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# Evolon<sup>®</sup> CR microfibre cloth as a tool for varnish removal The use of a conservation material unravelled



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#### Introduction

This research studies the effects of varnish removal from oil paintings using Evolon<sup>®</sup> CR microfibre cloth in comparison to the cotton swab method. Conservators are enthusiastic about the absorbing properties of this material, but little research has been carried out into its basic properties and little is known about advantages, disadvantages, possible applications and effects of the use of Evolon on the paint surface.

The aim of this research is to contribute to the knowledge about this material and to help conservators make a betterfounded choice for a certain method for varnish removal.



### **Evolon characteristics**<sup>1</sup>

Evolon is a non-woven microfilament textile consisting of a mixture of polyamide and polyester fibres. It has various applications in the packing, bedding and printing industry. The type of Evolon used for this research, Evolon<sup>®</sup> CR, has been specifically designed for conservation. According to the producer the fabric of Evolon has many benefits. It is lightweight, strong and

can be used for cleaning and packing. It doesn't contain binding media or fillers and can be washed at high temperatures, which implies it can be re-used when used for water soluble dirt. The material is soft and does not shed fibres. This makes Evolon, together with the compact fibre structure and the strong absorption, a useful material for both wet and dry cleaning.

Fig. 2.a-d Production process of Evolon









Fig. 1 Evolon on the paint surface of one of the case studies

2.a Polyester and polyamide particles are spun into a segmented filament

2.b The filaments are evenly spread on a surface

2.c With water jets the filaments are split into microfilaments

2.d The microfilaments are fixatea with the water jets, to create Evolon

#### Experimental

Nine interviews with conservators were conducted to make an Additionally a test was developed to visualize the distribution of solvent. Ethanol stained with fluorescein isothiocyanate (FITC) inventory of current application methods and experiences. Based on the interviews, experiments were set up to test was applied via the various application methods on a gelatine properties of Evolon and to compare the different application substrate, to leave a fluorescent stain that could be documented. methods to the use of cotton swabs.

Varnish removal tests investigating the cleaning efficiency and effects on paint layers were carried out on three case-study paintings. Two of these were 20<sup>th</sup> century paintings with paint layers sensitive to polar solvents. Observations were made with the naked eye, stereomicroscopy, Hirox<sup>®</sup>3D Digital Microscope, Reflectance Transformation Imaging and photography in UV and daylight.



Fig. 3 Gelatine substrate in a Fig. 4 Ernst van de Wetering, petri dish ready for testing with 1962. Oil on canvas 67 x 94,7 cm. FITC stained ethanol Varnishes applied in 1974

#### **Results** *Interviews*

The interviews resulted in an inventory of application Also the use of Evolon, and other tissue methods in methods of Evolon and descriptions of positive and general, are thought to make cleaning more objective. The application method can be easily repeated in the negative experiences. These interviews demonstrated that conservators use Evolon in various ways when same way on the entire surface. removing varnish (see Table 1), the main difference Even though Evolon's high absorbency is valued, there is being the moment and method of solvent application. a concern that smaller paint components may be extracted. The opacity of the material is also After solvent application, some conservators cover Evolon with Melinex<sup>®</sup> and/or apply additional disadvantageous as it is not possible to monitor the mechanical action by rubbing. Conservators consider it surface during treatment. And there is a possibility of an advantage that Evolon has a strong absorbency and the formation of 'tidelines' at the edges of the tissue that with its use, less mechanical action is applied on the which require additional cleaning after the treatment. paint surface.

Table 1 Interview results, different application methods of Evolon<sup>®</sup> CR



#### **Results** *Case studies*

Application to case studies showed that less mechanical action is left behind on the surface. In one case the structure of Evolon was visible in these dirt layers. required for varnish removal with Evolon than with cotton swabs, which makes it especially interesting for cleaning Evolon appeared to be unsuitable for surfaces with impasto, as sensitive paint surfaces. With a cotton swab these surfaces could the material is not flexible enough to follow the paint texture not be cleaned, since paint dissolved or varnish residue and resulting in varnish residues. On one of the case study paintings, cotton swab fibres were left behind. On the other hand, the penetration of fluorescent material to the back of the canvas decrease in mechanical action can result in surface dirt being was noted, an effect that increased with use of more solvent. *Fig. 5 Fibre residues on cleaned surfaces* Fig. 6 Varnish residues on impasto surface cleaned with Evolon



5.a Few fibre residues after cleaning with Evolon

5.b Many fibre residues after cleaning with cotton swab

## **Results** Solvent distribution tests

The developed testing system with the FITC stained ethanol proved to be a useful way to visualize the considerable variations in solvent distribution for different application methods. Application methods where more solvent is used, mechanical action (rubbing), covering Evolon with Melinex<sup>®</sup> and a longer



6.b Ultraviolet fluorescence

contact time all result in increased solvent spreading (Fig. 7.a-d). Evennes of solvent spreading was also evaluated. Especially methods where solvent was applied after Evolon made contact with the gelatine surface led to an uneven distribution of solvent on the surface.

Fig. 7.a-d The pictures show an increase in solvent distribution from left to right. Two drops of ethanol were used for each tested area of 1,5 x1,5 cm

### **Conclusion and discussion**

This poster has discussed properties and current Tests showed that Evolon compared favourably to applications of Evolon in cleaning paintings, and has cotton swab in cleaning the sensitive surfaces of test pinpointed various advantages and disadvantages or paintings, in particular in areas with little impasto. A number of questions require further research. The concerns. concerns of conservators with the potential removal of Tests investigating the influence of application methods on solvent distribution and amount of solvent used paint components by the highly absorbent Evolon has show that distribution varies greatly depending on not yet been addressed. Also the mechanisms behind

7.a No mechanical action 7.b No mechanical action No Melinex® With Melinex® No Melinex®



7.d With mechanical action With Melinex<sup>®</sup>

application methods mentioned in the interviews. In the undesirable penetration of fluorescent material general, the use of Evolon seems to result in a lower (possibly varnish) to the reverse of the canvas needs to amount of solvent used and less mechanical action be researched. during the cleaning of paint surfaces. This is potentially advantageous when cleaning solvent sensitive paint surfaces.

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