In the Wallcovering Association’s efforts to understand sustainability based initiatives, our collective technical knowledge of raw material choices is crucial. As we discussed at the WA 2019 Annual Meeting, we must become experts on all chemicals and chemistry of wallcovering products so that their use can be defended, when applicable, when questions are raised about their use in flexible vinyl wallcovering products. With that goal in front of us, this information attempts to provide a summary of the phthalate issue facing manufacturing flexible vinyl wallcovering.

How should phthalate issues be discussed and communicated? Should manufacturers and distributors have the responsibility to be the spokespersons for the phthalate industry? Should WA rely on the Vinyl Institute to respond to phthalate issues on WA’s behalf? Other questions come up too. So our first step is to understand the raw material and the issues that are attached to it.

Phthalate esters are a class of chemicals used to make vinyl products flexible. We all know this already. In “The Handbook of Environmental Chemistry” [reference below], it is explained that “Phthalate esters are not bound to the polymer with covalent bonds and are therefore able to migrate to the surface of the polymer matrix where they may be lost by a variety of physical processes. Nevertheless, various chemical-physical attractive forces hold the phthalate tightly within the vinyl matrix, so that such migration occurs at a very low rate.” Therefore, “retention in the polymer matrix is one of the main factors in considering which phthalate ester to use. The ester must be sufficiently nonvolatile to remain in the compound during its mixing and formulation stages.” Additionally, we are required to consider its use and end-of-life phases as well. The manufacturers of the flexible vinyl sheeting are making these decisions for the most part. They have to consider regulatory requirements, and perhaps restrictions, on their choice of phthalate in a product.

This Handbook goes on to say “The major portion of phthalate esters that are found in the environment are the result of the slow releases of phthalates from plastics and other phthalate containing articles due to weathering. Under conditions of high surface exposure and warm temperatures, phthalates can diffuse from the solid surface into the air, despite their rather low vapor pressures. Therefore, phthalate-containing consumer items during their useful lifetime may continue to be a source of phthalate esters to the atmosphere.” From this, we know there is an exposure source, so we need to determine if it is significant or of a low risk. Based on the scientific papers that have been conducted, the risk associated with exposure appear to be minimal. The American Chemistry Council created the document “Estimating Potential Exposures to DINP from Consumer Products” which included an example on consumer installation of vinyl wallcovering specifically to address California Prop 65 labeling questions. The exposure estimate after completing the worksheet was 15.3 ug/day. Prop 65 has a No Significant Risk Level of 146 ug/day. Therefore, the exposure is at about 10% of the No Significant Risk Level, if the calculations and assumptions used in the worksheet are valid.
Part of the difficulty in communicating information on phthalates is that there continue to be new studies or reports on specific exposure situations. For instance, recent news publications have included articles on phthalate chemical exposure early in life on children’s lungs; or that the research "rules out any extreme increase in risk," but still leaves open the question of whether some relationship exists between phthalate exposure and breast cancer. The current scope of scientific research seems to be directed at trying to establish links between exposure and specific health issues. This has to be difficult for researchers who are trying to determine those specific links to general exposures of phthalates from all possible sources found in the world.

The question of where is the exposure to phthalates coming from is very important. Could it be food contact packaging? Cosmetics? Building materials? Does phthalate exposure from vinyl wallcovering have any real exposure concern since there are other more probable sources to which people are routinely exposed? It should be obvious that wallcovering would not be a primary source but it would be difficult to conclude that it is not at least a minor contributor, and that is because it is found in the formulation of the product.

What should wallcovering messaging be? Are phthalates safe? The Flexible Vinyl Alliance wants to say “Phthalates have been safely used in consumer and commercial products for more than 50 years to enhance durability, flexibility and performance. Phthalates are primarily used to make polyvinyl chloride (PVC or vinyl) flexible and are used in hundreds of products in our homes, hospitals, cars and businesses. Phthalates are some of the most tested substances in commerce and the scientific data about their safety has been reviewed by multiple government agencies in the United States, Europe and Australia, including previous reviews by the Consumer Product Safety Commission.” Would this messaging effort be accepted by your customers?

The fact is that this topic is likely to continue to be a head scratcher going into the future. The research shows that there is an exposure potential but at this point, it appears that there is not a direct link to health issues studied so far. There are still as many questions as there are answers.

References