

Technical data sheet date 01.10.2010

| <h2>Table of contents group 1</h2> <h3>General advice to floor coating systems</h3> | |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Page 2-3 | Requirements to the subsurfaces that are to be coated - such as subsurface, residual moisture, subsurface preparation, cracks and joints, etc. |
| Page 4 | Ambient conditions for the placement of coating materials - such as temperatures, air moisture and unfavourable premises on processing and drying |
| Page 5 | Requirements for installing coatings - such as tools, mixing places and mixing the products, safety at work provisions |
| Page 6 | Selection of coating materials according to subsurfaces |
| Page 7 | Preface to subsurfaces – such as flatness tolerance |
| Page 8 | Concrete as subsurface: quality and resistance and further recommendations |
| Page 9 | Screed as subsurface: quality and resistance and further recommendations |
| Page 10 | Cement screeds as subsurface: quality and resistance and further recommendations |
| Page 11 | Cement bond hard-aggregate screed: quality and resistance and further recommendations |
| Page 12 | Anhydrite screed as subsurface: quality and resistance and further recommendations |
| Page 13 | Magnesia screed as subsurface: quality and resistance and further recommendations |
| Page 14 | Mastic asphalt screed as subsurface: quality and resistance and further recommendations |
| Page 15 | Tiles as subsurface: quality and resistance and further recommendations |
| Page 16 | Selection of installation thicknesses of coating superstructures - installation thicknesses of coatings for diverse loads |
| Page 17 | Special installation thicknesses of coating superstructures - on high concentrated loads or thermal charges |
| Page 18-19 | Selection of surfaces of coating superstructures - according to visual requirements, UV resistance, electrostatic charge, slip resistance |
| Page 20 | Chemical resistance of coating surfaces - on variable chemical influence as well as softener discoloration |
| Page 21-22 | Maintenance and cleaning of synthetic coatings - as maintenance cleaning, basic cleaning, maintenance, suggestions for avoiding dirt |
| Page 23 | General information to floor coating systems - registration duty for floor coatings in recreation rooms (AgBB) |

Technical data sheet date 01.10.2010

| General requirements to the subsurfaces that are to be coated | |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subsurface: | <ul style="list-style-type: none"> → Chose the type and thickness of the coating system according to the prospective loads as well as to the quality respectively stability of the subsurface. → Generally the subsurface must dispose of a tear resistance of 1.5 N/mm² minimum. → Mastic asphalt screeds must be sufficiently sustainable (e.g. quality class GE 10). → Use an additional levelling compound on thin coatings if there are smaller unevennesses on the subsurface that may also have been caused by peening or milling. → Attention! A levelling compound does not substitute the primer. → The EP-barrier coat is an exception that can be used as primer and as levelling compound on an open-cell character of the subsurface. |
| Residual moisture: | <ul style="list-style-type: none"> → Residual moisture of the subsurface must not be > 3 % (up to 4% with an application of minimum 2x0.5 kg/m²) on a conventional EP primer coat (construction resin). → On the EP-barrier coat maximum 5% with an application of minimum 2x0,5kg/m² → Usually this applies when there is a waiting period of ~ 8 weeks for screeds or 10-12 weeks for concrete floors before applying a vapour diffusion tight coating. → In case of doubt, execute a moisture measurement. → For vapour diffusion capable materials, moisture can amount to over 3 % (5%). |
| Opressive humidity in the subsurface: | <ul style="list-style-type: none"> → Verify with the following method if you doubt that the construction has been protected against rising humidity: → Fix a plastic film ~ 50 x 50 cm with double-sided tape on the subsurface. After 2 days, you can see if moisture has concentrated under the plastic film. → Furthermore a vapour diffusion capable coating can be applied as provision. |
| Concrete and screed subsurface pretreatment: | <ul style="list-style-type: none"> → The subsurface must be absorptive and free from loose or brittle components as well as from separative substances. → In order to achieve this, diamond grinding, shot-blasting procedures have proven of value. → Clean oilings with a concrete decontaminator as indicated in the technical data sheet. → Attention! On certain subsurfaces, you have to pay attention to some particularities on the subsurface pretreatment, e.g. anhydrite screeds that must not only be shot-blast but also grinded supplementarily for achieving the required >1.5 N/mm². → Screed and concrete surfaces that have been produced very dense and with a greasy gloss, require special attention on the subsurface pretreatment. Grinding with a Corundum disc or something the like is insufficient in most cases. You must use a different technique like shot-blasting for example. |
| Cracks and dummy joints | <ul style="list-style-type: none"> → Cracks and dummy joints must be extended with a flex disc and cross-cuts must be effected every 20 cm. → Afterwards the extensions must be cleaned with an industrial vacuum cleaner; insert the screed clips and positively cast with 2 K EP-primer (construction resin). → Attention! Make sure you are not using pre-filled products for casting. Otherwise a sufficient penetration depth of the construction resin cannot be warranted. → On a subsiding of the construction resin in the joints, re-cast a sufficient amount of material within 30 minutes fresh in fresh. → According to requirement and depending on the lamination periods, the resinated joints must be sanded on the entire surface fresh in fresh with quartz sand 0.3-0.8mm or 0.7-1.2mm. → If you detect that the EP-construction resin in the joints has sank in after curing, level with EP-construction resin + suspending agent. → According to the following coating layers, the leveled joints must be regrinded after curing. |

Technical data sheet date 01.10.2010

| General requirements to the subsurfaces that are to be coated | |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Movement joints: (building expansion joints) | <p>→ On columns, walls or other vertical building elements: These joints are to be kept free during coating works and need to be closed permanently elastic after having finished coating. For this purpose, 1K hybrid joint close can be used.</p> <p>→ Basics to horizontal building expansion joints: Basically, intended building expansion joints are to be adopted. There are exceptions, especially for old buildings that have been built with excessively many joints (e.g. concrete slabs ~ 6x6m or other similar dimensions).</p> <p>→ Joint patterns are often 2-4cm wide and joint flanks are weak points on chagement by fork lift trucks for example. Such joints will continue to break even after a surface coating. Thus the joint pattern/construction should be reduced to a minimum and appropriately reconstructed as described below.</p> <p>→ For reducing the permanently elastic joint pattern, for example in a hall of 500m², one joint in length and one in width can be adopted permanently elastic. Pay special attention to the supporting pillar's assembly. Here it makes sense to connect the joint's alignment with the respective supporting pillars.</p> <p>→ <i>This proceeding must be clarified between owner / designer and the flooring contractor beforehand.</i></p> <p>→ Processing: adopting horizontal building expansion joints elastically: Cuneiform chisel off existing joints in a total width of ~10 cm, exhaust and clean. → Mark the joint design (on the wall or a different method) → Precoat with EP-construction resin and close with 3 K EP-mortar in wet-on-wet method. (If wet-on-wet is not possible, broadcast the fresh primer coat with quartz sand 0.7-1.2mm) → Grind and fine spatler after curing and apply the coating. → After the curing of the coating, generally only after 48h/20°C but at the latest 1 week later, cut the joints with a diamond blade 0.5-1.0 cm and joint them with 1 Comp. PU Hybrid joint-close. (silicone and acrylic sealants are inappropriate)</p> <p>→ Processing: adopting horizontal building expansion joints non elastically: → The procedure is the same as above, except the marking and cutting of the joints.</p> |
| Joint edge: | <p>→ On joint edges of gates that are subject to driving traffic, we recommend chiselling off a wedge with a width of ~ 30 cm and a depth of ~ 3-4 cm and to trowel it off with EP-mortar according to the technical data sheet. But do not let the mortar run down to zero but connect with EP-fine spatling compound.</p> <p>→ Attention! Metal rails or something the like are always to be pretreated with 2K metal primer according to the technical data sheet.</p> |
| New surfaces: | <p>→ On new surfaces there is the possibility of drawing up the rough concrete to the top edge. Thus screed can be economised.</p> <p>→ The owner should be advised in writing that the evenness of the concrete/screed surface must be poured according to DIN 18202 part 5 line 4. Otherwise increased flatness compensation must be reckoned.</p> <p>→ Furthermore the surface must not be aftertreated with separating substances.</p> |
| Revision of old coatings | <p>→ Old coatings (older than 4 days) can be revised on the following conditions:</p> <p>→ On coarse coatings like sand toppings that are to be re-coated, we recommend an alkaline cleaning with a basic cleaner (treatment according TM) and a brush machine with hard brush attachment.</p> <p>→ On flat coatings thar are to be re-coated, we also recommend a basic cleaning but with a dished washer machine with coarse grinding/cleaning pad.</p> <p>→ Shot-blasting of the old coating (additional basic cleaning if there are impurities) and EP-priming with 5 % EP-thinner result in the best preconditions.</p> |

Technical data sheet date 01.10.2010

| Ambient conditions for the placement of coating materials | |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperatures: | <ul style="list-style-type: none"> → Attention: Temperature in the room and on the subsurface must not lie below 10 °C! → Temperatures above 30°C are unfavourable to coating works and may cause problems for the processing time and thus lead to undesirable surfaces. → Thus you should use materials that are solvent-free (water-free) and that have a correspondingly long pot life (processing time). → The basic rule is: mix the material, completely pour it out and quickly distribute it. Only process such container sizes that can be processed within the indicated pot life. → Ideal temperatures for mostly all coatings lie between 15°C-25°C. → Furthermore assure that materials are tempered to ~ 20°C before processing (e.g. by adequate storage). → Direct sunlight during coating works, especially during warm seasons, causes early hardening of the coating surfaces. (Especially when the subsurface is open porous like on sand toppings on the entire surface or other absorptive surfaces) Then the following problems during coating works may develop: <ul style="list-style-type: none"> - Blistering on the surface - Improper integration of colour chips or distributed material This aspect can be reduced by additional priming! → On low temperatures, curing is also deferred and thus the re-usability of the floor. |
| Air moisture: | <ul style="list-style-type: none"> → Assure air moisture of 80% maximum before and during coating works. This is important for the intermediate adhesion of coatings and also for avoiding surface and curing disturbances. → Especially for water-based products like EP-DF coatings, WE and EP-sealings, an air moisture rising must be reckoned. There is no air change on large surfaces in low rooms or on poor ventilation and this causes the following problems: <ul style="list-style-type: none"> - surface disturbances (frog eyes/cratering) - surface disturbances like remaining white fog on the surface - curing is being delayed or does not take place at all here and there |
| Surface disturbances on disadvantageous ambient conditions | <p><u>Surface disturbances during processing and curing</u></p> <ul style="list-style-type: none"> → During the processing of synthetic coatings, assure that there are no silicone or other fats or separating agents on the surface that is to be coated or in the ambient air. → The smallest silicone joints (e.g. on windows), installed days before the coating works, may still cause surface disturbances. → Floor joints based on silicone must be completely removed before coating and the areas cleaned with silicone remover. → Caution should also be exercised when air conditioners or other fans are directly blowing onto the areas that are to be coated. → Material wetting disturbances (so-called frog eyes) may also appear if the surface tension of the underground is too high. E.g. epoxy resin coatings/primer coats are older than 2-3 days. → Wetting disturbances may also appear on very dense surfaces like concrete or screed surfaces. → How can such surface disturbances be omitted? <ul style="list-style-type: none"> - Silicone contaminated subsurfaces must be alkaline cleaned before coating and then rinsed with clear water. Cleaning should be effected with a dished washer machine with cleaning pad or a wet vacuum cleaner. - Old coatings need to be grinded or shot-blast or/and basicly cleaned. - Dense subsurfaces must be made absorptive (e.g. by shot-blasting) - Switch off air conditioners and fans during coating works and curing. |

Technical data sheet date 01.10.2010

| Requirements for installing coatings | |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tools: | <ul style="list-style-type: none"> → For processing coating materials, one partially needs special tools that are available in specialised trade. → Especially for flow coatings, special trowel teeth are necessary that are available in the appropriate size. → Generally there should always be a sufficient number of tools on the construction site for ensuring a smooth processing. → In group 8 of the product catalogue you find nearly all tools. |
| Mixing sites: | <ul style="list-style-type: none"> → Mixing sites should always be installed near the place where the coating is to be effected but make sure that the underground is protected liquid-tightly against impurities caused by spilling the single components (e.g. by an interlayer and a layer of corrugated board on top). If single pure epoxy resin components penetrate the concrete/screed subsurface, this one needs to be carried off to the corresponding depth and renewed (e.g. with EP-mortar). Attention! A layering without eliminating would result in defects. |
| Mixing of coatings: | <ul style="list-style-type: none"> → Basically every user needs to be provided with the corresponding technical data sheets before coating works. Only this way, mistakes by the executing person can be avoided. → Generally, coatings need to be mixed with suitable electric stirring gears. A manual mixing is impossible and leads to mistakes in curing and in the final quality of the products. → Maintaining the prescribed mixing ratios is top priority and should always be executed according to exact weight proportions by using a corresponding digital scale. → Mixing by volume is associated with a high risk as material density does not always correspond to 1 litre and thus serious mistakes may develop. |
| Safety measures: | <ul style="list-style-type: none"> → Basically, products must only be processed by commercial flooring specialists. Sale to private customers, also via third parties, is to be avoided due to safety. Plasti-Chemie International GmbH will expressly not assume any recourse or warranty claims. → Generally, the technical data and safety sheets as well as the respective labelling of the single products are to be observed. Furthermore we refer to data sheet M 023 of the Mutual Indemnity Association of the chemical industry. <u>Instruction of employees:</u> → Anybody dealing with epoxy resins and hardeners should know that he needs to read in detail the safety data sheets and labelling of the respective products. Only this way you can avoid that, due to careless handling of epoxy resins and hardeners for example by skin contact, sensitizations are being caused. → Wearing safety glasses, e.g. when mixing the components, should be self-evident for preventing irritations or even chemical burns of the eyes. → Wearing safety gloves while processing these materials should also be an obligation as well as regular application of protective skin cream. → Basic principle: without material contact there will be no sensitization!!! → Ensure sufficient ventilation during coating works. |

Technical data sheet date 01.10.2010

Selection of coating materials according to subsurfaces

| | |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Selection of coating: | <ul style="list-style-type: none"> → <u>Concrete and screed floors with a residual moisture of max. 3% (5%):</u> <ul style="list-style-type: none"> - 2K EP-primer (construction resin) or 2K EP-barrier coat - 4K EP-sealing / coating or EP-Easy Floor coating - 4K EP-Elastic sealing / coating or EP-Easy Elastic coating → <u>Concrete and screed floors with a residual moisture of more than 3 % (5%) as well as magnesite and anhydrite screeds:</u> <ul style="list-style-type: none"> - 2K EP-DF adhesive agent as primer for self-levelling coatings - 3K EP-DF fine spatting compound/mortar - 4K EP-DF sealing / coating or 2K EP-DF Easy Floor - 4K EP-sealing WE or 2K EP-Easy seal → <u>Mastic asphalt subsurfaces:</u> <ul style="list-style-type: none"> - 2K EP-primer (construction resin) - 3K EP- fine spatting compound/mortar - 4K EP-Elastic sealing / coating or EP-Easy Elastic coating - 1K or 2K PU-sealing colourless on EP-Elastic coatings - 4K EP-sealing WE colourless on EP-Elastic coatings <p>Attention: On high point loads, you need to apply minimum 3mm self-levelling coating 2.5-3.0mm.</p> → <u>Tile subsurfaces without residual moisture max. 3% (5%) in the subsurface:</u> <ul style="list-style-type: none"> - 2K EP-primer (construction resin) or 2K EP-barrier coat - 3K EP- fine spatting compound/mortar - 4K EP-Elastic sealing / coating or EP-Easy Elastic coating - 1K or 2K PU-sealing colourless on EP-Elastic coatings - 4K EP-sealing WE colourless on EP-Elastic coatings → <u>Tile subsurfaces with residual moisture in the subsurface:</u> <ul style="list-style-type: none"> - 2K EP-DF adhesive agent as primer - 3K EP-DF fine spatting compound/mortar - 4K EP-DF coating or 2K EP-DF Easy Floor - 4K EP-sealing WE or 2K EP-Easy seal - 2K PU-sealing colourless on EP-DF coatings → <u>For outer surfaces:</u> <ul style="list-style-type: none"> - 2K EP-primer (construction resin) or 2K EP-barrier coat - 3K EP- fine spatting compound/mortar - 2K or 4K EP-Elastic coating (only chips on the entire surface >300g/m²) - 1K or 2K PU-sealing colourless on EP-Elastic coatings - 1K PU-Super Flex colourless or coloured - 2K PU-Mega Flex (only to be used as interlayer) → <u>Coatings for collecting trays / containers for storage of liquids:</u> <ul style="list-style-type: none"> - Coatings for this purpose have not been developed and basically, there is no advice or recommendation for this. |
| Old coating as subsurface: | <ul style="list-style-type: none"> → On an intended redevelopment of old coatings or old sealings, it is to be considered that these constitute a high risk if they are not being removed completely. The main reason is that the processor and also Plasti-Chemie International GmbH will not assume any warranty for the adhesion of the new coating on the old coating, also not for the compatibility of different materials and certainly not for the adhesion of the old coating on the subsurface. |

Technical data sheet date 01.10.2010

Preface to subsurfaces

Coatings are liquid substances, with synthetic materials as adhesive agent that are being applied subsequently onto the respective base layer (concrete, screed or tiles) for protecting this one.

A requirement for the durability and functional efficiency of our coating systems is the fixed compound to the respective base layer (concrete, screed, mastic asphalt or ceramic coatings).

Before realising coating works, it is essentially necessary to thoroughly examine the subsurface and to know the requirements for the respective coating.

The subsurface is being assessed by different criteria, e.g. compressive strength class, residual moisture, surface strength (tensile bond strength), surface roughness.

This examination is a basic requirement for the selection of the subsurface preparation (mortising, milling, grinding, needling or shot-blasting) and the coating system that is to be applied (sealing, self-levelling coating, elastic self-levelling coating, permeable self-levelling coating).

The subsurface must be absorptive and free from loose and brittle components, as well as from separative substances.

The subsurface must have a surface with flatness tolerances according to DIN 18202, minimum line 4.

Table 3: flatness tolerances (from DIN 18202 extended table)

| Column | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----|----------------|-----|----|-----|----|-----|----------------|----|----|-----------------|-------------------|--|
| Line | Reference | Depth gauges as limit values in mm at measuring point distances in m | | | | | | | | | | | | | |
| | | 0,1 ² | 0,6 | 1 ² | 1,5 | 2 | 2,5 | 3 | 3,5 | 4 ² | 6 | 8 | 10 ² | 15 ^{2,3} | |
| 1 | Non-surface finished top faces of ceilings, subconcrete and under-floors | 10 | 13 | 15 | 16 | 17 | 18 | 18 | 19 | 20 | 22 | 23 | 25 | 30 | |
| 2 | Non-surface finished top faces of ceilings, subconcrete and under-floors with increased requirements, e.g. for acceptance of swimming screeds, industrial floors, tile and panel coatings, bonded screeds, completed surfaces for minor purposes, e.g. in storage rooms, cellars | 5 | 7 | 8 | 9 | 9 | 10 | 11 | 12 | 12 | 13 | 14 | 15 | 20 | |
| 3 | Surface finished floors, e.g. screeds as utility screeds, Screeds for the acceptance of floor coatings Floor coatings, tile coatings, primed and bonded coatings | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 11 | 12 | 15 | |
| 4 | Corresponding to line 3, but with increased requirements | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 15 | |
| 5 | Non-surface finished walls and bottom sides of slabs | 5 | 8 | 10 | 11 | 12 | 13 | 13 | 14 | 15 | 18 | 22 | 25 | 30 | |
| 6 | Surface finished walls and bottom sides of ceilings, e.g. plastered walls, panellings, suspended ceilings | 3 | 4 | 5 | 6 | 7 | 8 | 8 | 9 | 10 | 13 | 17 | 20 | 25 | |
| 7 | Corresponding to line 3, but with increased requirements | 2 | 2 | 3 | 4 | 5 | 6 | 6 | 7 | 8 | 10 | 13 | 15 | 20 | |

² For these measuring point distances, values are included in table 3 of DIN 18202. The values for the other distances are interpolated

³ The flatness tolerances of column 6 also apply to measuring point distances over 15 m.

On coarse and uneven surfaces, it is necessary to level the surfaces that are to be coated by applying fine spatting or levelling compounds.

Attention !!! A levelling compound does not substitute a primer.

Important!!! The stability of the coating system **always** complies with the stability of the subsurface

Technical data sheet date 01.10.2010

Concrete as subsurface

Preface:

Concrete is a mixture of cement, water and additives.

Besides chemically and physically active concrete additives, like for example plasticiser, superplasticiser, air-entraining agent, retarder, accelerator and sealants, concrete additives are also being applied.

These can be stone dusts like quartz and limestone flour, pozzolanic additives, stone coal flue ash and colour pigments.

Hence a coloured screed is sometimes not easily to distinguish from coloured concrete.

Concretes are being classified into concrete groups according to their compression strength and and these are being classified into concrete strength classes.

| Concrete group | Concrete strength class | | Nominal strength in N/mm ² | Application |
|----------------|-------------------------|-------------------------------------|---------------------------------------|--------------------------------------------|
| | old (DIN 1045) | new (DIN EN 206-1 / DIN 1045-2) | | |
| Concrete BI | B 5 B 10 | C 8 / 10 C 8 / 10 | 10 10 | Only for non-reinforced concrete |
| | B 15 B 25 | C 12 / 15 C 20 / 25 | 15 25 | For non-reinforced and reinforced concrete |
| Concrete B II | B 35 B 45 B 55 | C 30 / 37 C 35 / 45 C 45 / 55 | 37 45 55 | |

Generally the concrete should correspond to concrete strength class B 25 (C20/25) minimum.

The surface tensile strength should be average minimum 1.5 N/mm². Single values of 1.0 N/mm² must not be undercut in any place. An increased material and labour input for the equalising layer is to be reckoned as many concrete surfaces do not correspond to the flatness requirements.

For the application of a coating permeable to vapour diffusion, the concrete should be 14 days old minimum.

On coatings non- permeable to vapour diffusion, residual moisture of the concrete should not exceed 3%.

For achieving these values, waiting times of about 8 – 10 weeks are not uncommon in practice.

Temperature of the air, the concrete surface and the processed material should be 10°C minimum. However temperatures of 15°C – 25°C would be ideal.

In any case, the surface temperature must be minimum 3°C above dew point temperature.

Successive coatings are usually only being influenced by air-entraining agents as they can change the concrete's absorptivity. In addition, excess of air spaces may adversely affect the concrete's contraction and its compression strength.

Surface preparation for a sealing or coating:

Shot-blasting or grinding of the subsurface and vacuuming with an industrial vacuum cleaner.

(An absorptivity of the subsurface must be produced)

Recommendation of the coating system: Residual moisture < 3%

EP-sealing coloured / EP-Elastic sealing coloured

EP-self-levelling coating coloured / EP-Elastic self-levelling coating coloured

EP-Easy Floor / EP-Easy Elastic

Recommendation of the coating system: Residual moisture > 3%

EP-sealing water-emulsified coloured

EP-DF sealing coloured / EP-DF self-levelling coating coloured

EP-DF Easy Floor

Please note that no liability of the manufacturer can be deduced notably from the content of these technical data sheets as application and processing are outside our sphere of influence. Delivery and benefits exclusively based on our general terms and conditions.

Technical data sheet date 01.10.2010

Screed as subsurface

Preface:

According to DIN 18560, screed is a component that has been produced on a supporting surface or on an intermediate separating or insulating layer that is immediately useable as floor or can be provided with a coating. Screeds level unevennesses of the building structure and function – according to execution– as humidity, heat and noise protection.

In DIN 18560 / DIN EN 13813 screeds are being classified according to their construction on the one hand, and according to the type of adhesive agent on the other hand.

Classification according to construction principles:

- Screed on insulating layer (swimming screed)
- Screed on separating layer
- Bonded screed

Classification according to adhesive agent:

| | old DIN 18560 | new DIN EN 13813 |
|--------------------------------------|--------------------------|-----------------------------|
| • Cement screed | ZE | CT |
| • Anhydrite screed | AE | CA |
| • Magnesite screed | ME | MA |
| • Cement-based hard-aggregate screed | ZE | CT |
| • Mastic asphalt screed | GE | AS |

A screed must be even in every layer in thickness, gross density and mechanic properties and dispose of an even surface with flatness tolerances according to DIN 18202, line 4 minimum that must have a sufficient surface strength for the intended purpose.

Average surface tensile strength must at least be 1.5 N/mm² whereas single values of 1.0 N/mm² must not be undercut in any place.

Temperature of the air, the concrete surface and the processed material should be 10°C minimum. However temperatures of 15°C – 25°C would be ideal.

In any case, the surface temperature must be minimum 3°C above dew point temperature.

Comment:

The stability of the coating system always complies with the stability of the subsurface.

Technical data sheet date 01.10.2010

Cement screed (symbol = (ZE) CT)

Preface:

Cement screed is a screed that is being produced by using cement, additive and water as well as by adding supplements (e.g. superplasticiser).

Cement screeds with an additive of natural stone and with a smoothed surface are being called Terrazzo.

Cement screeds are being classified into strength classes according to their compressive strength.

| Strength class | | Compressive strength in N/mm ² | | Bending tensile strength in N/mm ² |
|------------------|---------------------|----------------------------------------------|------------------------------------------------------|------------------------------------------------------|
| old DIN 18560 | new DIN EN 13813 | Smallest single value (Nominal strength) | Average value of each series (Serial strength) | Average value of each series (Serial strength) |
| ZE 12 | CT 12 | 12 | ≥ 15 | ≥ 3 |
| ZE 20 | CT 20 | 20 | ≥ 25 | ≥ 4 |
| ZE 30 | CT 30 | 30 | ≥ 35 | ≥ 5 |
| ZE 40 | CT 40 | 40 | ≥ 45 | ≥ 6 |
| ZE 50 | CT 50 | 50 | ≥ 55 | ≥ 7 |

Requirements to the subsurface of coating systems:

Basically the cement screed should correspond to strength class ZE 30 minimum.

The cement screed is accessible at the earliest after 3 days and fully loadable after ~ 28 days.

The cement screed can be overlain after 4 weeks at the earliest.

On impermeable coatings, residual moisture must be below 3.0 volume-percent.

Surface tensile strength must have an average value of 1.5 N/mm² minimum whereas single values of 1.0 N/mm² must not be undercut in any place.

Subsurface preparation for a sealing or coating:

Grinding with diamond blade or shot-blasting and vacuuming with an industrial vacuum cleaner.

(An absorptivity of the subsurface must be produced)

Recommendation of the coating system: Residual moisture < 3%

EP-sealing coloured / EP-Elastic sealing coloured

EP-self-levelling coating coloured / EP-Elastic self-levelling coating

EP-Easy Floor / EP-Easy Elastic

Recommendation of the coating system: Residual moisture > 3%

EP-sealing water-emulsified coloured

EP-DF sealing coloured / EP-DF self-levelling coating coloured

EP-DF Easy Floor

Technical data sheet date 01.10.2010

Cement-bond hard-aggregate screed for high strain (symbol = (ZE) CT)

Preface:

Cement-bond hard-aggregate screed is a cement screed with aggregate of resistant material (e.g. corundum). It consists of one layer, the resistant material layer, or of two layers, the transition layer and the resistant material layer.

M, A and KS indicate the type of aggregate:

- M = metals
- A (Allgemein) = compact natural stones, dense slag or mixtures with M and KS
- K = fused corundum
- S = silicon carbide

Cement-bond hard-aggregate screeds are being classified into strength classes according to their compressive strength.

| Strength class | | Compressive strength in N/mm ² | | Bending tensile strength in N/mm ² |
|----------------|------------------|-------------------------------------------|------------------------------------------------|------------------------------------------------|
| old DIN 18560 | new DIN EN 13813 | Smallest single value (Nominal strength) | Average value of each series (Serial strength) | Average value of each series (Serial strength) |
| ZE 55 M | CT 55 M | 55 | ≥ 70 | ≥ 11 |
| ZE 65 A | CT 65 A | 65 | ≥ 75 | ≥ 9 |
| ZE 65 KS | CT 65 KS | 65 | ≥ 75 | ≥ 9 |

Requirements to the subsurface of coating systems:

Basically the cement screed should correspond to strength class ZE 30 minimum, without resistant material. The cement-bond screed is accessible at the earliest after 3 days and fully loadable after ~ 28 days.

The cement-bond screed can be overlain after 4 weeks at the earliest.

A resistant material layer is advantageous for wear resistance for direct utilisation **without** additional coating. A resistant material layer is rather obstructive for a coating as the subsurface absorptivity is not given sufficiently. If a coating shall nevertheless be processed, one has to reckon an additional shot-blasting operation!

On impermeable coatings, residual moisture must be below 3.0 volume-percent.

Surface tensile strength must have an average value of 1.5 N/mm² minimum whereas single values of 1.0 N/mm² must not be undercut in any place.

Subsurface preparation for a sealing or coating:

Double shot-blasting in cross-coat and vacuuming with an industrial vacuum cleaner.

(An absorptivity of the subsurface must be produced)

Recommendation of the coating system: Residual moisture < 3%

EP- sealing coloured / EP-Elastic sealing coloured

EP- self-levelling coating coloured / EP-Elastic self-levelling coating

EP-Easy Floor / EP-Easy Elastic

Recommendation of the coating system: Residual moisture > 3%

EP- sealing water-emulsified coloured

EP-DF sealing coloured / EP-DF self-levelling coating coloured

EP-DF Easy Floor

Technical data sheet date 01.10.2010

Anhydrite screed (symbol = (AE) CA)

Preface:

Anhydrite screed is a screed that is being produced of anhydrite binder, aggregate and water and, when appropriate, with addition of additives (e.g. superplasticiser).

Coat thickness of anhydrite screeds may lie between 25mm and 50 mm.

As anhydrite screeds are very sensitive to moisture, there is nearly always installed a water sealing or vapour trap.

Anhydrite screed can be installed jointless on large surfaces as well (~1000 m²).

Anhydrite screeds are being classified into strength classes according to their compressive strength.

| Strength class | | Compressive strength in N/mm ² | | Bending tensile strength in N/mm ² |
|------------------|---------------------|----------------------------------------------|------------------------------------------------------|------------------------------------------------------|
| old DIN 18560 | new DIN EN 13813 | Smallest single value (Nominal strength) | Average value of each series (Serial strength) | Average value of each series (Serial strength) |
| AE 12 | CA 12 | 12 | ≥ 15 | ≥ 3 |
| AE 20 | CA 20 | 20 | ≥ 25 | ≥ 4 |
| AE 30 | CA 30 | 30 | ≥ 35 | ≥ 6 |
| AE 40 | CA 40 | 40 | ≥ 45 | ≥ 7 |

Requirements to the subsurface of coating systems:

Basically the anhydrite screed should correspond to strength class (AE) CA 30 minimum.

The anhydrite screed is accessible at the earliest after 2 days and fully loadable after ~ 28 days.

The anhydrite screed can be overlayn after 1 to 2 weeks at the earliest.

On impermeable coatings, residual moisture must be below 0.5 volume-percent.

Surface tensile strength must have an average value of 1.5 N/mm² minimum whereas single values of 1.0 N/mm² must not be undercut in any place.

Subsurface preparation for a sealing or coating:

Grinding with diamond blade or shot-blasting and vacuuming with an industrial vacuum cleaner.

(An absorptivity of the subsurface must be produced).

Attention! Mind that, on the subsurface preparation of anhydrite screeds, they must not only be shot-blast but mostly also subsequently ground for achieving the required >1.5 N/mm².

Recommendation of the coating system:

EP- sealing water-emulsified coloured

EP-DF sealing coloured

EP-DF self-levelling coating coloured

EP-DF Easy Floor

Conventional, **non**-vapour permeable coatings can only be used when you have ensured that the screed cannot absorb humidity from the undersurface and is absolutely dry.

Technical data sheet date 01.10.2010

Magnesia screed (xylolite screed) **(symbol = (ME) MA)**

Preface:

Magnesia screed is a screed that is being produced of caustic magnesia, aggregate (filler materials) and a diluted slat solution – generally magnesium chloride – and if necessary with addition of additives (e.g. pigments).

Magnesia screed up to a gross density class of 1.6 is being called xylolite screed.

As magnesia screeds are very sensitive to moisture, there is nearly always installed a water sealing or vapour trap.

Magnesia screeds are being classified into strength classes according to their compressive strength.

| Strength class | | Compressive strength in N/mm ² | | Bending tensile strength in N/mm ² |
|------------------|---------------------|----------------------------------------------|------------------------------------------------------|------------------------------------------------------|
| old DIN 18560 | new DIN EN 13813 | Smallest single value (Nominal strength) | Average value of each series (Serial strength) | Average value of each series (Serial strength) |
| ME 5 | MA 5 | 5 | ≥ 8 | ≥ 3 |
| ME 7 | MA 7 | 7 | ≥ 10 | ≥ 4 |
| ME 10 | MA 10 | 10 | ≥ 15 | ≥ 5 |
| ME 20 | MA 20 | 20 | ≥ 25 | ≥ 7 |
| ME 30 | MA 30 | 30 | ≥ 35 | ≥ 8 |
| ME 40 | MA 40 | 40 | ≥ 45 | ≥ 10 |
| ME 50 | MA 50 | 50 | ≥ 55 | ≥ 11 |

Requirements to the subsurface of coating systems:

Basically the magnesia screed should correspond to strength class MA 30 minimum.

The magnesia screed is accessible at the earliest after 2 days and fully loadable after ~ 28 days.

The magnesia screed can be overlayn after 3 weeks at the earliest.

Surface tensile strength must have an average value of 1.5 N/mm² minimum whereas single values of 1.0 N/mm² must not be undercut in any place.

Subsurface preparation for a sealing or coating:

Grinding with diamond blade or shot-blasting and vacuuming with an industrial vacuum cleaner.

(An absorptivity of the subsurface must be produced).

Recommendation of the coating system: (must generally be coated permeable to vapour diffusion)

EP- sealing water-emulsified coloured

EP-DF sealing coloured

EP-DF self-levelling coating coloured

EP-DF Easy Floor

Technical data sheet date 01.10.2010

Mastic asphalt screed (symbol = (GE) AS)

Preface:

Mastic asphalt screed is a screed that is being produced of bitumen and aggregate as well as with addition of additives if required. It is classified into 4 hardness classes. Coat thickness lies between 25 mm and 40 mm. On the installation of mastic asphalt screed a sealing against ascending humidity is not necessary. Successive coatings must be elastic.

Due to their hardness (penetration depth), mastic asphalt screeds are being classified into hardness classes.

| Hardness class | | Penetration depth in mm | | | Bending tensile strength in N/mm ² |
|----------------|------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------|
| | | Stamp cross section 100 mm ² at (22 ± 1)°C test period 5 h | Stamp cross section 100 mm ² at (40 ± 1)°C test period 2 h | Stamp cross section 500 mm ² at (40 ± 1)°C test period 0.5 h | |
| old DIN 18560 | new DIN EN 13813 | | | | |
| GE 10 | AS 10 | ≤ 1,0 | ≤ 4,0 | - | ≥ 8 |
| GE 15 | AS 15 | ≤ 1,5 | ≤ 6,0 | - | ≥ 8 |
| GE 40 | AS 40 | - | - | > 1,5 to 4,0 | - |
| GE 100 | AS 100 | - | - | > 4,0 to 10,0 | - |

Requirements to the subsurface of coating systems:

Basically the mastic asphalt screed should correspond to hardness class (GE) AS 10 minimum. The mastic asphalt screed is accessible at the earliest after 2 to 3 hours and fully loadable after ~ 2 days. The mastic asphalt screed can be overlayn after 4 hours at the earliest. Surface tensile strength must have an average value of 1.5 N/mm² minimum whereas single values of 1.0 N/mm² must not be undercut in any place.

Subsurface preparation for a sealing or coating:

Grinding with diamond blade or shot-blasting and vacuuming with an industrial vacuum cleaner. (Interlayers (scales) must be removed before coating)

Recommendation of the coating system:

EP-Elastic sealing coloured (thin coatings are not appropriate for concentrated loads)
 EP-Elastic self-levelling coating coloured, system 2.5-3 mm

Technical data sheet date 01.10.2010

Tiles as subsurface

Preface:

Tiles are ceramic products that are being shaped of clay and diverse mineral aggregates (quartz, china clay, Felspar et al.) and then hardened stone-like by firing.

According to the strain, substances are being fired at different temperatures (between 900°C and 1300°C).

There are different types of ceramic tiles, corresponding to the firing.

| | | |
|-------------------------|-------------------|------------------------------------|
| Creamware | ~ 950°C – 1100°C | Water absorption very high (> 10%) |
| Pottery | ~ 1150°C – 1300°C | Water absorption low (≤ 3%) |
| Stone ware | ~ 1200°C | Water absorption very low (≤ 0.5%) |
| Terracotta | ~ 950°C – 1050°C | |
| Clinker / cleft clinker | ~ 1200°C | Water absorption very low |

Requirements to the subsurface of coating systems:

Basically tiles should be securely attached to the subsurface.

Completely remove loose tiles or such with cavities and fill the void with epoxy resin mortar.

Surface tensile strength must have an average value of 1.5 N/mm² minimum whereas single values of 1.0 N/mm² must not be undercut in any place.

Temperature of the air, the concrete surface and the processed material should be 10°C minimum. However temperatures of 15°C – 25°C would be ideal.

In any case, the surface temperature must be minimum 3°C above dew point temperature.

Variation 1 with residual moisture of subsurface > 3%

Subsurface preparation for a coating:

Grinding with diamond-studded disc or shot-blasting of the subsurface and vacuuming with an industrial vacuum cleaner. (An absorptivity of the subsurface must be produced)

Recommendation of the coating system:

EP-DF adhesive agent 20% water inclusive

EP-DF fine spattling compound

EP-DF self-levelling coatings

EP-sealing water-emulsified or 2 Comp. PU-sealing water-emulsified

Variation 2 with high residual moisture of subsurface < 3%

Subsurface preparation for a coating:

Grinding with diamond-studded disc or shot-blasting of the subsurface and vacuuming with an industrial vacuum cleaner. (An absorptivity of the subsurface must be produced)

Recommendation of the coating system:

EP-primer

EP- fine spattling compound

EP- self-levelling coatings or EP-Elastic self-levelling coatings

EP-sealing or PU-sealing

Variation 3 with residual moisture of subsurface < 3%

Subsurface preparation for a sealing or coating:

Cleaning of surfaces with a basic cleaner with cleaning pad (grinding pad).

Recommendation of the coating system:

1 Comp. Adhesion primer

1 Comp. PU-Super Flex coloured

Technical data sheet date 01.10.2010

| Selection of installation thicknesses of coating superstructures | |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Installation thicknesses and loads: | <p><u>Generally coating systems vary as follows:</u></p> <p>→ <u>Impregnation:</u> - Utilisation as consolidation and protection against precocious sanding of the subsurface</p> <p>→ <u>Thin layer sealing coloured:</u> - Utilisation on slight loads and truck lift traffic up to 1.5t max (there must not take place any stock-removing impacts)</p> <p>→ <u>Thick layer sealing coloured:</u> - Utilisation similar to thin layer sealing, technical advantage in equalling concrete/screed cavities or slight traces</p> <p>→ <u>Self-levelling coating 1.0-1.5 mm:</u> - Due to the self-levelling property, surfaces can be produced without or with only little application traces by paintrollers for example. - Utilisation on slight traffic by truck lifts and electric ants, the total weight of 2.5t max should not be exceeded. - Surface is more resistant against stock-removing impacts as these remain in the coating surface (scratches)</p> <p>→ <u>Self-levelling coating 1.5-2.0 mm:</u> - Is the most applied coating type as its coating thickness corresponds to mostly all requirements as well as to efficiency and optics (levelling properties)/ flatness compensation and the anticipated loads. - Utilisation on traffic by truck lifts and electric ants as well as by forklifts (4 wheel types). The total weight of 3.5t max should not be exceeded. - Surface is more resistant (even better than the 1-1.5mm version) against stock-removing impacts as these remain in the coating surface (scratches)</p> <p>→ <u>Self-levelling coating 2.5-3.0 mm:</u> - This coating is characterised by its high aggregate of filler materials and thus belongs to the most resistant coatings. - Due to the self-levelling properties, very high self-levelling properties and flatness compensations are being achieved with a material minimum consumption of 5.4 kg/m². Often this coating type replaces an additional intermediate layer that would be required on thinner coatings. - Utilisation on traffic by truck lifts and electric ants as well as by forklifts (4 wheel types). The total weight of 6.0t max should not be exceeded. - Surface is more resistant (even better than the 1.5-2.0mm version) against stock-removing impacts as these remain in the coating surface (scratches)</p> |
| | |

Technical data sheet date 01.10.2010

Special installation thicknesses of coating superstructures

| | |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Special installation thicknesses: | <ul style="list-style-type: none">→ <u>Special thicknesses and special designs of coatings:</u> Special thicknesses and designs may become necessary when high mechanic and thermic loads are being applied onto the coating surface. → <u>Examples on high concentrated loads:</u><ul style="list-style-type: none">- Synthetic coatings that have a certain flexibility on the coating surface may possibly be smashed by high concentrated loads (e.g. 3 wheel forklifts) even after curing. This has nothing to do with the material's compressions strength as these values only express a statement to the peak value of material destruction.- For resolving most requirements, 2.5-3.0mm self-levelling coatings can be used for example that are being broadcast on the entire surface with hard material (corundum / granite / silicon carbide) when still fresh and then sealed coloured. → <u>Example on high thermal loads:</u><ul style="list-style-type: none">- Epoxy resin coatings are shortly resilient to temperatures up to ~ 150°C and permanently from ~ -30° to +80°C. However, on a short-term temperature change (as on cleaning with hotwater steam blasters or hot water, hot baking trays) a so-called impact on the installed coating system develops that may have effects as well.- For resolution, one has to pay attention to an ideal subsurface preparation in order to ensure an optimum adhesion of the primers. On the other hand, coating systems must possess minimal layer thicknesses of 5mm at each point of the coating surface. |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Technical data sheet date 01.10.2010

| Selection of surfaces of coating superstructures | |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Visual requirements: | <ul style="list-style-type: none"> → In visually demanding areas, mind that unprotected surfaces of synthetic coatings are relatively sensitive to scratches. → The installation of part- to full-scale colour chip dispersals and an additional clear varnish sealing may contribute to a better visual conservation of the coating surface. Also mind that slip resistance is being increased by scattering colour chips and that also light reflection is being interrupted which contributes to a better grain. → Synthetic coatings that have been developed for the industrial sector are rather inappropriate in residential areas like kitchen, bathroom or living room. The reason is that scratches by chairs or tables but also fine sand grains cause visually unattractive spots on the coating surface. Similarly problematic in residential areas are irreversible colour changes by UV-impact and the reaction of strongly discolouring products (red wine etc.). → For all commercial areas (also retail stores) where there is much movement by persons, we always recommend for visual reasons the 2K or 4K EP-Elastic coating with chips on the entire surface and a double colourless polyurethane sealing. |
| UV-resistance of outside surfaces: | <ul style="list-style-type: none"> → Epoxy resin systems are basically not free from yellowing and would more or less chalk on the coating surface without an additional PU-sealing. For avoiding this, you have to work with the best EP- coatings (EP-Elastic System) and additionally the surface need to be scattered with chips on the entire surface. In addition, UV-resistant, colourless polyurethane sealings are being applied (this recommendation also applies to the interior with high UV-impact). → Also mind that partial chips dispersals on epoxy resin coatings that are being subsequently sealed with colourless UV resistant polyurethane are not suitable for achieving an absolute freedom of yellowing. The PU-sealing only provides a temporary yellowing protection. → For terraces and balconies we also offer UV-resistant polyurethanes whereas epoxy resins are also used for the base layer. |

Technical data sheet date 01.10.2010

| Selection of surfaces of coating superstructures | |
|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electrostatic charging | <ul style="list-style-type: none"> → Synthetic coatings can charge electrostatically due to inappropriate circumstances and due to emerging friction e.g. by shoes, tyres. These electrostatic charges may cause unpleasant and perceptible discharging on persons. There may be failures on electronic units. → <u>When do these occurrences mostly appear?</u> <ul style="list-style-type: none"> - New coatings with very even and homogeneous surfaces - On very low air moisture thus dry air - Forklifts with corresponding tyres without earthing lead → <u>What can be done when these phenomena appear?</u> <ul style="list-style-type: none"> - Electrostatic charging decreases on new coatings by utilisation as gloss level and surface homogeneity decrease as well. - Synthetic coatings can be treated with an alkaline base cleaner so that in most cases electrostatic charging reduces or is completely eliminated. - Furnish vehicles with earthing leads → <u>What can be done previously to the coating selection?</u> <ul style="list-style-type: none"> - not choosing even and homogeneous coatings and producing surfaces for example with 0.20Kg/m² minimum colour chips or produce them as quartz/rough granite surfaces. - However, even by installing a special electrostatically dissipative coating system, electrostatic charging cannot be completely suspended. |
| Slip resistance surface: | <ul style="list-style-type: none"> → - Surfaces of the coatings should always be executed according to the directives of professional organisations. These directives can be ordered under order no.: ZH1/571 at Carl Heymann Verlag KG, Luxemburger Str. 449, 50939 Köln. → - Often, the owner or architect do not want a dispersal of colour chips, quartz sands or the like. Then the responsible should precisely point to the increased slip hazard and if necessary should let themselves be discharged in writing with regards to slip resistance. → - We provide your customers with test certificates where many coating superstructures that appear in practice can be consulted for a comparison of slip resistance. We point to the fact that the required slip resistance classes will only be achieved on strictest compliance of the superstructures described in the respective test certificates. → - As coatings are being produced in a variety of surfaces, it is also possible to deviate from existing system tests and to derive the respective slip resistances. Contact our technical hotline. |

Technical data sheet date 01.10.2010

| Chemical resistance of coating surfaces | |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chemical resistance: | <ul style="list-style-type: none"> → Generally coatings are water-resistant after curing and are not destroyed by water load with normal temperatures. If there is water load during curing there may develop white spots on the coating surface. → Epoxy resin coatings are basically only restrictedly resistant (that means there are discolorations on the surface) to blood, disinfectants (red iodine), red pepper (or other strongly dyeing fruit extracts), hair tinting lotions or similar substances. Thus it is imperatively necessary to apply an additional 1K or 2K PU-sealing colourless onto the epoxy resin coating. But this also is only another protective factor and not imperatively durable. Furthermore you can provide against visually distracting aspects during the selection of a coating and its colour and chips dispersal. → 1K PU-Super Flex is not resistant against tannic acid (forms by the decomposition of leaves), geranium leaves, green rust or similarly aggressive media. Thus 1K or 2K PU-sealing colourless must also be used additionally. → Verify, by consulting the corresponding data sheets, if the respective coating is durable in case there are further impacts onto the coating surfaces resistance by chemicals like acids / alkalines / bases and the like. Our tests are helpful for this as well. → Generally blanket requests and information to acid and alkaline resistance are not possible as maximum concentration, temperature and residence time are essential for evaluating resistance. |
| Softener stains | <ul style="list-style-type: none"> → When it comes to discolorations by softeners contained in car tyres, one needs to say that there can be discolorations of coating surfaces in garages at any time, due to the variety of car tyre brands and the changing softener additives. We can only speak from experience where problems have arisen frequently. Especially for 1K or 2K PU-sealings there have frequently been discolorations caused by softener migration. Thus these products should not be used in garages. Softener discolorations are most seldomly or not known on the products EP-DF sealing/coating and EP-sealing WE. Thus these products should be preferably used in garages. → Softener migration by car tyres is also being supported by tyre or rim cleaners that dissolve the softeners from the tyres and cause discolorations on the coating surfaces. → It is also known that vehicles that have stood on new mastic asphalt and have then been parked on surfaces with synthetic coating may cause discolorations. |

Technical data sheet date 01.10.2010

| Maintenance and cleaning of synthetic coatings | |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maintenance and cleaning: | <ul style="list-style-type: none"> → Synthetic coatings must be cleaned and maintained regularly for conserving visual quality in the long term. → According to strain and utilisation of synthetic coatings, they have more or less scratches on the surface. It is especially annoying in visually demanding areas when these scratches get choked by dirt. Thus the surface must be treated once or several times a year with a basic cleaning and subsequent polymerdispersion treatment. → Synthetic coatings that have already been treated with polymerdispersion after completion have the advantage that dirt (e.g. paint spray or other impurities) can be removed easier on a basic cleaning due to the polymerdispersion that functions as a separating layer. |
| Recommendations for avoiding dirt: | <ul style="list-style-type: none"> → Choose tyres for industrial trucks that are not black but have a bright colour and/or are not chalking. Impurities by black tyres are only hard to remove. Thus a corresponding precaution is advisable (talk to your industrial truck retailer). → Normally anti-slip surfaces are more difficult to clean and thus you must probably buy special cleaning machines. |
| Maintenance cleaning: | <ul style="list-style-type: none"> → On easy strain, for example by pedestrians, manual cleaning with a floor detergent is normally sufficient (The floor detergent is added to the cleaning water). On larger surfaces and stronger impurities you should use a cleaning machine. |
| Basic cleaning: | <ul style="list-style-type: none"> → On basic cleanings once or several times a year of floor surfaces that are subject to permanently strong pollution like rubber abrasion by fork lifts or pallet trucks, the application of basic cleaner is necessary. A manual cleaning with a brush with previous residence time of about 15 min on slight impurities is possible. The best cleaning results are achieved by spraying the cleaner diluted or pure with an aerosol can onto the floor surface and by letting it react at least 15 minutes. The basic cleaner must not dry during residence time. Strongly brush the floor surface when using a cleaning machine with a cleaning pad or a brush suction machine and add a bit of water. Afterwards take up the waste water with a wet vacuum cleaner. Repeat the cleaning procedure if there are still impurities and if necessary raise the basic cleaner concentration. In any case, rinse the surface with clear water. |

Technical data sheet date 01.10.2010

| Maintenance and cleaning of synthetic coatings | |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Treatment after basic cleaning: | <ul style="list-style-type: none"> → After cleaning with the basic cleaner and cleaning machine, you need to regularly double-apply a protective film with polymerdispersion by using a mop. The first layer must have dried completely before applying the second one. → By using the polymerdispersion small scratches on the surface are being closed and thus a new accumulation of dirt in these cavities is being reduced. → Make sure that no milky puddles remain on the surface when applying the polymerdispersion. Otherwise there is the risk of the polymerdispersion peeling off after drying. Thus it is better to apply thin layers in multiple operations. → The polymerdispersion is a reversible protective film that can be removed by another basic cleaning. → With regards to the protective film's surface, there is no entitlement to a regular surface quality, for example the gloss level. → Brilliant protective films become consistently more matt in the surface. Thus possible different gloss levels immediately after application are not relevant and need to be accepted. → Furthermore there are two types of polymerdispersions, one brilliant and one silk-mat. Please also observe the technical data sheet in group 7. |
| Treatment after new coating: | <ul style="list-style-type: none"> → Application as above without basic cleaning. |

Technical data sheet date 01.10.2010

| Registration duty for floor coatings in recreation rooms | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| With commencement of Building Rules List 2008/3 in March 2009 there is a registration requirement (general approval by building authorities) for building products that are being used in recreation rooms according to the directives of AgBB and the official implementation by DIBt. | | |
| What is this regulation? | | <p><u>German Building Rules List B part 1 2008/3 alteration annex 6:</u> This law says: This building product / assembly set can only be used in recreation rooms including associated adjoining rooms due to sanitary reasons if the proof of health safety has been passed by a general building-authority approval. This does not apply for workrooms and workplaces in buildings that are subject to the regulations of the hazardous substances legislation (especially for workplace exposure limits).</p> |
| What are recreation rooms ? | → → | <p><u>German Model Building Regulation Version November 2002, §2 definition:</u> Recreation rooms are rooms that are intended for not only temporary stay of human beings. <u>That are for example:</u> - living spaces like living room, bedroom, kitchens - rooms in public buildings like schools, nursery schools, gymnasiums</p> |
| In which areas does this regulation apply? | → → | <p>In recreation rooms that are not only intended for temporary stay of human beings. In interiors that are not subject to control of workplace exposure limits of air pollutants. <u>The regulations applies for example to:</u> - private living spaces - rooms in schools and nursery schools - recreation rooms (that are not subject to control of workplace exposure limits)</p> |
| In which areas does this regulation <u>not</u> apply? | → → → → | <p>In recreation rooms that are only intended for temporary stay of human beings. In interiors that are subject to control of workplace exposure limits of air pollutants. Industrially and commercially used areas where there are exclusively employees. Workrooms and workplaces that are subject to control of workplace exposure limits of air pollutants. <u>These are for example the following areas:</u> - Production and assembly halls, warehouses - Basement garages and parking decks, private garages - private cellar floors that are no recreation rooms</p> |
| What does that mean for floor coatings?: | → → | <p>As our products are mainly intended for industrially and commercially used floor surfaces and not for recreation rooms in terms of above regulation, this regulation does not apply to our products on appropriate and recommended utilisation. On an illegal application in areas that are subject to the regulation / directive of AgBB / DIBt, Plasti-Chemie International GmbH declines any warranty.</p> |