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ENGEL joins forces with Top Grade Molds to boost recycled material content in sandwich components

Coinjection revolution

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The new coinjection process, which ENGEL has developed in cooperation with Top Grade Molds, enables high and completely encapsulated recycled material content in the production of pails and is thus superior to conventional processes for sandwich injection moulding. The new process will fully demonstrate its advantages in the production of 5-gallon pails during the ENGEL live e-symposium 2021 from 22 to 24 June. Very short cycle times are achieved in combination with the new ENGEL duo speed injection moulding machine.

Political pressure to use recycled plastic materials is growing worldwide. Various countries already stipulate the minimum recycled content for certain products. In the Western US, for example, some market applications require 25 percent recycled content for pails. In addition, many brands do not want the dark colored recycled core material to be visible at the injection point. These trends have driven the development of the new coinjection process. With a recycled material content of more than 30 percent, the 5-gallon pails produced during the ENGEL live e-symposium easily comply with the US specifications, which are very challenging as compared with other international standards.

Very short cycle times

ENGEL's development partner is Top Grade Molds from Mississauga, Canada, a mould manufacturer specialising in packaging applications. The pail mould for the world premiere is being provided by US pail manufacturer M&M Industries from Chattanooga, Tennessee. It is being deployed on an ENGEL duo speed injection moulding machine, which ENGEL developed specifically to meet the requirements of producers of pails and storage and transport containers. This new large machine type combines productivity and efficiency with short cy-

cle times. The coinjection process provides similar cycle times as producing pails in conventional single-component injection moulding.

Coinjection makes it possible to concentrate the recycled material in the component's core and encapsulate it by a layer of virgin skin material. The virgin and recycled material are of the same type to ensure that the sandwich-moulded parts can also be recycled at the end of their useful life. HDPE is being used for the 5-gallon pails; the recycled material here originates from post-consumer collection.

Highest product quality

The greatest challenge in sandwich injection moulding is to achieve high recycled content without compromising product quality or performance. One focus of the development was therefore on combining the two molten plastics in the pail mould without mixing them beforehand in the melt stream. As a result, the system switches between recycled and virgin material at the cavity injection point by way of a coinjection valve gate.

5-gallon pails are universally used in North America for a wide variety of end use markets. Since the core and skin material fractions are strictly isolated from each other in the production process, and the core is encapsulated by the skin, including the injection point, the new coinjection process also can be considered for the food industry.

The presentation of the new coinjection process sees ENGEL further strengthen its expertise in the production of sandwich products with a core made of recycled material. While the ENGEL skinmelt process presented at the K show 2019 is primarily used for the production of technical parts, logistics boxes and pallets, the coinjection process developed with Top Grade Molds meets the requirements set by manufacturers of pails and other smaller packaging products and is also suitable for multi-cavity moulds.

Strengthening the use of recycled materials is one of the essential prerequisites for establishing a circular economy for plastics, which ENGEL is intensively promoting together with its partner companies.

5-gallon pails are universally used in North America for industrial, consumer and food products. (Picture: iStock)

For demonstration purposes, a transparent virgin skin material was combined with a black recyclate. The high content of recycled material thus becomes visible and the percent content more easily calculated. (Pictures: ENGEL)

ENGEL's compact dual-platen technology contributes to excellent efficiency, among other benefits. Across all clamping force sizes, the duo speed is shorter than comparable injection moulding machines used in this field of application, which saves expensive shop floor space. (Picture: ENGEL)

ENGEL AUSTRIA GmbH

ENGEL is one of the global leaders in the manufacture of plastics processing machines. Today, the ENGEL Group offers a full range of technology modules for plastics processing as a single source supplier: injection moulding machines for thermoplastics and elastomers together with automation, with individual components also being competitive and successful in the market. With nine production plants in Europe, North America and Asia (China and Korea), and subsidiaries and representatives in more than 85 countries, ENGEL offers its customers the excellent global support they need to compete and succeed with new technologies and leading-edge production systems.

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