THE CUT-OUTS OF HENRI MATISSE: A STUDY OF HIS GOUACHE PALETTE

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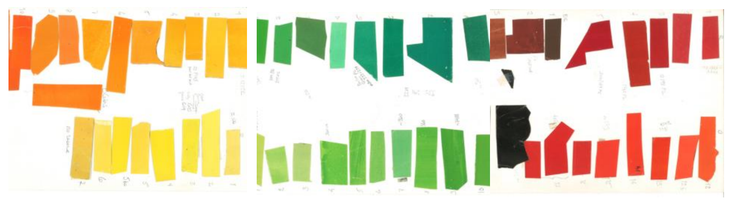
Lydia Delectorskaya, Hôtel Régina, Nice, c. 1952

In the last 18 years of his life (1938-1956), Matisse produced some his most admired and influential work, the Paper Cut-Outs.
In 2013, the artist's estate made a generous donation of samples taken from 6 original gouache tubes and of a set of 79 samples of gouached papers representing the artist's palette and believed to have been painted with Linel gouaches and used straight from the tube.

Lefranc Bourgeois brochure of Linel Gouaches
Conservation Dpt, MoMA

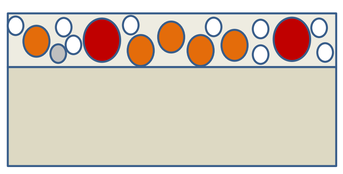


Set of 79 sections of gouached paper left overs donated by Matisse Estate

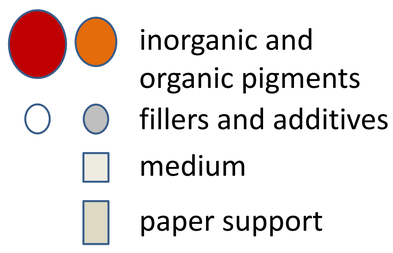
Original tubes of Linel gouaches
Preserved in Matisse Estate

Characterization of the reference samples set:

We have just embarked on a comprehensive analytical characterization of the gouached paper samples to identify the materials both in the gouache including pigments, fillers, medium and paper support and to determine their stability using both destructive and non invasive techniques.
To date, examination and analysis by microscopy, XRF, ATR-FTIR, DRIFT and color measurement as well as microfading have been performed. Next techniques will be PLM, SEM-EDS, FT-Raman, Raman, fiber analysis, etc…

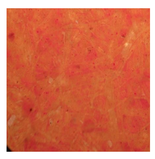


gouached paper sample

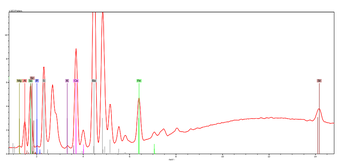


Sample O6bis

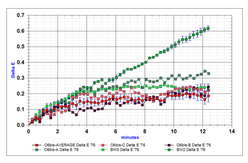
Documentation and color measurement



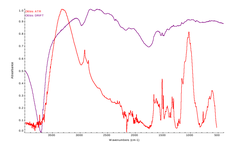
Examination under the microscope (x150) under bright field and UV light (organic orange background and small red stains)



XRF spectrum acquired with a handheld instrument (5mm spot size) (Al,S,Cl,Ca,Ba,Sr)



Microfading measurements and comparison with blue wool standards (>BW3)

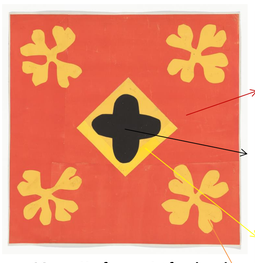


ATR-FTIR amd DRIFT spectra (PY95 + PY24 + aluminosilicates)

Validation of non invasive methods

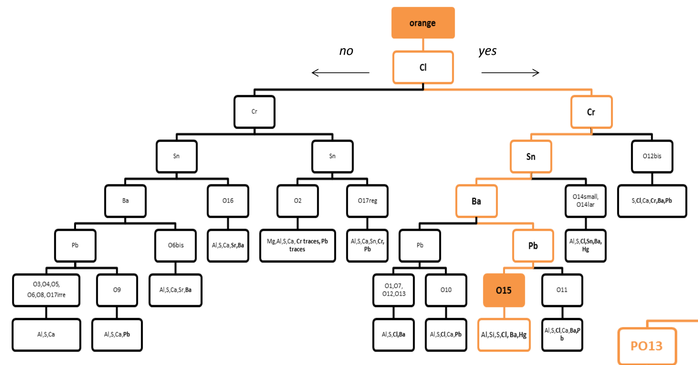
- The reference set is being used to validate non invasive techniques and test their limitations by comparing with the results of destructive methods, for example DRIFT vs ATR, XRF vs SEM-EDS etc…
- Data acquired for real objects using non invasive techniques can then be matched to the "fingerprints" of reference papers.

Analysis of artworks: case study

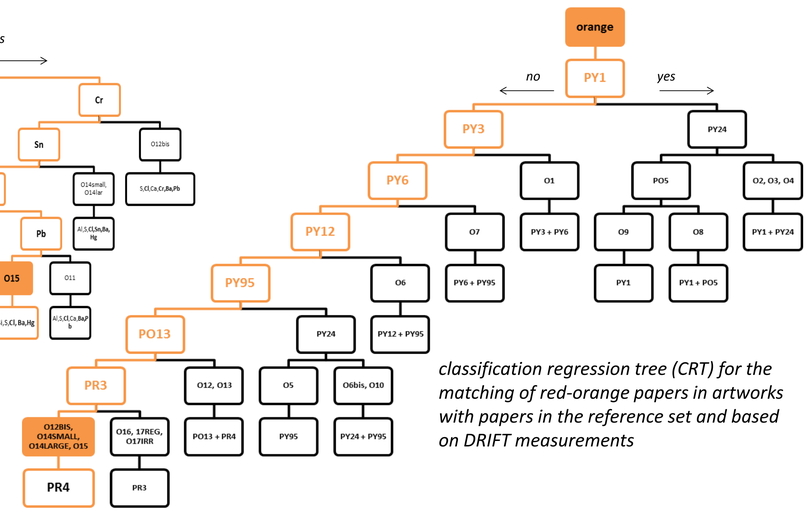


***Maquette for a set of red and yellow liturgical vestments* , Matisse (c. 1950)**

color	XRF	DRIFT	sample set match
red-orange	Al,Si,S,Cl,Ba,Hg	PR4 Aluminosilicates gum	O15
black	Al,Si,P,K,Ca,Ti,Cr,Zn, Fe,Pb	Prussian Blue Aluminosilicates gum	Black1
yellow	Al,Cl,P,Ba	PY1, PO13 aluminosilicates	J5 or J6
Light orange	Al,K,Fe,Zn,Sr,Ba,Hg	PY12?	no match



classification regression tree (CRT) for the matching of red-orange papers in artworks with the paper samples in the reference set and based on XRF spectra



classification regression tree (CRT) for the matching of red-orange papers in artworks with papers in the reference set and based on DRIFT measurements

The colors in the Matisse cut-out were matched with samples in the reference set based on the XRF and DRIFT analysis, expect for the light orange which contains an unusual amount of a zinc based substance.

Conclusions so far

- The gouaches painted on the paper samples generally contain more than one organic and/or inorganic pigment as well as an alumino-silicate filler.
- The reference sample set might be incomplete as the light orange could not be matched. One of the gouache tubes preserved by the artist estate is a zinc white based gouache and it is possible that its was mixed with an orange to produce the lighter orange for which we have no match.
- Studies of the reference set, historical materials and artworks will continue to help elucidate these questions.