



# Humidity and Mildew

causes and cures

Mold or mildew is a major problem in warm, humid climates such as Florida, where as many as 70% of all homes are reputed to eventually suffer from mildew problems. Mildew can contribute to allergies and give rise to expensive and frequent repairs and redecorating. Mildew is a mold which grows under warm, humid conditions. Optimal growth conditions are from 77°F to 86°F, and between 62% and 93% relative humidity. Under saturated conditions wood will rot swiftly – another cause of structural failure.

Condensation is readily visible on windows but also occurs in hidden spaces – such as between walls, in attics and in crawl spaces. These provide an ideal environment of the growth of mildew.

## *Sources of moisture in homes*

Moisture is generated in the home every day – when meals are prepared, dishes and clothes are washed, by steam baths, whirlpool tubs, showers, aquariums, plants, and even by people breathing. A 15-minute shower can add 1.7 lbs of moisture to the house; a cord of uncured wood drying out can add 600 lbs of water; the infiltration of humid air can add 360 lbs of water a day to a home.

Moisture also enters the home from outside – through open doors and windows and by infiltrating the building envelope. Natural ventilation through cracks, crevices and chimneys will cause some air infiltration, but this is accelerated by makeup air entering the building to replace air that has been “exhaled” by exhaust fans. Infiltration can change the air 24 to 48 times a day, and when air is brought in, moisture comes with it – throwing a tremendous load on air-conditioning equipment. This moisture can amount to hundreds of pounds a day. With 100% relative humidity, clothing, paper products, wood

and some textiles can absorb up to 20% of their weight in water.

## *The problem*

A single bathroom exhaust fan will exhaust 50-100 cubic feet a minute. A kitchen exhaust may exhaust 200 cf/m. Together, in four hours, air infiltrating the building on a humid day can bring in 74 lbs of water.

Construction materials add tremendous amounts of moisture to a home while the building is drying out in the first two years. A concrete foundation slab can give up to 8,300 lbs of water as it dries out.

After a rain storm, vapor pressure (the drive that causes moisture to migrate to dryer areas) can be severe. If a block wall absorbs water and is then exposed to hot sun, the vapor pressure becomes extremely high and drives moisture to the cooler interior.

## *Moisture removal costs a lot – so control it as it enters*

The only way to avoid mildew is to control the interior temperature and the intake and generation of moisture. Moisture is removed from the building by mechanical equipment, an air conditioner or dehumidifier. This equipment is costly to operate. The more moisture there is in the house, the more energy is required to remove it (and the larger the load put on the equipment). If the moisture load is high, it may exceed the capacity of the equipment to do the job.

For these reasons, the builder should design the home to minimize the moisture that is allowed to enter it, and the occupants should adopt living habits that will reduce the moisture that’s allowed to generate.