CASE STUDY HOUSEHOLD PLASTIC PAINT CONTAINER RECYCLING TRIAL

AkzoNobel · RPC · RECOUP RECycling Of Used Plastics Limited · B&Q · Community RePaint Proudly sponsored by Dulux · resourcefutures

HOUSEHOLD RECYCLED PLASTIC PAINT CONTAINER CLOSED LOOP TRIAL LIFE CYCLE

STAGE 1. Full and part-full containers collected at HWRC by CCORRN

Community RePaint Proudly sponsored by Dulux

Paint is recycled and redistributed to community projects

Stage 2. Containers, emptied, metal parts removed and baled at CCORRN

Empty Paint Containers are baled

Stage 3. Containers, Transported to Re-processor

Baled containers transported to reprocessor

Reprocessing

Stage 4. Containers processed into compound pellet

RPC

Stage 5. Recycled plastic compound pellet made into new paint containers

AkzoNobel

B&Q

Communications to Customers

Household Paint Use

CONTAINER COLLECTION

The recycling trial was linked with an existing Community RePaint scheme to recycle plastic paint containers already being collected for paint extraction. The trial concentrated on; collection, preparation, transportation, operational logistics, reprocessing and moulding into new containers. Each element of this process was investigated taking account of external considerations and possible future commercial viability of recycling plastic paint containers.

Full and part-full containers were collected from 6 HWRCs in Cambridgeshire and 3 HWRCs in East London, via Community RePaint. The containers were taken to the Community RePaint Scheme in March, Cambridgeshire (CCORRN), managed by Resource Futures.

LOGISTICS AND OPERATIONS

At CCORRN the paint was decanted and the containers prepared and stored. Any metal handles were removed prior to baling by a single shift baler (below).

Figure 1; Baler at CCORRN

The bales produced were unstable due to lack of pressure and the pressure being vertical. Each bale took on average 30 minutes labour time to prepare and on average weighed 29 kilos. Stacking of the bales was not possible due to their instability.

The bales were stored outside. Modifications to the baler resulted in the bales being more compact and heavier. The labour time to prepare each bale was an average of 30 minutes per bale.

Figure 2; Baled plastic paint containers

The bales had to be covered prior to transportation due to exterior contamination and were bagged in clear plastic pallet bags for shipment.

44 of the prepared bales were collected for reprocessing, the total weight of material was 1440 Kgs.

Alternatives were researched for the baler. Using a granulator as a shredder proved to be a quicker preparation process and allowed for easy storage and bagging prior to shipping.

Figure 3; Plastic paint containers put through granulator used as a shredder.

The bales were shredded, washed and processed into pellet. From the 1440 Kgs of baled material, 619 Kgs of pellet was sent to RPC for moulding. The contamination was mainly dry paint residue on the inside and outside of the containers.

The pellet, which was 100% recycled plastic paint containers was stiffer than that normally used by RPC. The trial was conducted using 100% of the reprocessed recycled plastic paint container pellet to mould containers.

Figure 4; Pellet from recycled plastic paint

Although the material moulded successfully the containers did not pass the stringent quality control at RPC.

Figure 5; Moulded plastic paint container from recycled plastic paint containers

Further laboratory tests indicated that the low melt flow rate of the material was likely to be the main reason for the failure. The laboratory tests also showed that there was a 3-5% of PE material within the compound pellet. It is not known if the pellet could be incorporated at a reduced percentage with other recyclate or virgin material to complete the closed loop process.

The trial concentrated on stages 1 - 5 of the process culminating in the moulding of test plastic paint containers.

The trial was not communicated to B & Q customers in store.

The trial confirms the complex market forces that would determine any future recycling of plastic paint container recycling;

- Paint container volume, collection and storage arrangements;
- Landfill costs that might otherwise be incurred;
- The need for removal of as much paint as possible, to reduce contamination to viable levels;
- Preparation prior to shipping i.e. baling verses or shredding;
- Haulage of material and prevent paint leakage throughout transportation;
- Wash processes and ability to deal with paint residue.
- Technical specifications of compound pellet and percentage mix at moulding.
- Suitable end markets.

Figure 6; Post-consumer plastic paint containers prior to baling at CCORRN

This piece of work was delivered through a consortium approach and the partners and their interests/roles were:

- **RECOUP;**
  Overseeing the project and facilitation.
- **Resource Futures;**
  Project management/supplier of empty plastic containers via Community Repaint scheme.
- **AkzoNobel;**
  Producer responsibility and sole sponsor of Community RePaint..
- **RPC;**
  Interested in recyclate for new plastic paint containers. Trial and moulding of material to investigate closed loop solutions.
- **B & Q/Kingfisher;**
  Communication & promotion of recycling paint containers.

REPROCESSING STATISTICS

- 1440 Kgs of baled material delivered for reprocessing.
- Recovered compound pellet 619 Kgs (43%).
- 5% yield loss.
- Contamination 749 Kgs, (52%).

KEY FINDINGS:

- That paint recycling initiatives should be connected to existing paint recycling schemes and that work would need to be undertaken to look at further reducing contamination.
- Based on current market forces, it is unlikely that a paint container recycling project could be financially viable if stand alone. The need to remove all paint for another use is crucial to any scheme success as this will drive down contamination.
- Vertical balers are not suitable for the task. The trial indicates that from an operational view point shredding at the hub would reduce labour, allow for increased levels of storage and transportation.
- While the trial has indicated that the material could be recycled, further work would need to be undertaken to understand why the Melt Flow Rate was so low. Solving the MFI issue would be necessary to recycle post-consumer paint containers into new paint containers.
- Further work/trials could be undertaken to find other end markets for the recycled plastic paint container pellet.
- Further work/trials could be undertaken to ascertain the blend of the recycled material and recyclate percentages that could be incorporated to mould plastic paint containers or other products.
- Success will be determined on the volumes that can be collected, processed, stored and transported.

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