bregau

Expert report

edding return box process

Subject of the expert report: recording and verification of the process for recycling and processing products collected in the edding return box.

The expert report includes:

- verification of the existing process descriptions, including subprocesses performed by partners,
- comparison of process descriptions with the processes actually in operation, including on-site audits at Nordthüringer Werkstätten GmbH (hereinafter Nordthüringer Werkstätten) and mtm plastics GmbH (hereinafter mtm plastics),
- analysis and evaluation of the input-output balances in the various subprocesses.

The complete process consists of various process stages:

1. **Collection and return of empty markers** in the return box. The return box is provided to the customer free of charge on request.

2. **Free despatch of full return boxes** by the customer direct to Nordthüringer Werkstätten.

    a. The return boxes arrive at Thüringer Werkstätten by post, sometimes several return boxes are emptied into larger [cardboard] boxes and despatched, enabling a total weight of up to 20 kg.

3. **Acceptance and mechanical pre-sorting of waste** by Nordthüringer Werkstätten and transportation for processing/recycling at mtm plastics. Nordthüringer Werkstätten is a certified waste management facility mainly focussing on the sorting of old electrical equipment for the local district (*Landkreis*) and is also a certified primary treatment plant within the meaning of section 21 of the German Electrical and Electronic Equipment Act (ElektroG). Temporary storage and recycling of hazardous and non-hazardous waste (plastics: in this case pens and writing implements) and treatment thereof are also certified. Regarding the process:

    a. Shipments are marked with the date of receipt when they reach the warehouse and are stored temporarily until they are processed.
    b. Following receipt, the date of receipt and total weight for the day are recorded in the operations log.
    c. The net weight is automatically determined in an Excel table by calculating the difference between the total weight and the packaging (tare) weight.
    d. Batteries, paperclips, stamp pads, erasers, pencils, card/paper, foiles and residual waste (such as food remains) found in the return box are separated out. Selected personnel carry out the sorting work (Efb employees).

    (On-site audit on 06.04.2022)

30 return boxes were specifically sorted in a trial conducted on 08.06.2022: in addition to 91.8% mixed plastics, the boxes contained 4.5% paper/card, 2% printing ink waste, 1.6% other waste and 0.1% mixed batteries.

4. Recycling and granulation by mtm plastics (different recycling processes with varying output).

mtm plastics carries out a range of recycling processes:

At mtm plastics, the returns from the box are recycled together with recycled waste from the *yellow sack*[1] (post-consumer material) in a process consisting of:

- shredders
- overbelt magnet sifting/magnetic drum
- NF separator
- air classifier
- cutting mill
- washer/dryer
- extruder with further sorting of lower-quality materials by sifting using a die plate (180µm) and subsequent granulation.
- (On-site audit on 07.04.2022)

A laboratory analysis by mtm plastics revealed that approx. 73% of returns from the return box could be recycled into reusable plastic. Furthermore, the recycling process produced approx. 8% iron and 4% aluminium. These materials are directed to the appropriate recycling processes. The rest is recovered using heat treatment.

Use of recycled materials for production of edding products

Post-consumer material (light PP 71 = purpolen [grey polypropylene recylate]) is used to produce plastic parts for the following EcoLine products:

- 2-28/e-29 whiteboard markers
- e-21/e-22/e-25 permanent markers and
- e-31/e-32 flipchart markers.
-

The pre-sorted pens from the return box are recycled with material from the *yellow sacks* to produce PP 71 (purpolen). The plastic parts (barrel, mouthpiece and cap) for the above EcoLine products are produced from this material.

[dated] Bremen, 20.07.2022

Jens Schröbers

[1] In Germany and Austria, the "yellow sack" is a thin, transparent yellow plastic sack used for the collection and disposal of plastic, metal and composite materials within the local waste disposal system. A yellow sack and the yellow bin (bin for collecting recyclables) are part of the dual waste-management system in Germany.