

# 1992 Technical Bulletins

4550 Jackson Street Denver, CO 80216  
FAX (303) 355-3516 (303) 355-3566 (800) 447-8326

**For More Information, Contact Steam Way International at (303) 355-3566**

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## **SICK BUILDING SYNDROME AND THE CARPET CLEANING INDUSTRY**

### **WHAT DOES THIS HAVE TO DO WITH THE CARPET INDUSTRY?**

I knew I was in trouble when I received a box full of official-looking manuals with "Environmental Protection Agency" on them. While I was waiting for Morley Safer and the rest of the "60 Minutes team to show up, I decided I'd better glance through the 2,000 or so pages of material to see what I was in trouble for. To my relief, it was material that Mike Berry had promised to send me after a short conversation at a Mid-South Professional Carpet Cleaners Association Convention. Mike Berry is the Deputy Director of the Environmental Criteria and Assessment Office of the United States Environmental Protection Agency. That was my introduction (over two years ago) to the incredibly complex issues surrounding "Sick Building Syndrome". Since that time, research has been taking place at many different levels, probably raising more questions than it seems to be answering about these issues.

You may ask yourself: "What is sick building syndrome and what does it have to do with the carpet industry?" Why is it an issue that demands the attention of the entire carpet value chain. 'From fiber producer to carpet mill to wholesaler/ distributor to carpet retailer to carpet installer to the professional carpet cleaner? The answer is quite simple. By confronting the issue in its infancy stage, we can be a part of the solution. By sitting idly by to see what will happen, we will probably be accused of being part of the problem. Although research and study of Sick Building Syndrome really is in its infancy stage, we already know that we can be a part of the solution, even if the sources of the problem are not completely defined. If we take these simple steps now, we will deflect a potential industry problem; but even more importantly~ we will protect the health and productivity of the public as well as protecting the public from those who would profit from sensationalistic paranoia. First, let's define the problem.

### **WHAT IS SICK BUILDING SYNDROME?**

What is sick building syndrome? It can be defined in two ways:

1. Indoor environmental pollutants that cause documented health hazards and problems to the occupants of the buildings.
2. Psychological reactions to the environment which cause perceptions of "real" health problems.

A great deal of research has been done on sick building syndrome by Dr. Michael Berry, the Deputy Director Of the Environmental Criteria and Assessment Office of the United States Environmental Protection Agency, and his associates. They have focused on hundreds of potential causes and sources for these problems. We are going to take one very small part of this research; i.e., the relationship of carpet installed in an internal environment—both commercially and residentially.

Due to the substantial moves made toward energy conservation all through the seventies and eighties, society has concentrated on providing buildings and homes with better, tighter insulation. It has worked. Cold air from outside does not as easily get inside. But, then, neither does a home or building ever "exchange" the air from within its environment. This "tight building" has been linked to the rise in complaints concerning Sick Building Syndrome.

Let's get back to the carpet industry, though. An article in the September 16, 1989 New York Times was titled "IN BATTLE ON POLLUTANTS, LATEST SUSPECT IS RUGS." The article's author, Barry Meier, detailed the possible (emphasizing possible, although the author did not) links between carpets and Sick Building Syndrome. Quoting from the article:

"The ruckus is triggering concerns that chemical vapors emitted by some new carpets may pose a health hazard."

"Some say the problem is not with carpets alone, but with other indoor pollutants. Others suspect a chemical substance found in latex carpet backing and some glues."

The article goes on to discuss that the Federal Consumer Product Safety Commission was stepping up an investigation of health problems suspected to have been caused by carpets. In summary, carpet is being investigated. No links have been demonstrated, much less proven.

But new carpets are not the industry's only connection to Sick Building Syndrome. Dr. Berry's research has also focused on maintenance related problems and their connection to carpet. Quoting from one of Dr. Berry's reports:

"Based upon what I have learned in recent months from researchers working in the United States, Canada, and Western Europe, I have reached the conclusion that carpeting and fabrics not cleaned and properly maintained have the potential to cause a variety of health problems inside-the building environment. From a public health perspective, I would find it impossible to justify the installation of carpets indoors without the existence of effective cleaning methods using environmentally-sound cleaning technology by individuals properly trained in the application of those methods and technology. I am very certain in my statement that carpets do serve as 'sinks' and collect pollutants of all kinds both from the indoor environment as well as the ambient environment. Humans in turn are exposed to those sinks through direct contact, such as children on the floor, or by the release of a contaminant from the sink. The 'sink' when loaded or filled becomes a releasing 'source.'"

Both ends of these investigations relate directly back to the basic research concerning Sick Building Syndrome. Complaints and problems toward Sick Building Syndrome have been linked to two sources for environmental pollutants:

1. Building Products Related
2. Maintenance Practice Related.

### **WHAT HAZARDS ARE RELATED TO SICK BUILDING SYNDROME?**

These health hazards usually manifest themselves by building or home occupants complaining of dizziness, headaches, breathing difficulties, and concentration problems. The E.P.A.'s own research has shown that these health hazards sometimes have a cause or a source that can be documented. But, many times, no cause or source is ever found. These psychological reactions may only be perceptions with no cause or source. Therefore, finger pointing and accusation of the source may claim the wrong "victim," and quite simply there are many times when there is nothing to blame.

Research has also been done on the effect of indoor pollutants on the productivity of the occupants in a building. By creating a "healthier" indoor environment, you may make workers more productive.

So now that we have defined the potential problem, let's get on to the more important task of determining the carpet industry's role in the whole issue.

### **THE TRUE ROLE OF CARPET**

First, let's take a look at the issue of relating chemicals found in carpets to Sick Building Syndrome. The New York Times article stated that the Federal Consumer Product Safety Commission has received "about 130" complaints concerning carpet in the last three years.

During this same time, according to MA22Q statistics released by the government, there were approximately 3.9 billion square yards of carpet installed. Sixty-five percent of this carpet was installed residentially; twenty-five percent commercially; five percent in area rugs; and five percent in automobiles, airplanes, etc. Using just the 90% that has been installed residentially and commercially, and figuring an average installation is 55 yards (an industry average), this gives us an approximate figure of 63,818,181 installations of carpet during the last three years. That is about a .000002% complaint rate — Hardly a cause for alarm. As a matter of fact, it's more of a cause for endorsing carpet as a "safe" floor covering. I would challenge the Federal Consumer Product Safety Commission to find any other commonly used product with a lower complaint rate.

In addition, part of the problem may be simply one of perception. New carpets have a distinct aroma. Based on our years of experience in the deodorization and odor control field, I can tell you that any new aroma introduced into an environment will cause some complaints and some compliments. Odor itself cannot cause health problems. Only chemicals causing the odor can. But odor can cause very strong psychological reactions—both positive and negative. The third problem with assigning blame to new carpet rests in the fact that the chemicals used on carpet or used to manufacture carpet can be (and I'm sure most have been) subjected to health hazard laboratory tests to determine any potential toxicity. If these tests do not indicate toxicity, then that would greatly reduce the chances of these chemicals being a sole source of Sick Building Syndrome.

Finally, it is ludicrously premature to assign any one "culprit." Dr. Berry's research has listed hundreds of potential sources for environmental pollutants. This list includes, but is not limited to

- (1) migration of outdoor pollutants;
- (2) sources of indoor air pollutants such as air conditioning and heating systems, building materials, copy machines, furnishings, household products, and insulation;
- (3) sources of disease causing bacteria such as heating and air conditioning systems, shower heads, pet urine and feces, contaminated foods, humans, mites, cockroaches, and water damage and mildew;
- (4) combustion products such as tobacco, cooking vapors, unvented heaters, natural gas appliances, wood-burning fireplaces, fire damage, candles, and fuel lamp;
- (5) contamination from chemical products used within the building such as fuels, solvents, pesticides, and improperly used cleaning products and methods. Obviously, in a new construction environment, carpet cannot be singled out. Where new carpet is installed in an existing environment, there are hundreds of other sources of potential problems.

### **WHAT THE CARPET INDUSTRY CAN DO**

So what do we conclude from all of this? Quite simply, the carpet industry does have a stake in this issue. We must take an aggressive role in assisting solving the problem. Some practical suggestions:

1. Using the health hazard data already done on raw materials and on chemicals used in carpet and fiber manufacturing, investigate to see if there is any sort of connection. Also test to see if these chemicals might be incompatible with other products or chemicals within a building environment.
2. Emphasize the benefits of carpeting as a floor covering alternative. Appearance, warmth, feel, insulation, acoustics, etc. At the same time, make sure the consumer understands that if a carpet is maintained properly and periodically cleaned by a professional, it is a completely safe floor covering.
3. Understand the importance of adequate ventilation to a safe environment. After a carpet is installed, allow the building time to clear the air out. Open doors and windows. You can even accelerate this ventilation process by using fans and/or carpet dryers to circulate the air. If it is unpractical to provide ventilation from the outdoors, then "treat" the air that is locked indoors. This can be done with electronic deodorizing equipment such as ion exchangers or ozone equipment.
4. If occupants of a building complain about the odor from new carpet, a thorough hot water extraction (steam) cleaning will not only "knock" down the odor, it provides a real and psychological benefit by removing all chemical residues from the environment.

Keep in mind that with a glue-down installation, the latex adhesives need a few days to cure before this fresh water rinse is done. Dr. Berry's research endorses hot water extraction as the best method for removing residues from carpet, a clean rinse, so to speak. Fresh water may be used or the addition of a very small amount of a residue emulsifier may be used to remove any residues left by the glues and adhesives used in the installation process.

In addition, the carpet industry can no longer ignore the cleaning and maintenance of carpets as an issue that has a direct effect on our future. Dr. Berry's own statements emphasize the need for periodical professional cleaning. Quoting again from one of his reports:

"Most cleaning is conducted for the sake of improving appearance. I would venture to say that health protection is rarely the reason the general population ever has carpet and fabric cleaned. In spite of this, every time carpets and fabrics are emptied of their pollution build-up through professional cleaning methods, there is a health benefit. Cleaning processes that extract pollutants from the microenvironment enhance the quality of the indoor environment by reducing exposure. Cleaning, especially through hot water extraction, improves environmental conditions and health protection.

"We have only begun to really become aware of the contents of carpet dirt and house dust. We do know that outside contamination levels, especially in soil, can reach the same concentrations indoors. We are also finding that typical vacuuming does not reduce fine particle levels indoors. Fine particles of less than 7 micron pass on through vacuum cleaning bags. These particles tend to build up over time and have the greatest potential to cause harm as they penetrate deep into the human lung. Furthermore, we are finding that the soil gases, such as the harmful decay products of radon and a variety of organic compounds, including pesticides, enter the microenvironment and adhere to particles or the surfaces of carpet and fabric. Until such time as the fibers are cleaned, the potential for human exposure and health risk remains high.

"The health benefit is derived by extracting: (1) fine respirable particles not controlled through normal cleaning processes such as frequent vacuuming, (2) particles to which other pollutants such as organics are bound, (3) biological allergens of all types, (4) heavy metals such as lead, cadmium, arsenic found in outside soil dusts, (5) pesticides and herbicides used in and around the microenvironment, and (6) combustion products from cooking, wood smoke, candles, and tobacco, to name but a few. Furthermore, the benefit of extracting is the overall reduction of respirable particles which cause most health effects, reduced cases of biologically induced illnesses, reduced lifetime cancer risks, and reduced complaints and liability for building owners and managers."

The realized benefits of professional carpet cleaning must now be recognized as being three-fold: better appearance, less wear, and a healthier environment. Du Pont's Flooring Systems Division has taken a leadership role in this realization. In their Professional Carpet Care Requirements material for Stainmaster® Carpet, it says:

"Du Pont recognizes that the beauty and value of carpeting is best maintained by periodic cleaning by a trained Certified Professional Cleaner."

Part of recommending a carpet as a floor covering for its many benefits should now include recommendations that the carpet be properly maintained.

By being at the forefront with proactive action and by being ready with well researched documentation, we can not only deflect potential problems, we can also be seen as an industry that is truly concerned about our customers. The Carpet and Rug Institute has issued a position paper on "Allegations of Carpet Causing Mysterious Illnesses Not Based on Fact." For a copy, write: Carpet and Rug Institute, Box 2048, Dalton, Georgia, 30722. For more information about the care and maintenance of carpeting, write to Steam Way International at: 4500 Jackson St., Denver, CO 80216.

As you can see, the issues surrounding Sick Building Syndrome are complex. We can now confront the issue's relationship to carpeting as a part of the solution.

About the author:

R. Doyle Bloss is the Chief Executive Officer for Steam Way International, Inc., in Denver, Colorado. Steam Way is a leading manufacturer of carpet and upholstery cleaning and restoration equipment and chemicals. Steam Way is involved in investigating issues related to carpet from its manufacture to its care.