

The PAS 64 is a Publicly Available Specification entitled:

MITIGATION AND RECOVERY OF WATER DAMAGED BUILDINGS - Code of practice

The **BS PAS 64:2013** was published after a two year review period in July 2013.
 It supersedes **BS PAS 64: 2005** now withdrawn.

Standards, contractor diligence and competence in disaster recovery throughout the UK are varied and without uniformity. Severe wide spread water damage events can often result in excessive and unnecessary levels of stripout, deployment of poor or inappropriate drying programs, poor monitoring, insufficient cleaning, air quality issues and an increase in preventable secondary damage. Amongst other issues, this elevates overall costs, extends time lines to completion, increases insurance premiums and increases the environmental impact.

The PAS 64 is a document that will be of interest to any party involved or overseeing recovery and provides a recovery route from the point of damage to handover to the re instatement contractor.

The PAS 64 has been developed to provide the damage management industry with a code of practice and the client with information, guidance and measurable results regarding damage restoration, sanitation and safety. It can be used as a reference document by those involved in recovering water damaged properties to confirm contractors compliance to accepted industry standards and legal obligations.

The PAS 64 has been ratified by the Association of British Insurers, Environmental Protection Agency, the British Damage Management Association, Academia, other leading well known experts and is recognized as industry best practice. This best practice is a route to professional restoration with verifiable results and although contractors are not bound to follow its guidance they should be expected to provide verification of their process. So, whether the contractor is nominated by insurers, loss adjusters or appointed directly, if followed, the PAS 64 will identify a documented route that the initial recovery – drying, indoor air quality and sanitation have been addressed in a professional, competent and diligent manner.

THE PAS 64 DOES NOT provide guidance on the restoration of affected contents other than the implications for drying or restoring the building.

THE PAS 64: 2013: OVERVIEW

Section 2: Pages 1 - 4 Provides an overall scope and lists commonly used terms and definitions.

Section 3: Pages 5 - 9 Details the mitigation and recovery process covering:

- Initial inspection - to determine the management stages and process of recovery.
- Setting drying goals - including timescale to achieve the drying goals.
- Setting cleaning goals – including timescale to achieve the cleaning goals.
- Selection of drying techniques and equipment.
- Selection of cleaning techniques and equipment.
- Assessment on indoor air quality & selection of indoor air quality cleaning techniques.
- Monitoring of drying progress and verifying goals have been met.
- Verification that cleaning goals have been met.
- Verification that indoor air quality goals have been met.

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Section 5: Page 11 Building repair and reinstatement.

Section 4: Page 10 Describes Documentation to be available and / or provided:

Scope of works / estimate.

Internal / external psychrometric records.

Structural material moisture content records.

Work logs – in effect detailed job sheets and equipment logs.

Risk assessments – **including Health /Decon risk assessments** – which must be acted on.

Electric and gas readings or calculations of usage.

Completion certificates - for drying, cleaning and air quality and validation data for each.

Provision of a hand off document to the re instatement contractor (Example – Annex 4).

Outlines the comprehensive information that the **damage management contractor (DMC)** should provide in the hand off document to those following on.

Pages 12 / 13: Gives an example of an initial inspection form that a DM contractor would be expected to undertake.

Page 14: Suggests a useful plan to give visual representation of moisture conditions. Good monitoring techniques will identify areas of concern and identify potential for secondary damage which must be addressed.

Authors Note: Professional **DMC's** will have their own documents to cover the detail of the previous two para's and which may be more comprehensive or in a different format than the examples shown.

Pages 15 – 18: Outlines guidance on the stripping out of structural materials.

Authors Note: The unnecessary and often wholesale stripping out of structural materials has become a major concern over the last decade especially as Insurance procurement routes have driven unit costs for the recovery and reinstatement industry. Such stripout leads to extended time out of the building for the occupants, escalating claim costs for the insurer or owner and increases environmental impacts - which affects everyone. The PAS 64:2013 outlines guidance on conditions that warrant stripping out, the actions to consider, inspection and drying options.

As a rule, only vapour barriers and failed or permanently compromised structural components need to be removed. Inappropriate or poorly selected drying methods especially in cold weather situations – can often lead to secondary damage, extended drying times and give a smoke and mirror cloak to the decision to hack off plaster, remove floors and remove other components.

Pages 19 -20: Covers sources of water damage and their health risks

General information - highlighting the potential for secondary damage caused by delays.

Categories of water damage.

Authors Note: Delays in progressing a water damage claim – howsoever caused – can escalate the category resulting in increased health risks. Delays will also increase the potential for secondary damage.

Continued...

Page 21: Surveying for practical moisture measurement.

Describes general information and guidance for moisture measurement and thresholds and makes a very important point that **to maintain equilibrium between the structure and the environment once drying equipment has been removed** is critical. This may mean installation of a conditioning program by the re instatement contractor after the point of handover.

Page 22: Gives examples of basic drying progress records.

Authors note: This section describes the importance of detailed measurement and records over the time line of the drying phase. The importance of this information cannot be over emphasised as compliance may prevent unnecessary secondary damage, realisation of inherent or construction defect and of course suitability and efficiency of the drying program.

Page 23 – 26 Covers moisture measurement.

Describes types of electrical moisture meters and moisture test equipment.

Describes the importance of moisture profiling.

Describes Hygrometer testing for dampness of concrete, cementitious and anhydrite bases.

Authors Note: The emphasis in this section is on the benefits and shortfalls of different measurement techniques. Historically there has been an unfounded reliance on simple pin meters designed to measure moisture content of wood. These meters cannot provide the necessary information in many of the materials encountered such as concrete, masonry etc.

Page 27 - 29: Covers general decontamination clearance

Gives a general guidance to surface decontamination and cleaning practices - it recommends that where chemical sanitisers or disinfectants are used that COSHH – the control of substances hazardous to health regulations 2002 (13) should be followed.

Authors Note: The use and application of chemicals with potential long lasting residual effects is recognised as an additional burden to the indoor air quality and possible sensitivity of building occupants over time. Source removal of contamination – ie silt or debris, which includes mould and bacteria is industry best practice and DMC's should ideally provide alternative decontamination protocols which limit the environmental impact. All contaminated surface cleaning should be verified with **a completion certificate detailing the levels of hygiene attained.**

Page 30- 31: Covers Indoor Air Quality

Outlines consequences to exposure to poor indoor air quality after a water damage incident and provides information on visual inspection, environmental sampling, decontamination, cleaning practices and air quality goals.

Authors note: It is recognized that even dead mould and bacteria have possible health consequence to the atopic* population which is estimated at between 10 and 40% of the population. The PAS 64:2013 identifies the need for the DMC to **complete an occupant health /decon risk matrix**. This assessment should be undertaken by the DMC **prior to starting his work at every visit. Where the score shows an unacceptable risk an appropriate independent indoor air quality specialist should be directed to oversee the decontamination of the property.**

A professional damage management company will undertake ongoing air quality surveys during their time on site. Air quality should be verified with **an air quality verification certificate**.

* Those predisposed toward developing an allergenic hypersensitivity reaction.

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A useable health/ decontamination risk matrix is included at the end of this document.

Pages 33 -36: Describes drying methods, systems and equipment.

This section describes the types of drying technology available and for the first time recognizes the **Convectant heat drying process**. (en.wikipedia.org/wiki/Convectant_drying).

Authors Note: Convectant drying is a modern speed drying technology that overcomes the known inefficiencies of traditional refrigerant and desiccant dehumidifier technology.

Page 37: Gives example of an environmental impact assessment.

Gives general information to be considered when selecting the drying process – such as power usage of equipment selected or CO₂ emissions for the drying duration using the chosen technology.

Gives an example of an environmental impact assessment.

Authors Note: An assessment should be available from the damage management technician if requested.

Page 38 - 40: Cost benefit assessment and consequential impact from drying process selected.

Outlines general information based on the effectiveness and choice of the mitigation and recovery processes. It gives a cost benefit example for power usage of the drying program, strip out - v - replacement costs and the consequential impacts. Such information can be an important development for the owner of a damaged property as it allows for a drying method comparison and thereby control of the recovery route selected.

Authors Note: Although commonly overlooked when comparing against or using preferred supplier cheapest unit cost or room rate, the most appropriate and correctly deployed drying equipment or program – sometimes appearing to cost more initially - plays a major part in the reduction of property strip out and downtime thus reducing the overall cost of recovery and environmental impacts. A benefit of modern heat drying air exchange drying techniques is that they can help deal with air quality issues.

Page 41 e 42: Covers Drying goal data.

Gives examples of a chart that could be expected to show progress of the drying trend to goal.

Gives examples of psychrometric calculations which allow for comparisons and understanding of conditions within the target areas. Such information allows the DMC to alter, change, increase, reduce or remove his drying program.

Page 43: Example Completion Certificate.

Gives an example of the completion certificate:

Authors Note: All drying, air quality and hygiene completion certificates should be accompanied by comprehensive verification data or the certificates will be meaningless – **ALWAYS insist on such data.**

Page 44 – 46: Example of an informative leaflet for building owners or occupiers

Provides an example of a PAS 64 information leaflet that the diligent professional damage management contractor would hand out to property owners and occupiers. Each DM contractor may have their own version.

SUMMARY: The PAS 64 : 2013

WHAT YOU SHOULD BE EXPECTING FROM ANY COMPANY WHO IS EMPLOYED TO INITIALLY CLEAN, DECONTAMINATE AND DRY YOUR FLOODED BUILDING.

Continued...

- 1: **Timely response** to your call out from instruction. There is NO excuse for unreasonable delays in attending the damaged building. Delays cause secondary damage and increase the overall cost.
- 2: **A thorough Inspection** / walk through of your property obtaining information to put together a full report / scope of works identifying the most cost effective and appropriate route to recovery. The initial report should also include a health / decon risk assessment. The health / decon risk assessment will identify areas of concern and provide an overall score which should be acted on appropriately.
- 3: **Provision of standard prices or ideally a written estimate** based on the scope of works - to include details of the costs for labour, the cleaning & decon program, the drying program AND the monitoring and air quality testing program.
- 4: **Information** on making safe by removal of permanently compromised structural materials or vapour barriers that would inhibit drying.
- 5: **Identification and inclusion of the most appropriate drying program** which should also seek to prevent secondary damage such as mould proliferation. The program should also include room or area containment plans to prevent cross contamination of any dust or mould spores. If required the drying technician should be able to provide a comparative cost benefit analysis of drying methods to show the selected method is the most appropriate.
- 6: **Planning and Provision for a meaningful monitoring program** to monitor the state of hygiene, air quality and the drying out appropriate for the level of damage. Any provision should include:
 - (1) A comprehensive **drying record** ideally using several monitoring techniques.
 - (2) **Hygiene test record** – using ATP or swabs or in lesser damage, simply a white glove test.
 - (3) **Air quality test record** to quantify pre clean and post clean fungal biomass and other contaminantns.
- 7: **Regular visits to monitor the drying program** (unless being monitored remotely).
- 8: **Availability of comprehensive detailed job sheets** to detail and record works undertaken, hire information, associated information and mandates. (The technician will usually ask you to sign such a job sheet at the time of visit).
- 9: **Reassurance that secondary damage has been contained or prevented.**
- 10: **Regular updates** to allow for decision making.
- 11: **Provision of a comprehensive and transparent invoice** on completion breaking down all the components of the works and processes undertaken.
- 12: Where appropriate: Provision of :
 - (1) **A surface hygiene certificate with verification data if applicable.**
 - (2) **An air quality certificate with verification data if applicable.**
 - (3) **A drying certificate with verification data and exclusions if applicable.**
- 14: **Contact details:** Company / technician / sub contractors contact details etc.
- 15: **Clearance of all rubbish associated with his works** – Rubbish removal requires the tech to have a waste carriers licence and to provide waste transfer notes as applicable for waste in their care.

END.

INITIAL HEALTH RISK & DECONTAMINATION ASSESSMENT

For guidance purposes only

WATER CATEGORY	EXTENT OF DAMAGE	ELAPSED TIME	VISIBLE DETRITUS	RH
NOT APPLICABLE (N/A)	CONTAINED	DRYING PROGRESSING	NONE	< 60%
CLEAN	LOCALISED TO SMALL AREA	<24 HOURS	LIGHT	> 60%
GREY	LOCALISED BUT SPREADING	24 - 48 HOURS	MODERATE	
BLACK	SEVERAL AREAS AFFECTED	2 - 5 DAYS	HEAVY	
CONTROLLED	THROUGHOUT ONE LEVEL	LONG TERM	SEVERE	
	THROUGHOUT PROPERTY			
SCORE TO BE CARRIED FORWARD				

VISIBLE MOULD PROLIFERATION	LIKLIHOOD OF HIDDEN MOULD	RECOGNISED SUSCEPTIBLE OCCUPANCY	OCCUPANTS CLAIM SYMPTOMS	SHOULD OCCUPANTS BE RELOCATED	STANDARD OF CLEAN EXPECTED OR NEEDED
NONE VISIBLE	UNLIKELY	PROPERTY UNOCCUPIED	N/A	N/A	NONE
N/A	POSSIBLE - INVESTIGATE	FUTURE VISITORS	NO	NO	MINIMAL
LEV 1 - isolated area < less than 0.93 sq mt	EXPECTED TO BE MINIMAL	NO	YES	YES	VISUAL CLEAN ONLY
LEV 2 - Mid size isolated areas 0.93 - 2.78 sq mt	EXPECTED TO BE MODERATE	YES			TECH CERTIFIED CLEAN
LEV 3 Large Isolated areas 2.79 - 9.23sq mtrs	EXPECTED TO BE SEVERE	WORKFORCE DECONTAMINATING			HYGIENIST CERTIFIED CLEAN
LEV 4 - Extensive contamination greater than 9.23 sq mt		KNOWN ATOPIC			ADVISED BY CLIENT - NO CLEAN -
SCORE TO BE CARRIED FORWARD					

TICK	RISK CATEGORY SCORES TOTAL	OVERALL SCORES TOTAL
<input type="checkbox"/>	ACCEPTABLE < 22	Remediation can be conducted by the TECHS as long as they are trained on proper clean-up methods, personal protection, and potential hazards.
<input type="checkbox"/>	TOLERABLE 22 - 29	Remediation can be conducted by the TECHS as long as they are trained on proper clean-up methods, personal protection, and potential hazards.
<input type="checkbox"/>	UNACCEPTABLE >30	Environmental health and safety professionals with experience performing microbial investigations and/or mold remediation should be consulted prior to remediation activities to provide independent oversight for the project. Abatement personnel must be trained in the handling of hazardous materials and be equipped with appropriate PPE and engineering controls.

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PAS 64 - DAMAGE MANAGEMENT CONTRACTOR - CHECKLIST

NB: Score total to be assessed on completion of the contractors works

Date	Task		YES	NO	N/A	SCORE
	Timely attendance from original instruction	At start				
	Provision of Company details and contacts etc	At start				
	Provision of PAS 64 information	At start				
	Provision of a health / decontamination risk assessment, score and recommendations	At start				
	Provision of surface cleaning / hygiene program if appropriate to incident	At start				
	A: Provision of standard pricelists	Score either A or B				
	B: Provision of written estimate					
	Provision of overview report	At start				
	Information on stripout of structural materials or vapour barriers VERBAL OR WRITTEN OK	At start				
	Cost comparison if appropriate - to determine the most cost effective drying regime - to include the electrical running cost of the program	ASAP To validate program				
	Provision of meaningful monitoring program to include where appropriate methods from (C - J) below	As drying commences				
	C: Electrical moisture meter for relative scale moisture readings and comparison	Ongoing				
	D: In depth ERH measurement for components such as brick, block, concrete.	Ongoing				
	E: Surface ERH measurements for components such as brick, block and concrete	Ongoing				
	F: Calcium Carbide AMC measurements for components such as brick, block and concrete	Final testing				
	G: Environmental conditions measurement & record	Ongoing				
	H: Salts testing if inherent damp suspected.	If inherent damp suspected				
	I: Thermal imaging scan if appropriate	As needed				
	J: Remote recording of components from c,d,e,g	If deemed appropriate				
	Provision of drying certificate with verification record	After completion				
	Weekly visits to monitor unless remote monitoring used	Ongoing				
	Installation of air quality control program if appropriate	As soon as				
	Provision of air quality monitoring program if appropriate	As soon as				
	Provision of air quality certificate and verification record	After completion				
	Provision of hygiene certificate if appropriate with verification record	After completion				
	Inspection to confirm no visible mould proliferation	After planned decontamination				
	Regular updates on progress	Ongoing				
	Power usage estimate or meter readings recorded	At time of invoice				
	Removal of all waste availability of waste transfer notes	On demand				
	Provision of comprehensive job sheets and hire record.	On demand				
	Provision of transparent invoice calculation breaking down all component parts to be totalled on the invoice	With invoice				

GUIDE: SCORE TOTAL: LESS THAN 62 - GOOD STANDARD OF SERVICE
 ASSESS CONTRACTOR ON COMPLETION ABOVE 62 - REQUEST EXPLANATION & ADDITIONAL PROTOCOLS
TOTAL SCORE

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