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TO: All Vinyl Institute Members
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SUBJECT: Environmental Fact Sheets

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We have recently updated two items that we regularly use as part of the VI's environmental communications work:

- *"Some Common Misperceptions About Vinyl"* — A Q&A piece you can use to answer questions from customers, prepare letters to the editor, extract material from for presentations, and use as a quick reference.
- *"Vinyl Plastics and Solid Waste: Some Basic Facts"* — A quick overview designed for your use with all audiences. Previously, this fact sheet was printed on cream-colored paper with the V-3 insignia. We have converted it to this format to make it easier and less expensive to update.

Copies of both pieces are attached. If anyone in your organization uses either of these items and needs copies of the new version, please contact us.



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A Division of The Society of The Plastics Industry, Inc.

VINYL PLASTICS AND SOLID WASTE: SOME BASIC FACTS

Municipalities across the country are moving to establish comprehensive solid waste management programs. In the process, many questions arise as to how to handle individual components of the waste stream. This fact sheet has been produced to provide information on one of those components: vinyl plastics — otherwise known as PVC, or polyvinyl chloride.

ABOUT VINYL

Vinyl is the world's second most widely used plastic material, found in everything from house siding and water pipe to business machine parts and wall coverings. Despite the large amount of vinyl produced, relatively little (about two and a half percent) is found in the waste stream. That's because most vinyl applications are long-term uses that are not disposed of quickly. Most vinyl found in the waste stream consists of vinyl packaging — bottles, blister packaging and flexible film. Even this amount is relatively small, equaling about five percent of all plastic packaging found in the waste stream, or less than 0.5 percent of the total waste system.

Experience has shown that vinyl wastes can be handled by all conventional processes: recycling, incineration and landfilling. No "special handling" or special precautions are required to include vinyl in the typical solid waste management program. Here are some additional facts:

Vinyl Is Recyclable and Is Being Recycled

Currently, about 1,200 communities in the United States have access to vinyl recycling through curbside or drop-off center collection programs for mixed plastics. Once collected,

vinyl can be processed with other plastics to create "commingled" products such as plastic lumber, or can be separated out for use in a number of "second generation" products. A study conducted by the University of Toledo in 1989 identified nearly 100 such applications for recycled vinyl.

Vinyl containers or rigid blister packaging can be sorted by hand using The Society of the Plastics Industry's voluntary coding mark, which is required by law in many states. The code for vinyl is V-3. A vinyl container can also be identified by the "smile" or "slash" mark found on its bottom side.

The vinyl industry was one of the first to recognize that hand-sorting is not economically feasible for large-scale recycling operations and has been at the forefront in helping to develop the technology that allows different plastics to be separated from each other automatically. A number of these automated sorting systems are now commercially available and in use throughout the country. Because of its unique polymer composition, vinyl packaging lends itself especially well to these systems, which typically use patented scanning technology to distinguish one plastic material from another.

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Once separated, routine washing, chopping and drying is all that is required to prepare vinyl for reuse. According to current estimates, potential demand for recycled vinyl is likely to be double the available supply, even if all vinyl packaging is eventually collected and recycled. Other potential sources for recycled vinyl include scrap from construction demolition and remodeling, as well as various components found in durable applications such as automobiles, computer housings and appliance parts. Even vinyl used in some medical applications (such as IV solution bags) can be recycled if a workable collection program is put in place.

The vinyl industry has taken its commitment to recycling one step further and has established the only information center within the plastics industry that is staffed full-time with personnel dedicated exclusively to handling questions related to environmental and solid waste issues. This center, reached by calling 1-800-969-VINYL, provides information, acts as a networking source and helps introduce the concept of vinyl recycling to decision-makers throughout the country. A number of publications about vinyl recycling, including a directory of vinyl recyclers and a catalog of products made from recycled vinyl, are available through the Vinyl Environmental Resource Center as well.

Vinyl Can Be Incinerated Safely, Without Harm to the Environment

Studies conducted by independent authorities (most notably, the New York State Energy Research and Development Authority) have shown that the presence or absence of vinyl wastes in incinerator feed has no effect on the amount of dioxins produced by incinerators, and that dioxin production from any source can be minimized by carefully controlling incinerator operating conditions. Modern pollution control equipment further minimizes

dioxin emissions and scrubbers will remove over 90 percent of the acid gases produced by incinerating vinyl and other components of municipal solid waste.

Vinyl Is A Stable Material That Can Be Landfilled Safely

Vinyl is a chemically stable material that resists attack from the corrosive water and soil conditions typically found in landfills. It remains inert and will not leach harmful chemicals into groundwater. Because of its stability and resistance to attack, vinyl often is used to manufacture liners and leachate collection systems for landfill sites.

ABOUT THE VINYL INDUSTRY'S WORK

Through the Vinyl Institute, the vinyl industry maintains an ongoing program of technical research designed to develop practical methods for integrating vinyl products into responsible solid waste management programs. The Institute has funded independent studies, provided exploratory grants to promising enterprises and acted as an information source as new developments occur. If you have questions about the role of vinyl in the solid waste stream, please contact:

The Vinyl Environmental Resource Center
1-800-969-VINYL
1-800-969-8469

or write The Resource Center at:

One Cascade Plaza, 19th Floor
Akron, Ohio 44308

The Vinyl Institute is a division of the Society of the Plastics Industry, Inc. Headquarters:

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A Division of The Society of The Plastics Industry, Inc.

Some Common Misperceptions About Vinyl

1) No one is recycling vinyl.

Not true. Of course, industrial scrap vinyl has been recycled for years, but now, post-consumer vinyl recycling is growing, too, with about 5 million pounds of post-consumer vinyl (primarily bottles) currently being recycled. When the Council for Solid Waste Solutions (now, the American Plastics Council) conducted a nationwide survey in 1991, it found that there were an estimated 1,100 municipal recycling programs in place or planned in the United States that include vinyl.

2) There's no market for recycled vinyl.

Not true. In 1989, the University of Toledo identified nearly 100 uses for recycled vinyl. Overall, the potential demand for recycled vinyl is estimated to be about twice the potential supply (494 million pounds needed vs. 207 million pounds available via recycling of bottles). A recent directory published by the Vinyl Institute lists nearly 50 companies that make commercial products out of recycled vinyl.

3) Vinyl is the "problem child" in municipal recycling because it contaminates other resins.

Contamination can occur whether or not vinyl is present. Other resins are just as much a contamination problem for vinyl. Except for commingled (mixed) plastics applications, different plastic materials cannot be mixed successfully in most recycled products applications. This is why it's so important to develop the technology to efficiently separate one plastic from another. Thanks to the chlorine that is present in it, vinyl lends itself very well to automated sorting technology.

4) If vinyl products were banned from the waste stream, there would be no problem sorting plastics.

Not true. The only plastic applications that are currently easily separated are PET soda bottles and HDPE milk bottles. But according to a study conducted by the Massachusetts Executive Office of Environmental Affairs in 1988, programs that limit themselves to these two products can only hope to capture 11 percent of the plastic packaging in the waste stream. To institute a truly comprehensive recycling program, you must include all the other products made from PET and HDPE (which aren't always easily identified), plus the products made from vinyl, LDPE, polystyrene and polypropylene. With or without vinyl, comprehensive plastics separation is a challenging problem.

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- 5) **Individual municipalities can't afford the technology to separate different plastics. It's better to concentrate just on soda bottles and milk jugs.**

Eventually, consumers will want more. The ideal is to give them a curbside system that lets them dispose of all plastics, without requiring them to make involved decisions as to which container is "allowed" in the program. Long-term, the vinyl industry believes that the only feasible way for municipalities to do this is to band together to support the implementation of regional plastic recycling facilities (PRFs), where smaller volume plastics (the "third bale" that remains after you take out milk jugs and soda bottles) can be sorted economically.

- 6) **Rather than dealing with all these smaller volume plastics, it's better just to ban the ones that can't be easily recycled.**

Consumers and manufacturers would give up a lot if this were to happen. Vinyl has been used for years in packaging applications because it provides a combination of properties that other materials cannot provide. These include cost, appearance and technical performance. For small-volume applications in particular (such as house or regional brands), vinyl is often the most cost-effective packaging choice. In other applications, such as meat wrap, vinyl is the only suitable material.

- 7) **PET and HDPE packaging are listed as 1 and 2 in the SPI recycling coding system because they are the most recyclable.**

Not true. The numbers assigned to each plastic in the SPI coding system are purely arbitrary and do not reflect the material's recyclability.

- 8) **Vinyl gives off dioxin when it's incinerated.**

A study conducted by the New York State Energy Research and Development Authority in 1987 found that the presence — or absence — of vinyl wastes in incinerators had no effect on the levels of dioxin produced. Rather, it was found that incinerator operating conditions (primarily, temperature) were the key to controlling dioxin formation. Most recently, German officials examined the issue of incinerating vinyl waste and decided there was no cause for concern.

- 9) **Vinyl should be banned from incinerators because the chlorine in it produces acid gases and causes acid rain.**

This ignores the big picture. About 50 percent of the chlorine present in incinerator wastes comes from sources other than vinyl such as table salt and food wastes. So even if all vinyl products were banned, incinerators would still need to operate with scrubber systems to make them environmentally acceptable. One of the leading manufacturers of incinerator systems, Ogden Martin Systems, has advised the EPA that its equipment "can tolerate reasonable increases in acid-producing waste components without adverse effect," and does not "perceive the anticipated increases in PVC food packaging to be problematic." As to acid rain, power plants burning fossil fuels, which produce sulfur dioxide and nitrogen oxide, are considered to be the primary cause of acid rain. In Europe and Japan, studies show that only about 0.3 percent of all atmospheric acidity can be traced to the incineration of vinyl.

- 10) Vinyl should be banned from incinerators because it contains heavy metal additives.**

This is an evolving issue. Many vinyl products are being reformulated to eliminate the use of heavy metals. Granted, some use of heavy metals is likely to continue, but banning vinyl from incinerators will not eliminate this problem. Rather, regulating agencies (like the EPA) must make sure that all incinerator residues (ash) are disposed of appropriately.

- 11. European packagers and grocery stores have banned vinyl.**

Not true. There is only one ban on vinyl packaging in Europe, and that is on the use of vinyl to bottle mineral water in Switzerland — a ban that was orchestrated by the marketers of Swiss mineral water, who used it as a ploy to block the sale of French mineral water in that country. There is a voluntary agreement in Denmark by industry to substitute alternatives to vinyl packaging when feasible and some municipalities in Germany have restricted the use of certain vinyl products in municipally funded building projects. Industry is working to change those restrictions.

Elsewhere in Europe, vinyl packaging continues to be widely used. In Great Britain, one of the leading retailers, Marks & Spencer, has chosen vinyl over other materials as the chain's most "environmentally friendly polymer." In Switzerland, retailer Migros has stated that its whole attitude toward vinyl will change when incinerator scrubber technology is fully employed. The current trend in Europe — led by the Germans — is to take a comprehensive look at waste reduction and make industry a partner in that process. This involves all industries, not just the vinyl industry. Overall, Europe remains a larger consumer of vinyl packaging than the U.S.

- 12) Vinyl plastics decompose in landfills and give off vinyl chloride monomer.**

Not true. Like all plastics, vinyl is an extremely stable landfill material. It resists chemical attack and degradation, and is so resistant to the conditions present in landfills it is often used to make landfill liners. On those occasions when vinyl chloride monomer is detected in landfills, it typically can be traced to the presence of other chemicals and solvents.

- 13. Vinyl products should be banned because they are made from vinyl chloride monomer — a cancer-causing agent that can harm workers and the environment.**

The vinyl industry adheres to very strict standards for the manufacture, use and transportation of vinyl chloride monomer (VCM). These include regulations set by the U.S. Environmental Protection Agency, the Department of Transportation, and the Occupational Safety and Health Administration. Like many other materials used by industry every day, vinyl chloride monomer can be potentially hazardous. Today, however, the use of vinyl chloride monomer presents virtually no hazard to workers or the environment because of the safeguards that have been put in place throughout the manufacturing process.

It's also important to note that once VCM is converted to PVC, or vinyl, it becomes inert and cannot convert back to its former state. On an industry basis, 99-plus percent of all VCM used is converted into useful product, and since the 1970s, the vinyl industry has reduced its VCM emissions by 95 percent.

14. Other plastics are more environmentally "friendly" than vinyl.

Not true. A recent study conducted by Chem Systems, Inc., an independent consulting firm, compared vinyl to a number of other packaging materials and found that vinyl consumed the least amount of energy, used the lowest level of fossil fuels, consumed the least amount of raw materials and produced the lowest levels of carbon dioxide of any of the plastics studied. In fact, the Norwegian environmental group Bellona has concluded that "a generally reduced use of vinyl plastics will, given today's circumstances, lead to a worsening of the environmental situation."

15. In a fire, vinyl products burn quickly, give off toxic gases and are an unusual fire hazard.

Because they contain chlorine, vinyl products are inherently flame-retardant and resist ignition. When it does burn however, vinyl produces carbon monoxide, carbon dioxide and hydrogen chloride. Of these, the most hazardous is carbon monoxide, which is produced by virtually anything that burns and can be lethal at relatively low doses. Hydrogen chloride is an irritant gas that it can be lethal at extremely high levels. However, research indicates that those levels are never reached or even approached in real fires.

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