Valid from March 1, 2016

BASE AND ITS PREPARATION – TECHNICAL CONDITIONS OF MONTAGE OF ELEMENTS MADE OF ARCHITECTURAL CONCRETE

Below instructions are only guidelines concerning verification and base preparation for fixing elements and they cannot be substitute for good building practice. Evaluation of base stability and evaluating if the fixing is possible should be made at construction site and in conformity with good building practice.

PRELIMINARY WORK

Remove potential weak and non-cohesive layers all the way to sound base.
Grind the entire surface. Very carefully clean remains and dust off the surface.

CONCRETE BASE

Concrete shrinks during slow drying and it causes so-called shrinkage.
Concrete made in autumn shrinks in spring.
Facings can be fixed onto cement mortar, when concrete has shrunk no less than 75%.
Approximate time of unmodified concrete C20/25 shrinking to the level of 75%:

- 7 cm thick – about 3 months
- 20 cm thick – about 4 months
- 50 cm thick – about 12 months

GYPSUM PLASTER

It may serve as base for cement adhesive, if the surface is correctly prepared.
Single-layer plaster minimum 10 mm thick should be used.
Ceramic tiles should not be put on smoothed down walls and thin plasters.
Gypsum bases should not be applied in spaces like baths or industrial kitchens.
Priming is necessary.
Machine applied gypsum plaster, designed to go under facings, cannot be felted.
Compressive strength of gypsum plaster should not be lower than 2,5 N/mm^2

GYPSUM CARDBOARD AND GYPSUM FIBREBOARD

Because of its composition, these boards are building boards and at the same time hygrophilous and flame retardants.
Subframe of boards and boardwalls must be made in conformity with good building practice and if there is possibility that there will be load, heavyweight facings should be applied.
Potential weak and non-cohesive layers should be removed all the way to sound base.
Grind the entire surface and very carefully clean remains and dust off the surface.
Priming is necessary.

BASES MADE OF PAINTS

One should identify a type of pint coating.
Paints burning off leads to plaster damage.
Adherence between coating and base should be checked by scratching it with a scriber.
Condition of plaster base should be checked by “percussion’”.
If after scratching, grooves are deep or plaster loosens – it should be replaced.
If the above mentioned things do not occur, the surface should be scratched densely, incised or dulled.
In case of paint coating – contact bridge should be used.

PLASTERS

Durability of layers' complex depends on quality of the base.
Adherence between adhesive mortar and base and ceramic facing has to correspond with tensile strength of base.
Plasters, which will serve as base for facings, have to have a minimum compressive strength of 2,5 MPa.
In case of cement plasters, their tensile strength fluctuates between 0,5 – 1,0 MPa
After one day plasters and cement mortars attain around 25% of their ultimate strength, after 7 days – 70% and after 28 days – 90%.

Features	Categories	Values
Range of compressive strength after 28 days of storage (seasoning)	CS I	0,4 – 2,5 N/mm²
	CS II	1,5 – 5,0 N/mm²
	CS III	3,5 – 7,5 N/mm²
	CS IV	$\geq$ 6 N/mm²

ELEVATION

Polystyrene foam boards covered with cement mortar and reinforcing fabric – examples of handling.
DIN 18515-1:1998-08 Ausenwandbekleidungen - Teil 1: Angemortelte Fliesen oder Platten; Grundsatze fur Planung und Ausfuhrung
DIN 18515-1:1998-08 Elevations - Part: Tiles fixed with mortars, rules of planning and realization.
Technical approval of system's producer, e.g. HECK KERAMIKSYSTEM. Individual project in conformity with standard or approval.
Sprayer – rendering of structural clay tile:
Mortar according to EN 998-1:2003, category CS IV
Minimum compressive strength of 6,0 MPa.
Recommended thickness of layer – around 3mm.
Smoothing layer
Mortar according to EN998-1:2003 category CS II W1.
Compressive strength 1,5 – 5,0 MPa, but no less than 2,5 MPa
Polystyrene foam minimum EPS 100
Fabric made of fibreglass minimum 160 g/m² or 2 layers of fabric 145 g/m² (Germany minimum 200g/m²)
Reinforcing layer 5 – 7 mm thick.
Polystyrene foam boards, apart from fixing, have to be studded at depth recommended for given base.
Depth of anchoring in concrete – minimum 4 cm
Depth of anchoring in structural clay tile – minimum 6 – 6,5 cm
Anticorrosive metal plugs: 6 – 8 items/m²
Studding through fabric
Freeze proof facings – GRC concrete, freeze resistance F150
Maximum tiles weight – 40 kg/m² (Germany 35 kg/m²)
Air pores volume of bottom side of tile $\geq$ 20 mm³/g
Adhesive mortar minimum class C2 S1
Adhesive method: Floating-Buttering (double smearing)
Recommended thickness of the layer: minimum 3 mm
Fixing according to montage guidelines
Recommended joint thickness 8 -10 mm.
Condition: joints' surface has to take minimum 6% of tiles' surface

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Pointing mortar with good permeability to water vapour
Important: additive of emulsion seals joint.
Multi-zone dilatations and dilatations between walls
Multi-zone - 2 – 4 mb intervals, depending on local conditions and directions of the world, colours of the tiles
Between walls – always
For dilatation – permanently elastic joints, e.g. Mapeflex PU45

SMOOTHING THE BASE

Examples of handling: Smoothing mortar **Nivoplan Plus Mapei** serves to smooth surfaces of floors, walls and ceilings inside and outside of buildings and to complement defects and local irregularities of the base. It can be used in order to prepare the base before fixing ceramic and stone tiles and other facing materials. The layer should be 3-50 mm.
When one smooths concrete surfaces and applies thin layers, **Nivoplan Plus** mortar should be mixed in correct proportions with **Planicrete** preparation (maximum 1,25 litres for 25 kg of smoothing mortar – it should be used as partial substitute of water!). It should be put on damp surfaces, **moisten the base with water.** One should ensure that mortar adjoins the base tightly – smooth down initially and then immediately put the proper layer, in order to obtain smoothing layers with appropriate thickness (max 50 mm).
Compressive strength - 23N/mm^2 (23MPa).
Consumption depends on thickness of the layer and it is around 1,5 kg/m^2 for 1 mm of the layer.
Consumption of Planicrete – 1 kg for 25 kg Nivoplan Plus mortar.

Montage of concrete facing elements - according to montage guidelines.

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