

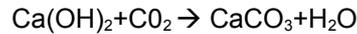
## THE FRESCO

Vico Calabrò's technical notes

The word "fresco" or "good fresco" refers to the wall-painting where colors are dissolved in water and then are extended on a fresh plaster, that is recently extended.

So, due to the reaction between the lime of the plaster and the carbon of the air, colors can fix until they become insoluble and harder.

This chemical reaction is named "carbonation of the lime", and its formula is:



that is calcium hydrate that matches with carbonic anhydride and leads to lime carbonate + water that evaporates.

During the phase of drying of the mortar, the water, that comes out, brings to the painted surface enough lime hydroxide to form the skin that will turn into colored lime carbonate.

The main elements to make a Fresco are:

1. the wall and the render
2. the layer of lime
3. plaster
4. lime
5. sand
6. colors

## THE WALL AND THE RENDER

The wall of stones or bricks, must be healthy under any point of view, that is without patches of smeared without nails or wood pieces, it must not present either any traces of cement or plaster renders and it is important that it is supported on a dry place because the moisture is the main enemy of the plaster. The render, composed by coarse sand and lime, is the first rough spillage of mortar, useful to level the different prominences of the stones.

## THE LAYER OF LIME

That is mortar of lime and sand. You must throw it on the render, leaving about a centimeter of thickness on the wall and the surface rough to facilitate the accession of the next layer.

## THE PLASTER

That is mortar of lime and thin sand and it is the part where you paint.

Its width is of few millimeters.

Every morning you must extend the part of the plaster that has to be painted the same day.

Then the painter has to project the boundaries of the following portions, called "days" and the master Mason must add the mortar exactly, without overcoming or scratch the painted part.

## THE LIME

The lime is achieved by cooking calcareous stones in wood fire oven and the following weakness in trench.

$\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$  the carbonate of lime through cooking releases the carbon dioxide and remains the calcium oxide which is the bright lime.

$\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2$  the bright lime is slaked in water and turns into lime hydrate that is dull lime.

## THE SAND

Usually, it is sand from rivers. Some people prefer quarry and crusher sand, because the particles are angular and it is easier to compress them, and they produce a smoother surface of the plaster.

In any case the sand do not has to contain impurities such as land, plants, animal remains or other things.

## THE COLORS

The colors melt into water, then you have to blend them into thin grains. The alkalinity of the lime does not allow you to use all the colors such as in the other pictorial techniques. In the past the palette of the fresco painter was very limited. From a couple of centuries the scientific investigations have allowed to extend the range with artificial pigments of absolute resistance. There is a particular chapter that treats every single colour that can be used in the Fresco.

## HOW TO MADE THE FRESCO

1. Sinopia
2. Painting cartoon
3. Stencil
4. Painting

## SINOPIA

The drawing has to be represented (using the cross-town) from the sketch to the layer of lime to see the effect in the final dimension.

This work, which then disappears under the plaster is called sinopia because it was usually done with a red earth that came from the city Sinope (Turkey).

## PAINTING CARTOON

From the sinopia or sketch, the "painting cartoons" are stripped out: they are drawings featuring the final size and can be painted in detail in order to be studied for the Fresco.

## STENCIL

The process of passage of the cartons to the plaster is called "stencil" and consists of perforating the limits of the drawing and pouring on its gaps a powder color which is set in the mortar in order to reproduce the profile of the figures.

Stencil is also made passing on the cardboard (in this case light paper) a tip that leaves a mark on the pencil.

## PAINTING

Before starting the painting, you must check if the surface "resists" under the brush: it must "hold" that means the pretty oily wet lime surface must retain the colors in order to allow the painter a good handle of mixture and to melt paintings.

The fresco painting acquires the sensitivity, that he needs to work properly, only with the practice.

For the first colors, laden tones must be used, because the moisture in the plaster melts them quickly and therefore weakens them. Overlays should be made after a short break to let them the time to fix at every spillage.

If a part of the plaster remains to paint, you need to break it down and start again the work the next day on a new plaster.

## NOTES ON PIGMENTS THAT CAN BE USED IN THE FRESCO

### BLUE

The unique blue colors that resist the lime are chemical preparations made in the beginning of the 19th century. In the past, the blue were extended on dry walls, with tempera of all kinds.

### COBALT BLUE

It is cobalt and aluminum oxide,  $\text{Al}_2\text{O}_3\text{CoO}$ . It was discovered by Thenard in the 1802. It covers very well and it is characterized by its elevated resistance to all agents.

### CERULEAN BLUE

It is stannate of cobalt,  $\text{CoO-SnO}_2$  in use in the second half of the 19th century. Limited power to cover but excellent resistance.

### WHITE

The most efficient is the St John one, that is dull lime treated in special ways. Of course this white is the most suitable for the Fresco, but it is also possible to work with milk of lime and other white composed by  $\text{CaCO}_3$ .

### TITANIUM WHITE

It is oxide of titanium,  $\text{TiO}_2$ , that has been used from later 1920. It is an excellent white, but must be extended on the plaster mixed with St. John white.

### BROWN

Good all the lands, both the natural and the calcined ones.

### LAND of CASSEL or COLONY, PARDO VAN DYCK

It is the darker natural color for the Fresco. It consists of 90% organic substances (peat and lignite) plus iron, silicon, aluminium.

### YELLOW

All the OCHRES are excellent for the Fresco, in addition:

**CADMIUM YELLOW**, Cadmium sulfide,  $\text{CaS}$ , used since the 1829. It is very efficient and steady.

### CHROME YELLOW

It is chrome-plated lead,  $\text{PbCrO}_4$ , proposed in the 1798. Variable between lemon yellow and orange hue depending on the fatness of the particles.

### MARS YELLOW, also known as ARTIFICIAL OCRE YELLOW

Artificial compound consists of iron and aluminium, has been used from half of the 19th century.

### BLACK

The only natural black accepted by the lime is the SCREW BLACK, obtained by the burning of shoots or grounds. Since it discolours a lot, it has to be used only if you want to get a grey. For the darker colors it is better to use the Land of Kassel, which is darker natural color and it is most suitable for the Fresco.

Artificial black you can use:

the BLACK of MANGENESO manganese dioxide, used in the 19th century;

the BLACK of MARS or OXIDE BLACK obtained by calcination of iron hydroxide.

### OCHRE

For the Fresco all ochre are excellent, widespread clay in various colors according to the amount of oxide of iron and salt included.

**RED**

Every red of mineral origin is good: both natural and burned lands.

Among the artificial red, the CADMIUM RED, cadmium sulfide, CdS, is excellent, it features good resistance to the light. It has been used since the 1850.

**MALACHITE GREEN**

Carbonate hydrate mineral for copper, that has been used for ages.

Today it is sold an artificial product, but it is little stable.

**GREEN LAND**

Silicate of iron, that varies depending on its components of potassium salts, magnesium and aluminium. It can varies, depending on the area of extraction, from a dull green with a weak blue to an intense green with yellow matrix.

**COBALT GREEN**

Oxide of zinc and oxide of cobalt  $\text{CoO}+2\text{ZnO}$  proposed in the 1870.

**CHROMIUM OXIDE GREEN**

There is the OPAQUE green and TRANSPARENT one

The OPAQUE green is chromium dioxide,  $\text{Cr}_2\text{O}_3$ , it has been used from half of the 19th century;

The transparent green is chromium oxide hydrate,  $\text{Cr}_2\text{O}_3\cdot 2\text{H}_2\text{O}$ , that has been used from the second half of the 19th century.

**PURPLE****COBAL PURPLE**

- cobalt phosphate  $\text{Co}_3(\text{P}\text{O}_4)_2$  or also

- cobalt arsenate  $\text{Co}_3(\text{As}\text{O}_4)_2$

Known from the second half of the 19th century.