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SCHOMBURG Building Product Systems

Technical Data Sheet

ASO®-EZ4

Art.-No. 2 05527

Water repellent special cement

Properties:
- Water repellent
- Protects against efflorescence
- Fibre reinforced
- Rapid setting
- Long working time
- Foot traffic after approx. 6 hours *)
- Permits early installation of tiles
- For interior and exterior use
- Can be heated to recognised technical regulations after 3 days

Areas of application:
ASO-EZ4 is a fibre reinforced special cement for the production of water repellent, low shrinkage cement-based screeds and mortars that permits coverings to be installed early. Due to their water repellent properties, screeds and mortars produced with ASO-EZ4 offer increased protection against frost damage and efflorescence. As a water repellent, rapid setting mortar bed when installing natural stone and tiles externally and in wet areas such as balconies, terraces, loggia, stairwells, swimming pools, damp environments, car washes and water containers.

Screeds produced with ASO-EZ4 are suitable as either bonded, unbonded, floating or heated screeds, whether as a wearing finish or as a substrate for tiles, slabs or natural stone. For installation the general directives for cementitious screeds to DIN 18560 and DIN 18353 are obligatory. The substrate must be able to take the loading according to DIN 1055.

Furthermore drainage mortars can be produced with ASO-EZ4, that can drain off incidental water via its porous microstructure with many voids. At the same time, due to their hydrophobic composition, ASO-EZ4 drainage mortars do not absorb any moisture and inhibit capillary action.

In wet duty areas classified 0, A02, B0 in accordance with the ZDB information sheet [*1] screeds produced with ASO-EZ4 should be waterproofed with a suitable SCHOMBURG waterproofing system. In wet duty areas e.g. swimming pools, swimming pools surrounds, communal showers, screeds produced with ASO-EZ4 should be waterproofed with a suitable SCHOMBURG waterproofing system. In wet duty areas such as e.g. brine or wet duty areas classified as C in accordance with the ZDB information sheet [*1], screeds produced with ASO-EZ4 should be waterproofed with a suitable SCHOMBURG waterproofing system.
[*1] see advice section

Technical Data:

Basis:	special cement, additives
Colour:	grey
Mixing ratio:	ASO-EZ4/aggregate: 1:4 to 1:5 parts by weight
Water addition:	dependent on the moisture content of the aggregate used. 33% by weight (damp earth consistency) to max 40% by weight (stiff plastic) relative to the ASO-EZ4 addition, i.e. 8.25 to 10 litres water per 25 kg ASO-EZ4; these values refer to the use of dry aggregate
Mix method:	Forced paddle mixer, free fall mixer
Bulk density of fresh mortar:	approx. 2.2 kg/dm^3 dependent on the aggregate used
Storage:	12 months when stored dry in the original unopened packaging. Use opened packaging promptly.

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Application/ substrate temp:	min. approx. +5° C to max. approx. +30 °C
Packaging:	25 kg bags
Cleaning:	clean tools and equipment with water immediately after use
Foot traffic after *):	approx. 6 hours
Fully cured after *):	approx. 7 days
Working time *):	approx. 60 minutes

*) Values refer to +23° C and 65% relative humidity, higher temperatures reduce, lower temperatures extend these given times.

Approx. consumption, kg/m² ASO-EZ4:

	Mixing ratio	Parts by weight
Screed thickness, cm	1:4**)	1:5**)
1	4.1	3.4
4	16.3	13.6
5	20.4	17.0
6	24.4	20.4

**) 1:4 parts by weight equal to approx. 1:2.7 parts by volume, 1:5 parts by weight equal to approx. 1:3.3 parts by volume

Minimum nominal thickness to DIN 18560:

Beneath tiles	45 mm on insulation or separating layer
Beneath parquet, carpet, linoleum or PVC	35 mm on insulation or separating layer
In general	10 mm bonded

Product preparation:

For preparation we recommend using the Brinkmann screed boy with a 65 mm hose diameter, or other conventional screed mixers PFT, Putzmeister Mixocret or similar. Pay attention to the moisture content of the aggregate and avoid excess water. The working time is approx. 60 minutes at +20 °C. Mixing, application and finishing must follow each other swiftly. Only measure out areas that can be completed within this working time. Higher temperatures reduce and lower temperatures extend the working time and setting time. For bonded screeds firstly brush ASOCRET-HB-flex onto the prepared, e.g. mechanically abraded, concrete substrate. Lay the screed into the wet slurry coat. The general directives for cement-based screeds DIN 18560 and 18353 should be followed for screed laying.

Mixing recommendations for mixing and rotary feed machines:

In a conventional mixing machine with rotary feed with a 220 litre mix capacity e.g. PFT, Putzmeister Mixocret mix together a total of 200 kg aggregate with 50 kg ASO-EZ4. This relates to a mixer capacity of approx. 80% - which is generally recommended by the equipment manufacturers.

Please observe the following steps:

First half fill the mix vessel with aggregate 0/8 (approx. 15 shovels at 7kg), approx. 5-6 litres of water and 50 kg of ASO-EZ4 and mix to a plastic consistency for 2 minutes. Then fill the mixing vessel with the rest of the aggregate (dependent on the mixing ratio another 15 shovels at 7 kg) and the remaining water. Dependent on the moisture content of the aggregate a total of approx. 10-20 litres of water will be necessary. The latter value relates to dry aggregate. In general 0/8 aggregate has a moisture content of approx. 4%, therefore 8 litres of water are already contained in 200 kg of aggregate. Keep to a total mix time of 4 minutes, as only then are all components dispersed and the final consistency achieved.

Mixing recommendations for a free-fall mixer:

Recommended mixing ratio: 1:3 by volume (equates to approx. 1:4.5 parts by weight); add approx. 3 litres of water, approx. 60 kg aggregate (0-8 mm diameter, approx. 8 shovels) with 25 kg ASO-EZ4 and premix for approx. 5 minutes. Add the remaining aggregate approx. 40 kg (0-8 mm diameter, approx. 6 shovels) and mix for 1-2 minutes. Adjust to a damp earth to stiff plastic consistency by adding water.

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Mixing recommendation for mortar:
Mix ASO-EZ4 to a mix ratio of 1:3 by volume (equates to 1:4.5 parts by weight) with aggregate (of particle size 0-4 mm diameter) in a free fall mixer or with a suitable stirrer. Minimum mix time 5 minutes. Protect the fresh screed from drying out too quickly e.g. through heat or drafts. The screed is ready to take tiled finishes after three days when installed at 5 cm thick when the ambient and substrate temperatures are at +23 °C and the relative humidity is 50% and when the mixing ratio is 1:4 parts by weight and dry aggregate conforming to DIN 4226 is used with a particle size distribution between A8-B8 closer to B8 with consistent grading and with a water addition of 17 litres per 50 kg ASO-EZ4. Confirmation should be sought by measuring the moisture content with a carbide hygrometer (CM). For screeds that need to conform to a particular screed quality in accordance with DIN EN 13813, performance tests will be required. These are to be carried out prior to commencing work.

Mixing and application recommendations for water permeable drainage mortars (also known as single grain mortars, mono grain mortars or drain mortars):
Mix ASO-EZ4 to a mix ratio of 1:3 by volume (equates to 1:4 parts by weight) with aggregate without fines in a suitable screed mixer. In this context use aggregate e.g. fine flint of particle size 2/5 mm, 5/8 mm, 8/12 mm, or pearl gravel of particle size 4/8 mm. The choice of aggregate is to be made from the desired mortar bed thickness and availability. The water addition is to be varied according to the moisture content of the aggregate. When using dry aggregate approx. 30 to 36% by weight of water related to the ASO-EZ4 addition, i.e. 7.5 to 9 litres of water per 25 kg ASO-EZ4 is needed. Only add enough water to the fresh mortar until a damp earth consistency is achieved. The minimum thickness of the mortar bed must be determined by the aggregate used as well as the total construction and the expected service loads. Ensure adequate drainage of the sub-base.

The following steps should be taken:
Fill a suitable screed mixer with ASO-EZ4 and aggregate in the mixing ratio 1:1 by volume. Subsequently add water and dependent on the screed mixer, mix for 4 to 5 minutes in order to achieve a viscous mortar after this mix time. Now add the remaining two parts by volume, mix for a short while until a homogenous drainage mortar with a damp earth consistency is achieved. The consistency is correct when the fresh, lightly glistening mortar can be squeezed together in the hand but falls apart upon opening the hand. Drainage mortars that are too damp lose their ability to drain because the voids between the grains become clogged with binder. Lay natural, concrete slabs or ceramic tiles professionally into the drainage mortar.
Different variations are possible:

a) Bonded drainage screed on a load bearing concrete slab

Brush a bonding slurry of ASOCRET-HB-flex to saturation onto the load bearing substrate that has been laid with adequate falls and e.g. waterproofed with AQUAFIN-2K/M. Subsequently install the drainage mortar with a damp earth consistency into the wet bonding coat and strike off to the designed level. Due to the aggregate the drainage mortar is virtually self-compacting and only needs to be lightly tamped.
Coat the rear of the slabs/tiles with ASOCRET-HB-flex and lay them into the freshly installed mortar bed and tap into position. Dependent on the finishing material, grouting is carried out with CRISTALLFUGE, ASO-Flexfuge or HF05-Brillantfuge after 3 days at the earliest. The minimum thickness is 3 cm but also a minimum of 5 times that of the largest particles used. Ensure there is adequate dewatering if the drainage layer. I.e. an adequate fall of min. 2-3% in the sub-base and on the surface of the finishing material is to be designed. To improve the horizontal dewatering effect we recommend variation b.

b) Drainage screed on a separating layer on a concrete slab e.g. Aquadrain EK, GUTJAHR

Install a drainage mat e.g. Aquadrain EK onto the waterproofed, e.g. with AQUAFIN-2K/M, load bearing substrate. Subsequently apply the drainage mortar in a damp earth consistency, lightly tamp, install edge sections and strike off to the designed level. Coat the rear of the slabs/tiles with ASOCRET-HB-flex and lay them into the freshly installed mortar bed and tap into position. Dependent on the finishing material, grouting is carried out with CRISTALLFUGE, ASO-Flexfuge or HF05-Brillantfuge after 3 days at the earliest. The minimum thickness is 5 cm but also a minimum of 5 times that of the largest particles used. Ensure there is adequate dewatering of the drainage layer. I.e. an adequate fall of min. 1 to 2% in the sub-base and on the surface of the finishing material is to be designed.

c) Bonded or on a separating layer as described in a) or b) onto the pre-installed cured drainage screed

Install the natural stone or ceramic finish in a thin-bed or medium-bed adhesive onto the cured drainage screed that has been installed to the designed level, lightly abraded and smoothed. The installation of the tiles is carried out with CRISTALLIT-flex, CRISTALLIT-MBK-flex or LIGHTFLEX that have each been modified with 2 kg UNIFIX-B per 25 kg (15 kg for LIGHTFLEX). Once the thin-bed or medium-bed adhesive has cured, grout with CRISTALLFUGE, ASO-Flexfuge or HF05-Brillantfuge.

d) Floor finishes in the drainage mortar onto an unbonded mineral-based base layer

This type of construction is suitable for light duty areas such as garden paths, terraces, private driveways, private entryways etc. With floor finishes where subsidence is likely choose another construction as described previously. The substrate in question must be load bearing, able to drain and adequately designed for the planned dynamic loads. Advice can be taken from the directives for earthworks and road construction – see “important advice” section.

- The supporting substrate – soil direct to prepared ground or adequately compacted hardcore – should be struck off to falls. With cohesive soil layers, design falls in the substrate ≥ 3% and where necessary provide drainage. In all cases ensure there is adequate dewatering of the sub-base.
- In order to avoid penetration from fines in slurry form or from neighbouring soil into the construction – that will eventually impair the drainage – install edge aprons. Other measures that prevent the backflow of surface water or penetration into the soil such as e.g. channels, edging blocks are also possible.
- Arrange in layers a compacted cement-based supporting layer e.g. 0/45 mm, 0/32 mm ballast as a capillary breaking layer onto the prepared substrate. Dependent on the trafficking and sub-base an approx. 20 cm (sandy substrate) to 40 cm (loamy substrate) thick compacted supporting layer will be necessary.
- The supporting layer is subsequently overlapped with the water permeable protective and slip membrane ASO-Systemvlies-02.
- Subsequently apply the drainage mortar in a damp earth consistency, lightly tamp and strike off to the designed level. The minimum thickness is 6 cm but also a minimum of 5 times that of the largest particles used. Coat the rear of the slabs/tiles with ASOCRET-HB-flex and lay them into the freshly installed mortar bed and tap into position. The slabs/tiles must be frost resistant, minimum 3 cm thick and laid to falls of minimum 1.5% or up to 3% for rough surfaces in the direction of the dewatering.
- Grouting is carried out after a minimum of 3 days with the water permeable grout POXICRET or POXICRET-1K.

Important advice:

- By high temperatures, direct sunlight and drafts, protect the screed from water loss during drying. To ensure ideal hydration of cement, the screed can be protected during the curing phase e.g. with plastic sheeting or with continuous light misting.

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- Instead of ASOCRET-HB-flex use an alternative bonding slurry consisting of ASOPLAST-MZ diluted 1:1 to 2 with water and screed mortar consisting of 1 part by volume of ASO-EZ4 and 2 parts by volume of aggregate of particle size 0-4 or 0-8 diameter.
- ASO-EZ4 is ready to receive floor finishes quickly because it contains additives that require an especially low water demand. If more water is added than needed to achieve a stiff or stiff plastic consistency, the excess water cannot be bound within the system and must evaporate. This leads to the screed being ready to receive finishes later.
- If a shorter mix time is selected or mixing is not intensive enough, then the dispersion of all components is not guaranteed. The readiness to receive finishes early and high strength are no longer guaranteed.
- ASO-EZ4 already contains fibres. If additional fibres are to be mixed in, this can lead to delays in the readiness to receive finishes.
- For installation in areas where there is an inadequate aggregate quality or where storage of the mortar components is not possible or desired, the pre-blended mortars ASO-EZ4-Plus, ASO-EZ2-Plus, ASO-EZ6-Plus or ASO-EZ-LIGHT are available.
- Lower temperatures, high humidity and thick screeds delay the setting, drying and achievement of readiness for laying finishes (see also the BEB data sheet "climatic requirements for the drying of screeds"). Trials have shown that at lower temperatures (+5 °C to +12 °C) the binding of the water proceeds at a delayed rate so that the readiness to receive floor finishes was only achieved belatedly.
- Water that bleeds to the surface indicates too much water or aggregate addition (more than 3.3:1 by volume equating to 5:1 parts by weight), the wrong particle size distribution or inadequate mixing. This results in a sandy surface.
- If when smoothed off the surface cannot be adequately closed, this indicates that there are too little fines in the aggregate. Here greater quantities of ASO-EZ4 are required to replace the missing fines.
- Where there is rising damp from the substrate, a functioning damp proof membrane is necessary prior to laying the screed. Not relevant in conjunction with finishes on drainage mortars on an unbonded mineral-based supporting layer.
- Ventilation on site is necessary. The interior and floor temperature during application and for 1 week afterwards must be a minimum of +5 °C. De-humidifiers may not be used during the first 3 days.
- To determine the screeds readiness to receive finishes carry out moisture measurements using a carbide hygrometer (CM). Keep to the following limits:

Important advice table 1:

Maximum moisture content of the screed determined with a carbide hygrometer

Floor finish		heated	unheated
Vapour impervious finishes		1.8 %	2.0 %
Textile finishes	Vapour barrier	1.8 %	2.5 %
	Vapour permeable	2.0 %	3.0 %
Parquet		1.8 %	2.0 %
Laminate flooring		1.8 %	2.0 %
Ceramic tiles, natural stone/concrete slabs	Sand: Cement fixing	2.0 %	2.0 %
	Adhesive fixing	2.0 %	2.0 %

The measurements with the carbide hygrometer are to be carried out in accordance with the current work instructions of the FBH-AD from the technical information "coordination of cut out areas for heated floor constructions".

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- The quality of the aggregate used determines the properties of the screed produced with it. The aggregate must not contain any deleterious or coloured constituents. Aggregate to DIN 4226 with a consistent grading between A and B closer to B to DIN 1045 should be used. If aggregates with other particle size distributions are used, then the binder demand can increase. Aggregates with a grading between B and C to DIN 1045 require a high level of ASO-EZ4. Which grade for which screed thickness should be taken from the following table:

Grading	Minimum thickness	Maximum thickness
0–4 mm	10 mm	30 mm
0–8 mm	25 mm	80 mm
0–16 mm	50 mm	160 mm

- Perimeter, bay, construction and movement joints are to be carried through or incorporated in the designated position and composed of suitable material e.g. edging strip. Crack control joints are to be cut into the top third of the installed screed.
- Do not mix with other cements or binders.
- Do not add any additives or other materials.
- Take heed of the technical data sheets for the aforementioned products.
- The relevant current regulations are to be observed. E.g.

DIN 18157 DIN 18318 DIN 18332
DIN 18333 DIN 18352 DIN 18560
DIN EN 13813 DIN 1055 DIN 1045
DIN 4226
The BEB data sheets distributed by the National Association for Screeds and Finishes
The technical information ""coordination of cut out areas for heated floor constructions"
The ZDB data sheets distributed by the Technical Association of the German Tile Industry.
[*1] Advice on the installation of waterproofing combined with ceramic
tiles in interior and exterior areas.
[*2] Ceramic finishes subjected to high mechanical stress.
["3] Movement joints in tiled finishes.
[*4] Ceramic tiles, slabs, natural stone and concrete blocks on cement-based screeds over insulation.
[*5] Ceramic tiles, slabs, natural stone and concrete blocks on heated cement-based floor constructions.
[*7] Exterior finishes.

The technical structural information for natural stone slabs from the German Association for Natural stone slabs, especially the information paper DNV 1.4 floor finishes, external.
Directives for earthworks and road construction:
The "directives for earthworks and road construction", RStO-2001.
The ZTV E-StB. 94 "Additional technical contractual terms and directives for earthworks and road construction".
The ZTVT-StB. 95 "Additional technical contractual terms and directives for supporting layers in road construction".
The FGSV-working paper "Paved areas with block pavers and slab finishes accomplished by bonding", draft September 2003 from the Research Association for road and traffic systems.

Please observe a valid European safety data sheet!

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