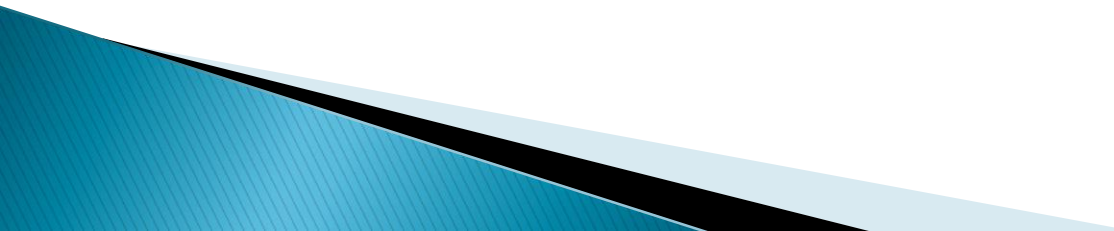




Sustainable housing, Department of Environmental Health 2016, 4th Year

# Dampness, Mould and Asbestos Hazard


# Structure

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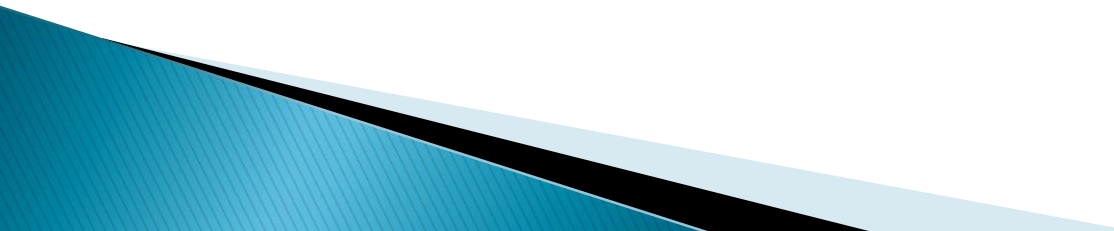
# Dampness and Mould

Accommodation building is one of those basic social conditions that determine the quality of life and welfare of People and places.

A number of studies have found links between damp building and the present of mould and high rates of asthma and respiratory illness, especially among children.

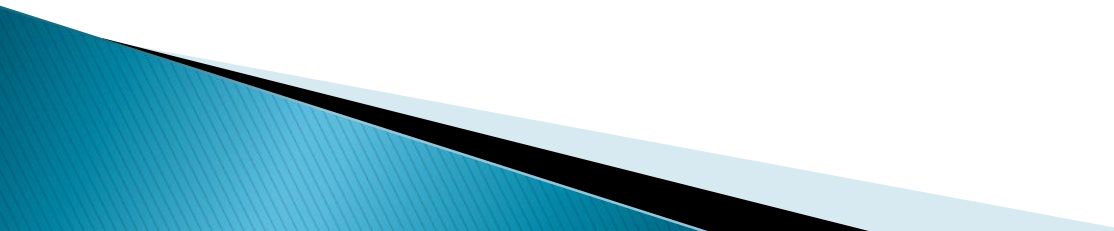


In the case of elderly people, it has been argued that damp and cold building are an important factor in excess winter deaths in Britain and not just in the extreme form of hypothermia, but also in increases susceptibility to coronary and central thrombosis and respiratory disease.



Damp is one of the major contributor to mold growth, mildews, bacteria, and insects, as well as contaminated ventilating, and air-conditioning (HVAC) systems which can distribute these contaminants through the building.


Mold and mildew are forms of musty-smelling fungi that thrive in moist environments.



They grow, penetrate, and infect the air we breathe.

There are thousands of species of molds, which include pathogens, saprotrophs, aquatic species, and thermophiles.

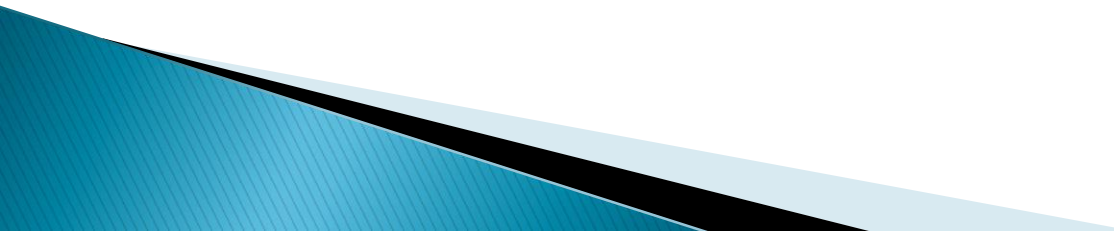
Molds are part of the natural environment growing on dead organic matter and are present everywhere in nature; their presence is only visible to the unaided eye where mold



colonies grow.

The key to controlling indoor mold growth is to control moisture content and the temperatures of all surfaces.

Mold generally needs a temperature range between 40 and 100 °F to grow, and maintaining relative humidity levels between 30% and 60% helps control mold and many of these known biological contaminants.



Exposure to fungus in indoor air settings has emerged as a health problem of great concern in both residential environments and workplaces. Fungi are primitive plants that lack chlorophyll and therefore feed on organic matter

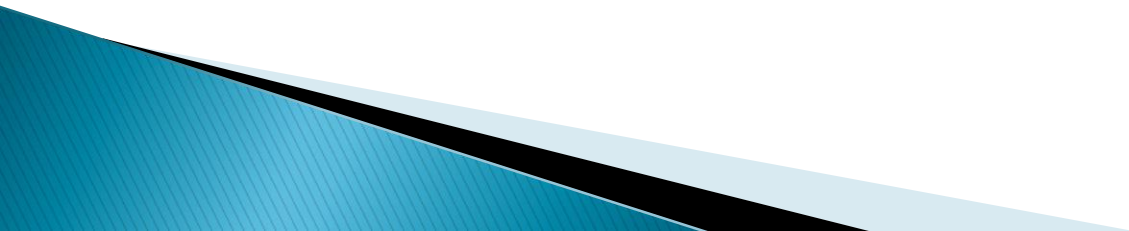
which they digest externally and absorb, or they must live as parasites.





True fungi include yeast, mold, mildew, rust, smut, and mushrooms.


When mold spores land on a damp spot indoors, they can grow and start digesting whatever they are growing on.



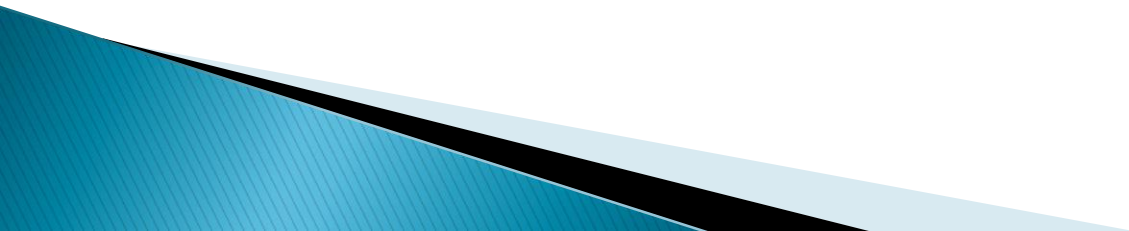
# The effects of Damp and Mold on Health

Mold is the main home-related trigger for Asthma. It is an *Aspergillus* species, tends to grow where there is moisture, and therefore the two prime locations for mold formation are the kitchen and the bathroom.

Mold triggers asthma by releasing. mycotoxin-containing spores into the indoor atmosphere



Once inhaled, these mycotoxins can inflame the pulmonary tissues causing asthma

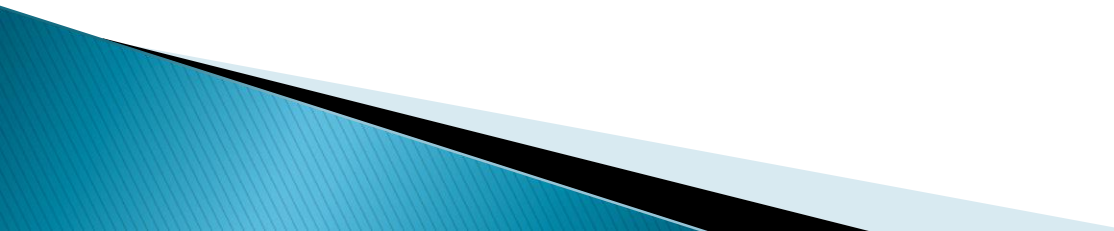


# Table 1 – List of typical Molds Found in damp Buildings

Fungal species	Substrate	Possible metabolites	Potential health effects
<i>Alternaria alternata</i>	moist windowsills, walls	allergens	asthma, allergy
<i>Aspergillus versicolor</i>	damp wood, wallpaper glue	mycotoxins, VOCs	unknown
<i>Aspergillus fumigatus</i>	house dust, potting soil	allergens  many mycotoxins	asthma, rhinitis, hypersensitivity pneumonitis toxic pneumonitis infection
<i>Cladosporium herbarum</i>	moist windowsills, wood	allergens	asthma, allergy
<i>Penicillium chrysogenum</i>	damp wallpaper, behind paint	mycotoxins  VOCs	unknown  unknown
<i>Penicillium expansum</i>	damp wallpaper	mycotoxins	nephrotoxicity
<i>Stachybotrys chartarum (atra)</i>	heavily wetted carpet, gypsum board	mycotoxins	dermatitis, mucosal irritation, immunosuppression


# Mold assessment and remediation

The method involved in assessing and eliminating the mold includes:

1. Determine the growth's root cause
  2. Evaluate the extent of the growth, this can be done through visual examination, use instruments such as moisture meters, thermal imaging equipment, or borescope cameras to identify moisture in building materials or “hidden” mold growth
- 

Toxic molds and fungi are a significant source of airborne VOCs that create IAQ problems, as can be seen in figure 1 and 2.

Toxicity can arise from inhalation or skin contact with toxigenic molds. Some molds produce toxic liquid or gaseous compounds, known as mycotoxins, in addition to infectious airborne mold spores that often cause serious health problems to residents.



Mold on a ceiling growing out of control; this can be found in damp buildings






## Mold remediation expert examining mold infestation prior to writing remediation estimate






# *Asbestosis*

*Asbestosis* (asbestos– is widely used in construction industry, caused lung disease) is progressive and often severe. Following an initial latent period measured in years, patients develop diminished lung function with consequently reduced oxygen transfer to the blood. The shortness of breath (dyspnea) that results may be incapacitating. Ultimately, the condition is lethal in many patients.



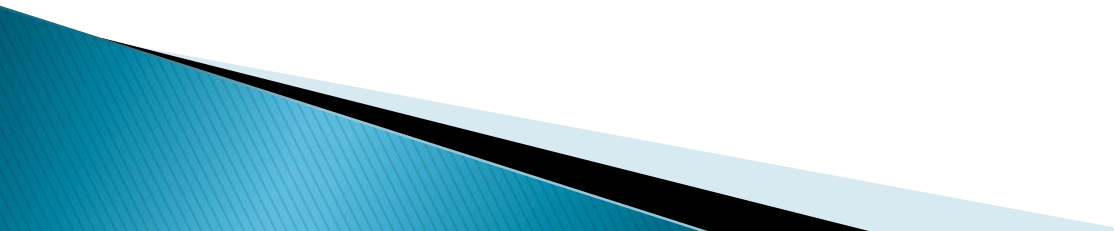
In addition, patients with asbestos-related lung disease are at greatly increased risk of lung cancer and an otherwise rare malignant tumour called mesothelioma.

Lung cancer and mesothelioma that occur because of asbestos exposure are extremely lethal. Except in the few cases

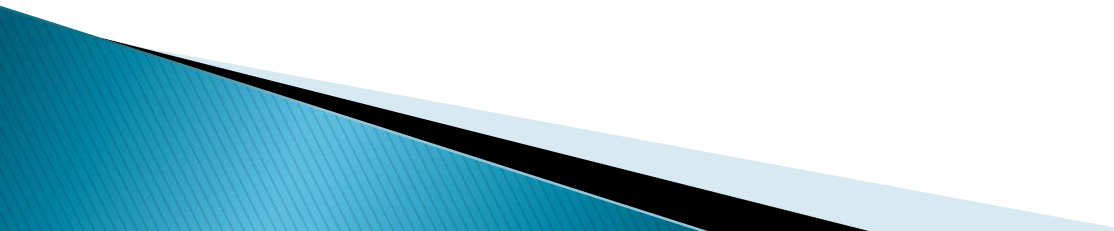


that may be cured surgically, existing treatments are not very effective.


Part of the syndrome of asbestosis is proliferation (abnormal growth) of cells in the membrane or pleural that lines the outer surface of the lung and the inner surface of the chest cavity.



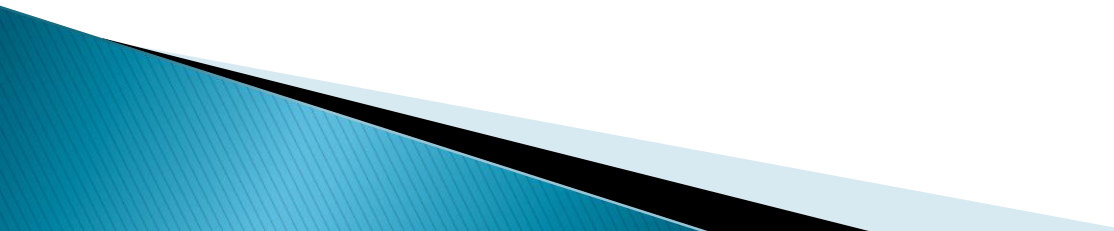
The pleural membranes are made of a tissue called mesothelium ((a cancer of the chest and abdominal linings). The proliferating mesothelium is visible on chest radiographs as pleural plaques that are highly characteristic of the pneumoconiosis caused by asbestos.



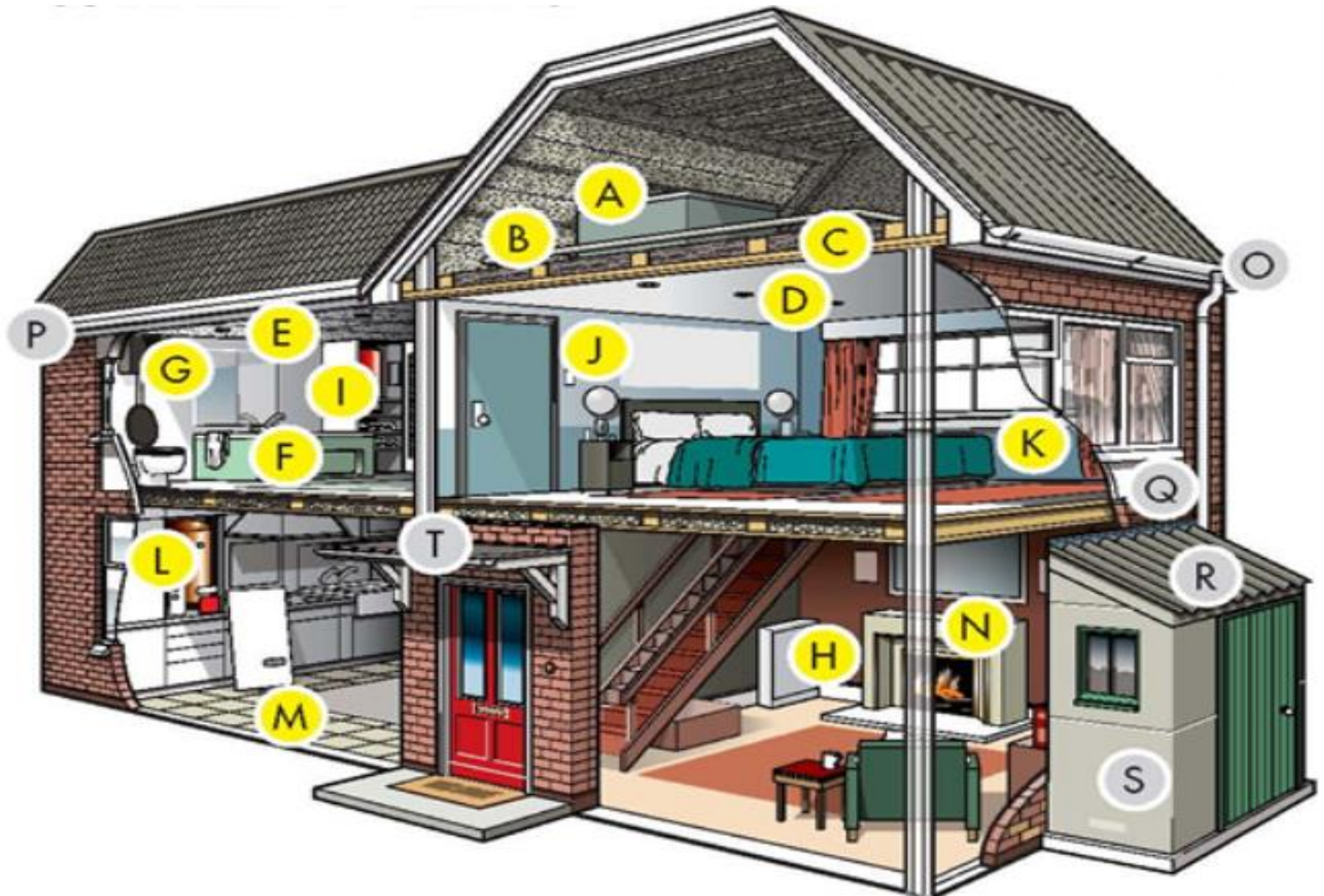
Asbestosis is one of a class of diseases labelled *pneumoconiosis*. Pneumoconiosis are caused by exposure to airborne particles of a variety of types. Significant occupational illness has resulted from breathing any of a wide variety of inorganic and organic dusts or particulates. Many pneumoconiosis are not as severe as asbestosis. In addition, not all such illnesses are associated with an increased risk of cancer.



The risk of airborne asbestos fibers is generally low when the material is in good condition. However, when the material becomes damaged or if it is located in a high-activity area (family room, workshop, laundry, etc.) the risk increases. High concentrations of airborne asbestos can occur during demolition and after asbestos-containing materials are disturbed by cutting, sanding, and other activities




# Asbestos in Residential Property






# Inside residential property

- a. Asbestos cement Water tank
  - b. Pipe lagging
  - c. Loss fill insulation
  - d. Textured decorative coating e.g. artex
  - e. Asbestos Insulating Board ceiling tiles
  - f. Asbestos Insulating Board bath panel
  - g. Toilet seat and cistern
  - h. Asbestos Insulating Board behind fuse box
- 



- i. Asbestos Insulating Board airing cupboard and/or sprayed insulation coating boiler
- j. Asbestos Insulating Board partition wall
- k. Asbestos Insulating Board interior window panel
- l. Asbestos Insulating Board around boiler
- m. Vinyl floor tiles
- n. Asbestos Insulating Board behind fire

# Outside residential property

- o. Asbestos Cement gutters and downpipes
  - p. Soffits – Asbestos Insulating Board
  - q. Asbestos Insulating Board exterior window panel
  - r. Asbestos cement roof
  - s. Asbestos cement panels
  - t. Roofing felt
- 

# Table 1 – Material that may contain Asbestos

- Acoustical ceiling texture
- Asphalt flooring
- Base flashing
- Blown-in insulation
- Boiler/tank insulation
- Breaching insulation
- Brick mortar
- Built-up roofing
- Caulking/putties
- Ceiling tiles/panels/mastic
- Cement board
- Cement pipes
- Cement roofing shingles
- Chalkboards
- Construction mastics
- Duct tape/paper
- Ductwork flexible connections
- Electrical cloth
- Electrical panel partitions
- Electrical wiring insulation
- Elevator brake shoes
- Fire blankets
- Fire curtains/hose
- Fire doors
- Fireproofing
- Furnace insulation
- Gray roofing paint
- High-temperature gaskets
- HVAC duct insulation
- Incandescent light fixture backing
- Joint compound/wallboard
- Laboratory hoods/table tops
- Laboratory fume hood
- Mudded pipe elbow insulation
- Nicolet (white) roofing paper
- Packing materials
- Paper fire box in walls
- Pipe insulation/fittings
- Plaster/wall joints
- Poured flooring
- Rolled roofing
- Roofing shingles
- Sink insulation
- Spray-applied insulation
- Stucco
- Subflooring slip sheet
- Textured paints/coatings
- Vapor barrier
- Vermiculite
- Vinyl floor tile/mastic
- Vinyl sheet flooring/mastic
- Vinyl wall coverings