

Pollution Mitigation: The Gap Between Research and Application

An empirical study of the present situation and management of indoor air pollution in German collections

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Introduction – History of Material Testing

- Since the 1890s effects of inappropriate display materials to artefacts are analysed.
- Since the 1970s numerous methods for testing display and storage materials have been developed within the museum sector:
 - ➔ Qualitative & semi-quantitative methods, e.g. Oddy-Test
 - ➔ Highly specialized quantitative methods, e.g. thermodesorption / GC-MS.
- ➔ How is the current handling with emitting display materials within collections?
 - Problem awareness?
 - Solution (prevention)?
 - Standards/ processes employed?

To what extent do processes employed and applied analytical methods reduce pollution?

Frames of the Empirical Study

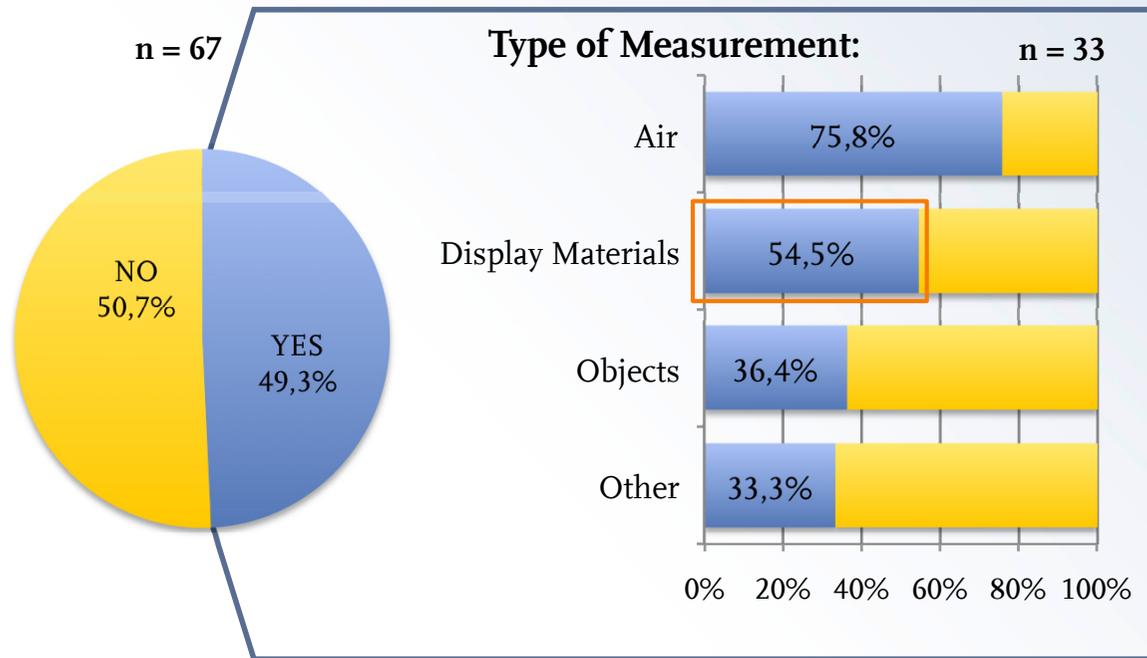
- Composition and representativeness of the sample:
 - ca. 6000 museums in Germany ⁱ
 - Target group of empirical study: museums with experts (conservator, chemist, others)
 - Selection criteria: number of visitors correlate with size range of institutes
 - Systematical selection method (number of visitors > 100,000)
- Population: 216 => 185 museums
- Sample: 86 (return rate 46.5%)
- Running time: 50 Days (25. Juni – 15. August 2008)



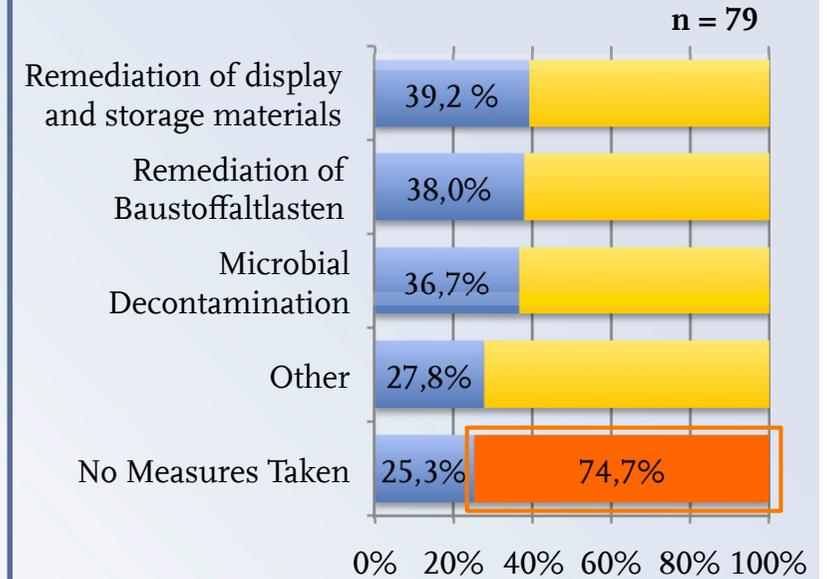
- i. Institut für Museumsforschung (2006): Statistische Gesamterhebung an den Museen der Bundesrepublik Deutschland für das Jahr 2006. Herausgegeben von Staatliche Museen Berlin. (Materialien aus dem Institut für Museumskunde, 61), S. 3

Management of Pollution/Damages in Museums

Measurement of Pollution:



Measures Taken to Remove Damages and Contaminants :

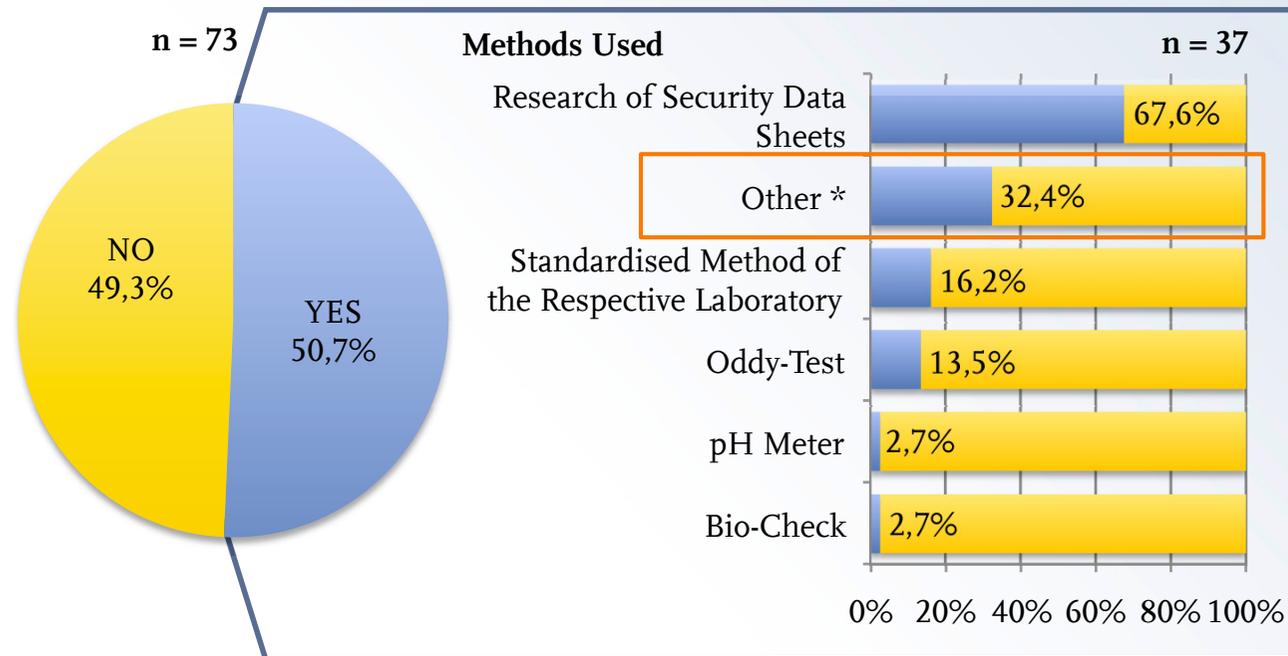


More than 70 % of the involved institutions had experience with this complex of problems.

Damages and contamination have been predominant removed without further examining the cause.

Testing of Storage and Display Materials in Museums - Methods Used

Testing of Display Materials



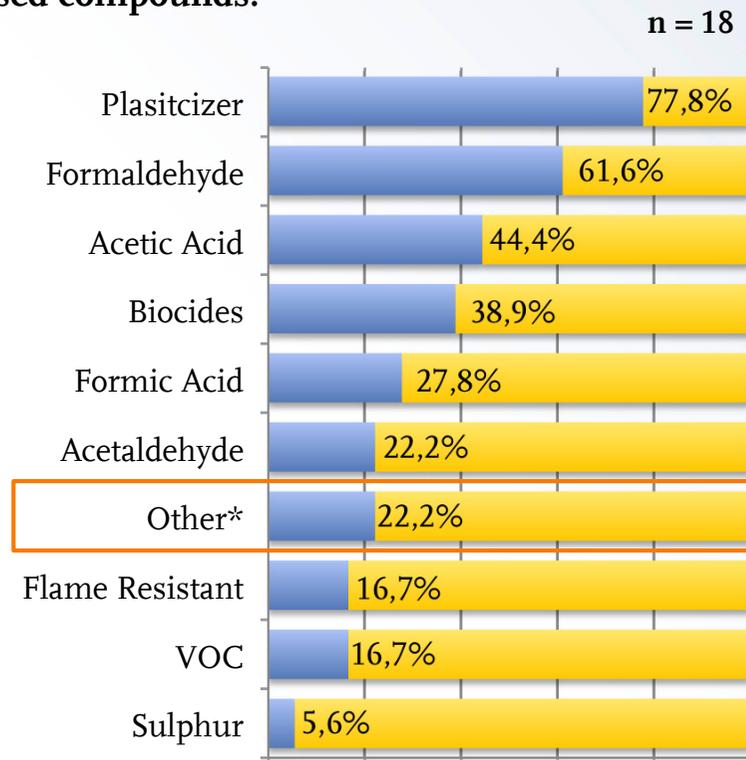
„Other“:

- Experience of the Curator
- Query of Colleague
- Consulting Engineer
- Function-Test
- Field-Test
- Fire-Test
- Testing of Appearance

There is a bright variance of testing methods that have been used to evaluate suitable display and storage materials.

Testing of Storage and Display Materials in Museums - Analysed Compounds

Analysed compounds:



* „Other“:

- Asbestos
- Pest
- Material Property
- Test of „Material neutrality“

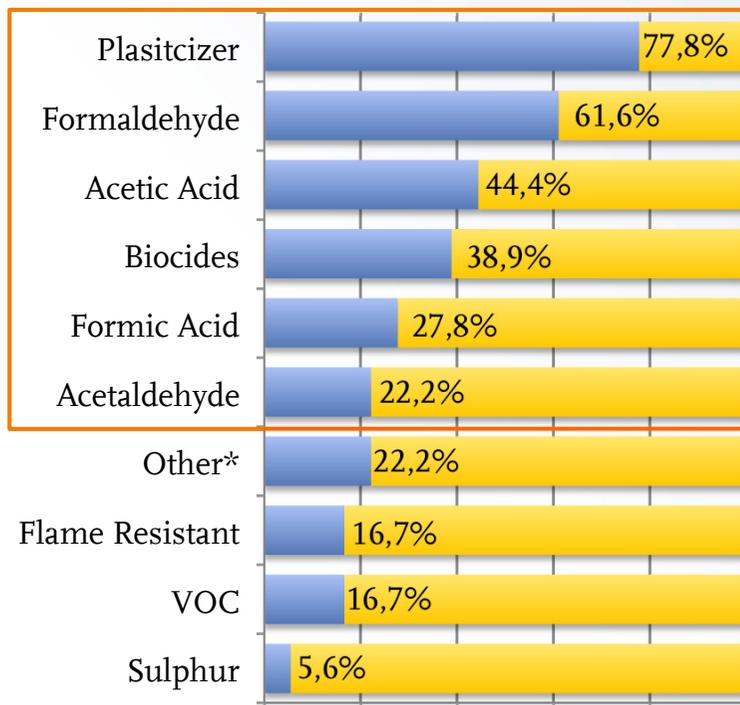
During testing “museum quality” materials, various agents are analysed.

Testing of Storage and Display Materials in Museums

- Example: Security Data Sheet

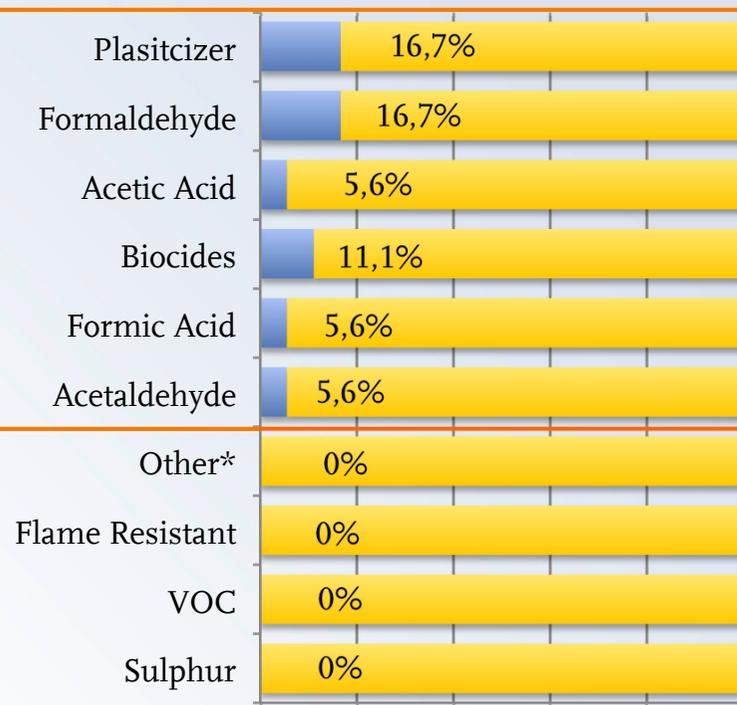
Analysed Compounds:

n = 18



Analysed Compounds by the Use of Security Data Sheets:

n = 18

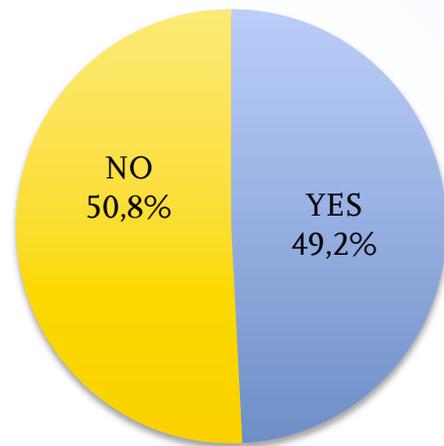


Some of the used methods are not adequate for testing display materials.

Standard Requirements for Display Materials Outlined During the Tenders Call

Call of Pollution Reduced Display Materials:

n = 61



Examples:

*„Substances must be environmentally friendly and not able to be damaging to health. They should not contain **any pollutants that harm indoor air quality.**”*

*„Plasticizers and **pollutants** cannot be distinguished.“*

„Material neutrality.“

„Free of Formaldehyde, no separation of acetic acid for seals.“

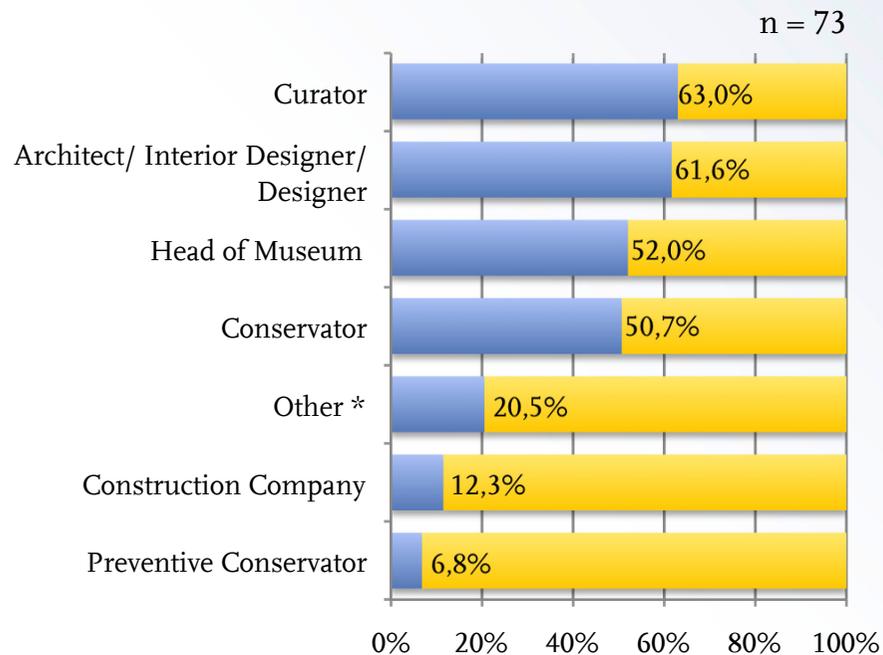
„AGÖF (Work Group for Ecological Research) target value (not possible to establish).“

„Use of inert materials or a negative result using the Oddy-Test .“

During the tender call only half of the museums ask for pollution reduced materials.

The text for invitation to tender is often not to achieve.

Decision maker by the selection of display materials.



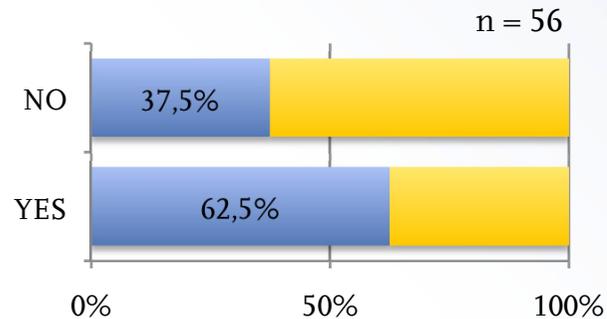
* Other:

- Scientist
- Member of Conservation Department
- Head of Conservation department
- Building Department
- Project Manager
- Depot Administrator
- Head of Engineering Building Services
- Exhibition Engineer
- Head of Exhibition

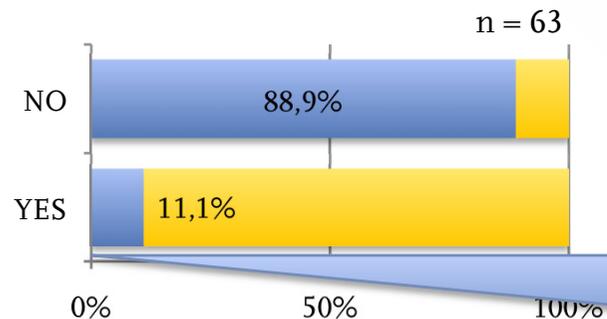
Selecting display materials is done by a group of people that is predominant interested in public relation and aesthetic aspects.

Importance of Standard and Routinized Methods When Selecting Display Materials

Necessity of Standard and Routinized Methods :



Implementation of Standard and Routinized Methods :



What is part of this Standards & which guidelings are used?

Examples:

„1. Evaluation of **security data sheets** by conservator, 2. *Realisation of Oddy-Tests for Materials that are not inert* [...] 3. *Final assessment by scientists, conservator and director of the museum* 4. *in case of doubt qualifid pollution analysis by special laboratory.*“

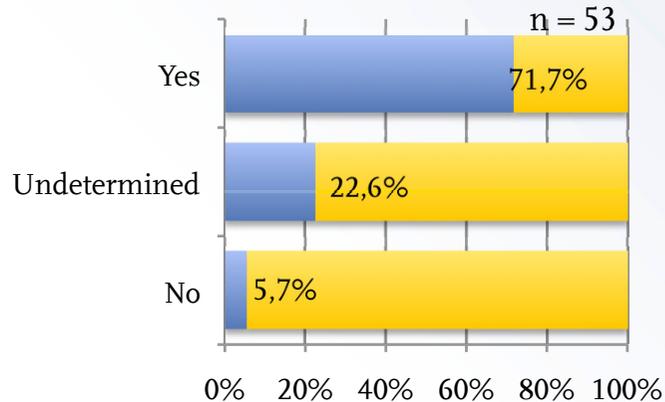
„**Accreditation by 17025**“ => *standard for quality managemnt of laboratories (DIN EN ISO/IEC 17025: Allgemeine Anforderungen an die Kompetenz von Prüf- und Kalibrierlaboratorien)*

„[...] it is not allowed to use **reactive agents**; application of **pollution reduced materials** “

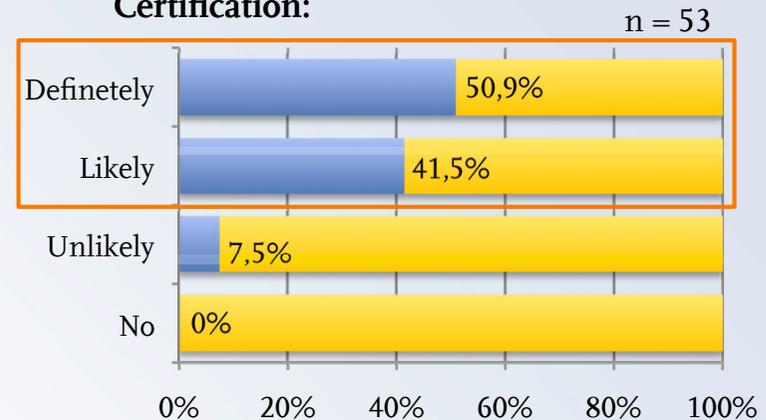
More than 60% think that standardized and routine examinations are worthwhile, but only ca. 10% have quality controls in place.
The used „guidelines“ are various.

Consumer Acceptance for a Seal „Museum Quality“ Materials

Necessity of a Certification:



Preference for Materials with Certification:



High market potential for a "Museum Quality" seal.



Summary/ conclusion

- Problem itself is being taken seriously
 - Material testing in ca. 50%
 - missing guidelines/standards
 - various methods/
 - various agents
 - Call of tender not target-oriented
- ⇒ Contribution of pollution mitigation is small
- ⇒ Standards/seal for „Museum Materials“ desirable & strongly necessary



Thanks to:

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Thanks for Your Attention!



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