

FASZINATION KALK ...

OTTERBEIN



... SEIT JAHRTAUSENDEN BEWÄHRT®

Who prefers the *Nature*
can rely on us.

HISTOCAL® Historic plasters and mortars

The future of historic buildings
lies in the knowledge of the past ...



Products for ...

renovation & restoration



HISTOCAL® Historic Pure Lime Plaster

Preservation of historic know-how to preserve historic monuments ...

The use of lime as a mortar binding agent had been state of the art at nearly all historic monuments before 1850. Due to the development of cements and their use in the preservation and restoration of historic monuments, the know-how and craftsmen tradition with respect to lime mortar had sunk into oblivion. The use of dense and rigid cement mortars resulted in immense damages to historic building structures. Until today, there are many cement-based mortars in the guise of the terms "Hydraulic binding agents" or "Hydraulic limes" as "Lime mortars" sold on the market.

HISTOCAL® Historic Pure Plasters (HRP) are made of pure minerals exclusively consisting of the binding agent "**Natural Hydraulic Lime**" and are thus completely **free from cement**. These products fulfil in an exemplary fashion the **reference to the historic findings** – the lime mortar requested by the preservation of historic monuments. Due to the interaction of **hydraulic and carbonate hardening HISTOCAL® Historic Pure Lime Plasters** harden slowly and **tension-free**, they have a **low E-module** and are thus capable of absorbing thermal and mechanical tensions without problems.

HISTOCAL® Historic Pure Lime Plasters have a **natural capillarity** and a **very high water vapour diffusion capacity**, any moisture in the stonework through rain or condensation can quickly evaporate through the plaster surface, the **moisture household of the building will thus be regulated**. **HISTOCAL® Historic Pure Lime Plasters** uniformly harden **throughout the complete plaster cross-section** – the carbonation serves as an additional improvement of structural strength. The repeated dissolution and precipitation of calcium hydroxide and the recrystallization connected therewith results in a "**Self-curing**" of micro-cracks possibly occurred.

The high **alkalinity** of the **HISTOCAL® Historic Pure Lime Plasters** prevents an **infestation through algae and mould in a natural way and without a treatment with biocides as an environmental load**. Used in the interior, **HISTOCAL® Historic Pure Lime Plasters** provide a balanced and **healthy room climate**. **HISTOCAL® Historic Pure Lime Plasters** exclusively consist of **natural raw materials** and have a **natural state colouring**. These products are available with a **maximum grain size of 2 mm or up to 4 mm**.



Church of Steyerberg
Walter Joedicke, Liebenburg

Monastery Schönau, Strüth
Nüthen Restorations, Erfurt



Church St. Leonhard, Frankfurt
Preservation of Historic
Monuments Mühlhausen

TECHNICAL DATA:

Mortar group:	CS I, EN 998-1 Plc, DIN 18550	CS II, EN 998-1 P II, DIN 18550
Fire Class:	A1	A1
Grain size:	0-1.6 or 0-4 mm	0-1.6 or 0-4 mm
Solid mortar raw density:	1.50 kg/dm ³	1.50 kg/dm ³
Compressive strength, approx.:	0.8 N/mm ² after 28 days	1.8-2 N/mm ² after 28 days
E-module, approx.:	1.300 N/mm ²	1.300 N/mm ²
Water vapour diffusion resistance factor μ:	< 8	< 8

HISTOCAL® Historic Masonry and Grouting Mortar

The ancient Romans already knew ...

... how to construct long-lasting buildings. Many of those still exist today after 2000 years. At that time, lime as well as pozzolanic additives, thus latent hydraulically hardening substances, had been added to the mortars to increase stability.

The HISTOCAL® Historic Masonry and Grouting Mortars (HMF) perform very similar. The unique binding agent "Natural hydraulic lime" will provide to the mortar the advantages of **slaked lime mortars** – on the one side – and **excellent permanent stability** through the **moderate hardening** – on the other side.



"I recommend natural hydraulic lime, because it enables me as a user a safe processing due to the hydraulic components and guarantees to my customers a high degree of sustainability through the carbonate binding agent components."

Gerhard Buchenau,
Conservator and Head of the Conservation
Department of the Claus Ellenberger Bau GmbH
Herleshausen

Their **natural capillarity** provides for a **regulation of the moisture household** in the stonework and the **preservation of the building structure**. Moisture can be transported out of the stonework without any problems as a **capillary effect or by way of diffusion** via the joint. Any penetrating water will not be trapped but will be quickly dispensed.



Heidecksburg, Rudolstadt
Dreikant GmbH, Weimar

Saale bridge, Jena, BAB 4
Messrs. Späte, Zeitz

Due to the **high water vapour permeability**, an hazardous increase of the humidity in the stonework through internal condensation will be reliably prevented. **HISTOCAL® Historic Masonry and Grouting Mortars** are purely mineral, consist of natural raw materials.

TECHNICAL DATA:	MG II	MG IIa
Mortar group:	M 2,5, EN 998-2 NM II, DIN V 18580	M 5, EN 998-2 NM IIa, DIN V 18580
Grain size:	0-1.6 or 0-4 mm	0-1.6 or 0-4 mm
Solid mortar raw density:	approx. 1.65 kg/dm ³	approx. 1.65 kg/dm ³
Compressive strength:	approx. 2.5 N/mm ² after 28 days	approx. 5.0 N/mm ² after 28 days
Flexural strength:	approx. 1.0 N/mm ² after 28 days	approx. 2.0 N/mm ² after 28 days
E-module:	approx. 3.5 kN/mm ²	approx. 7.5 kN/mm ²

HISTOCAL® Lime Trass Plaster

Plaster made to tradition ...

HISTOCAL® Lime-Trass Plaster (KTP) consists of formulated lime (trass lime) EN 459-1 FL B 2 (NHL 80, P20) and grain graduated crushed lime sands – without any cement material. For this reason, it is the perfect solution for monument preservation and may be used in interiors and exteriors on any type of masonry, concrete and plaster supports. It may be applied on all suitable substrates in one or several layers.

TECHNICAL DATA:

Mortar group:	CS I, EN 998-1
Fire Class:	A1
Grain size:	0-1.6 mm
Solid mortar raw density:	1.36 kg/dm ³
Compressive strength:	approx. 0.9 N/mm ² after 28 days
E-module:	approx. 1.400 N/mm ²
Water vapour diffusion resistance factor μ :	< 8

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HISTOCAL® Pore Plaster

Salt-storing plaster for a permanent protection of the building substance ...

HISTOCAL® Pore Plaster (PP) consist of "Natural hydraulic lime – NHL 5" and small amounts of sulphate-resistant cement as a binding agent. Carefully selected and composed highly porous light additives provide for a high capillarity and an optimum salt storing capacity due to their pore distribution and geometry. Due to the excellent capillary properties, the moisture can penetrate through the plaster layer nearly without impedance. This ensures an optimum moisture regulation of the masonry and a dry, salt-free plaster surface. Very suitable as "sacrificial" plaster layer and compression plaster for severely salt-loaded substrates. Thanks to the low vapour diffusion resistance factor of **HISTOCAL® Porous Plaster**, moisture is easily carried away by a diffusion process.



Royal Library, "Kommode", Berlin
Potsdamer Sanierungsbau



TECHNICAL DATA:

Mortar group:	PII, DIN 18550, CS II, EN 998-1
Fire Class:	A1
Grain size:	0-1.5 or 0-3.5 mm
Solid mortar raw density:	1.20 kg/dm ³
Compressive strength:	3.5 N/mm ²
Water vapour diffusion resistance factor μ :	< 8
Porosity:	approx. 35 % per volume

HISTOCAL® Injection Mortar

Value conservation for old masonry ...

HISTOCAL® Injection Mortar (IM) consists of "Naturally hydraulic lime – NHL 5" to EN 459-1, pozzolan and grain graded crushed lime sands. Our **HISTOCAL® Injection mortar** is the perfect solution for crack and cavity closing, in particular for historical buildings and masonry rehabilitation

TECHNICAL DATA:

Mortar group:	M5, EN 998-2
Fire Class:	A1
Compressive strength:	> 5 N/mm ²
expected compressive strength acc. to 56 d:	> 10 N/mm ²
Solid mortar raw density:	1.45 kg/dm ³
Grain size:	< 0.7 mm
Water absorption:	W0

HISTOCAL® Anchor Mortar

Asset protection for constructional cracks ...

HISTOCAL® Anchor Mortar (AM) consists of "Naturally hydraulic lime – NHL 5", pozzolan and grain graded crushed lime sands. **HISTOCAL® Anchor Mortar** is used for pressfitting and sealing anchor systems in masonry. Thanks to the soft, pliable consistency, anchor holes can be filled in an overhead process. **HISTOCAL® Anchor Mortar** is very suitable for the installation of anchors with so-called anchor sleeves.

TECHNICAL DATA:

Mortar group:	M5, EN 998-2
Fire Class:	A1
Compressive strength:	> 5 N/mm ²
expected compressive strength acc. to 56 d:	> 12 N/mm ²
Solid mortar raw density:	1.45 kg/dm ³
Grain size:	< 1 mm
Water absorption:	W0

Application	HRP	HMF	KTP	PP	IM	AM
For the preservation of valuable building structure	●	●	●	●	●	●
Inside and outside	●	●	○	●	●	●
For the renovation of moist and salt-containing substrate	—	—	—	●	—	—
For the plastering of facades based on historic analyses	●	—	●	○	—	—
For the renovation / restoration of stonework based on historic analyses	—	●	●	—	—	—

Properties	HRP	HMF	KTP	PP	IM	AM
Free from cement and synthetic additives	●	○	●	○	●	●
Hygic and mechanical properties matching historic mortars	●	●	○	●	—	—
High water vapour permeability to regulate the moisture balance in the stonework	●	●	●	●	—	—
Low E-module – high elasticity to absorb thermal and mechanical tensions	●	●	●	●	●	●
Compositions and grain size distributions matching historic stoneworks	●	●	—	○	—	—
High alkali content	●	●	●	●	●	●
Non-hydrophobic – capillary emission of moisture from the plaster/stonework	●	●	●	●	●	●
High storage capacity of salts through special pore structure and pore geometry	—	—	—	●	—	—
Clean and salt-free facades	○	○	○	●	—	—
Dry rooms – moisture- and climate regulating	●	○	●	●	—	—
Prevention of mould and algae generation through high alkalinity	●	●	●	●	●	●
Low-tension, slow hardening process, good subsequent hardening	●	●	●	●	—	—
Self-curing of micro-cracks through recrystallization	●	●	●	●	—	—
High natural water retention properties	●	●	●	●	—	—
Uniform hardening through the complete mortal cross-section, additional stability increase through carbonation	●	●	●	●	—	—

Composition – Manufacturing	HRP	HMF	KTP	PP	IM	AM
Purely mineral, exclusively consisting of natural raw materials	●	●	●	●	●	●
As pure NHL mortar (MG II, CS I)	●	●	—	—	—	—
As NHL mortar and additive of sulphate resistant cement (MG II a, CS II)	—	●	—	●	—	—
Natural state colouring	●	●	●	●	●	●
Grading curve according to historic findings	●	●	—	○	—	—
Uniform quality due to modern mixing technology and monitoring	●	●	●	●	●	●
Available in different grain size distributions	●	●	—	●	—	—

Legend:

● fully applicable ○ partially applicable — not applicable

Further information included in the respective technical data sheets.

HRP: Historic Pure Lime Plaster
HMF: Historic Masonry and Grouting Mortar
KTP: Lime Trass Plaster
PP: Pore Plaster
IM: Injection Mortar
AM: Anchor Mortar

System solutions from Otterbein for historic conservation work and for the construction of houses under ecological aspects: natural – manifold – sustainable



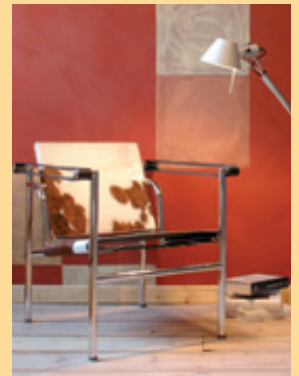
System OTTERBEIN Natural hydraulic limes

for the production of individual brick and plaster mortar mixed on site according to models of historical buildings



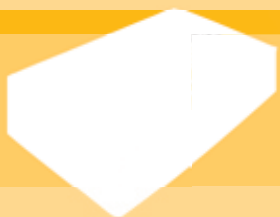
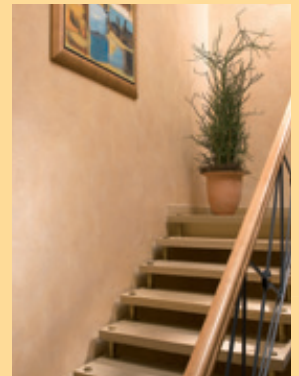
System OTTERBEIN CALCEA® lime plaster and lime coating system

the perfectly integrated system of lime products such as base plasters, lime spatterdashing mortars, lime thermal plasters, lime fillers, lime paints, lime slurries as well as lime glazes



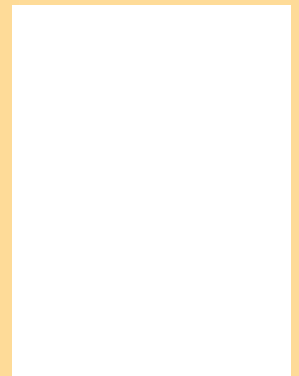
System OTTERBEIN CAREMA® lime-clay plasters

are a unique combination of the advantages of a pure lime plaster with the natural colouring of a clay plaster



System OTTERBEIN HISTOCAL® traditional lime renders and mortars

without cement, on the basis of natural hydraulic lime NHL for the renovation and restoration in historic building conservation work



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