Industry Initiative for Recycling of PVC Products in Japan

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Abstract

To facilitate recycling, not only conducting R&D but also creating efficient recycling systems — involving collection and processing recyclates as well as finding appropriate end-uses — all are essentially important. PVC has an advantage in particular in mechanical recycling as compared to other major plastics, however, there is no one-size fits all approach. Specific situations of the used or off-cut products and the applications need to be well studied. Vinyl industry in Japan has devoted itself for many years to the promotion of recycling vinyl products.

Various technologies have been developed including some which are actually commercially operating. Some new developments include mechanical recycling for products like wall covering and tarpaulin which were considered difficult to recycle. There was also progress in chemical recycling with a technology to remove chlorine from shredder dusts. Recovery of chlorine is a major challenge for the future. Collaboration among various players involved in recycling of a specific product is essential for success.

Keywords: *Mechanical recycling; Chemical recycling; R&D; Industry initiative*

1. Introduction

A strong environmental advantage of PVC products, as compared with those made of other plastics, is their long life and their recyclability even after decades of use. In Japan PVC industry started an initiative six years ago to actively promote the recycling of various types of PVC products. As new recycling technologies emerge and some became operational since then, PVC products are now well recognized as environmentally friendly goods.

2. Industry Initiative

PVC industry in Japan launched an initiative called "Recycle Vision" in 2007 as its commitment to recycling of PVC products. It started a program to support R&D to facilitate the introduction of new recycling technologies.

The R&D support is to cover half of the expenditure for an emerging technology which has a high potential of practical application in near future but still needs some additional efforts of developments and/or testing. The program is unique in the sense that not the public sector but a private sector supports R&D activities with is own resources. Project proposals are assessed by an independent board which consists of scholars in recycling and industry experts. The Vinyl Environmental Council (VEC), which runs the program, decides whether it adopts a proposal based on the recommendations proposed by the board.

Seven projects were completed by April 2013 which chronologically include 1) separation of PVC compound and fibers out of wall coverings and tarpaulin (MR), 2) recycling of tile carpets (MR), 3) production of active charcoal from wall coverings (FR), 4) fractal shape artificial forest (shades) from rigid PVC (MR), 5) reuse of PVC backings of used tile carpet as thickener (MR), 6) removal of chlorine from automobile shredder dusts for cement production (FR) and 7) pealing off PVC compounds from tarpaulin sheet edges. Among these four [1), 2), 6) and 7) are in operation and one is under weathering testing (4)]. Legend: MR = Materials Recycling; FR = Feedstock Recycling.

It is encouraging to see that new MR technologies emerge for composite products which were regarded difficult to recycle as material. The separated PVC compounds are used together with virgin PVC and/or other used PVC products such as cable sheaths to produce masking mats for construction sites, for an example.

3. For a Successful Recycling

Economy is always key for successful recycling. It is therefore essential to carefully study specific cases to confirm key elements such as stable supply of used or off-cuts PVC products, the demands for the recyclates and the costs of processing/conversion as well as of transportation. When VEC receives soundings of a project proposal, it carefully conducts such a study and often plays as a matchmaker to connect potential suppliers and users of recyclates to improve the feasibility of the project.