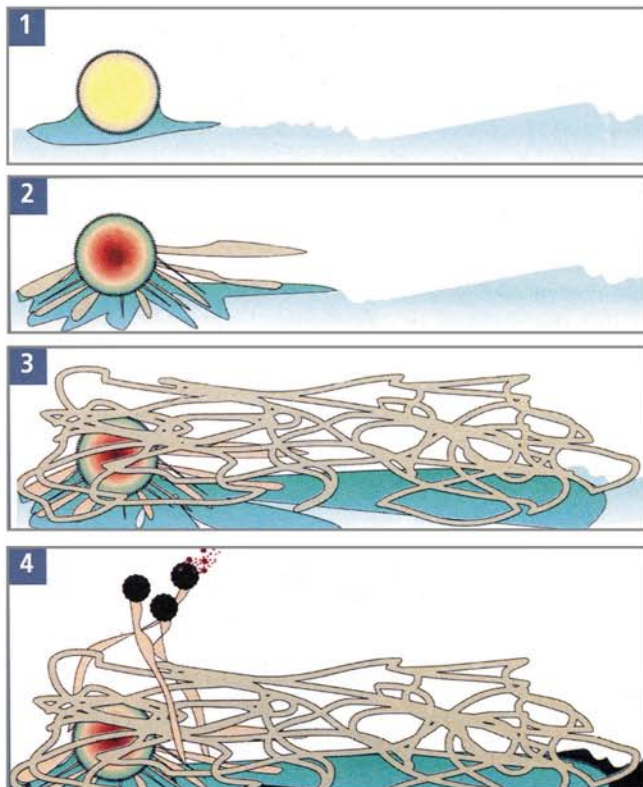


## A WORD ON AIR

### Introduction

Moulds and fungus are mono or pluricellular organisms which can be found nearly everywhere: on the ground, on plants, on animals, in the air and in living and working places. Although about 100,000 species of fungus are known, 3,000 to 10,000 spores being 1 to 60 microns in diameter can be found per cubic metre of air, in buildings under ordinary hygienic conditions. About 10% of them can grow and multiply in a favourable environment and under propitious conditions. *Cladosporium*, *Penicillium* and *Aspergillus* are the most commonly found species even though many others can be identified. Under certain conditions, moulds can produce a great quantity of mycotoxins which can cause health problems when inhaled. Humidity is one of the conditions necessary for the germination of spores and for the fungus growth. Due to different reasons, many buildings are excessively humid and under conditions favouring the proliferation of these agents.



Conditions favouring or limiting the development of bacteria, viruses and different pathologies. As you can see, excellent hygienic conditions can create when relative humidity is 30% to 60%.

### Mould growth

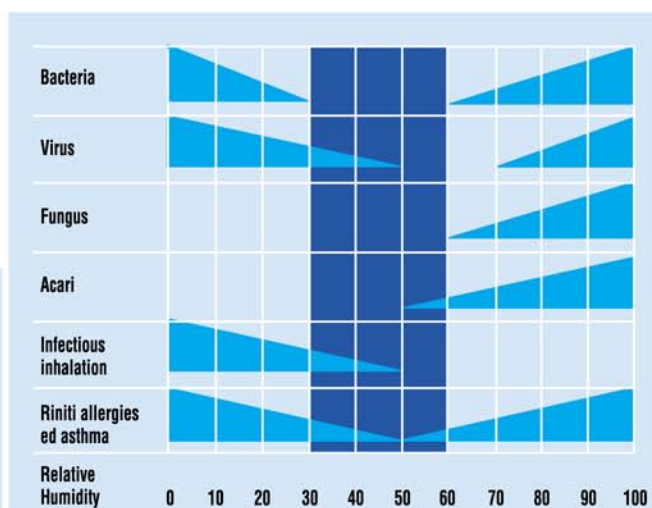
Mould spores need a feeding source to grow and multiply.

In most cases this feeding is represented by humid areas having organic materials of different origin in them. When a mould spore deposits in a favourable environment, enzymes constituting the outer surface solubilize hence dissolving nutritive substances nearby. The latter are absorbed through the membrane wrapping it because of the difference in the osmotic pressure compared to the external one. Then the spore starts to develop its typical filaments, also covered in enzymes that, in their turn, dissolve further organic substances and make fungus grow and develop very rapidly, provided conditions are favourable.

Further spores developing are then moved by displacements of air therefore colonizing other areas.

This process can be summed up in four essential phases shown in the figure. Colonies of fungi can develop in 48 to 72 hours in false ceiling panels or in plasterboard partition walls.

Drawing on the left side: growing phases of moulds starting from the setting down of a spore on a surface providing the necessary conditions under the form of humidity and different organic substances.



### Health hazards

Moulds and fungi produce unhealthy conditions in rooms, are responsible for bad odours and damage a great part of organic materials and substances among which are fabrics, leather and hides, as well as food of course.

Although most of the fungi do not have any direct effects on man's health, some of them can cause problems through infections, toxin production or overstimulation of the immune system. Fungus infections can go from relatively benign pathologies to dangerous ones as pulmonary histoplasmosis or infections of *Aspergillus* type in people having a repressed immune system. Fungi can cause hypersensitivity involving the immune system, as for example allergies, asthma and other diseases. All these reactions are caused by the inhalation of fungi or fungus antigens. More than 60 species of fungi can cause chronic allergies. *Penicillium* and *Apergillus* are fungi commonly present inside buildings that can cause asthma. An increase in these reactions, as asthma, has been noticed in many countries, most of all in children.

In people having no problems in their immune system, infections can develop above all on skin, on mucosae and in the lungs.

### Regulation in force

Legislative Decree 81/08 ex law 626 of 94 supplies information on how to guarantee hygiene in the workplace and the workers' health protection, with particular reference to air breathed in and sanitary water. In the document prepared for the **PERMANENT CONFERENCE ON RELATIONS BETWEEN THE STATE AND THE REGIONS** (4th April 2000) *Legionella* infection is acknowledged as a highly lethal severe illness. Epidemiologic, clinical, diagnostic and therapeutic aspects of the infection are therein defined and **PREVENTION AND CONTROL MEASURES OF PLANTS** where it develops are given. Intervention strategies on the different parts of the plant are described in detail. More operative information is given by **LAW CTI UNI 8065** which defines the characteristics that sanitary water and water used for the air humidification must have.