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VINYL



We're Glad You Asked

Answers to the most
commonly asked
questions about vinyl

We're Glad You Asked . . .

The Vinyl Institute (VI) is a trade association of the nation's leading manufacturers of vinyl (polyvinyl chloride or PVC), vinyl feedstocks and additives, and film and sheet products. The VI was formed in 1982 to promote and protect the industry and its many markets.

The VI sponsors scientific research to confirm the safe performance of vinyl products and monitors regulatory activity affecting the industry. Marketing programs promoting the use of vinyl are a key VI function.

What is Vinyl?

Vinyl is composed of two simple building blocks: chlorine, derived from common salt, and ethylene, from crude oil.

The resulting compound, ethylene dichloride, is converted at very high temperatures to vinyl chloride monomer (VCM) gas. Through the chemical reaction known as polymerization, VCM becomes a chemically inert powder: polyvinyl chloride resin.

Vinyl's Performance Properties

Because PVC resin can be combined with a multitude of additives and modifiers, vinyl is a product well-suited to a variety of needs and industries.

Vinyl is often selected over other materials because of its low cost, versatility and performance properties.

Vinyl is strong, durable, abrasion and moisture-resistant, impervious to rust and corrosion, electrically non-conductive, and ignition-resistant.

Vinyl can be produced in almost any color, with end products ranging from opaque to crystal-clear.

Through a variety of extrusion, calendaring and molding processes, vinyl is used in products as rigid as pipe or as flexible as upholstery and food wrap.

Vinyl's Uses

Vinyl is the world's second largest-selling plastic, with almost nine billion pounds sold in the U.S. alone in 1990.

Vinyl has many uses in construction, including water pipe, house siding, gutters and downspouts, floor tile, electrical wire and cable insulation, window treatments and wall coverings.

Flexible vinyl film is a leading packaging material for wrapping meats and produce, and for tamper-proofing over-the-counter medications and food products. Vinyl bottles store everything from peanut butter and cooking oil to shampoo and lighter fluid.

Vinyl is used in parts for appliances and automobiles, in fiber optics and electronics, as well as consumer and institutional goods like shower curtains, window shades, garden hoses, footwear, credit cards and automobile parts.

In the field of medicine, vinyl meets the exacting standards required for blood bags, heart catheters, medical tubing and surgical gloves.

Vinyl and the Solid Waste Stream

Currently, less than a half percent of the municipal waste stream by weight is composed of vinyl. Under typical

compression conditions, it represents only 1.25% by volume. Less than 5% of all discarded plastic packaging is vinyl bottles, blister packaging or flexible film.

Vinyl and Recycling

Even after a useful lifespan of decades, vinyl products can be recycled into new applications lasting decades more.

A current directory of vinyl recyclers is available from the Vinyl Institute.

At the industrial level, a significant amount of vinyl scrap — coming from polymer manufacturers and plastic processors — is collected and recycled.

Still in its infancy is post-consumer vinyl recycling. While less than one-tenth of one percent of all post-consumer vinyl is recycled — about five million pounds — that amount is growing.

When large, single-use applications (soda bottles and milk jugs) are set aside, recycle rates for vinyl are comparable with those plastics considered highly recyclable.

The long-term outlook for vinyl recycling is good. In 1989, the University of Toledo estimated demand for recycled vinyl at 494 million pounds — about twice the current potential supply.

Sophisticated new scanning equipment such as that developed by National Recovery Technologies can now separate vinyl from the waste stream for recycling using its unique chemical composition as an identifier.

Vinyl's Recycled Uses

The University of Toledo study identified nearly 100 potential uses for recycled post-consumer PVC. Some of the leading products to date are bottles, floor mats, bleacher covers, flower pot covers and irrigation pipe.

Vinyl and the Environment

• Conservation of natural resources.

Vinyl is less dependent on petrochemicals than any other plastic in use. Only 43% of vinyl's raw material comes from crude oil.

A recent study by the West German Society for Packaging Research found that displacing vinyl packaging would increase the total weight of packaging by 10% and the energy needed to produce alternatives by at least 40%.

• Incineration.

Vinyl can be safely incinerated in a state-of-the-art facility, according to a study by the New York State Energy Research and Development Authority at a full-scale incinerator. Vinyl incineration is not responsible for an increase in dioxin emissions.

Operating conditions, particularly burn temperatures, rather than the composition of the garbage burned, most influence the level of emissions.

Incinerators properly equipped with pollution scrubbers will remove over 99% of acid gases produced, including hydrogen chloride.

When recycling vinyl is not feasible, its high energy value, which is midway between that of wood and coal, can be recovered via incineration and converted to steam or electricity.

• **Landfilling.**

Where neither recycling nor incineration of the vinyl product is practical, vinyl can be safely landfilled. Vinyl products are chemically inert and stable, and do not leach contaminants into groundwater. In fact, landfill liners are often made of vinyl.

• **Chlorine.**

Vinyl won't harm the atmosphere. Once chlorine is processed into PVC, free chlorine gas cannot be liberated from the product. Vinyl products either incinerated or landfilled do not release chlorine gas into the atmosphere. There is no known connection between the depletion of the ozone layer and vinyl products.

Vinyl and Health

Worker health hazards due to prolonged high exposure to VCM were discovered in the late 1970's but new manufacturing technology has resolved those problems.

Vinyl production facilities are regulated by the Occupational Health and Safety Administration, and all emissions are regulated by the U.S. Environmental Protection Agency and reported under state and federal law.

There has been a 95% reduction in VCM emissions nationally over the last 20 years.

There is virtually no residual VCM in fabricated products; furthermore, vinyl products coming in contact with food and drinking water must meet stringent federal regulations.

Vinyl and Fire

Vinyl products are inherently flame-retardant due to their chlorine composition, do not readily ignite, and will not continue to burn once a flame or heat source is removed.

Unlike metal tubing, vinyl conduit will not arc or short, thereby reducing the hazard of fires in electrical uses.

Vinyl combustion products are not more hazardous than those produced by many other common materials, both natural and synthetic.

When it burns, vinyl does release hydrogen chloride (HCl), but studies have shown that HCl does not incapacitate or become dangerous until it reaches concentrations much higher than those measured in real fires.

For more information on vinyl issues, call the VI's Vinyl Environmental Resource Center at (800) 959-VINYL, or write

The Vinyl Institute, a division of The Society of the Plastics Industry, Inc. • Wayne Interchange Plaza II • 155 Route 46 West • Wayne, NJ 07470 • (201) 890-9299