STEULER | Linings

TI 353

Technical Information Surface Protection Linings
Issue 18.09.2019

STEULER ACID CEMENT AE

Halogen-free water glass mortar for bedding and jointing of acid resistant tiles and bricks

Base

Potassium water glass

Material Group

Mortars, Jointing Materials

Description

Halogen-free 3-component water glass mortar for the construction of filled joint- and hollow joint- applied acid resistant tile and brick linings on floor areas.

In contrast to traditional silicate mortars, the mortar cannot only be applied in acidic areas but also in neutral areas, i.e. outdoors.

Use

Laying of acid resistant tiles and bricks on floors, in trenches, foundations and autoclaves (in particular in steam zones); acid resistant tile and brick linings in towers and pipes. The mortar can also be used as a potting or injection compound.

Properties

- halogen-free
- can be applied directly to metallic substrates without any special preparation (no corrosion on lead- or chromium-nickel-steel)
- thermal resistance up to 450 °C

Physical Data

Property (unit), Test method	Value
Density [g/cm³], DIN EN ISO 1183-1, ASTM D 792	2.15 (acc. to DIN EN ISO); 2.13 (acc. to ASTM)
Compressive strength [MPa], DIN EN ISO 604, ASTM C 579	70
Modulus of elasticity [MPa], DIN EN ISO 178, ASTM C 580	3×10^4
Adherence to concrete / screed [MPa], DIN EN ISO 4624	> inherent strength of concrete
Adherence to ceramic bricks [MPa], DIN EN ISO 4624	> inherent strength of ceramic Bricks
The thermal coefficient of linear expansion [1/K], ISO 11359-2, ASTM C 531	1.5×10^{-5}
Thermal conductivity [W/mK], ISO DIS 22007	1.2
Tensile Strength [MPa], DIN EN ISO 527, ASTM C 307	7
Lowest working temperature [°C]	10
Maximum working temperature [C]	40
	Data are mean values

Chemical Resistance

For detailed information about the chemical resistance please refer to Technical Information TI 350.

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Please contact our application engineering for approval of the project-specific possible application.

+ = resistant at 20 °C

(+) = short time resistant

− = not resistant

Substances

Acids	
Formic/acetic/lactic acid	+
Chromic acid 30 %	+
Hydrofluoric acid	-
Oleum	+
Nitric acid 65 %	+
Hydrochloric acid up to 37 %	+
Sulfuric acid up to 98 %	+
Alkalis	
Ammonia solution 25 %	(+)
Chlorine bleaching	-
Sodium hydroxide solution, potassium hydroxide solution	-
Solvents	
Aldehyde	+
Alcohols	+
Benzene / Toluene / Xylene	+
Ester / Ketones	+
Formaldehyde	+
Methylene chloride	+
Mineral oils	+
Petrol	+
Trichlorethylene	+
Other	
Amines	+
Vegetable/animal oils and fats	+

Substrate

Uneven spots should be levelled in the substrate already. Do not apply the mortar directly to the substrate! If the substrate is not provided with a surface protection system, apply with a suitable primer and sprinkle if necessary. Please contact our Application Technology Department for possible solutions.

Usually the mortar is applied onto STEULER-KCH's coating systems or rubber linings.

Concrete / screed

Refer to DIN EN 14879-1 as well as to STEULER-KCH-Formsheet 010.

To attain a sufficient adhesive tensile strength, the substrate is generally to be pretreated in such a way that it is free of cement slurry, cement skin, loose and crumbly particles, structure imperfections and separating substances.

The residual moisture of cementitious substrates must not exceed 4 %.

Steel

Refer to DIN EN 14879-1 as well as to STEULER-KCH-Formsheet 020.

The steel surface shall be sandblasted to a metallic bright finish. A preparation degree of SA 2 ½ as specified in DIN EN ISO 12944-4 and a roughness grade "medium (G)" as specified in DIN EN ISO 8503-1 must be achieved; minimum surface roughness R_z = 70 µm. After blasting, the formation of new rust must be prevented by suitable measures, e. g. priming directly.

The substrate should have a temperature of approx. 10 – 25 °C.

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Moisture

During application, the substrate must be kept absolutely dry. Uncured material has to be protected from any kind of moisture (condensation, fog, precipitation or other water source). Distance to dew point has to be at least 3 K, at a relative humidity of above 70 % at least 5 K.

Packaging / Shelf life

All components must be stored and transported dry and frost-free. The minimum storage life applies to a storage temperature of 20 °C, unless otherwise specified. Higher temperatures reduce, lower temperatures increase the shelf life.

Components	Item number	Package	Content	Shelf life
Acid-Cement-AE-Solution 1	5021001001	Drum	25 kg	24 Months (at min. 5 °C)
Acid-Cement-AE-Solution 2	5021002002	Drum	20 kg	24 Months (at min. 5 °C)
Acid-Cement-AE-Solution 2	5021002003	Canister	5 kg	24 Months (at min. 5 °C)
Acid-Cement-AE-Powder	5021137001	Bag	25 kg	24 Months

For handling, transport and storage observe the relevant material safety data sheets.

If the Acid-Cement AE solution shows 2 solid components (crystallization at low temperatures), a homogeneous solution can be restored by heating to 40 °C for a short time (maximum duration of heating: 2 days). While heating keep the cans closed and move them by shaking once in a while for a correct mixture.

Mixing Ratio / Consumption

STEULER Acid mortar AE-B for bedding and jointing

	Part by weight	Part by volume
Acid-Cement-AE-Solution 1	4.75	3.3
Acid-Cement-AE-Solution 2	1.0	1.0
Acid-Cement-AE-Powder	41.7	32.5
Consumption	2,150 kg/litre mortar mass	
Bed / bed joint thickness		5 - 8 mm
Joint width		5 - 8 mm
Joint width (hollow joint laying)		5 - 8 mm
Joint depth (bumpy joint installation)		min. 15 mm

Consumption of mortar by filled-joint laying (bed joint 5 mm / butt joints 7 mm):

Split tiles 240 x 115 x 20 mm	approx. 7.5 l	16.3 kg/m²
Split tiles 240 x 115 x 40 mm	approx. 9.5 l	20.5 kg/m²
Bricks 240 x 115 x 65 mm	approx. 11.5 l	24.8 kg/m²
Bricks 240 x 115 x 80 mm	approx. 13 l	28 kg/m²

STEULER Acid Mortar AE Casting and injection material:

	Part by weight	Part by volume
Acid-Cement-AE-Solution 1	7.5	5.26
Acid-Cement-AE-Solution 2	1.0	1.0
Acid-Cement-AE-Powder	50.0	39.0
Consumption	2.130 kg/litres casting material	

Pot Life

Pot life depends on temperature:

20 °C	approx. 30 - 60 minutes

Curing times

To support foot traffic at 20 °C at least 24 hours.

To achieve full chemical resistance: at least 8 days at 20 °C.

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Usually a post-treatment is not necessary for applications in pressure leaching vessels.

In case of risk of neutral stress after termination of work and before commissioning, e.g. by rain water, an acidification of the joints will be required.

Acidification should be performed after a waiting time of 8 days at least. If there is no acid stress during the start-up-procedure, an acidification becomes necessary as well.

For an acidification following media can be used: sulphuric acid 20 % or alcoholic sulphuric acid 20 %.

Floor areas and trenches jointed with STEULER ACID CEMENT AE are to be acidified always approx. 24 hours after termination!

Safety and Disposal

- Sufficient aeration and de-aeration (especially in tanks and pits).
- No smoking/no fire
- Refer to the Safety Data Sheets
- Observe danger references and safety recommendation labels.
- Wear required personal protective equipment (avoid skin contact with materials)
- Clean and protect hands with skin protective soap and skin protection cream (no solvents)
- Wear a dust mask when sanding (e.g. for repairs).
- Instructions as per § 14 of GefahrstoffV (Toxic Substances Act) and TRGS 507 (Technical regulations for Hazardous Substances - Germany)
- Accident precautions issued by the Liability Insurance Association for the Chemical Industries (Germany)

Do not expose materials to heat or open flame, this applies in particular to welding works (weld beads).

Preferably consume residual quantities. Do not pour into a spout or dustbin! Collect separately for disposal in durable, lockable and labeled containers.

Cleaning of Equipment

Tools can be cleaned with water. During application the mortar must not come into contact with water!

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This issue replaces all previous versions.