

A Discussion of Materials Commonly Used in Street Painting

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Introduction and Commentary

This white paper discusses the common materials found in a typical street painting for the purpose of executing a painted or chalk-based piece of art. The purpose of the paper is to bridge the discussion between the regulatory community and the artist community about the use of art materials. This white paper in its present form is a draft document that will be revised as additional information is provided.

References used for this document are cited and ongoing research is taking place to uncover additional information for this white paper. I have contacted at least three chalk or paint companies for comments about their product(s). As of this writing no company has come forward with information about their product. I will speculate this is due to the information I am requesting is proprietary and any given company does not want the information disclosed to their respective competitors, which is understandable.

I took the conservative case of using the State of California criteria for three reasons: a) it is some of the most stringent criteria in the country and b) a large number of street painters live in California, who can benefit immediately from the information provided, and c) some of the information provided in this document was given to a street painter residing within California for permit submission (for a project.) While other governmental jurisdictions sometimes defer to the California criteria because of its stringency, anything requiring submission to, say, another state will likely need a literature review specific to the area of concern.

Do not hesitate to contact me if there are: a) questions about the information herein, b) if you have comments/suggestions, c) if you have information for possible inclusion in the white paper or d) you need assistance for a permit submission to a governing body.

Chalk Pastels

Natural chalk is composed of tiny, prehistoric, salt-water organisms with a high calcium content, which formed sediment that turned rocklike. Its appearance ranges from white to gray and, occasionally, red, or sanguine, when it is naturally impregnated with ferric oxide (rust). Although chalk itself is abundant, the number of deposits of rock chalk is not, and it is this scarcity that prevented its widespread use. Until the fifteenth century, red and white chalks were used primarily for quick sketching. When an effective method was devised to pulverize chalk, wash out the sand, and combine the chalk powder with pigments in a usable form, chalk-based drawing materials were taken more seriously.

In the sixteenth century, the Italians developed what is known today as the chalk pastel. It had a narrow range of colors consisting of some earth colors, white, and black. It was not until the introduction of a broad range of mineral pigments in the nineteenth century that the color range broadened to the hundreds of colors and shades that we are familiar with today. Today, pastel is the common name for chalk-based drawing materials; the chalk is mixed with pigment and a

binder to a paste and then shaped and dried into sticks. Modern pastels may contain chalk, or such chalklike materials as kaolin (white clay) or lithopone (half barium sulfate and half zinc sulfide) as the white filler. The filler is mixed with a pigment and a binder such as gum tragacanth or methyl cellulose, both of which are natural-based components. Most manufacturers have stopped using hazardous pigments, such as lead and lead compounds. Therefore, professional artists' pastels can be considered safe.

Sources:

1. *The Definitive Guide to Artists' Materials*, by Steven Saitzyk © 1987
2. *A discussion of Chalk-based materials*, *The Mining Institute* © 1994

Tempera Paint

Egg tempera paint is simply made from artist quality finely ground dry pigments, egg yolk and water. The standard medium is pure yolk which is free from the white. If white is included in the medium it will cause the paint to dry more rapidly and to drag on application.

Commercial tempera paint, or school house paint, is similar to egg tempera in that it includes artist quality finely ground dry pigments and water. However a commercial drying agent is substituted to extend shelf life. A wide variety of pigments can be used to color tempera paint. The following list of colors are safe pigments, and considered non toxic. Please note that both white, black and green are on the list, the three most commonly used colors used by street painting artists to prepare the surface for their work.

Sometimes street painting artists bypass the use of paint and use strictly a water/pigment slurry because of the temporary nature of the art.

The List of Safe Pigments

- Burnt Sienna
- Caput Mortuum
- English Red
- Flesh Ochre
- Gold Ochre
- Green Earth/Terre Vert
- Green
- Indian Red
- Iron Oxides (except for Mars Brown)
- Ivory Black
- Mars Black
- Orange
- Raw Sienna
- Red
- Red Ochre
- Titanium White
- Transparent Red Oxide (also yellow and orange)
- Ultramarine Blue
- Venetian Red

- Violet
- Yellow Ochres (naturally-colored clays, mostly yellowish)

Sources:

1. "Technical Information" by the Society of Tempera Painters © 2013
2. *The Materials of the Artist and Their Use in Painting*, by Max Doerner © 1946
3. *The Artist's Handbook of Materials and Techniques* (3rd ed.), by Ralph Mayer © 1976

Environmental Considerations

Given the low amount of art materials used in the execution of any given art project and given the discussion above regarding the natural, environmentally inert and non-toxic materials used for street painting, the only environment concern should be turbidity (suspended solids) introduced to receiving water. Using the State of California standards for "Aquatic Life and "Recreational Use/Aesthetics" the cited turbidity limit is a change of "5 NTUs" or "No Guideline."

Considering that a few 10-foot by 10-foot street paintings would use a total of approximately one pound of art materials and considering one thousand gallons of water will either wash off the art from its background, or dilute the art materials before getting to the receiving water, the concentration would be less than the detectable limit or slightly more than one part per 10,000 parts of material to water, by weight.

The aforementioned example is highly conservative because it is well understood that typically more water than one thousand gallons will "see" the art materials before measurement at the receiving water. Commonly accepted scientific and mathematical methods for converting concentration to NTUs show the example concentration to be virtually in the "Non-detectable" region, certainly below the allowable increase of 5 NTUs. Further, where the state criteria is "No Guideline" the point is moot. **Bottomline:** When street paintings are not immediately next to the receiving water where water quality will be measured there is no environmental concern from the art materials.

It should also be pointed out that the cited example is conservative because of the assumption that all art materials will be suspended all the way to the receiving water. Typically this is not the case. A portion of the material is bound to soil, bound to the paving surface the art was executed on or bound to conveyance parts of the system such as pipes, open canals, catch basins, etc.

Sources:

1. *Ambient Water Quality Guidelines (Criteria) for Turbidity, Suspended and Benthic Sediments, State of California*
2. *Water Quality Network Design and Statistical Procedures, Water Resource Publications, 1991, Colorado State University.*
3. *Hydraulics in the Environment, Ven Te Chow, Wiley Press. 1978.*
4. *Restoring Streams in Cities: A Guide for Planners, Policymakers, and Citizens, Ann L. Riley, Waterways Restoration Institute, Berkley, California, 1998.*