

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.

Comprising the drying oven, capacity appr. 53 l with electronic regulator maintaining a constant temperature at 163° C. Complete with door with window and built-in rotating shelf rotated by an electric motor with 5 to 6 1/min., suitable for 3 test pans 140 mm dia. or up to 9 test pans 55 mm dia.

Technical Data

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

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 pressure vessel with connecting elements, pressure/temperature sensors, heating unit controlled by the thermostat as well as Touchscreen-PC and 10 test cups. Compressed air source > 21 bar or compressor 20-44950 must be provided. Up to 10 customised sequences pressure/temperature/time storable.



Technical Data

Dimensions	560 x 520 x 470 mm
Weight	50 kg
Electrical data	230 V, 50/60 Hz, 0,5kW
Working pressure	21 bar - max. 25 bar

20-44000

Advantage:

- ▶ Compact design
- ▶ Up to 10 freely 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. Test System for Determination of Flexural Creep Stiffness of Asphalt Binder at low temperatures.

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

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

Technical data

Dimensions	1000 x 425 x 500 mm
Test bath approx.	11 l
Weight	80 kg without accessories
Electrical data	230/240 V, 50/60 Hz, 0,5 kW
Temperature range	-40... + 20 °C
Temperature resolution	$\pm 0,1$ K
Usable stroke of load shaft	10 mm,
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



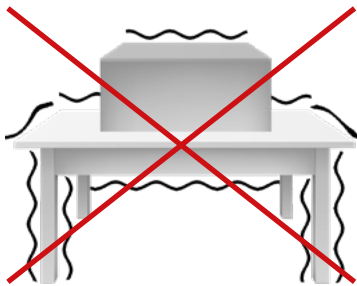


TOUCH PANEL

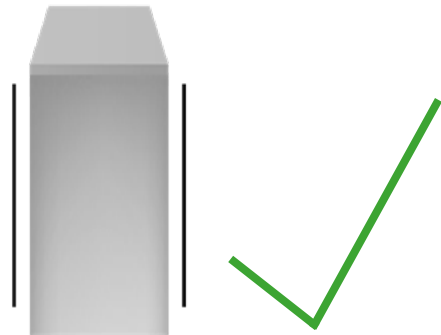
Easy and fast control via the well arranged display.

Advantage:

- ▶ 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

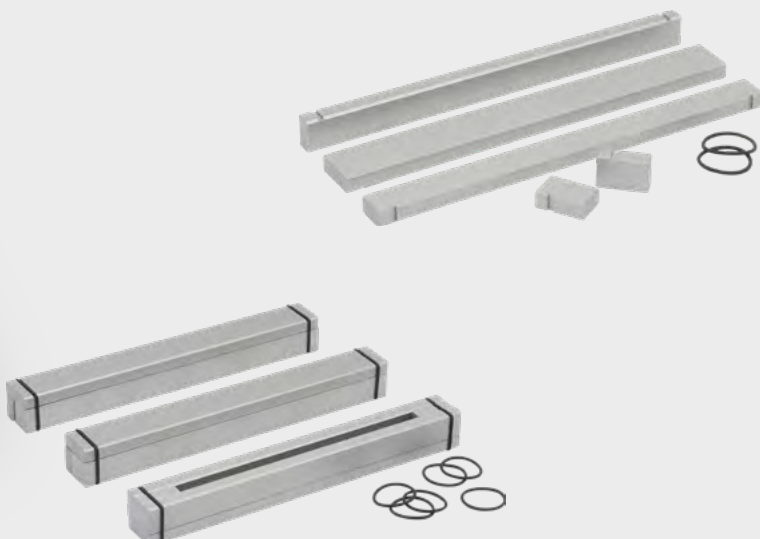


STAND ALONE UNIT

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 casing with isolated water bath with cover and glass window as well as a stepper motor providing a variable speed range 1 to 50 mm/min. by the digital displacement measuring system. Up to 4 samples can be tested simultaneously. Fully computer-controlled version with Windows software. One measuring place is equipped with an electronic load transducer 500 N, resolution 0,1 N (100 N, resolution 0,01 N as an option). Three additional load transducers 20-2357 can be connected. The complete test is controlled by the software with on-line graphics and database as well as evaluation of test with the calculation of planimetry. Special test sequences can be programmed by the user. The water bath temperature can be recorded continuously by use of temperature sensors 20-2359, available on option.

For operation, a computer with Windows has to be provided. The bath temperature can be controlled by a ductilometer Bath Heating Thermostat (20-2370), if required with additional cooling unit (20-2377) or an external cooling/heating unit. (Test moulds, bath heating attachment and computer are not included).

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

Advantage:

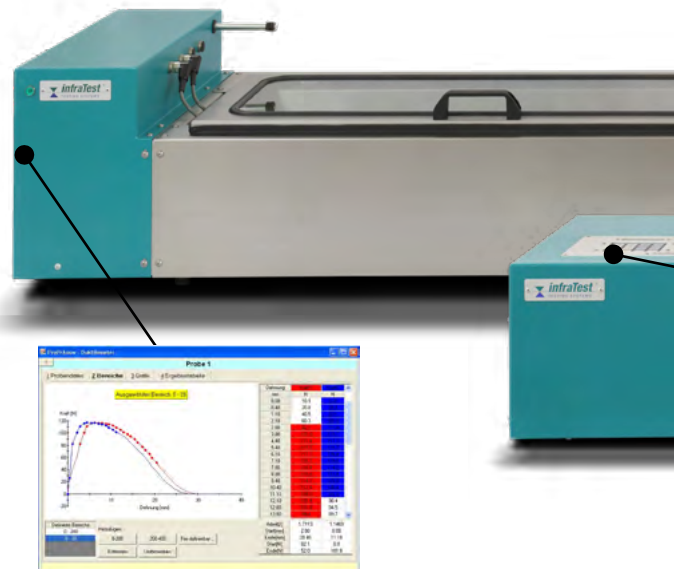
- ▶ Display of the test graph and current test data in real time
- ▶ Automatic test execution with windows based software
- ▶ Quick calibration option
- ▶ Up to 4 measuring stations that can be equipped
- ▶ Test protocol

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 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

Advantage:

- ▶ 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 casing with isolated water bath and stepper motor providing a variable speed range 1 to 50 mm/min. with digital displacement measuring system. Up to 4 samples can be tested simultaneously. The operation panel at the left side of the apparatus with digital display memorizes up to 4 displacement values. Glass thermometers are installed to control the temperature in the water bath. The bath temperature can be controlled by a ductilometer Bath Heating Thermostat (20-2370), if required with additional cooling unit (20-2377) or an external cooling/heating unit. (Test moulds, bath heating attachment and cover for the bath are not included).

Technical data

Dimensions	2400x500x380 mm
Weight	100 kg
Electrical data	230 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	2300 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



Advantage:

- ▶ 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	24 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.

Advantage:

- ▶ 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

20-2080E20 47,5 g for 20-2050/60

20-20660E40 47,5 g for 20-20665

20-20670E40 47,5 g for 20-20670

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

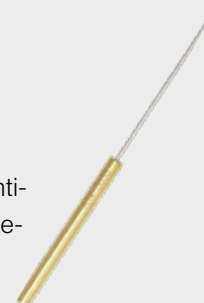
Penetration Needle 2,5 g / 3,2 mm

for 20-2050 + 20-2060

20-20710

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.



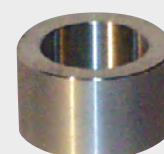
20-2090

Reducing Ring

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 P53 - GOST 11506-73 Determination of the Softening Point of Bitumen.

With glass-ceramic heating plate and magnetic stirring motor with variable speed range below. Operation by use of a touch panel. The microprocessor-controlled system provides a temperature rise of 5 K/min. as per standard with continuous temperature measurement inside the glass beaker. The ring and ball values are automatically registered by two photoelectric cells right and left with a digital display of results and difference. Two test options 30 to 80° C for water and 80 to 150° C for glycerol are provided. Supplied with glass beaker 600 ml, stirring rod as well as a test frame with two rings, two balls and two ball centring supports.

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



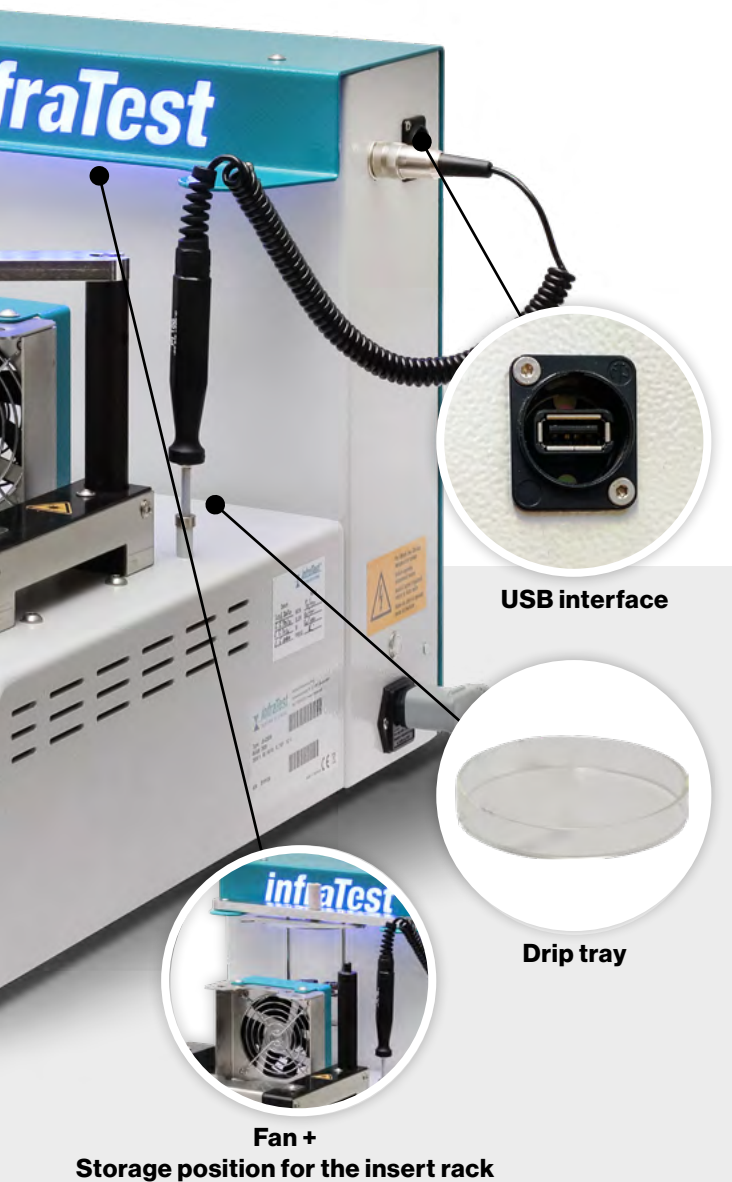
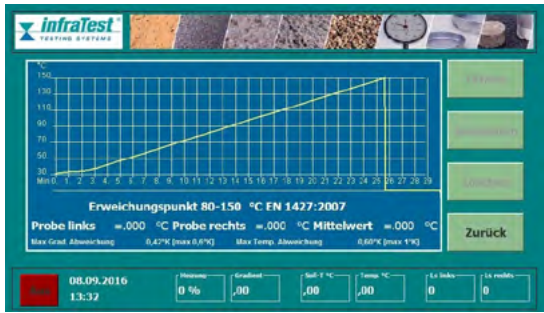
TOUCH PANEL

Easy and fast control via the well arranged display.



Advantage:

- ▶ 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



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 sam-
ples for ring and ball test.

20-2045



Glass Beaker 600 ml

low shape for ring and ball
tests.

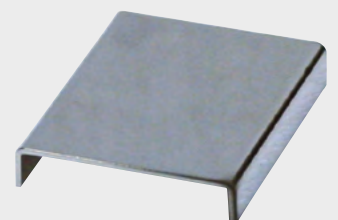
20-2050



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.

The temperature-controlled oven with door and viewing glass is preset to a test temperature of 163°C. The rear inside wall is equipped with a vertical carriage, rotated by an electric motor at 15 1/min. and prepared to support 8 glass test cups. An outlet orifice 1 mm dia. is connected to a copper tubing with air-jet providing an airflow of 4000 ml/min. to the samples. To set the required airflow a special regulator is installed. Compressed air or an air compressor 20-2577 is necessary for the test. Required glass test cups 20-2573 or 20-2574 to be ordered in addition.

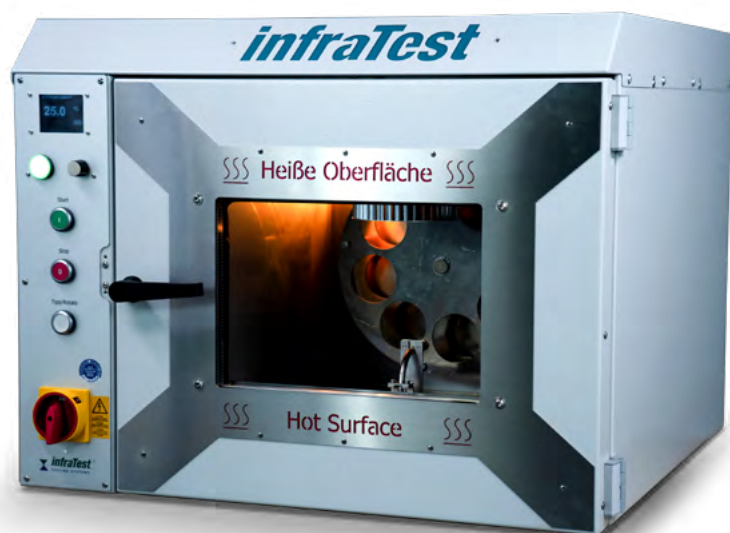
Technical data

Dimensions	850 x 730 x 620 mm
Weight	110 kg
Electrical data	230 V, 50 Hz, 2 kW

20-25720

Advantage:

- ▶ 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



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

Bitumen Washing Machine

to clean bitumen polluted containers, glass flasks etc. using trichlorethylene in a closed system. The stainless steel wash container 500 x 300 x 300 mm is equipped with an indirect heating system and spray nozzles. Sprinkling and solvent steam is used for the washing process. The complete process is computer controlled with variable washing cycles. Usual runtime appr. 30 .. 40 minutes. Supplied including 8 inserts for round bottom flasks 1 l or RTFOT glass.

Technical data

Dimensions	1000 x 750 x 1300 mm
Weight	196 kg
Electrical data	400 V, 50 Hz, 4kW

20-5010

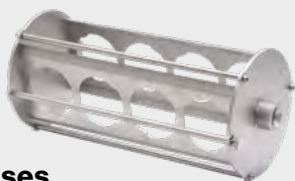
20-5010-60 **Bitumen Washing Machine 60 Hz**

Advantage:

- ▶ Closed solvent cycle
- ▶ Different accessories possible
- ▶ Easy programming
- ▶ Process optimization



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 Extraction



**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
- ▶ Stainless steel corrugated cooler in the recovery ensures an enlarged surface
- ▶ Additional inlet sieve in the recovery system for catching of very light asphalt components

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TESTING SYSTEMS