



CONSTGLASS



Table of results



1-Pilot object

Pilot object:	AFA Smolensk, Cracow	
Picture		<p>Identification of the panel: Bay: 1 Panel: 1 Internal face</p> <p>Treatment: Cleaned with water with unknown detergent. Adhesive: epoxy resin Epidian® 53 with amino hardener (triethylenetetramine). Application: from inside only, directly on glass breaks without panel dismantling. Note: according to FTIR analysis the material is a epoxide resin but probably not Epidian®.</p>



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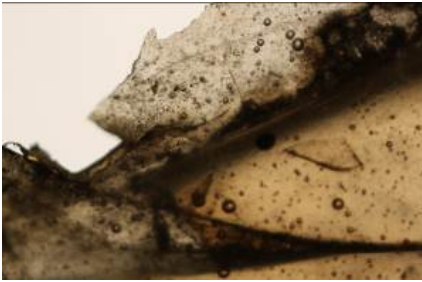
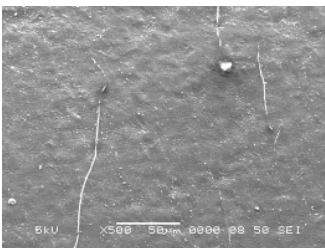
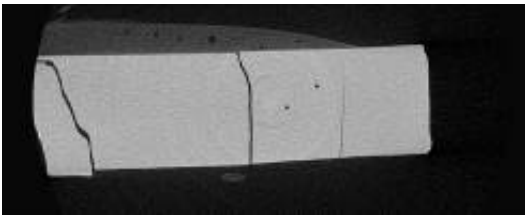



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2-Results

sample reference: AFA-1

Questions	Techniques	Answers
Morphology - What is the morphology of the weathered coating? - What is the process of the weathering? - How is the bonding between coating and glass?	Optical Microscope	Discolouration (yellowing, browning), loss of transparency, adsorption of dirt 1. Loss of adhesion (bubbles) on surface 2. Strong adhesion inside breaks 3. No detachment of glass flakes 
	SEM	small fissures on the surface 
	Desktop tomography	Good visualization of partial penetration into break 
	Phase-contrast tomography on Synchrotron	Good visualization of poor penetration of adhesive into breaks 

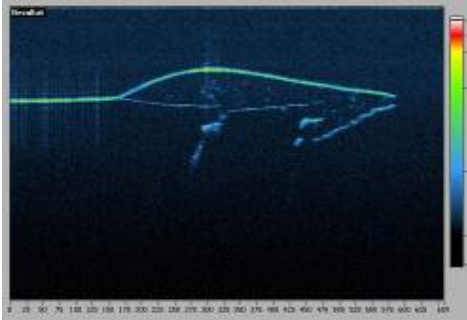


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	OCT tomography	Good view of adhesive - glass bond, bubbles of air, and break in glass. 
Chemical Composition	SEM/EDX	
Organic component composition <i>- What is its chemical evolution?</i>	FTIR	epoxide resin - probably not Epidian®
	RAMAN	
Microbiology <i>- Is there a biological contamination?</i> <i>- Is there an active infestation?</i>	Molecular biology ATP measurements	Low biological contamination on glass and adhesive High contamination in putty - possible source of further contamination
Reversibility <i>- How can I remove the film without damage?</i> <i>- Which kind of method and of solvent, can I use?</i>	Test studies Elimination	On the glass surface: spontaneous delamination. Inside breaks: resistant to simple solvents. Weakening of a bond after moderate heating. Softening of the adhesive in commercial paint stripper (ethylene chloride based in gel form) possible removal with wooden spatulas.
Retreatability <i>- Should I retread the panel?</i> <i>- With which product?</i> <i>- What is its durability? (light, temperature, microorganisms)</i> <i>- What is the compatibility between old and new consolidant?</i>	Test studies Re-treatability	The retreatment is necessary - removal of old adhesives, cleaning, partial regeneration of leading. The treatment will be performed without dismantling the window. The new adhesive of lower viscosity will be used probably Paraloid® B72 10-15%. No surface consolidant is necessary. Preparation for full treatment of all windows.



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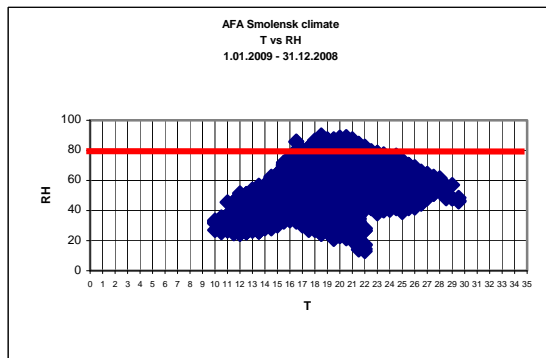
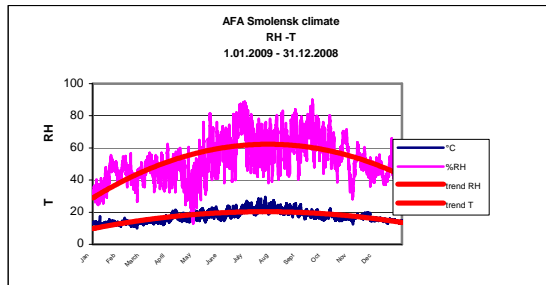


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Climate measurements

- *Is climate impact important?*



Because there is no protective glazing, the influence of climate, mostly temperature and humidity is important, particularly due to night-day changes. Because, however, the climatic conditions are not very aggressive, and the window itself has no delicate parts such as painting layer, corrosion etc. it is suggested to perform conservation as soon as possible, mostly for technical reasons (weak leading). This is also connected with sophisticated ironwork and window opening construction, which is the important object itself. The installation of outer glazing without destroying the ironwork is not possible. The owner of the building does want to save the original structure.