RESPONSIBLE USE OF PVC

Tarkett, a global leader in innovative and sustainable solutions for flooring and sports surfaces, passionately believes in building a business that takes equal account of its impact on people, planet and profits, whilst transforming to a circular economy business model powered by Cradle to Cradle® principles. Tarkett works with the Cradle to Cradle® consultancy EPEA, lead by Prof. Dr. Michael Braungart to assure its materials and processes are rigorously tested against C2C’s human health and environmental criteria.

Background on PVC
Worldwide, about 45 Mio tons of PVC are produced each year. PVC is used for many different applications, amongst others for toys, packaging and coated papers. PVC has historically been associated with many issues, and therefore attacked from different sides.

Tarkett has taken the raised issues seriously and addressed them by designing our products with good materials by substituting phthalate plasticizers and heavy metal based stabilizers, while take back systems for the safe and productive post-use management are established.

Changing the Paradigm
Historically, there was a good reason for the invention of PVC and its patenting on July 4, 1913. PVC was industrially developed as a way to manage chlorine, a by-product of the caustic soda production from the separation of rock salt.

The magnitude of the issue can be illustrated by looking at the market: Caustic soda is one of the most demanded chemicals with a production volume exceeding 60 million tons/year¹, with increasing volumes. As a byproduct, almost the same amount of chlorine is produced annually.

Caustic soda is a consumable with no opportunity to be kept in technical cycles. The demand is difficult to meet with production routes other than the chloralkali process. In effect, likely more than 98% of caustic soda and 100% of chlorine are produced this way². As long as the demand for caustic soda prevails, a transitional chlorine management solution is obviously needed³.

Against this background, EPEA has come to the conclusion that it is preferable to sequester chlorine in PVC applications with positively defined composition that can be managed after-use.

3. **Volatile Organic Compounds (VOCs):** Tarkett is committed to using materials that emit low or no VOCs, ensuring that the indoor air is healthy. Its R&D efforts have enabled it to become an industry leader in lowering VOC levels in PVC from 2-20 times lower than the requirements for Greenguard for children and schools.

**Collaboration Across the Industry**
Tarkett is also committed to working with its suppliers to assure that they optimize their PVC production and use safe materials across plasticizers, stabilizers and additives. We also work with customers and suppliers to maximize our ReStart® reclamation and recycling program.

**How Recycling is Good for People and the Planet**
There are environmental and health risks when PVC is landfilled or incinerated in an uncontrolled way, potentially leading to the leaking of additives or the release of dioxins and furan formation. This problem is solved when PVC is taken back and recycled as a technical nutrient for durable goods such as pipes, window frames, and flooring, according to the C2C philosophy.

**How Tarkett is Improving the Material Health of PVC**
Tarkett has worked on the responsible use of PVC, in collaboration with the C2C scientists from EPEA, in three ways:

1. **Stabilizers:** Tarkett has substituted all its heavy-metal stabilizers (used to prevent material degradation) such as lead and cadmium by non-harmful alternatives: calcium-zinc and barium-zinc.

2. **Plasticizers:** These are used to provide flexibility to PVC flooring. Some studies show that ortho-phthalates, the most common form of plasticizers, may be of concern and have been listed on banned lists of chemicals. As part of its C2C vision, Tarkett is committed to substituting all its phthalate plasticizers for alternative forms of plasticizer by 2020. Tarkett pro-actively started deploying the phthalate-free technology in North America and Europe in 2010. The phthalate-free plasticizers we selected are approved for food contact5 and can be used for children toys intended to be placed in the mouth6.

3. **Safe Production**
- No mercury used for separation of chlorine and caustic soda
- No release of VCM4 during production or in the concentration of the final product

**End of Use**
- Take back and recycling programs in place

**What is responsible use of PVC?**
As long as chlorine will continue to be generated, it appears a better option from a Cradle to Cradle point of view to convert it to PVC used only for durable goods (pipe, window frame and flooring) designed with safe materials and a manageable post-use recycling chain in place. In summary:

**Applications**
- Durable goods only (such as pipes, window frames and flooring)

**Product Composition**
- Safe plasticizers (no phthalates)
- Safe heat stabilizers
- Safe additives

**How Recycling is Good for People and the Planet**
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To this end, Tarkett has been involved in recycling since 1957 through its Re-Start programs in North America and Europe.

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**CRADLE TO CRADLE IS ABOUT INSPIRATION, CELEBRATION OF THE HUMAN FOOTPRINT. IT’S NOT MINIMIZING NEGATIVE IMPACT, NOR OPTIMIZING EXISTING BAD PRACTICES. THIS IS A STEP-BY-STEP JOURNEY, WHICH NEEDS SOLIDARITY, TRANSPARENCY AND COMMITMENT FROM ALL STAKEHOLDERS – MANUFACTURERS, SUPPLIERS, CONSUMERS – AS WELL AS CREATIVITY AND INNOVATION TO DESIGN HIGH-QUALITY AND ECO-EFFECTIVE PRODUCTS. LET’S BE BENEFICIAL, WE DON’T NEED TO BE PERFECT, WE CAN SAY “LOOK THIS IS WHERE WE ARE AND WHERE WE WANT TO BE”. THIS IS WHY TARKETT IS SO INTERESTING, BECAUSE THEY HAVE A LONG-TERM STRATEGY.**

Prof. Dr. Michael Braungart. Founder and Scientific Director, EPEA (Environmental Protection and Encouragement Agency.)

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For more information, visit: http://epea.com/en/content/position-paper-pvc-and-chlorine-management