MPA NRW.
Materialprüfungsamt Nordrhein-Westfalen
TESTING ▪ SURVEILLANCE ▪ CERTIFICATION

check it!

The newsletter of Materialprüfungsamt NRW

Issue 2016

Contents

The new testing hall of the fire testing centre Erwitte.

No more long distances: the new cold chamber in the testing hall in Erwitte.

Key for the future

Eight months after the dosimetry building the MPA NRW will inaugurate the new testing hall in Erwitte in mid-January.

The MPA NRW is strengthening its core competencies with regard to radiation protection and fire protection with new buildings and test devices. After the inauguration of the new building for the personal dosimetry service in May 2015 the inauguration of the new testing hall of the fire testing centre in Erwitte is now planned for January 2016.

Handover of the keys in front of the new dosimetry building (from left to right): Dr. Hans-Rudolf Wilde, head of the radiation protection department, Helmut Heitkamp, head of BLB NRW Dortmund, Dr. Martin Chaumet, managing director of BLB NRW, Minister for economic affairs for North Rhine-Westphalia Garrelt Duin, Jens-Peter Steuck, head of the MPA NRW, Dr. Frank Busch, head of the personal dosimetry service

The new testing hall will enhance the test offer for natural smoke and heat exhaust ventilators. Furthermore, functional reliability tests can be carried out under normal and low ambient temperatures as well as under wind and snow loads.

The new building also shortens the distances in the MPA NRW: So far, a part of the tests had to be carried out in the company's headquarters in Dortmund. "Now we have everything under one roof in Erwitte", says a pleased Dieter Goedecker, head of the fire testing centre. "This is also a benefit for our customers."

Calibrate first, then test

The calibration laboratory of the MPA NRW makes an important contribution to the success of the label "made in Germany".

Vickers indenter approaching the surface

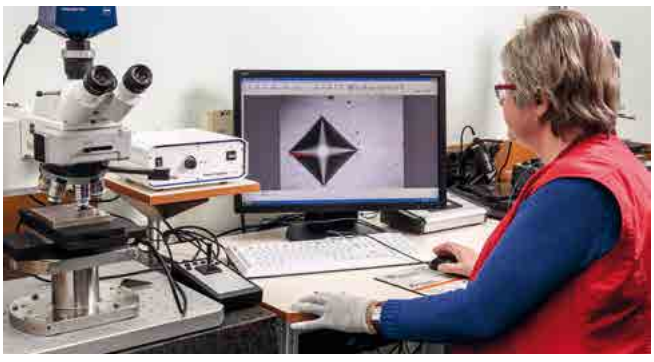
The DAkkS calibration laboratory at the MPA NRW is accredited for the calibration of electrical quantities, temperature, relative humidity, material testing machines, hardness reference blocks and indenters. Industrial users can compare the test results of the calibrations carried out by the experts of the MPA NRW due to the traceability to the national standards. Thus, these calibrations contribute to securing the quality of the label "made in Germany" at the German industrial location. The quality assurance of many semi-finished products and components in the steel industry, the engineering industries, plant construction, the aircraft and motor vehicle construction is achieved by means of hardness tests.

For the various applications hardness reference blocks with a hardness value of approximately 60 up to 3,000 Vickers units are calibrated together with the process-specific indenters. The applied hardness testing method depends on the specific measuring task. In the course of this, the test forces range between 30 kilonewton (kN) and a few millinewton (mN). Accordingly, the indentation size ranges between six and a few thousandths of a millimetre. The test force, the indenter form, the type of indentation measurement and the calculation of the hardness value are pre-defined by national and international standards.

Industrial users apply the hardness reference blocks for the normatively demanded periodic reviews of hardness testers. For each hardness reference block the MPA NRW provides a control card for its documentation in the form of an Excel table which can be downloaded on the internet. The calibration of hardness reference blocks has a long tradition – it was one of the first task ranges when the MPA NRW was founded in 1947. In the former German standard DIN 51303 the MPA NRW was named as the only calibration service for hardness reference blocks. The reason for this normative determination was the industry's wish for uniform and stable calibration values of hardness reference blocks.

Calibration of a hardness reference block according to Brinell

Measurement of a calibration indentation according to Vickers



The employees of the MPA NRW develop and enhance the calibration devices in order to be able to correspond to new or changed standardisation requirements. In the course of this they always work with state-of-the-art measurement instrumentation.

The MPA experts contribute their specialist knowledge in international and national standardisation bodies, in the VDI/VDE working groups for hardness tests, in the specialist com-

Calibration of a hardness tester according to Leeb

E-module determination on a hardness reference block for the UCI-procedure

■■■ | Accreditations

The calibration laboratories of the MPA NRW are accredited by the German Accreditation Body (DAkkS) according to DIN EN ISO/ IEC 17025 for the calibration of material testing machines, hardness reference blocks and indenters, electrical measured values, temperature and relative humidity as well as tensile and compression forces, voltage ratio, pressure.

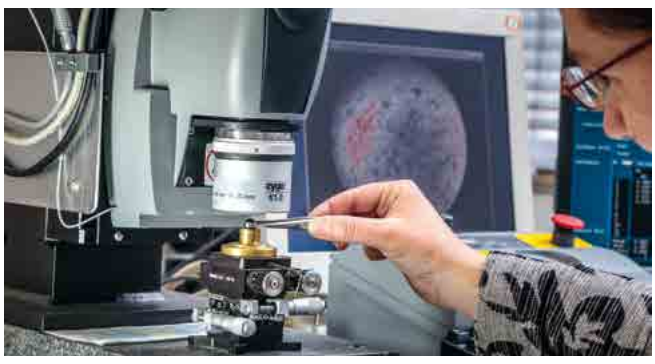
■■■ | Forum Hardness

At the Forum Hardness taking place on 24 February 2016 the MPA NRW will inform its customers about the newest technical developments in the sphere of hardness as well as about the up-to-date standards for hardness tests.
www.mpanrw/aktuelles

mittee "Hardness Test" of the AWT as well as in the VMPA, and also with contributions on international and national meetings or congresses or within the scope of the annual Forum Hardness of the MPA NRW. With regard to the calibration of material testing machines the field staff services of the calibration department are not only limited to hardness tests", says Karlheinz Fenning, head of the department. Thus, the engineers of the MPA NRW also calibrate inter alia strain-compression testing machines, pendulum impact testers, pre-stressed concrete presses, pressure gauges and force transducers. The tension rod of the MPA NRW for the calibration of rope testing machines with a nominal capacity of 20 MN is the biggest in Europe. These rope testing machines inter alia test ropes for securing oil platforms in the North Sea as well as the ropes of cableways and chairlifts in the Alps. Because here also the rule applies that "only a calibrated and monitored testing machine according to the normative guidelines guarantees security and comparability of test results". Against this background the supreme rule of measurement technology explains itself: Calibrate first, then test!

Falling body before hitting the surface during the calibration of a hardness reference block according to Leeb (left photo)

Measurement of a calibration indentation according to Brinell



Calibration of a test ball for the Rockwell hardness test

Safe line

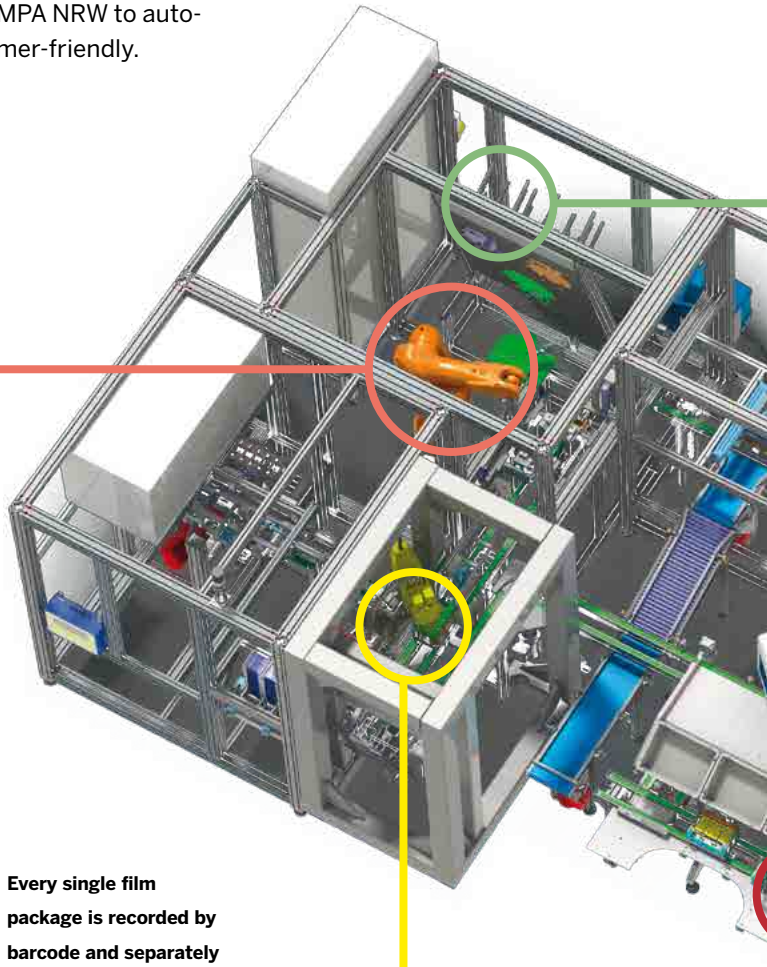
The new dispatch line for film dosemeters works largely automatically.

The dispatch line which was brought into operation in summer 2015 is the logistic centre of the new dosimetry building. Here the unexposed film dosemeters are prepared for dispatch largely automatically. Three manual workplaces see to it that also other products can be dispatched. The processes are digitally controlled and ensure that every customer receives his dosemeters in a timely manner.

In parallel to the new dispatch line the personal dosimetry service has developed new shipping cartons. By means of these customers can send used film dosemeters back to the MPA NRW even faster and with less effort. The new dispatch line is an important part of the concept of the MPA NRW to automate dosimetry processes and thus make them more customer-friendly.

The daily requirement of carton blanks for three different packaging sizes is held ready in the machine. Filling up the machine remains manual work.

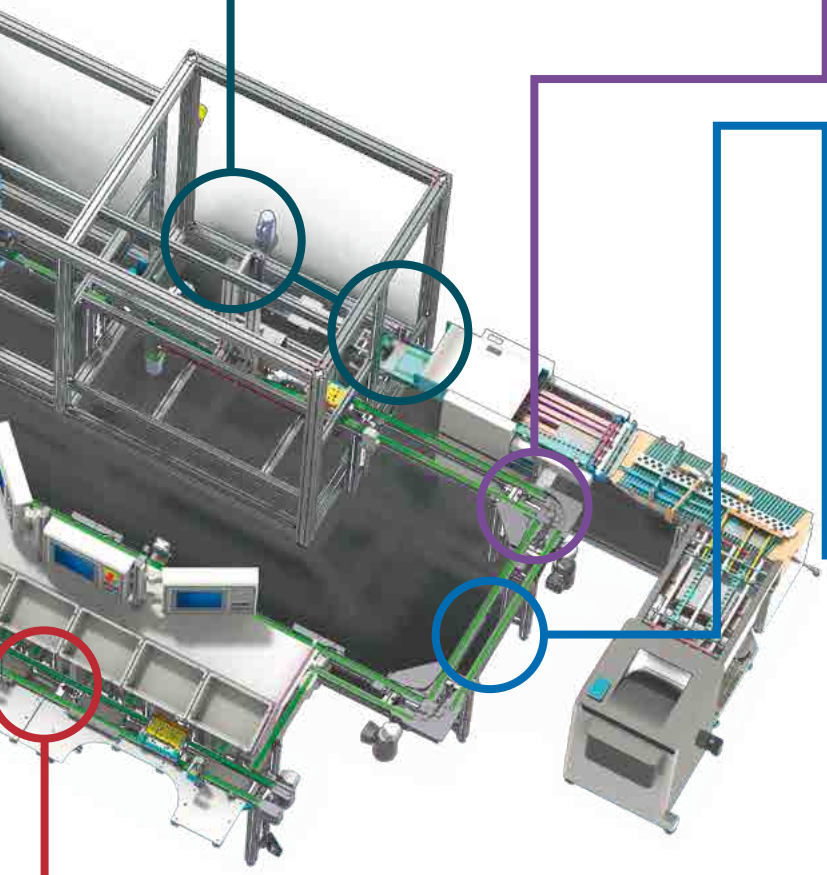
The required blank size is taken from the supply by a robot arm, coated with hot glue and placed upright into the waiting transport trolley by means of a positioning device.



Every single film package is recorded by barcode and separately placed into the waiting carton. Optionally the film package can be printed with e. g. the name of the dosemeter user.

Finally the accompanying documents are printed and placed into the package. Address and postal charges are already imprinted and appear in the address window of the closed package. The annual output of the dispatch line amounts to 1.3 million films and 100,000 packages.

Packages waiting before the document feeder



Partially filled packages in transit through the dispatch facility

At a manual workplace e. g. ring dosemeters can be placed into the parcel.

Tests for the world market

The MPA NRW offers its customers a complete test range in the sphere of safety glass for motor vehicles and the building industry. Now new appliances for testing plastic vehicle glazing have been added.

Large format projector for testing the optical properties of a windscreen by raster projection

"In the sphere of motor vehicle safety glass we can carry out all tests necessary for the approval of a motor vehicle on many markets of the world". This is how Dr. Matthias Duemmler describes the test offer of the MPA NRW. The technical and professional performance is always state-of-the-art. One reason for this: The head of the testing laboratory for safety glass plays an active part in national and international standardisation committees. "Here test procedures are developed and safety-related requirements to the products are stipulated," explains the graduate physicist. The knowledge and experience of the experts of the testing laboratory are also demanded by the United Nations. In the bodies of the UNECE in Geneva worldwide uniform requirements to motor vehicle glazing are stipulated. However, the customers of the MPA NRW also benefit from the international involvement: We want to be pilot and partner for our business partners when approving their products for the national and international market.

Headform test with deceleration measurement for determining the risk of injury of a passenger head hitting a plastic pane.

The internationally applied ECE–Regulation No. 43 for the approval of motor vehicle glazing has recently been broadened to include new types and application fields of plastic glazing, i. a. windscreens. "Even if the manufacturers will need a little time to develop approvable products they know that we can begin with all necessary tests as soon as we get the first pane", promises the head of the test laboratory. The two recently acquired devices for the additional new abrasion resistance tests have passed the trial operation and are ready for use: "The wiper test simulates the surface wear by the windscreen wipers, and in the car wash test a synthetic brush rotates over the pane surface just like in an old car wash. In the sand drop test which has been used at the MPA NRW for visors for a long time and has now been modified for plastic vehicle glazing, fine quartz sand runs onto the material." After the test duration stipulated in the regulation the pane must show no signs of view-obstructing wear.

Before newly developing a test procedure, the experts of the bodies first investigate if already existing test devices can be adapted to the new requirements. "For the sand drop

Car wash test for testing the abrasion resistance of plastic glazing

Ball drop test for determining the resistance against manual attack of architectural glass

test we modified a procedure that is already in use for approval tests of visors of protective helmets worn on motor cycles. Only in few cases like for instance the wiper test must we develop new test procedures." Or testing facilities for established tests are improved. This was the case with the large format projector that was recently taken into operation and with which classical optical tests are carried out by means of raster projection. "Here testing laboratories and glass manufacturers have so far used conventional small-format slide projectors", explains graduate engineer Stephan Biller, deputy head of the testing laboratory. "However, these devices do not meet the high demands to the image sharpness and imaging quality and are becoming less and less available. Therefore we worked together with a manufacturer who constructed a special high-performance projector including high-precision rasters according to our requirements."

All in all the MPA NRW belongs to the leading testing laboratories worldwide, whereas testing possibilities for motor vehicle glazing and also architectural glass can only seldom be found in one testing institute. The testing laboratory in Dortmund possesses all essential accreditations necessary for the world-wide market. The customers can rely on the MPA NRW. This was also confirmed by the Federal Motor Transport Authority (KBA) in May 2015 which evaluated its suppliers for technical services: the testing laboratory received a certificate confirming "excellent quality".

■■■ | The testing laboratory for motor vehicle safety glass

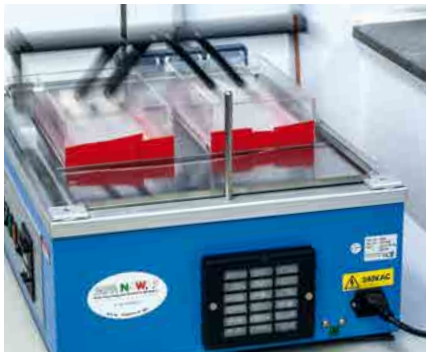
... tests i. a. thermally toughened safety glass, laminated safety glass, plastic glazing, double-glazed units and films. All safety relevant properties are determined, such as: mechanical strength, the breakage behaviour, the resistance to the environment and the optical properties of the glass or plastic.

... has been accredited by the German Accreditation Body ("Deutsche Akkreditierungsstelle", DAkkS) and designated by the German Federal Motor Transport Authority (Kraftfahrt-Bundesamt, KBA) for tests according to the ECE-Regulation No. 43, according to the EC-Directives 92/22/EEC, 97/24/EC and 2009/144/EC as well as according to § 22a of the German national vehicle safety standard (StVZO) TA No. 29;

... has been accredited by the "Automotive Manufacturers Equipment Compliance Agency" (AMECA) for tests according to US American standard ANSI/SAE Z26.1-1996 respectively FMVSS No. 205;

... has been accredited by the MOTC Taiwan for tests according to the "Vehicle Safety Testing Directions", Item 25-1 and Item 25-2.

Device for determining the abrasion resistance by means of wiper test



■■■ | The testing laboratory for architectural glass

... determines i.a. the mechanical strength, the breakage behaviour, the resistance to the environment as well as the luminous and solar characteristics of architectural glass. It also offers approval tests, surveillance tests and acceptance tests.

... has been approved i.a. by the German Institute for Constructional Engineering (Deutsches Institut für Bautechnik, DIBt) as a Testing, Inspection and Certification Body according to the German Building Regulations of the German State NRW (index No. NRW02) for architectural glass products and glass constructions;

... is a Notified Body (Notified Body No. 0432) for the assessment and verification of the constancy of performance of architectural glass within the scope of the Construction Products Regulation (CE-marking);

... is accredited as a testing laboratory and a product certification body for architectural glass by the German Accreditation Body ("Deutsche Akkreditierungsstelle", DAkkS) for tests according to various European standards.

First-hand information

Also in this year the MPA NRW is going to host customer forums: the MPA NRW-Forum Hardness and the Fire Protection Forum Erwitte

Forum of the Quality Management Certification Body in 2015: for customers a good opportunity to ask the experts of the MPA NRW questions.

For our customers the forums of the MPA NRW are an important source of information and offer the opportunity to learn details about new standards or to ask the experts of the corresponding department questions.

In February 2015 the Quality Management Certification Body hosted a customer forum on which detailed information about the new requirement standard DIN EN ISO 9001:2015 was provided. "We could give instructions how the new requirements could be effectively implemented. We also had the possibility of receiving a feedback from our customers concerning the work of our certification body. This is important for us so that we can further optimise our work", explains the department head, graduated engineer Hans-Artur Orlikowski. The forum aroused such an interest that it had to take place in a Dortmund hotel for reasons of space.

Exchange and information are also the main points of the other forums of the MPA NRW. The Forum Hardness in Dortmund has already become tradition, in 2016 it will take place for the 15th time. This forum that will take place in February is about current issues on standardisation in the field of hardness testing, on the conversion of hardness values, on characteristic values of tensile tests, on mobile hardness tests and on the determination of measurement uncertainties.

The Fire Protection Forum in Erwitte in April will be about testing possibilities and current developments in the field of fire protection. External experts, for instance representatives of the German Institute for Structural Engineering DIBt and the construction supervision agency have also been invited. They will answer the questions of the visitors. The customers coming to the forum will also have the opportunity to visit the fire testing centre and its new testing hall. There they can witness tests of smoke and heat exhaust ventilators as well as the sample preparations for the Single-Burning-Item (SBI) Test. The SBI test is a European test method to determine the reaction to fire of building products.

Forums at the MPA NRW

Forum Hardness 2016
Current developments in the field of standardisation and hardness tests
24 February 2016
MPA NRW Dortmund

Fire Protection Forum Erwitte
Testing possibilities and current developments
13 and 14 April 2016
Fire Testing Centre Erwitte

Further information
www.mpanrw.de/aktuelles

The speakers at the Forum Hardness 2015 (from left to right): Graduate engineer Joachim Laimmer, Open Grid Europe GmbH, B.Sc. Irina Repp, MPA NRW, graduate engineer Febo Menelao, PTB, graduate mechanical engineer Dieter Schwenk, MPA NRW, Prof. Dr.-Ing. Reinhard Tscheuschner, MPA-IfW TU Darmstadt, Dr.-Ing. Manfred Tietze, Newsonic, Dr.-Ing. Thomas Polzin, Prof. Dr.-Ing. Wolfgang Magin, FH Frankfurt

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