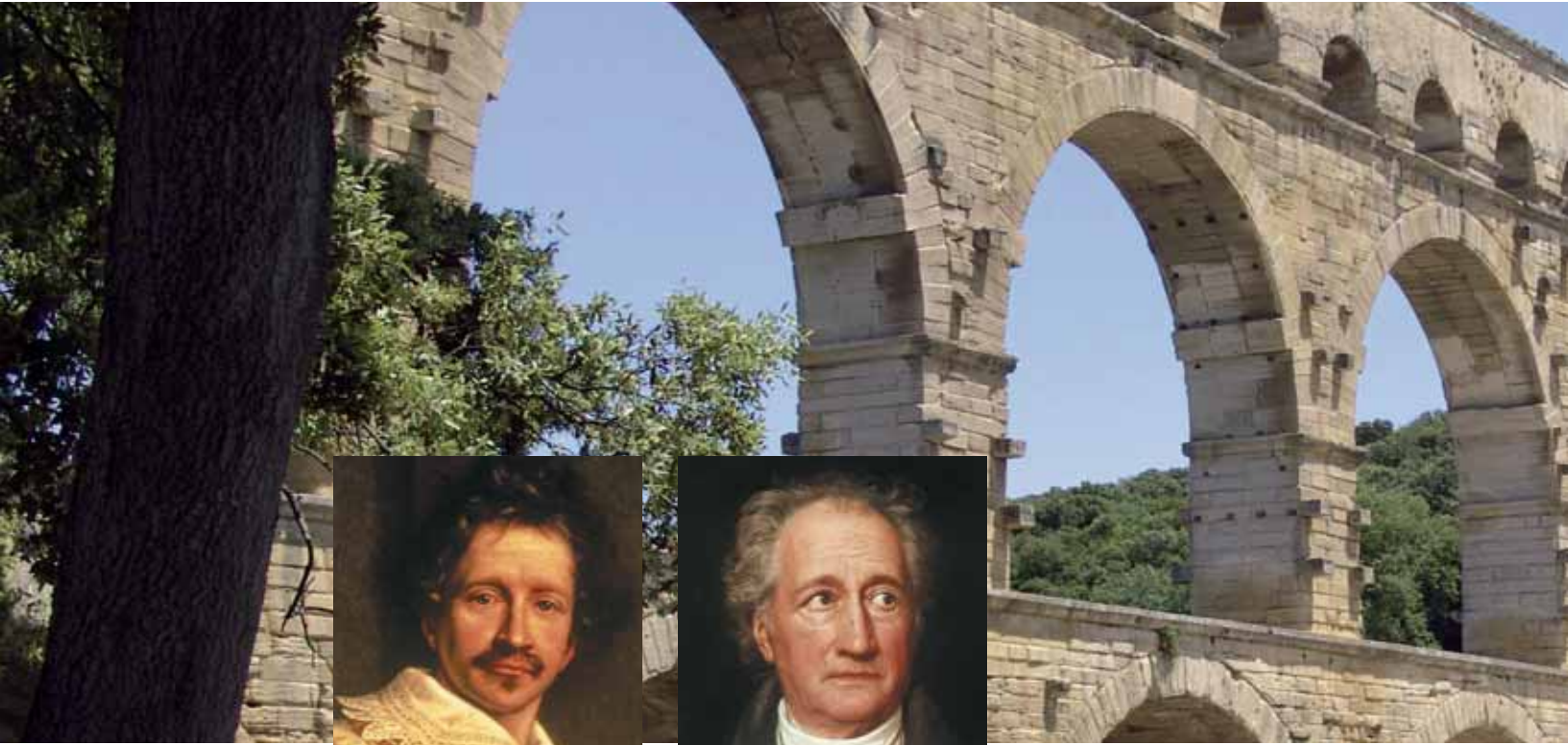


# **KEIM silicate paints unique by more than 125 years**

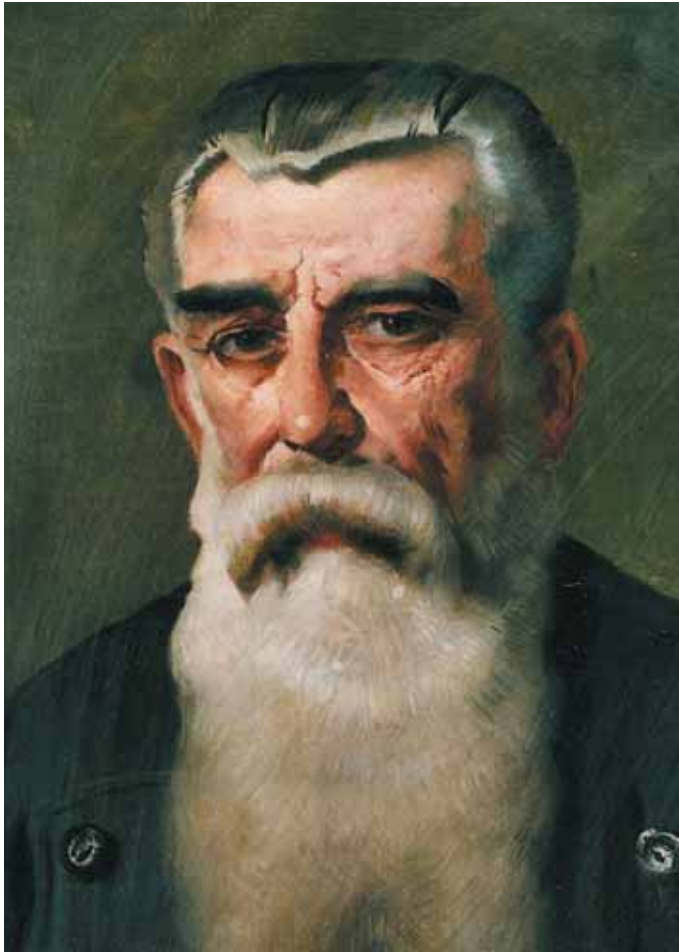


**... ecological,  
economical, social**



*Pictures above:  
King Ludwig I &  
Johann Wolfgang  
von Goethe.*

*Picture below:  
A.W. Keim, Inventor  
of Mineral Paints*





## The history of a pioneering idea

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**Water glass (potassium silicate solution) makes the colors!**

KEIM mineral paints are a Bavarian invention with their roots deep in the region's heritage. They are synonymous with the technical refinement and high quality also found in other products originating from this area of alps, kings and castles. The scientist Adolf Wilhelm Keim successfully combined water glass (potassium silicate solution) with inorganic mineral pigments to produce a paint that both penetrates and chemically bonds with the mineral substrate onto which it is applied. KEIM paints become an integral part of the surface, whereas organic paints merely form a skin on the surface. This high quality silicate paint system offers performance, durability, protection and color-fastness that is not surpassed. Buildings coated with KEIM paints in the 19th century are still in excellent condition today. Amongst such examples are the "White Eagle" inn, Stein am Rhein and the City Hall, Schwyz, both of which

are in Switzerland and were decorated in 1891, together with facades in Oslo (1895) and in Traunstein, Germany (1891).

Potassium silicate has been known since the Middle Ages, when it was termed Liquor Silicium, but was not exploited because of a lack of production know how and end uses. Then in 1768 Johann Wolfgang von Goethe, the prolific German poet, playwright and scholar, commented upon his own experiments, "what most occupied my spirit for a long while was the so called Liquor Silicium which is obtained if pure quartz sand is melted with an adequate proportion of alkali, giving rise to a transparent glass which melts in air yielding a beautiful clear liquid...".

However Goethe was unable to translate his thoughts into any practical uses. The catalyst for Adolf Keim's

*Picture right above:  
House in  
Walenstadt/  
Switzerland,  
decorated with  
KEIM mineral paints*

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**The Bavarian King as innovation leader**



development work was King Ludwig I of Bavaria. This monarch had a great passion for the arts. He longed to have the fine Italian lime fresco work in his own kingdom but the harsh climate north of the Alps destroyed such frescos within a short time. He thus appealed to Bavarian scientists to develop a paint that was of similar appearance to lime frescos but also had much greater durability.

*Picture left:  
advertising from the  
beginning of the  
20th century*

*Picture right:  
Town Hall in  
Schwyz with the  
original painting  
from 1891*

**A permanent bond  
between color and  
substrate**

The unique solution to these requirements was embodied in Keim's invention - a liquid silicate paint that becomes a part of the surface to which it is applied and binds the color pigment into it as well. KEIM's classic mineral paint enabled him to build his position as the leading manufacturer of mineral paints for the decoration of facades through research-based improvements to product characteristics and a thorough knowledge of the various substrates for the paints.



## Milestones

**1878**

### **1878 – the first generation: KEIM Purkristalat**

**Some 125 years ago**, KEIM developed the first practical silicate paint. It consists of a powder component with mineral coloring pigments and extenders and a liquid component, the binder potassium water glass. According to German standard DIN 18363, 2.4.1, "silicate paints" are accordingly formulated in two components and contain no organic constituents. They can only be used on solid, absorbent, mineral renders.

**1962**

### **1962 – the second generation: KEIM Granital**

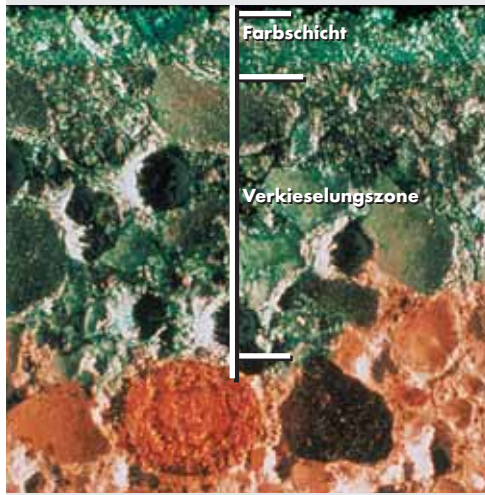
**1962** saw the introduction of the "silicate emulsion paint", the second generation silicate paint. Its advantage resides in its single-component formulation, which makes it considerably easier to handle and increases reliability of application. Silicate emulsion paints are also covered by a standard as an independent product category and, according to German standard DIN 18363, may contain at most 5% of organic constituents (dispersion and additives).

**2002**

### **2002 – the third generation: KEIM Soldalit**

**In 2002**, what is now the third generation of silicate paints revolutionised the exterior wall coatings market: the "sol-silicate paint" is based on an entirely new binder concept and so opens up whole new areas to silicate paints. The sol/silicate binder, a stabilised combination of silica sol and water glass, bonds with mineral substrates by silicification, but additionally develops strong adhesive forces which ensure a firm attachment to coatings based on organic resin binders, so allowing application to virtually any common substrate. Having an organic content of below 5%, the sol-silicate paint also satisfies the requirements of DIN 18363 for "silicate emulsion paints".

# Outstanding characteristics and advantages of KEIM´s silicate technology



## Natural ingredients

Selected raw materials underlie the unique quality of KEIM's silicate paints: the ideal combination of liquid potassium silicate as binder, naturally occurring mineral extenders and inorganic coloring pigments ensure maximum weathering resistance and unsurpassed durability.

## „Silicification“, an inspired concept

Silicate systems are based on the silicification of the binder with the substrate. A strong, permanent bond is created between the paint and the underlying substrate (render, natural stone, concrete etc.). The render cross-section reveals the silicification process using colored KEIM Fixativ (liquid potassium silicate).

*The enlarged render cross section shows the so called "silicification zone" below the paint layer.*

*The binding agent (potassium silicate) petrifies with the substrate and creates a permanent, insoluble bonding.*

## Durability

KEIM silicate paints have an unequalled durability – numerous buildings worldwide provide proof for more than hundred years due to KEIM's unique properties: Potassium silicate as a binder is highly resistant to weathering, the mineral fillers are perfectly combined and the chemical bond with the substrate is extremely durable.

KEIM silicate paints don't flake, the binder does not disintegrate by UV-light. They are ideal for structural soundness, and moreover, absolutely resistant to acid gases (acid rain) and industrial pollution. The durability of KEIM silicate paints is unequalled still today.

*Photograph:  
House in Walenstadt, 1890*



### **Moisture balance**

From the standpoint of building physics, an elevated water vapour permeability is the most important criterion for an equated humidity balance. The extremely high permeability for water vapour of KEIM silicate coatings is the result of a specific structure of the cured water glass. Humidity contained in the building structure may thus be released unhindered and fast into the environment. No accumulations of humidity, which may lead to damages, can occur between coating and substrate. In combination with a low water absorption, this is an optimal protection against water and frost damages. In addition KEIM coatings dry faster. Further, almost no condensation humidity, one of the principal reasons for algal and fungal growth, forms on the surface of the coating. In a nutshell: Under building physics aspects, KEIM silicate coatings are the ideal coating for mineral substrates.

### **Economics and maintenance of value**

The great durability and weathering resistance of KEIM products generate unbeatable economic advantages. Maintenance of structures renovated with KEIM products is distinctly lower than usual. Longer renovation intervals thanks to longlasting, clean and color-stable coatings or surfaces save real money. This applies to both renders and insulated exterior walls. Thanks to their long life cycle combined with simple refinishability (there is no stripping needed - just cleaning and recoating) and economic material consumption, KEIM's silicate paints are a convincing solution from an economic standpoint too.

# Outstanding characteristics and advantages of KEIM´s silicate technology



## Cleanness

The tendency of coated surfaces to become soiled is influenced, apart from by condensation behaviour, by the static charging characteristics and thermoplastic properties of the binder. Organic synthetic resin/silicone resin binders become electrostatically charged in the wind due to friction and so actually attract dirt particles onto themselves from the air. At higher temperatures, these binders additionally exhibit thermoplastic behaviour, i.e. they become "tacky", creating ideal conditions for dirt particles to become stuck and collect in greater numbers on the surface. A strong beading action (i.e. the much discussed "lotus effect"), originally regarded as the guarantee of clean exterior walls, has proved in practice not to be quite so "magical". KEIM paints with a water glass binder are antistatic and non-thermoplastic. Over the long term, they therefore remain cleaner than organically bound paints.

*Large picture: Augsburg Town Hall, painted with KEIM silicate paints after 20 years service life*

## Color stability

The color stability of exterior wall paints is influenced by the nature of the pigments and the binders. UV light modifies the colorfulness of organic pigments. KEIM paints contain exclusively high-quality, lightfast, mineral inorganic pigments. Apart from the pigments, the UV resistance and "weather fastness" of the binder also play an important part in color stability. UV light and exposure to weathering sooner or later give rise to binder degradation in organic binders. Microcracks form, which modify refraction and make the color shade of the coating appear greyer. Moreover, coloring pigments are partially "uncovered" and increasingly exposed to UV radiation from the sunlight. This additionally accelerates the color change of the organic pigments. Mineral binders such as potassium water glass or sol/silicate exhibit the greatest UV resistance of all binders and are moreover absolutely weather-resistant. That means: KEIM Silicate paints are the best and most color stable.

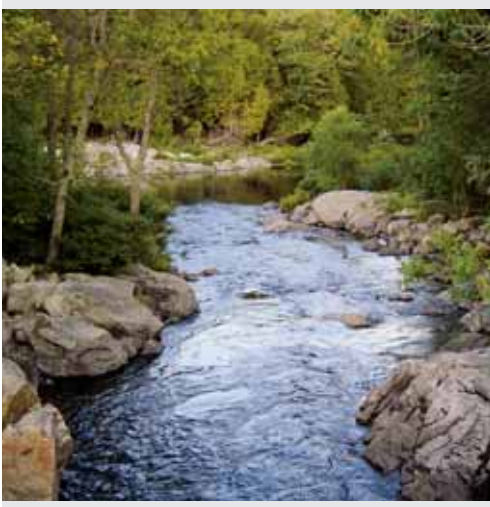
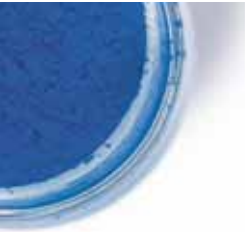
*Large picture: Town Hall Schwyz, original painting from 1891*

## Aesthetics

KEIM silicate paints show an impressive color brightness. Dispersions such as synthetic resins or silicone resins form a film around the coloring pigment and so modify the original color effect. In contrast, transparent water glass allows light to pass through unhindered and impinge on the pigment. This gives rise to the fascinating, vibrant luminance of KEIM silicate coatings. The natural matt surface moreover creates a particularly elegant and pleasing visual impression.

*Large picture:  
The house of the Three Magi in Trier, painted with KEIM silicate paints, an impressive demonstration of the luminance of a matt silicate coating.*





### Safety

Even when exposed to the flame from a welding torch, KEIM's silicate paints don't ignite, completely unlike emulsion or silicone resin paints. If there is a fire, KEIM means maximum safety and no toxic gases - as confirmed by fire tests in Germany, Great Britain, and USA. It is not without reason that silicate paints are still the only paints used in many public areas such as for example in underground subway stations and tunnels, airports, schools or cinemas - nothing is as important as safety and health.

### Environment

The mineral composition of KEIM silicate paints has huge environmental advantages. Using water glass as the binder makes it possible to do completely without solvents, plasticisers and preservatives. Over their entire life cycle from raw material extraction to production, processing and ultimate disposal, KEIM's silicate paints have an excellent environmental profile. When it comes to refinishing, KEIM coatings require no stripping with its associated environmental impact, all they need is to be washed with water and overcoated, so minimising environmental effects. In a nutshell, KEIM paints are 100% sustainable entirely safe products for environmental building and healthy living.

# KEIM Product systems



## **KEIM Exterior paint systems**

- Unequaled longevity
- Highest water vapor permeability
- Ideal moisture budget
- Keeps facades clean for many years
- Color consistent, lightfast, UV-stable
- Mineral matt surface
- Highly diversified design options
- Economically unrivalled
- Easily redecorated
- Non combustible
- Ecologically flawless

## **KEIM Interior paint systems**

- Highly water vapor permeable
- No emissions, solvents, plasticizers
- No preservatives
- Suitable for allergic persons
- Resistant against disinfectants
- No off-gassing of active ingredients
- Mechanically strong, scrubbable
- Non combustible, no toxic fumes
- Ecologically flawless
- Mineral, alkaline nature resists mold
- Color consistent, lightfast and UV-stable
- Soil resistant, cleanable

## **KEIM Mineral renders and fillers**

- Environmentally friendly
- Economic
- Water vapor permeable
- Resistant to weathering
- Non combustible



***KEIM Natural stone  
repair system***

- Adapted repairs through specific system components
- Effective protection against acids and humidity
- Broad spectrum of applications
- Versatile design possibilities



***KEIM Concrete  
repair and protection system***

- Adapted surface protection systems (Water/CO<sup>2</sup>-protection)
- Reliable repair products
- Economic and longlasting
- Safe through a perfectly balanced system
- Unique design possibilities
- Environmentally friendly
- Mineral to the extent possible



**Proof of quality:  
KEIM's mineral  
paints established  
in 1878**

*Original KEIM silicate-coating  
from the 19th century in Stein am  
Rhein, Walenstadt, Traunstein  
and Oslo show impressively the  
durability, light fastness and  
ultimate quality of  
KEIM's silicate paints.*

# **KEIM** MINERAL COATINGS

of America, Inc.

10615 Texland Boulevard, #600  
Charlotte, NC 28273, USA  
Tel: 704-588-4811  
Fax: 704-588-4991  
Toll-free in the USA: 866-906-5346

[www.keim.com](http://www.keim.com)  
[keim-info@keim.com](mailto:keim-info@keim.com)

**KEIM**  
consistently mineral

# Design options with KEIM silicate paints

## **Opaque Finish**

An opaque coating with KEIM silicate paints is possible on smooth as well as rough surfaces with historic appeal. The results are surfaces with luminous color effects and the typical mineral matt visual impressions.



## **Color Wash Finish**

Low-pigmented paints are fascinating by their vibrant character. The translucent effects of this technique keep and intensify the colored and vivid substrate texture. Low-pigment finishes are used for Historic Preservation as well as modern architecture. Both facades and interior walls can be accentuated in this very special way.



## **Historic facade design**

Color and plasticity of architectural style elements as well as motive painting find an excellent realization with KEIM silicate paints. Facade painting of historic and modern buildings stand out by their resistance to weathering and air pollution.



## **Modern facade design**

Modern and artistic wall and architectural painting are gaining more and more importance. Full-cover illusion painting on facades show the extended range of KEIM silicate paints.



# Creating with KEIM silicate paints

## ***Drapery and arrangement of folds***

Draperies means decoratively folded and arranged wall curtains which were used in medieval times. Painted curtains and draperies are an essential element of the Trompœil painting technique. Deceptively realistic draperies can be portrayed with KEIM silicate paints.



## ***Grey and single tone painting***

Painting with differently gradated color shades in grey or other single color shades is a special technique both in ornamental decoration and in traditional architectural painting. The design possibilities are very diverse: from facade ornaments and pedestal decoration to complex architectural painting and generous creative decoration of sacral spaces.



## ***Free-hand wall design***

The possibilities of creative work have no limits with KEIM silicate paints. Whether interior or facade design, modern or classic, low-pigmented or opaque, full-cover or linear - KEIM creative paints give you free reins!



## ***Marbling***

Sacral rooms, glamorous castles and luxurious patrician homes testify to the brilliant beauty of this technique. As in former times pillars, columns and the pedestal areas offer ideal possibilities for the use of stone and marble painting. KEIM silicate paints are excellent tools for this.

