



CRITICAL AND ANALYTICAL APPROACHES IN A CONTEMPORARY MURAL PAINTING' RETOUCHING PROCESS: THE KEY STUDY OF MURALS BY ANTONIO CARENA

Paola Mezzadri (1), Francesca Valentini (2), Maria Concetta Capua (3)

- (1) Paola Mezzadri, Istituto Centrale per il Restauro: ICR official conservator-restorer, paola.mezzadri@beniculturali.it
(2) Francesca Valentini, Istituto Centrale per il Restauro: ICR official art-historian, francesca.valentini-01@beniculturali.it
(3) Maria Concetta Capua: Koiné Conservation and Restoration cooperative, mariaconcetta.capua@gmail.com

ABSTRACT

This paper focuses on critical and analytical approaches behind the reintegration process in the conservation project of two contemporary mural paintings designed by Antonio Carena and located in the outdoor contemporary museum of Piscina in Italy. Moreover, there will be evaluated materials and techniques applied, in this selected case study, where contemporary criteria on chromatic reintegration, still connected to a case by case situation, confirm that the aesthetic presentation of a work of art is the phase of the restoration in which the exquisitely critical nature of the intervention is best expressed, since it implies a scientific plan at the basis and the objective critical judgment of the operator which is called to interpret some formal, visual and historical values of the work of art, acting on them. Finally, there will be analysed theoretical and technical methodologies to explain how scientific criteria, which are also objective and based on the visual perception of colour by the human psyche and its consequent aesthetic elaboration, passes through a scientific-critique interpretation of the constituent materials in the work of art.

Keywords

Carena; Chromatic reintegration; Contemporary mural painting; retouching techniques; synthetic polymers; natural polymers; pilot methodology.

1. INTRODUCTION

This study wants to introduce the first results in the retouching process of two contemporary murals by Antonio Carena, located in the open-air contemporary art museum of Piscina in Italy. The conservation project was achieved between June and July 2021 by ICR (Istituto Centrale per il Restauro), in collaboration with two conservation companies, developing specific solutions in choosing critical and analytical approaches for the reintegration techniques of these two mural paintings.

The research is still in progress: in time, the materials applied and the methods selected for the application will be monitored to understand their behaviour related to their specific outdoor context and to the original ones in order to develop an appropriate ordinary maintenance plan.

The project Piscina Arte Aperta, which was born in 1991 from a brilliant idea of a local painter, was yearly developed by a group of artists, curators, art critics, designers as an important artistic manifestation strictly connected to its territory.

The aim was to create an intimate and urban open air art gallery collection for the community, enriched in time, and now constituted by almost 70 contemporary complex artworks.

Nowadays Piscina Arte Aperta is legally recognised as an open-air contemporary art museum that winds its polymateric and complex Cultural Heritage through the squares and streets of the town.

1.1 The open-air museum of contemporary art in Piscina: conservation history

Piscina Arte Aperta (P.A.A.), developed as an open artistic process, involved in 10 years of activity established and emerging artists which lived and worked in the Piedmont region reaching the heritage of 70 works between 1991 and 2002. Piscina is a small town in the hinterland of Turin, a large industrial city in Northern Italy. A museum-laboratory, born as a "cultural operation", in which the theoretical discussion and the creative happening prevailed upon the open air exhibited collection that the promoting group defined "the concrete and material outcome - and perhaps - at least in its surviving component, not even the most relevant "[1]. In fact, the project itself implied the acceptance of a progressive degradation of the works in the open air, "a strongly - and deliberately! - degradable heritage...

Many artists invited to Piscina (perhaps most of them) made this eventuality one of the reflections to the basis of the work to be carried out"[1]. With no tourism or "urban redevelopment" aims, the project lived in the relationship with the artists, the citizens and the territory. Since the first editions of the event, the promoting group has sought the relationship with the population, through public dissemination initiatives, temporary exhibitions, publications, activities in schools. The promoters keep a rich documentary archive that allows us nowadays to reconstruct the evolution of a spontaneous event: search for funding, selection of artists, publicity of the event, administrative aspects. Undocumented but told by the protagonists are the episodes of vandalism, removal, destruction of works [3]. Despite the curators' approach of accepting an inevitable deterioration of the works exhibited *en plein air*, a formal request for generic "protection" was required from the private owners who accepted the exhibition of works on the outside of their houses, without any obligation to restore or maintenance [4].

The institutionalization of the P.A.A. project in a public municipal museum owned by the Municipality of Piscina in May 2021 led to the pilot restoration of, among others, the work of Carena

1.2 The artist and its poetic

Antonio Carena (1925-2010) was born in Rivoli and made his debut in the art world in the mid-1940s. The artist began his career by creating informal artworks to reach a lyrical and also pop hyper-realism in the Sixties with his *Cieli*, "aerographic skies", artworks realized with airbrush on different types of supports: from bodywork to perspex, canvases, walls. The artist used to ironically define his artworks as "*cielagioni*" or "*cielismi*" (a sort of italian pop name-game for his "skies"). He was also a precursor of the so-called *graffiti writing*, developing an art made by unique and repetitive signs, as the clouds, more real than the reality. The anti-naturalistic and hyper-realistic realization of the Skies leads Carena's art to the limit of the conceptual, in which the surface is homogeneous, mirroring, without imperfections, according to a similar principle to that of monochromes.

Carena's activity in Piedmont is widely documented: he painted *Cieli* on the vault of the staircase of the Contemporary Art Museum of the Castello di Rivoli, 1984, now hidden by a repainting, at MACAM in the village of Maglione (TO) in 1991 and in the one of Borgo Campidoglio (TO) in 1998 [5]. The intervention for Piscina Arte Aperta involved the artist in the first edition of the 1991 event, invited by the artistic director Francesco Preverino to participate with the utmost freedom of expression. In *Due trance di cielo*, 1991, Carena adapts its iconic "brand" in a site-specific work, painting the buffered windows of a private residence, playing with the reality of the place, in which a glimpse of the sky illuminates a blind window like a theatrical backdrop. The work underwent deterioration quite quickly, in particular in the right panel, as shown in a 2001 photo [6].

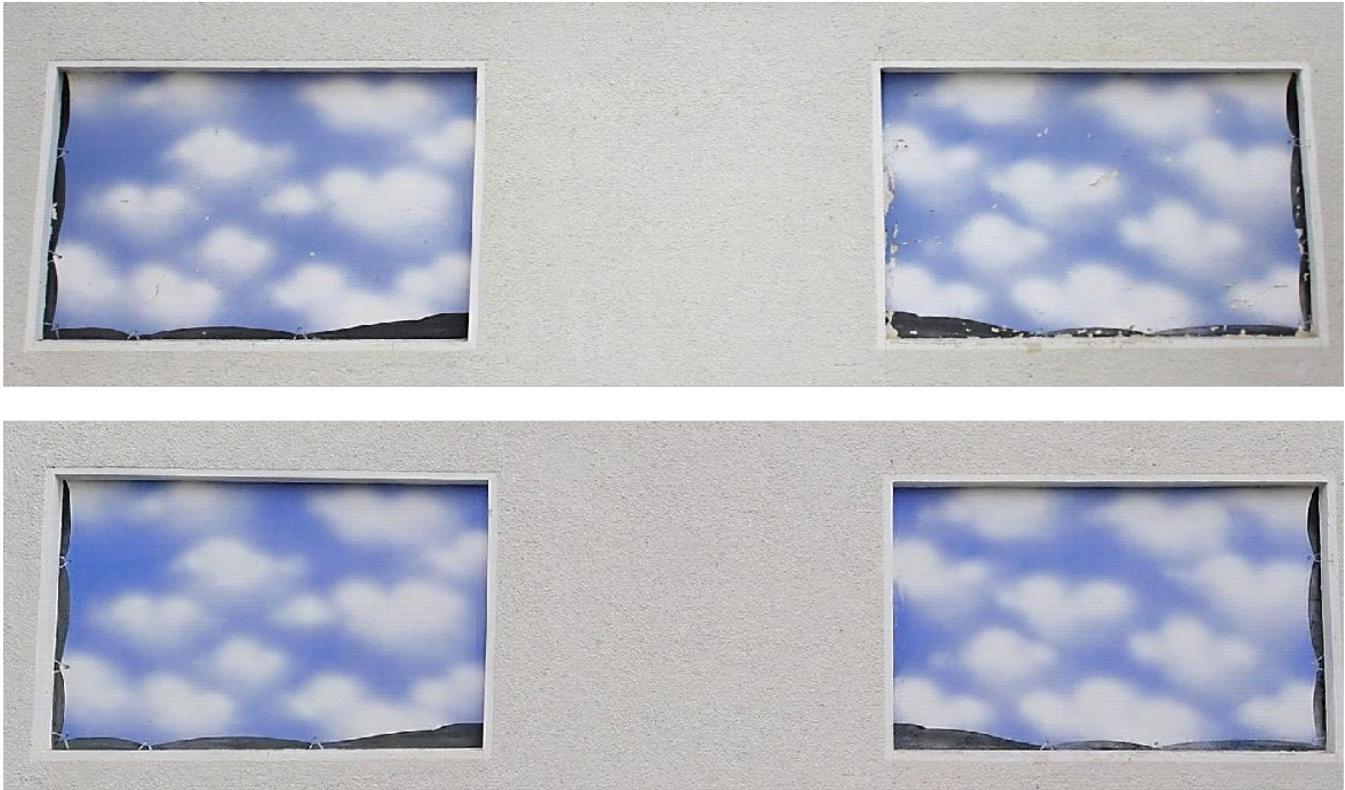


Figure 1 – Upper image: Carena murals before the conservation project. Lower image: the murals after the ICR restoration.

1.3 Conservation issues and conservation history: the social and legal recognition of the murals in the ephemeral outdoor context

Generally talking, an open-air museum is constituted by three main factors: the outdoor context and the community that differently interact with the artwork which needs to be socially and legally recognised as artwork and, therefore, as part of Cultural Heritage and Cultural Landscape [7].

Infact, the main conservation issues related to the murals were connected both to natural and anthropic decay processes linked to the principal risks of the outdoor context: the natural risk (with direct or indirect causes) like the exposure to the sun, rains, winds and strong thermo hygrometric changes typical in the environment of the north of Italy, and the anthropic risk, with direct or indirect causes too, more related to the interaction with the community.

In this specific case, the degradation problems connected to the anthropic interference can be named as an unconscious vandalism, or a lack of care, due to the partial forgetfulness of Piscina Arte Aperta

Cultural Heritage in time. Nowadays, the community and the municipality itself are more mindful of the unpredictable outdoor context and their fragile rediscovered heritage after the conservation project.

2. EXECUTIVE TECHNIQUES AND STATE OF CONSERVATION

The murals, called *Due trance di cielo*, measure about 1,08 m² each one and were painted during the first artistic manifestation of Piscina Arte Aperta in 1991. These aerographic skies are revealed from two curtains tied to nails fixed along the perimeter of two fake windows. The tromp l'oeil reproductions of these hyper-realistic and mirroring skies ironically reveal their fiction three times leading the paints to the limit of the conceptual.

Carena painted its skies in two outdoor blind compartments of a private building that recalls the shape of two windows.

The artists used different synthetic paints that differently interacted with the outdoor context. Infact,

the blue of the skies is a VeoVa based paint layer, while the white of the clouds is a paint sensitive to the water whereas the black of the curtains is, instead, an acrylic paint (FT-IR by Giancarlo Sidoti: ICR official chemist).

The outdoor risks mentioned above caused different decay problems, especially on the right mural, also related to the differential alteration caused by the overlapping of diverse synthetic paints which tend itself to develop delamination and deformation processes in all the layers, due to the intrinsic executive techniques.

Moreover, diffuse spots in the white layer of the murals, due to some previous roadworks performed too close to the latter, were detected on all the surface (anthropic risk).

Also natural decay processes were identified like: presence of incoherent deposit (especially organic nature), *lacunae* and micro *lacunae* in the pictorial film (blue and white colours) and in the primer (avana colour), cracking and detachments of the pictorial film (different typologies according to the rigidity of the specific pictorial layer), lack of adhesion of the pictorial film from the plaster, lack of cohesion of the white's clouds and in the blue of the skies, diffuse spots in the white layer due to the swelling of the binder caused by the water extraction and biological colonization (black spots diffused in the central area of the right mural).

3. MATERIALS AND METHODS: THEORETICAL AND TECHNICAL PRINCIPLES IN THE REINTEGRATION PROCESS OF CONTEMPORARY MURALS

3.1 Critical and analytical approaches in the reintegration process of mural paintings

The aesthetic presentation behind every reintegration process in the conservation of mural paintings is always based on critical and analytical conservation approaches.

Therefore, also contemporary criteria on chromatic reintegration are still connected to a case-by-case situation, where the aesthetic presentation is the phase of the restoration in which the exquisitely critical nature of the intervention is best expressed because it implies a critical judgement of the operator, in order to interpret some formal, visual and historical values of the work of art, acting on them.

Infact, the operator's judgement and its consequent action must be based on precise theoretical principles that guarantee that the reintegration will move on a track of univocity in methods according to objective values. For this reason, at the basis of the reintegration intervention, there must be a specific plan founded on scientific criteria which are also objective and based on the visual perception of colours by the human psyche, and its consequent aesthetic elaboration, which passes through a scientific-critique interpretation of the constituent materials in the work of art. In the history of restoration, two different theoretical orientations have always been opposed: the first one, more linked to the educated context of academia, has considered the work of art a real material document enhancing its historical value and underlining the need for preserve its originality; the other, linked to the antiquarian world, was instead more interested in the figurative and aesthetic message of the work of art in restoring the original figurative idea through typological and stylistic comparisons and analogical procedures. Only with Riegelian [8] thought and with the more systematic Brandian theory [9], the opposing forces of the two different positions will be recomposed in a theory whose critical and methodological rigour still remains unsurpassed. Also, in contemporary cases.

3.2 Theoretical and technical principles in materials and methods selected

Therefore, preliminarily to the practical intervention there was developed a specific reintegration plan supported by scientific criteria and by the state of conservation of the paintings. The latter, especially the right one, were affected by a massive presence of different typologies and shapes of *lacunae* that prevented the correct perception of the original figurative message based on perfect and mirroring skies. As well known, the perception of the *lacunae* in our psyche depends on their weight and it's also related to their colours. Moreover, this perception is related to their collocation in the space of the paintings too, as well as the distance or proximity between the *lacunae* themselves. Therefore, the process of the reintegration began choosing to close micro *lacunae* that were located, as diffuse spots, everywhere on the white layer of the clouds due to some splashes of water because of previous roadworks that were performed too close to the murals. The operation re-created the conclusion of the intangible clouds in the skies. After that, the ones located in the proximity of the natural

reading of the paintings in an occidental way (from left to right and especially where the dark colours were related to the light colours, as in the curtains) were retouched in order to obtain a surface more and more mirroring; after that, the process continued closing the larger one in the centre of the paintings until all the figurative message was regained. The methodology in applying colours was entrusted to the restorer's ability, or rather to his sensitivity, to perceive and evaluate the chromatic accordance between colours and light related to the perspective in viewing; infact, one of the hardest difficulties, in case of the retouching of monochromatic paintings (or similar), is represented by the disturbance generated due to the reflection of the light on the materials. This visual alteration, called "metamerism"[10], was particularly evident also in this key study because Carena skies are pictorially builded by monochromatic colours, therefore thanks only to technical skills was reached a good retouching result and balance in order to eliminate, or at least attenuate, the effect.

The technical reflections on the decay process of murals, composed by different synthetic paints, were focused on the experimentation of synthetic materials too that were tested before the intervention on mocks up. All these materials needed to present specific characteristics reported below:

- The necessity to select conservation materials appropriate in the retouching operation of mainly polar solvents' sensitive paints on walls.
- The requisite to use reintegration products that would allow to perform a retouching intervention to fill the thickness of the blue synthetic pictorial film of the skies.
- The necessity to obtain an almost transparent and immaterial veil for the reintegration of the white clouds layer with opposite solubility to the original one.
- The use of materials reversible or, at least, retractable and compatible with the chemical-physical characteristics of the original one.
- The requirement to obtain filler and reintegration materials for the lacunae builded with the alternation of apolar and polar system (with opposite solubility to the original one).

- The similarity to the original one in terms of chromatic gloss.
- The use of products compatible with the outdoor context and their thermo hygrometric conditions in progress.

Table 1 – Different types of binder selected.

TYPE OF BINDER	CHARACTERISTICS	SOLUBILITY
Arabic gum (watercolours Winsor and Newton)	Natural polymer Polysaccharide	Water
Laropal A81 (Gamblin Conservation Colours)	Synthetic polymer Urea-aldehyde resin $T_g = 49-57^\circ\text{C}$	Aliphatic hydrocarbons

The binders selected were two: Laropal A81 and watercolours (table 1).

The technical application of the materials is all specifically described in the table 2 and were based on pigments added in Laropal A81 (an urea - aldehyde resin) and/or a modification of the *Gamblin conservation colours* line, with the addition of ZnO in order to be recognisable by UV fluorescence and other additives as TiO₂ to reach a good hiding power for the white of the clouds. Infact, Laropal A81 is well known in the world of restoration for having been selected as a binder for the colour line *Gamblin Conservation Colours* [11-12]. There is bibliographic evidence which attests their use in outdoor context, with final protective on the top; moreover, this resin shows a great hiding power similar to the thick original paint film. Finally, LA81 also showed opposite solubility from the original one and good reversibility or retreatability. The other materials selected, in order to obtain a semi-transparent layer for the retouching of the white clouds were watercolours. The latter, whose binder is gum arabic, were chosen too in order to obtain a correct juxtaposition of apolar and polar materials on the painting [13]. Moreover, watercolou

Table 2 – Reintegration System selected: based on the alternation between apolar and polar materials.

TRIALS AND TESTS IN THE REINTEGRATION SYSTEM			
COMPOSITION BINDER + PIGMENTS	APPLICATION METHOD	REMOVAL METHOD	OBSERVATIONS
N1. BLUE COLOURED FILLER: GCC cerulean blue + minimum quantity of white ZnO	wet spatula in white spirit to facilitate the spreading of the filler.	Removal of the filler: by swab with Ligroin and methyl ethyl cheton and with the aid of the scalpel.	-Medium workability. -The primer underneath can be spotted during the removal process. -Mimetic reintegration recognizable by the use of UV fluorescence.
N.2 BLUE COLOURED FILLER: 60:40 ratio between acrylic lighten filler (cromix) + GCC cerulean blue + white ZnO WHITE PICTORIAL FILM (medium lacunae) GCC white TiO ₂ mixed with ZnO WHITE PICTORIAL FILM (micro lacunae) White watercolours W&N (ZnO+TiO ₂) POLYDIMETHYLSILOXAN: Final Protective layer	wet spatula in white spirit to facilitate the spreading of the filler. Retouching Brushes of different sizes	-Removal of the protective: by swab with Ligroin. -Removal of the watercolours: by swab with water. -Removal of the filler: by swab and with the aid of the scalpel with Ligroin and methyl ethyl cheton	-Medium workability -Difficult removal of the filler: too much plastic. -The primer underneath can be spotted during the removal process. -Mimetic reintegration recognizable by the use of UV fluorescence. -Possible biological colonization.
N.3 BLUE COLOURED FILLER: 50:50 ratio between acrylic lighten filler (cromix) + minimum quantity of white ZnO + blue ultramarine watercolours W&N (gum arabic binder)	wet spatula in water to facilitate the spreading of the filler.	Removal of the filler: by swab and with the aid of the scalpel with methyl ethyl cheton and water.	-Medium workability -Easy removal with polar solvents but too close to the solubility of the original one. -The primer underneath can be spotted during the removal process. -Mimetic reintegration recognizable by the use of UV fluorescence. -Possible biological colonization.
N.4 WHITE FILLER: 0.9g micronised CaCO ₃ + minimum quantity of white ZnO+ 2,3 g Laropal A81 WHITE PICTORIAL FILM: (micro lacunae) white watercolours W&N (ZnO+ TiO ₂) BLUE PICTORIAL FILM: GCC (Laropal A81 ultramarin blue) WHITE PICTORIAL FILM (medium lacunae) GCC (Laropal A81 white TiO ₂ mixed with ZnO) POLYDIMETHYLSILOXAN: Final Protective layer	wet spatula in white spirit to facilitate the spreading of the filler. Retouching Brushes of different sizes	Removal of the filler: by swab and with the aid of the scalpel with ligroin or white spirit.	-Good workability -Easy spreading of the filler -Safe removal in comparison to the solubility of the original one. -Mimetic reintegration recognizable by the use of UV fluorescence
N.5 WHITE FILLER: 0.9g Meudon White + minimum quantity of white ZnO + 1,3 g Laropal A81	wet spatula in white spirit to facilitate the spreading of the filler.	Removal of the filler: by swab and with the aid of the scalpel with methyl ethyl cheton and water	-Hard workability -The filler is too sticky and glossy due to the excessive amount of the binder. -Mimetic reintegration recognizable by the use of UV fluorescence

are commonly used and selected for pictorial reintegration in the world of conservation because, in time, they have shown versatility since their transparency allows proceeding by glazing operation. They are soluble in water and therefore they are reversible. Nevertheless, even though they are often discarded for the reintegration of synthetic paint films, as they are not sufficiently hiding, they were used in combination with apolar materials in the outdoor context with final protective on the top.

4. RESULTS AND DISCUSSIONS: MOCK-UPS FOR THE APOLAR AND POLAR REINTEGRATION SYSTEM

The reintegration process of Carena murals was, then, performed by choosing the alternation between apolar and polar materials, all reversible one with the other.

The mock-ups were evaluated to test the reversibility of the system, as shown in figure 2 and table 2.



Figure 2 – Mock-ups during the removal process of test n.2.

Moreover, at the very basis of the retouching process there was surely the choice to separate the layer of the filler from the one of the pictorial film. In fact, test 1, 2 and 3 - where filler and pictorial film was builded by a unique coloured layer - showed medium workability especially because the primer underneath could be

spotted during the removal process. Moreover, the addition of cromix lightened filler was too close to the solubility of the original one and the latter is not suitable for the use in outdoor context due to probable biological colonization. Test n.5 was, instead, excluded because the aggregates were too similar in granulometric terms and the consequence was that the filler resulted too sticky and glossy due to the excessive amount of the binder. Test n.4, with an aggregates/binder ratio of the filler 1:2 and based on 0,9 g of micronised CaCO_3 plus a minimum quantity of white ZnO added on 2,3 g of Laropal A81, was the best solution both in terms of application and materials selected. The white filler was applied wetting a spatula in white spirit to facilitate its spreading in all the lacunae and, after that, a layer of ultramarine blue of GCC. Micro lacunae of the white pictorial film of the clouds (located on the original blue layer) were retouched with white Winsor and Newton (W&N) watercolours based on TiO_2 with the addition of ZnO in order to be recognisable by UV fluorescence. While medium lacunae of the white pictorial film (located on the blue and apolar LA81 layer) was regained with the application of white GCC based on Laropal A81 too with TiO_2 with the addition of ZnO. The reintegration was performed with brushes of different sizes in order to be as mimetic as possible of the surrounding surface and to attenuate the metamerism phenomena.

5. THE REINTEGRATION PROCESS OF CARENA MURALS: TECHNICAL AND THEORETICAL CONCLUSIONS

In conclusion, the fillers were all based on LA81 resin, used as binder at high concentration [14], mixed with white aggregates while the pictorial film - composed by monochromatic thick blue and impalpable white - have been reconstructed by using alternatively Gamblin Conservation Colours and watercolours in order to obtain again that clear mirroring effect of the aerographic skies that is at the very base of the figurative message of the work of art. The addition of a minimum quantity of ZnO both in all white fillers

and in white pictorial film was necessary to be recognisable from the original one by using UV fluorescence. Finally, the reintegration system was protected with the application of a polydimethylsiloxane on the top. Therefore, larger lacunae of the blue and white pictorial film have been mimetically integrated with the aim of regaining the visual perception of the hyper realistic skies concluded in their own colour and in their own shape: same chromatic tone and value. Micro lacunae of the pictorial film have been closed by glazing, with watercolours, with the same chromatic tone and value compared to the original one. All the reintegration products were opposite to the solubility of the original ones, respecting the reversibility of the intervention, of the original one and of its conservation history, while the use of fluorescence materials was necessary to perform a mimetic retouching process identifiable with the aid of UV lamp. The theoretical conclusions were based on critical choices balancing the aesthetical and historical nature of the artworks. Infact, the interruptions in the figurative text produced by losses, lacunae and micro - lacunae prevented the correct perception of the articulation figure-background. The losses, which had their own shape and colour, were perceived by observers as foreign bodies appearing as "figures" relegating the painting to act as a "background" to the lacunae themselves. It was necessary then to reintegrate as much as possible to define again the correct articulation figure-background of the abstract and repetitive aerographic skies. The operation was fundamental to re-establish the identity, lost or ambiguously readable, of one colour compared with the other and to regain the ironic illusionistic tricks given by trompe l'oeil reproductions of mirroring skies and their hyper-realistic fictions in viewing. The historical nature of the murals were respected using compatible and recognizable materials compared to the pictorial film; this passage was fundamental for the future reversibility or retractability of the intervention and to guarantee the authenticity of the original materials in the mural paintings. This key study represents one of the research steps for the retouching process of "plastic on

walls" in outdoor context. In future, the conservation materials applied will probably be part of a specific and differential decay process connected to the outdoor context. Therefore, the materials selected and applied for the reintegration of Carena murals in the open-air contemporary art museum of Piscina will be studied and monitored in a future technical maintenance plan and will be part of a biggest research in retouching materials from the ICR Mural Painting Laboratory in order to develop more trials in the retouching field of synthetic paints on walls to establish an ICR institutional protocol for the specific reintegration process of public art in outdoor context.

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