2. Technical e-NEWSLETTER

Demonstration of packaging product solutions (biodegradable wine bottle tray) based on transformed hop waste

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In 2020, a team of TRIDAS engineers decided what the bottle tray should look like based on standard wine bottle dimensions and how it could be suitable for production using hop fibre. TRIDAS designers produced a 3D design sample of wine bottle packaging consisting of the top and bottom part of closable packaging which should be suitable for a standard wine bottle.

Design for a bottle tray, Photo by TRIDAS

After receiving a batch of 125 kg of hop waste from partner ZELFO Technology, TRIDAS started the first production of 1,000 demos of wine bottle packaging.

PACKAGING PRODUCTION PROCESS

The whole process started by mixing collected waste paper (cardboard and newspaper) mixed with hop waste material in the hydropulper. Here, the material was mixed with water and within 15 to 20 minutes, it was de-fibred to establish pulp. This mixture was pumped through a two-stage filtration where, in the first cycle, heavy impurities (small stones, sand, paperclips) were separated and, in the second cycle, all light impurities were separated (wood, plastic, polystyrene, and adhesive tapes). The pure pulp was stored in tanks, ready for subsequent use. The final step of the pulp preparation wasto mix it to reach the required operation parameters.

Material mixing, Photo by TRIDAS

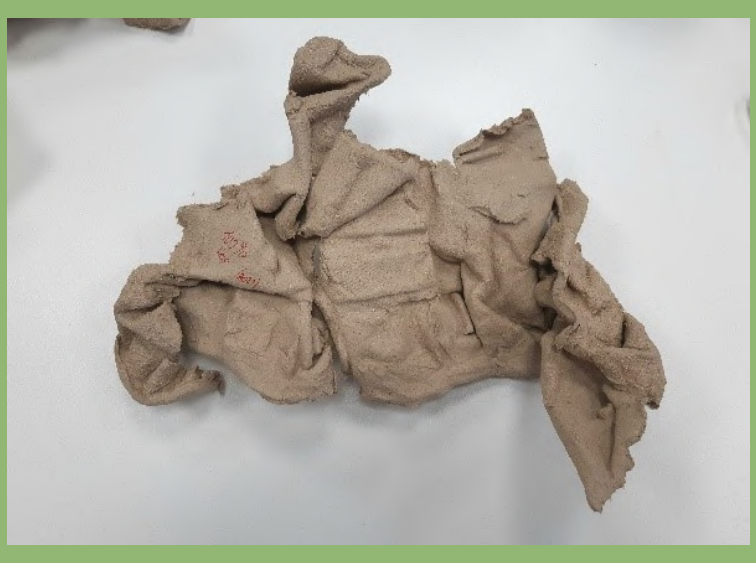
The second productions step was the pumping of pulp to the forming section of the line where it was sucked onto aluminium moulds. After residual water has been exhausted, the already finished product was transferred into hot forming moulds. During the drying process, still wet trays were pressed under high pressure. The product drying time varies between 60 and 150 seconds, in relation to the size and weight of the tray.

Drying process (50 % mix), Photo by TRIDAS

TESTING OF PACKAGING MIXTURES

First, TRIDAS tried 100% hop waste material which, as expected based on previous tests, didn´t work. The material was too squashy so it didn´t hold together. Then, a 70% mix of hop waste material and fibre showed better results, but not perfect for wine bottle packaging. The trays were torn and didn´t hold their shape.

100 % hop waste material, Photo by TRIDAS



70 % hop waste material, Photo by TRIDAS

A big surprise for everyone was that a mix of 50 % fibre with 50 % hop waste material worked perfectly and the packaging held together. It was surprising as the previous tests had indicated that this mixture would not work, but the reality in production exceeded expectations.

Packaging from 50 % hop waste material, Photo by TRIDAS

PLANS

TRIDAS is planning another 1,000 demos of material production after they will receive another batch of material from Zelfo Technology.

1,000 pcs of final wine bottle packaging, Photo by TRIDAS

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