ASTM 16C),
- 1 glass beaker (600 ml),
- 1 heater support board (bored, 50 mm / 2"),
- 1 pouring plate (brass),
- 1 mortar with pestle

Technical Data:

- Test places : 2
- Working range : approx. +25 to +200 °C
- Dimensions / Weight : 16 x 18.5 x 20.5 cm (W x D x H), 3 kg
- 10-0281 Power supply : 230 V, 50/60 Hz, 800 W, EU-plug
- 10-0284 Power supply : 115 V, 50/60 Hz, 800 W, US-plug



10-0281

Options & Accessories

- 50-5315 **Tongs** for beaker
 - 50-9167 **Bath Liquid**, silicone oil, water clear, 1 kg, water clear, heat resistant up to approx. +250 °C, viscosity at +25 °C: 190 till 210 mPa-s
- For former referee tests acc. IP 58 & NF T66-008:
- 10-0048 **Rings**, tapered (former IP & NF), pack of 10
 - 10-0051 **Ball Centering Guide** for tapered rings (former IP & NF)

Thermometers

Precision Made	Officially Certified	Type		Range
		ASTM	IP	
10-0061	10-0062	15C	60C	-2 to +80 : 0.2 °C
10-0063	10-0064	15F	-	+30 to +180 : 0.5 °F
10-0065	10-0066	16C	61C	+30 to +200 : 0.5 °C
10-0067	10-0068	16F	-	+85 to +392 : 1.0 °F



Ring & Ball Accessories



50-5315

Spare Parts

- 10-0052 **Ball Centering Guide** for shouldered rings
- 10-0055 **Load Balls**, steel (Ø 9.5 mm, 3.5 g), pack of 10
- 10-0049 **Rings**, shouldered, nickel-plated brass, pack of 10 (acc. ASTM, ISO, EN, IP, NF)
- 10-0455 **Ring-Holder Assembly** for 2 rings
- 10-0056 **Glass Beaker** (600 ml) as bath
- 10-0070 **Mortar** with pestle (ISO 4625, ASTM E 28)
- 10-0079 **Plate**, brass, U-shape (50 x 75 mm) as pouring plate to fill the rings
- 11-0138 **Support Board** for heater, glass ceramics, (150 x 150 x 4 mm), with center hole (Ø 50 mm / 2")
- 11-0018 **Heater Rod**, 200 W, 115-230 V
- Heating Element** (4 heater rods)
 - 11-0019 ... 230 V, 50/60 Hz, 800 W
 - 11-0029 ... 115 V, 50/60 Hz, 800 W
- Control Module "M2"** to regulate the heating power
 - 25-0004 ... 230 V, 50/60 Hz
 - 25-0009 ... 115 V, 50/60 Hz
- Electric Stirrer** with propeller blade
 - 25-0042 ... 230 V, 50/60 Hz, EU-plug
 - 25-0043 ... 115 V, 50/60 Hz, US-plug



Softening-Point - Wilhelmi Method (manual)

Bituminous materials: **DIN 1996-15**

Thermoplastic materials: **EN 1871-F**

Main Unit

Manual Softening-Point Tester, Wilhelmi Method

Features:

- single test place
- electric heating
- electronic power regulator

Consisting of:

electric heater (800 W) in stainless steel housing with electronic power regulator "M2", 4 heater rods, laboratory stand (1 bar, 1 special clamp, 1 ring support)

Supplied with:

- 1 Wilhelmi ring,
- 10 load balls
- 2 thermometers (precision made, 1 x ASTM 15C, 1 x ASTM 16C),
- 1 glass beaker (1000 ml),
- 1 heater support board (bored, 50 mm / 2"),
- 1 pouring plate (glass)

Technical Data:

Test place : 1
 Working range : approx. +25 to +200 °C
 Dimensions / Weight : 16 x 18.5 x 20.5 cm (W x D x H), 3 kg
 Power supply : 230 V, 50/60 Hz, 800 W, EU-plug

10-0071

Options & Accessories

50-5315 **Tongs** for beaker

50-9167 **Bath Liquid**, silicone oil, water clear, 1 kg, heat resistant up to approx. +250 °C, viscosity at +25 °C: 190 till 210 mPa·s

For automatic tests see Ring & Ball-Apparatus RKA 5:

10-0800 **RKA 5** - Automatic Softening-Point Tester, Ring & Ball Method

10-0860 **Test Rack Kit RKA 5** "acc. Wilhelmi"

Thermometers

Precision Made	Officially Certified	Type		Range
		ASTM	IP	
10-0061	10-0062	15C	60C	-2 to +80 : 0.2 °C
10-0063	10-0064	15F	-	+30 to +180 : 0.5 °F
10-0065	10-0066	16C	61C	+30 to +200 : 0.5 °C
10-0067	10-0068	16F	-	+85 to +392 : 1.0 °F

Spare Parts

- 10-0077 **Load Balls** (Wilhelmi), steel (Ø 15 mm, 13.9 g), pack of 10
- 10-0075 **Rings** (Wilhelmi) with bayonet lock
- 10-0076 **Ring-Holder** (Wilhelmi)
- 10-0106 **Glass Beaker** with spout (1000 ml) low shape, as bath
- 10-0057 **Plate**, glass (120 x 120 x 6 mm) as pouring plate to fill the rings

- 11-0138 **Support Board** for heater, glass ceramics, (150 x 150 x 4 mm) with center hole (Ø 50 mm / 2")
- 11-0018 **Heater Rod**, 200 W, 115-230 V
- 11-0019 **Heating Element** (4 heater rods) ... 230 V, 50/60 Hz, 800 W
- 25-0004 **Control Module "M2"** to regulate to heating power ... 230 V, 50/60 Hz

Scope of Application

To determine the temperature at which a hot casting substance used in road construction attains a particular degree of softness.

Suitable for joint sealing compounds in road construction and thermoplastic materials for pavement marking.

Summary of Method

A horizontal disk of a sample casted in a ring supports a steel ball and is heated at a controlled rate in a liquid bath (up to +80°C in distilled water or silicone oil, above +80°C in glycerin or silicone oil).

The **softening-point** is reported as the temperature at which the softening disk experiences a plastic deformation.



10-0071



Wilhelmi Ring (10-0075)



Load Balls
(for manual instruments only)
(10-0057 & 10-0077)

MANUFACTURER OF PETROLEUM TEST EQUIPMENT SINCE 1873



PETROTEST BUILDING



DEVELOPMENT

ISO 9001
CERTIFIED
PROCESSES...

...ALL UNDER
ONE ROOF!



PRODUCTION



QUALITY CONTROL



TRAINING



STORAGE

Presented by:

We reserve the right of changes without prior notice.

petrotest®

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