



RE-RENDERING OLDER BUILDINGS

Technical Bulletin

The Problem

Wind driven rain is a major problem especially in coastal areas, as it can saturate the building fabric, leading to staining, spoiling of internal decorations, even to structural damages long-term.

Salts dislodged by driving rain from the fabric can be deposited by water onto internal surfaces leading to efflorescence and crumbling of the wall fabric.

Current (Modern) Solutions

In order to protect old walls from driving rain, a common solution is rendering the wall fabric with a waterproof render.

The fabric of older buildings – typically the ones built before the 1930s – often contains a significant amount of moisture, which is kept in check by *ongoing natual evaporation*. In order to keep moisture levels low, the render used for the waterproofing of old buildings must allow this evaporation, i.e. it must be breathable.

Because waterproofing and breathabilty are two opposing characteristics which are technically difficult or expensive to achieve, in the process of waterproofing **breathability is often overlooked or sacrificed**. This oversight results in the gradual build-up of moisture inside the wall fabric, leading to (often undetected) major dampness problems in old buildings.

Due to its widespread use and low cost, one of today's most common rendering materials is *cement* – a material that offers good weather protection, but due to its low porosity and high density is also non-breathable.

Some of the reasons why cement-based renders should not be used in older buildings are:

- **1. Non-breathable**: they don't let moisture freely evaporate from the underlying (damp) wall fabric, resulting in an excessive *build-up of moisture* leading to long-term dampness problems.
- **2. Too hard**: they stress the underlying fabric, resulting in *detachment* of the render which can damage the softer building fabric.
- **3. Too brittle**: being inflexible, ongoing vibrations and building movement *crack* cement renders. Once their waterproofing ability gets compromised they let rainwater in, becoming part of the dampness problem.
- **4. Poor heat insulator**: being a non-porous, dense material, cement is a poor thermal insulator, resulting in *condensation and mould* problems.

The Right Solution

The ideal solution to the problem of driving rain in older buildings is a rendering system that is both waterproof and breathable.

The technology of a traditional rendering system that fulfills both of these criteria originates from **ancient Rome**. Being outstanding architects and builders, the Romans have discovered that by adding **volcanic soils and other minerals** to lime, they can significantly alter its properties, especially its *mechanical strength* and *water resistance*, while *retaining its breathablity*.

The materials most commonly added to lime were *pozzolans* (volcanic soils or rock fragments) and cocciopesto (milled bricks or terracotta fragments). These reacted chemically with the free lime, forming water resistant compounds. Such mortars were able to harden quicker not only in the presence of water but even underwater in the total absence of air, and they are known as hydraulic mortars.



Mixing lime putty with volcanic minerals (pozzolans) can make lime renders waterproof while retaining their breathability

It is important to understand that **the degree of porosity and breathability of lime plasters is primarily determined by the properties of lime** and not by its hydraulic additives, an important factor being the firing temperture of lime. By firing limestone at low temperatures (at around 850-900 °C), the *breathability of the lime is retained*, while the carefully selected hydraulic additives make the mortar *fully waterproof*. These are different from today's NHL mortars, whose much higher firing temperatures (~1200 °C) affect their breathability.

These lime mortars have been extensively used by the Romans in very demanding environments including *sewers, ports, spas and aqueducts.* They have also been widely used in *Venice*, well suited to the humid and aggressive environment of the Venetian lagoon.



Rendering Schedule

For a long-lasting, building-friendly breathable rendering solution, the following rendering schedhule is recommended:





1. RINZAFFO MGN lime base coat [10 mm]

Rinzaffo MGN is a microporous breathable lime waterproof and salt-resistant base coat. Its main role is to stop rainwater penetrating into the underlying wall fabric, keeping the walls dry.

Rinzaffo's internal pore structural is formulated in a way to stop (larger) liquid water molecules, while letting (smaller) water vapours molecules through, facilitating evaporation.



Scanning electron microscope image of the Rinzaffo MGN base coat showing its unique micropore structure

Rinzaffo MGN Waterproof lime base coat

Sanacolor 2000 MGN Lime main coat 20 mm

2. SANACOLOR 2000 MGN main coat [20 mm]

Sanacolor 2000 MGN is a traditional macroporous lime plaster that promotes the continuous evaporation of humidity present in the masonry, keeping surfaces dry and aesthetically pleasing.

It comes in a range of 24 colors. In addition to white lime there are light pastel and vivid meditteranian color options, **mass colored with natural earth pigments** that are UV resistant and do not fade.



Therefore, under the effect of weathering and mechanical abrasion it *preserves its color* and original appearance for a very long time. (typically 20+ years). Being colored in mass, it doesn't need to be periodically repainted, making it *maintenance free*.

Being macroporous, it improves the thermal performance of the masonry, *keeping the building much warmer* than modern cement-based renders.

Being highly breathable, it does not retain water, minimizing the danger of any frost damage. It also *prevents the formation of mould* due to stagnation of moisture.



The 3.8 km monumental roofed arcade of the 17th century **Sanctuary of the Madonna** of **San Luca** from Bologna restored with Sanacolor 2000 MGN in 1996.

Application of the Render

1. Preparation of the wall fabric

Hack off the old render, remove all loose parts and foreign materials (wood, tar, metals etc.). Wash the surface throughly to remove all loose debris and residues. Before applying the render, wet the surface.

2. Applying the Rinzaffo MGN Base Coat

Pour the contents of the package into the mixer adding clean tap water only. Do not add any additives or other materials (e.g. cement, gypsum etc.) to the mix. Mix it for about 3-5 minutes until a homogeneous, creamy paste is obtained. Do not overwork it.

On freestanding walls apply a 10 mm coat, covering the whole surface, **leaving no gaps**. For areas undeground or subject to sideways water pressure, apply 2 coats with a fiberglass mesh in-between. Wait 24 hrs between subsequent coats. **Darker spots** of the first coat denote areas of insufficient thickness of the render. Patch them up with additonal Rinzaffo before applying the main coat.





Dark patches: insufficient thickness

Uniform color indicates good coverage

3. Applying the Main Coat

After the Rinzaffo MGN scratch coat has dried, apply a first coat of **Sanacolor 2000 MGN** traditional macroporous lime render.

Mix the contents of the Sanacolor 2000 package with clean water in a quantity necessary to obtain a uniform plaster. If using a cement mixer mix it for no longer than 5 minutes.

Apply the product in layers of max 15 mm; with a recommended thickness of at least 15 mm for interior and 20 mm for exterior surfaces.

Apply a **first coat** of approximately 15 mm Sanacolor 2000 leveling coat and wait until it's dry, then apply a **second coat** of Sanacolor 2000 (about 4-5 mm) as the finish.

For a smoother finish: compress and smoothen the surface with a stainless-steel trowel.



For a coarser finish: use a sponge float.

If a greater thickness is desired, after the first coat proceed in layers, waiting for the previous layer to dry. Once the desired thickness is achieved, let the body of the plaster to dry and apply the last 4-5 mm finishing layer as described earlier.

Rendered surfaces must be protected from rain and excessive moisture until the surface has completely dried (3 - 10 days depending on weather conditions).

Please contact us with any questions WE OPERATE NATIONWIDE

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