

Carpets in schools don't compromise indoor air quality, says Cornell researcher

FOR RELEASE: March 19, 2001

Contact: Susan S. Lang
Office: 607-255-3613
E-Mail: SSL4@cornell.edu

ITHACA, N.Y. -- Carpets in schools can help the quality of indoor air by trapping contaminants and allergens, says a Cornell University indoor environmental expert.

The findings run counter to growing concerns of some doctors, parents and schools that carpeting might be affecting some children's health by compromising schools' indoor air quality (IAQ).

"Concerns that carpeting in schools is contributing to an increase in respiratory problems, allergies and asthma in schools are unfounded," says Alan Hedge, professor of design and environmental analysis at Cornell. "As long as schools keep floors clean and use high-efficiency microfiltration vacuum bags, carpets can be a healthy, safe and economical floor covering in schools and day-care centers. Microfiltration bags will trap very small particles, such as dust mites and feces, so that these will not become airborne."

Exposure to dust-mite allergens, mainly from mite feces, can trigger asthma attacks in about 40 percent of asthmatic children, but this allergen is rare in schools. Asthma afflicts about 4 million American children and is one of the leading causes of childhood hospitalization and school absenteeism.

Hedge presented his findings at the annual meeting of the Council of Education Facility Planners, International in Orlando, Fla., recently.

Carpeting, he reports, can improve IAQ because it captures and holds dirt, contaminants and allergens that would otherwise become airborne. These substances are readily and effectively removed by vacuuming with the high-efficiency bags. Synthetic carpets are better than wool, Hedge says, because their fibers' electrical charges attract potential contaminants.

"Also, modern carpeting that sports the green IAQ testing label can help to improve air quality because these carpets emit less chemical contamination into the air than many types of vinyl-based floor products do," says Hedge. Carpeting, he says, also can improve classroom acoustics and promote child safety by protecting against slips and falls.

He researched the health effects of carpets in the wake of proposals by some school districts to ban carpets in schools. In Florida and Vermont, for example, some allergists advised school districts that carpets were contributing to asthma and other respiratory problems in children. Mite-allergen exposure, Hedge says, is most likely to occur not from carpets but from pillows, bedding, mattresses, sofas and clothing, all of which come into closer contact with the face for longer periods of time. A typical mattress has at least twice as many mites per gram of dust than does a heavily contaminated carpet. Keeping the humidity level around 50 percent, keeping the

carpet regularly vacuumed and, as an added precaution, occasionally using an acaricide (mite-killing) powder, controls mites in carpets.

"Although there can be thousands of dust mites and their droppings in a carpet, these allergens do not become airborne as easily as they do over smooth floors or from mattresses and bedding, except during vacuuming if the vacuum doesn't have a good filter bag. However, even within 20 minutes after regular vacuuming of a contaminated carpet, dust-mite allergens cannot be detected in the air because they are so heavy they have sunk to the ground. And if microfiltration bags are used, the best of which also have electrostatic liners, or if a vacuum cleaner with a HEPA filter is used, the allergens are efficiently removed before becoming airborne even during vacuuming," Hedge says.

He points out that Sweden, which banned carpeting in schools in the late 1980s, has experienced skyrocketing childhood asthma rates ever since, contrary to expectations. Research studies suggest many reasons for this including children who are genetically predisposed to developing asthma, becoming allergic to other allergens, especially from cats and dogs. In addition, Hedge says, "Carpets eliminate slip hazards, reduce the severity of falls and provide a more comfortable surface to stand, walk and sit on. Carpeting improves the acoustics in a classroom by minimizing impact noise and reducing reverberating sounds, and this reduces background noise that can interfere with children's learning and increase stress."

Both smooth floor coverings and carpets have advantages and disadvantages for schools, concludes Hedge. Smooth floors can provide an easy surface for cleaning up spills, but some chemical cleaners can provoke asthma symptoms, and reused bucket water (which accumulates biological contaminants that are then spread on the floor) can contribute to air quality problems. And dust and allergens on the floor get airborne very easily. Microbial growth can occur under smooth floor coverings if the floor stays wet, and this can cause problems. "We've had this problem even in our own department at Cornell," Hedge says. Synthetic carpets are easy and economical to clean in the long run, and, like any other floor surface, providing they are kept dry and clean, they will not promote microbial growth.

The best design solution for classrooms, Hedge says, is to combine the strengths and benefits of carpeting for areas under desks and where sitting and teaching activities occur but to use smooth floorings around wet sink areas and boot/shoe storage. But, says Hedge, "Whatever the floor covering, it's critical that it be kept clean and dry to eliminate any IAQ risks from biological contaminants such as bacteria, fungi and dust mites."

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