November 2004

Technical *bulletin*

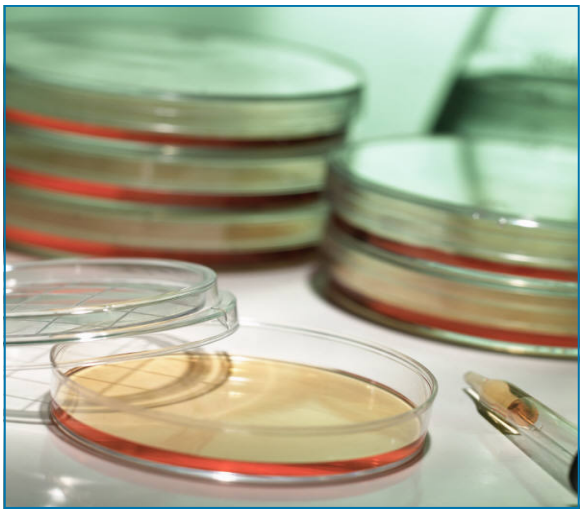
EPS Insulation Mold Resistance

Expanded polystyrene (EPS) rigid foam insulation was tested in accordance with ASTM C1338 "Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings" which is used to evaluate the ability of new insulation materials to support five types of fungal growth. Third-party testing conducted by SGS US Testing Company, Inc. demonstrates that under laboratory controlled conditions favorable for the growth of mold that EPS scored no traces of growth over a 28-day incubation period.

Mold is not the result of a single source culprit. As building methods and products evolve, building science has become a complex learning process with regard to materials and how they interact in the building envelope. As energy costs continue to rise, the trend is to build structures as "tight" as possible to provide an energy efficient environment. Unfortunately, ventilation to deal with naturally occurring indoor humidity and air quality was an afterthought. Other issues involve modernized architecture which is much more ornate and detailed placing greater demand on construction crews to keep moisture out.

The proper use of vapor retarders versus vapor barriers in various climates is also brought into question. At this time, building codes prescribe only two approaches to address moisture control: vapor barriers and venting attics and/or crawl spaces. These components lend to an increase in the perceived mold problem.

EPS insulation is a closed cell foam that offers a high degree of dimensional stability under moisture exposure. Because of its closed cell structure it delivers excellent resistance to moisture absorption by submersion in water and most moisture gains are either surface or interstitial and have little effect on thermal performance. Avoidance of continuous exposure of building envelope components to liquid water is a fundamental design objective. Proper management of moisture vapor depends on the knowledge of how moisture properties relate to the design and how they interact in actual assemblies not simply whether a permeability value is high or low.



ASTM C1338 determines the ability of new insulation materials and their facings to support fungal growth.

Fast Facts On Mold

The *New York Times* reported that the Institute of Medicine assembled a panel of epidemiologists, toxicologists and pediatricians to examine the hundreds of scientific papers and reports to assess whether or not mold in homes poses a serious health risk. The panel found no evidence that a link exists between mold and various health conditions, but did affirm that mold as well as indoor dampness will affect those with respiratory problems and asthma.

How are spores activated? Water and warmth are the needed components. Building interiors meet the warmth criteria. Where water pools or high humidity levels result in condensation or dank conditions, spores can be activated. To keep the mold and fungi outside, moisture must be kept under control.

The "Mold Cause, Effect and Response Handbook" compiled by The Foundation of the Wall and Ceiling Industry, indicates that using highly permeable materials on the cold side and low permeability materials on the warm side of the wall system maximizes vapor diffusion from the wall, meaning that water vapor inside the wall system will migrate from the wall cavity into the interior space.

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A health promoting building regulates the temperature and moisture content of the indoor air to enhance circulation and prevent condensation.

Because some building materials are expected to endure prolonged water exposure throughout their useful life, various methods and terminology have been created to describe corrective measures. Wood is often 'preserved' to guard against fungal rot. Caulk for showers sometimes has biocides incorporated to 'treat' the material. EPS is not usually treated in any way. Its resistance to mold or fungi growth is not due to any special additives.

As new products and building methodologies continue to enter the market, product manufacturers must educate contractors on the proper storage, installation and use of their products. Working together will help identify and provide solutions can be made to reduce the chances that mold will grow. Incorporating building materials that do not provide a nutrient source for mold is one step. Also selecting materials and finishes that allow air and moisture to move freely through the wall system is an effective strategy for controlling condensation and mold. As demonstrated by recent testing, expanded polystyrene rigid foam insulation is a non-nutritive source.

Mold is as common as the air we breathe. With thousands of different types of molds, it is one of the oldest natural occurring organisms on earth. As a living organism, mold needs oxygen, organic material and water to grow. Media hype and litigation have increased scrutiny and misperception of mold in building structures. To reduce the risk of mold in buildings, proper design, product choice and good construction practices are important factors to consider. The construction industry has begun to reexamine existing practices to avoid and prevent mold. A feat that is near impossible since the only way to completely eliminate mold would be to remove all oxygen from a structure which would render the building uninhabitable.

SGS U.S. Testing Company, Inc. Report No. 110170 (July 2004)

Common Indoor Mold Strains	Expanded Polystyrene Specimens Tested In Accordance With ASTM C1338-00
Aspergillus Niger	No traces of Growth
Aspergillus Versicolor	No traces of Growth
Penicillium Funiculosum	No traces of Growth
Chaetomium Globosum	No traces of Growth
Aspergillus Flavus	No traces of Growth

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