

BITUMEN TESTING EQUIPMENT

ALWAYS
2 STEPS
AHEAD!





Bitumen Testing Devices according technical standards for Asphalt Roads

The requirements of European and national standards are providing a safe basis for the production and the use of bitumen products.

For technical classification and evaluation of the different bitumen types are essential testing methods in use, which determine the consistency and viscosity of bitumen in relation to the temperatures.

To maintain exact and correct test results, it is important to guarantee stable test parameters and a correct sample preparation.

Indication of source: webpage Arbit, September 2016

This goal can only be achieved if the testing machine is operated with high precision and repeatability.



Precise & repeatable



Not precise & not repeatable



Precise & not repeatable



Not precise & repeatable

We recommend regular calibrations for all testing machines in order to guarantee consistently reliable and exact results.

Loss-on Heating Oven TFOT

EN 12607-2 for the determination of loss on heating of bitumen under temperature.

The unit consists of a drying cabinet with glass door with electrical control to maintain a constant internal temperature of 163°C. In the interior there is a motor-driven platform with 5-6 1/min. for holding 3 test pans Ø 140mm or 9 test pans at Ø55 mm.

Technical Data

Dimensions	850 x 730 x 620 mm
Weight	53 kg
Electrical data	230 V, 50/60 Hz, 2,5 kW
Volume	53 l

20-25700



Testing Cup Ø 140 x 9,5 mm

20-2575

Pressure Ageing Vessel PAV

EN 14769, AASHTO R28, ASTM D6521 for long term ageing of bitumen and for the simulation of asphalt mixture ageing after 5 to 10 years.

Consisting of the pressure vessel with connection elements, pressure / temperature sensors, thermostat-controlled heating device as well as PC with touch screen and 10 test cups. A compressed air source >21 bar or compressor 20-44950 must be provided.

Technical Data

Dimensions	470 x 520 x 560 mm
Weight	58 kg
Electrical data	230 V, 50/60 Hz, 0,6kW
Working pressure	21 bar - max. 25 bar

20-44000



Advantages:

- ▶ Compact design
- ▶ Up to 10 free programmable test sequences can be saved
- ▶ Graphical user interface
- ▶ Representation of pressure and temperature in real-time
- ▶ PC with touch screen
- ▶ Menu-driven user control

ACCESSOIRES

Compressor for PAV

Complete with pressure container and frame.



Technical Data

Dimensions	583 x 309 x 337 mm
Weight	16,2 kg
Electrical data	230 V, 50 Hz, 1,5 kW
Air supply	97 l/min bei 5 bar
Maximum pressure	34 bar
adjusted	>21 bar
Number of cylinders	2
Tank volume	8,6 l
Noise	70 dBA

20-44950

Soundproof cabin for PAV compressor

20-44952

Testing Cup for PAV

EN 12607-2 - EN 14770
Ø 140 x 9,5 mm



20-2575

Bending Beam Rheometer (BBR)

DIN EN 14771, NF T66-062, ASTM D 6648, AASHTO T313, PNST 79-2016, GOST 58400.8-2019.

to determine the flexural creep stiffness of bitumen at low temperatures.

Among other things, the deflection is determined to evaluate the behaviour of bituminous binders and similar products at low temperatures. With a resolution of 1 µm, the deflection of the specimen is measured. The test force is controlled with an accuracy of $< \pm 5$ mN.

Automatic, software-controlled operation and standardised evaluation and presentation of the findings.

Technical data

Dimensions	650 x 600 x 1500 mm
Width including PC on bracket	1200 mm
Weight	80 kg without accessories
Weight thermostat	60 kg
Total weight	140 kg
Electrical data	230/240 V, 50/60 Hz, 2 kW
Test bath approx.	11 l
Temperature range	-40... + 20 °C
Temperature resolution	$\pm 0,1$ K
Linear-electromagnetic loading unit	max. lift 10 mm max. force 2000 mNw
Incremental transducer resolution	1 µm
Load cell accuracy class	0,1
Force control accuracy	$< \pm 5$ mN
Force range	0... 1500 mN
Bath liquid (recommended)	Silicone Oil (Fragol Therm X-T12)
Compressed air	min. 5 bar

20-44220



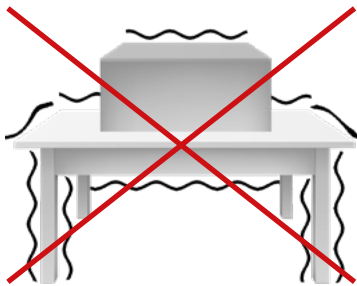


TOUCH PANEL

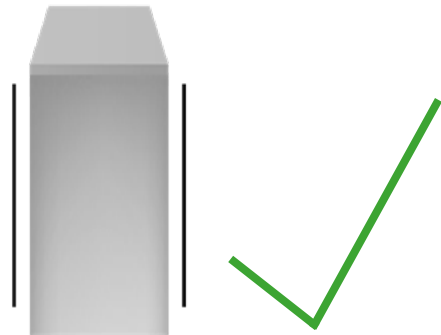
Easy and fast control via the well arranged display.

Advantages:

- ▶ Integrated programmable software controls and records measured data
- ▶ Compact tempering unit with heater and chiller
- ▶ Free selectable test temperatures up to -40°C
- ▶ Test bath with overflow for constant fluid level
- ▶ Customer layout
- ▶ All Test Data available as csv-file
- ▶ Stand alone device to avoid the transition of vibrations



TABLETOP DEVICE

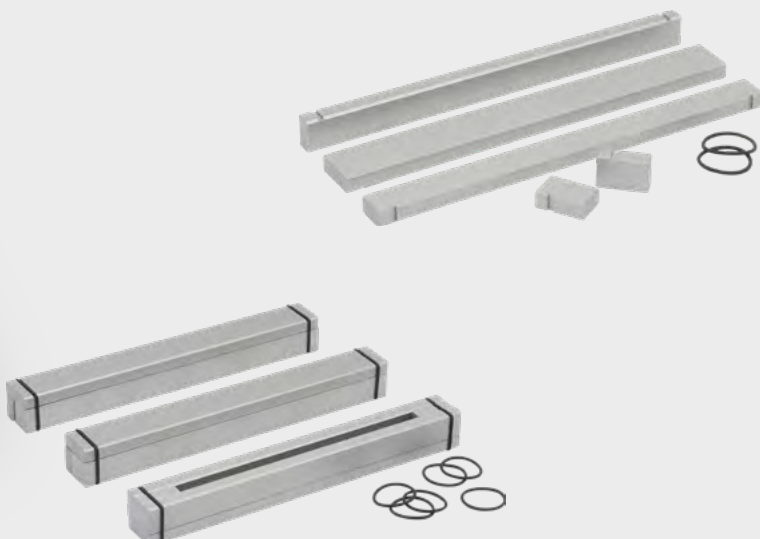


STAND ALONE UNIT

ACCESSOIRES

Set of 3 BBR Beam Moulds

20-44230



Ductilometer 1500 mm digital

EN 13398 - EN 13589 - EN 13703 - ASTM D113 - AASHTO T 51 - GOST 11505-75 for the determination of load ductility and elastic recovery of bitumen.

Stainless steel housing with an insulated water bath, hinged lid with glass cut-out as well as stepper motor-driven traction device with constant feed speed and digital displacement measuring device. The included software allows user-oriented sequence programming and controls the test sequence with an online output of force and displacement and test evaluation with a calculation of planimetry.

- ▶ Simultaneous testing of up to four samples
- ▶ Electronic version for PC operation with software under Windows 10 and higher
- ▶ To determine the force ductility, one measuring point is equipped with a force transducer 500 N, resolution 0.1 N (special version 100 N, resolution 0.01 N). Three additional force transducers can be retrofitted
- ▶ Storage of the tests in a database in dBase format

(A PC with screen and keyboard is required for operation. Without moulds, without bath temperature control unit and without PC).

Technical data

Dimensions	2300x500x380 mm
Weight	95 kg
Electrical data	230 V, 50/60 Hz, 0,5 kW
Feed rate	1 bis 50 mm/min.

20-2356

Advantages:

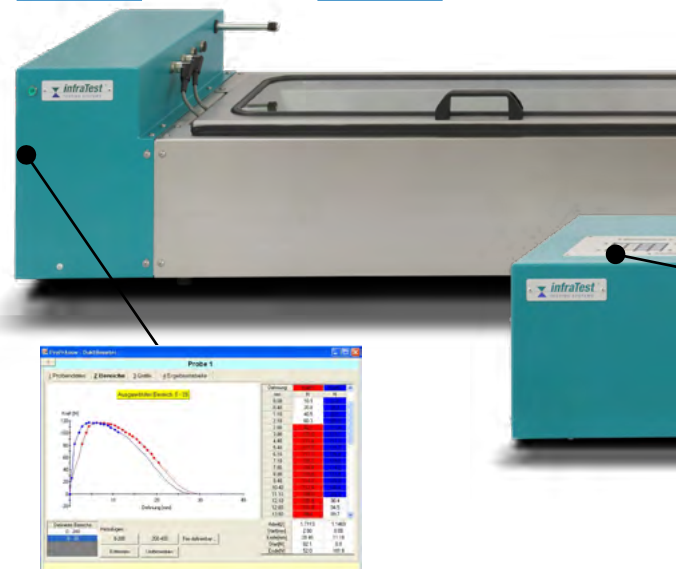
- ▶ Display of the test graph and current test data in real time
- ▶ Automatic test execution with windows based software
- ▶ Quick calibration option
- ▶ Up to 4 measuring stations that can be equipped
- ▶ Test protocol

Ductilometer 1000 mm digital

20-2346

Ductilometer 400 mm digital

20-2336



ACCESSOIRES



Load Cell

resolution 0.1 N (optional 100 x 0.01 N) additionally installed in 20-2336/46/56.

20-2357 500 N

20-2358 100 N



Ductilometer Water Bath Heating Thermostat

ready installed in the water bath of 20-2331... with circulation pump for tests above ambient temperature up to +95°C of together with 20-2377 from +5 up to +95°C. Digital version with over temperature limiter. 230 V, 50/60 Hz.

20-2370

Temperature Sensor

for ductilometer bath of 20-2336/46/56. Two sensors, one of which is installed inside the water bath and one more fixed to the movable crosshead.

20-2359

Advantages:

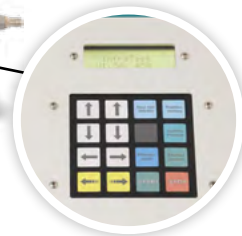
- ▶ Self-explanatory display
- ▶ Userfriendly operation
- ▶ Short-term memory for current measurements
- ▶ Up to 4 test results measurable

**Ductilometer
1000 mm**

20-2341

**Ductilometer
400 mm**

20-2331

**Ductilometer 1500 mm**

EN 13398 - ASTM D113 - AASHTO T 51 for the determination of ductility of bitumen.

Stainless steel housing with an insulated water bath and stepper motor-driven pulling device with constant feed speed and digital displacement measuring device. Thermometers are installed in the water bath to check the bath temperature.

- ▶ Simultaneous testing of up to four samples
- ▶ Complete with an integrated operating unit on the left side of the unit
- ▶ With additional test option elastic reset

(Without moulds, without bath temperature control unit and without hinged lid for the bath)

Technical data

Dimensions	2400x500x380 mm
Weight	100 kg
Electrical data	90-260 V, 50/60 Hz, 0,5 kW
Feed rate	1 bis 50 mm/min.

20-2351

Brass Ductility Mould

(complete with stainless steel base plate).

20-2361 EN 13398

20-2362 EN 13589 (10 x 10 mm)

**Brass Ductility
Mould**

ASTM D113 + AASHTO T 51

20-2360

**Brass Ductility
Mould**

ASTM D 6084-04

20-2364

**Cooling unit to
Ductilometer 400 /
1000 / 1500 mm**

for 20-2331 to 20-2356 suitable for tests from +5° up to +95°C together with 20-2370.

Technical Data

Dimension	230 x 580 x 380 mm
Weight	18.0 kg
Electrical data	230V, 50Hz

Complete with all connecting parts. 20-2370 additionally required!

20-2377



Kinexus DSR-III Rheometer Plattform inkl. rSpace Software

EN 14770 - EN 13702 - EN 13302 - AASHTO TP 70 - AASHTO T 315 - ASTM D 7175 - ASTM D 7405 - ASTM D 4402

The Kinexus DSR-III from NETZSCH Analyzing & Testing is an entry-level rheometer for tasks in quality assurance with a unique concept for parameterization, implementation and evaluation of rheological measurements. The following standard measurements include possible with the Kinexus DSR-III:

- ▶ Temperature sweep (T-sweep)
- ▶ Multiple Stress Creep and Recovery Test (MSCRT)
- ▶ Rapid bitumen typing procedure (BTSV)
- ▶ Phase transition temperature of viscosity-modified binders (constant shear rate)

The results can be exported to other spreadsheet programs as a csv file. There is also an import function for existing measurement data.

Technical data

Dimensions	485 x 490 x 680 mm
Weight	47kg
Electrical data	230V, 50 Hz
Torque viscometry	100 nNm - 150 mNm
Torque oscillation	100 nNm - 150 mNm
Torque resolution	0,1 nNm
Moment of inertia drive unit	1,3e-5 kgm ²
Angular speed	10 nrad/s - 200 rad/s
Deformation jump	< 10 ms
Angular resolution	< 10 nrad
Oscillation frequency	1µHz bis 100 Hz
Normal force range	0.01 N bis 20 N
Normal force response time	< 10 ms
Vertical lift speed	0.1µm/s bis 20mm/s
Gap resolution	0,1 µm
Maximum data rate	5 kHz

20-44405



Advantages:

- ▶ Quick collision unit of the upper measuring plate enables quick and uncomplicated changing
- ▶ Sensitive spindle drive with air bearing
- ▶ User-friendly temperature control thanks to the cylinder Peltier temperature control
- ▶ Uncomplicated exchange of geometry and temperature control

More Rheometers

Kinexus DSR Rheometer Plattform inkl. rSpace Software

20-44401

Kinexus DSR+ Rheometer Plattform inkl. rSpace Software

20-44404

Kinexus DSR-III Rheometer Package-BTSV

20-44405B



Discover the Kinexus DSR NOW!

In a small trailer we show you how the Kinexus DSR works. Scan, watch and become a fan.



ACCESSOIRES

Upper Measureing plate

20-4456 Ø 4 mm

20-4454 Ø 8 mm

20-4452 Ø 25 mm

Lower Measureing plate

20-4457 Ø 4 mm

20-4455 Ø 8 mm

20-4453 Ø 25 mm

Rotational Viscometer High Performance DV2T

20-2480

Kinexus cylinder environmental controller

20-44410

Kinexus low temperature option

20-44411

DSR High temperature Standard-Cannon-Oil

20-44408

DSR Silicone filling mold set

20-44462 Ø 8 mm and Ø 25 mm

20-44461 Ø 25 mm

Automatic Digital Penetrometer

EN 1426 - ASTM D 5 - AASHTO T49 for determination of the needle penetration.

The penetration depth of the penetration needle is determined with an electronic position measuring system, which is decoupled from the plunger during the test. An influence on the load and friction is excluded, because of this an the free guidance of the plunger.

The run-up and touch down of the needle are carried out automatically via the measurement system. Manual joystick mode is also possible. Then the plunger is enabled by an automatic device and blocked again after the testing period. The test result is displayed on the graphical touch display. The plunger can easily be removed to calibrate its weight.

Technical data

Dimensions	280 x 490 x 760 mm
Weight	26 kg
Electrical data	100/240 V, 50/60 Hz, 0,6 kW
Measuring range	0-300 penetration units (equivalent to 0-30 mm)
Resolution	0,01 mm
Test load	100 g (plunger 97.5 g + 2.5 g penetration needle)
Test time	free (adjustable from 0,01 second)

20-20670



TOUCH PANEL

Easy and fast control via the well arranged display.

Advantages:

- ▶ High precision through automatic detection of the sample surface
- ▶ Manual and fully automatic operation possible
- ▶ Internal memory for up to 15,000 tests

More Penetrometers

Penetrometer

20-2050

Penetrometer with Timer Controller

20-2060

Digital Penetrometer

20-20665

ACCESSORIES

(penetration needle 20-20711, preheating bath ...) are also required to carry out the test.

Plunger Head 47,5 g

for the penetrometers 20-20665 and 20-20670 to take the penetration ball and cone.

20-20670E35

Penetration ball

EN 13880-3 with shaft 27,5 +/- 0,1 g, 3,2 mm dia. for the use with plunger head 47,5 g.

20-20810

Penetration Cone

EN 13880-2, ASTM D217, ASTM D937
27,5 +/- 0,1 g, 3,2 mm dia.

Not suitable for 20-20670.

20-20811

Penetration Water Bath 160 mm dia.

Stainless steel with integrated coil and two tube connection pieces for tempering with water.



20-2076

Perforated Base Plate

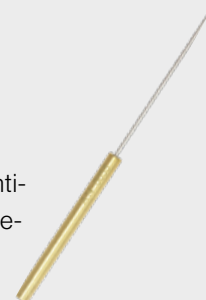
used in the penetration water bath to place the test container.



20-2078

Penetration Needle 2,5 g / 3,2 mm magnetic

EN 1426, ASTM D5, AASHTO T49-07 with magnetic head and engraved identification number. Suitable for penetrometers 20-20665 and 20-20670.



20-20711

Stainless Steel Penetration Container

20-2084 Ø 55 mm, h. 35 mm

20-2086 Ø 55 mm, h. 45 mm

20-2088 Ø 70 mm, h. 45 mm

20-2089 Ø 70 mm, h. 60 mm



Penetration Preheating Bath

Stainless steel with cover and immersion heater 25 .. 100 x 0,1° C for preheating of penetration test samples. Equipped with water circulation pump and attachment to connect to 20-2076. 230 V, 50/60 Hz.



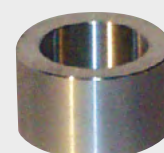
20-2090

Reducing Ring

Ø 53/36 to reduce sample quantity in penetration containers.

20-2092 20 mm

20-2093 30 mm



Automatic Ring and Ball Tester

EN 1427 - ASTM D36 - AASHTO T53 - GOST 11506-73
Determination of the Softening Point of Bitumen.

With glass-ceramic plate, halogen radiator for heating and magnetic stirrer with adjustable speed built-in underneath. Operation is via a touch panel. A microprocessor-controlled regulation with continuous temperature measurement in the beaker ensures a standard-compliant temperature rise of 5 K/min. The temperature rise can be monitored in real-time on the touch display. The passage of the balls is detected by a light barrier on the right and left and the respective temperature value is displayed digitally. At the same time, the difference between sample 1 and 2 is output. The test data is stored in an internal protocol and can be called up at any time in the unit or transferred via a USB interface.

Three test modes can be preselected, one for water from 30 to 80° C and one for glycerol from 80 to 150° C. In addition, we offer an optional test procedure for silicone oil from 80 to 200°C.

Complete with beaker 600 ml, stirring rod and insert frame with 2 test rings, test balls and 2 ball centring devices. The user languages are German, English and French.

Technical data

Dimensions	290 x 580 x 380 mm
Weight	17.0 kg
Electrical data	230 V, 50/60 Hz, 0,7 kW

20-22000

Advantages:

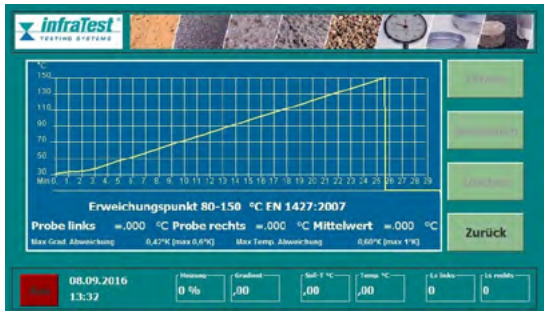
- ▶ Measuring of temperature rise in real time
- ▶ Innovative infrared heating system
- ▶ Cooling function for the beaker
- ▶ Up to 15,000 attempts can be saved
- ▶ Optional operation with silicone oil



TOUCH PANEL

Easy and fast control via the well arranged display.





Fan +
Storage position for the insert rack

ACCESSORIES

Ring and Ball Test Frame

to 20-22000

20-22150



Test Ring shouldered type

EN 1427 ASTM AASHTO

20-2125



Test Ball 9,5 mm dia

20-2135



Sample Cutter

with straight cutting edge
used for preparation of samples for ring and ball test.

20-2145



Glass Beaker 600 ml

low shape for ring and ball tests.

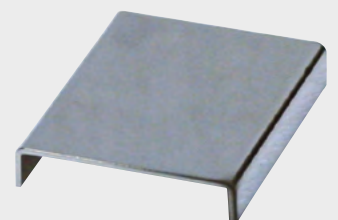
20-2150



Sample Plate

EN 1427. Made of galvanized brass.

20-21420



Rolling Thin Film Oven RTFOT

EN 12607-1 (RTFOT), ASTM D2872-12, AASHTO T47, T179 for the determination of temperature and air influence on bitumen.

Consisting of:

- ▶ Heating cabinet with a viewing window in the door and thermostatically controlled temperature regulation
- ▶ The rear inside wall is equipped with a vertical carriage, rotated by an electric motor at 15 1/min.
- ▶ Electric drive unit with holder for up to 8 glass test cups
- ▶ Nozzle for feeding the air onto the sample, with flow meter for regulating the air volume (airflow of 4000 ml/min.)
- ▶ Fan to circulate the air inside the chamber
- ▶ Control thermometer in the interior

The heating cabinet is preset to a test temperature of 163°C. The user is informed about the test procedure by optical and acoustic signals. The test procedure is automatic.

A source of compressed air or a compressor 20-25770 is required to carry out the test. The sample vials 20-2573 or 20-2574 are additionally required.

Technical data

Dimensions	850 x 730 x 620 mm
Weight	117 kg
Electrical data	230 V, 50 Hz, 2.5 kW

20-25720

ACCESSORIES

Glass Test Cup RTFOT



concave opening

20-2573

Glass Test Cup RTFOT



convex opening

20-2574

Compressed-Air Unit RTFOT



20-25770

RTFOT glass scraper



20-2576

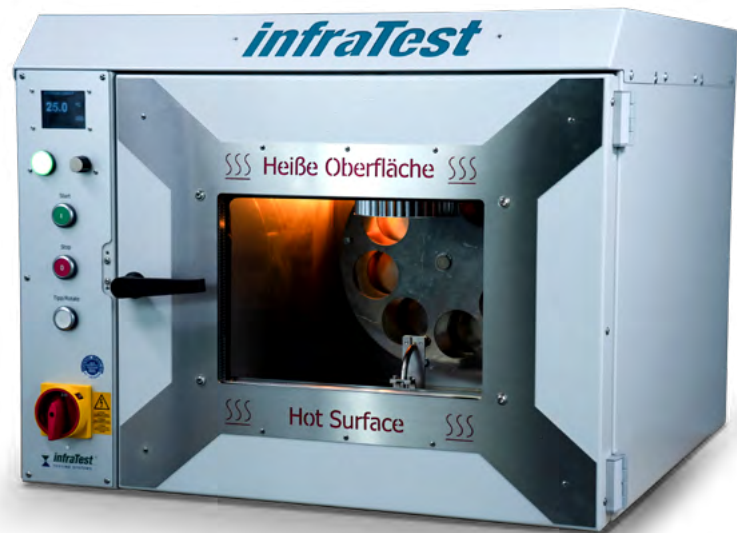
Beaker tong with insulated ceramic tips

300 mm

20-2578

Advantages:

- ▶ 4-line LC Display
- ▶ Customer-specific test sequence
- ▶ Standardized test procedure according to EN, ASTM and GOST
- ▶ Digital flow measurement
- ▶ Menu navigation and signal tone for operation status indication



Bitumen Washing Machine

For the removal of bitumen residues and small parts and glassware with non-flammable solvents trichloroethylene (TRI), perchloroethylene (PER, Tetra) or methylene chloride (methylene) in a closed cycle.

- ▶ Heated washing area approx. 500 x 300 x 300 mm with spray nozzles for internal and external cleaning of up to 8 parts
- ▶ Collecting sieve at the solvent drain for coarse soiling
- ▶ Integrated distillation at the solvent tank and residue tank
- ▶ Integrated recirculating air drying at the end of the process
- ▶ Variable process control via integrated SPS with variable cleaning and drying times
- ▶ Connections for solvent supply and disposal
- ▶ Various insert racks optionally available

Technical data

Dimensions	1030 x 780 x 1280 mm
Weight	196 kg
Electrical data	3/N/PE, 400 V, 50 Hz, 4kW

20-5010

20-5010-60

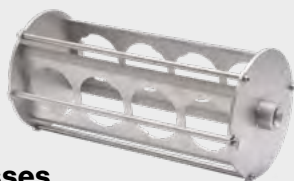
Bitumen Washing Machine 60 Hz

Advantages:

- ▶ Closed solvent cycle
- ▶ Different accessories possible
- ▶ Easy programming
- ▶ Increased efficiency of the workflow through an uncomplicated and quick purification



TIP



Clean RTFOT glasses easy and quick in the Bitumen Washing Machine or in our Asphalt Analyzers.

Insert basket for small parts

20-5010E10



NEW

YOU!
Safe Extractions



**Asphalt Analyzer
YOU!**

20-11300

**Asphalt Analyzer
YOU! Touch**

20-11320

**Asphalt Analyzer
YOU! PG**





20-11340

The new features:

- ▶ Two maintenance windows in the recovery cover
- ▶ Direct connection to the rotary evaporator
- ▶ Temperature limiters above recovery cover
- ▶ Additional inlet sieve in the recovery system for catching of very light asphalt components

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TESTING SYSTEMS