

Contenuti corso

Conservazione e sistema manufatto-ambiente

- **Deterioramento** come processo spontaneo
- **Ambiente di conservazione** e velocità di deterioramento k
- **Prevenzione** come azione per minimizzare k
- **Fruizione** → condizionamento ambientale → compromesso
- **Interazione manufatto-ambiente** → processo continuo

Sistema unico *manufatto-ambiente*!

Parametri fisici ambientali significativi per l'ambiente di conservazione

- **temperatura**
- **luce** e temperatura
- **umidità** e temperatura
- **inquinamento** (particolato e contaminanti)

I parametri fisici non sono *cause di degrado* !

Altri aspetti ambientali significativi

- **infestanti** (causa ed effetto del degrado)
- micro / macro **strutture**

Gli interventi e la questione ambientale

- **problemi antichi e moderni**

evoluzione dei manufatti e delle modalità di fruizione

- **approccio moderno**

patologia : diagnosi e terapia-diagnosi e trattamento, chirurgia-restauro,
prevenzione-questione ambientale ➔

i) approccio scientifico

ii) gestazione e nascita della *questione ambientale* per la conservazione

- **tematiche ambientali**

i) conservazione e fruizione

ii) supporto e contenuto

iii) strutture storiche (compromesso *funzionalità-tutela*)

la luce

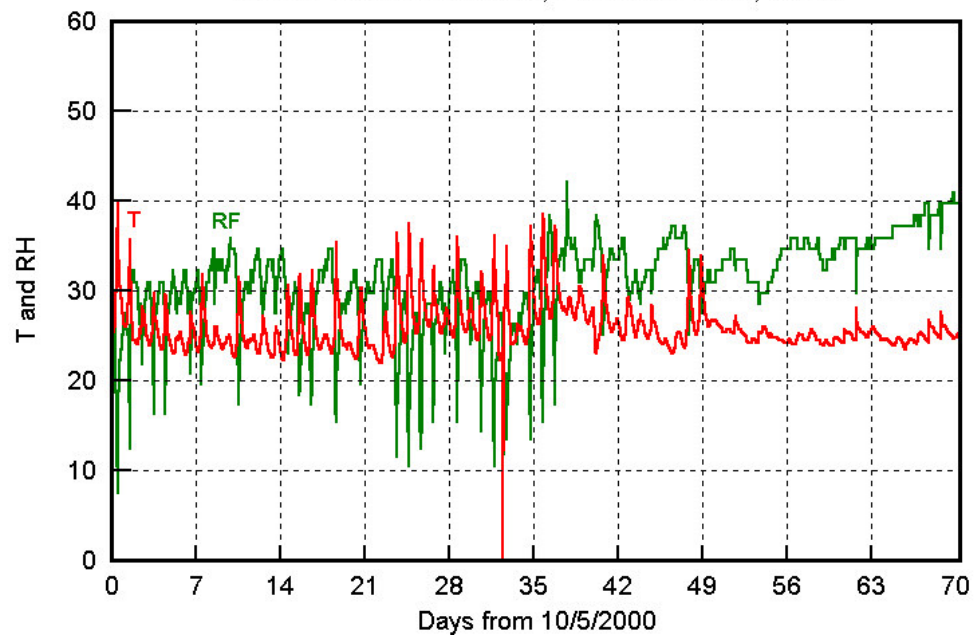


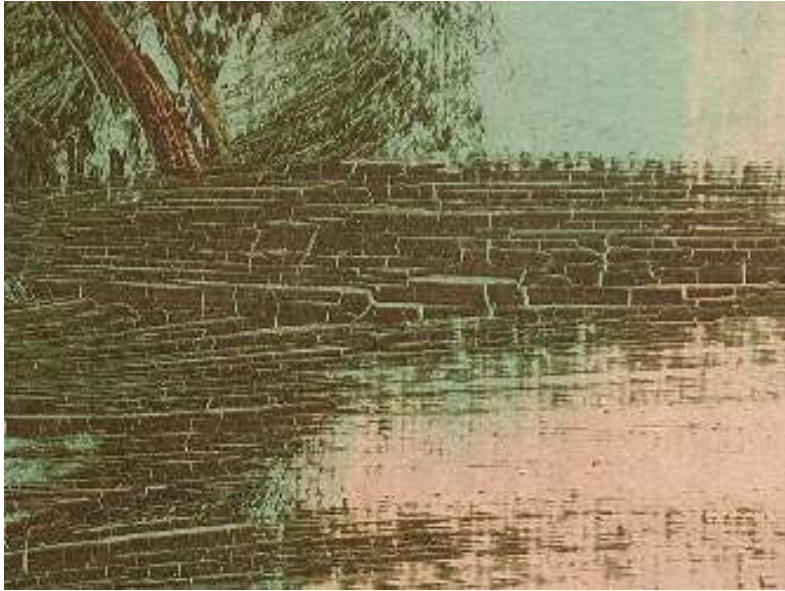


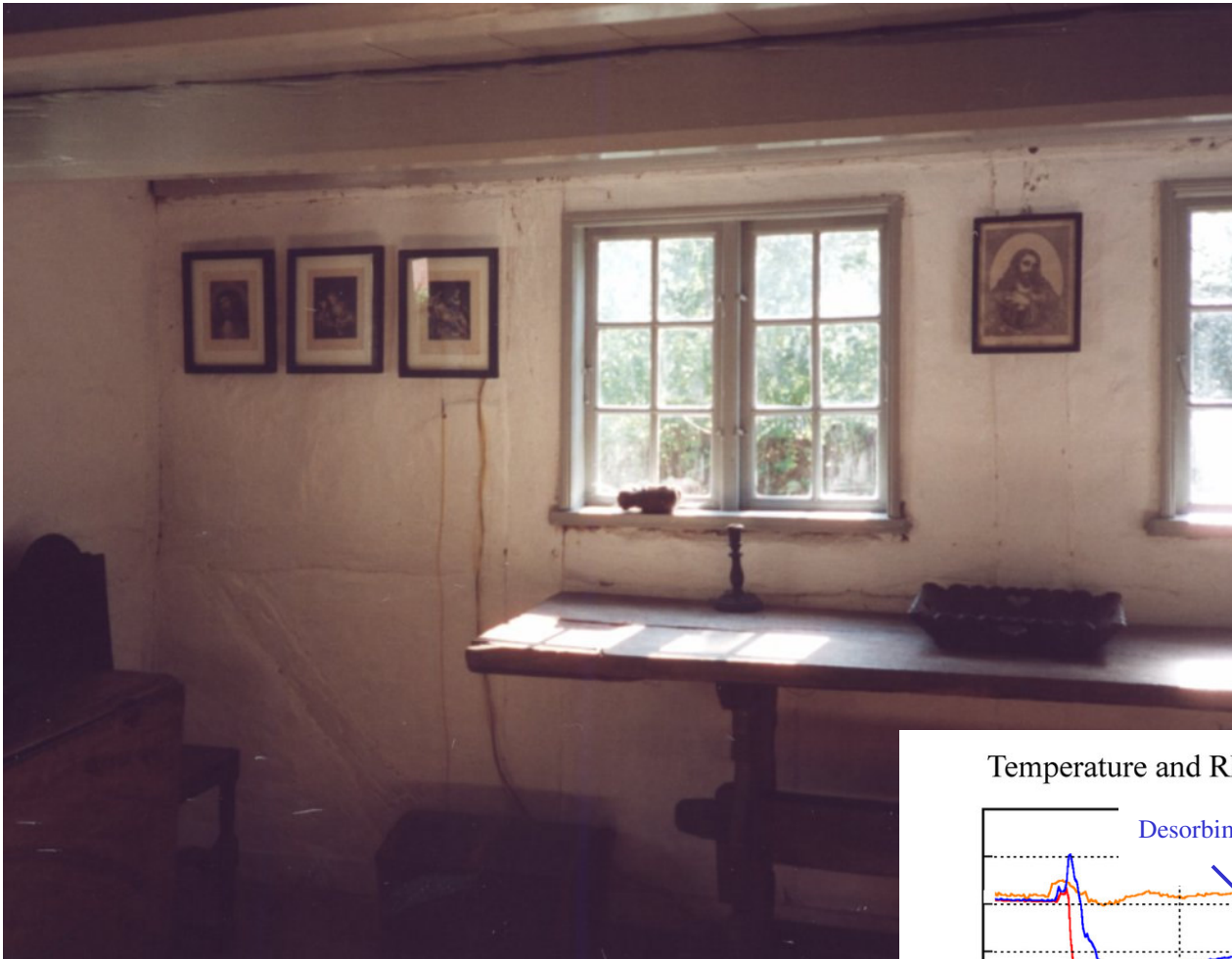




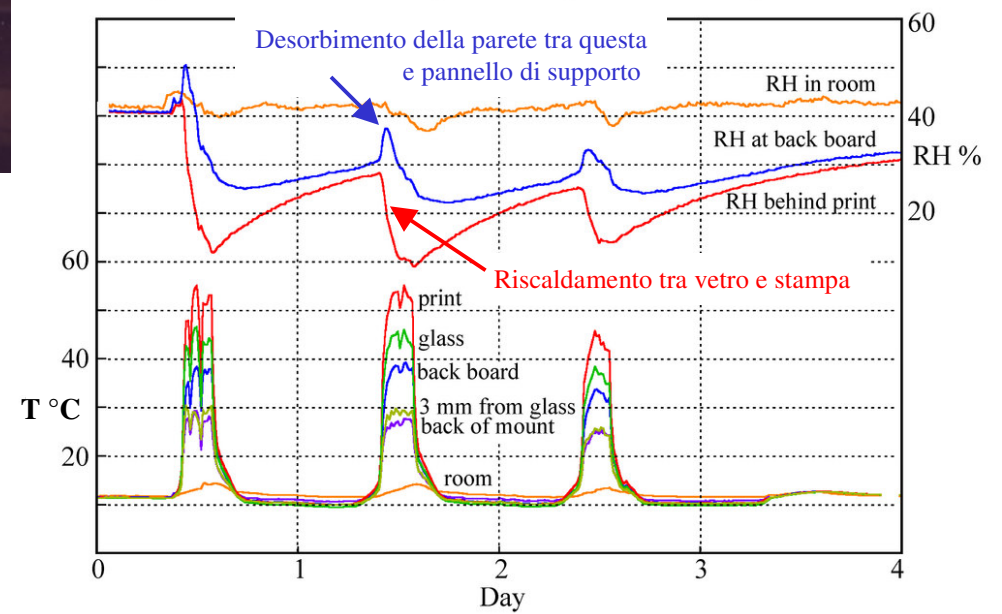
Klima i 'elfenbensmontre', Prinsens Palais, forhal







Temperature and RH in a picture exposed to sunlight indoors



Esposizione a 50lx

12 anni

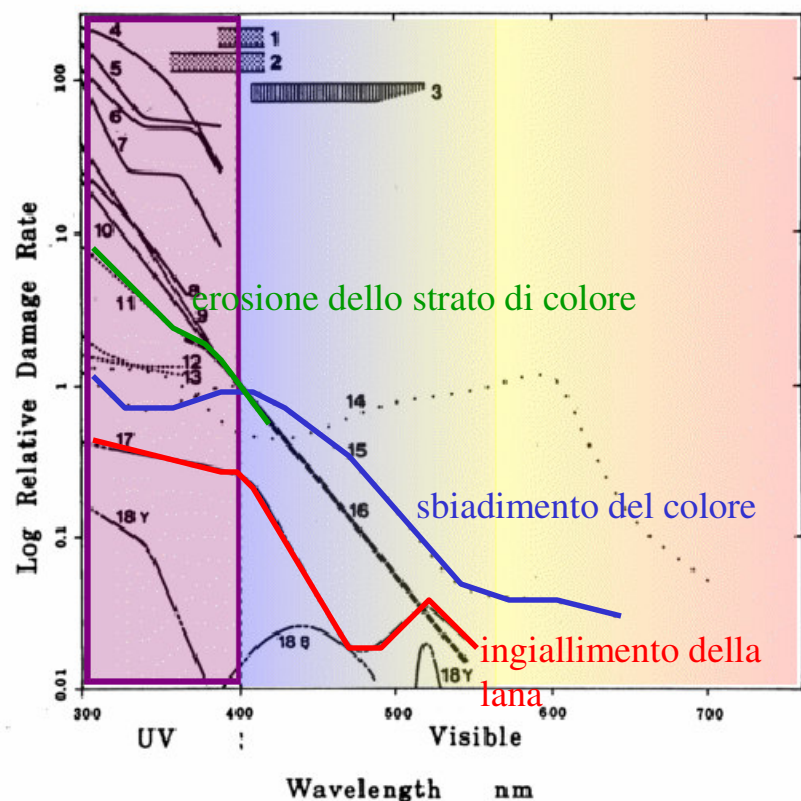
3 anni

25 anni



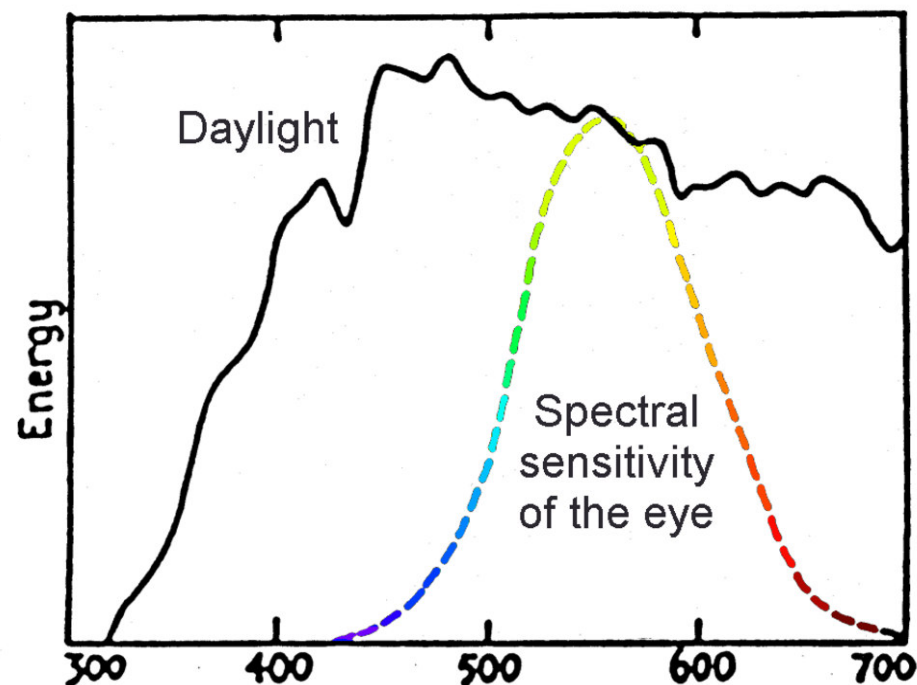
FIG. 1. Some of the faded specimens. The rectangular areas are unexposed. The three square areas on each specimen have been exposed to 7·8, 36 and 91 million lux hours of light from Atlas "Northlight" fluorescent tubes. In all the dycings illustrated here the palest area has received the greatest light dose. The GS difference between exposed and unexposed dye is written on the unexposed part.





1. Chalking of PVA latex paint, anatase TiO_2 , appx. daylight band response
2. " " " ZnO Hoffmann and Saracz (1971)¹⁷
3. Bleaching of newspaper Leary (1967)¹³
4. Polyethylene photo-oxidation, Carbon black + rutile TiO_2
5. " " " anatase TiO_2
6. " " " ZnO
7. " " " rutile TiO_2 Arnaud and Lemaire (1979)¹⁶
8. Polyethylene, loss of elongation at break, Stephenson et al (1961)¹⁵
9. Rubber, gas evolution Eateran (1947)⁹⁵
10. Methacrylate resin varnish, decrease in solubility Feller (1964)¹⁴
11. Alkyd paint, erosion (weight loss) Miller (1958)⁹⁶
12. Linseed oil paint, photo-oxidation, vermillion
13. " " " verdigris Rasti and Scott (1980)⁹⁷
14. Colour fading, litharge
15. " " " rhodamine B Kenjo (1985)⁹⁸
16. Paper strength (pulp) NES (1953)⁷
17. Wool, yellowing, fluorescent whitener added
- 18V " " " natural
- 18B " " " bleaching, natural Leaver and Ramsay (1989)¹⁰

Fig. 1. Wavelength dependence of radiation damage in the UV and the Visible.

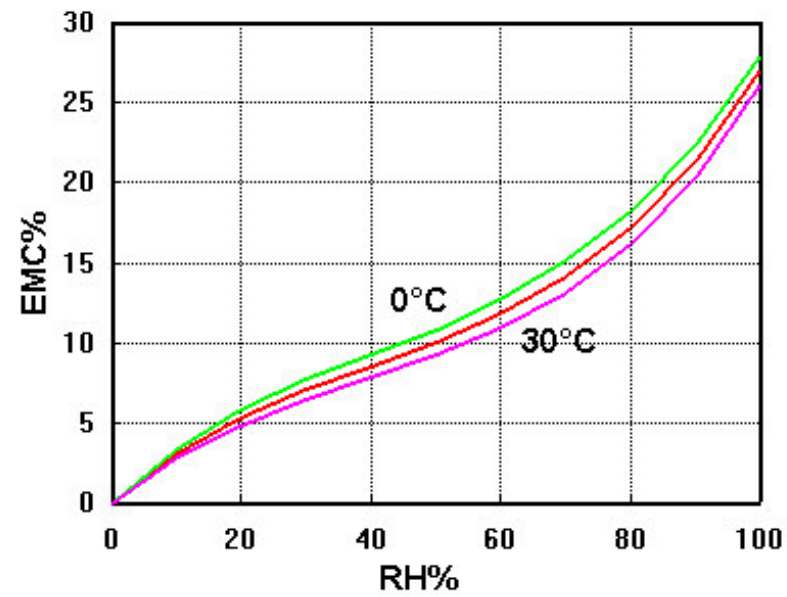


Wavelength nm	Relative damage arbitrary scale
546	1
436	22
405	60
389	90
365	135

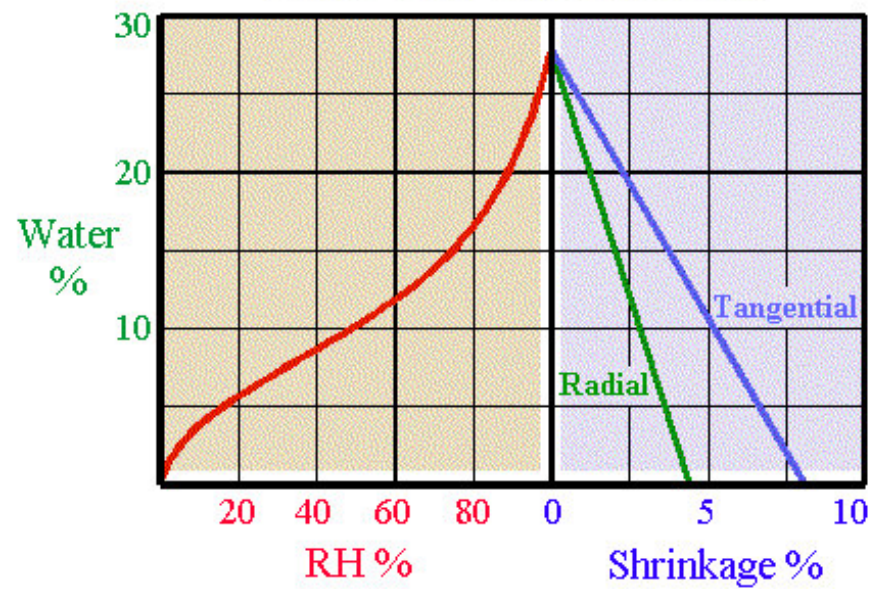
Thus, damage to paper by exposure to light could be reduced to a low level by the use of a filter that excludes wavelengths shorter than about 415 nm.

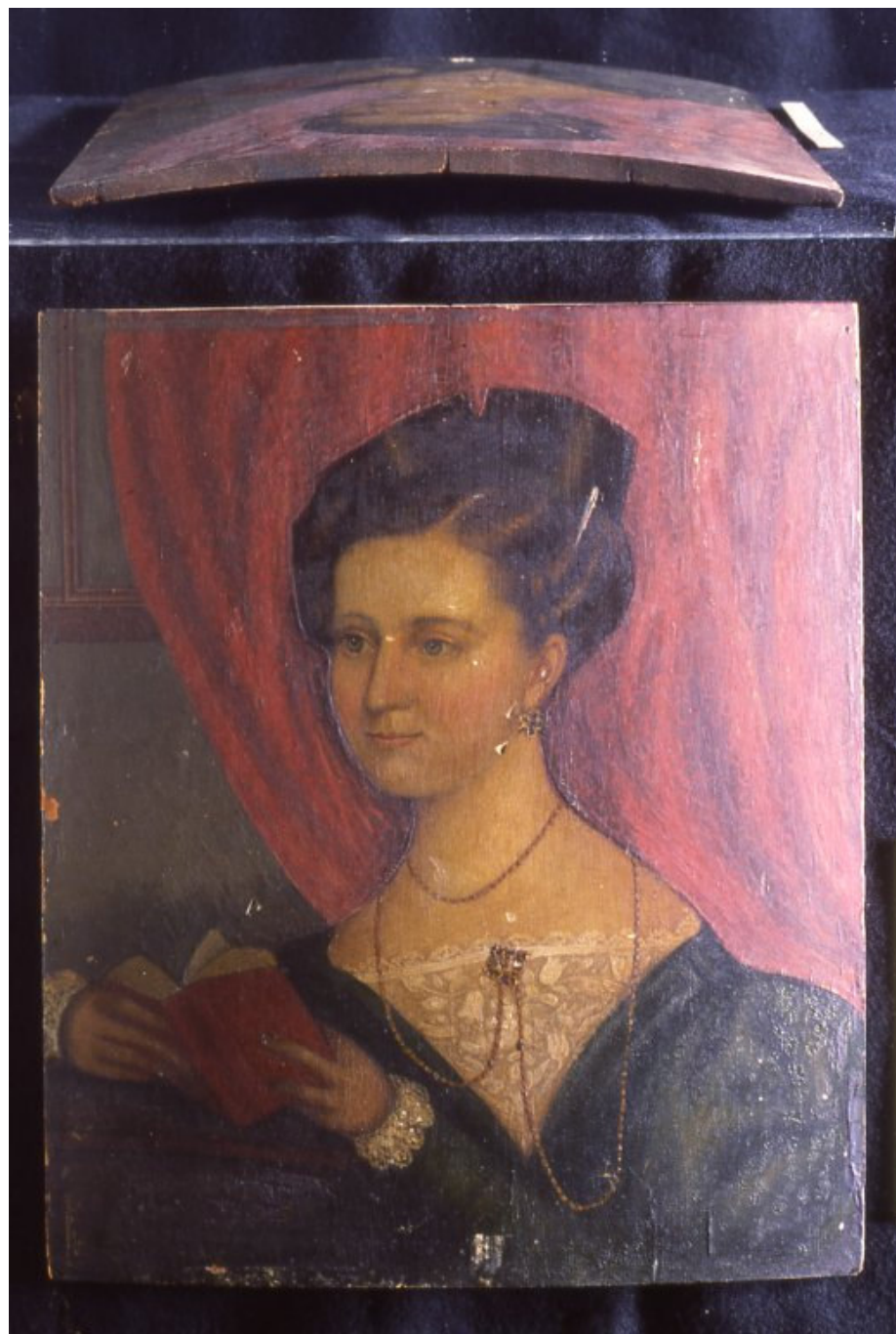
l'umidità



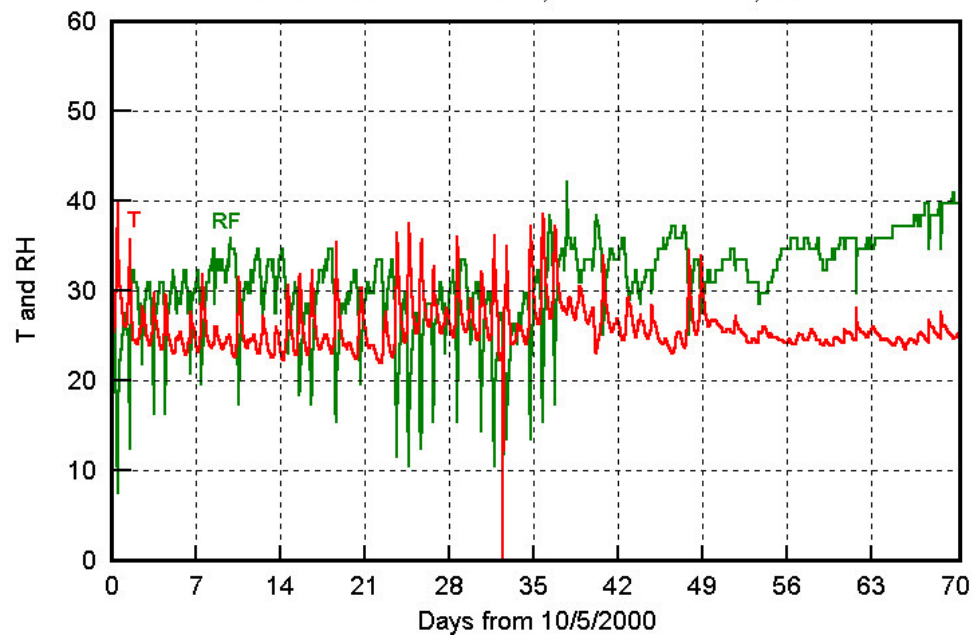


Wood: water content and size





Klima i 'elfenbensmontre', Prinsens Palais, forhal





T, UR e stabilità chimica



Temperature °C	Relative Humidity (%)				
	25	30	40	50	75
60	28.00	33.00	44.00	55.00	83.00
55	17.00	21.00	28.00	35.00	52.00
50	11.00	13.00	17.00	22.00	33.00
45	6.60	8.00	11.00	13.00	20.00
40	4.00	4.80	6.40	8.00	12.00
35	2.40	2.90	3.80	4.80	7.10
30	1.40	1.70	2.20	2.80	4.20
25	0.80	0.90	1.30	1.60	2.40
21	0.50	0.60	0.80	1.00	1.50
20	0.45	0.53	0.71	0.89	1.30
18.3	0.37	0.44	0.58	0.73	1.10
15	0.25	0.29	0.39	0.49	0.74
10	0.13	0.16	0.21	0.26	0.39
5	0.07	0.08	0.11	0.14	0.21
0	—	—	—	0.07	—
-18	—	—	—	0.005	—

le norme (standards)

Standardization Organizations

→ Internazionali



→ Europee



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

→ Nazionali



→ Internazionali



ISO
11799

Information and documentation —
Document storage requirements for
archive and library materials

→ Nazionali

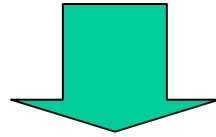


NORMA ITALIANA	Documentazione Condizioni climatiche per ambienti di conservazione di documenti grafici e caratteristiche degli alloggiamenti	UNI 10586
		SETTEMBRE 1997
NORMA ITALIANA	Beni di interesse storico e artistico Condizioni ambientali di conservazione Misurazione ed analisi	UNI 10829
		LUGLIO 1999

→ Europee



Nel 2001 la UNI promuove al CEN



Standards on Conservation of Cultural Property CEN/TC 346

- WG 4 - Environment

It has the responsibility for the drafting of guidelines for the control of environmental variables, and of standards on the measurement of indoor, including exhibition and storage conditions, and outdoor environmental conditions, and on artefacts/environment interaction.

Norme e raccomandazioni vanno lette e studiate **criticamente** !

Le norme non
sono un *manuale* !

Table 1 Suggested values for the optimal conservation of artworks for steady-state indoor climate conditions.

Artworks materials	UNI 10829 standard				Decree of 10 th may 2001	
	θ_e (°C)	$\Delta\theta_{max}$ (°C)	u_p (%)	Δu_{max} (%)	θ_e (°C)	u_p (%)
<i>a) Organic materials/objects</i>						
Paper, papier-mâché, paper artwork, tissue-paper, wallpaper, stamp collections, manuscripts, papyri, printings, cellulose materials	18 - 22	1.5	40 - 55	6	15 - 24	50 - 60
Fabric, veils, drapery, carpets, fabric tapestry, arras, silk, costumes, dresses, religious vestments, natural fibre materials, sisal, juta	19 - 24	1.5	30 - 50	6	-	40 - 60
Wax, anatomical waxes	<18	N.R.	N.R.	N.R.	-	-
Herbaria and botanical collections	21 - 23	1.5	45 - 55	2	-	40 - 60
Entomological collections	19 - 24	1.5	40 - 60	6	-	-
Animals and anatomical organs preserved in formalin	15 - 25	-	N.R.	N.R.	-	-
Animals, dried anatomical organs, mummies	21 - 23	1.5	20 - 35	-	19 - 24	40 - 60
Furs, feathers, stuffed animals and birds	4 - 10	1.5	30 - 50	5	15 - 21	45 - 60
Water-colours, drawings, pastels	19 - 24	1.5	45 - 60	2	19 - 24	50 - 60
Ethnographic collections, masks, leather, leather clothes	19 - 24	1.5	45 - 60	6	-	50 - 60
Painting on canvas, oil on canvas, and canvas					19 - 24	35 - 50
Ethnographic collections, masks, leather, leather clothes	19 - 24	1.5	45 - 60	6	-	50 - 60
Lacquer, inlaid, decorative furniture	19 - 24	1.5	45 - 60	2	19 - 24	50 - 60
Polychromatic wood carvings, painted wood, paintings on wood, icons, wood pendulum-clocks, wood musical instruments	19 - 24	1.5	50 - 60	2	19 - 24	45 - 65
Unpainted wood carvings, wickerwork, wood or bark panels	19 - 24	1.5	45 - 60	2	19 - 24	40 - 65

Figure 42: A page from a listing of two Italian standards.

studieremo
(criticamente)

NISO TR01-1995

ISSN: 1081-8006

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Environmental Guidelines for the Storage of Paper Records

<http://www.niso.org/standards/resources/tr01.pdf>

ANSI/NISO Z39.79-2001

ISSN: 1041-5653

SCARICABILI

Environmental Conditions for Exhibiting Library and Archival Materials

<http://www.niso.org/standards/resources/Z39-79-2001.pdf>

IFLA PRINCIPLES FOR THE CARE AND HANDLING OF LIBRARY MATERIAL

<http://www.ifla.org/VI/4/news/pchlm.pdf>

citeremo

INTERNATIONAL
STANDARD

ISO
11799

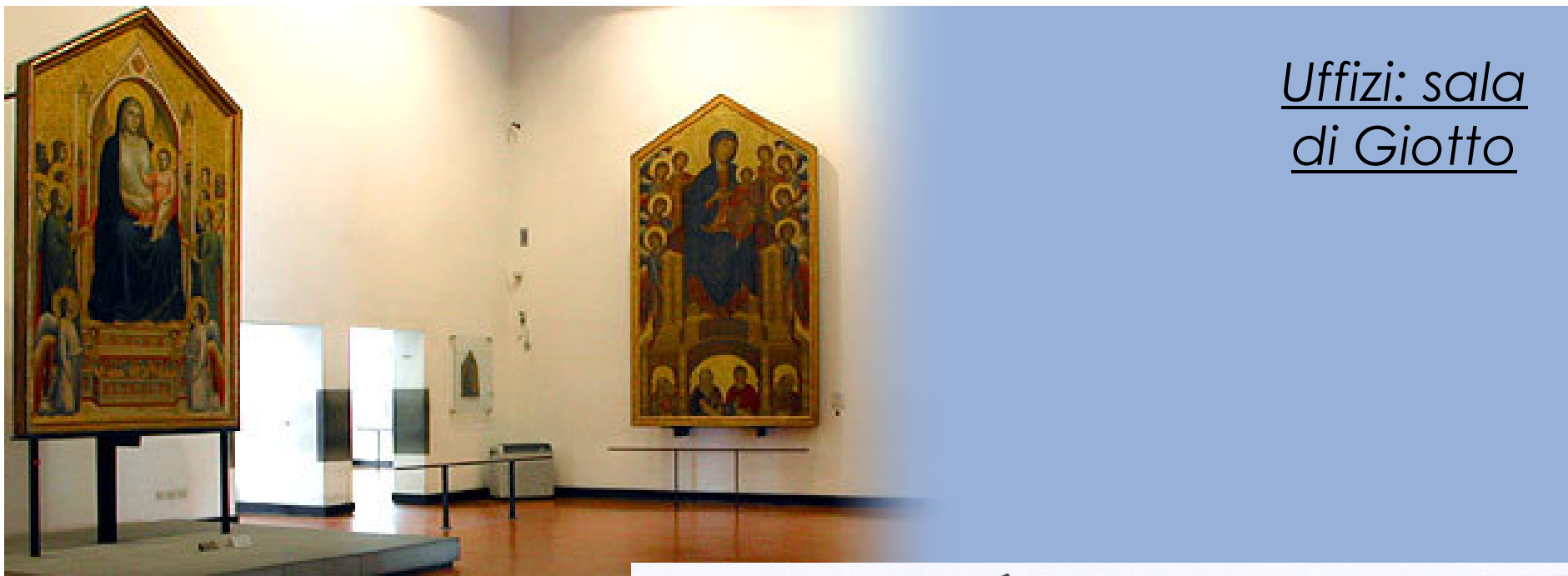
First edition
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Information and documentation —
Document storage requirements for
archive and library materials

*NON
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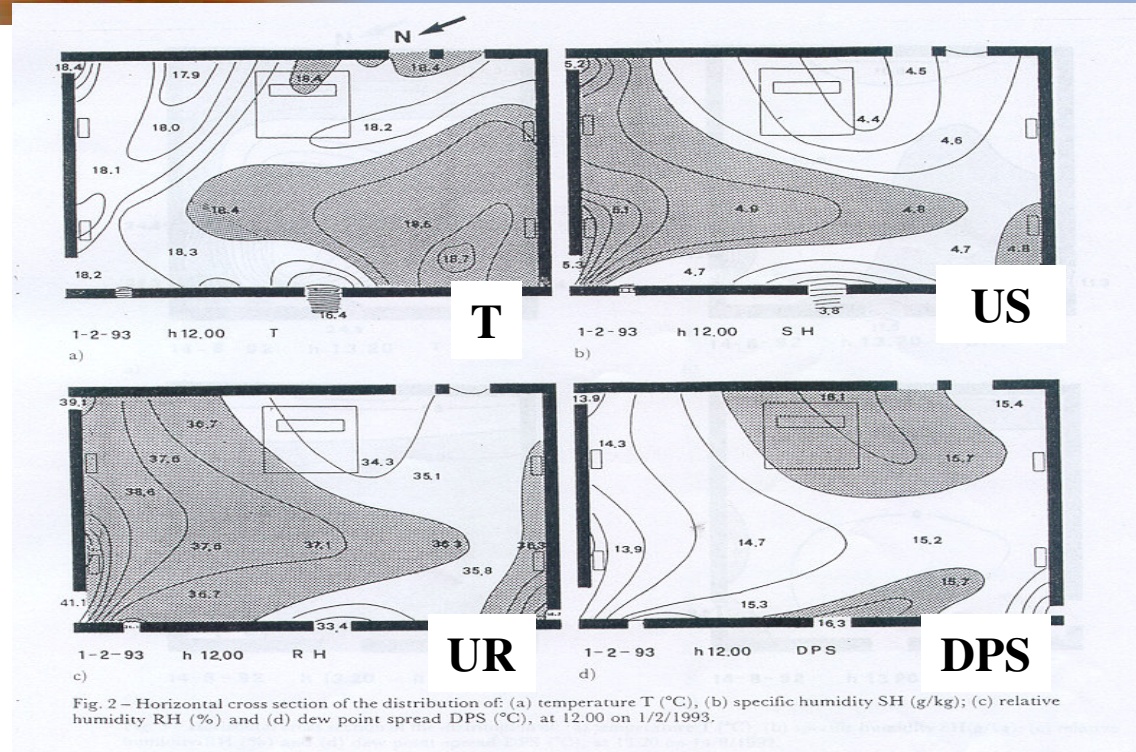
NORMA ITALIANA	Beni di interesse storico e artistico	UNI 10829
	Condizioni ambientali di conservazione Misurazione ed analisi	
		LUGLIO 1999
NORMA ITALIANA	Documentazione	UNI 10586
	Condizioni climatiche per ambienti di conservazione di documenti grafici e caratteristiche degli alloggiamenti	
		SETTEMBRE 1997

il controllo microclimatico



Uffizi: sala
di Giotto

spaziale





Uffizi: sala
del
Pollaiuolo

temporale

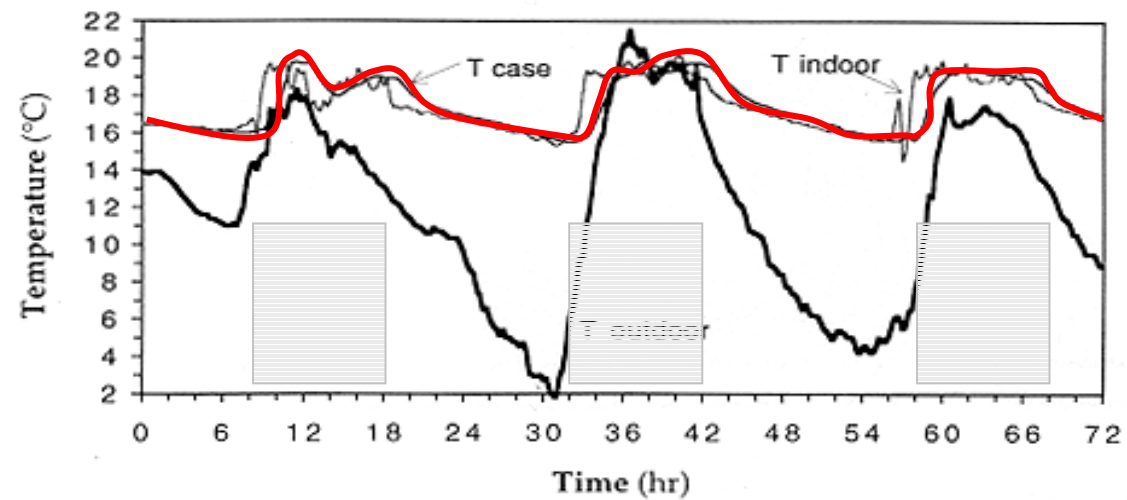
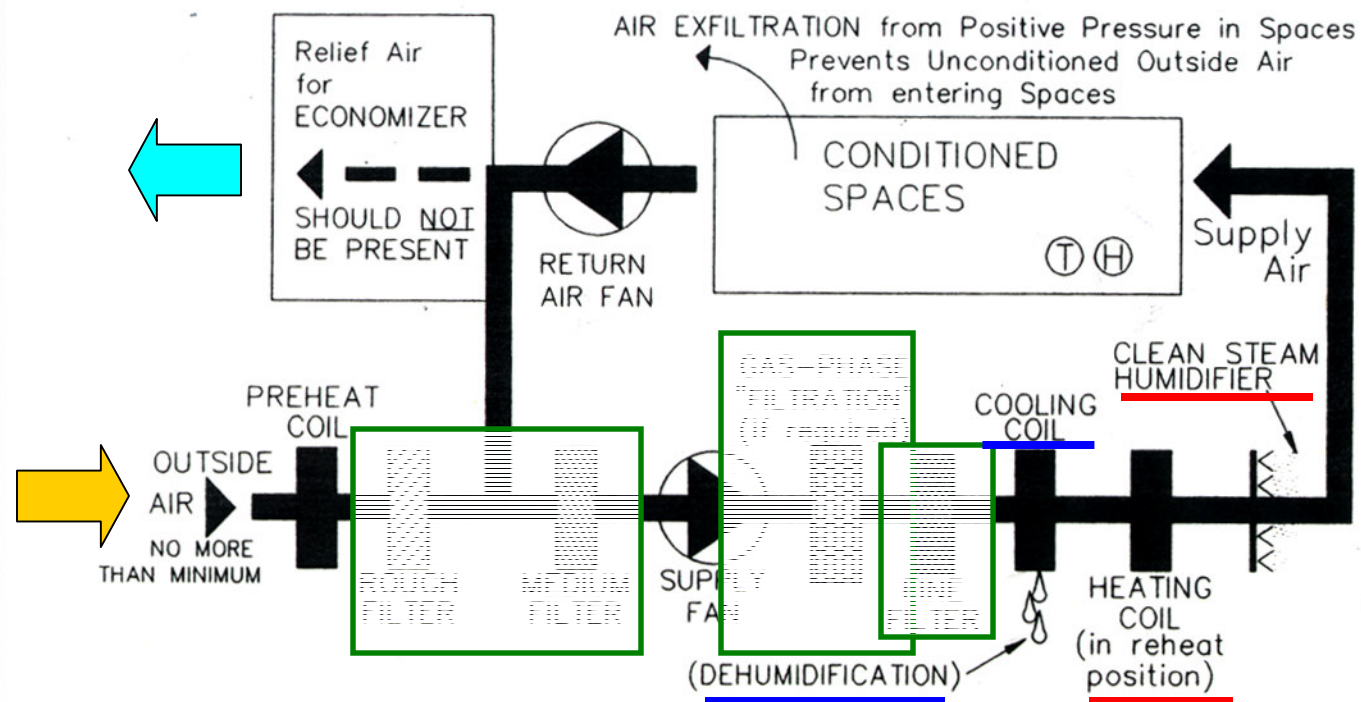


Fig.1.8 Comparison between the outdoor temperature, the indoor value and the temperature inside a show-case. Pollaiuolo Room, Uffizi Gallery, Florence, 11 to 13 March 1997.

le strutture



il condizionamento



PRIMARY FUNCTIONAL ELEMENTS OF A CONSERVATION ENVIRONMENT HVAC SYSTEM

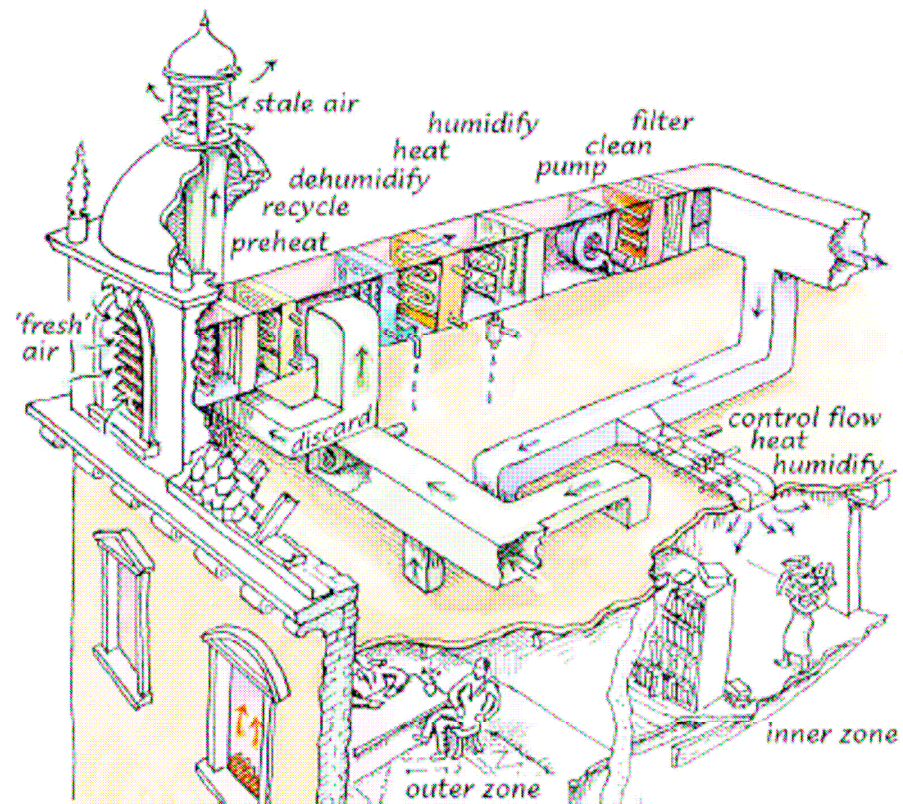


Figure 48: Typical air conditioning equipment for a large building.

il progetto dell'ambiente di conservazione

