

1 \ OBJECTIVE

This document complements the information presented in the relevant product's Technical Data Sheets, further detailing that data, but does not replace them.

In this document, we present possible technical solutions, for typical types of repair work on walls of old buildings, using CIMPOR Dry Mix Mortars.

2 \ TYPES OF REPAIR

2.1 \ Characterization of the main types of repair on old walls.

2.1.1 \ Superficial render layer replacement.

- Only the top-most layers of the old render (up to 2 cm deep) require replacement.
- Usually happens when the old building is in a good state of repair, and it is one needs to replace the final coats.
- A single product is usually enough in these cases, unless a smooth plater finish is desired, in which case a second one may be required.

2.1.2 \ Partial render replacement

- The old render is damaged, requiring deep replacement, but not all the way to the base Wall.
- Usually happens when the old building is in a low/medium level of disrepair, and it is necessary to replace both the top and the main layer of the render, and, sometimes, some limited replacement of the base layers.
- Requires 2 to 3 different products.

2.1.3 \ Total render replacement

- This case happens when the old building is in a medium-high level of disrepair, and state of the walls require full render replacement, but the base wall itself is not really damaged.
- Requires at least 3 different products.

2.1.4 \ Partial/superficial repair of the Base Wall

- This case happens when the old building is in a medium-high level of disrepair, and state of the walls requires not only full render replacement, but also repairs must be done on the base wall masonry itself.
- Requires at least 3 different products.

2.1.5 \ Stone walls joints repair

- Situation that may arise in old non-rendered stone walls, when the joints between the stones require repair, but the wall itself is still in good condition.
- A single product is usually enough in these cases.

2.1.6 \ Old walls structural repair/reinforcement

- Situation that arises when the core of the wall or of the structural element is damaged, or when the surface damage has progressed to a point that compromises the load-bearing capacity of the wall, while still maintaining enough strength to not justify demolition and rebuilding.
- It happens when the building's state of disrepair is near the limit when demolition becomes the advised option.
- There are two basic ways to repair this situation:
 - If the walls surface and the thickness of the Wall needs to be maintained, the solution would involve specific injection grouts, that while highly effective, require technically complex techniques and equipment.
 - If the Wall surface can be replaced or covered, then applying a compression layer, anchored to the original wall, is the best solution. Please contact us for the best solution.

2.2 \ Repair plans

2.2.1 \ Superficial render layer replacement

Replacing up to 4 cm deep:

1 – Render Top Layers

Apply up to 3,5 cm of **ACH** (in individual layers less than 2 cm thick), leaving 0,5 to 0,8 cm for the finishing layer. This layer should be reinforced with a mesh fibreglass net, with openings of 10 mm to 14 mm, shall be used, between individual layers, and at approximately half the total thickness of the render. This net is applied on top of still fresh render, and care must be taken to assure a homogenous and total cover of the underlying layer.

Next apply the finishing layer using **ACHF** or **ACH** (choose according to the type of fineness of the finish required), with a thickness that should be between 0,6 and 0,8 cm. This finishing layer shall also be reinforced with a fibreglass mesh, with openings of 8 mm to 10 mm, using the method presented in point 3.

This finishing layer can be used as a support for paint, if the resulting texture is the desired one.

Replacing up to 1 cm deep:

1 – Render Top layer

Apply the finishing layer using **ACHF** or **ACH** (choose according to the type of fineness of the finish required), with a thickness that should be between 0,6 and 0,8 cm. This finishing layer shall also be reinforced with a fibreglass mesh, with openings of 8 mm to 10 mm, using the method presented in point 3, ensuring that it is folded nor is it in the interface between different layers.

This finishing layer can be used as a support for paint, if the resulting texture is the desired one.

2 – Smooth Finishing layer (Indoors only) – If a smooth finish is required Apply **PE** (up to **2 mm thick**, only after the underlying render is totally dry), and allow it to dry before painting.

2.2.2 \ Partial render replacement

Replacing more than 4 cm deep:

1 – Base render coat replacement

Apply the necessary **AE**, in order to fill the Wall, leaving 2 cm for the top layers. Ensure, however, that the total applied thickness of **AE** is at least twice the depth left for the top layers.

2 – Render Top Layers

Apply up to 1,5 cm of **ACH**, leaving 0,5 to 0,8 cm for the finishing layer. This layer should be reinforced with a mesh fibreglass net, with openings of 10 mm to 14 mm, shall be used, between individual layers, and at approximately half the total thickness of the render. This net is applied on top of still fresh render, and care must be taken to assure a homogenous and total cover of the underlying layer.

Next apply the finishing layer using **ACHF** or **ACH** (choose according to the type of fineness of the finish required), with a thickness that should be between 0,6 and 0,8 cm. This finishing layer shall also be reinforced with a fibreglass mesh, with openings of 8 mm to 10 mm, using the method presented in point 3.

This finishing layer can be used as a support for paint, if the resulting texture is the desired one.

3 – Smooth Finishing layer (Indoors only) – If a smooth finish is required Apply **PE** (up to **2 mm thick**, only after the underlying render is totally dry), and allow it to dry before painting.

2.2.3 \ Total render replacement

Replacing more than 4 cm deep:

1 – Spatterdash coat

If a spatterdash coat, prior to rendering, is required, it can be done using **AE**. Mixing water should, in this case, be adjusted in order that **AE** has the proper workability for this purpose. Allow the spatterdash to dry for 72 hours before continuing with the rendering.

2 – Base render coat replacement

Apply the necessary **AE**, in order to fill the Wall, leaving 2 cm for the top layers. Ensure, however, that the total applied thickness of **AE** is at least twice the depth left for the top layers.

3 – Render Top Layers

Apply up to 1,5 cm of **ACH**, leaving 0,5 to 0,8 cm for the finishing layer. This layer should be reinforced with a mesh fibreglass net, with openings of 10 mm to 14 mm, shall be used, between individual layers, and at approximately half the total thickness of the render. This net is applied on top of still fresh render, and care must be taken to assure a homogenous and total cover of the underlying layer.

Next apply the finishing layer using **ACHF** or **ACH** (choose according to the type of fineness of the finish required), with a thickness that should be between 0,6 and 0,8 cm. This finishing layer shall also be reinforced with a fibreglass mesh, with openings of 8 mm to 10 mm, using the method presented in point 3.

This finishing layer can be used as a support for paint, if the resulting texture is the desired one.

4 – Smooth Finishing layer (Indoors only) – If a smooth finish is required

Apply **PE** (up to **2 mm thick**, only after the underlying render is totally dry), and allow it to dry before painting.

2.2.4 \ Partial/superficial repair of the Base Wall

1 – Base Wall repair

Fill in all cracks, holes, or other voids, and replace all old stones (that fell during the removal of the damaged render) using **AE**, making sure that you obtain a roughly flat surface (flat enough so that the following render coats have a similar total thickness). Allow it to dry for 7 days before continuing with the rendering.

2 – Spatterdash coat

If a spatterdash coat, prior to rendering, is required, it can be done using **AE**. Mixing water should, in this case, be adjusted in order that **AE** has the proper workability for this purpose. Allow the spatterdash to dry for 72 hours before continuing with the rendering.

3 – Base render coat replacement

Apply the necessary **AE**, in order to fill the Wall, leaving 2 cm for the top layers. Ensure, however, that the total applied thickness of **AE** is at least twice the depth left for the top layers.

4 – Render Top Layers

Apply up to 1,5 cm of **ACH**, leaving 0,5 to 0,8 cm for the finishing layer. This layer should be reinforced with a mesh fibreglass net, with openings of 10 mm to 14 mm, shall be used, between individual layers, and at approximately half the total thickness of the render. This net is applied on top of still fresh render, and care must be taken to assure a homogenous and total cover of the underlying layer.

Next apply the finishing layer using **ACHF** or **ACH** (choose according to the type of fineness of the finish required), with a thickness that should be between 0,6 and 0,8 cm. This finishing layer shall also be reinforced with a fibreglass mesh, with openings of 8 mm to 10 mm, using the method presented in point 3.

This finishing layer can be used as a support for paint, if the resulting texture is the desired one.

5 – Smooth Finishing layer (Indoors only) – If a smooth finish is required

Apply **PE** (up to **2 mm thick**, only after the underlying render is totally dry), and allow it to dry before painting.

2.2.5 \ Stone walls joints repair

Joint replacement up to 1 cm deep:

Apply **ACH** or **ACHF** (choose according to the type of fineness of the finish required) in the open joint, pressing firmly.

Joint replacement up to 3 cm deep:

Fill in the open joint with **ACH**, leaving 0,5 cm to 1 cm for the top layers. Apply **ACH** or **ACHF** (choose according to the type of fineness of the finish required) in the open joint, pressing firmly.

Joint replacement over 3 cm deep:

In this case, a case-by-case analysis is recommended, as we may be facing a structural issue, that may require a solution that goes beyond a simple repair.

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2.2.6 \ Old walls structural repair/reinforcement

If the thickness of the Wall or it's surface must be kept as before

If the walls surface and the thickness of the Wall needs to be kept unchanged, the solution would involve specific injection grouts, that while highly effective, require technically complex techniques and equipment.

1, after the structural work is done, further non-structural repair is needed, then one of the plans presented in this document can be chosen.

If it is not necessary to keep the thickness of the Wall or it's surface as before

1 – Structural steel armour

The structural steel rebar framework should be mechanically anchored to the underlying wall, keeping a 2 to 3 cm gap between the old Wall and the rebar.

The steel used should be stainless steel, specific for highly corrosive and oxygen exposed environments, and the thickness of the rebar wires should be selected according with the desired compressive strength, and taking into account the total thickness of the new structural reinforcement wall.

2 – Structural layer

With the steel reinforcement in place, apply a first coat of **AE**, by hand, in order to stabilise the old Wall surface.

Fill in the structure, with **AE** using a Shotcrete projection machine, until the entire steel reinforcement is fully covered with a layer of at least 2 cm.

3 – Base render coat replacement

Apply the necessary **AE**, in order to fill the Wall, leaving 2 cm for the top layers. Ensure, however, that the total applied thickness of **AE** is at least twice the depth left for the top layers.

4 – Render Top Layers

Apply up to 1,5 cm of **ACH**, leaving 0,5 to 0,8 cm for the finishing layer. This layer should be reinforced with a mesh fibreglass net, with openings of 10 mm to 14 mm, shall be used, between individual layers, and at approximately half the total thickness of the render. This net is applied on top of still fresh render, and care must be taken to assure a homogenous and total cover of the underlying layer.

Next apply the finishing layer using **ACHF** or **ACH** (choose according to the type of fineness of the finish required), with a thickness that should be between 0,6 and 0,8 cm. This finishing layer shall also be reinforced with a fibreglass mesh, with openings of 8 mm to 10 mm, using the method presented in point 3.

This finishing layer can be used as a support for paint, if the resulting texture is the desired one.

5 – Smooth Finishing layer (Indoors only) – If a smooth finish is required

Apply **PE** (up to **2 mm thick**, only after the underlying render is totally dry), and allow it to dry before painting.

3\ Fibreglass mesh

- If the repair requires mortar replacement above 4 cm deep:

Unless there are structural issues, it is not usually necessary to fully reinforced the Base Coat Render (**AE**). However in specific zones, such as, transition zones between different supports, the corners of Wall openings or transitions between zones with very different base thickness, apply fibre glass mesh, with openings of 10 mm to 14 mm, at approximately the last 2 cm of the Base Render.

The Top Layers (**ACH/ACHF**) should always be reinforced, halfway through each layer, using a fibre glass, alkali –resistant, meshe, with a mesh size between 8 and 10 mm,

Apply the mortar onto the substrate using a suitable notched trowel (6 to 8 mm teeth), and lay in the mesh, embedding it in the mortar, using the flat face of the trowel, and flattening the notches. Make sure the mesh is flat, without any folds and is not touching the board.

Cover the mesh with the mortar, applying it with the straight edge, using the minimum amount of mortar necessary to ensure that the mesh is totally embedded

- If the repair requires mortar replacement up to 4 cm deep:

The Top Layers (**ACH/ACHF**) should always be reinforced, halfway through each layer, using a fibre glass, alkali –resistant, meshe, with a mesh size between 8 and 10 mm,

Apply the mortar onto the substrate using a suitable notched trowel (6 to 8 mm teeth), and lay in the mesh, embedding it in the mortar, using the flat face of the trowel, and flattening the notches. Make sure the mesh is flat, without any folds and is not touching the board.

Cover the mesh with the mortar, applying it with the straight edge, using the minimum amount of mortar necessary to ensure that the mesh is totally embedded.

4\ FINAL NOTES

- This guide presents only general work plan suggestions, and it should always be evaluated accordingly to the specific situation of each repair work. If your situation is not covered, or if you feel you need further information, please contact us.
- We recommend that you run a sample on site so that you can analyse the products used.
- Download our technical sheets only at www.cimpor.com .

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