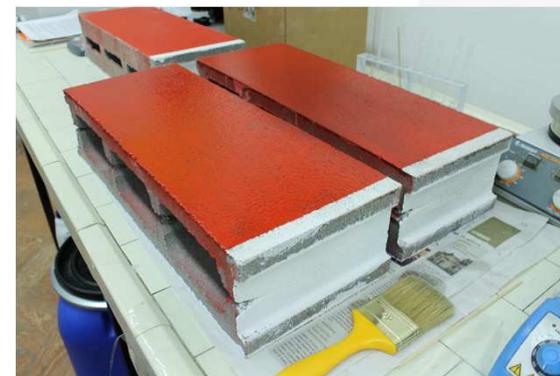


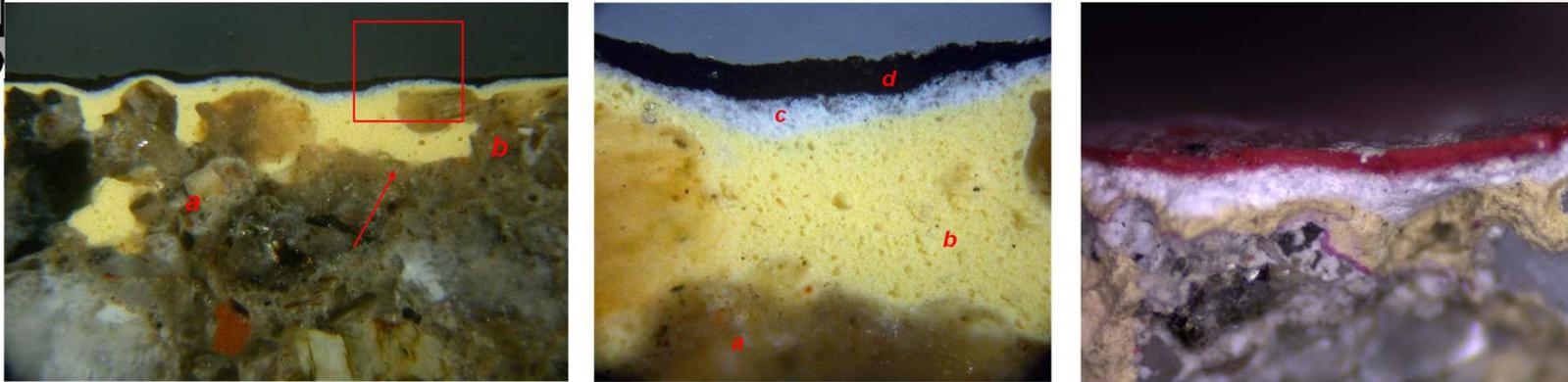
1. CLEANING TESTS- NIGUARDA ANTIFASCISTA

Mock-ups have been prepared following microscope observation results, details deriving from artists' interviews and social context dialogue, photographic archive documents, cross section structure and analysis materials (samples and in situ e.g. portable Raman)

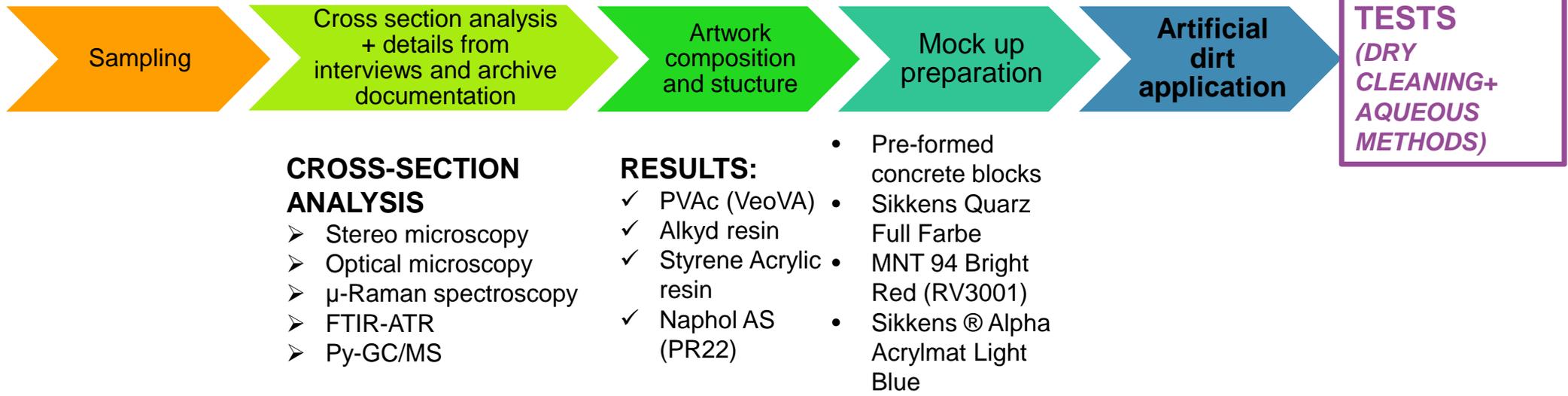
LAYER g	Composition	Products tests/methods
SUPPORT	Concrete (pre formed concrete blocks)	
PRIMER	Sikkens® Quartz Full Farbe	
PAINTING LAYER:	MNT 94 Bright Red (RV3001) Sikkens® Alpha Acrylmat Light Blue	
STANDARD DIRT	<ul style="list-style-type: none"> • Carbon black • Iron oxide-ochre • Micronized Silica • Kaolin • Gelatin Powder • Soluble starch • Cement • Olive oil • Mineral oil • White spirit D40 	<ul style="list-style-type: none"> ➤ <i>dry cleaning</i> ➤ <i>aqueous buffer solutions pH and conductivity</i> ➤ <i>adjusted, semi humid methods,</i> ➤ <i>Agar gels</i>
OVERPAINTINGS	<ul style="list-style-type: none"> • Nero d'inferno dye (Fabbrica Chimica Unione srl) • Signal Blak marker (Molotow CoversAll™) • Bitumen Black Matt (Molotow CoversAll™) • Revered Violet RV-27416 (Montana Colors MTN 94) • Chrome (Molotow-Burner400) 	<ul style="list-style-type: none"> ➤ <i>Solubility test blends</i> ➤ <i>Solubility test blends on Evolon™</i> ➤ <i>Solvent surfactant gels</i> ➤ <i>Ligroin- Propilene carbonate blends</i> ➤ <i>Benzyl Alcohol in Velvesil Plus™</i>



Mock ups preparation and application of overpainting materials photo credits: CESMAR7



“Niguarda Antifascista” – sample 1 – cross section – reflected Visible light – magnification 35x (left) 150x (right); sample 6: reflected Visible light - magnification 45X Photo credit: ANTARES-CESMAR7

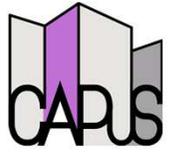


CROSS-SECTION ANALYSIS

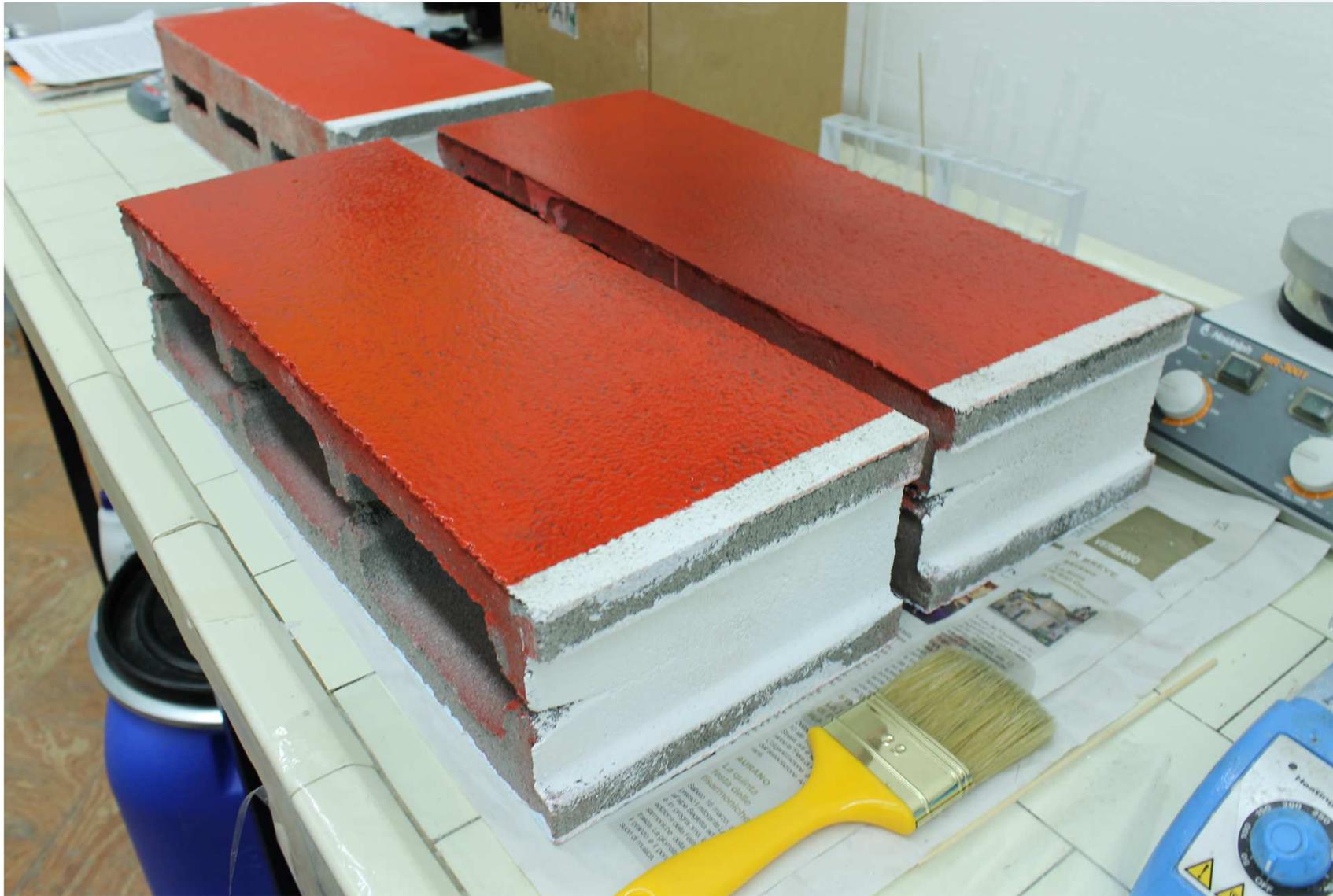
- Stereo microscopy
- Optical microscopy
- μ-Raman spectroscopy
- FTIR-ATR
- Py-GC/MS

RESULTS:

- ✓ PVAc (VeOVA)
- ✓ Alkyd resin
- ✓ Styrene Acrylic resin
- ✓ Naphol AS (PR22)
- Pre-formed concrete blocks
- Sikkens Quarz Full Farbe
- MNT 94 Bright Red (RV3001)
- Sikkens © Alpha Acrylmat Light Blue

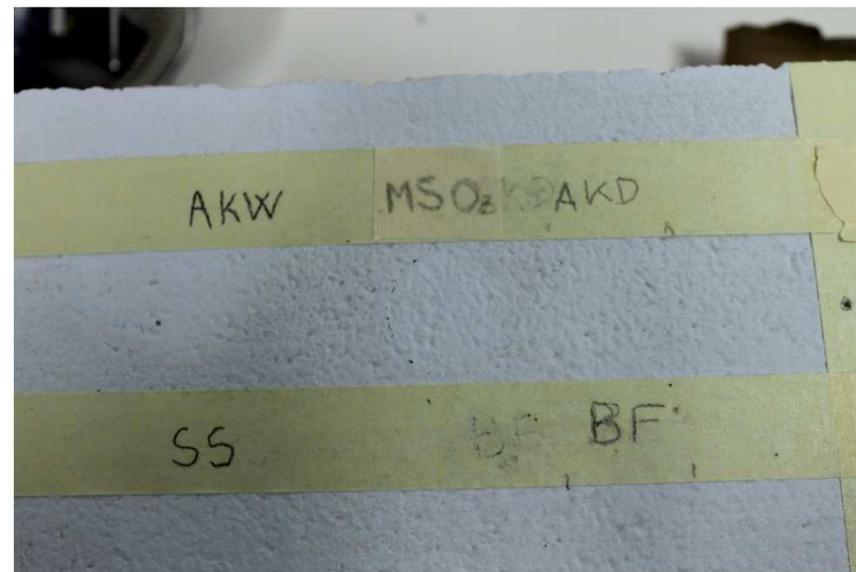
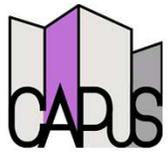


Cleaning tests



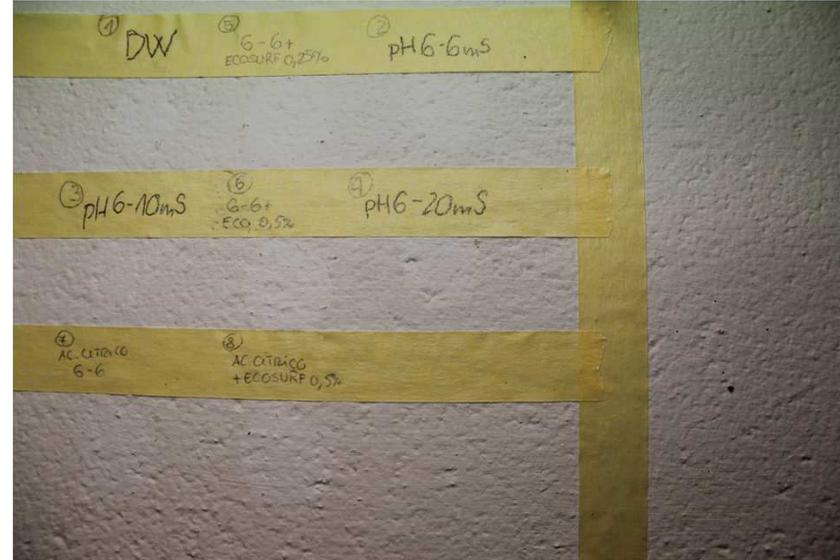
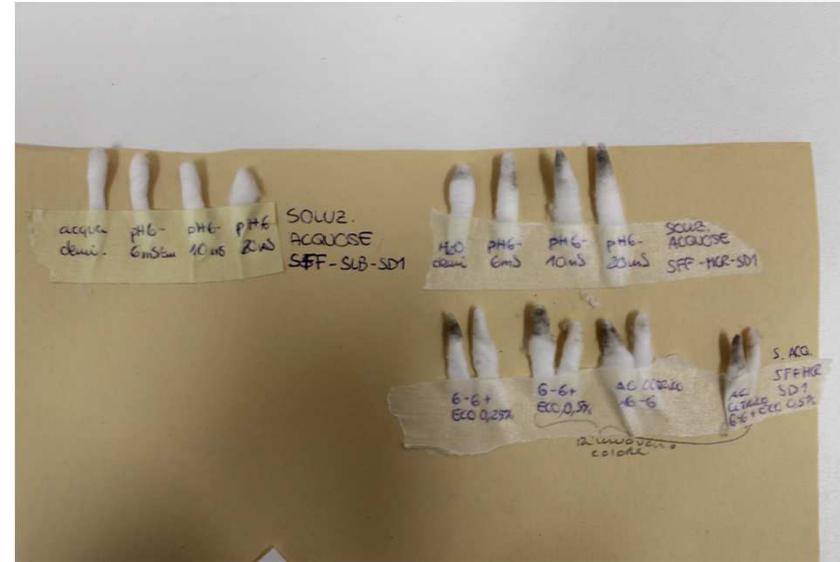
Artificial dirt application, Photo credits: CESMAR7, November 2019

Cleaning tests



Dry cleaning methods , Photo credits: CESMAR7, November 2019

Cleaning tests

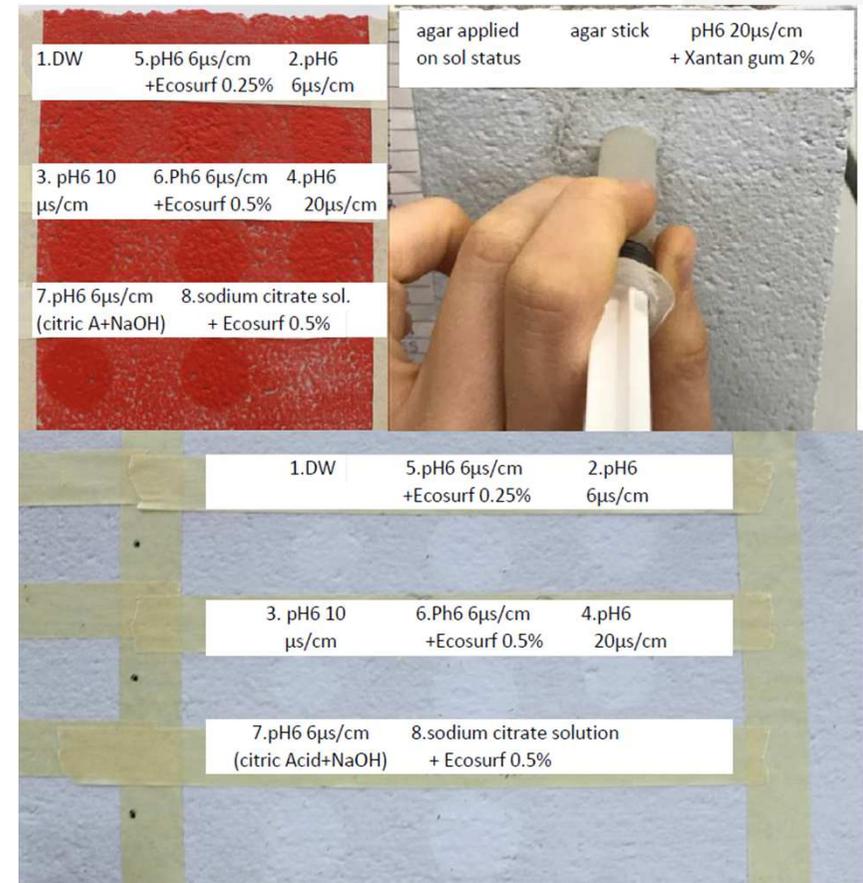


Aqueous methods tests, Photo credits: CESMAR7

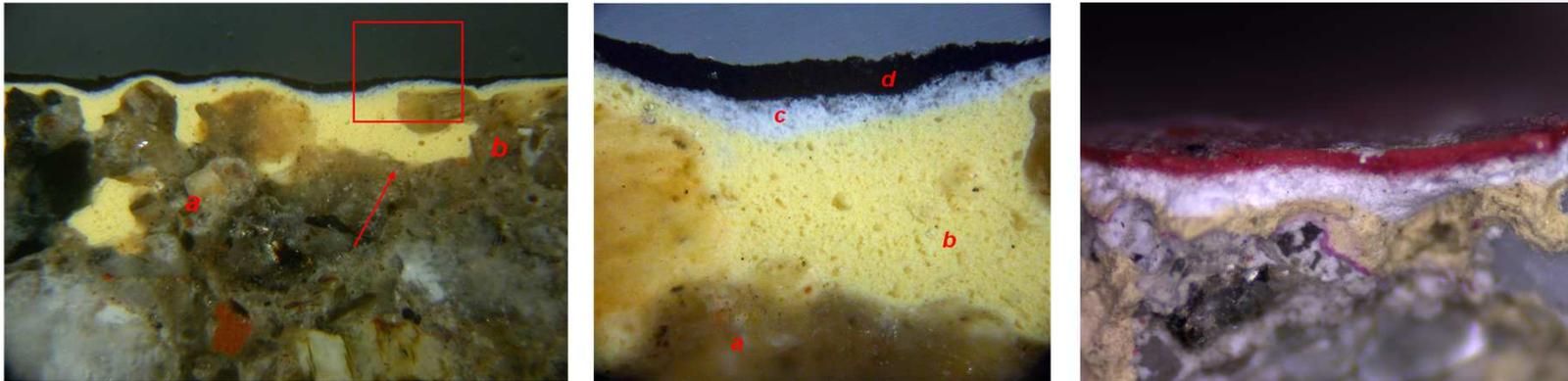
RESULTS OF AQUEOUS METHODS ON *NIGUARDA* ANTIFASCISTA MOCK UPS

T preservation of the topography integrity
Cr presence and clearance of the residues
G preservation of the surface gloss
Cp cleaning efficiency and evenness
Am method feasibility
(Pp pigment pick up)

- **AQUEOUS SOLUTIONS:** The best results is achieved with pH6, 20mS/cm solution (*hypertonic*) in 2% Xanthan gum on both red and blue areas. This formulations is able to reach the macro porosity
- **SEMI HUMID METHODS:** *tdi* make up sponge with pH 6, 20 mS/cm solution has an high cleaning power and it is very respectful of the surface
- **AGAR:** fluid agar achieves the best result (vs agar stick: residues into the porosity)



Cleaning tests on MCR and SLB paint layers
photo credit: CESMAR7



“Niguarda Antifascista” – sample 1 – cross section – reflected Visible light – magnification 35x (left) 150x (right); sample 6: reflected Visible light - magnification 45X Photo credit: ANTARES-CESMAR7



CLEANING TESTS SOLVENT BASED METHODS

CROSS-SECTION ANALYSIS

- Stereo microscopy
- μ-Raman spectroscopy
- FTIR-ATR
- Py-GC/MS

RESULTS:

- ✓ PVAc (VeOVA)
- ✓ Alkyd resin
- ✓ Styrene Acrylic resin
- ✓ Naphol AS (PR22)

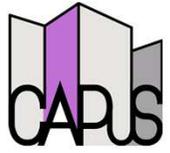
- Pre-formed concrete blocks
- Sikkens Quarz Full Farbe
- MNT 94 Bright Red (RV3001)
- Sikkens ® Alpha Acrylmat Light Blue

- Nero d'inferno dye (Fabbrica Chimica Unione srl)
- Signal Blak marker (Molotow CoversAll™)
- Bitumen Black Matt (Molotow CoversAll™)
- Revered Violet RV-27416 (Montana Colors MTN 94)
- Chrome (Molotow-Burner400)

OVERPAINTINGS

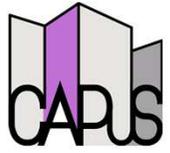
- **Nero d'inferno ink**
(*Fabbrica Chimica Unione srl*)
- **Signal Blak marker**
(*Molotow CoversAll™*)
- **Bitumen Black Matt**
(*Molotow CoversAll™*)
- **Chrome**
(*Molotow-Burner400*)
- **Revered Violet RV-27416**
(*Montana Colors MTN 94*)





Microscope slides mock ups preparation with overpaintings materials, Photo credits: CESMAR7

Cleaning tests

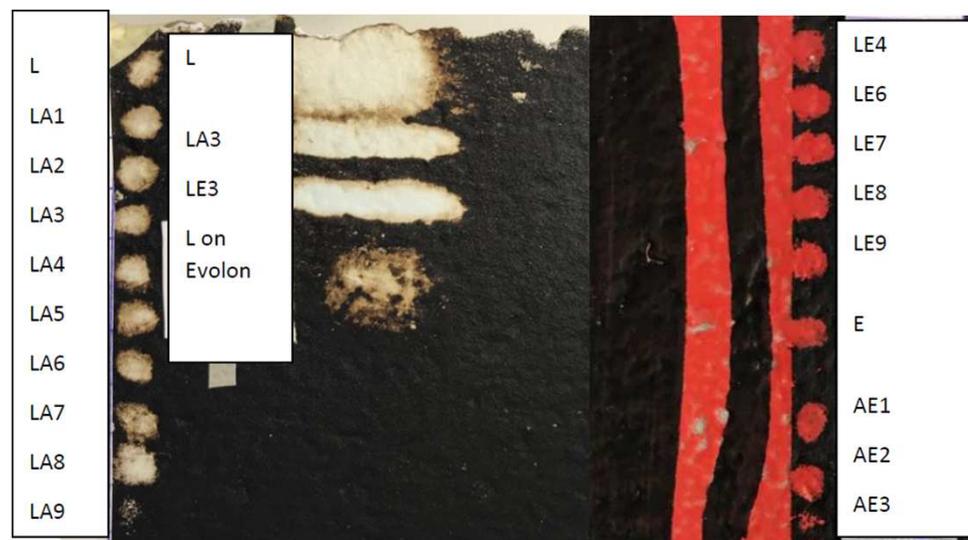


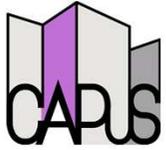
Microscope slides mock ups with overpaintings materials, Photo credits: CESMAR7

Cleaning tests

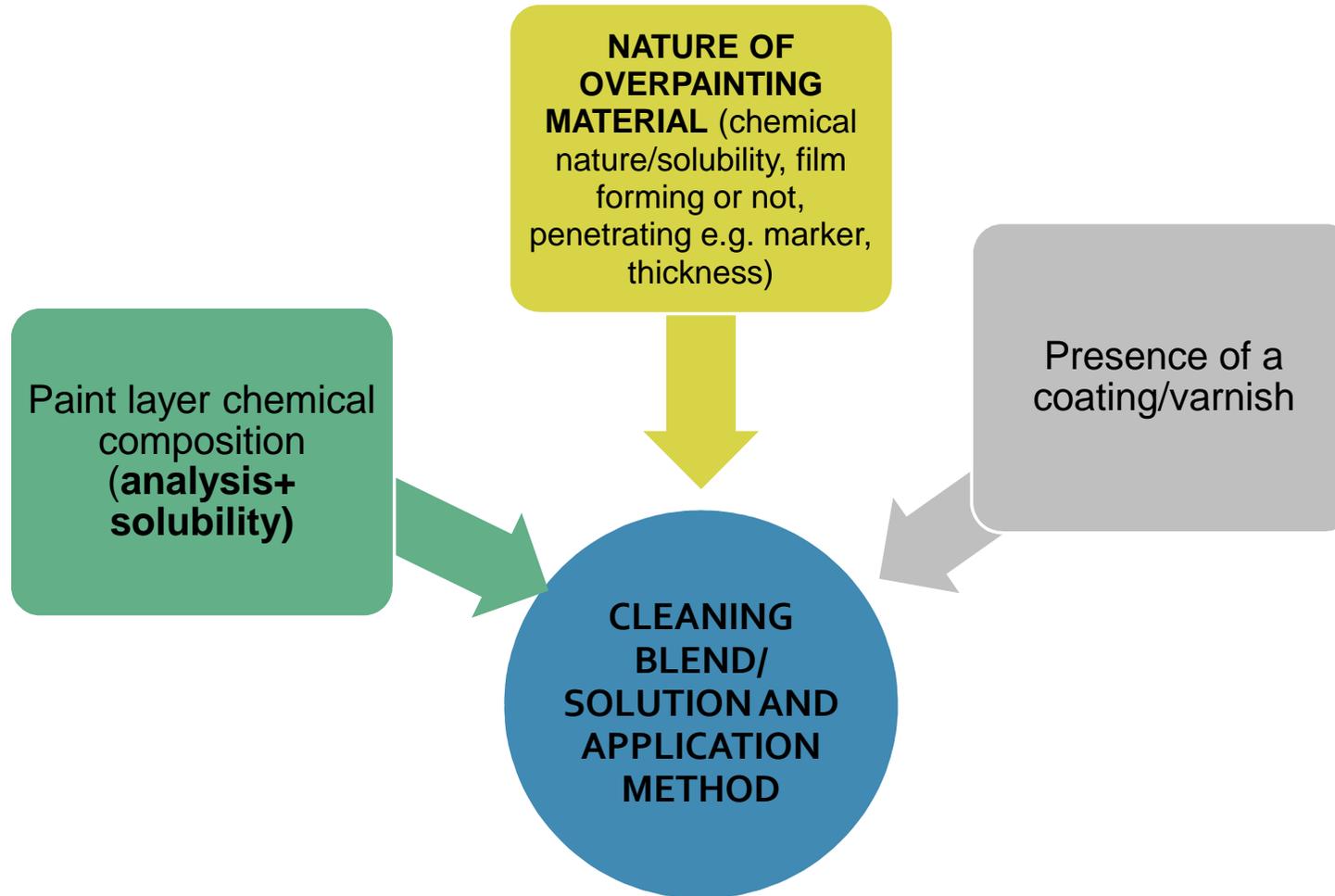
RESULTS OF SOLVENT BASED METHODS ON NIGUARDA ANTIFASCISTA MOCK UPS

- (except for *Molotov spray* that starts to swell with Ligroin only) the best results are achieved with LE3 and LA3 (swelling of overpaintings but general respect of the painted surface. Faster action with Solvent Surfactant Gel n3
- *Evolon* + LE3/LA3 requires several applications
- L/PC blends require many applications (best results with L25/PC75 or PC)





DECISION MAKING PROCESS



CAPuS cleaning results

This document was produced within the project ***Conservation of Art in Public Spaces (CAPuS)***.

Authors:

CESMAR7- Centro per lo Studio dei Materiali per il Restauro



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