

Sealed Air Corporation

Polyvinylidene chloride (PVdC) is a type of plastic used as a very thin layer in food and medical packaging for its excellent barrier properties against water vapor, oxygen, and odors, helping to preserve the freshness and quality of food and pharmaceutical products. PVdC offers a unique combination of barrier properties for flexible packaging, for which currently there are no viable substitutes. It's important to note that while PVdC shares some chemical characteristics with polyvinyl chloride (PVC), it is distinct and should not be equated with it.

Many perishable food products, such as fresh beef, pork, lamb and cheese require protection from oxygen to maintain product color and prevent spoilage during distribution. In situations where distribution distances are long, or where extended shelf life is desired, this barrier requirement is extremely important to prevent product loss. An additional challenge is that for moist food products such as meats and cheeses, the presence of this moisture can compromise the barrier properties of alternative barrier materials thus reducing shelf life and increasing product spoilage and waste. No single material has the overall gas and water permeability resistance of PVdC.

The report to the legislature states that "polyvinyl chloride (PVC) and polyvinylidene chloride (PVDC) are the main polymers made of organochlorine substances used in packaging and often comprise a large part of the packaging material". While PVC volume may be large, PVdC volume is estimated to be about 162,000 kg per year used in the state of Washington based on per capita consumption of vacuum packaged meat.

It also states that "akin to other plastics, plastic packaging polymers such as PVC and PVDC degrade to microplastics (defined as particles smaller than 5 mm in their longest dimension) which people, including sensitive populations, can inhale or ingest." We are not aware of studies of PVdC specific microplastics nor studies suggesting that PVdC has different properties relative to microplastics than other plastic materials.

While the manufacture of PVC uses vinyl chloride, Syensqo, the major manufacturer of PVdC uses the monomer Vinylidene Chloride to manufacture PVdC in their facility in France. Syensqo's PVdC contains < 10 ppm VC.

The report states that "PVC and PVDC are a hindrance to the goal of a circular economy for packaging in Washington. The recycling rate for post-consumer PVC and PVDC in Washington is negligible because there are no facilities that can recycle these materials at scale in the state (Eunomia, 2023). Most of the packaging made from these materials ends up in landfills, is incinerated or burned." Collection and processing of flexible films, no matter the chemical content, is challenging due to the mechanics of flexible materials being incompatible with the gears and conveyors used at sortation facilities. Technology to separate PVdC in order to create a polyethylene rich stream for further processing has been developed and is in use at Sealed Air's South Carolina recycling facility. When sufficient infrastructure is available to handle flexible packaging materials at scale in Washington it is likely that this separation technology will be commercially available to allow PVdC to be separated from the PE stream.

It also states that "burning PVC and PVDC materials can form dioxins, another group of hazardous organochlorine substances (Baca et al., 2023). Dioxins are persistent organic pollutants that accumulate in animals and contaminate food." Dioxin formation is dependent on temperature, time

and turbulence during incineration and are not formed when combusted in modern incineration systems. While a typical landfill fire burns at a lower temperature, a 2006 combustion study at 700 deg C showed that a PVC sample produced 207 ng/g of total dioxins and a PVdC sample produced 57.4 ng/g of total dioxins (Yasuhara et al, 2006).