Cimorné plaster: a colourful and luminous cladding

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ABSTRACT
The Modern era is characterized by the development of new building techniques and finishes. Experimental development focuses in particular on the decorative and colourful aspect. An exceptional example of colourful, luminous finishes is the cimorné plaster. Traditionally, plasters were painted or coloured in the mass to cover up the unattractive grey colour of cement-based mortar. But pigments washed out and the bright colours faded through time. The cimorné finish however is based on the application of a bright coloured mortar that hardly fades. Cimorné (or ciment orné) means ‘decorated cement’ and was developed in the late twenties by Pierre Petroons. Little glass parts, remains from the Marbrite production, were projected into wet mortar in order to obtain a shimmering aspect, a certain hue or a unique texture. The current damage such as contamination of the glass, cracks and peeling off cannot be repaired without leaving visible marks. Therefore, a decent restoration strategy needs to be formulated.

Keywords: 20th century, modern heritage, plaster, coloured finish, renovation strategy

1. INTRODUCTION
This paper treats the cimorné technique, its origin, characteristics and renovation issues. This outstanding finishing technique, however, evokes a lot of questions: how are these bright coloured surfaces come about? What is the application technique: are the glass pieces mixed into the mortar or projected after application onto the mortar surface? What is the composition of such a finish? What causes the damage noticed nowadays? (fig.5) Is this finish as colour-fast as it claims to be? How should this young heritage be dealt with during renovation? Etc. Hardly any written or iconographical sources exist on the cimorné plasterwork. Only some vague building specifications in local publications [1] and a student thesis [2] deal with this subject. A research through the historic patent
database [3] resulted in three useful patents regarding the cimorné finishing, its original formula and application. This paper gives a short description on the cimorné technique as valorisation of this unique cladding applied in the 20th century.

2. COLOURED PLASTERWORK & THE DESIRE FOR AN EVERLASTING COLOUR INTENSITY
Applying a protective plaster or paint layer helps to preserve building materials and ensures a more homogeneous view of the surface. That is why plastered façades become so popular during the 18th and 19th century. Imitation techniques using plaster, mortar and paint even try to approach more distinguished finishes. Often, the plaster finish is painted in stone imitations, a trompe l’oeil concept of working towards perfection of building materials. The 20th century is characterized by the development of new and empirical finishes of which the cimorné technique, presented in this paper, is a remarkable example.

3. CIMORNE FINISH
Mass coloured plasterwork is developed because of 20th century architects’ desire for large bright coloured surfaces. In order to obtain an intense colour, alkali-resistant pigments like metal oxides are added to cement plaster [4]. Adding pigments to cement mortar isn’t a lasting solution to create sustainable, bright coloured façades because of the disadvantage of fading and washing out. Pierre Petroons develops the cimorné plaster based on the created need for a finish technique that ensures everlasting colour intensity.

In 1928, Pierre Petroons experiments with domestic materials like crushed bottle glass and waste of the Marbrite glass production as a first introduction of the cimorné technique which is launched at the International Exposition of 1930 at Liège. The colourful cimorné plaster is applied in 1935 on the façades of his private house (fig.1), designed by architect A. Castiaux, to imitate a quarry-stone look as is the case for the baseboard (fig.2) and the driveway and some garden ornaments. In some way, this excess of cimorné plaster in the Petroons’s villa rather might feel kitschy.

Cimorné or ciment orné literally means ‘decorated cement’ and consists of little coloured glass particles embedded in a mass coloured cement mortar (fig.3). These glass granulates, remains from the Marbrite production [5], are projected into a wet mortar layer to obtain a specific hue.

Unlike other types of surface finishes, the cimorné technique combines an interesting decorative aspect, a large colour variety and a low cost price about 20 to 50% lower compared to traditional finishes [6]. The low price can be explained by the economics of the raw materials, in particular the re-use of waste of the Marbrite production Factory (S.A. des verreries de Fauquez) and an efficient execution (about 40m² is finished in one week by 3 or 4 craftsmen). The waste materials correspond to about 30% of the Marbrite production which would otherwise end up in the garbage bin [7]. This financial aspect fits well within the period of economical crisis of the Thirties of last century, where there is a tendency to replace more noble materials by cheaper equivalents. Beside the low cost price, only a minor
preparation is needed and once applied the finish is rainproof and requires little or no maintenance: it is ‘maintained and cleaned by the washing action of rain’[8].

As main advantage, the cimorné finish allows bright coloured appearance that in principal should not fade. The use of coloured glass particles in combination with the in mass coloured cement plaster insure a durable colour intensity and a brilliant aspect.

3.1 A combination of colours

A wide range of colours and different hues are available in approximately 24 shades and about 100 blends so that owners can personalize their dwellings by applying different colour mixtures (fig.2). The hues ‘jaune chrome’ (chromium yellow) and ‘rouge vermillon’ (vermillion red) cost about 100 Euros per ton in 1932, while others cost only 48 Euros per ton and are consequently more frequently applied [9].

In contrast with blue shades, green and brown are most applied, probably because these hues can be obtained by
using crushed bottle glass, which is even cheaper than Marbrite particles. The combination of light brown walls and dark brown window framings is also often found (fig.4). Another popular, but more expensive colour scheme, is the combination of red-brown walls and bright red framings. Beside a juxtaposition of contrasting colours, a uniform tinted grey finish is often chosen (fig.5).

3.2 Formula
Cimorné plaster is based on Portland cement, which is textured with grinded Marbrite. The supporting surface will be first covered with one or two layers of a waterproofed cement mixture (1 part of grey cement and 2 parts of sand) forming the rendering layer. Secondly, a top layer is applied consisting of 2 parts of white cement and 1 part of white sand [10]. After the surface has been smoothed, crunched Marbrite is added to this top layer ‘which is preferably tinted to an appropriate background shade’. This top layer is about 3.175 millimetres (1/8 inch) thick and ‘should be uniform in thickness so that the glass fragments will be uniform in penetration and projection, and for this purpose pebbles of substantially uniform size may be incorporated. (...) the pebbles acting as spacing members and thereby facilitating the subsequent smoothing operation which may be performed in the usual way with a smoothing trowel’[11].

The granular glass fragments, free of sharp cutting edges, must be sufficiently irregular to provide solid anchorages to the mortar. The production of glass fragments with a size of 3 to 4 millimetres is described in the patent specification GB481752: ‘In the preparation of such glass fragments, glass in the state of “pot metal”, is subjected to a tempering heat treatment (...) The glass is next crushed between inclined pivoted jaws which have fluted surfaces. The coarsely broken glass is next subjected to a second crushing and grinding treatment between adjustable rollers the surfaces of which have rounded ribs(...) After this second crushing the fragments of glass are transported to a sieve or other classifying apparatus by which they are graded in size. They are then ready for application to the surface to be roughcast.’

3.3 Application
As described in part 3.2, at first one or two layers of watertight Portland cement mortar are applied. (fig.6) To create a good attachment, the second layer is roughened or scratched by means of a metal comb while it is still wet. A thin top layer of cement is applied onto the remoistened rendering and can be mass coloured by means of dry pigments. Next, fragments of glass are projected into the top layer of cement. The projection of glass pieces is executed on the façade in horizontal strips.

The glass fragments may be projected either by hand or mechanically. Different sources come up with different explanations. According to Walloon building specifications, [12] the application is erected manually top-down. A part of the glass granulates attaches to the cement mortar while the other part falls down into a wooden tray. Immediately after projecting the glass pieces, another craftsman pushes the granulates into the plaster, using a trowel or a rubber faced float.

Besides this labour-intensive way of applying crushed glass by hand, several patents [13] describe a mechanical way of projecting the Marbrite particles into the mortar surface. Petroons claims a patent specification entitled ‘improvements in or relating to apparatus for roughcasting building structures’ in 1932. Herein he describes ‘a machine for
“rough casting building structures, an object being to provide for waste or broken material being used in the coating.” As illustrated in Figures 7-8, the crushed glass is put in a drum and projected onto the roughcast surface. For that, under and in the hopper (D) one of three available funnels (B) is first filled with glass fragments. The choice of one out of three funnels depends on the size of the glass particles. By operating a handle (H), the drum (E) will start to rotate and so the material is thrown from the drum onto the surface. The machine is held at a distance of approximately 10 to 30 cm from the surface. Afterwards, the glass pieces are pushed into the cement mortar by means of a trowel.

4. RENOVATION ISSUES
The cimorné technique has kept its promise: after more than 70 years, this finish has preserved his intense colour. Nevertheless, damage due to contamination, peeling off and cracks occur, as illustrated in Figure 5. To gain better knowledge of the historic material properties and to continue this research, several samples will be taken onsite for further analysis at the laboratories of the Royal Institute for Cultural Heritage in Brussels (KIK-IRPA). The lab analysis will reveal the composition of the cement mortar, renderings as well as top layers. These results will lead, in combination with the information of the records and literature sources, to scientific founded guidelines for future restorations.

Once the original formula and application technique are discovered, there will still arise several problems: new glass fragments from the Marbrite productions are no longer available since the glass factory ‘S.A. Verreries De Fauquez’ has closed in 1964 [14]. Therefore, further research is required to incorporate new types of glass fragments, in which the authentic colour and aspect is respected.

Another issue is the possible export of this regional plastering technique. Patent specification GB481752 mentions Pierre Petroons from Braine-L’Alleud and Fernand Rene Lang from London as contractors. This means the cimorné technique is also known and applied in Great Britain and further research is necessary to gather information about their similarity.

5. CONCLUSIONS
Many cimorné-decorated façades disappear because of a change of fashion and radical renovation campaigns. Sen-
sibilization is therefore almost as important as developing renovation and restoration techniques. Besides damage due to lacunas of the plaster, pollution and development of microorganisms, rupturing and cracking of the plaster, peeling off, loosening of the glass pieces, etc. our heritage management stands up for the conservation and survival of the cimorné technique. The restoration scene has to recognize the value and particularity of this remarkable regional technique developed by craftsmanship, considering the fact that this technique is not only ‘maintained by the washing action of rain’[15].

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