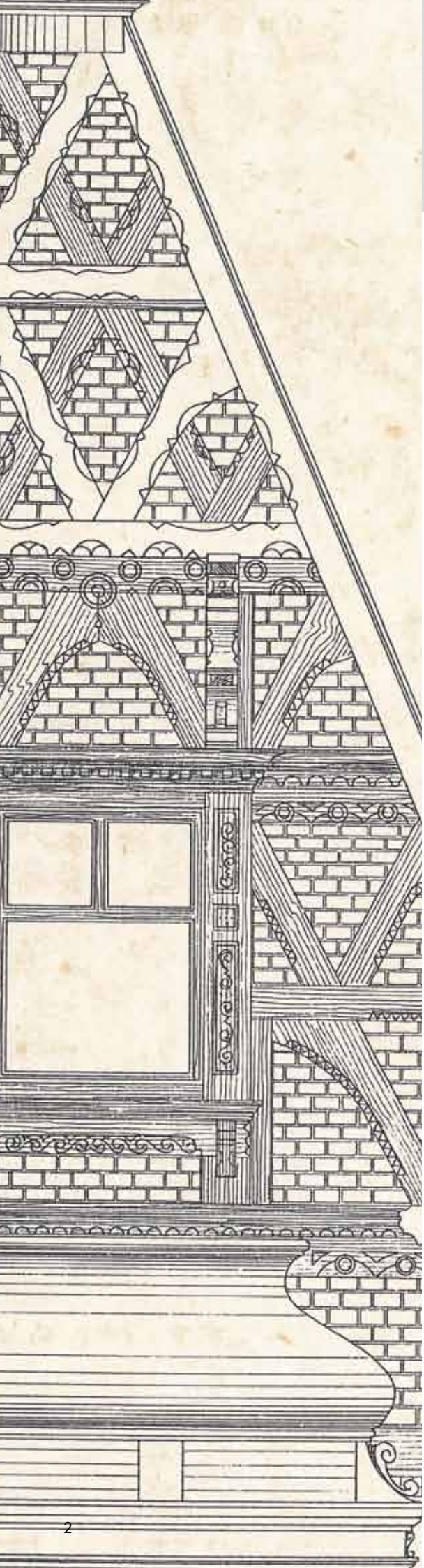
Wood coating in the field of monument preservation

KEIM Lignosil –
aesthetic, unique, durable



Wood – Building material with history and future

Building with wood – a trend for thousands of years

Wood, next to mineral materials, is the most common building material in all cultures and eras. The high availability and easy handling has given wood an indispensable technical and social importance with regard to construction of buildings and to many items in daily life.

Centuries old buildings witness the timeless beauty, functionality and durability of wood. Moreover, wood plays clearly an essential role in modern architecture. This natural material does not only provide unique, ecological benefits but, in combination with modern technological improvements also new and surprising ways in construction and performance.

Throughout history people have realized their creative ideas by using wood and of course, colours have played a principle part for either prestigious, sacral constructions or residential houses and farm buildings.

This is why it is an integral part of activities for heritage conservation to renew or preserve coloured designs of wooden frameworks and facades for the long term.

Buildings made of wood – protecting and preserving

To a certain extent, wood is capable to independently protect itself against external influences. For this, nature uses resins, oils and tannins, which are already contained in wood.

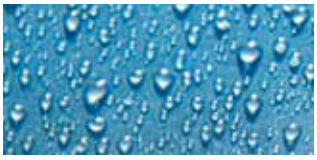
For construction, wood also requires additional measures in order to achieve sustainable building protection. In doing so protection from moisture and UV light has top priority. Beside carefully planned construction and skillfully performed craftsmanship are the coatings the ones which increase lifespan and minimize maintenance.

No durability without protection

A particularly indispensable demand for future generations is the preservation of important structures in terms of art heritage and cultural history. Insufficient protection can destroy the surface and consequently cause the replacement of damaged areas and in a worst case situation even the total loss of a monument and structure.

Next to protecting properties, wood paints must meet high demands for materiality, aesthetics, design and sustainability especially in monument preservation.

Potential risks for wooden surfaces



Moisture
- Expanding/Shrinking
- Leaching/Greying
- Rot

UV light
- Disintegration and decomposition of the lignin
- Darkening

Chemical and biological influences
- Environmental factors
- Wood-destroying fungi
- Wood-destroying insects

Thermal stress
- Temperature gradients in the cross-sectional view
- Spontaneous and fast cooling-off of the profile surface

Deficits of conventional wood coatings

Disadvantage: insufficient UV resistance

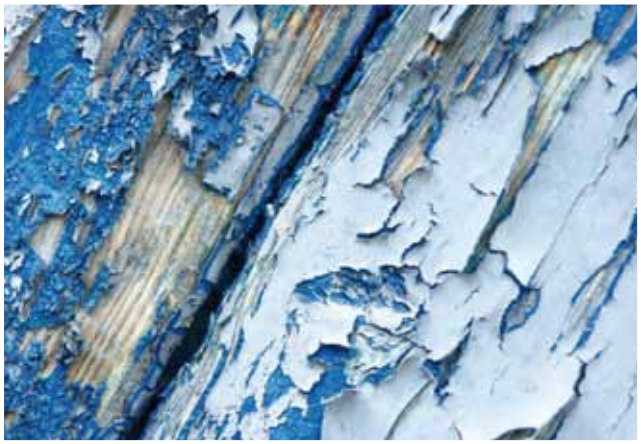
Often unusual agents were used for the protection of wood. Best proven coatings were based on oily binders such as linseed oil or other vegetable oils up to mixtures partly blended with fillers like wood flour, clay or inorganic rock flours. Such coatings are supposed to reduce penetrating moisture and the disintegration of the lignin by UV light.

Originally and organically based coatings including their modern successors with synthetic binding agents have one common failing: These coatings are not resistant to UV light which disintegrates the binders over time. First recognizable changes of the brilliance or colour shade remain often without functional damage. But increasing embrittlement adds to adhesion failures in the long term and can even lead to peeling.

Unlike mineral building materials, wood demands enormous requirements for adhesion of a coating due to its swelling and shrinking processe. Peeling and flaking of a coating allows moisture to enter unimpeded, intensifying the "movements" of wood and thus accelerating damage to happen.

The repair of such coatings requires labour-intensive removal of loose coating remnants and leads in individual cases to loss of substance. Delayed intervention ends often times in partial or total loss of building parts.

Consequence: loss of substance



Wood as building material – coating with silicate paint

Silicate paint

KEIM silicate paints have been proven highly weather-resistant and durable on mineral building materials. They are particularly suitable for monument preservation thanks to their typical lime-matt appearance and purely inorganic pigmented colour shades. Since the invention of silicate paints there have been testings time and time again to transfer these sensational features to wood materials. Partial successes were only achieved with well protected building parts or in interior spaces.

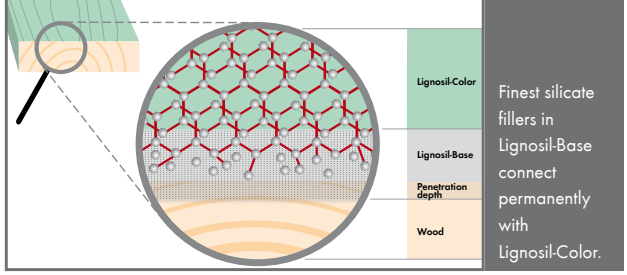
The transfer – so simple, but ingenious

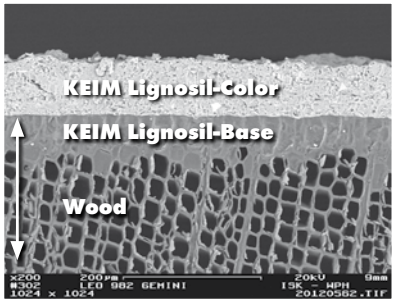
In the meantime the developers at KEIM have been successful and the transfer of features has been solved. As it is often the case, the solution is quite simple. KEIM combined successfully two proven coating materials: An oil primer which penetrates easily into wood and a top coat of silicate paint which protects reliably from weathering and exposure to UV light. Of course, this simple and brilliant idea needs special formulas both for the primer KEIM Lignosil-Base and for the silicate top coat KEIM Lignosil-Color.

One system – lots of benefits

The know-how of the system is so sensational that a European patent was granted. In this combination Lignosil provides the following incomparable features:

- Excellent moisture protection
- UV-stable and absolutely lightfast
- Highly weather-resistant
- Unequalled durability
- Matt appearance suitable for monument preservation
- Easy to renovate





KEIM Lignosil – aesthetic, unique, durable

Test object in Oslo, coated in 1996, photographed in 2010

KEIM Lignosil provides decisive benefits when preserving historic structures.

The low diffusion resistance of the system structure and the very small material and work effort while renovating makes KEIM Lignosil in technical and economic aspects unbeatable.

Thanks to the ageing behaviour of KEIM Lignosil which is a typical characteristic for silicate paints, a highly durable coating structure provides the advantage that the surfaces usually don't need to be sanded off prior to a refinish. A thoroughly performed cleaning of the surfaces is all the preparation work it takes. For this reason priming with KEIM Lignosil-Base is unnecessary and, consequently a KEIM Lignosil-Color coating offers the prerequisite for a future, purely mineral refinish.

Significant increases of the diffusion resistance will not occur. So the system provides a considerable contribution for the structure's durable function.

KEIM Lignosil – a successful procedure to preserve and protect historic building structures.

Application / Function	Exterior use		Interior use	
	Opaque coating	Creative coating	Opaque coating	Semi-transparent coating
Crack-filling	Lignosil-HRP Holzrisspaste (wood filler)			
Priming	2 x Lignosil-Base/-DL	2 x Lignosil-Base/-DL	–	
Top coat	2 x Lignosil-Color*	1 x Lignosil-Color 1 x Lignosil-Artis/-DL	2 x Lignosil-Inco*	2 x Lignosil-Inco/-DL*
	*If required (in case of bleedings due to staining wood ingredients) 1 x Lignosil-Scudo as intermediate coat			

KEIM Lignosil®-System

The first silicate paint for wood

Funded by the

Federal Ministry
for Economics
and Technology

as per resolution of the German Parliament

Fraunhofer
monitored **WKI**
Nr. OT.135-2010

Innovation patented!
EP 2 208 544

www.lignosil.com

KEIMFARBEN – Your specialist for mineral construction protection

- Facade paints
- Interior paints
- Creative design
- External thermal insulation composite systems
- Concrete repair and surface protection
- Mineral renders
- Natural stone repair
- Wood coatings

KEIMFARBEN GmbH

Keimstraße 16
D-86420 Diedorf
Fon +49 (821) 4802-0
Fax +49 (821) 4802-210

www.keimfarben.de

Frederik-Ipsen-Straße 6
D-15926 Luckau
Fon +49 (35456) 676-0
Fax +49 (35456) 676-38

info@keimfarben.de

KEIMFARBEN
consistently mineral

www.lignosil.com

Stand 01/2015 engl.