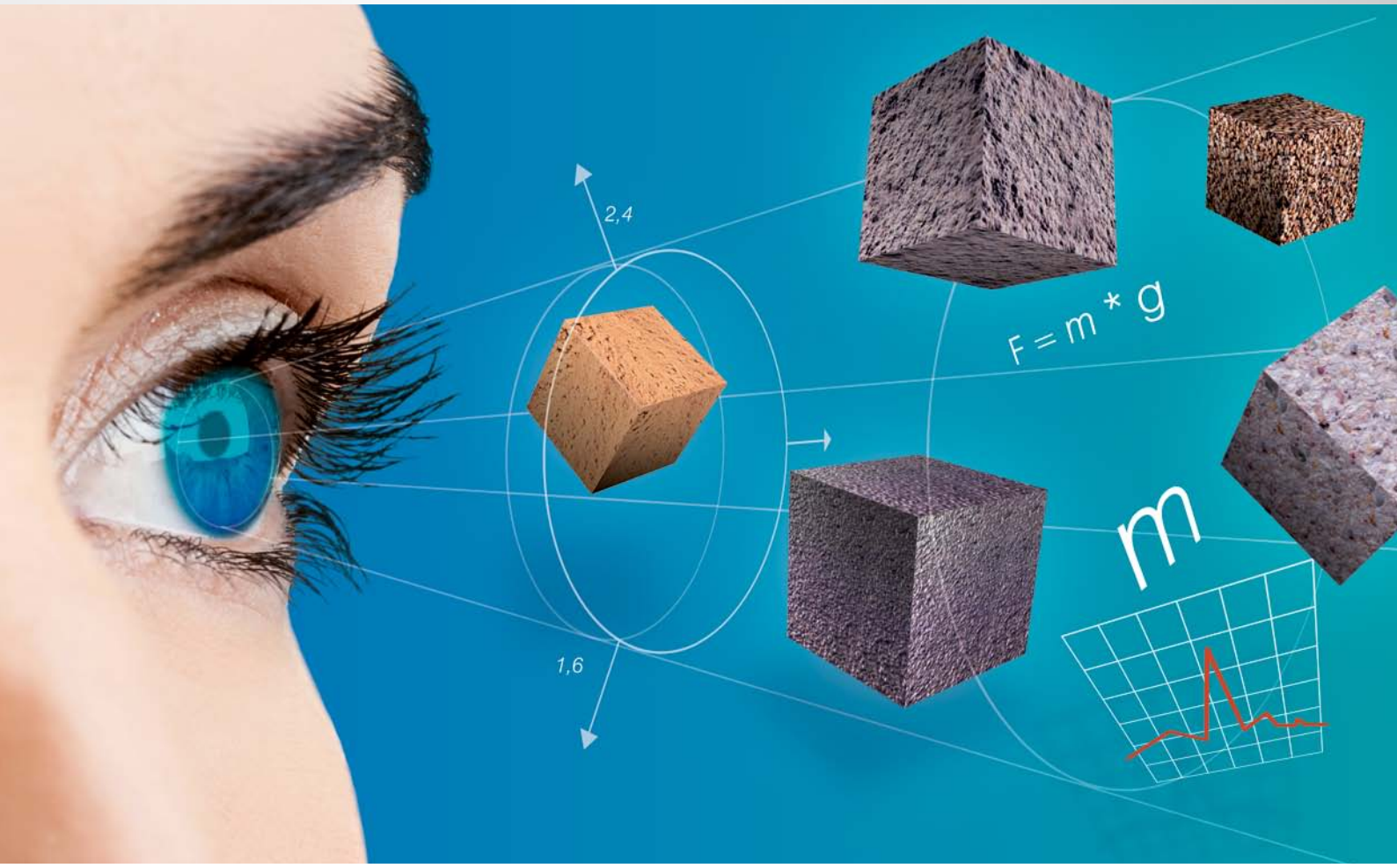
BITUMEN TESTING



infraTest®
TESTING SYSTEMS

Modifications and supplements of the Technical Guidelines for Asphalt Pavement: Additional testing procedures to gain experience with regard to durability.

In newsletter “Straßenbau Nr. 11/2012” the German Federal Ministry of Transport, Construction and Urban Development listed additional requirements to the tests of asphalt building material with bituminous binders. In addition to the current testing procedures as softening point ring and ball, needle penetration, etc. supplemental tests are required:

EN 12607-1, ASTM D2872	Test Method for Effect of Heat and Air on a Moving Film of Asphalt (Rolling Thin-Film Oven Test)
EN 14769, ASTM PS 36, AASHTO PP1, SHRP 005	Long-term aging test PAV
EN 14770, ASTM D7175, D7552-09	Dynamic shearing tests DSR
EN 14771, ASTM D6648, AASHTO TP1/T313	Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR)

Further information to the required equipment is listed in this catalogue.

Pressure Aging Vessel PAV

EN 14769, ASTM PS 36, AASHTO PP-1, SHRP 005 for the determination of 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 thermostat. The system will be operated by a test software via Windows. The PC and the compressor 20-4495 have to be ordered separatlye Power supply: 400 V, 50/60 Hz.

20-44000

Compressor

for PAV device. Complete with base frame and pressure tank.

Technical data:

- Suction capacity 150 l/min
- Maximum pressure 25 bar
- Pressure tank 16 l
- Excess pressure 70 dBA
- Weight 75 kg
- Dimensions 880 x 560 x 590 mm
- 240 V, 50/60 Hz

20-4495

Bending Beam Rheometer BBR

DIN EN 14771 – NF T66-062 – (ASTM D 6648 – AASHTO TP1/T313 – SHRP 1002/B-002)

to evaluate the behaviour of asphalt binder and similar products at low temperatures. The deflection of the specimen is measured for this purpose with a resolution of 1 μm. The test force is regulated with an accuracy of 1 mN. This makes determination of the flexural strength possible with reproducibility of 1 % independent of the operator. The specimen unit is moved by an electromotor and makes fitting and removing the specimens uncomplicated and simple.

The test procedure is automatic and software-controlled with standardised data acquisition and evaluation of the test results. The automatic system is monitoring various diagnosis functions and prepares the required diagnosis records. The system consist of a tempering unit with heater, compressor cooling, powerful pressure/suction pump and separate test bath with constant level maintenance. The standard software version allows tests according the DIN / EN, NF-T and a special version according to ASTM-AASTO, see 20-44310.

PC workplace with operating system Windows SE or higher (min. 2,2 GHz, min. 1 GB RAM, min. 100 MB hard disc capacity, VGA, CD drive for installation, interface RS 232 C) are required. For the demoulding of the specimen we recommend a separate cooling bath (- 10°C).

Technical data:

- Temperature range -40 … +200°C, resolution ±0,01 K
- Loading unit max. lift 10 mm
- Max. force 2000 mN
- Incremental transducer, accuracy better than 1 μm
- Load cell accuracy class 0.1 (better than ± 0.1 %)
- Force control better than 1 mN
- Working range 0 … 1500 mN
- Dimensions (WxDxH) 950 x 480 x 750 mm
- Weight approx. 80 kg without accessories
- Bath volume tempering unit: approx. 4,9 l
- Test bath: approx. 11 l
- Recommended bath liquid Ethanol, 95 %
- 230/240 V, 50/60 Hz
- Output 2000 VA

20-44200

Casting mould made of aluminium

for binder specimen 6.25 x 12.5 x 127 mm for BBR tests (packing unit 5 pieces)

20-44300

Dynamic Shear Rheometer DSR

EN 14770, ASTM D7175, D7552-09 PC-controlled rotation rheometer consisting of:

- Tripod with stable basic plate and high precision drive unit with measuring system including module for easy and fast changing adjustment the measuring plates
- Height adjustable adapter for setting the measuring plate system 20-4445 with precision positioning unit
- Separate measuring and electronic controller
- Windows software for CR, CS and oscillation tests

CR test:

- preset constant shear speed and measuring of the shear stress:
  - result: viscosity
- preset shear speed and measuring of the shear stress:
  - result: flow and viscosity curve
- preset shear speed leaps (strain/relaxation test) and measuring of the shear stress:
  - result: starting/decay curve, shear modulus, viscosity, strain/ relaxation time

CS test:

- preset shear stress-time-ramp and measuring of the shear speed:
  - result: flow and viscosity curve, flow limit
- preset shear speed and measuring of the shear stress:
  - result: flow and viscosity curve
- preset shear stress tests (creep retardation test) and measuring of the deformation:
  - result: creep diagram, compliance

Oscillation tests:

- preset harmonic shear stress oscillations and measuring of the deformation:
  - results: memory modulus G`, loss modulus G``, complex modulus G*, loss factor tan Alpha

MSCR test:

- Determination of multiple stress creep recovery

The measuring plate system 20-4445 as well as measuring plates 20-4452/52 are required in addition. As an option further measuring systems to carry out tests according to DIN EN 13302 – 13702 – 14896 – 15324 – 15325 are available. PC-working place with operating system Windows SE or higher, free capacity on hard disc min. 10 MB, 2 serial interfaces (COM) or 2 USB interfaces 2.0 are necessary.

20-4440

Technical data:

- Torque range: 0.1 … 200 mNm
- Torque resolution: 0.002 mNm
- Speed range: 0 … 1000 rpm
- Speed resolution: 0.015 rpm
- Temperature range: -60 … +350°C
- Angle range: -50 … 300°
- Angle resolution: approx. 0.001°
- Frequency range: 0.001 … 10 Hz
- Complex module: approx. 3*102 … 6*109 Pa
- Phase angle: approx. 0 … 90°
- Connection: 230 V, 50/60 Hz

Measuring plate system

with attachment to use with 20-4440. Cooling range -10...+150°C is effected using a peltier operated base plate and included cooling thermostat. The base plate is prepared with space to fit the sample and can be cleaned easily. Supplied with sample centering tool.

20-4445

Measuring Plate

with special connecting shaft.

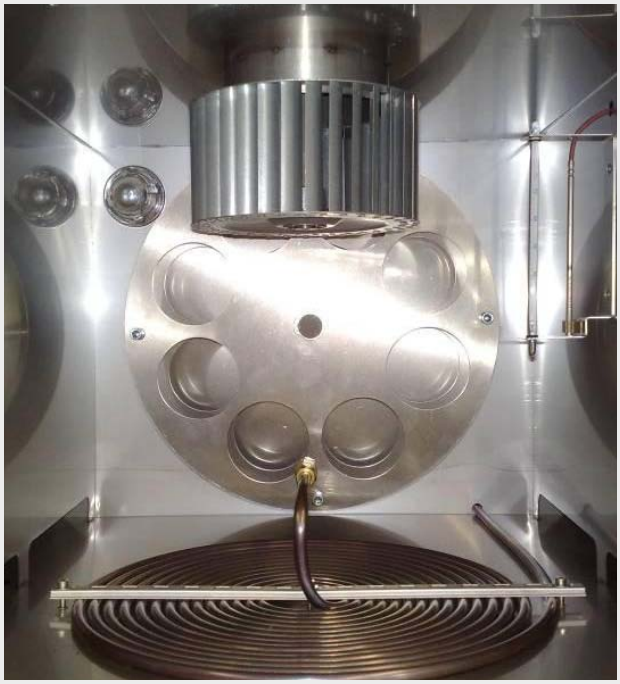
20-4452 Ø 25 mm
20-4454 Ø 8 mm

Rolling Thin Film Oven (RTFOT)

EN 12607-1 (RTFOT), ASTM D2872 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:

- Dim.: 830 x 820 x 700 mm
- Weight appr. 72 kg
- 230 V, 50/60 Hz, 2 kW



Interior view

20-2572

Glass Test Cup RTFOT

concave opening

20-2573

Glass Test Cup RTFOT

convex opening

20-2574

Compressed-Air Unit RTFOT

Compact design with basic frame, air tank and connecting tube for 20-2572.

- Suction capacity 17 l
- Pressure 6 bar
- Noise appr. 38 dB
- Weight 18 kg
- 230 V, 50/60 Hz

20-2577

Fully Automatic Digital Penetrometer

EN 1426 – ASTM D 5 – AASHTO T49 for determination of the needle penetration of bituminous binders. The penetration arm is fully automatic-controlled via motor drive, either manually with joystick or in automatic mode by means of the automatic surface recognition. The device independently recognises the surface of the specimen via contactless measurement system and releases the plunger automatically. After the preset time (5 seconds) the plunger is blocked again and the needle penetration is measured automatically and is then digitally displayed. For calibration purposes the plunger can easily be removed. Plungers with other weights and further accessories e. g. for the evaluation of cone penetration are available on request.

Penetration needles, vessels etc. are required in addition.

Technical data:

- Measuring range: 0 … 30 mm (equivalent to 0 … 300 penetration units)
- Resolution: 0.01 mm
- Test load: 100 g (needle penetration)
- Test time: 0.1 … 3000 seconds preselectable
- Dimensions: 270 x 480 x 750 mm
- Weight: approx. 24 kg
- Power supply: 230 V, 50/60 Hz

20-20670

Automatic Ring and Ball Tester

EN 1427 - ASTM D36 - AASHTO P53; with glass-ceramic heating plate and magnetic stirring motor with variable speed range below. The device is operated via 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 digital display of results and difference. Two test options 30 to 80° C for water and 80 to 150° C for glycerol are provided. The system will be supplied with glass beaker 600 ml, magnetic stirrer and test frame with support for test rings, two balls and two ball centering devices. 230 V, 50/60 Hz, 1 kW.

20-2200

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