CONSERVATION OF PUBLIC MURALS: testing materials for surface coatings

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Introduction

Today there are numerous works of street art and public murals made by significant artists in big cities worldwide. Street art and public murals are exposed to extreme environmental conditions. This research assesses protective coatings for their ability to protect the colored surface from weathering, paint deterioration and damage from over-painting by vandals. The question was how to design an effective experimental process to test different coating materials, in different environmental conditions.

Part 1: Pre-experimental process

Materials and techniques for outdoor public murals

The most popular material is spray paint but artists are also using acrylic paints, vinyl emulsion paint and other materials. Likewise, there is a large variety of techniques and substrates. So a five-question questionnaire was developed and shared with 30 Greek artists for extra marking of different materials and the substrates that these artists use to create a piece in the streets of Athens.

Materials selection

Twelve different materials were selected and tested as protective layers. Seven of these materials were also tested as a double protective layer. The materials tested are commonly used in conservation as consolidants, coatings, binding media and anti-graffiti materials. The materials should fulfill the following criteria:

1) Must prevent photodegradation and include UV protection
2) Must create an anti-graffiti intervention layer and form a single, colourless, and transparent film
3) Must have a low Tg (glass transition temperature)
4) Low toxicity
5) Should not be soluble in the same solvents as the paint-layer and should not bloom
6) Ease of application
7) Low cost

consolidants acrylic resins coatings PVA dispersion binding media silicates anti-graffiti materials waxes

Categories of tested materials

Creation of samples

120 pre-aged mortar samples were prepared in order to test the different coating materials for artificial aging during the removal of overpaint, and to be used as reference samples. For every coating two different samples were created. Other 40 samples were created in an outdoor wall for natural aging.

Total number of samples: 160

Part 2: Methods

Examination

All samples were examined visually and with a microscope, and were examined in ultraviolet light, the samples for artificial aging underwent measurement before and after aging, using CIE L*a*b* colour space.

Artificial aging

The samples made for artificial aging were placed in the an In-house environmental aging chamber for 1,024 hours, completing five different aging cycles, from high-summer hit temperatures and minimum humidity (heat wave). Filling low-winter temperature and 100% humidty (Winterrain). 40 other samples were tested in natural weathering with direct sunlight. In an outdoor wall with the same materials as the other 120 samples.

Over-painting removal

The samples for the removal of overpaint were over-painted. The removal was tested with various solvents.

Part 3: Results - Discussion

The experimental results helped to find the most suitable materials that could be used in the preservation of outdoor public murals.

Most of the materials used showed good results regarding their resistance to heat and radiation. Some materials prove to be more effective than others.

Future research could concentrate on finding ways to:

- reduce the surface tension of the coating
- add a matting agent in order to reduce gloss
- improve the UV protection efficiency by using UV absorbers
- make coatings in spray form

For more information, please contact me.