

	
	

Pilot objects	COLOGNE	FRESH MATERIAL
Bay (date)	NVI (panel 4bL), choir clerestory ; "Cycle of Kings" (ca. 1300)	samples: Ugent/Orm/1 LBW/Orm/1 LBW/Orm/2 LBW/Orm/3
Exposure - protective glazing	North – protective glazing	-
Composition of the product	Multiple-layered protective system with glass flakes: - base lacquer (50% Ormocer® + 50% Paraloid® B 72, solved in ethyl acetate 1:3), twice applied; - protective lacquer (50% Ormocer® + 50% Paraloid®, solved in ethyl acetate 1:10), three times applied; in each single layer inorganic pigments (glass flakes) were inserted; - covering layer: Paraloid® B 72, solved in Toluene 1:9, one time applied.	inorganic-organic hybrid polymer, a heteropolysiloxane mixed with Paraloid® B 72.
Application: date (age of product) ; studio ; protocol	1989 ; Cologne Cathedral (protocol)	2008 Cologne Cathedral (protocol), application 3 times
Morphology		
Direct observation	The external surface was completely coated with the Ormocer® protective system. Visibly the coating is in a stable condition. Partially the material has some bubbles and several parts of the coating (thickly applied) has a milky aspect. The putty around the glass segments was coated with Ormocer®, too.	good and stable
SEM observation	good adhesion to glass, no fissures between glass and ORMOCER® detectable, no flakes detectable	-
Desktop Xrays tomography	It was possible to detect the ORMOCER®-layer with CT. The retreatment with doped Paraloid® was not truly detectable.	-
Synchrotron tomography	n/a	-
Chemical behaviour		
FTIR	ORMOCER® didn't change in the 22 years of aging	-
Raman	No chemical changes of the ORMOCER® during over 20 years of exposure are observable.	-
Mechanical behaviour		
	Solid; slightly elastic.	stable
Contamination		
Fungi	n/a	medium
Bacteriae	n/a	no
Active infestation		
Biological activity	n/a; investigations done with fresh ORMOCER®	low
Microbiological susceptibility		
		negligible

	CONSTGLASS	
	ORMOCER[®] Coating	

Reversibility		
Product 1	MEK gel (5% Klucel [®] G) / compress (only tests). Duration: 4 times (10 and 15 min) together 45 minutes + secondary cleaning with cotton swab (MEK) and brush (dry). Results: Ormocer [®] was removed by the compress; some remains of the embedded glassflakes were additionally removed with a MEK-soaked cotton swab, but there were still rests of the flakes on the surface.	-
Re-treatability		
Product 1	only for the tests of reversibility/retreatment: Paraloid [®] B72	-
Product 2	ORMOCER [®]	-
General observations		
	From the conservator's point there is no necessity to remove Ormocer[®] at the moment.	-
Recommendations		
Safety/healthy	The solvent part of SZA and Ormocer [®] is highly flammable; the mixtures are also classed as irritants. Vapours may cause drowsiness and dizziness so use in a properly ventilated area is recommended.	-
Preparation	Both are ready to use solutions; if necessary Ormocer can be diluted in the workshop with methylethylcetone, toluene or butoxyethanol	-
Application	It can be applied by brush. In most cases several treatments are recommended. Depending on the solvent / mixture of solvents a drying time of about 12 to 24 hours between every step of application is recommended	-
Future conditions of conservation	no action has to be done for the moment	-