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Carpet's Positive Impact on Indoor Environments

A healthy environment is one that radiates a sense of well being. By definition this is a healthy environment, or a state of physical, mental, and social well-being. Since most of us spend approximately 90% of our time at home or in the work place our indoor environment needs to radiate inviting and friendly conditions. It is widely recognized that carpet has many positive attributes to enhancing environmental quality indoors. Unfortunately, the end-point of ineffective cleaning and maintenance is an unattractive carpet, which will oppress rather than uplift occupants, and may lead to the misperception associated with carpet and adverse health effects. Carpet, just as much as any other home furnishing, must be maintained. Studies by the Environmental Protection Agency (EPA) show that carpet can be readily cleaned and maintained in a sanitary state.

Maintenance is critical to the quality of our indoor environment. For many years, carpet manufacturer's have made recommendations for cleaning; emphasizing frequent vacuuming and periodic professional cleaning based upon extraction principles. These measures have shown to be an effective way of reducing indoor pollutants including house dust and dust mite allergen (who's exposure is a risk factor for allergic sensitization, asthma development, and asthma morbidity). Of the 20 percent of the U.S. population that suffers from allergies more than 53 percent are allergic to house dust and 70 percent of those allergic to house dust are allergic, specifically, to mite allergen.

Pollutants that originate indoors are put into three categories: VOC's, particulate, and biological, which include dust mites and microorganisms, such as bacteria, mold, and spores. In an EPA sponsored study, "The Total Building Cleaning Effectiveness Study" it was demonstrated that organized cleaning programs contribute to the reduction in particles, volatile organic compounds (VOC's) and biological pollutants in excess of 80-90%. In another study aimed at determining the feasibility and effectiveness of physical interventions to mitigate house dust and dust mite allergen, homes with high levels of dust mite allergen in carpets were subjected to a single treatment of steam cleaning and vacuuming. Dust samples were collected at baseline and again at 3 days and 2, 4, and 8 weeks. Based on comparisons of pretreatment allergen concentrations and loads to post treatment values, proper maintenance resulted in a significant reduction in carpet dust mite allergen and load that persisted for up to 8 weeks. Other studies aimed at determining the effect of routine vacuum cleaning alone indicated that frequent vacuuming over a short time significantly reduces dust mite allergen levels in carpet (house dust mites are unavoidable in climates of moderate and high humidity). The use of a vacuum with an efficient filtration system has also shown to reduce allergen (dust load) in a room. This information should be of vital concern to those individuals with allergies and asthma.

Dust loading in carpet can vary widely, and as previously indicated, appears to be a strong function of maintenance practices. It also reflects the fraction of dust available for potential re-suspension. Approximately 1% of bulk carpet dust is on the surface and available to dermal contact; which suggests that dermal

exposures to these dusts may actually be lower from properly maintained carpets than from smooth surfaces. In fact, there is very little data around that even suggests that dusts and allergens that may accumulate in carpet have any impact on health risks different from smooth floorocovering. According to two recent hospital studies no difference in infection rates were noted between carpeted and non-carpeted wards and rooms.

The composition of household dusts, which accumulate on indoor surfaces, depends upon a number of factors. The following appear to be of the greatest significance: (1) general location of the building or home (2) end-use (3) occupant activities and behaviors. The majority of dust mass is inorganic in nature, which includes various oxides of aluminum, silicon, iron, calcium, etc. Other inorganic compounds such as sulfates and nitrates can be significant portions of the total inorganic mass and tend to be associated with combustion processes. Indoor sources can be attributed to degradation of building materials (e.g plaster, ceiling tiles) and the use of combustion heating. As already noted, viable microbiological organisms are also a component found in these dusts. On a mass basis these rarely represent a significant contribution to the total. However, pathogenic bacteria and fungi, pollens, and non-viable biological debris present in these dusts pose a more significant risk to humans.

Another consideration in maintaining a healthy environment is maintenance costs. Carpet requires less time and equipment to maintain than traditional hard floor surfaces. Published statistics show that cleaning costs are reduced in carpeted environments. More water is used and disposed of on an annual basis in cleaning hard floors. For those sensitive individuals who believe hard floors are a healthier alternative to carpet it is important to note that significantly larger amounts of chemicals are stored, used, and disposed of in the maintenance of hard floors. Additionally, chemical residue is much higher with hard floor maintenance (e.g. floor wax has approximately 38 times the volatile organic compound emissions found emanating from carpet).

There have been hundreds of studies that describe, measure, address particles, dusts and contaminants of all types in carpet and not from carpet. Despite the claims throughout the media and misinformed general public that carpet is unhealthy, these claims cannot be supported by scientific literature. In fact, research to date, some going back over 30 years, shows no evidence that directly links poor health to items or materials originating from carpet. A properly maintained carpet at worse is benign in relation to human exposure or adverse health effects.

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