

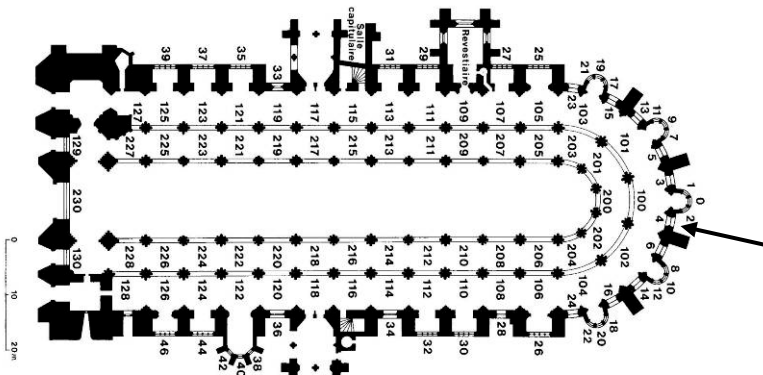



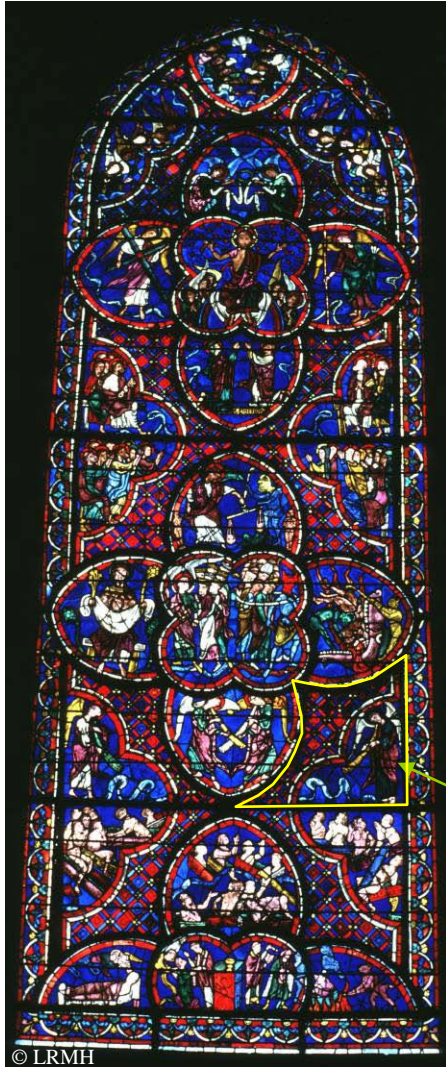



	<h1>CONSTGLASS</h1>	
<h2>Data sheet for pilot objects</h2>		

<b>Object:</b>	<b>Bourges Cathedral, BOU_b4p15</b>	<b>Date:</b> 19.01.2010
<b>OBJECT IDENTIFICATION</b>		
<b>Site</b>	Bourges ( <i>France</i> )	
<b>Building</b>	Saint-Etienne Cathedral	
<b>Location and orientation of the window</b> <b>Plan of the building</b>	<p>Ambulatory, bay 4</p>  <p>© Corpus Vitrearum – Centre André Chastel</p>	

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<b>Description of the window opening (dimensions, number of lights; photo, test panel marked)</b>		<p>A broken arch lancet from the beginning of the 13th century.</p> <p>Several restorations since the creation of this stained glass window. The most important was in 1853 by Coffetier studio. During the Second World War the window was removed, and then replaced in 1946, by Chigot and Lorin studios (no information about storage conditions). The last one was in 1976 by Chauffour studio.</p> <p>42 panels, Total height : ca 6 m Total width : ca 2.20 m</p>
<b>Date</b>	Ca 1210-1215	
<b>Short description of the window (identification of subject, artist, workshop)</b>	The glass window represents the last Judgement. Unknown artist or studio. The panel 15 represents an angel holding an instrument.	
<b>Owner</b>	French government	
<b>Person(s) in charge</b>	DRAC (Direction Régionale des Affaires Culturelles) of Centre, Orléans (45) Curator : J.P. Blin	
<b>Investigated panel (inventory number, CVMA number, size)</b>	Bay 4 Panel 15 (CVMA numeration) Size : 77.5 x 69 cm	

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<b>Manufacturing technique</b>	unpainted glazing		<input checked="" type="checkbox"/>
	painting glazing		<input checked="" type="checkbox"/>
		oxide paint / grisaille paint inside	<input checked="" type="checkbox"/>
		oxide paint / grisaille paint outside	<input type="checkbox"/>
		silver stain inside	<input type="checkbox"/>
		silver stain outside	<input type="checkbox"/>
		transparent enamel inside	<input type="checkbox"/>
		transparent enamel outside	<input type="checkbox"/>
		.....	<input type="checkbox"/>
		.....	<input type="checkbox"/>
<i>Further information:</i>			

<b>ENVIRONMENT IN SITU / IN STORAGE</b>			
<b>Protective glazing</b>	no protective glazing		<input checked="" type="checkbox"/>
	protective glazing		<input type="checkbox"/>
		installed in the original position of the ancient panels	<input type="checkbox"/>
		mounted to the outside (ancient panels stay in their original position)	<input type="checkbox"/>
		no ventilation	<input type="checkbox"/>
		internal ventilation	<input type="checkbox"/>
		external ventilation	<input type="checkbox"/>
		size of interspace between ancient panel and protective glazing	cm
		ventilation slot at the top (size)	cm
		ventilation slot at the bottom (size)	cm
	date of installation		
<i>Further information:</i> Protected with a wire fence (grillage)			
<b>Material protective glazing</b>	No protective glazing		



**Surround materials and construction related materials**



Limestone of Charly and restoration stone\* (Lise Leroux, LRMH)

- External wire grilles (iron),
- saddle bars (iron),
- sealant in stone groove (non-hydraulic lime mortar),
- sealant between stained glass panels and supporting framework (linseed oil putty).

External view

\*Les pierres de la cathédrale de Bourges, BLANC Annie; ROLLAND Olivier

**Museal exposition / Storage**

Room	<input type="checkbox"/>
Cabinet	<input type="checkbox"/>
Store (during the CONSTGLASS project)	<input checked="" type="checkbox"/>
<i>Further information:</i> Room temperature and relative humidity in the LRMH store : around 20°C and 30% RH	

**Objects exposed to**

partial sunlight	<input checked="" type="checkbox"/>
daylight, but no direct sunlight	<input type="checkbox"/>
artificial warmlight	<input type="checkbox"/>
artificial coldlight	<input type="checkbox"/>
mixed warm-/coldlight	<input type="checkbox"/>




*Note:*

**Climate of the building**

**East exposure**  
**No heating system**

1 datalogger from April 2008 to Mai 2009  
Climate in the cathedral, internal surface of the window :

	Minimum	Maximum	Average
Air temperature (°C)	0,0	24,5	12,7
Relative humidity (%)	41,5	93	73,3

	
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## INSPECTION OF THE SITE BEFORE REMOVAL (WITH PICTURES)

<b>Requirements for a safe removal in respect of minimal intervention</b>	No particular recommendation: rubbing forbidden, vertical removal.
<b>Environmental causes for damage</b>	
<b>Short report of removal</b>	Removal by <b>Vitraux Jean Jacques Prel studio</b> in 2008. No specific difficulty to remove the panel. Presence of putty near metal structure. Fabrication of a specific wood box with a foam insert. Vertical removal.
<b>Short report of transport</b>	Horizontal or vertical transport in the specific wood box.

## CONSERVATION MATERIAL

<b>Conservation material (producer, product name, characterization, data, etc.)</b>	<b>No conservation material applied, in order to compare its alterations with the ones of the protected panels (with Viacryl®).</b>	
<b>Application technique</b>	consolidation of paint layer / paint pigments	<input type="checkbox"/>
	coating / lamination	<input type="checkbox"/>
	edge bonding	<input type="checkbox"/>
	.....	<input type="checkbox"/>
	application with brush	<input type="checkbox"/>
	application with spray	<input type="checkbox"/>
	single application	<input type="checkbox"/>
	repeated application	times
	concentration	%
	mixing ration	:
.....	<input type="checkbox"/>	
<i>Further information :</i>		
<b>Date of application</b>		
<b>Documentation of this treatment</b>	photographs (colour transparencies, b&w prints, colour prints, digital images)	<input type="checkbox"/>
	written records	<input type="checkbox"/>
	diagrams	<input type="checkbox"/>
	data-files	<input type="checkbox"/>
	Do you think this documentation is	exact
	more or less reliable	<input type="checkbox"/>
<b>Previous restorations (data, treatments, material)</b>	Surface cleaning with EDTA	
	Do you think the information is	exact
	hearsay	<input type="checkbox"/>

**CONDITION REPORT / DOCUMENTATION IN THE WORKSHOP**

**Pictures of panel / glass in transmitted light**



*[All digital photos in this data sheet: LRMH, Nikon D2X for panels, and Canon PowerShot S70 for details]*

Panel on a luminous table

© LRMH

Panel 15, internal surface

**Pictures of panel / glass in reflecting and raking light, internal surface**



© LRMH

Panel 15, internal surface

**Pictures of panel / glass in reflecting and raking light, external surface**



© LRMH

Panel 15, external surface



### Examination of the object (if possible with microscope)

*Description of condition concerning glass, paint, lead, putty, coating, deposits; scrutinizing internal and external surface*

**External face:** No protection on the external surface.



*Glass:* hole and crater alterations, uniform weathering  
*Paint:* no painting  
*Lead:* good condition  
*Putty:* dry and waterproof  
*Coating:* none  
*Deposits:* resumption of the corrosion process

**Internal face:**



*Glass:* it seems to be less deteriorated on the internal surface. There are some holes of alterations dispersed.  
*Paint:* ancient painting with thick line and wash drawing. Brown-red painting (warm brown).  
*Lead :* good condition  
*Putty :* dry and waterproof  
*Coating/consolidant :* none  
*Deposits:* thick, hard white and brownish deposit on most of the pieces: distemper ? mastic residue ? Those deposits often dissimulate the glass corrosion.

### Selected damages

*Selected choice of representative damages with short description and photo; add benchmark, note lighting conditions, note coordinates of documented area, etc.  
These pictures will be part of the damage atlas.*

**External surface**

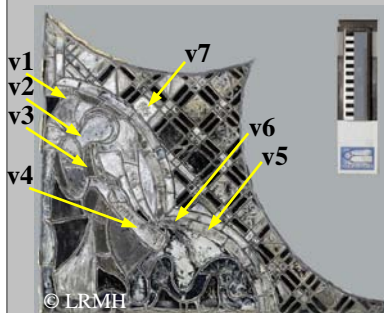
Even on the most recent pieces, process of corrosion has started.



**Selection and documentation of samples to be analysed**

**Questions to the scientists**

*Diagrams, records and pictures, including a separate data-sheet for every single sample.*



**v1 - White piece**



**v2 - Beige piece**



**v3 - Dark red piece**



**v4 - Yellow piece**



**v5 - Red piece**



**v6 - Red piece**






**v7 - Dark blue piece**

Comparison with a protected panel, on the same register (panel 13):  
 Viacryl<sup>®</sup> protected the glass more than it damages it, or on the contrary, it damages it more than it protected it?

**Selection and documentation of areas for reversibility tests or reactivation tests**

No previous treatment.



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### RESPONSIBLE CONSERVATORS (name, phone, e-mail)

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<b>Person 3</b>	Delphine Geronazzo, <a href="mailto:geronazzo@dgvitrail.fr">geronazzo@dgvitrail.fr</a>
<b>Person 4</b>	Jennifer Edaine, <a href="mailto:jennifer.edaine@gmail.com">jennifer.edaine@gmail.com</a>