





European Quality Standards

Product Standards (simplified and based on 20 x 20 cm (BIII), or 30 x 30 cm (BI))	Extruded Ceramic Tiles DIN EN 14411		Dry-pressed Ceramic Tiles DIN EN 14411		Test Standards
	group AI _a + AI _b "Nature" "Precision"	group AII _a -part 1 "Nature" "Precision"	group BI _a + BI _b	group BIII	
A) Dimensions + Surfaces					
1. Length and Width	± 2% ±1.0%	± 2% ±1.25%	± 0.6%	± 0.5%	DIN EN ISO 10545-2
2. Thickness	± 10% ± 10%	± 10% ± 10%	± 5%	± 10%	DIN EN ISO 10545-2
3. Straightness of Edges	± 0.6% ± 0.5%	± 0.6% ± 0.5%	± 0.5%	± 0.3%	DIN EN ISO 10545-2
4. Rectangularity	± 1.0% ± 1.0%	± 1.0% ± 1.0%	± 0.5%	± 0.5%	DIN EN ISO 10545-2
5. Surface Flatness					DIN EN ISO 10545-2
5.1 Curvature at Centre	± 1.5% ± 0.5%	± 1.5% ± 0.5%	± 0.5%	+ 0.5/-0.3%	DIN EN ISO 10545-2
5.2 Curvature at the Edges	± 1.5% ± 0.5%	± 1.5% ± 0.5%	± 0.5%	+ 0.5/-0.3%	DIN EN ISO 10545-2
5.3 Skewness	± 1.5% ± 0.8%	± 1.5% ± 0.8%	± 0.5%	± 0.5%	DIN EN ISO 10545-2
6. Surface Quality	at least 95%	at least 95%	at least 95%	at least 95%	DIN EN ISO 10545-2
7. Colour Deviations	•	•	•	•	DIN EN ISO 10545-16
7.1 Colour Shade Grading	•	•	•	•	Deutsche Steinzeug
8. Size Grading ¹⁾	•	•	•	•	Deutsche Steinzeug
B) Physical Properties				glazed	
1. Water Absorption on average / max. individual value	AI _a E ≤ 0.5%/0.6% AI _b 0.5% < E ≤ 3%/3.3%	≤ 6/6.5%	BI _a ≤ 0.5% BI _b ≤ 3%	> 10%	DIN EN ISO 10545-3
2. Modulus of Rupture Value in brackets = min. individual value	AI _a min. 28 (21) N/mm ² AI _b min. 23 (18) N/mm ²	min. 20 (18) N/mm ²	BI _a min. 35 (32) N/mm ² BI _b min. 30 (27) N/mm ²	Thickness < 7.5mm: 15 N/mm ² Thickness ≥ 7.5mm: 12 N/mm ²	DIN EN ISO 10545-4
2.1 Breaking Strength ≥ 7.5 mm thickness	AI _a min. 1300 N AI _b min. 1100 N	at least 950 N	BI _a min. 1300 N BI _b min. 1100 N	at least 600 N	DIN EN ISO 10545-4
2.2 Break. Str. < 7.5 mm thickness	at least 600 N	at least 600 N	at least 700 N	at least 200 N	DIN EN ISO 10545-4
3. Resistance to Shock	•	•	•	•	DIN EN ISO 10545-5
4. Resistance to Deep Abrasion	≤ 275 mm ³	≤ 393 mm ³	≤ 175 mm ³	–	DIN EN ISO 10545-6
5. Resistance to Glaze Abrasion	0-5	0-5	0-5	0-5	DIN EN ISO 10545-7
6. Max. Coefficient of Expansion	•	•	•	•	DIN EN ISO 10545-8
7. Thermal Shock Resistance	•	•	•	•	DIN EN ISO 10545-9
8. Moisture Expansion	< 0.001 mm/m	< 0.001 mm/m	appr. 0.001 mm/m	appr. 0.01 mm/m	DIN EN ISO 10545-10
9. Resistance to Glaze Cracking	required	required	required	required	DIN EN ISO 10545-11
10. Thermal Conductivity	appr. 1 W/mK	appr. 1 W/mK	appr. 1 W/mK	appr. 0.8 W/mK	Deutsche Steinzeug
11. Electrical Leakage Resistance	> 10 ¹⁰ Ohm ³⁾	> 10 ¹⁰ Ohm ³⁾	10 ¹⁰ Ohm	10 ¹⁰ Ohm	DIN EN 1081
12. Steam Diffusion Resistance	appr. μ 120,000	appr. μ 120,000	appr. μ 120,000	appr. μ 100,000	DIN EN ISO 12572
13. Resistance to Frost	required	not required, but met by AGROB BUCHTAL	required	–	DIN EN ISO 10545-12
14. Light and Colour Fastness	•	•	•	•	DIN 51094
15. Luminance	acc. to specifications	acc. to specifications	acc. to specifications	acc. to specifications	Deutsche Steinzeug
16. Behaviour in Fire	A1/A1 _{fl}	A1/A1 _{fl}	A1/A1 _{fl}	A1/A1 _{fl}	DIN 4102/DIN EN 13501-1
C) Chemical Properties²⁾					
1. Resistance to Chemicals	see test certificate	see test certificate	see test certificate	see test certificate	DIN EN ISO 10545-13
2. Resistance to Household Chemicals and Bath Water Additives	min. GB or UB	min. GB or UB	min. GB or UB	–	
3. Stain Resistance (glazed)	min. Cl. 3	min. Cl. 3	min. Cl. 3	min. Cl. 3	DIN EN ISO 10545-14
4. Lead and Cadmium Delivery	•	•	•	•	DIN EN ISO 10545-15
5. HT	see test certificate	see test certificate	see test certificate	see test certificate	Deutsche Steinzeug
D) Slip resistance					
1. Coefficient of Friction	•	•	•	•	E-DIN EN ISO 10545-17
1.1 Industrial Areas (BG) Trade Associations	Groups R9-13/V4-10	Groups R9-13/V4-10	Groups R9-13/V4-10	–	DIN 51130 DGUV-R 108-003 (BGR 181)
1.2 Barefoot Areas (BUK) German National Association of Accident Insurance Companies	Groups A/B/C	Groups A/B/C	Groups A/B/C	–	DIN 51097 DGUV-I 207-006 (GUV-I 8527)

1) Boxes marked according to size and colour shade.

2) Hydrofluoric acid and its compounds excluded.

3) Exceptions:

KerAion ELA 10.6: Electrical Leakage Resistance 10⁶ Ohm (DIN EN 1081)

Deutsche Steinzeug tiles present better values than required by the standards.

In addition, they are construction biologically, ecologically, hygienically and bacteriologically safe; this is guaranteed through the choice of raw materials, method of processing and firing technique.

Terms and Classification according to DIN EN 14411

All our tiles consist of natural raw materials such as clay, quartz sand and feldspars, which are processed, refined and fired. Depending on the application they are manufactured with a glazed (GL) or unglazed (UGL) surface. They can be classified in accordance with DIN EN 14411 as follows:

Classification of the ceramic tiles according to their groups of water absorption (E) and their shaping

Shaping	group I E ≤ 3%	group II _a 3% < E ≤ 6%	group II _b 6% < E ≤ 10%	group III E > 10%
A extruded tiles	group AI _a E ≤ 0.5% (Annex L)	group AII _{a-1} ^{a)} (Annex B)	group AII _{b-1} ^{a)} (Annex D)	group AIII (Annex F)
	group AI _b 0.5% < E ≤ 3% (Annex A)	group AII _{a-2} ^{a)} (Annex C)	group AII _{b-2} ^{a)} (Annex E)	
B dry-pressed tiles	group BI _a E ≤ 0.5% (Annex G)	group BII _a (Annex I)	group BII _b (Annex J)	group BIII _{b)} (Annex J)
	group BI _b 0.5% < E ≤ 3% (Annex H)			

- a) The groups AII_a and AII_b are subdivided into two parts (parts 1 and 2) with different product requirements.
- b) Group BIII essentially applies to glazed tiles. There is a small number of dry-pressed unglazed tiles manufactured with a water absorption of more than 10% to which this product group does not apply.

Traditionally the following terms are used:

Extruded tiles

(marked with A)

Tiles that are cut off with a certain length from a bar formed from the plastic mass by means of an extruder.

Dry-pressed tiles

(marked with B)

Tiles that are formed from a finely ground and subsequently granulated mass by pressing under high pressure.

Split tiles are frost-resistant, extruded double-tiles which are fired at a temperature of up to max. 1,280 °C in upright position.

Stoneware tiles are frost-resistant, single extruded vitrified tiles with a firing temperature of appr. 1,260 °C.

KerAion® is the unique extruded ceramic large-size panel from AGROB BUCHTAL.

Vitrified dry-pressed tiles are frost-resistant, single dry-pressed tiles with a firing temperature of up to 1,200 °C.

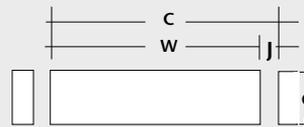
Porcelain stoneware stands for especially densely sintered tiles with a water absorption of < 0.5 %.

Mosaics are small porcelain stoneware tiles stuck onto sheets.

Earthenware tiles are non-frost-resistant, single dry-pressed tiles with a firing temperature of up to appr. 1,100 °C.

The water absorption E in weight-% is determined in accordance with DIN EN ISO 10545-3.

Description of dimensions



Coordinating dimension (C) in cm = Work size (W) + joint (J)

Work size (W) in mm = Dimensions of the visible surfaces and thickness (d)

Dimensions and Surfaces

1-5. Dimensions, DIN EN ISO 10545-2

All dimensions are determined in accordance with the standard.

Permissible length and width tolerances corresponding to the product standards						
DIN EN 14411	group AI _a / AI _b (25x12.5 cm)		group AII _a (25x12.5 cm)		group BII _a / BII _b (30x30 cm)	group BIII (10x10 cm)
	"Nature"	"Precision"	"Nature"	"Precision"		
Deviation from the work size	± 2%	± 1.0%	± 2%	± 1.25%	± 0.6%	± 0.5%
Deviation from the average side length	± 1.5%	± 1.0%	± 1.5%	± 1.0%	± 0.5%	± 0.5%

The work sizes of our **special pieces** are given according to visual sides.

6. Surface Quality, DIN EN ISO 10545-2

The surfaces of 1 m² or 30 pieces are tested at 300 lux for visible defects at a distance of 1 m.

7. Colour Deviations, DIN EN ISO 10545-16

Glazed mono-coloured products with values of Δ E_{cmc} < 0.75 are considered as identical in colour; the value of 1.0 applies to unglazed mono-coloured products.

7.1. Colour Shade Grading

The colour shade code is stamped on the box. Only identical colour shades will result in a uniform surface look. In the case of rustic split tiles greater colour deviations are normal. During laying, tiles from different boxes should be mixed.

8. Size Grading

The production sizes vary for technical reasons. The production size is coded and stamped on the box. Only boxes with the same coding should be laid together. According to VOB, the differences are evened out in the joints.

All references to as well as quotations from product and test standards are to be considered as information which is not binding. The latest versions apply.

Physical Properties

1. Water Absorption, DIN EN ISO 10545-3

The **water absorption (E)** gives the weight increase in % as compared to the dry weight of boiled samples saturated with water.

1.1 Apparent Density, DIN EN ISO 10545-3

It gives the ratio between mass and external volume.

2. Modulus of Rupture, DIN EN ISO 10545-4

The breaking strength **F** is determined on samples by means of the three-point load in N. From this, the modulus of rupture and the breaking load are calculated according to the following formula.

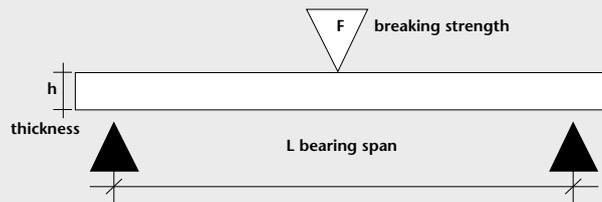
Modulus of Rupture

$$R = \frac{3 \cdot F \cdot L}{2 \cdot b \cdot h^2}$$

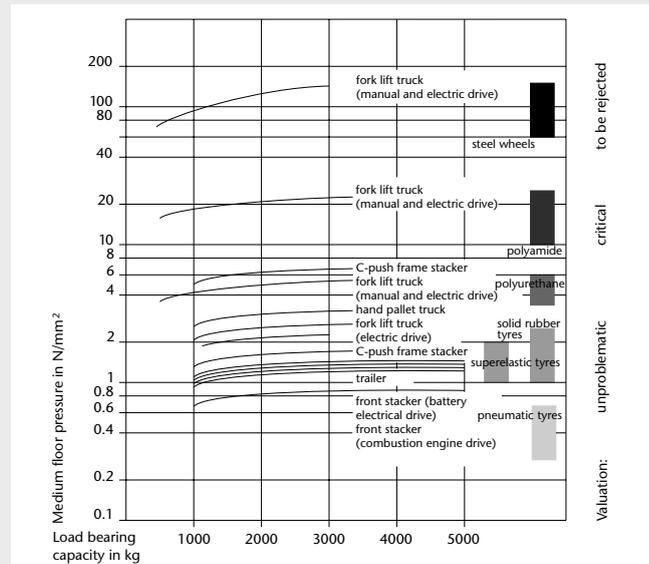
F = breaking strength in N
L = bearing span in mm
b = width in mm
h = thickness in mm
R = modulus of rupture

Breaking Load

$$S = \frac{F \cdot L}{b}$$



Possible Applications	Stress Group
Breaking strength under 1,500 N, normal duty, e.g. housing construction, swimming pools	1
Breaking strength 1,500 – 3,000 N, practicable with pneumatic tyres, e.g. trade and administration, exhibitions and sales areas	2
Breaking strength 3,000 – 5,000 N, practicable with elastic and solid rubber tyres, e.g. trade and industry Floor pressure up to 6 N/mm ²	3
Breaking strength 5,000 – 8,000 N, practicable with vulkollan tyres, e.g. industry and hypermarkets Floor pressure 6-20 N/mm ²	4
Breaking strength above 8,000 N, practicable with polyamide tyres, e.g. heavy-duty areas Floor pressure above 20 N/mm ²	5



Important note:

The "application possibilities" are of course only recommendations, as the method and quality of laying are decisive factors. Our recommendations are based on conventional, professional laying. With increasing mechanical load as well as harder tyres a thicker tile is required.

All references to as well as quotations from product and test standards are to be considered as information which is not binding. The latest versions apply.

Mechanical Strength

Deutsche Steinzeug offers tiles in thicknesses from 5 up to 22 mm for extreme loads in industrial and commercial areas.

The breaking load values of our products partly are by far better than the values required by DIN EN 14411 (the relevant test certificates will be made available on request).

The calculated breaking load indicates the suitability for floors subject to mechanical loads. The stress itself is caused by bending rather than by pressure. The "extra strong" tiles from our programme with their high pressure, breaking and bending strength values are the ideal covering for floors subject to heavy loads. They withstand the wheels of industrial trucks, fork lift trucks and platform lift-trucks with their high floor pressure. They are especially suitable as floor coverings for industrial logistics, hyper- and supermarkets.

Floor pressure in N/mm² of industrial truck wheels according to a FMPA test in Stuttgart

The table illustrates the floor loads and indicates the effect of the different wheel types: steel wheels should be rejected and polyamide (Nylon and Perlon) is not advisable. Softer tyres (≤ 75 Shore-A-Hardness) as well as larger wheel diameters and wider supporting surfaces are especially advantageous.

3. Compressive Strength

The compressive strength of tiles is not standardized. In the case of vitrified dry-pressed tiles it reaches values of up to 150 N/mm². The following conversion table shows the importance of a perfect and professional embedding of the tiles on site. The relatively low values for cement and thin-bed mortar can only be compensated by special and professional laying (mortar composition, water/cement value and manual or mechanical compression).

4. Resistance to Shock, DIN EN ISO 10545-5

Rebound measurement with 5 samples.

5. Resistance to Deep Abrasion, DIN EN ISO 10545-6

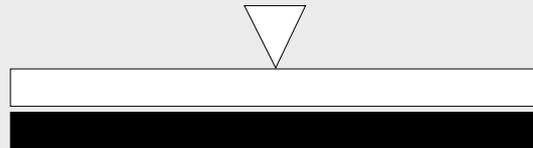
With regard to the deep abrasion on unglazed tiles, the abrasion is determined by means of fusion corundum and a rubbing plate. The lower the value, the higher the wear resistance of the material.

6. Glaze Abrasion, DIN EN ISO 10545-7

The stress group of glazed tiles is established in the wet test. Artificial abrasion is produced with the help of aluminium oxide grains, steel balls and the addition of water in an eccentrically revolving system. The number of revolutions at which a visible change of the test surface occurs results in the following classification:

Resistance to Surface Abrasion	
Class	Revolutions
0	100
1	150
2	600
3	750/1500
4	2100/6000/12000
5	>12000*

* Must pass the stain test according to DIN EN ISO 10545-14.



Vitrified material has a compressive strength approx. 10 - 20 times higher than cement mortar, cast plaster floors and reinforced concrete.

Conversion table for different materials

Types of material	N/mm ²	N/cm ²	KN/cm ²
Vitrified dry-pressed tiles	100 – 150	25,000 – 30,000	25 – 30
Extruded split tiles	180 – 250	18,000 – 25,000	18 – 25
Cement mortar Gr. III	10	1,000	1
High-grade cement mortar	20	2,000	2
Thin-bed mortar	15 – 30	1,500 – 3,000	1.5 – 3
Epoxy resins	60 – 75	6,000 – 7,500	6 – 7.5
Cement screed CT, C12 (ZE 12)	12	1,200	1.2
CT, C20 (ZE 20)	20	2,000	2
CT, C30 (ZE 30)	30	3,000	3
Mechanically resistant floor 65	65	6,500	6.5
Reinforced concrete C 20/25 (B 25)	25	2,500	2.5
C 30/37 (B 35)	35	3,500	3.5

Class 0

The use of glazed tiles of this class for floor coverings is not recommended.

Class 1

Floor coverings in areas mainly walked on in soft footwear or barefoot and not exposed to abrasive dirt (e.g. bathrooms and bedrooms without direct access from outside).

Class 2

Floor coverings in areas occasionally walked on with soft or normal footwear and exposed to only little abrasive dirt (e.g. rooms in living areas of houses, except kitchens, entrances and similar heavily frequented rooms). This does not apply to special footwear such as e.g. hobnailed boots.

Class 3

Floor coverings in areas frequently walked on with normal shoes and exposed to little abrasive dirt (e.g. kitchen-cum-living-rooms, halls, corridors, balconies, loggias and terraces). This does not apply to special footwear such as e.g. hobnailed boots.

Class 4

Floor coverings walked on regularly and exposed to little abrasive dirt, so that they are subject to greater stress as in the case of class 3 (e.g. commercial kitchens, hotels, exhibition and sales rooms).

Class 5

Floor coverings subject to heavy pedestrian traffic over long periods of time and exposed to little abrasive dirt, so that they are subject to the most extreme stress under which glazed tiles can be applicable (e.g. public areas such as shopping centres, entrance halls of airports, hotel foyers, public footpaths and industrial applications).

Every floor covering is subject to wear. This depends on the area of application and the frequency of use, the kind and degree of dirt as well as the hardness and resistance to wear of the covering material. While unglazed vitrified floor tiles can be used practically anywhere, glazed floor tiles have to be categorized according to stress groups. Scrapers, mats and the like help to remove dirt and abrasives and to protect glazed floor coverings. Something of this kind has to be provided especially in rooms with direct access from outside or from the garden.

Extreme Stress

For such areas we recommend the use of integrally coloured, unglazed tiles, which are available in a wide range of colours and sizes. Examples: floors subject to high traffic loads, e.g. in supermarkets, hotels, schools, administrative buildings, railway stations, hospitals, passageways, etc., taking into account the mechanical load.

7. Coefficient of Expansion, DIN EN ISO 10545-8

The coefficient of expansion is ascertained between room temperature and 100°C. The measured values are at around 10⁻⁶ m/m*K in the case of vitrified materials. At 8 m length and 50° temperature difference the result is an expansion of 2.4 mm (in the case of screed/concrete 4.6 mm and steel 5.6 mm).

8. Thermal Shock Resistance, DIN EN ISO 10545-9

The thermal shock resistance is tested between 15° and 145°C.

9. Moisture Expansion, DIN EN ISO 10545-10

The moisture expansion is determined between tempered and water-saturated samples.

10. Resistance to Glaze Cracking, DIN EN ISO 10545-11

This test takes place in the autoclave at 500 KPa with subsequent colour control.

Glazes with hair cracks/crazes are marked as such and require the wetting of the covering prior to pointing to avoid deposits of fine particles of the pointing mortar in the hair cracks. Coloured pointing compounds are not suitable in the case of these glazes. The glaze surfaces must not be marked with felt-tip pen and the like.

11. Thermal Conductivity etc.

Thermal conductivity, heat radiation and storage capacity as well as the thermal resistance are not standardized. Vitrified material produces the following approximate values:

Thermal conductivity:	1 W/mK	Heat storage capacity:	0.8 kJ/kgK
Heat radiation:	5.3 W/m ² K ⁴	Thermal resistance:	0.01 m ² K/W

These are excellent values compared to other building materials.

12. Electrical Leakage Resistance

With a volume resistance of > 10¹⁰ Ohm (DIN EN 1081), our ceramics is insulating in dry condition. With the series Eladuct and KerAion ELA 10.6, however, we offer ceramics for floors capable of discharging static electricity. The glaze of ELA 10.6 has a surface resistance of approx. 10⁶ Ohm according to DIN EN 1081. The discharge of static electricity is effected from the glaze via conductive joints and tile adhesive into copper strips to be connected to earth, which are laid on the base to be tiled. In the case of Eladuct, the complete tile body is capable of discharging static electricity. Here, conductive joints are not required; apart from that, the base has to be carried out as described for ELA 10.6.

13. Steam Diffusion Resistance

According to DIN EN ISO 12572 the steam diffusion resistance is approx. μ 120,000 in the case of vitrified material/split tiles and μ 100,000 in the case of earthenware (excluding joints).

14. Resistance to Frost, DIN EN ISO 10545-12

The test for frost resistance is carried out on 10 samples or > 0.25 m² samples. After water saturation under vacuum the samples are checked for defects after 100 frost-thaw alternations.

The resistance to frost of an outdoor flooring, however, does not only depend on the quality of the ceramic tiles used. **Professional construction and laying are essential.** For this, please refer to our specifications and the notice of the umbrella organization of the German building and construction industry "Outdoor Tiled and Paved Coverings".

15. Light and Colour Fastness

Both glazed and unglazed ceramics are light- and colour-fast according to DIN 51094.

16. Luminance

The lightness value of a tile describes the brightness of the surface as perceived by the human eye. The measuring value Y = 100 corresponds to the brightness of an absolutely white surface, and Y = 0 to that of an absolutely black surface. The lightness value is determined for mono-coloured tiles.

17. Behaviour in Fire

Ceramic tiles are classified A 1 according to EN ISO 13501-1 and DIN EN 14411. Therefore, they are generally non-combustible and thus fire-resistant. Also in the case of fire they do not release any toxic emissions.

Chemical Properties

1. Resistance to Chemicals, DIN EN ISO 10545-13

Resistance to Household Chemicals and Bath Water Additives

- Household chemicals
 - Ammonium chloride solution 100g/l
- Bath salts
 - Sodium hypochlorite solution 20mg/l

Classes

- unglazed: UA/UB/UC*
- glazed: GA/GB/GC*

Resistance to Acids and Alkalis

- Low concentration (L)
 - a) Hydrochloric acid solution 3% (V/V)
 - b) Citric acid solution 100g/l
 - c) Potassium hydroxide solution 30g/l
- High concentration (H)
 - a) Hydrochloric acid solution 18% (V/V)
 - b) Lactic acid solution 5% (V/V)
 - c) Potassium hydroxide solution 100g/l

Classes

- unglazed: ULA/ULB/ULC or UHA/UHB/UHC*
- glazed: GLA/GLB/GLC or GHA/GHB/GHC*

Acid Protection and Apparatus Engineering

The resistance for acid protection engineering DIN EN 993-16 or chemical apparatus engineering DIN 28062 is subject to individual tests.

* Class A shows the highest resistance to chemicals, which decreases more and more towards C.

2. Stain Resistance, DIN EN ISO 10545-14

Stain Forming Substances

- Stain forming substances, leaving traces
 - Green stain forming substances in oil
 - Red stain forming substances in oil
- Chemical stain forming substances
 - Iodine, 13g/l in alcohol
- Stain forming substances, forming a film
 - Olive oil

Cleaning (within the framework of the test)

- Cleaning agent
 - Hot water (+55 °C)
 - Weak cleaning agent
 - Strong cleaning agent
- Solvent
 - Hydrochloric acid solution 3% (V/V)
 - Potassium hydroxide 200g/l
 - Acetone

Classes

Cl. 5 / Cl. 4 / Cl. 3 / Cl. 2 / Cl. 1*

3. Lead and Cadmium Delivery

The glazed surfaces are exposed to an acetic acid solution. Then, the quantity of the delivered lead and cadmium is determined.

* Class 5 shows the highest stain resistance, which decreases more and more towards 1.

Surface Coatings and Upgradings

HT

HT is a highly effective and durable coating of tiles and panels of Deutsche Steinzeug.

The coating baked onto the surface on the base of titanium dioxide uses the principle of the photocatalysis.

It offers the user the following advantages:

A) HT decomposes bacteria and germs

The surface is activated by sunlight or artificial lighting. Activated oxygen forms, which decomposes microorganisms.

B) HT eliminates disagreeable odours

Disagreeable or even unhealthy odours in the air are also eliminated by HT.

C) HT reduces the cleaning efforts

The hydrophilic surface makes it possible for water to get under the dirt. In this way the quantity of cleaning agents is considerably reduced, which means a contribution to environmental protection and the saving of time for manual works at the same time.

HT surfaces are odourless, non-poisonous, meet the requirements for food and are completely harmless for persons suffering from allergies.

Laying and pointing are carried out by the usual techniques. The conventional agents (without hydrofluoric acid and its compounds) are applicable for cleaning. All additives forming a film, leaving fat on the surface or impregnating are excluded, which impair the surface activation by light.

Renowned institutes in Germany and abroad have confirmed us the corresponding effects of HT.

Protecta Surface Upgrading



Better Beats Good ...

Unglazed vitrified tiles are hard-wearing and resistant by nature. Thanks to the Protecta surface upgrading, the stain and dirt resistance could be improved considerably: during the firing process, the coating applied in-plant is ceramically bonded to the biscuit and closes the existing "micropores" quite natural for unglazed ceramics. In this way, the penetration of substances forming stains is prevented. Thus, an impregnation is no longer required and may possibly even have a negative effect in the case of slip-resistant tiles with Protecta surface upgrading, as the impregnating agent can not penetrate the tile but remains on the surface as lubricating film.

Products with Protecta surface upgrading are marked with this symbol in the corresponding series:



Hygiene

Glazed tiles and tiles with Protecta surface upgrading of Deutsche Steinzeug ensure the best possible hygiene conditions. Thanks to the closed surface, they offer no possibility for germs to proliferate. Tests of institutes for hygiene confirm the suitability for the covering of drinking water reservoirs. Hyper-sensitive people such as those suffering from allergies make the best experiences with tiles.

Cleaning

On principle, claddings and coverings must be protected by appropriate measures against heavy soiling which may be caused in particular by subsequent construction works (painting etc.). Our tiles can generally be cleaned with water and a neutral or alkaline cleaning agent.

In the case of hard water, the sporadic use of acid cleaning agents is required. In the case of stains, cleaning depends on the type of stains and has to be carried out with suitable chemicals.

In the case of a higher concentration of the cleaning agent used, subsequent wiping with clear water is required. Rinsing with clear water is absolutely necessary when carrying out a basic cleaning. Cleaning agents containing maintenance additives are not recommended by us. They usually reduce the slip resistance and cause a negative visual appearance of the floor covering by forming layers! Important: the use of cleaning machines with pads containing abrasive grain has a polishing effect by which the slip resistance of the tiles is considerably reduced. We therefore expressly disapprove of such methods. Hydrofluoric acid or its compounds attack the ceramics and cause irreversible damage!

You will find detailed cleaning instructions for ceramic tiles on the Internet at www.agrob-buchtal.de

- Service
- Architects & Planners / Dealers / Tilers
- Cleaning Instructions.

Impregnation

Unglazed stoneware without Protecta surface upgrading or HT coating should be impregnated in order to prevent the penetration of coloured liquids, fats and oils and to facilitate cleaning.

The impregnating agent must be applied on the clean and dry floor; excess material must be removed immediately.

Slip Resistance

1. Coefficient of Friction/Slip Resistance

Workshop rules as well as accident prevention regulations require floors to be smooth, slip-resistant and easy to clean. Special protective measures against slipping are necessary where there is a risk as a result of the use of water, oil, slush, grease or waste. This should be taken into consideration when choosing the surface material. This clear requirement is based on investigations carried out by the insurance companies, which proved that slipping is the primary cause of accidents.

1.1. Industrial Areas

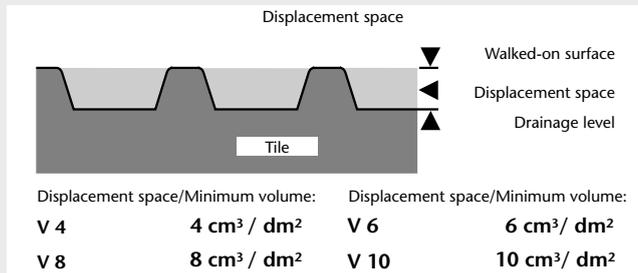
Competent authority:

Deutsche Gesetzliche Unfallversicherung,
Mittelstraße 51, 10117 Berlin-Mitte, tel.: +49 (0)30 28876-3800,
fax: -3808, www.dguv.de, info@dguv.de

Test standard: DIN 51130

Code of practice: DGUV regulation 108-003 "Floors in work rooms and work areas with high risk of slipping" (previous BGR 181)

Test procedure: Inclined plane, safety footwear worn, test medium oil. The surface finish can be smooth, fine-rough, rough or profiled.



The displacement space (V4-V10) is the open space between the upper walked-on surface and the drainage level of profiled surfaces.

Valuation Groups

In a detailed table (see next page) the required valuation groups are assigned to work areas where there is a high risk of slipping. Information is available from Deutsche Gesetzliche Unfallversicherung and AGROB BUCHTAL.

Test on "inclined plane"

Valuation groups	Angle of inclination	Industrial + commercial areas
R9	> 6°- 10° low static friction	
R10	> 10°- 19° normal static friction	
R11	> 19°- 27° increased static friction	
R12	> 27°- 35° high static friction	
R13	> 35° very high static friction	

The indicated angles of inclination exclusively serve for the assignment of the valuation groups and can not be equated with the angles of inclination of slopes/ramps.

Slip-resistant tiles are marked with the logo "GRIP" in the corresponding series:



10.10 Technical Information

Legal Basis

Workshop rules as well as accident prevention regulations require floors to be smooth, slip-resistant and easy to clean. The brochure "Technische Regel für Arbeitsstätten" ASR. A 1.5/1.2 "Floors" (Code of practice for work areas) contains detailed requirements.

Publisher:

Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (Ausschuss für Arbeitsstätten) [Federal institute for safety at work and occupational medicine (Committee for work areas)]

Available at:

Download at www.baua.de

0 General work rooms and areas*)

0.1	Entrance areas, indoors**)		R9
0.2	Entrance areas, outdoors		R11 (or R10 V4)
0.3	Stairs, indoors***)		R9
0.4	Outdoor stairs		R11 (or R10 V4)
0.5	Inclined ramps, indoors***) (e.g. for wheel chairs, compensation slopes, routes of transport)	One R-group higher than that required for the covering of the access area	V-value of the covering of the access area, where applicable
0.6	Sanitary rooms		
0.6.1	Toilets		R9
0.6.2	Changing rooms and washrooms		R10
0.7	Break rooms (e.g. recreation room, company canteens)		R9
0.8	First aid rooms and comparable facilities (see ASR A4.3)		R9

1 Manufacture of margarine, edible fats and oils

1.1	Melting of fat		R13 V6
1.2	Cooking oil refinery		R13 V4
1.3	Margarine production and packaging		R12
1.4	Cooking fat production and packing, oil bottling		R12

2 Milk processing, cheese production

2.1	Fresh milk processing and butter production		R12
2.2	Cheese production, storage and packaging		R11
2.3	Icecream manufacturing		R12

3 Chocolate and confectionery production

3.1	Sugar processing		R12
3.2	Cocoa production		R12
3.3	Production of raw mixtures		R11
3.4	Fabrication of chocolate bars and shells and filled chocolates		R11

4 Production of bread, cakes and pastries

	(bakeries, cake shops, production of long-life bakery products)		
4.1	Dough preparation		R11
4.2	Rooms in which predominantly fats or liquid mixtures are processed		R12
4.3	Washing-up rooms		R12 V4

5 Slaughtering, meat processing

5.1	Slaughter-house		R13 V10
5.2	Tripe processing room		R13 V10
5.3	Meat sectioning		R13 V8
5.4	Sausage kitchen		R13 V8
5.5	Boiled sausage unit		R13 V8
5.6	Raw sausage unit		R13 V6
5.7	Sausage drying room		R12
5.8	Gut store		R12
5.9	Salting and curing rooms, smoking establishments		R12
5.10	Poultry processing		R12 V6
5.11	Cold cuts and packaging unit		R12
5.12	Workshop with sales area		R12 V8 ****)

6 Fish processing, production of delicatessen

6.1	Fish processing		R13 V10
6.2	Production of delicatessen		R13 V6
6.3	Manufacture of mayonnaise		R13 V4

7 Processing of vegetables

7.1	Production of sauerkraut		R13 V6
7.2	Vegetable tinning		R13 V6
7.3	Sterilizing rooms		R11
7.4	Rooms in which vegetables are prepared for processing		R12 V4

8 Wet areas in food and beverage production

	(if not specifically mentioned)		
8.1	Storage cellars		R10
8.2	Beverage bottling, fruit juice production		R11

9 Catering establishments

9.1	Kitchens in the catering trade (restaurant kitchens, hotel kitchens)		R12
9.2	Kitchens catering for homes, schools, day-care facilities for children, sanatoria		R11
9.3	Kitchens catering for hospitals, clinics		R12
9.4	Large kitchens catering for industrial and university canteens, and contract catering		R12 V4

9.5	Food preparation kitchens (fast food kitchens, convenience restaurants and snack bars)		R12
9.6	Kitchens for heating up frozen meals		R10
9.7	Coffee and tea kitchens, hotel garni kitchens and ward kitchens		R10
9.8	Washing-up rooms		
9.8.1	Washing-up rooms for 9.1, 9.4, 9.5		R12 V4
9.8.2	Washing-up rooms for 9.2		R11
9.8.3	Washing-up rooms for 9.3		R12
9.9	Dining rooms, guest rooms, canteens including serving counters		R9

10 Cold stores, deep freeze stores

10.1	for unpacked goods		R12
10.2	for packed goods		R11

11 Sales outlets, shops

11.1	Reception of goods, meat		
11.1.1	for unpacked goods		R11
11.1.2	for packed goods		R10
11.2	Reception of goods, fish		R11
11.3	Serving counters for meat and sausage		
11.3.1	for unpacked goods		R11
11.3.2	for packed goods		R10
11.4	Serving counters for meat and sausages, packed goods		R10
11.5	Serving counters for dairy products and delicatessen, unpacked goods		R10
11.6	Serving counters for fish		
11.6.1	for unpacked goods		R12
11.6.2	for packed goods		R11
11.7	Serving counters, except for nos. 11.3 to 11.6		R9
11.8	Meat preparation rooms		
11.8.1	for meat preparation, except for no. 5		R12 V8
11.8.2	for meat processing, except for no. 5		R11
11.9	Florists shops		R11
11.10	Sales areas with ovens		
11.10.1	for the production of bread, cakes and pastries		R11
11.10.2	for the warming up of prefabricated bread, cakes and pastries		R10
11.11	Sales areas with chip pans or grills		R12 V4
11.12	Shops, customer rooms		R9
11.13	Preparation areas for food for self-service shops		R10
11.14	Cash register areas, packing areas		R9
11.15	Outdoor sales areas		R11 (or R10 V4)

12 Health service rooms

12.1	Disinfection rooms (wet)		R11
12.2	Pre-cleaning areas of sterilization		R10
12.3	Faeces disposal rooms, discharge rooms, unclean nursing work rooms		R10
12.4	Pathological facilities		R10
12.5	Rooms for medical baths, hydrotherapy, fango preparation		R11
12.6	Washrooms of operating theatres, plastering rooms		R10
12.7	Sanitary rooms, ward bathrooms		R10
12.8	Rooms for medical diagnosis and therapy, massage rooms		R9
12.9	Operating theatres		R9
12.10	Wards with hospital rooms and corridors		R9
12.11	Medical practices, day clinics		R9
12.12	Pharmacies		R9
12.13	Laboratories		R9
12.14	Hairdressing salons		R9

13 Laundry

13.1	Rooms with continuous-flow washing machines or with spin-drier		R9
13.2	Rooms with washing machines at which the clothes are taken out dripping wet		R11
13.3	Ironing rooms		R9

14 Fodder concentrate production

14.1	Dried fodder production		R11
14.2	Fodder concentrate production using fat and water		R11 V4

15 Leather production, textiles

15.1	Wet areas in tanneries		R13
15.2	Rooms with fleshing machines		R13 V10
15.3	Areas where leather scraps accumulate		R13 V10
15.4	Rooms for making leather impermeable by means of grease		R12
15.5	Dye mills for textiles		R11

16 Paint shops

16.1	Wet grinding areas		R12 V10
16.2	Powder coating		R11
16.3	Painting		R10

17 Ceramics industry

17.1	Wet grinding mills (processing of ceramic raw materials)		R11
17.2	Mixers; handling of materials like tar, pitch, graphite and synthetic resins		R11 V6
17.3	Presses (shaping); handling of materials like tar, pitch, graphite and synthetic resins		R11 V6
17.4	Moulding, pressure die casting areas		R12
17.5	Glazing areas		R12

18	Glass and stone processing	
18.1	Stone cutting, stone grinding	R11
18.2	Glass shaping of hollow glass ware, container ware	R11
18.3	Grinding areas for hollow glass ware, flat glass	R11
18.4	Insulating glass manufacture; handling of drying agents	R11 V6
18.5	Packaging, shipping of flat glass; handling of anti-adhesive agents	R11 V6
18.6	Etching and acid polishing facilities for glass	R11
19	Cast concrete factories	
19.1	Concrete washing areas	R11
20	Storage areas	
20.1	Storage areas for oils and fats	R12 V6
20.2	Storage areas for packed food	R10
20.3	Outdoor storage areas	R11 (or R10 V4)
21	Chemical and thermal treatment of iron and metal	
21.1	Pickling plants	R12
21.2	Hardening shops	R12
21.3	Laboratory rooms	R11
22	Metal processing, metal workshops	
22.1	Galvanizing shops	R12
22.2	Grey cast iron processing	R11 V4
22.3	Mechanical processing areas (turnery, milling shop), punching room, pressroom, drawing shop (pipes, wires) and areas exposed to increased stress by oil and lubricants	R11 V4
22.4	Parts cleaning areas, exhaust steam areas	R12
23	Vehicle repair workshops	
23.1	Repair and servicing bays	R11
23.2	Working and inspection pits	R12 V4
23.3	Car washing halls, washing areas	R11 V4
24	Aircraft repair workshops	
24.1	Aircraft hangars	R11
24.2	Repair hangars	R12
24.3	Washing halls	R11 V4
25	Sewage treatment plants	
25.1	Pump rooms	R12
25.2	Rooms for sludge draining facilities	R12
25.3	Rooms for screening equipment	R12
25.4	Stands of workplaces, scaffolds and maintenance platforms	R12
26	Fire brigade buildings	
26.1	Vehicle parking places	R12
26.2	Rooms for hose maintenance equipment	R12
27	Functional rooms in the respiratory protection training facility	
27.1	Preparation room	R10
27.2	Fitness room	R10
27.3	Training room	R11
27.4	Sluice	R10
27.5	Target room	R11
27.6	Acclimatization room	R11
27.7	Control room	R9
28	Schools and day-care facilities for children	
28.1	Entrance areas, corridors, assembly halls	R9
28.2	Class rooms, group rooms	R9
28.3	Stairs	R9
28.4	Toilets, washrooms	R10
28.5	Instructional kitchens in schools (also see no. 9)	R10
28.6	Kitchens in day-care facilities for children (also see no. 9)	R10
28.7	Machine rooms for wood processing	R10
28.8	Special rooms for handicrafts	R10
28.9	Schoolyards	R11 (or R10 V4)
29	Financial institutions	
29.1	Counter areas	R9
30	Plant traffic routes in outdoor areas	
30.1	Footpaths	R11 (or R10 V4)
30.2	Loading platforms	
30.2.1	covered	R11 (or R10 V4)
30.2.2	not covered	R12 (or R11 V4)
30.3	Sloping ramps (e.g. for wheel-chairs, loading platforms)	R12 (or R11 V4)
30.4	Tank-up areas	
30.4.1	covered	R11
30.4.2	not covered	R12
31	Parking areas	
31.1	Garages, car-parks not exposed to weather influences*****)	R10
31.2	Garages, car-parks exposed to weather influences	R11 (or R10 V4)
31.3	Open-air parking areas	R11 (or R10 V4)

*) For floors in wet areas walked on barefoot, see the DGUV information 207-006 "Floor coverings in wet barefoot areas" (previous GUV-I 8527).

**) Entrance areas according to number 0.1 are all areas with direct access from outside and in which moisture from outside can be brought (also see point 6 para. 3, utilization of products absorbing dirt and moisture). For adjoining areas or other rooms with large surfaces, point 4 para. 10 of ASR A1.5/1,2 has to be observed.

***) Stairs and ramps according to numbers 0.3 and 0.5 are those possibly exposed to moisture brought in from outside. For adjoining areas, point 4 para. 10 of ASR A1.5/1,2 has to be observed.

****) If the same floor covering was laid in all areas, the displacement space can be lowered down to V4 after a risk assessment (taking into consideration the cleaning method, the working processes and the quantity of slippery substances on the floor).

*****) The pedestrian areas which are not subject to a risk of slipping because of weather influences such as driving rain or moisture brought in.

Floors in rooms must not present any irregularities, cavities or dangerous slopes; stumbling must be impossible on these floors.

Floors are to be designed without inclination. Exception: functional inclinations, e.g. for the drainage of liquids.

In areas which must be continuously frequented in the scope of their normal utilization, the slip resistances of the different floor surfaces must not differ from each other to such an extent that there may be a risk of stumbling and slipping. This may be the case if the surface qualities within one floor covering (e.g. because of covers, markings or films glued on the floor) or of adjoining floors differ from each other with regard to the slip resistance by more than one R-group.

Entrances of buildings have to be designed in such a way that dirt and moisture brought in do not cause a risk of slipping. This can be achieved by providing clean-off zones in the form of mats absorbing the dirt and the moisture, which are specially designed for the expected pedestrian traffic with regard to their length, width and the material used and are at least 1.5 m long in the direction of walking over the whole width of the passage.

If liquids or slippery substances get on the floor to such an extent that there is a risk of slipping for persons, adequate measures have to be taken. Fluid liquids, for example, can be discharged by a sufficient slope of the floor (e.g. a slope of at least 2 per cent in the case of liquids with a flow behaviour similar to that of water). The discharge of liquids via traffic routes should be avoided, if possible. An adequate measure against the risk of slipping due to slippery substances such as e.g. oil or leftovers are floor coverings with a sufficient displacement space.

10.12 Technical Information

1.2. Barefoot areas

Competent authority:

Deutsche Gesetzliche Unfallversicherung, Mittelstraße 51, 10117 Berlin-Mitte, tel.: +49 (0)30 28876-3800, fax: -3808, www.dguv.de, info@dguv.de, www.unfallkassen.de.

Floors in wet barefoot areas, e. g. swimming pools, hospitals as well as dressing rooms, washrooms and showers in sports and work facilities.

Test standard: DIN 51097.

Code of practice: DGUV information 207-006 "Floor coverings in wet barefoot areas" (previous GUV-I 8527).

Testing method: Inclined plane, walked on barefoot, wetting agent solution as test medium.

The surfaces are smooth, micro-rough or slightly profiled. "Non-slip" glazes with their micro-rough surfaces have proved to be excellent in practice.

The various areas are assigned to the valuation groups. Information can be obtained from Deutsche Gesetzliche Unfallversicherung and AGROB BUCHTAL.

Valuation group A

- Barefoot passages and sanitary areas (nearly dry)
- Individual and common dressing rooms
- Pool floors in non-swimmer areas if the water depth is more than 80 cm in the entire area
- Sauna and relaxation areas (nearly dry)

Valuation group B

- Barefoot passages and sanitary areas, if not classified in group A
- Showers
- Steam baths
- Area of disinfecting spray facilities
- Pool surrounds
- Pool floors in non-swimmer areas if the water depth is less than 80 cm in certain areas
- Non-swimmer sections of wave-action pools
- Movable floors
- Paddling pools
- Ladders and stairs outside the pool area
- Accessible surfaces of diving platforms and diving boards, if not classified in group C
- Sauna and relaxation areas, if not classified in group A

Valuation group C

- Ladders and stairs leading into the water
- Stairs up to diving facilities and water slides
- Surfaces of diving platforms and diving boards over the length reserved for the diver (the slip-resistant surface of the diving platforms and diving boards must cover the front edge where the hands and the toes of the divers grip)
- Walk-through pools
- Inclined pool edge designs
- Kneipp basins, water-treading basins
- Ramps in the pool surround area

Test on "inclined plane"

Valuation groups	Angle of inclination	Barefoot area
A	$\geq 12^\circ$	
B	$\geq 18^\circ$	
C	$\geq 24^\circ$	

The indicated angles of inclination exclusively serve for the assignment of the valuation groups and can not be equated with the angles of inclination of slopes/ramps.

1.3. Measurement of sliding friction

Competent authority:

Deutsche Gesetzliche Unfallversicherung, Mittelstraße 51, 10117 Berlin-Mitte, tel.: +49 (0)30 28876-3800, fax: -3808, www.dguv.de, info@dguv.de, www.unfallkassen.de.

Test standard: DIN 51131

Code of practice: DGUV information 208-041 "Assessment of the risk of slipping under operating conditions" (previous GUV-I 8687).

This test is not a type examination and thus is neither suitable for the choice of floor coverings at the planning stage nor for classification in a slip-resistance valuation group. The method can be applied, e.g. for assessing the success of cleaning measures or in the event of planned changes of utilisation.

For the choice of a floor covering, DGUV information 108-003 (previous BGR 181) and DGUV information 207-006 (previous GUV-I 8527) respectively must be applied exclusively!

1.4. Private areas

With regard to slip resistance, ceramic floor coverings in private areas are not subject to standard regulations. Independent of that, however, we recommend that you choose slip-resistant tiles according to your personal safety requirements.

List of Addresses

Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA)
 (Federal institute for safety at work and occupational medicine)
 Friedrich-Henkel-Weg 1-25, 44149 Dortmund
 Telephone: +49-231-9071-0, fax: -2454,
 www.baua.de, poststelle@baua.bund.de

DGVV Rules and Regulations (BG/GUV)
Deutsche Gesetzliche Unfallversicherung
 Mittelstraße 51, 10117 Berlin-Mitte,
 Telephone: +49-30-28876-3800, fax: -3808,
 www.dguv.de, info@dguv.de

DIN/EN/ISO Standards Sheets
 Deutsches Institut für Normung e.V., 10772 Berlin
 Telephone: +49-30-2601-0, fax: -60,
 www.din.de, peter.anthony@din.de,
 Available from:
 Beuth Verlag GmbH, Burggrafenstraße 6,
 10787 Berlin, Telephone: +49-30-2601-2201-0, fax: -1260,
 www.beuth.de, info@beuth.de

KOK Directives for Swimming Pool Construction
Construction Directives for Medical Baths
RK-List of Tested Cleaning Agents
DGfdB Rules and Regulations
 Deutsche Gesellschaft für das Badewesen e.V.,
 Alfredstraße 73, 45130 Essen
 Telephone: +49-201-87969-0, fax: -20,
 www.boeb.de, info@boeb.de
 Directly available from the publisher

Deutscher Industrieverband Keramische Fliesen und Platten e. V.
 Luisenstraße 44, 10177 Berlin
 Tel. 030/27 59 59 74-0, www.fliesenverband.de

ZDB Notices
Professional Association for Tiles and Natural Stone in the
Central Association of the German Construction Industry, Berlin
 Kronenstr. 55-58, 10117 Berlin-Mitte,
 Telephone: +49-30-20314-0, fax: -419,
 www.fachverband-fliesen.de, info@fachverband-fliesen.de
 Available from:
 Verlagsgesellschaft Rudolf Müller GmbH & CoKG,
 Stolberger Straße 84, 50933 Köln
 Telephone: +49-221-5497-0, fax: -326,
 www.baufachmedien.de. vbv@rudolf-mueller.de

Quality Controls
 Quality controls are carried out by:
 - manufacturers themselves with strict sorting
 - controls and special tests by the Deutsche Steinzeug laboratories
 - individual and batch testing by external material testing institutions in Germany and abroad

Certificates

The characteristics and the quality of our products are constantly tested by acknowledged material testing institutions. The corresponding test certificates are available.



Register number: P1B017/01



10.14 Special Pieces for Barrier-free Building



Register number: P1B017/01

Shower Tub System – Plural non-slip/Plural unglazed/ Emotion GRIP/Basis 3/Basis 2 +/Valley

The shower tub system consists of special tiles for realizing a shower tub integrated in the tile covering.

The shower tub system is a registered design. It meets the requirements of DIN 18024 "Barrier-free building" and DIN 18025 "Barrier-free living" and has been awarded the "Barrier-free. DIN tested" test symbol (except Valley) (Register number: P1B017/01).

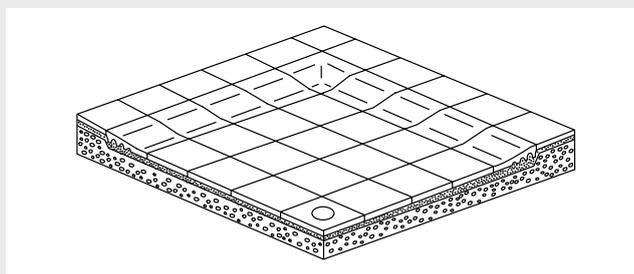
In Germany, the 10 mm lip means that it is possible to take full advantage of various housing grants.

The 100 mm modular dimension inclusive of a 3 mm wide joint guarantees perfectly hygienic tile coverings with a narrow joint width and accurately sized tiles.

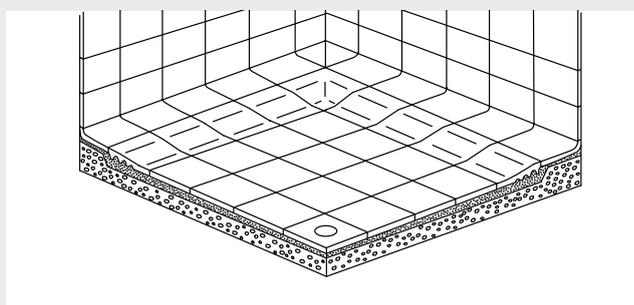
As with all slip-resistant surfaces of Plural non-slip/Plural unglazed/ the series Emotion GRIP/the series Basis 3/Basis 2 +/the series Valley, the surfaces of both the glazed and the ceramically upgraded unglazed tiles are very easy to clean.

The shower tub system is predestined for wet areas in hospitals, sanatoriums, rehabilitation centres, old people's and nursing homes, but also for showers in commercial areas, swimming pool, sauna and sports facilities, hotel and private bathrooms.

1. The shower tub is a module with the necessary slope that can be integrated in the joint grid of the tile covering as required.



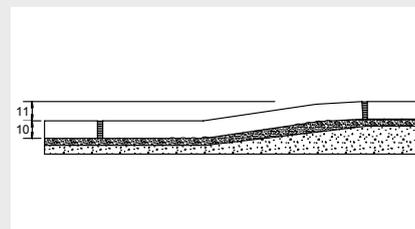
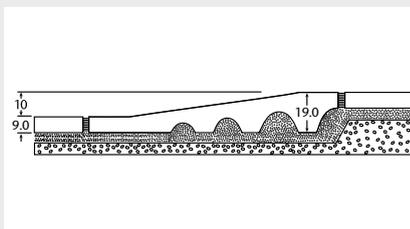
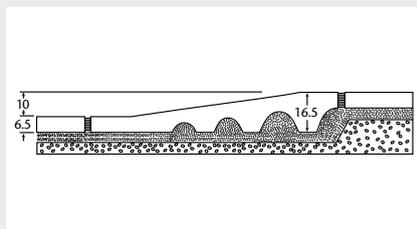
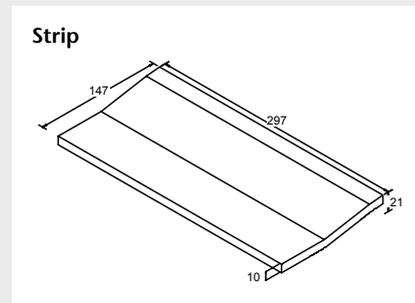
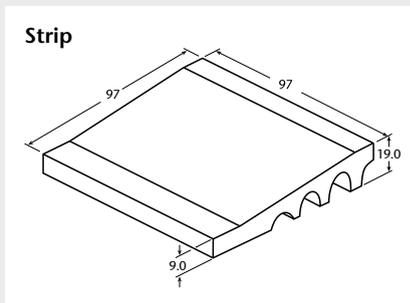
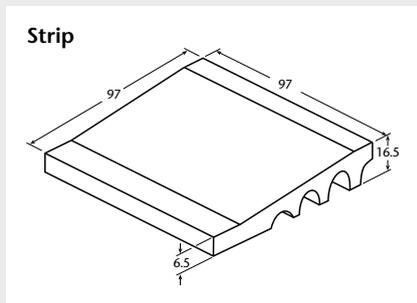
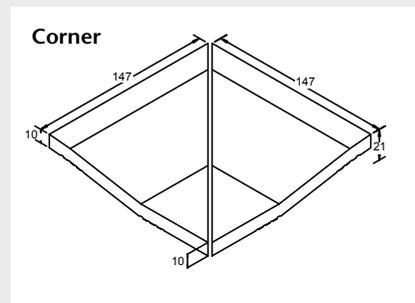
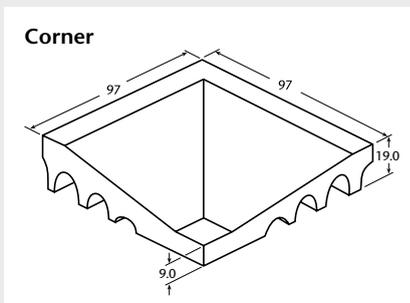
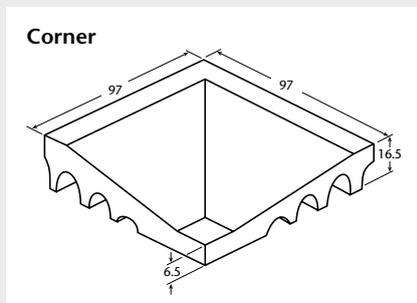
2. In combination with the cove skirting laid horizontally, a rounded transition between floor and wall covering is possible.



Plural non-slip, Plural unglazed

Emotion GRIP/Basis 3 Softcorn, Basis 2 +

Valley





Register number: P1B017/01

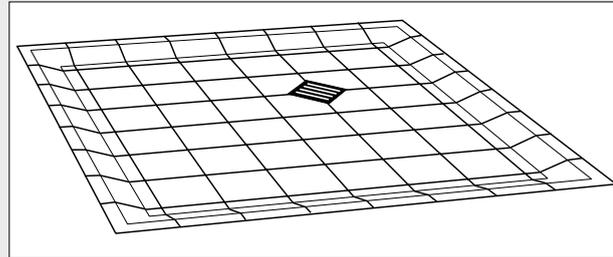
The Shower Tub System of the Series Marino, Capestone, Chroma Pool/Chroma unglazed – Quantum and Rovere

This shower tub system consists of only two components: the strip and the one-piece corner belonging to it.

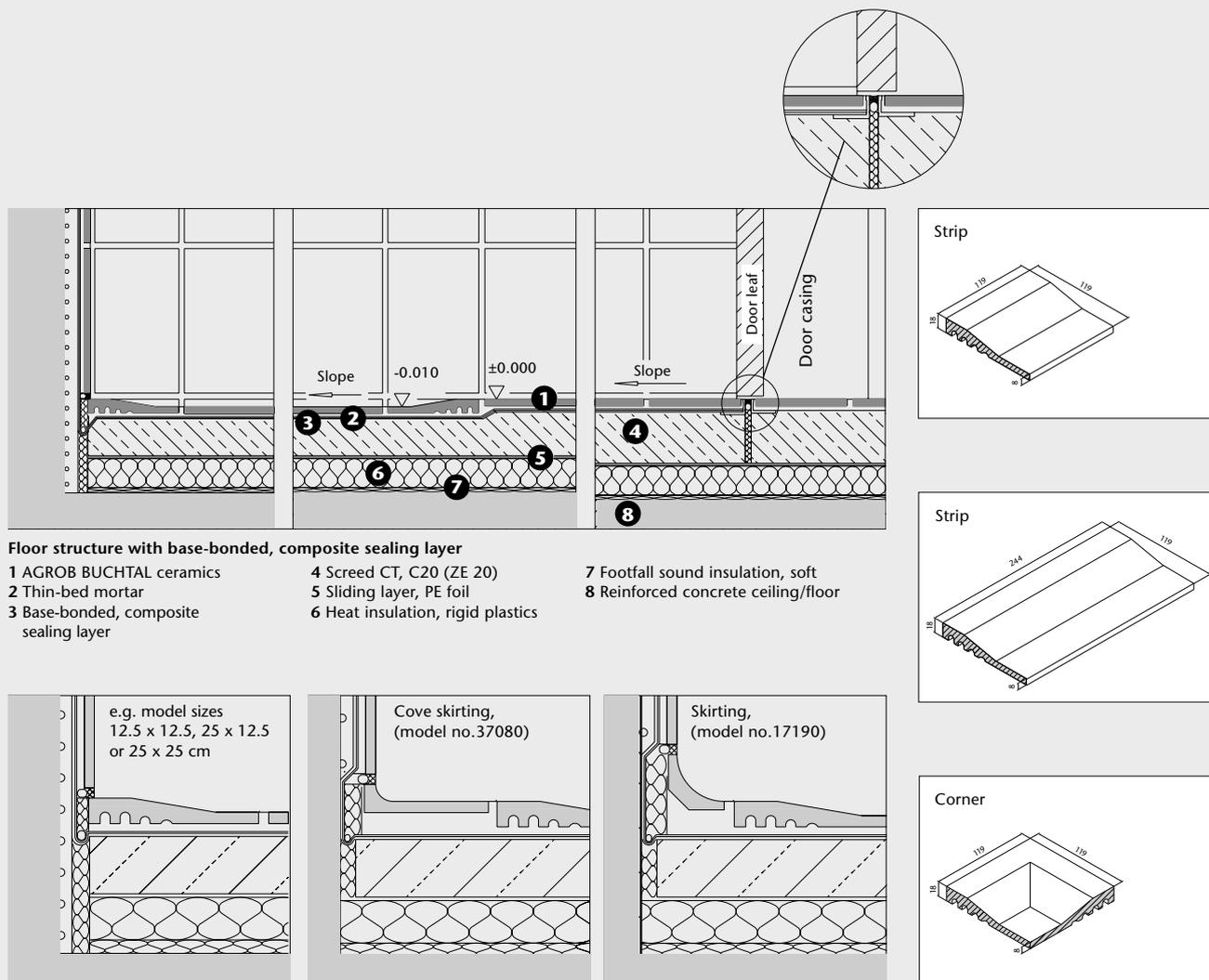
A peculiarity of the system is the special form of the slope which provides a difference in height of 10 mm. The edge of the shower tub designed in this manner is easy to pass on foot and with a wheel-chair. The relevant requirements (e.g. DIN 18024 or 18025) with regard to barrier-free construction taking into account the needs of senior and handicapped persons are effectively supported in this way.

Thanks to the "integrated slope" the time-consuming execution of the edge of the shower tub on site is no longer required, and together with the even lower side facilitating laying the processing of these tiles is absolutely simple:

The shower tub system is perfectly completed by the series Marino, Capestone, Chroma Pool/Chroma unglazed - Quantum and Rovere.



The shower tub system is based on a grid size of 12.5 x 12.5 cm. This permits a very variable dimensioning of the shower tub independent of standard dimensions and a harmonious integration in the shower installation or sanitary block.



Wall connection variants

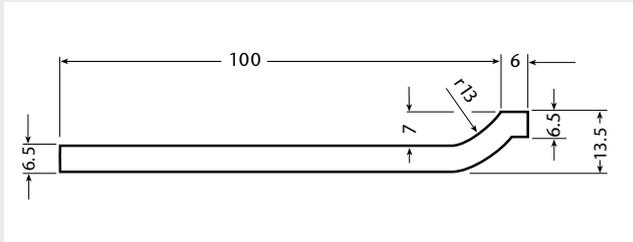
The shower tub systems of AGROB BUCHTAL are laid on a continuous cement screed and therefore do not require a high-maintenance movement joint between shower tub and adjoining areas.

All references to as well as quotations from product and test standards are to be considered as information which is not binding. The latest versions apply.

10.16 Details

Cove Skirting 10 x 10, 10 x 15, 10 x 20 and 10 x 30 cm (details)

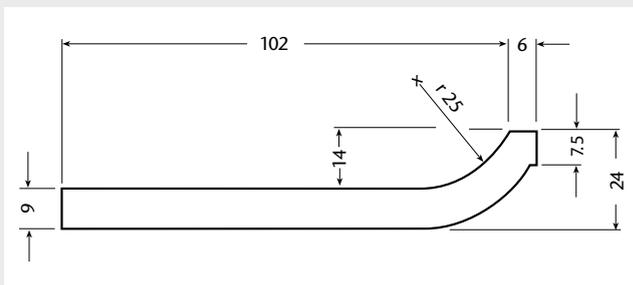
Cove Skirting 10 x 10 cm



Plural/Plural non-slip, smooth and slip-resistant, 10 x 10 cm
Basis 2, smooth, 10 x 10 cm
 glazed, length 97 mm

Basis 3, smooth, 10 x 10 cm, unglazed

Cove Skirting 10 x 10, 10 x 15, 10 x 20 and 10 x 30 cm



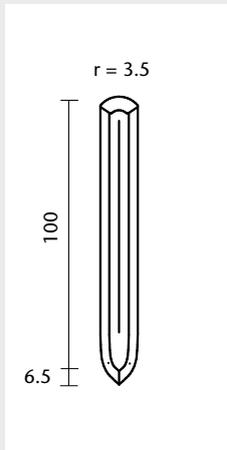
Fitting to:

Emotion GRIP, smooth or Softcorn
 10 x 10, 10 x 15,
 10 x 20, 10 x 30 cm, unglazed

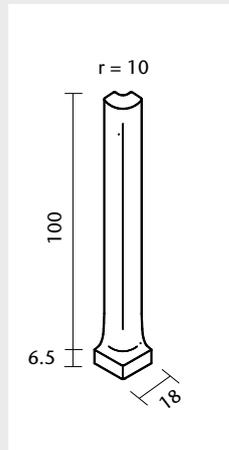
Basis 2 +, 10 x 10,
 10 x 20 cm, glazed

Basis 3, smooth 10 x 15,
 10 x 20 cm, unglazed

Internal Corner



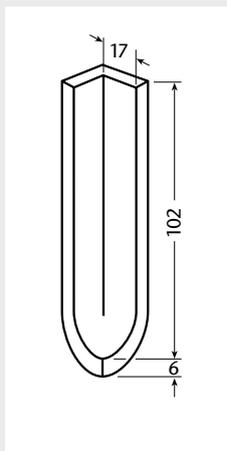
External Corner



Fitting to cove skirting:

Plural non-slip, 10 x 10 cm, glazed

Internal Corner



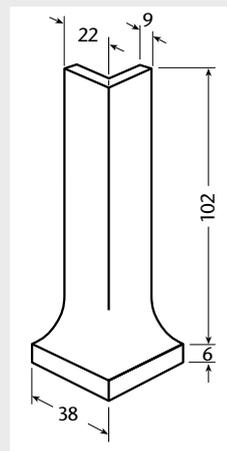
Fitting to cove skirting:

Emotion GRIP,
 10 x 10, 10 x 15, 10 x 20
 and 10 x 30 cm, unglazed

Basis 2 +, 10 x 10 cm, glazed

Basis 3, 10 x 15 and
 10 x 20 cm, unglazed

External Corner



Fitting to cove skirting:

Emotion GRIP,
 10 x 10, 10 x 15, 10 x 20
 and 10 x 30 cm, unglazed

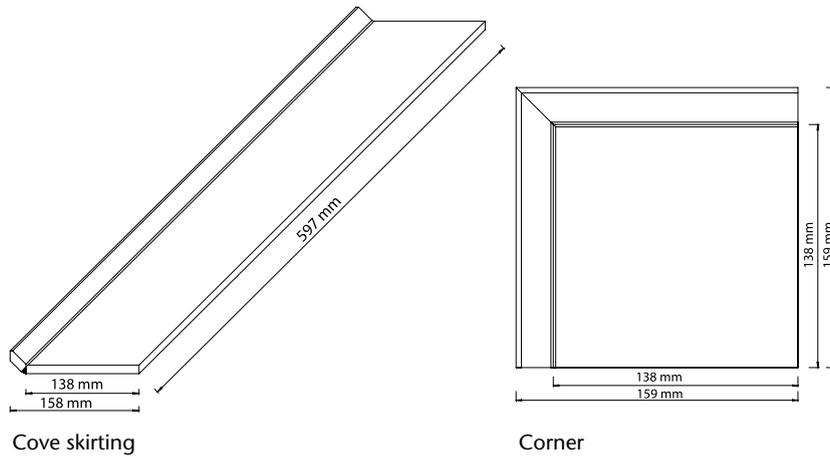
Basis 2 +, 10 x 10 cm, glazed

Basis 3, 10 x 15
 and 10 x 20 cm, unglazed

Porcelain stoneware cove skirtings 15 x 60 cm and porcelain stoneware internal corners 15 x 15 cm

Details:

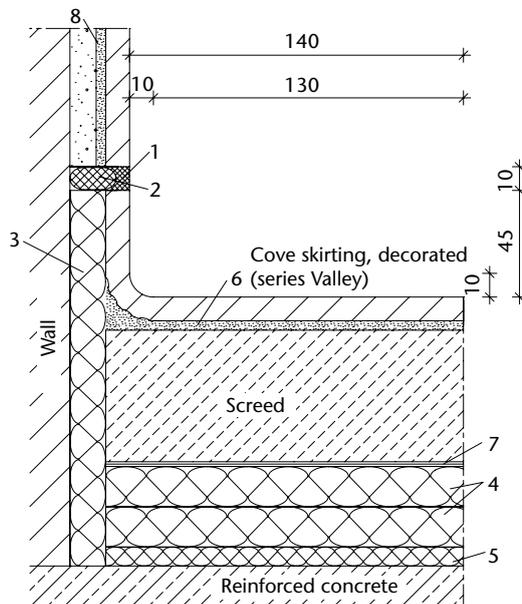
Can be manufactured from every porcelain stoneware tile. The look and the haptics correspond to those of the adjoining surface, i.e. both the same structure and the same colour are guaranteed. Minimum order quantity for the skirtings: 50 pieces; corner: 50 pieces.



Porcelain stoneware cove skirtings 15 x 60 cm, series Valley

Details:

Can be manufactured from every porcelain stoneware tile (group BI₃). The look and the haptics correspond to those of the adjoining surface, i.e. both the same structure and approximately the same colour are guaranteed. Minimum order quantity for the skirtings: 500 pieces



1. PCI Silcoferm Ve
2. PCI Polyband or separating foil
3. Water-resistant elastic filling material
4. Heat insulation, rigid plastics
5. Footfall sound insulation, soft
6. Thin-bed mortar
7. Sliding layer, PE foil
8. Thin-bed laying on rendering

10.18 Glazed edges, natural stone and glass decoration elements

Glazed edges – earthenware tiles (10% per delivery)

	15 x 15 cm	15 x 20 cm	15 x 30 cm	20 x 20 cm	20 x 40 cm
Longitudinal edge	yes	yes	yes	yes	no
Short edge	no	no	no	no	yes

Edges always overglazed only by 2/3.

Natural stone decoration elements

Every natural stone is a naturally grown material. Consequently, each individual granite tile and natural stone decoration element becomes a unique piece. Different structures and colour shades underline the character of this natural material and have always been typical of the appearance of a natural stone covering.

As a result, we can not assume liability for differences with regard to colour, structure and other natural characteristics. The natural stone articles do not meet the chemical and physical requirements of DIN EN 14411. For cleaning, only acid-free, non-caustic cleaning agents may be used.

The illustrations of the natural stone decoration elements in this price list/programme of delivery convey only a general impression. For reasons of printing, however, they have to be regarded as non-binding.

Glass decoration elements

The glass decoration elements offered by us are, for the most part, hand-made design elements. Each piece is unique. As a result of the manufacturing process, slight variations with regard to the size, the colour and the structure may occur, which lend this special product its individual character. For cleaning, we recommend a commercially available glass cleaning agent, which should be applied by means of a clean and soft cloth. To avoid permanent damage on the surface, it is absolutely necessary to make sure that the glass elements do not come into contact with scratching (mortar and bonding agent residues) and abrasive materials (cleaning powder).

The illustrations of the glass decorations in this price list/programme of delivery convey only a general impression. For technical reasons of printing, however, they can not be considered as binding.

1. Construction Products Regulation (CPR)

The CPR distinguishes itself from the previous Construction Products Directive (CPD) above all by the Declaration of Performance, CE marking as well as assessment and verification of the constancy of performance of the product concerned.

Construction products brought into circulation after 1 July 2013 must comply with the CPR. "Bringing into circulation" means that a construction product is made available on the European market for the first time by the manufacturer. We would like to point out that the term of "provision" is delineated from that; it means the passing on of a construction product brought into circulation in the supply chain, e.g. from the specialist tile trade to end consumers.

Essential characteristics of a construction product – here ceramic tiles – are defined in Annex ZA of the harmonised standard DIN EN 14411.

2. CE marking

With the CE marking, the manufacturer indicates that it assumes responsibility for the conformity of the construction product with the performance stated in the Declaration of Performance as well as compliance with all relevant European legal regulations.

Furthermore, it is responsible for making sure that the CE marking is applied to the actual construction product, to a label or on the packaging. The CE marking is the sole conformity identification for all essential characteristics of a construction product. Additional marks may only be used for aspects which – in our case – are not regulated by DIN EN 14411.

3. Declaration of Performance

As of 1 July 2013, every manufacturer is obliged to establish a Declaration of Performance for each of its construction products. It thereby assumes responsibility for the conformity of the construction product with the declared performance. The Declaration of Performance replaces the former Declaration of Conformity.

The technical documentation of the manufacturer serves as basis for the Declaration of Performance. Among other things, it includes the results of the in-plant production controls such as e.g. initial tests.

The Declaration of Performance has to be provided with an arbitrary reference number by the manufacturer to which the CE marking refers, thus permitting unambiguous identification of the construction product.

The Declaration of Performance can be made available in printed or electronic form (e.g. by e-mail, CD or USB stick).

In addition, the Declarations of Performance for the construction products of AGROB BUCHTAL GmbH are to be found at www.agrob-buchtal.de/leistungserklaerung. Alternatively, you can scan this QR code:

