

ONE COAT RENDERS - User Guidelines

Section 1: use and application of One Coat Lime Renders

This document is a summary of the Technical Advice paper issued by the French Scientific and Technical Centre for the construction industry (CSTB) with some notes related to St. Astier products.

1. One coat renders are principally used to protect external surfaces from water penetration but their use internally is not excluded. They are normally applied in one coat, sometimes in two passes depending on the required thickness and type of background.
2. One Coat Lime Renders are suitable for the following backgrounds:
NEW BUILD
 - Concrete blocks
 - Bricks
 - Clay blocks *
 - Light weight blocks *
 - Stone

* For these types of backgrounds we recommend only Thermocromex.

 EXISTING BUILDINGS
 - bricks and blocks
3. Specifically excluded are the following backgrounds:
 - gypsum
 - wooden boards
 - lath
 - cob, adobe
 - frozen masonry units
 - over saturated
 - waterproofed (unless an adequate key has been provided)
 - pre cast units with presence of demoulding oils
 - painted, unless paint has been removed
 - background incorporating multiple elements unless a reinforcing mesh has been applied
4. The choice of a One Coat Render is related to the following:
 - 3.1 Background
 - 3.2 Exposure
 - 3.3 Usage in communal and public buildings
 - 3.4 Usage in basements
 - 3.5 The application method
 - 3.6 The climate conditions during application
 - 3.7 The type of finishing required
 - 3.8 The application of further decorative elements or coats

BACKGROUND: two main types are identified:

TYPE A:

All concrete and masonry elements with the exclusion of weak elements

Related St. Astier product: **MONOSTASTIER**

Type B:

All types, including weak elements

Related St. Astier product: **THERMOCROMEX**

Note: on type B, specifically on light weight blocks, some products still need a stipple coat or a bonding coat. This is not the case with Thermocromex. In all cases the background must be suitably dampened.

EXPOSURE

This is generally related to exposure to rain.

The choice of a product with low capillarity ($< 2.5 \text{ g.dm}^2.\text{min}^{1/2}$) will be beneficial.

Capillarity on all St. Astier One Coat renders: < 2.5

In high rain exposure areas all One Coat renders should not be applied on flat surfaces or on surfaces with an inclination below 10° .

USAGE IN COMMUNAL AND PUBLIC BUILDINGS

The adoption of a product with high flexural strength $> 2.7 \text{ MPa}$ is recommended in these situations where abnormal impact and shocks could be experienced. A good elasticity is also required (between 5000 and 10000 MPa).

| St. Astier One Coat renders related data | | |
|--|---------------------|------------------|
| PRODUCT | FLEXURAL STRENGTH | ELASTICTY |
| <i>MONOSTASTIER</i> | $> 2.5 \text{ MPa}$ | 5000 – 10000 MPa |
| <i>THERMOCROMEX</i> | $> 2.5 \text{ MPa}$ | 4000 – 6000 MPa |

USAGE IN BASEMENTS AREAS

In these areas, products with the following characteristics are recommended

- Dry mass density: between 1400 and 1800 $\text{kg}.\text{m}^3$
- Flexural strength up to 2.7 MPa
- Capillarity: not above $2.5 \text{ g.dm}^2.\text{min}^{1/2}$

| St. Astier One Coat renders related data | | | |
|--|-------------------------------|---------------------|--|
| PRODUCT | Dry density KG x m^3 | FLEXURAL STRENGTH | CAPILLARITY $\text{g.dm}^2.\text{min}^{1/2}$ |
| <i>MONOSTASTIER</i> | 1550 - 1750 | $> 2.5 \text{ MPa}$ | < 2.5 |
| <i>THERMOCROMEX</i> | 1350 - 1550 | $> 2.5 \text{ MPa}$ | < 2.5 |

THE APPLICATION METHOD

There are 4 major application methods:

- Manual application

Please Note: Products especially made for spraying could present some “Stickiness” when applied manually

- Using a pneumatic hopper gun : all products should be able to be used with this method. Take care in the spraying

distance and pressure to avoid greater thickness and a consumption higher than necessary

- Using spraying machines. Each supplier should give its approval on the suitability of their products for this type

of application. St. Astier One Coat renders are easily applied with machines such as Putzmeister and Lancy

- Using continuous spraying machines (i.e plaster sprayers). These are generally less powerful than the previously

mentioned machines and require mortars with particular characteristics.

When using spraying equipment it is essential to respect the Manufacturer recommendations on the water addition and mixing time. It is also essential, as for all rendering/plastering work, that the background is correctly prepared.

CLIMATIC CONDITIONS DURING APPLICATION

Apart from what already mentioned regarding exposure to rain, it is important to consider hot weather, drying wind and the type of background.

In warm climate and in the presence of drying wind, an added benefit to the correct dampening of the background and suitable protection will be to use products with an high water retention (between 90 and 100%) to avoid high shrinkage.

| St. Astier One Coat renders related data | |
|---|------------------------------------|
| PRODUCT | Hydration Water retention % |
| <i>MONOSTASTIER</i> | 86 - 94 |
| <i>THERMOCROMEX</i> | 92 - 96 |

Heavy renders (dry mass over 1800 kg.m³) they are normally stronger but tend to dry much quicker in warm weather. Apart from the potential shrinkage problem, this can also make a scratched finish more difficult, if this is the finish required.

In cold climates, light renders (dry mass up to 1400 kg.m³) can have longer hardening period and therefore some finishes could require longer time to complete.

The dry density of St. Astier products classifies these as medium weight renders and therefore usable in all climatic zones, subject to the correct working practices.

Do not apply in temperatures below 5°C or above 30°C.

TYPE OF FINISHING REQUIRED

The main finishes are:

- as sprayed or rough cast
- partly smoothed roughcast
- scratched
- floated
- spatterdash (dry) For each, please see relevant paragraph under “Application recommendations”.

APPLICATION OF FURTHER DECORATIVE ELEMENTS OR COATS

Cladding by applying **tiles** directly on the render is possible. Follow the supplier recommendations.

The suitable render will have:

a minimum flexural strength of 2 MPa

and an elasticity moduli between 7500 and 14000 MPa.

The drying time and the cladding technique should be discussed with the supplier. In all cases tiling should not be applied on a scratched surface.

If a **decorative render coat** is to be applied on the render, it should be of at least 5mm thickness and with lower density, elasticity and flexural strength than the main render.

If the backing render is waterproofed, the bonding capability of the decorative coat should be tested.

Section 2: Working Practices

1. Background preparation and types

The application surfaces must be clean. No dust, traces of other materials, paints, salts, organic growth etc... should be present.

Lightweight blocks should be brushed and keyed in case of smooth blocks. Concrete surfaces should be brushed and washed. Traces of materials such as building mortar should be scraped off if they are over 1/3 of the proposed render thickness

Dub out: in order to maintain the true thickness of the render to be applied (max. 20mm in one pass), some areas of the surface might need dubbing out with a suitable mortar at least 48 hours before the application of the render. In dubbed out areas deeper than 3 cm., a reinforcing mesh has to be introduced. The render can be applied between 4 to 7 days after, depending on the thickness of the dubbed areas, the weather conditions and the type of binder in the render mortar.

On cement surfaces the recommended St. Astier pre-dressing mortars are:

Ready Mixed

- the same One Coat Render Mortar, manually applied
- **INTERCROMEX** base mortar

*Site mixed: mortars made with **HOUREX** (1 : 2.5 binder:sand ratio)*

Wetting/Dampening: as a rule the background should be damp but dry on the surface. Dampening must take into account the overall background suction and the climatic conditions at the time of application and should be done about half hour before application.

Products with water retention between 80 and 90% must be applied on a correctly dampened background.

Products with higher water retention should be dampened in hot weather conditions, in the presence of strong drying wind and on high suction backgrounds.

Do not render on over saturated surfaces (when water runs off it after wetting) or on previously waterproofed surfaces unless these have been keyed properly.

On lightweight blocks it is advisable to apply first a rough dash coat to diminish the suction.

This is not necessary with **THERMOCROMEX** on dampened lightweight blocks.

On very smooth and non suction surfaces:

- make a 1st pass with added SBR , or any of the following
- key the surface with a chisel
- sand the surface to create a key
- apply a rough dash coat with added SBR

New masonry units should not be rendered for at least 1 month after production to be sure that these units have dried out and that most of their shrinkage has taken place.

On pre cast concrete units or on poured concrete walls the surface should be free of any demoulding oil. If not this has to be done by sanding or high pressure washing (min. 400 bars).

When rendering on masonry units with vertical joints not filled, the joints over 5mm width should be pointed.

When rendering on masonry units built with large joints, to avoid shadows:

- either apply the one coat render in multiple passes waiting 1 day maximum between passes or
- apply a base coat and render on it after about 5 days

Recommended St. Astier base coat: **INTERCROMEX**

Always respect masonry joints if present.

2. MIXING

Always respect the manufacturer recommendations on water addition and mixing times.

Do not add any other material.

Always use whole bags.

Always use the same water dosage for each mix (proper measuring devices should be used).

Use the mixed material within 1 hour.

Do not try and re-work the mortar.

3. Protection and curing

Protect fresh work against adverse weather conditions. To avoid blooming, do not apply One Coat renders with strong colours at temperatures below 8°C and high humidity. In hot weather or windy conditions, cure the work repeatedly with light water mist for at least 2-3 days.

4. Waterproofing effect

This is achieved when the render thickness is at least 10mm. Do not apply in coats over 20mm. If a thicker coat is required, apply in 2 or more passes at 48 hours interval. In cold weather this interval should be 1 week. The maximum overall thickness should not be over 40mm.

5. Coat/s thickness

Do not apply in coats over 20mm. If a thicker coat is required, apply in 2 or more passes at 48 hours interval. In cold weather this interval should be 1 week. The maximum overall thickness should not be over 40mm.

6. Different finishes obtainable

6.1 Rustic (rough cast), partly smoothed rough cast and dragged finishes

Work in 2 passes at an interval of some hours. The first pass has to be at least 10mm to guarantee the waterproofing effect of the whole work. If the second pass cannot be done within few hours, dampen the surface before its application. In sprayed renders, make sure that the pressure and the distance of the spraying nozzle are constant.

- In rough cast finishes the render is left as cast.

- Smoothing a rough cast finish is done once the render is slightly hardened

- Dragged finishes are achieved by scraping the surface once sufficiently hardened.

6.2 Scratched finishes

The render is applied in 2 passes: the first will be cast on or sprayed as a bonding coat (3-5mm), the second is applied soon after. The total thickness of the work should be minimum 15mm.

Rule the second coat immediately after application.

The scratching should be uniform and using appropriate scratching tools (devil floats etc...) and it can be done between 3 to 24 hours after ruling, depending on the weather conditions

Remember that scratching will cause a different visual effect in the colour of the product from the colour of the same product with a smooth finish.

Deep scratched surfaces are more sensible to rapid drying and therefore more attention should be paid to curing with light water mist. This should not be done in full sun or on sun baked surfaces (cure in advance and later on in the day).

6.3 Sanded finish

Proceed as per scratched finish. When the surface is hard enough, usually 48 hours but could be longer, sand it down after light dampening

6.4 Sponged finish

Can be applied on various types of work, using different sponges texture or hardness when the work is sufficiently dried.

6.5 Smooth floated finishes (floats, sponge, trowel)

The render is applied to a maximum of 12mm in total, ruled and floated when sufficiently dry. The minimum thickness has to be 10mm after floating

Note: on large surfaces without joints it might be necessary to introduce joints. In all cases, if joints are present in the background, these should not be bridged.

6.6 Dry dashing

Apply the render in 2 passes to achieve a 15mm overall thickness. Dry dashing is possible on the second pass when still fresh

6.7 Lined finishes

Lined finish, simulating stonework, is achievable with the appropriate tools on a 15mm render when sufficiently hard.

7 Visual appearance diagnostics (normally not influencing stability and durability).

| PROBLEM | MAIN CAUSES |
|--|---|
| <p>CRACKING not due to movement</p> <p>Cracking webs: very fine, normally on surface only</p> <p>Micro cracking: less than 0.2mm, various directions</p> <p>Macro cracking: up to 2mm</p> <p>Fissures : over 2mm</p> | <p>Wrong choice of product's characteristics and specification with poor product knowledge.</p> <p>Movement cracks in the background. Cracked joints. Bridged joints Wrong water addition.</p> <p>Insufficient mixing time. Non application of metal or fibre mesh when needed.</p> <p>High shrinkage due to background suction or climatic conditions.</p> <p>Render too thick in places. Overworking the surface.</p> |
| WATER ABSORPTION | <p>Cracks Render below 10mm minimum thickness. Too deep scratches, reducing minimum thickness at lowest point.</p> |
| DELAMINATION | <p>Background not cleaned and prepared properly. Over saturated background High suction in the background Absence of a bonding coat on particular backgrounds Rapid drying of the render due to suction or climatic conditions especially in thin coats.</p> |
| <p>SHEARING Mainly on low strength backgrounds such as light weight blocks.</p> | <p>Wrong product choice. Background not dampened. Masonry units not ready (own shrinkage not completed). Absence of bonding coat.</p> |

IMPORTANT NOTE:

This document is meant to give specifiers some guidelines and does not constitute a specification.

For further Guidance, contact your St Astier Distributor.

Copyright © Setra Marketing Ltd. 2006

