

DIY Mould Removal



This DIY guide provides basic information and guidance for those considering removing mould in their own homes.

The guide has been designed to highlight the risk all humans and animals face from exposure to mould - especially those who are chemically-sensitive or sensitised to mould. Everyone would benefit from following the guide instead of using off the shelf remedies that can exacerbate matters.

The UK's Health and Safety Executive (HSE) lists mould (fungi) as an occupational hazard in Health and Safety law - the Control of Substances Hazardous to Health Regulations 2002 (COSHH). HSE includes common water damage species of mould as human pathogens on its approved list of biological agents. By law, workers must be protected or protect themselves and others from biological agents, such as mould.

Just like the hazardous substances such as asbestos and lead, exposure to mould - even small amounts over time - can be hazardous to our health.

Health risks from mould will be dependent on:

- The species of mould
- The dose (the amount of mould a person is exposed to)
- The duration of exposure (how long a person is exposed)
- The frequency of exposure (how often a person returns to the mould exposure)
- Individual biological differences in those exposed (specific vulnerabilities e.g. immunocompromised)

Please remember mould **WILL** return no matter how well you remove or clean it if the underlying damp or humidity issues are not resolved.

Please seek professional help if your mould situation is unmanageable.



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What would a professional remediator do?

Professionals who have been adequately trained in mould remediation will treat mould as a potential hazard to health and implement control measures to prevent spreading it. They will start with a full risk assessment before taking action to protect themselves and others from inhalation and other routes of exposure (mucous membranes, skin absorption and ingestion).

Control measures and safe practices would include:

Containment - Ensuring microscopic particles do not spread requires the use of high grade filtered Local Exhaust Ventilation and/or creating enclosures around the work area, usually with polythene sheeting to prevent air exchange and cross-contamination of adjacent areas.

Pressure Differentials - This is a technique where Air Filtration Devices or Negative Air Machines (also referred to as 'air scrubbers') are deployed to clean the air as work is carried out. These filter and / or eject filtered air while reducing the air pressure in the work area, ensuring that contaminated air does not flow out of the work area into other areas.

Completed (decontaminated) rooms are often pressurised relative to surrounding rooms so contaminants do not float into them from adjacent work areas.

Vacuuming - Professional H-class vacuum cleaners with High Efficiency Particulate Air (HEPA 14) filters would be used to ensure that whatever is vacuumed up from surfaces with one end of the machine, is not discharged into the atmosphere for recirculation from the other end of the machine.

Demolition and Disposal of Material - Many visually contaminated materials (e.g plasterboard, wallpaper, textiles) must be physically removed after vacuuming. Such materials would be encapsulated (wrapped or bagged up) and the bag exteriors would be decontaminated before removal from the work area to avoid contaminating surrounding rooms that may not be affected. Once outside the building, mould can be treated like compost.

Personal Protective Equipment (PPE) – Professional remediators will wear appropriate eye protection, gloves and hooded overalls to avoid contaminating their own clothing and prevent exposure through their own skin, eyes and ears. Shoe covers will also be included for their footwear. The footwear may also be safety footwear in areas where there are hazards which may cause injury to feet.

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Respiratory Protective Equipment (RPE) - This is a subset of PPE but warrants a separate discussion. The minimum standard for a biological hazard will be FFP3 (Filtering Face Piece) which protects the user from 99% of the particulates in the air. FFP1's give 80% protection and FFP2's give 94% protection and would not normally be considered as suitable and sufficient for mould remediation.

Ideally, a respirator which is close fitting or will be used for the highest level of protection. Furthermore, these protection percentages are also conditional on the wearer having been fit-tested by a professionally certified fit-tester to ensure that the style of respirator seals properly to the wearer's face.



FFP1



FFP2



FFP3



Close fitting
full face mask
with HEPA filter
cartridges



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Contents Cleaning – Whether items can be cleaned or whether they should be disposed of depends on whether there is visible growth on them and whether they are

1. Porous type 1 - items that are machine washable
2. Porous type 2 - items unable to fit in a washing machine
3. Semi-porous - Unfinished wood items, for example
4. Non-porous - Glass or plastic, for example

As long as there is no visible mould growing on them, porous items that may be easy to clean include items such as clothes, bedsheets and curtains if they are machine washable (type 1), but porous items that are likely to have to be disposed of will be items like mattresses, pillows, sofas, etc. (type 2).

Non-porous items with visible mould growing on them may be decontaminated. Semi-porous contents would typically be unfinished wood items.

For the professional cleaner the cost of restoration of any item is calculated against the item's replacement value. Organising decontamination of contents is a complex process. Contents can be cleaned outdoors in the fresh air, which is usually best, but weather dependent.

Chemicals – Most trained mould remediation professionals will not use anti-microbials (spraying or fogging, for example) before they have removed all physical traces of mould. They would most certainly know not to use chlorine bleach (sodium hypochlorite).

Mould is a territorial organism and one of the few on our planet that engages in chemical warfare to defend its territory against other moulds. Applying chemicals designed to “kill” mould is likely to solicit chemical retaliation and sporulation (the release of spores).

Including the chemical being used, the combination of chemicals now being released may result in a synergistic effect and make the things much worse.

Chlorine bleach must not be used.

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The safest* antimicrobial that could be used would be Hydrogen Peroxide. An application of hydrogen peroxide at 6% to 8% is enough to destroy mould residues but the chemical residues from the peroxide itself reverts to water and oxygen. No rinsing is required. Just a light spray for coverage and let it dry on its own. Hydrogen peroxide should only be used on colourfast surfaces, or they may be bleached to a lighter colour.

*HSE lists terms that are considered to be misleading and must not be used when advertising biocides including:

- low-risk
- non-toxic
- harmless
- natural
- environmentally friendly
- animal friendly
- any similar terms

The DIY Option

Removing mould yourself without employing a paid professional will save funds but carries risk. Chemically-sensitised persons and persons already experiencing any ill-health from mould contamination should not be involved in this work.

Cross-contamination between rooms and poor decisions on which items of contents to clean or dispose of could be a contributing factor to continued poor indoor air quality and ill-health.

In undertaking mould remediation, the aim is to achieve a Condition 1 in every room in the property. The following are definitions as stated in the ANSI/IICRC S520 Standard for Professional Mold Remediation: 2015 - 3rd Edition.

Conditions 1, 2, and 3 are defined for indoor environments relative to mould.

- Condition 1 (normal fungal ecology): an indoor environment that may have settled spores, fungal fragments, or traces of actual growth whose identity, location, and quantity are reflective of a normal fungal ecology for a similar indoor environment.
- Condition 2 (settled spores or fungal fragments): an indoor environment which is primarily contaminated with settled spores or fungal fragments that were dispersed directly or indirectly from a Condition 3 area, and which may have traces of actual growth.
- Condition 3 (actual growth): an indoor environment contaminated with the presence of actual mold growth, associated spores, and fungal fragments. Actual growth includes growth that is active or dormant, visible, or hidden.

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Getting prepared

Armed with some of the key background information above, the following is a summary of the main considerations before you get started:

- How much mould growth is there? Some publications suggest that professional help is not required unless the amount of mould growth is over one square foot - some say a square meter. However, it is not that simple. One square foot of one species of mould could be much more hazardous than another species. A small amount of mould is enough to trigger a reaction in a person who is sensitised. Small amounts of mould on bathroom tiles and grout may be a perfect opportunity for DIY but you should still exercise caution.
- Is the person proposing to do the work fit and able? Persons who are mould sensitive or chemically-sensitive should not undertake the work.
- Is your vacuum cleaner up to the task? Vacuuming is the first step of mould remediation. Will it exhaust mould into your airspace instead of capturing it? Homeowners will typically not own an adequate HEPA vacuum cleaner, never mind an H-Class vacuum cleaner even if the manufacturer claims that their device is of a HEPA standard. Bagless machines, whether 'HEPA' or not, are inadequate for biological hazard clean-up. See above for details on the right vacuum cleaner. If you are unable to access the right vacuum, alternatively, if your vacuum has a long enough hose, ensure the exhaust of the vacuum is outside.
- What level of PPE/RPE is available to you? Remember that a relatively expensive FFP3 respirator may not be much better than a cheaper mask if it does not fit your face properly or you do not wear it correctly. Are you healthy enough to wear a respirator? Respirators DO restrict airflow to the lungs. Note: All FFP's will be CE marked and will have straps that go around the back of the head. If the markings include the letters NR that also means they are NOT REUSEABLE, i.e., single use only. You should also not wear an FFP respirator continuously for more than an hour.
- How will you contain the spread of invisible mould spores and hyphal fragments as you work? Will you make other rooms worse and contaminate more contents as you attempt to make one room better? Consider containment and air pressurisation advice above.
- How do you know if or when you achieve condition 1? You might like to consider air testing. Contact Indoor Air Aware for air testing advice.

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The Clean-up Procedure

If you are determined to do this, subject to:

- a) all the considerations above, and
- b) all the control measures you have decided that apply to your own home situation

The next steps would be as follows:

- Vacuum all mouldy surfaces using the best HEPA vacuum cleaner you have been able to get. Loose spores and hyphal debris should lift from the surface and fly into the vacuum. A no-touch technique should be used - keeping the nozzle of your vacuum cleaner hose a few millimetres from the surface without touching the mould. You should not touch any mould growth with brushes or other attachments.
- Using a microfibre cloth and a bowl of water (ideally deionised water as tap water has chlorine in it), wash down any mould that has not flown into the vacuum with clean water. Dispose of the cloth after use.
- Any residual surface staining can then be washed with warm soapy water - a few drops of liquid soap work well. Try not to douse the area as it will take longer to dry.
- Unfinished wood may be sanded. Mould only grows to a depth of about 0.1mm to 0.2mm (100-200 microns) on wood. Other types of fungi (rots) are responsible for decay.
- Vacuum ALL remaining surfaces – building and contents. If contents have been removed from a room, they should not be returned until they have been cleaned and the room has been cleaned.
- Decisions relating to dealing with contents are provided above. Ideally, contents should be removed and should be cleaned in a controlled area or outdoors and returned to their location, clean, avoiding cross contamination.
- When all mould removal has been completed, an antimicrobial (disinfectant) product may be used. A pressurised sprayer (the kind that might be used for spraying the roses in the garden) could be used. Alternatively, a hand trigger spray would work. Beware - use of such products may present an issue for chemically sensitive persons.

Final word

Be wary of products claiming to be 'mould removers' or 'mould killers' - some even claim they can 'magic mould away' - and other solutions like ozone and fogging. None of these are likely to work unless you have carried out a thorough and careful job in physically removing the mould.

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References

Most of the information provided in this document is from knowledge acquired over many years in the cleaning and remediation industry. However, the foundation of this knowledge and some of the references made, comes mainly from the following documents:

- ANSI/IICRC S500:2021 Standard for Professional Water Damage Restoration 5th Edition
- ANSI/IICRC S520:2015 Standard for Professional Mold Remediation 3th Edition ANSI/IICRC R520:2015 Reference Guide for Professional Mold Remediation 3rd Edition
- BS: PAS 64:2013 Mitigation and recovery of water damaged buildings – Code of practice
- The Health and Safety at Work Act 1974
- The Control of Substances Hazardous to Health Regulations 2002
- Personal Protective Equipment at Work Regulations 1992
- HSE: Respiratory Protective Equipment - HSG53
- HSE: The Approved List of biological agents: 2021

Acronyms

ANSI = American National Standards Institute (USA equivalent of BSI)

IICRC = Institute of Inspection Cleaning and Restoration Certification

BSI = British Standards Institute

HSE = Health and Safety Executive

This guide was prepared in association with The Restoration Academy UK Limited and is based on the information sheet 'Mould DIY' available here: <https://www.the restorationacademy.co.uk/wp-content/uploads/2022/12/Mould-DIY-21-12-2022.pdf> authored by Director Adam Jankowski, MBICSc FISSE MISSE Tech IOSH, Director of The Restoration Academy UK Limited and expert advisor to the UK Centre for Mould Safety.



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