CONSTGLASS

Table of results

1- Pilot Object

Pilot object:	*The Death and Assumption of the Virgin*, CHARTRES **Bay 42, panel 20**
Pictures	 

Identification of the panel:

Bay: 42
Panel: 20
Internal face, transmitted light
Internal face, reflected light

Treatment:

- **1988**, by Alliou studio.
- Products: polyurethane resin (80% Viacryl® SM564 + 20% Desmodur® N75), silicone CAF 3 and cold painting.
- Application: with a soft brush after cleaning.

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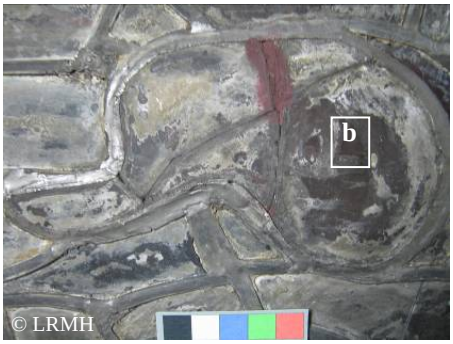
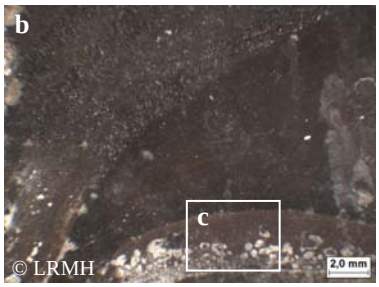
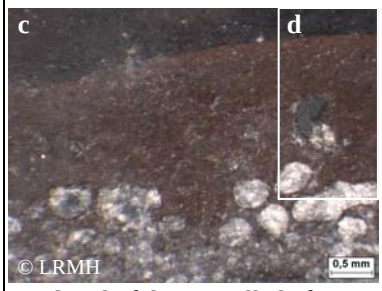
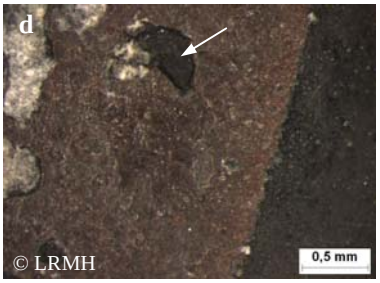
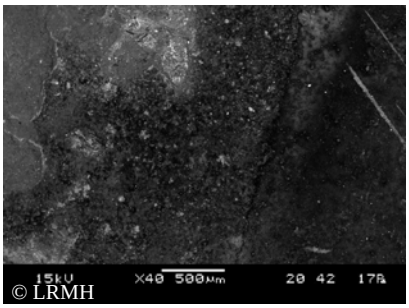
2-Results

Sample reference:	***CHA_b42p20_I_v4**: white glass with Viacryl® consolidation on internal surface, silicone bonding and back plating*

Questions	Techniques	Answers
Morphology - *What is the morphology of the weathered coating?* - *How is the bonding between coating and glass?*   *White rectangle locate the optical microscope observations*	**Optical Microscope**	 *a - detail of the silicone bonding, external surface.* No visible deterioration: it is still smooth, has a good adherence with the edges of glass.  *b - detail of consolidated grisaille internal face.* The gel layer is gone, it seems to be the cause of the departure of the grisaille, not the contrary.  *c - detail of the grisaille before and after cleaning with a cotton saturated of water*. The Viacryl® consolidant is visible on the cleaned area (brilliant aspect).  *d - detail of the grisaille after cleaning*. Viacryl® seems to be still effective on the paint. Was the gap (arrow) formed before or after Viacryl® application?
	SEM	 The SEM confirms the microscope observations (see optical microscope photo d): - there is organic compound (normally, Viacryl® resin), - there is no macro-cracks, - Viacryl® polymer seems to be mixed to grisaille, - deposits are in the gaps of paint (on/under Viacryl®?)
	Desktop tomography	*Not foreseen in this case: samples too large for tomography system.*
	Phase-contrast tomography on Synchrotron	*Not foreseen in this case: samples too large for tomography system.*

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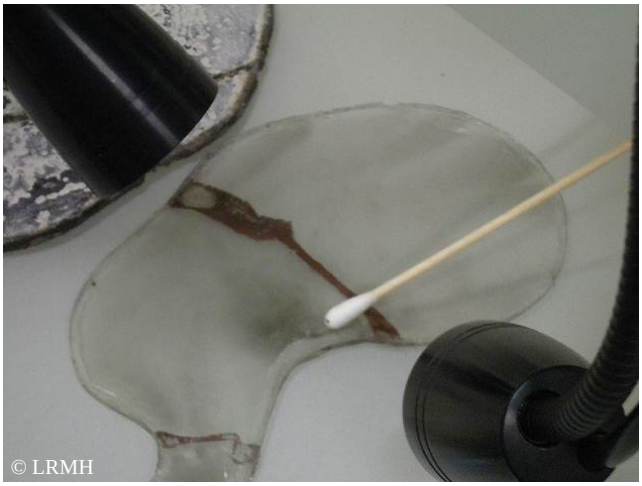
Chemical Composition - *What is the chemical composition of the alteration products?*	**SEM/EDX**	Calcium sulphate neo-crystallisations (gypsum) on the internal surface. On external surface, the white deposit is calcite, coming from the corrosion of the putty.
Organic component composition	**FTIR**	*Not foreseen in this case*
	RAMAN	*Not foreseen in this case*
Microbiology	**Molecular biology** **ATP measurements**	 Dust and soot are observed on the internal side of the recent glass, due to a non-hermetic bonding. But it does not seem to be a cause of microbial contamination. The results on silicone bonding and back plating are the following: • slight accumulation of dust and dirt: no visible fungal infestation; • metabolic activity: not undertaken in this case; • isolated microorganisms: none.
Reversibility	**Test studies** **Elimination**	Mechanical reversibility of the silicone rubber between back plating and ancient glass is easy: after opening the system with high precautions (with a scalpel), tearing off the joint and scouring with a rubber. Concerning glass paint, nothing was attempted regarding to its good state of conservation. *See tests performed on bay 37.*
Re-treatability	**Test studies** **Re-treatability**	Two products were tested to re-treat edge bondings: a new transparent silicone without acetic acid (Silirub N05 neutral, Soudal) and an epoxy rubber (Araldite® 2020, Ciba). Both of them were satisfactory during application and have a good mechanical behaviour when dried. No need to re-treat grisaille on this case. *See tests performed on bay 37, panel 16.*

Conclusion: the consolidation is still effective on most of the paints of the panel. There is not much corrosion products, but a lot of putty which was not removed during last restoration. The corrosion of the latter is starting or resuming on some isolated areas. On some pieces, the healthy grisaille is taken off by a thin layer of deteriorated glass. The consolidation does not avoid this phenomenon.

Regarding silicone rubber on the character's face, the bonding is still effective even after the unstopping of the piece. Concerning the silicone used in back plating, no deterioration and no biological contamination were observed. Removing the polymer is easy, and the re-treatment with neutral silicone is possible.