

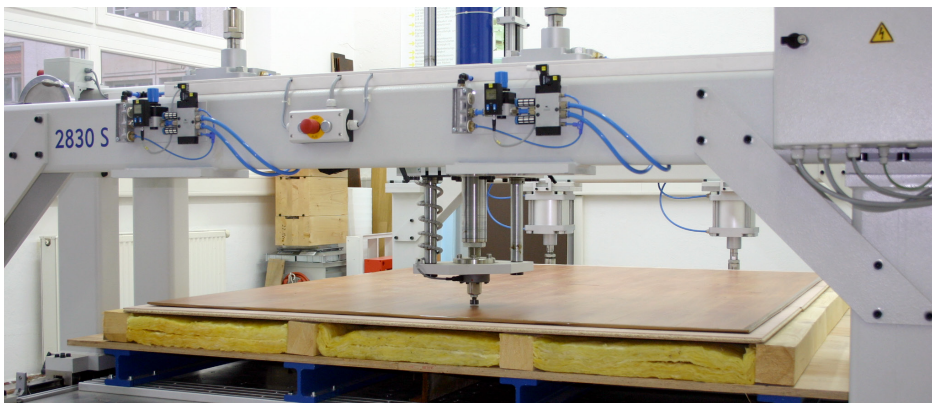
# Services for Floorings/ Sports Areas and Deckings



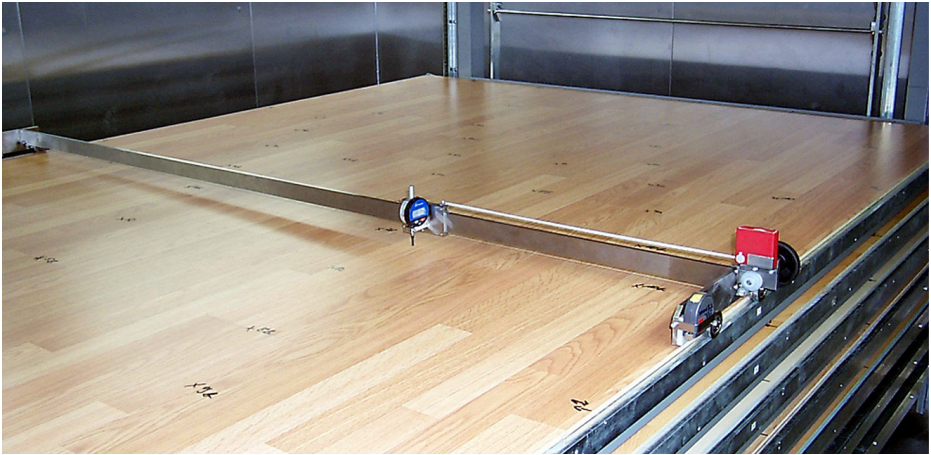


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# Research and Testing on Floor Coverings



The Institut für Holztechnologie Dresden (IHD) works in the field of research on testing and evaluation of floorings since many years. As results of these test methodological works new methods e.g. methods for the determination of wear resistance and ageing resistance of surface, of long term stability of glue-free connection systems, of walking sound emission and glueing quality of parquets were developed.

The working field of IHD and EPH includes both solid flooring (wood and laminate floor coverings, veneered flooring) as well as resilient and semirigid floorings and flooring constructions and its underlay materials. Besides the research activities and the test practice the participation of our experts in ISO, CEN

and DIN standardisation and committees of DIBt, EPLF and MMFA is basis of our know-how. Our IHD-flooring colloquium, which takes place biannually, have an excellent reputation as forum for information exchange in our industry sector.

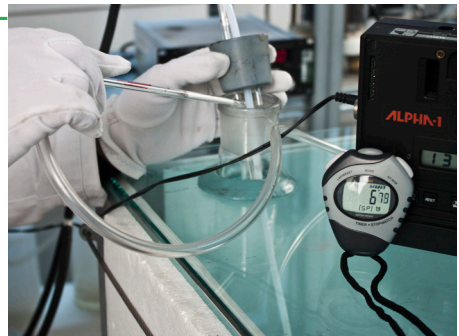
The IHD subsidiar, the test laboratory EPH, is accredited according to ISO 17025 and is furthermore e.g. Notified Body for floor coverings and sports areas (No. 0766), Testing Body of DIBt for emission testing of glues, coating and underlay materials. The fulfillment of specific quality features or the external production control can be demonstrated by test certificates in connection with our quality signs.

## Examples for research projects on floor coverings:

- Development of a test method for simulated downfall on flooring constructions
- Temperature stability and locking strength of MMF-flooring and LVT
- New test methods for quality assessment of parquets
- New test methods for structured surfaces of laminate flooring
- Modified castor chair resistance test method
- Interaction between parquet and underlying surface
- Development of UV-LED coatings

## Investigations/Tests on following properties

- Static and dynamic mechanical values of substrates (e.g. bending or compression strength, Brinellhardness)
- System tests on flooring constructions (test area 3,6 m x 2,4 m)
- Glueing quality of multilayer parquett
- Printability on substrates
- Adhesion of coatings and appearance of surfaces
- Wear resistance (e.g. abrasion, scratch and impact resistance) and of the ageing resistance (e.g. light fastness) of surfaces
- Long term stability of glue free connection systems
- Emission behaviour (formaldehyde, VOC) and the odour
- Safety-relevant properties (e.g. electrostatic behaviour, reaction to fire or slippery re-



*Determination of VOC emission in a test chamber*

- sistance)
- Suitability for underfloor heating and resistance
- Mechanical properties of underlay materials
- Walking sound emission and impact noise
- Dimensional stability at climate influence on big test areas
- Antibacterial and fungicidal properties
- Damage analysis
- Wood species determination

# New Test Methods for Quality Assessment of Parquet



In the frame of EUROPARQUET, an European CORNET-Research project, Holzforschung Austria (HFA) and Institute of Wood Techno-

logy (IHD) have carried out the following test methodological investigations:

## Glueing quality

- Several methods for pretreatment procedures and methods for determination of the glue line quality were investigated.
- Results of parallel tests on warm water floor heating systems have shown a good correlation to preferred glueing quality tests.
- The test methods according to IHD-W-482 are able to differentiate different glueing qualities. They were used for initiation of European Standardisation.
- For the resistance on floor heating the test method IHD-W-473 was developed.

## Surface quality

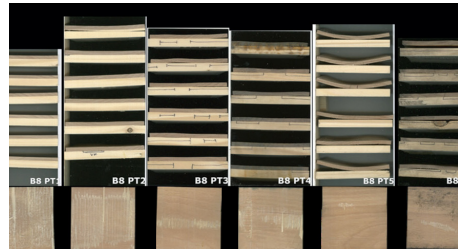
- A test method and a classification scheme for the chemical resistance was worked out (IHD-W-481).
- A test method for the pollution resistance was developed and validated (IHD-W-477).
- A test method for wet abrasion using a linear test device or the Martindale device was also developed (IHD-W-480).

## Dimensional stability

- The following test method acc. to IHD-W-478 with big test areas (3 m x 2 m) has shown a good ability for differentiation and repeatability:
  - 1 week at 23 °C, 50 % rh.
  - 4 weeks at 23 °C, 85 % rh.
  - 4 weeks at 29 °C, 20 % rh.
- Influence factors of parquet construction on dimensional stability were found
- Parallel FEM investigations were carried out



*Test on pollution resistance*



*Determination of gluing quality*

All developed test methods show a good correlation to the real behaviour and have been validated in Round Robin Tests. The project results provide a basis for uniform procedures for assessing the quality of par-

quet flooring in Europe and was brought forward to European Standardisation. The test method for gluing quality was published as EN 17456:2021. Requirements based on this test method are defined in EN 13489:2023.

For further information see:  
<http://europarquet.eu>

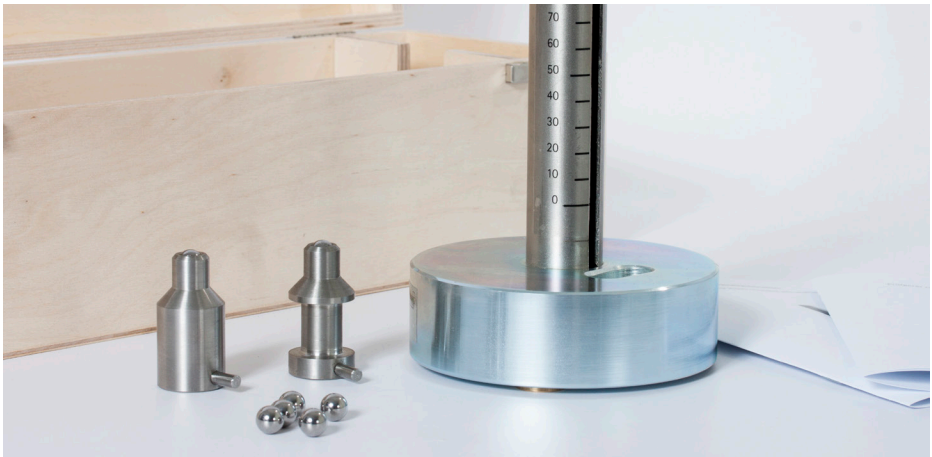
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by the German Bundestag



# New Test Methods for Structured Laminate Surfaces

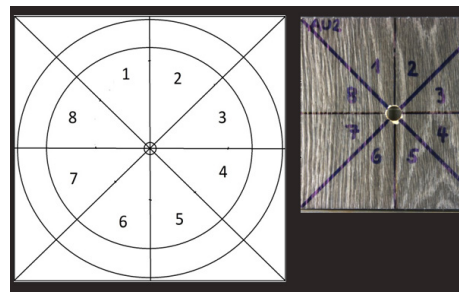


EPLF and IHD have carried out together a research project on surface test methods for deep and matt structured surfaces to allow a better prognosis of long term stability as

well as to improve the reproducibility of the methods. The following properties were investigated:

## Abrasion resistance

- Between laboratory results according to EN 13329:2009 and the results of practical behaviour, for deep structures no correlation exists, which was proven in field test within the project.
- Various parameters have been modified in the existing method with the Taber Abraser (counterweight, wheel hardness, number of cycles between sand paper change) in order to provide results which correlate to the real behaviour.



*Abrasion: Modified assessment scheme acc. to IHD-W-479/EN 13329:2017*

- Eventually, the existing method was modified, using a different division of the sample (six of eight octants) as well as a bigger IP area (1 mm<sup>2</sup>).



## Impact resistance with small ball

- For the improvement of the reproducibility of the test, a new test device with the falling mass principle was developed using the falling test parameters:
  - 100 g
  - 10 mm ball (exchangeable)
- New values (falling height in mm) for the impact existing classes IC1 – IC4 were created in very good correlation to the old existing classes.

## Polishing resistance

- A new test method for the polishing resistance by use of the Martindale test device with the following test parameters was developed:
  - Polishing material SB 7448,
  - Load 6 N,
  - 320 cycles and
  - Assessment of polishing by gloss change
- A good correlation between the results of this method to results of a field test was determined.



*Test device for polishing resistance acc. to IHD-W-475*

## Use of the results

- The developed test methods were integrated into
  - EN 13329:2017 and ISO 24338:2022 (abrasian resistance),
  - EN 17368:2020 und ISO 24335:2022 (impact resistance with small ball) and
  - EN 16094:2021 (polishing resistance).

# System Castor Chair Test



## Initial situation

The durability of laminate, MDF or LVT floorings with click connection exposed to dynamic load and laid on elastic underlays is

an important quality criterion. For proving it, the castor chair test acc. to EN 425 is widely used. System structures can hardly be tested.

## Implementation

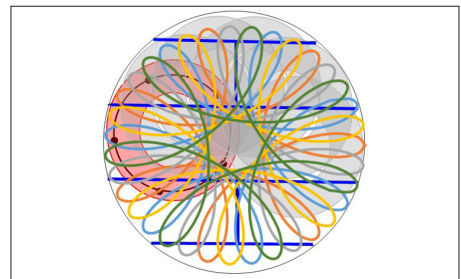
The IHD has developed a castor chair test that is state of the art (a quintet of castors) and allows the practical testing of floor coverings on elastic underlays.



*Sample holder*

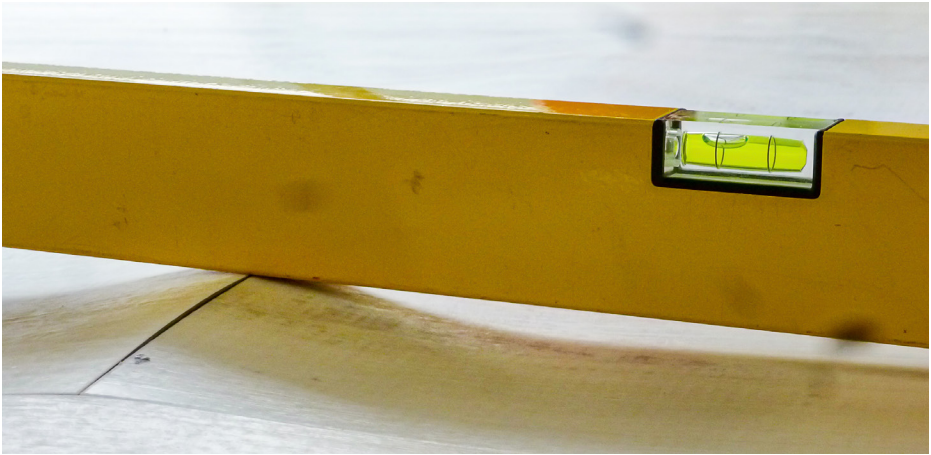
## State of affairs

It was proved that – by applying a test castor quintet – laminates and their suitable underlays pass the castor chair test. Resilient floorings can be tested only after adapting the design of the test plate in the castor chair test. The test parameters were adjusted.



*Roller distance of a device with 5 rollers*

# Temperature Resistance of Resilient Floor Coverings



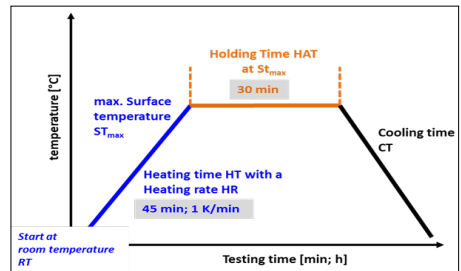
## Initial situation

Resilient floor coverings show concave or convex deformations or/and gapping of joints when exposed to unusual temperatures, such as solar irradiation. Normative methods

(ISO 23999) make use of only small samples without any joints. The simulated heat impact does not correspond with real practice.

## State of affairs

Two technical test devices were set up - with approx. 4 m<sup>2</sup> or with 0.4 m<sup>2</sup> test area. Both follow a defined temperature cycle of heating, holding and cooling. The thermal irradiation takes place from above of a partial area of the flooring. Both test devices measure the possible thermal change with sensors. Limit values were defined to evaluate the thermal behaviour.

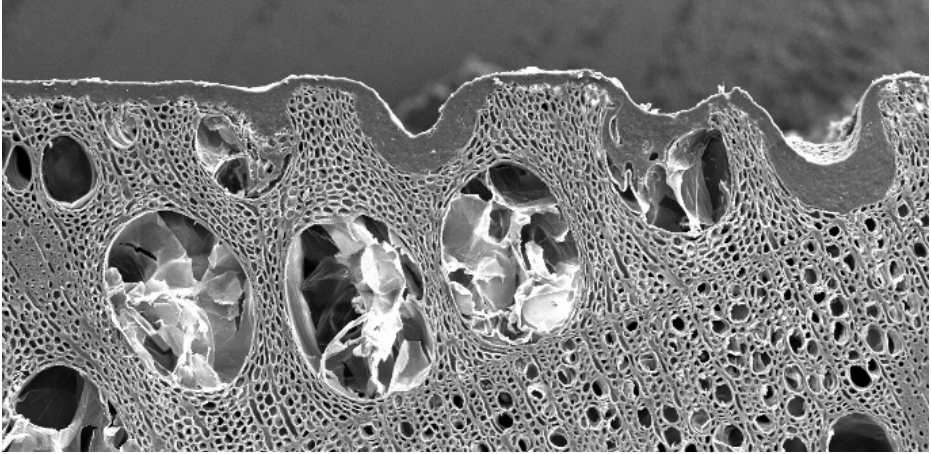


*Scheme of a measuring procedure*



Supported by:  
 Federal Ministry  
for Economic Affairs  
and Energy  
  
on the basis of a decision  
by the German Bundestag

# Chemical Resistance of Wood Flooring



## Structured parquet with a natural appearance

As part of the European CORNET project Surf-Parquet, developments on coatings for structured parquet were carried out. In doing so, it was possible to develop variants of coating systems and application techniques that, for test persons, did not

differ visually or haptically from natural wood. Thus, a refinement of deeply structured parquet surfaces that is invisible to customers has become possible.

## Resistance of parquet to construction chemicals

In the course of construction work, complaints about freshly laid parquet sometimes arise due to discolouration. In order to avoid these complaints, the project investigated the resistance of parquet to various construction chemicals and developed a

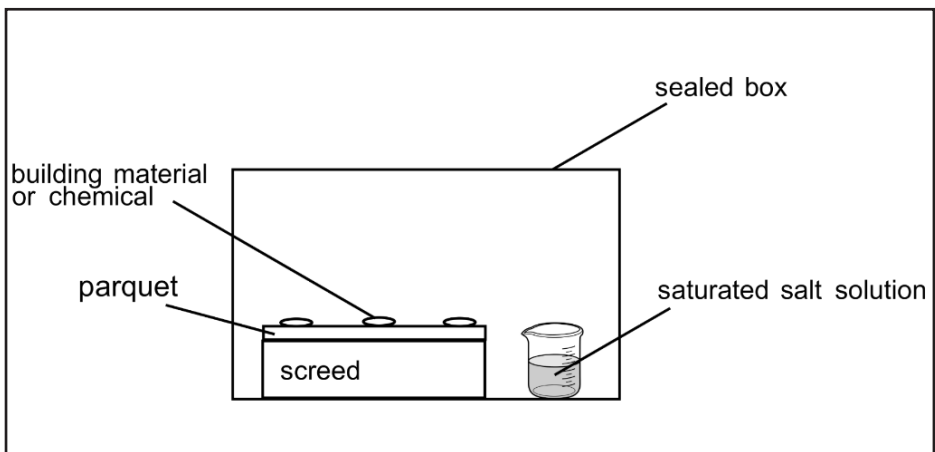
test method with which both liquid and gaseous contaminations on parquet can be examined. A technical leaflet for floor layers has also been published in order to prevent discolouration.

## Restoration of structured wooden floors

The reconditioning of parquet surfaces represents a unique selling point of these floors. Several work steps are required here, among other things the old parquet surface is sanded, whereby structural elements are lost. Investigations were carried out in the project to enable the restoration of structured parquets. After the surface was sanded down, a fresh structuring was achieved together with a new coating of the surface. Thereby structured parquet products can also be reconditioned much like parquets without deep structured surfaces.



*Oak parquet after restoration*



*Test method for discolouration tendency*

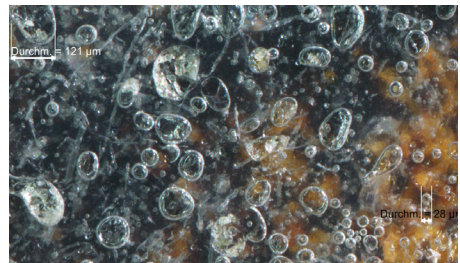
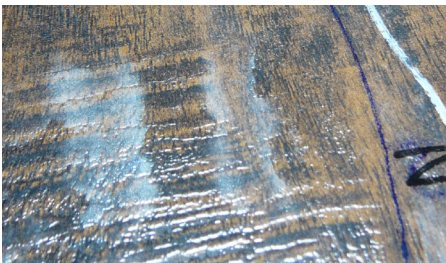
# Failure Analysis



IHD provides specialized investigation techniques to reveal reasons for damages of a brought variety of products.

## Focus/Typical damages

- Discolouration/spots and stains
- Emissions in housing/fogging
- Delamination/detachment of coatings and laminates
- Ageing-, illumination-, weathering-, and biologically-induced phenomena for outdoor materials (e.g. WPC, terraces)
- Adherence of floorings



Cloudy areas on laminate and with 100x magnification (right)

## Cloudy areas on laminate

Task:

- Origin of cloudy areas

Technique used:

- Light microscopy

Results:

- Cloudy areas are a consequence of numerous small bubbles inside the melamine layer which influence the light scattering
- Probable reasons: unsuitable pressing parameters; too high moisture content

## Detachment of adhered parquet

Task:

- Reason for detachment of parquet incl. adhesive from screed

Technique used:

- IR spectroscopy

Results:

- Primer applied on screed probably bases on a styrene-acrylate copolymer
- This type of primer is incompatible with the 1C-PU adhesive used according to its technical data sheet



*Detached parquet on screed*

# CE Declaration for Flooring/Sports Areas



European Standards for resilient, textile and laminate floor coverings (EN 14041) and wood flooring (EN 14342) were published in several versions. The latest version of EN 14342:2013 excludes flooring made of lignified materials other than wood (e.g. bamboo or palm). EN 14904 is the harmonized standard for sport areas.

As a notified body and services partner for CE marking, the Development and Testing Laboratory Wood Technology GmbH (EPH) is

at your disposal. For the Declaration of Performance (DoP) – as pre-requisite for the CE marking of your products – we will determine the required or optional performance characteristics. If necessary (System 1), we will test the performance characteristics (initial type test), evaluate and certify the Constancy of Performance and conduct the regular external surveillance. Our documents can be used too for UKCA-certifications by our cooperation partner SATRA.

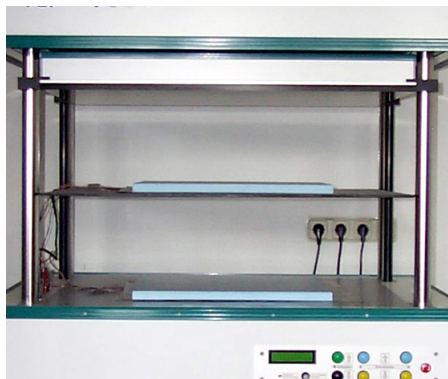


## Properties according to EN 14041

- Obligatory declaration
  - Fire resistance according to EN 13501-1
  - Slippery resistance according to EN 13893
- Optional declaration on demand
  - Electrostatic behaviour according to EN 1815
  - Formaldehyde emission according to EN 717-1, EN ISO 12460-3
  - PCP-content according to CEN TR 14823
  - Thermal resistance according to EN 12667 or EN 12524

## Properties according to EN 14342

- Obligatory declaration
  - Fire resistance according to EN 13501-1
  - Formaldehyde emission according to EN 717-1
  - PCP-content according to CEN TR 14823
- Optional declaration on demand
  - Bending strength according to EN 1533 (except for veneered flooring)
  - Slippery resistance according to CEN TS 15676
  - Thermal conductivity according to EN 12664 or EN 12524
  - Biological durability according to EN 350-2



*Determination of the thermal conductivity*



*Determination of the formaldehyde emission*

# VOC-emission of Building Products



## General technical approvals/Voluntary DIBt expert opinion

Coatings, treatment materials and adhesives for wood floors and underlayments for laminate floor coverings and parquets require a general technical approval issued by the construction supervising authority (abZ). Basis for granting an approval is the MW TB (Model Administrative Provisions - Technical Building Rules with the "Requirements for building constructions regarding health protection" ABG - Annex 8.

### Approval procedures – course of events

- Manufacturer/retailer apply for approval at DIBt
- DIBt confirms the application and notifies the data and information required for the product/product group (product description, material specification sheets)

- Applicant forwards data and information
- DIBt sets up test program
- Applicant arranges that tests are conducted at an approved testing body like EPH
- DIBt evaluates results and, after positive evaluation, grants approval issued by the construction supervising

### Emission testing – AgBB-scheme/ABG

- Determination of the VOC- and SVOC-emission according to EN 16516 by means of examinations conducted by the respective chambers
- Product specific and emission dependent test with test period up to 28 days
- Evaluation of the results according to AgBB-scheme/ABG

# Determination of Odour Emission of Building Products



## DIN EN ISO 16000-28

In Germany, the evaluation of emissions from building products is based on the AgBB-scheme (AgBB: committee for Health-related Evaluation of Building Products). Since its introduction in 2002, it has been foreseen to include a sensory assessment in this evaluation scheme. Therefore, a methodical approach for testing and assessment of odour emissions was developed within the last years which is the base of DIN EN ISO 16000-28:2012-12 (Indoor air – Part 28: Determination of odour emissions from building products using test chambers). Depending on the task different parameters such as perceived intensity, hedonic, or acceptance can be determined.

In the near future, the assessment of odour is intended to be included in the AgBB-scheme as well as in the awarding basis of the Blue

Angel environmental label. Therefore this test will be combined with the determination of VOC and formaldehyde emissions.

In the framework of the Finnish M1 classification, odour acceptance is determined according to DIN EN ISO 16000-28 and assessed in accordance with the M1 requirements.

The (EPH) has the appropriate technical equipment and has established the test method in a special odour laboratory.

In the EPH, from a large number of employees a panel of 16 persons were trained and according to strict criteria as appropriate examiner selected.

# EPH and TÜV PROFiCERT-product Interior Label



## A Cooperation for an independent product label

### 1. What is TÜV PROFiCERT-product Interior?

TÜV PROFiCERT-product Interior is an independent quality label for products for interior use, concerning emission and optionally further quality features. The programme offers a strict separation of testing and surveillance

from the certification procedure, taking divided between two independent companies. The TÜV PROFiCERT-product Interior brand is available as Standard and Premium variant.

### 2. How does the cooperation between EPH and TÜV work?

Within the TÜV PROFiCERT-product Interior programme, EPH GmbH is – along with TFI Aachen GmbH – responsible for the testing and surveillance. The certification decision is

made by TÜV Hessen on the basis of results of both testing and surveillance, in accordance with the criteria for the allocation of the TÜV PROFiCERT-product Interior brand.

### 3. For which products is the Label TÜV PROFiCERT-product Interior label available?

The TÜV PROFiCERT-product Interior label can be claimed for all interior products, e.g.

floorings, wall or ceiling coverings, as well as wood based panels.

#### 4. How do I get a TÜV PROFiCERT-product Interior label?

##### **Inquiry (EPH)**

- Quotation
- Contract



##### **Testing and Surveillance**

- Initial testing  
(With or without quality features)
- Initial surveillance



##### **Certification (TÜV Hessen)**

- Once in 3 years
- Entitles to brand usage
- TAB expert opinion (option)



##### **Testing and Surveillance**

- Annual surveillance
- Annual testing  
(With or without quality features)

After you have placed an inquiry for testing, surveillance and certification of your product(s) at EPH, we will ask you for the specification of the product features in order to form collections (if necessary). Then, you will receive a tailor-made quotation including all the features you are interested in. By signing the quotation, you place the order, and a contract between your company and EPH is closed.

Next, the initial testing and surveillance of your product(s) is made. The results are sent to the Certification Body, which issues one or more certificate(s), valid for three years.

The regular surveillance of the factory or factories, including sample drawing and testing, takes place at least once a year.

## 5. What does PREMIUM mean?

All products branded with the Standard TÜV PROFiCERT-product Interior label fulfil the criteria according to AgBB, CAM (Italy), French VOC-Emission Class A, Belgian Regulations on VOC emissions from construction products, LEED v4 as well as BREEAM International New Construction, General Level.

The PREMIUM label is available only for products which fulfil further, especially harsh criteria regarding the emissions. Following criteria are fulfilled in the PREMIUM-variant:

### General criteria:

- AgBB, February 2015/AgBB 2018
- MWVTB, Annex 8 (ABG)
- Emissions Class A+ according to the French VOC Regulation „Décret n° 2011-321 du 23 mars 2011"
- Belgian Regulations on VOC emissions from construction products „8 MEI 2014. – Koninklijk besluit tot vaststelling van de drempelniveaus voor de emissies naar het binnenmilieu van bouwproducten voor bepaalde beoogde gebruiken"
- CAM Italy - „Minimum environmental criteria in the procurement of planning and work services for new buildings, renovation and maintenance of buildings and the management of public administration construction sites", CRITERI AMBIENTALI MINIMI PER L’AFFIDAMENTO DI SERVIZI DI

PROGETTAZIONE E LAVORI PER LA NUOVA COSTRUZIONE, RISTRUTTURAZIONE E MANUTENZIONE DI EDIFICI PUBBLICI, decreto 11 ottobre 2017

- LEED v4 (outside North America; LEED v4 for BUILDING DESIGN AND CONSTRUCTION, April 5, 2016)
- BREEAM International New Construction 2016 (Technical Manual SD233 1.0), Exemplary Level
- Finnish M1-Classification for construction products, version 15.11.2017 (the criteria according acceptance and ammonia are not included, except of ammonia emission from smoked oak parquet.)

### In addition for parquet and wood flooring, laminate floor coverings, MMF floor coverings:

- DE-UZ 176 (Blue Angel), January 2013
- Austrian environmental label, guideline UZ 07, wood, wooden materials and wooden floor coverings, version 9.0, January 1, 2019

### In addition for resilient floor coverings:

- DE-UZ 120 (not for PVC flooring), February 2011
- Austrian environmental label, guideline UZ 42, elastic floor coverings, version 4.0, January 1, 2019 (The requirements for odour are not included)

### **In addition for textile floor coverings:**

- GUT/PRODIS (Gemeinschaft umweltfreundlicher Teppichboden e. V.) (The requirements for odour are not included.)
- DE-UZ 128 (Blue Angel) February 2016 (The requirements for odour are not included.)
- EU-Ecolabel for textile floorings (2009/967/EC)
- Austrian environmental label, guideline UZ 35, textile floor coverings, version 4.0, January 1, 2019 (The requirements for odour are not included.)

### **In addition for underlays for installation, flooring installation materials:**

- Emicode EC1<sup>Plus</sup>, 18.04.2018
- DE-UZ 113 (installation materials), June 2011
- DE-UZ 156 (flooring underlays), February 2011

### **In addition for coated and uncoated wood materials:**

- DE-UZ 76 (Blue Angel)
- Austrian environmental label, guideline UZ 07, wood, wood-based materials and floor coverings made of wood, version 9.0, January 1, 2019

## **6. Is it possible to make changes in the certificate within a certification cycle?**

Yes, you can apply for a change in your certificate (expansion/amendment, e.g. for changes in the product names) at EPH GmbH directly,

which informs after checking the certification body the TÜV Hessen.

## **7. Which quality features can be certified?**

All features included in the product standards can be tested and certified. Please contact EPH

for a detailed offer.

Test reports/certificates in the frame of TÜV PROFiCERT surveillance can be used for voluntary expert opinions as proof for fulfillment of requirements accord-

ing to MVVTB (Annex 8, ABG). The TÜV PROFiCERT certification programme was accepted by an European TAB organisation which can issue this expert opinion.

# Testing of Flooring Surfaces



The customer selects floorings after the appearance and he aspects that this appearance will be preserved as long as possible. You should use the know-how of EPH for the

evaluation of properties of flooring surfaces. You can use the extensive range of standard test methods and specific IHD standards.

## Testing of the processing properties and adhesion of coatings as well as characteristics of the appearance

- Determination of the adhesion with cross cut and pull off methods
- Determination of colour, gloss and surface structure

## Wear resistance

- Determination of abrasion, scratching and impact resistance as well as hardness and elasticity
- Determination of the resistance to cigarette burn, castor chairs and moving of furniture legs



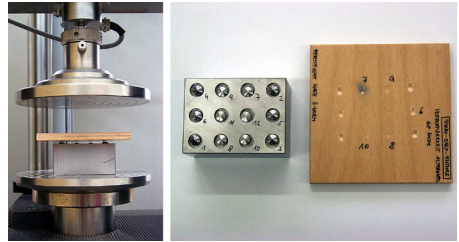
*Determination of the abrasion resistance with Taber Abraser with integrated Grit Feeder (falling sand-method)*

- Determination of the resistance to stainings and pollution



## Temperature, climate, light and ageing resistance

- Determination of the resistance against water and water vapour
- Determination of the light fastness, determination of the resistance to changing temperatures
- Determination of the resistance to changing climates (crack, colour and gloss stability) as well as dimensional stability at changing and constant climate tests



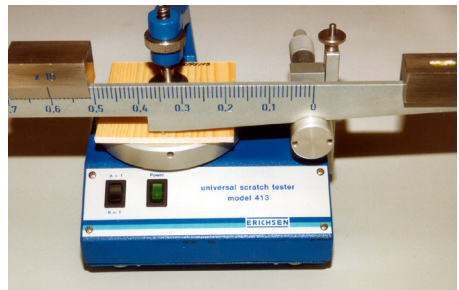
*Determination of the elasticity*

## Indoor air conditions und safety relevant properties

- Determination of the resistance to saliva and sweat and migration behaviour
- Determination of the emission behaviour and the odour of substrates, coatings and panels
- Determination of the electrostatic behaviour
- Determination of the slippery resistance with sliding measurement, pendulum and ramp devices

## Examples for testing and evaluations according to product standards

- EN 13329, ISO 14486, ISO 24334 – 24339, EN 438 – T.5, (laminat floorings)
- EN 13696, EN 1534, EN 1910, ÖNorm 2354, IHD-requirement profile (wood floorings and coatings for stairs)
- EN 14354 (veneered floorings)
- EN ISO 10581-82, ISO 10874, EN 12104, EN 13845
- EN ISO 20326 (resilient floorings)
- EN 16511 (MMF-floorings)

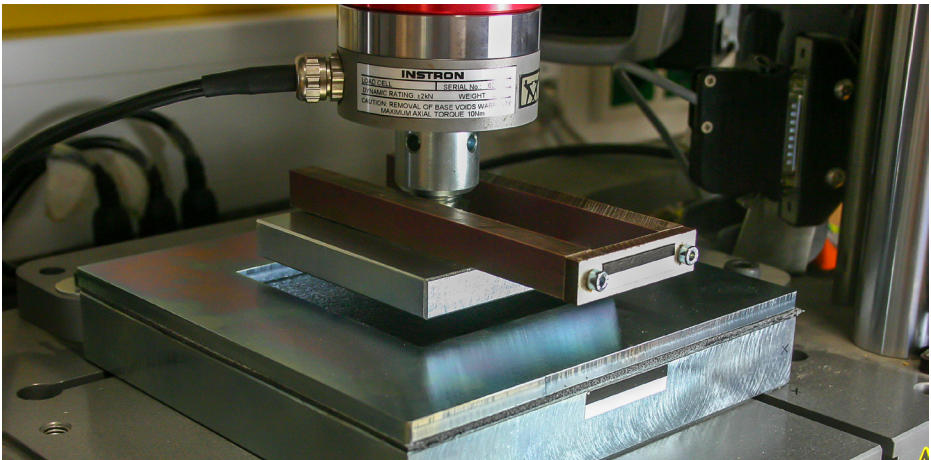


*Determination of the scratch resistance*

For the conformity evidence the test laboratory (EPH) accredited according to ISO 17025 issues test certificates with which you can demon-

strate the fulfillment of specific quality features or the external control of your manufacture.

# Testing of Underlay Materials for Laminate Flooring



## Important properties according to EN 16354:2018

### Structure-based

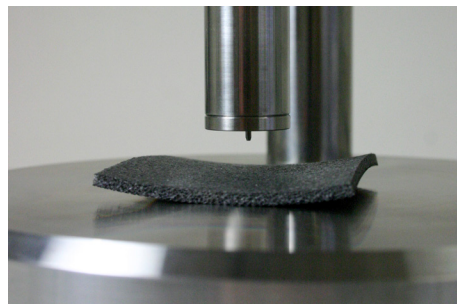
- Thermal insulation/Heated or Cold floors (R)
- Protection against uneven-ness (PC)
- Protection against moisture (SD)

### Use-based

- Protection against loads and usage (CS: Temporary exposure caused by loads, DL: Dynamic exposure caused by walking, CC: Long-term exposure caused by static loads)
- Protection against falling objects (RLB)

### Acoustics-based

- Impact sound insulation (IS)
- Reflected walking sound (RWS)



*Determination of PC-value*

## Impact sound – EN ISO 10140-3 and EN ISO 717-2

- Floor stimulation via so-called standard tapping machine
- Noise measurement in the room below (by contrast with walking noise testings)
- Result: evaluated impact noise insulation (unit: dB)



*Standard tapping machine*

## Reflected walking sound acc. to EN 16205

- Stimulation via tapping machine
- Result: Reflected Walking Sound in Sone

## Requirements

- EN 16354 table 1
- EPLF bulletin for underlay for laminate floor coverings
- MMFA bulletin for underlays for MMF - flooring
- FEP bulletin for underlays for parquets

## Reflected walking sound – IHD Works Standard 431

- Excitation of noise emissions by walking on a floor with ladies' high-heeled shoes
- Result: absolute and relative changing of the psycho-acoustic measurand "loudness" of the emitted noise (unit: Sone or %)



*Microphone for Testing*

# Resilient Floorings and Sandwich Constructions



Next to classic resilient floorings like PVC with different back layers, linoleum or cork also sandwich constructions fitted as loose panels are more and more popular. The sandwich constructions are consisting of a resilient wear layer (cork, PVC; linoleum, rubber) and a substrate based on wood based material (mainly HDF).

These panels for loose laying with standardised resilient surface are standardised in EN ISO 20326. Multilayer modular flooring (MMF) with other not standardised resilient surfaces are defined in EN 16511.

We offer you a wide spectrum of testing facilities for the quality confirmation of classic resilient floorings and sandwich constructions.

## Testing of resilient, multilayer modular or loose layed panels

### Test for product standards or technical declaration

- Abrasion resistance acc. to EN 660-2/ISO 24338
- Resistance against staining acc. to EN ISO 26987/EN 438-2
- Resistance against movement of a furniture leg/castor chairs acc. to EN ISO 16581/EN ISO 4918
- Geometrical dimensions/mass acc. to EN ISO 24341, EN ISO 24342, EN ISO 24346, EN ISO 24340, EN ISO 23997/ISO 24337
- Peel resistance and shear force acc. to EN ISO 24345/EN 432
- Residual indentation acc. to EN ISO 24343-1

- Impact resistance (big ball) acc. to EN 438-2
- Flexibility acc. to EN ISO 24344
- Dimensional stability acc. to EN 662/EN 669/  
EN ISO 23999/24339/IHD-W-487
- Thickness swelling acc. to 24336
- Locking strength acc. to 24334
- Exudations of plasticizers acc. to EN 665
- Resistance to stubbed and burned cigarettes  
acc. to EN 1399



*Determination of the electrical resistance acc. to EN 1081*

### Tests for harmonized standard EN 14041/VOC-regulation

- Reaction to fire acc. EN 9239-1/EN ISO 11925-2
- Formaldehyde emission acc. to EN 717-1/2
- PCP-Content acc. to CEN TR 14823
- Coefficient of friction acc. to EN 13893
- Electrostatic behaviour acc. to EN 1815
- Electrical resistance acc. to EN 1081
- Thermal resistance acc. to EN 12667
- VOC-Emission acc. to ISO 16000/CEN TS 16516

### Requirements (examples)

- EN ISO 10581, 10582, ISO 10874 (PVC floorings)
- EN 12104 (cork flooring tiles)
- EN ISO 20326 (panels for loose laying)
- EN 16511 (MMF floorings)

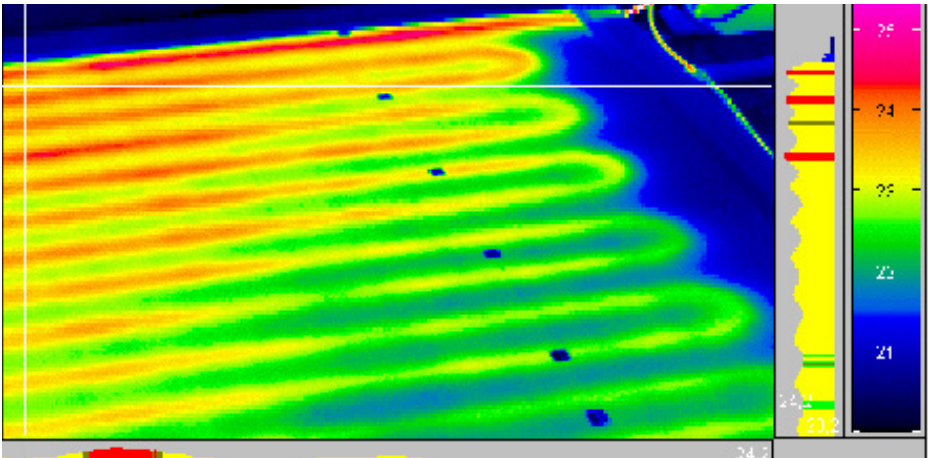


*Determination of the abrasion resistance with falling sand test*



*Determination of the locking strength of Floorings*

# Resistance against and Suitability for Floor Heatings



## Problem

With the installation of the wood- and laminate floor coverings on floor heatings the

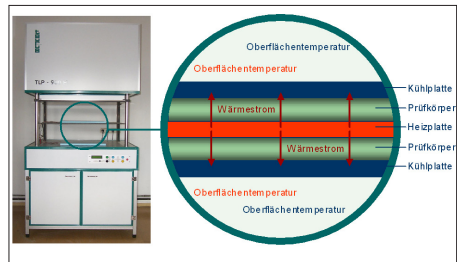
following problems have to be considered:

**Aspect resistance against floor heatings:** Due to the swelling and shrinking of the hygroscopic flooring materials opening of joints, delamination of the top layer cracks, as well as convex and concave deformations are possible. The floors should be able to resist surface temperatures of 29 °C.

**Aspect suitability for the floor heatings:** The materials have a relatively small thermal conductivity (additional insulating and compensating materials should be taken into consideration).

## Suitability for the floor heatings

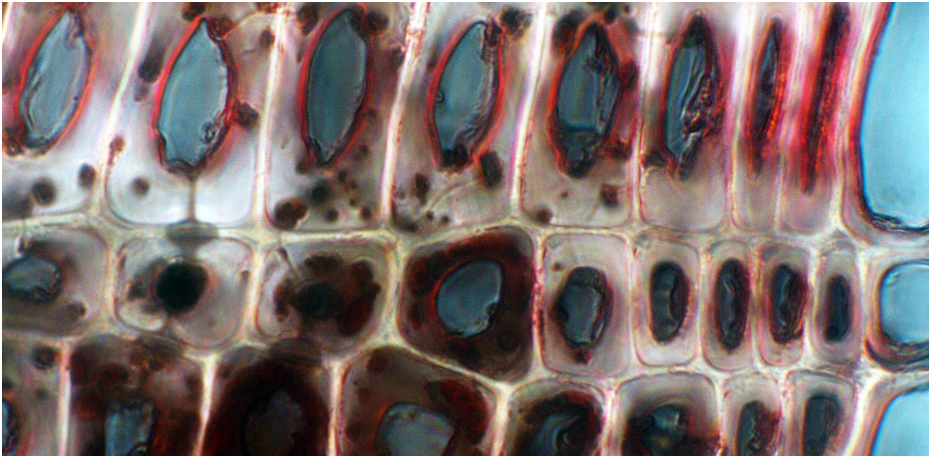
- Compliance test of requirements
  - Determination of thermal resistance of floorings by means of guarded hot plate (DIN EN 12664, DIN EN 12667)  
Requirement: thermal resistance of flooring and underlay material - 0,15 (m<sup>2</sup>\*K/W)
- Test of performance parameters
  - Determination of surface temperatures (temperature fields) of floorings by means of an infrared camera
- Optimisation of system constructions
  - Numerical method - Calculation of thermal resistance of the composition or components according to E DIN EN ISO 10077-2 and DIN EN 10211-1
  - Calculation of thermal insulation properties of the system (e.g. floor, under-



Determination of thermal resistance of a flooring

- floor heating and flooring) or the individual components (e.g. multilayer flooring)
- Optimisation of thermal insulation properties of systems or configurations of components with arbitrary number of optimisation steps
- Advantages of the method: fast, variable, cheap, large scope of evaluation

# Testing of Terrace Deckings



Deckings for terraces are influenced by abiotic (rainfall, changes of temperature and moisture, sun radiation, dirt particles) and biotic factors (fungi, algae, insects). These impacts on the optic as well as the usability of the

products. The EPH is a competent testing body for the determination of the resistance of deckings from wood and wood polymers composites (WPC).

## Biological durability

- Wood destroying and discolouring fungi
- Algae

## Field tests

- Horizontal or 45° weathering
- Soil contact

## Artificial weathering

- Xenontest, QUV, leaching, alternating climate
- Accompanying investigations:
  - Colour changes (measurement, visual)



*Fungus test of thermally modified timber (TMT)*

- Water absorption, shrinking/swelling
- Evaluation of structural changes



## Slip resistance

- Pendulum test
- Ramp test
- Dynamic friction

## Mechanical tests

- Bending strength and breaking behaviour
- Shrinking and swelling
- Creep behaviour
- Falling mass impact resistance

## Investigation of claims

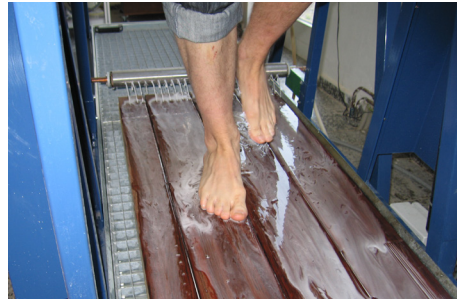
- Identification of fungi, algae and insects (microscopy, molecular biology)
- Expertises (wood quality, causes, cracks, discolouration etc.)

## European product standards for WPC

- EN 15534-1 (test method)
- EN 15534-4 (specification for deckings)



*Weathering of samples*



*Ramp test for the determination of slip resistance*

EPH is approved testing body by the Association for quality of wood composites for WPC products. Tests can be performed also in the procedure for the certification "Certification Mark TMT".

# EPH Trainee Programme "Testing/Assessment of Floorings"



Our experts are working in the ISO and CEN standardisation of floorings and in national expert groups. They have also a lot of practical experience on flooring tests. We offer you a trainee program in which we transfer our

knowledge to you connected with practical exercises in our accredited/notified test laboratory. The trainee courses can be designed individual according to the wishes of our customers:

## 1. Theoretical introduction into the European and international testing and assessment schemes for wood/parquet, semi-rigid multilayer and laminate floor coverings

- EN, ISO and selected national product standards
- Harmonised standards for CE-labelling
- Test methods for surfaces
- Test methods for mechanical and hygroscopic/thermal properties
- Emission tests and assessments to different systems (e.g. German, Belgian, French, Finnish)
- Odour test and assessment

## 2. Explanation of the principles of all relevant flooring test devices by the test specialists for the different methods on the devices in the labs

- Acoustic tests (walking and impact sound)
- Emission tests (formaldehyde, VOC, ammonia)
- Fire tests for floorings in construction and for ships
- Slippery resistance tests

- Electrostatic tests
- Light fastness and climate test on big areas
- Test for stability of connection systems
- Mechanical test for underlay materials for floorings

### 3. Practical exercises following the wish of the customers, e.g.

- Surfaces tests (all abrasion, scratch, impact and stain tests)
- Mechanical tests (locking strength, internal bond, surface soundness)
- Hygroscopic/thermal tests (swelling, dimensional stability)
- Geometrical properties

### 4. References

- Several successful individual trainee courses (in German, English or Turkish) for technical specialists from flooring industry as well lacquer producer from Belgium, Germany, Poland, Sweden, Switzerland, Turkey and USA.
- As proof, each participant receives a certificate of participation.



# Test Devices



## Emissions test chamber

The determination of formaldehyde and VOC emissions from wood-based materials, construction products and furniture is a core competence of the EPH for many years.

As accredited test body for emission testing, the EPH provides not only professional know-how but also technical equipment in terms of emission test chambers and gas analysis systems.

These test systems are especially characterised by an easy operability and a layout adapted perfectly to customer's needs as well as by an attractive price. Among others, the systems are established in the wood-based materials, binder- and furniture industry and at testing institutes. Emission testings can be conducted according to several test procedures.

We are pleased to support you on your tasks, to validate your system by appropriate comparison tests and to train your laboratory staff.

## System PK-ES (stainless steel)

- Interior volume 100 l/225 l/1 m<sup>3</sup>
- Electrically polished interior
- Digital display and recording of test parameters temperature and rel. moisture; volume flow optional acc. to customer requirements

## System PK-GS (glass)

- Interior volume 100 l and 225 l
- Digital display and recording of test parameters temperature and rel. moisture; volume flow optional according to customer requirements

## Applications

- VOC and formaldehyde emission testing according to national and international standards



## Surface test devices

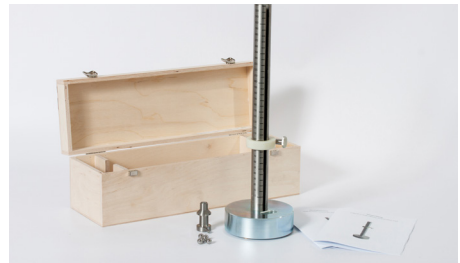
The test devices offered are based on test-methodological research of the IHD or long-term test practise of the EPH. The impact resistance device for laminate floorings according to EN 17358 was developed together with EPLF in course of an IHD research project. The other impact resistance devices are based on the long-term technical testing experience in normative testing of flooring. The equipment for pollution resistance according to IHD-W-477 was developed by IHD in the EUROPARQUET-research topic for the testing of non-film forming coatings on wooden floors.

## Impact resistance test devices for floorings:

- Impact resistance device according to EN 17368 for laminate floor coverings

## Devices for testing of surface durability

- Test appliance for determining the pollution resistance acc. to IHD-W-477



*Determination of impact resistance acc. to EN 17368 for laminate floor coverings*

# Quality and Conformity Marks

- Conformity Mark (CE mark) European Notified Body



- EPH Quality Mark "Quality proven" with external surveillance



- TÜV PROFICERT-product Interior



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Entwicklungs- und Prüflabor Holztechnologie GmbH

Zellescher Weg 24

01217 Dresden · Germany

+49 351 4662 0

[info@eph-dresden.de](mailto:info@eph-dresden.de)

[www.eph-dresden.com](http://www.eph-dresden.com)

Follow us on LinkedIn 

## Contact persons

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Dr.-Ing.

**Rico Emmler**

+49 351 4662 268

[rico.emmler@eph-dresden.de](mailto:rico.emmler@eph-dresden.de)



Managing Director EPH

Head of Notified Body · Head of seminar ·  
Product manager floorings

Dipl.-Ing.

**Andreas Möschner**

+49 351 4662 407

[andreas.moeschner@eph-dresden.de](mailto:andreas.moeschner@eph-dresden.de)



Head of Laboratory

Surface testing · Surface test devices

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Dipl.-Ing.

**Martina Broege**

+49 351 4662 340

[martina.broege@eph-dresden.de](mailto:martina.broege@eph-dresden.de)



Head of Laboratory

Chemical analysis · Emission/odour

Dipl.-Ing.

**Jens Gecks**

+49 351 4662 243

[jens.gecks@eph-dresden.de](mailto:jens.gecks@eph-dresden.de)



Head of Laboratory

Mechanical testing · Floor systems

---

Dipl.-Ing.

**Petra Schulz**

+49 351 4662 316

[petra.schulz@ihd-dresden.de](mailto:petra.schulz@ihd-dresden.de)



Head of Department

Surface

B. Eng.

**Andris Pokulis**

+49 351 4662 271

[andris.pokulis@eph-dresden.de](mailto:andris.pokulis@eph-dresden.de)



TÜV-PROFICERT · Surveillance body

---

Dipl.-Biol.

**Katharina Plaschkies**

+49 351 4662 334

[katharina.plaschkies@eph-dresden.de](mailto:katharina.plaschkies@eph-dresden.de)



Biological testing

Dipl.-Ing. (BA)

**Robert Piatkowiak**

+49 351 4662 391

[robert.piatkowiak@eph-dresden.de](mailto:robert.piatkowiak@eph-dresden.de)



Reaction to fire

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Dipl.-Phys.

**Heiko Kühne**

+49 351 4662 259

[heiko.kuehne@eph-dresden.de](mailto:heiko.kuehne@eph-dresden.de)



Acoustic properties · Underlay materials

Dipl.-Ing. (FH)

**Michael Peter**

+49 351 4662 360

[michael.peter@eph-dresden.de](mailto:michael.peter@eph-dresden.de)



Surface testing · CE-Test laboratory

