The Use of Cyclododecane as a Temporary Fixative for Loose Surface Media on Paper to Allow Mechanical Conservation Treatments

By Marie-Lou Beauchamp
Paper Conservation Student
Master of Art Conservation
Queen's University

Abstract

This project studied the use cyclododecane spray (Figure 1) as a temporary fixative for loose surface media, like pastel, to secure the pigments during mechanical conservation treatment on the verso of the object. The application of cyclododecane may allow the conservator to perform treatments like mechanical backing removal, surface cleaning and flattening under light weight.

Hypothesis

Cyclododecane (C12H24) has been used in the field of conservation for almost two decades. In the paper speciality, its use is mainly oriented towards its properties to act as a temporary fixative for aqueous treatment of soluble media. In artefact conservation, cyclododecane is mostly used to secure fragile artefacts during movement and transportation. It was expected that a film of cyclododecane applied on the media would protect it from disruption, smudging, smearing and crushing during test.

Experiment

Two sets of samples were created. The first series tested the change in gloss, color and the difference between the use of Artist's Fixative and cyclododecane as a protective coating. Before and after measurements have been taken with a glossmeter and colorimeter. The second set of samples were submitted to a smudge test, based on the ASTM *D-6279*. Pastel was applied on one side of the sample sheet and then folded over itself in the middle. Then the verso of the folded sample was rubbed. After testing, UV photography and reflected photography were used to detect any smudging, abrasion or pigment transfer from the pastel area during the test. (Figures 2 to 4)

Figure 1 Cuclododecane spray bottle as sell by Kremer Pigments

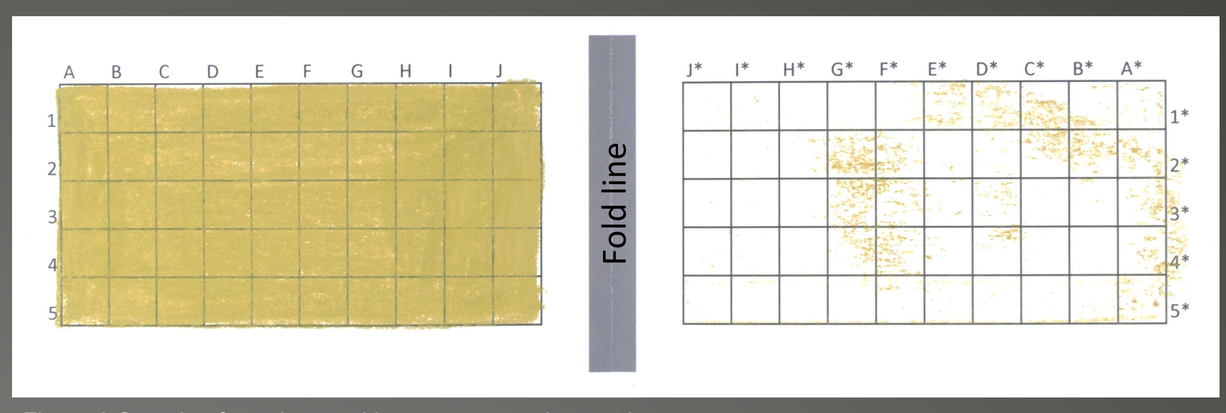

Figure 2 Sample after rub test without any protective coating

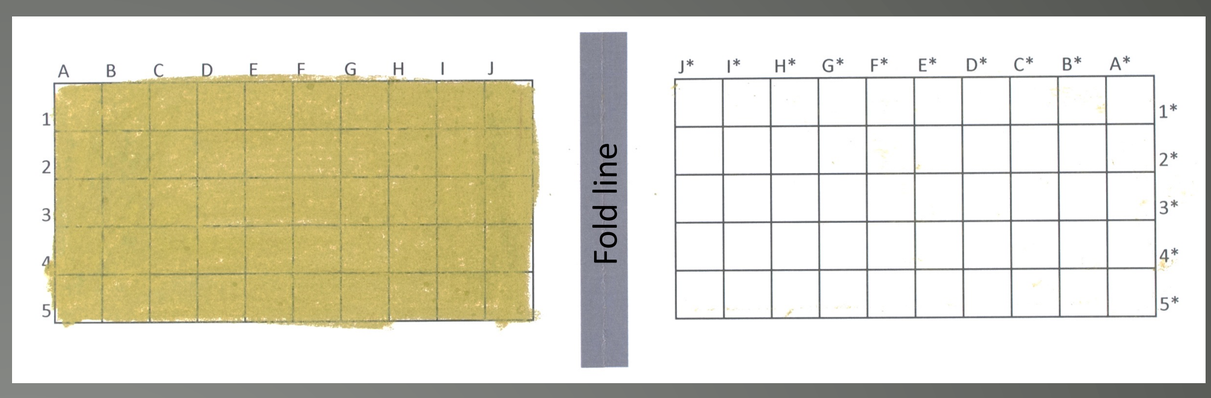

Figure 3 Sample after rub test with Artist's Fixative protective coating

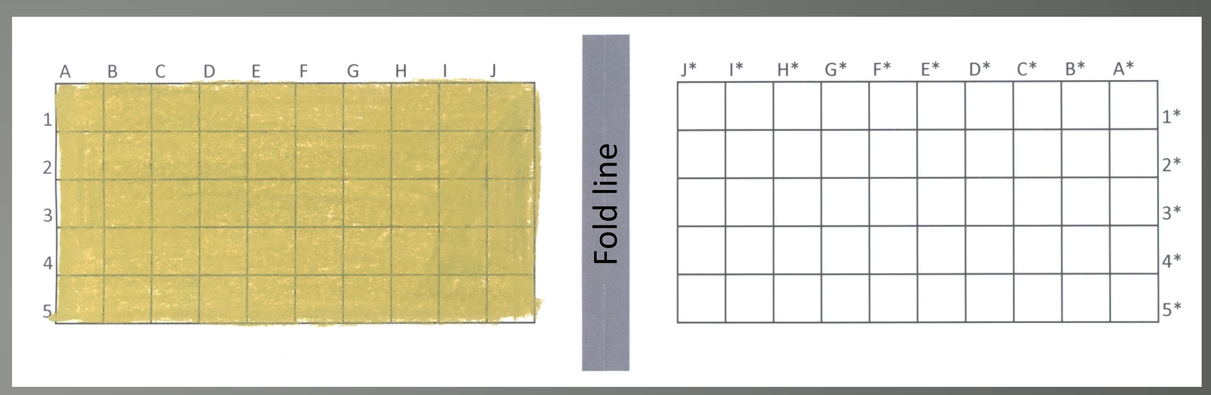

Figure 4 Sample after rub test with cyclododecane spray protective coating

Results

As expected, the unprotected samples that sustained the rub test showed a significant amount of pigment transfer (Figure 2). The samples protected with the Artist's Fixative showed less transfer (Figure 3), but samples tested for color and gloss change present a change after application of fixative (Table 1 and 3). The samples protected with cyclododecane shown no sign of pigment transfer (Figure 4) and minimal color and gloss change (Table 2 and 3).

Conclusion

This study showed that a commercial cyclododecane spray can act as a temporary fixative during mechanical treatments on pastels drawings, under experimental conditions that placed a greater stress on the samples than a conservator would normally put on an object during treatment.

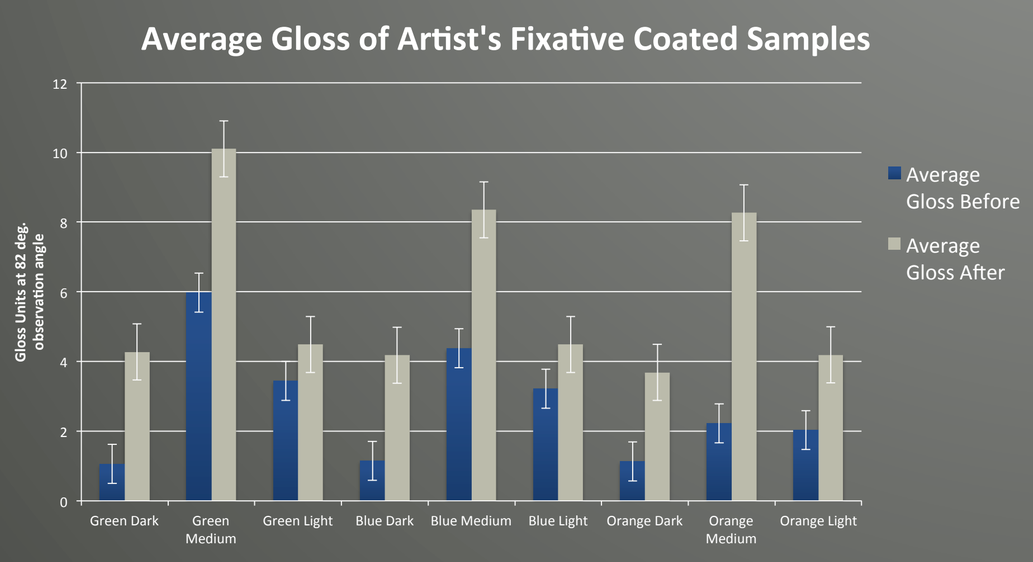

Table 1 Comparison of the glossiness before and after application Artist's Fixative coating.

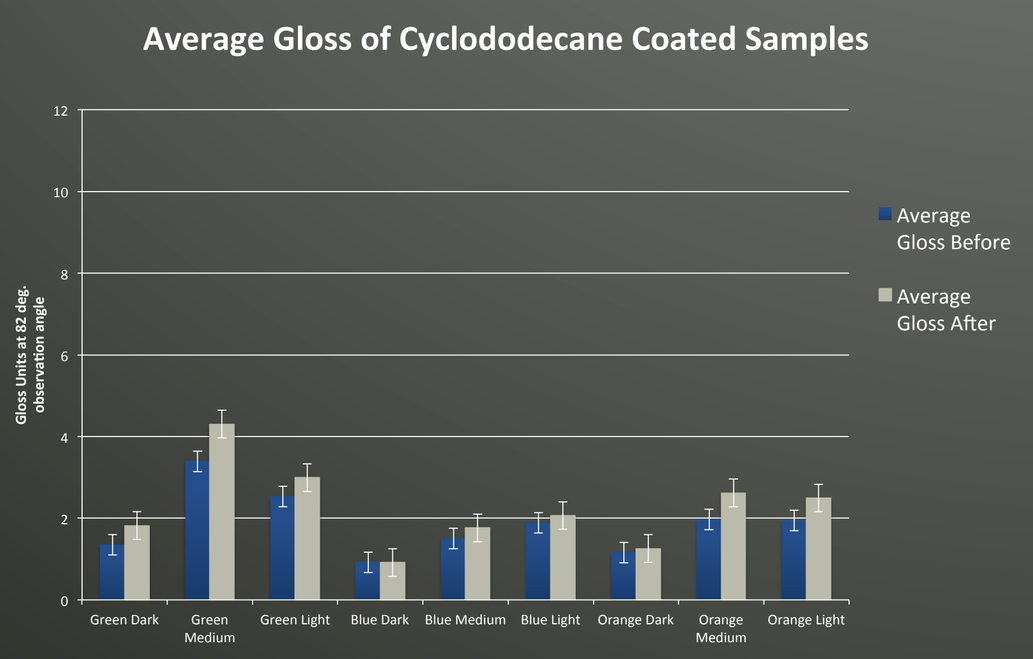

Table 2 Comparison of the glossiness before and after application cyclododecane coating.

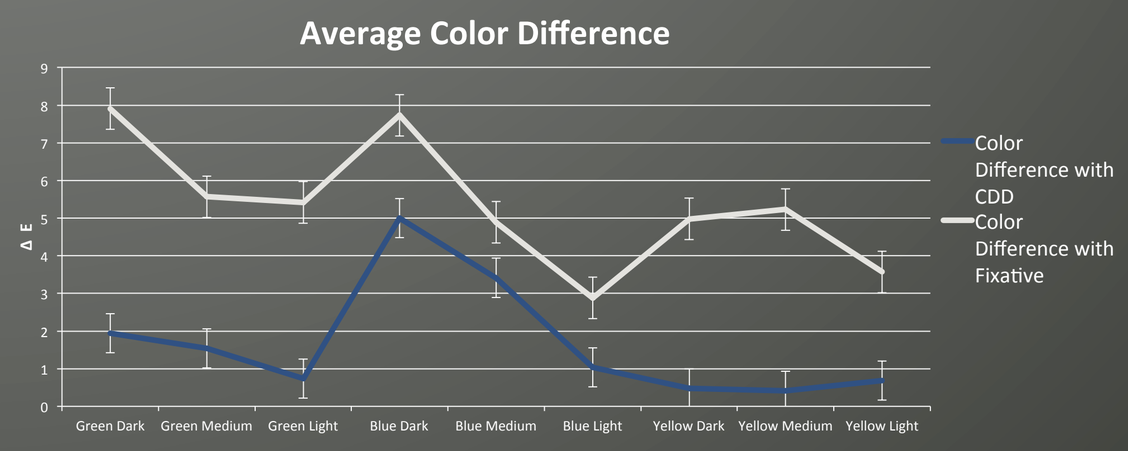

Table 3 Average color difference before and after application of cyclododecane and Artist's Fixative.

References

ASTM Standard Designation: D6279, 2003 (2013), " Standard Test Method for Rub Abrasion Mar Resistance of High Gloss Coatings," ASTM International, West Conshohocken, PA, 2013, DOI: D6279-03(2013), www.astm.org.

Kremer Pigment Inc. 2010. Material Safety Data Sheet: Cyclododecane. http://shop.kremerpigments.com/en/mediums--binders-und-glues/cyclododecane87100:.html (accessed October 1, 2013).

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Contact: marielou.beauchamp@gmail.com