

VINYL WALLCOVERINGS – INDOOR AIR QUALITY

INTRODUCTION

Throughout our daily lives, we are bombarded with a growing number of health, safety and environmental quality issues. These issues are often complex and controversial, with far reaching implications in our society. Moreover, perceived “problem issues” that have been identified have no single, simple solution. One of the many issues that has risen to the forefront of current concern is indoor air quality. As with many environmental quality issues, there is a great deal of debate surrounding the actual impact of indoor air quality and proposed solutions to assure a healthy environment.

Although there is still much to learn about indoor air quality, there are a number of factors that have been identified as affecting indoor air quality, as well as a number of partial solutions that can be implemented to improve the quality of the indoor air. Virtually everything inside a building can have some effect on the air quality, including furnishings, wallcoverings, and floor coverings. This article focuses on some of the most significant indoor air quality issues and the potential impact of wallcovering materials on indoor air quality.

INDOOR AIR QUALITY

What is indoor air quality? Perhaps the most widely publicized issue associated with indoor air quality is the so called “Sick Building Syndrome” (SBS), a collection of non-specific symptoms frequently including dizziness, sore throat, coughing, headaches and generalized discomfort, that have come to be commonly perceived as related to poor indoor air quality. In most cases of SBS, no single specific cause can be identified as the source of complaints. More importantly, many of the complaints associated with SBS relate to the abstract issue of personal comfort, rather than distinct health and safety issues.

In light of the abstract and subjective nature of SBS, it is not surprising that indoor air quality professionals face a difficult challenge in diagnosing and remediating SBS cases. To a limited extent, there are a few common indoor air contaminants that have been identified as having a causal link to SBS complaints. Contaminants such as carbon monoxide, carbon dioxide, particulate matter, volatile organic compounds (VOCs), biological agents, radon, asbestos, heavy metals and tobacco smoke have been shown to contribute to both personal discomfort and potentially, adverse health effects.

SOLUTION/CONTROL

An assessment of indoor air quality must start outside of the building. All of the air that is present inside a building was once outside; therefore, the quality of the surrounding air can have a significant impact on indoor air quality. So what can we do to control our indoor air quality? The most significant single control of indoor air contaminants is ventilation. An efficient, well maintained ventilation system can remove most indoor air contaminants by filtration of incoming and recirculated air, and dilution with fresh, outdoor air. In addition to assuring adequate ventilation, we can carefully evaluate the contents of our indoor environment. Every carpet, wallcovering, furnishing, cleaner, disinfectant, or appliance used in a building can influence indoor air quality.

Indoor air quality is not only impacted by the emissions from new materials, that characteristic “new smell” from carpets, drapes, wallcoverings and furniture; certain materials can trap dust and odors, re-emitting these contaminants over time. Soft absorbing furnishings, considered “sinks” because they capture and hold contaminants, continue to affect indoor air quality throughout the life of the product. In contrast, hard surfaces such as vinyl wallcoverings are not “sinks.” Therefore, factors such as ease of cleaning and potential to absorb and re-emit contaminants are as important to consider as the composition and initial emission potential of new furnishings.

WALLCOVERINGS

Vinyl wallcoverings are recognized by design professionals as a good choice for commercial indoor finishes because they combine versatile aesthetics with low maintenance and durability. As with most manufactured interior products, such as carpeting, fabrics, automobile interiors, and furniture, newly installed vinyl wallcoverings may have an initial characteristic odor or “new smell.” This slight odor can be attributed to stabilizers and plasticizers, which are integral components of the vinyl material, and residual organic solvents associated with printing. These residual volatile components are trapped as the newly manufactured products are packaged for shipment and generally will quickly dissipate upon application.

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One reason vinyl wallcoverings have a relatively low potential for odors or emissions is that many wallcoverings utilize water-based inks for printing. These water-based inks may still contain trace amounts of organic solvents, but the potential for emissions from the finished wallcovering product is quite low. In addition to the use of water-based inks, nearly all wallcovering adhesives in use today are 100% water based. These mixtures of natural and synthetic polymers do not contain organic solvents, therefore, their emission potential is very low. Painting a room with oil and/or solvent based paints can result in emissions of approximately nine times the amount of VOCs as from the use of wallcoverings that incorporate these water-based adhesives and inks.

As with most new interior furnishings, vinyl wallcoverings emit a “new smell” during the first few days after installation. This smell quickly dissipates as emissions drop rapidly to a fraction of their original levels. This initial period of highest emissions can be easily controlled by increased ventilation which utilizes up to 100% outside air.

In addition to consideration of initial and continuous emission potentials, another important factor in the overall assessment of emissions is the useful life span of a product. Because the emissions from most interior furnishings will dramatically decrease over time, the frequency with which these furnishings must be replaced can greatly impact the net emission potential over their useful life. Vinyl wallcoverings generally have a useful life of at least five years and remain in many buildings for decades, which in combination with their low initial emission potential, gives them a low net emission profile over their useful life.

CONCLUSION

Indoor air quality can be influenced by many complex and diverse factors, many of which remain unidentified or only partially understood. It is generally recognized that building ventilation is the most important influence on indoor air quality. Therefore, maintenance of ventilation systems is critical to providing good indoor air quality. Emissions from the contents of the building, including furnishings, wallcoverings, and floor furnishings also can have an important influence on air quality. As this article has shown, vinyl wallcoverings, due to their inherently low potential for emissions, offer a viable option for flexibility and durability in interior design without causing a significant negative impact on indoor air quality.