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PAS 198:2012

Specification for managing environmental conditions for cultural collections



Collections
Trust



A The National Archives



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Foreword

This Publicly Available Specification (PAS) was sponsored by The National Archives (TNA), with additional sponsorship from Collections Trust, CyMAL: Museums Archives and Libraries Wales, a division of the Welsh Government, and Museums, Libraries and Archives Council. Its development was facilitated by BSI Standards Limited and published under licence from The British Standards Institution. It came into effect on 26 March 2012.

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- Dr David Saunders, British Museum
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- Collections Trust
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This PAS is not to be regarded as a British Standard. It will be withdrawn upon publication of its content in, or as, a British Standard.

The PAS process enables a specification to be rapidly developed in order to fulfil an immediate need in industry. A PAS may be considered for further development as a British Standard, or constitute part of the UK input into the development of a European or International Standard.

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Relationship with other publications

This PAS can be used in conjunction with the following additional publications for the cultural sector:

- PAS 197:2009, *Code of practice for cultural collections management*

PAS 198 is set within the cultural collections management framework given in PAS 197:2009, in particular with respect to collections care and conservation.

- PD 5454:2012, *Guide for the storage and exhibition of archival materials*

PD 5454:2012 references PAS 198 as a specification for managing environmental conditions for cultural collections that can be used by those managing archives. PD 5454:2012 superseded BS 5454:2000, *Recommendations for the storage and exhibition of archival documents* and PD 0024:2001, *Archival documents – Guide to the interpretation of BS 5454:2000 – Storage and exhibition of archival documents*.

- European standard on sites and buildings intended for the storage and use of cultural collections

The European Committee for Standardization has started work on a new European Standard on sites and buildings intended for the storage and use of cultural collections. The work is being conducted through a working group of the European technical committee, CEN/TC/346, Conservation of cultural property. PAS 198 is expected to form part of the UK's contribution to the environmental aspects of this new European Standard.

Use of this document

It has been assumed in the preparation of this PAS that the execution of its provisions will be entrusted to competent people who are appropriately qualified and experienced in the care and management of cultural collections for whose use it has been produced.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in italic type, and does not constitute a normative element. The word "should" is used to express recommendations, the word "may" is used to express permissibility and the word "can" is used to express possibility, e.g. a consequence of an action or an event.

Spelling conforms to *The Shorter Oxford English Dictionary*. If a word has more than one spelling, the first spelling in the dictionary is used.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a PAS cannot confer immunity from legal obligations.

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0 Introduction

0.1 General

PAS 198 has been developed to help collecting organizations meet their responsibility to establish and maintain environmental conditions that preserve the cultural collections in their care for future use and enjoyment. It is a specification for managing environmental conditions for collections and covers temperature, relative humidity, light and pollution. The starting point for users of this PAS is to develop an understanding of the sensitivity of collection items to these agents of deterioration.

This PAS aims to help users make their own judgements about specifying beneficial environmental conditions appropriate to local circumstances. The emphasis is on providing conditions for the materials and structures of collection items that will help prevent rapid deterioration or irreversible damage. Although deterioration cannot be arrested altogether, it can be significantly slowed down. Good management of environmental conditions can extend the lifetime of even sensitive materials.

This PAS also takes account of a move in the UK towards energy restraint, prompted by the international drive to reduce the use of fossil fuels. Annex A explains the thinking that underlies the requirements of this PAS on the relationship between energy economy and environmental conditions. Architectural or engineering aspects of environmental control are beyond the scope of this specification, however, and guidance on building options is therefore not included.

0.2 Background

The development of PAS 198 is in part a response to the statement issued by the UK National Museum Directors' Conference (2009) that "museums need to approach long-term collections care in a way that does not require excessive use of energy, whilst recognising their duty of care to collections. There is general agreement that it is time to shift museums' policies for environmental control, loan conditions and the guidance given to architects and engineers from the prescription of close control of ambient conditions throughout buildings and exhibition galleries to a more mutual understanding of the real conservation needs of different categories of object, which have widely

different requirements and may have been exposed to very different environmental conditions in the past."

This PAS also reflects a debate initiated in 2009 by the UK Arts and Humanities Research Council (AHRC) and UK Engineering and Physical Sciences Research Council (EPSRC) Science and Heritage Programme research cluster "Environmental Guidelines: Opportunities and Risks" (EGOR). One of the outcomes of the EGOR initiative was a recommendation that new environmental standards based on recent scientific evidence should be developed for cultural collections in the UK. These should apply to the range of materials commonly found in archives, libraries and museums, thus going beyond the scope of BS 5454:2000, *Recommendations for the storage and exhibition of archival documents*, which has been superseded by PD 5454:2012, *Guide for the storage and exhibition of archival materials*.

0.3 Approach

Users of this PAS are required to evaluate the sensitivity of their collection items to temperature, relative humidity, light and pollution, recognizing that materials react in different ways to different agents of deterioration, and that collection items are often composite objects with a structure combining a number of different materials. Collecting organizations often need to find ways of dealing with a wide range of material sensitivities. Collection items also often have a history of repair and conservation treatments, which can be relevant when specifying beneficial environmental conditions.

This approach reflects the increasing use of the results of research over the past century into the effects of temperature, RH, light exposure and pollution on the rates of change of collection materials, to determine specific environmental conditions for specific aims, rather than highly prescriptive limits for environmental conditions for all collections.

Users are required to make decisions about suitable preservation environments on the basis of information about a collection, including any available data on its current and past storage and display environment, the materials and structures of collection items and their current condition. Other key factors include the significance of particular collection items in the context

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of the collection, and the impetus to reduce energy consumption. Decisions need to be made in the context of local priorities, and compromises might be necessary.

On the basis of this information, organizations are required to develop an environmental management strategy appropriate to the collection. The strategy will set out an agreed understanding of the "expected collection lifetime", that is, the length of time over which the usable life of collection items can be prolonged by means of preservation measures. The expected collection lifetime depends on the resources the organization decides to invest in its collection items for preservation purposes, taking into account their significance, planned use and display, and the rate at which their constituent material or materials would be expected to deteriorate if no preservation measures were taken. The expected collection lifetime could range from a few years for an ephemeral collection to many centuries.

Against the background of the strategy, organizations are required to set an environmental specification for the collection. Guidance on suitable environments is given in Annexes B to G. The aim of these annexes is to help users estimate the likely impact of environmental conditions on the lifetime over which collection items can be preserved, with the focus on those which because of their component materials or complex structure are recognized as sensitive to temperature, relative humidity, light and pollution. Collecting organizations are required to monitor environmental conditions and take measures to mitigate damage caused by these four agents of deterioration.

In implementing this PAS, a balance needs to be struck between the often conflicting demands of the care of the collection, the use and display of collection items and energy economy. While there are many factors that influence the environmental conditions in which collection items are stored, displayed or transported, PAS 198 aims to provide an effective framework for managing the preservation of collections over the expected collection lifetime as the highest priority.

An illustration of the different parameters to consider when setting environmental conditions for a cultural collection is given in Figure 1.

0.4 Research

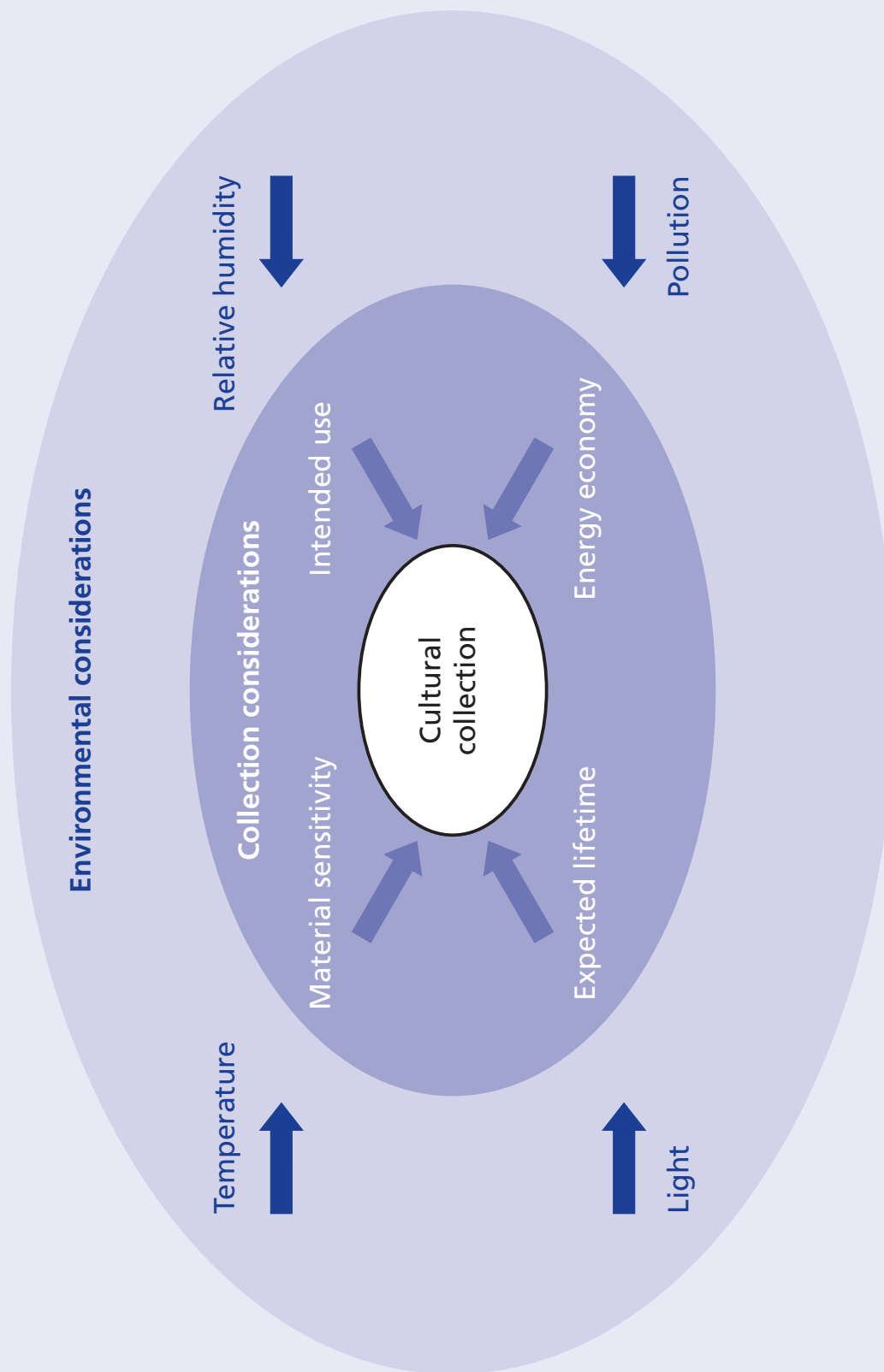
The body of published research relating to the collection environment has grown over the last 10 years. Where possible, PAS 198 refers to research publications with the aim of promoting understanding of the risks to collections arising from decisions on environmental conditions. Heritage science research is sometimes limited since experimental work cannot be carried out on original objects. As scientific research is therefore often reliant on material models or simulated conditions to measure and predict material change, it might not reflect accurately the behaviour of the actual object being modelled or simulated. Therefore, alongside this empirical research, it continues to be important to take account of the experience of, and data collected by, conservation professionals who witness first-hand the changes to objects over time.

It is recognized that research evidence is lacking in some areas, and where this is the case, accumulated professional experience forms the basis for the requirements. Inclusion of a reference recognizes that it reflects the best available scientific evidence at the time of developing this PAS. In view of the gaps in the evidence currently available, it is clear that further research is needed into the response of a variety of materials commonly found in collections to a broad range of environmental factors and the full range of conditions.

Full details of research publications referenced in this PAS can be found in the bibliography, which has been compiled with contributions from experts including members of the PAS 198 Steering Group and Review Panel and members of TNA PAS 198 Working Group.

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Figure 1 – Parameters to consider when setting environmental conditions for a cultural collection



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1 Scope

This PAS specifies requirements for managing the setting of environmental conditions for collection items held in cultural collections in the UK, whether in storage, on display or in transit.

It sets out a framework within which environmental conditions can be specified and methods of achieving them can be determined. It also provides guidance in the form of notes and informative annexes to support collecting organizations in complying with the requirements of this PAS. Such informative material, however, does not constitute a normative element of this PAS.

The areas specifically covered by this PAS include:

- a) the general management of environmental conditions (Clause 3, Annex A and Annex B);
- b) temperature (see Clause 4, Annex C and Annex E);
- c) relative humidity (see Clause 5, Annex D and Annex E);
- d) light (see Clause 6 and Annex F); and
- e) pollution (see Clause 7 and Annex G).

This PAS is applicable to all types and sizes of cultural collections held by individual collectors and all types of collecting organizations such as archives, historic houses, libraries and museums, whether public or private.

It covers the materials and physical structures of collection items but does not cover born-digital material.

It does not cover the architectural or engineering aspects of environmental control.

It is for use by collecting organizations with a responsibility for the environmental management of their cultural collections. It can be used by collection owners, collection and building managers, architects and engineers, archivists, conservators, curators, librarians, registrars, scientists and others concerned with collections care and conservation.

It is also of use to sponsoring and funding bodies and others who need to understand the environmental requirements of collections.

It focuses on climatic conditions prevailing in the UK and therefore is aimed primarily at UK users. However, it does take account of an international readership.