

Facts

about the
environmental,
health
and safety
performance
of vinyl and
vinyl
wallcoverings



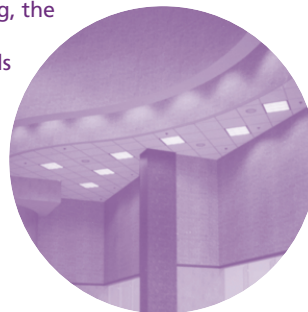
- Durable
- Recyclable
- Versatile
- Easily produced
- Safe to manufacture
- Easy to maintain
- Inherent fire resistance
- Resource- and energy-efficient
- Safe in disposal
- A material with a proven record of safety

Is the process for manufacturing vinyl wallcovering safe for the environment, workers and the surrounding community?

Yes. The processes used to manufacture vinyl resin, an inert and stable powder material, are essentially enclosed and practically all waste is recycled back into the system. This has occurred both as a result of government regulations and a voluntary public commitment by U.S. vinyl manufacturers to the stringent codes of the American Chemistry Council's Responsible Care® program, one of the most comprehensive and conscientious standards of health, safety and environmental conduct governing any industry.

Through the combined effect of government standards and voluntary improvements in processes and technologies, workplace and environmental emissions from vinyl production have been significantly reduced. The U.S. Environmental Protection Agency (U.S. EPA) has estimated that the vinyl industry's emissions of vinyl chloride monomer (VCM) have been reduced by more than 99 percent since a closed manufacturing process was introduced in the 1970s.

Vinyl wallcovering manufacturers mix vinyl resin together with other materials and, using heat, roll the product into a thin film. Either before or after laminating, the vinyl sheets are decorated using any of a variety of printing techniques and the rolls are then packaged and shipped. These processes also operate according to stringent industry safety standards and do not pose a hazard to human health or the environment.



- Versatile
 - Easily processed
 - Cost-effective
 - Inherently flame retardant
 - Safe in disposal
 - Extensively researched
- to maintain
- efficient
- d of safety

Does chlorine as a raw material in vinyl wallcovering impact the environmental performance of these products?

Chlorine is a naturally occurring element that is essential to life and is also used in ways that protect public health and safety and improve the quality of life. Some good examples are pharmaceuticals, water purification and hundreds of different manufacturing operations that are based on chlorine chemistry.

The chlorine used to manufacture vinyl's chemical building blocks is derived from common salt, an abundant natural resource. The use of chlorine in the vinyl manufacturing process does not pose a hazard to human health or the environment. When made into vinyl resin and finally into vinyl wallcovering, chlorine is a safe and inert material.

Why do some environmental activists link vinyl manufacturing and disposal to emissions of dioxin to the environment?

Dioxins are a family of chemicals that are byproducts of natural and industrial processes. They are formed when certain organic compounds and chlorine are heated to high temperatures. Examples include incineration, forest fires, metal smelting, coal burning and certain industrial operations. Consider these facts:

- In the past 30 years, while production of vinyl has more than tripled, dioxin levels in the environment have steadily declined as a result of improved waste incineration, the phase-out of leaded gasoline, advances in emissions controls, prohibitions on open burning, changes in pulp and paper bleaching and other actions.
- The vinyl industry recently completed an extensive analysis to determine how much dioxin vinyl manufacturing might contribute to the environment. That study was conducted according to U.S. EPA protocols, and the results were reviewed by an independent panel of scientists. The findings indicate that the entire vinyl production chain is likely accountable for less than 1 percent of the approximately 3,000 grams (6.6 pounds) of total dioxin that the U.S. EPA estimates is emitted in the United States each year. The vinyl in wallcovering accounts for only a fraction of this small amount.
- A landmark study on dioxin emissions from waste incinerators, conducted in 1995 by the American Society of Mechanical Engineers, determined that incinerator design and operating conditions – primarily temperature – are the keys to controlling dioxin. The U.S. EPA's most recent incinerator regulations attempt to control dioxin emissions in precisely this way. The bottom line is that all incinerators have the potential to release dioxin if not properly designed and operated, regardless of the presence of vinyl in the waste stream.

4 How does vinyl wallcovering behave in accidental fires?

Vinyl wallcoverings are based on a naturally fire retardant polymer. In addition, many vinyl wallcoverings contain additives that improve the fire resistance of the material. This means generally that vinyl wallcovering is slow to catch fire, its flame spread is slow and it ceases to burn after the flame source is removed.

Standards have been established to test flame spread and smoke development of materials used on walls and ceilings, including substrates and adhesives. Wallcoverings that meet "Class A" requirements have the best fire rating and most vinyl wallcoverings meet these standards. Also, it is important to note that wallcoverings are a lightweight decorative product and typically are a small component of any given building in the context of smoke development.

While the growing presence of synthetic materials – including vinyl wallcoverings – has sometimes been blamed for creating a more lethal fire environment, in actuality the U.S. fire death rate has steadily decreased since the time when most construction and decorative products were made of "natural" materials.

5 Are any potentially harmful gases released when vinyl wallcovering burns?

Firefighters recognize that a fire's most toxic byproduct is carbon monoxide, which is produced in all fires. The mix of gases produced when vinyl burns is very similar to those of other common materials, including wood and fabrics.

Third-party organizations have concluded that fires involving vinyl – and the associated smoke – are no more toxic than any other fires. In particular, studies have looked at the effects of hydrogen chloride – a gas produced when vinyl burns – and found that the very small quantities emitted pose no unusual toxic threat in a real fire situation. This is because hydrogen chloride gas immediately condenses upon contact with the nearest surface, and is no longer subject to inhalation.



Are plasticizers used in vinyl wallcovering a health issue?

Phthalate plasticizers have been thoroughly researched and there is no evidence of adverse human health effects when properly used in vinyl wallcovering. Because of vinyl's physical nature, phthalate plasticizers are tightly held in the polymer, limiting the potential for human contact or release to the environment.

A blue-ribbon panel headed by former Surgeon General C. Everett Koop has declared that two plasticizers commonly used in wallcoverings, DINP and DEHP, are safe enough to be used in vinyl toys and medical products. The panel, convened by the American Council on Science and Health, based its findings on a comprehensive review of all available scientific literature on the plasticizers. In addition, an expert panel from the U.S. National Toxicology Program (NTP) Center for the Evaluation of Risks to Human Reproduction has stated that, at current estimated exposure levels, it is unlikely that DINP constitutes a risk to human reproduction or development.

Aren't there other dangerous components in vinyl wallcovering?

No. To improve the composition of its products, the wallcovering industry has worked to reduce and eliminate heavy metals such as cadmium and mercury, previously used as pigments, stabilizers and biocides.



Are there any restrictions to disposing of vinyl in landfills?

No. Vinyl wallcovering is essentially an inert material that does not require special handling for disposal. In fact, vinyl membranes have been used as geomembranes to line and protect landfills. In any case, vinyl wallcoverings have a long, useful life and compose a tiny fraction of the waste stream.

Can vinyl wallcovering be recycled?

Yes. Most manufacturers of vinyl wallcovering actively recycle scrap during the manufacturing process to minimize waste related to production. End-use or post-consumer recycling of vinyl wallcovering requires the availability of a demolition-waste recycling program. From a technical standpoint, such post-consumer vinyl wallcovering is definitely recyclable. The vinyl industry supports efforts to recycle vinyl wallcoverings and other vinyl products.

Why have some companies chosen to replace vinyl with other materials?

Vinyl competes with many materials on a cost/performance basis and is not competitive in all applications. However, for every company that has decided not to use vinyl, numerous others select it as a material of choice—particularly in wallcovering applications—because of its long-term durability, low maintenance requirements and cost-effectiveness, just to name a few benefits. Vinyl has grown to become the second largest plastic material sold globally and consistently grows year after year in the world market.



11 Do vinyl wallcoverings have a negative impact on indoor air quality?

The Institute of Medicine (IOM), established by the National Academy of Sciences, recently found insufficient information to link childhood asthma to plasticizers, but IOM did find evidence linking the disease to allergens caused by pets, cockroaches, dust mites and second-hand tobacco smoke.

In fact, because vinyl wallcoverings are so easy to clean, they actually contribute to the quality of indoor air by making it easy to remove sources of known allergens. And tests have shown that, with adequate ventilation, the initial odor in vinyl wallcoverings will dissipate much faster than the odors of most paints. Vinyl wallcoverings have a relatively low potential for odors or emissions and have not been identified as hazardous or a source of "sick building syndrome."

The vast majority of bad indoor air complaints result from fungi and bacteria growth in poorly ventilated buildings. While problems with mildew are sometimes attributed to vinyl wallcoverings, the primary cause of mildew is actually condensation resulting from warm, humid air infiltrating the wall cavity. Because vinyl wallcoverings are fairly impermeable, they can trap moisture inside the wall cavity, where it condenses against the relatively cool inside surface of the wall. Manufacturers of vinyl wallcoverings have taken steps to address these concerns with innovations such as mildew-resistant wallcovering and adhesives and "microvented" wallcoverings, which allow moisture trapped behind a show surface to escape into the room.

10 How does vinyl compare with other materials in environmental performance? Is it a sustainable material?

Vinyl's environmental performance is outstanding. The primary raw material in vinyl resin comes from common salt, which is in abundant supply. This means that vinyl is less reliant on petroleum resources than other plastics. The vinyl manufacturing process is highly efficient – more than 99 percent of all vinyl produced ends up in a finished product. And the energy required to make vinyl wallcovering is only half as much as the amount needed to produce the same amount of paper wallcovering. In addition, most vinyl wallcovering manufacturers actively recycle scrap related to the manufacture of the product.

Find out more about vinyl wallcovering at

www.vinylbydesign.com

www.wallcoverings.org

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