Developing injection molds for in mold labels using nanotechnology and comparing with self-adhesive labels.

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Abstract

Nanocomposites, a fusion of traditional food packaging material with nanoparticles are gaining active interest in food packaging sector. In addition to its remarkable antimicrobial spectrum, it displays great mechanical performance and tough resistant characteristics (Montazer and Harifi, 2017). Nanocomposites are usually made up of a polymer matrix in a continuous or discontinuous phase (Arora and Padua, 2010). It is a multiphase material resulting from the amalgamation of matrix (continuous phase) and a nano-dimensional material (discontinuous phase). Based on the nano-material, the nano-dimensional phase is generally characterized into nanospheres or nanoparticles, nanowhiskers or nanorods, nanotubes and nanosheets, or nanoplatelets.

The problem of the research represented in the poor resistance of self-adhesive labels to surrounding factors compared to their counterpart installed during molding and their relatively low quality, the high costs of self-adhesive labels and the increase in production stages and time, the presence of environmental problems when recycling labels locally, in addition to the difficulty of implementing relatively complex designs for packages with traditional molds .

The aim of the research is to spot light on the importance of using nanotechnology in injection moulds, and compare the methods of fixing cards on plastic packages, and to determine which is better to develop them and increase work with them in the Egyptian market to achieve:

• Treating and protecting the final appearance of the packaging and making sure of that product and packaging identity is preserved.

• Reduce phases and runtime.

• Facilitate recycling operations.

Important results

By comparing the self-adhesive labels and In mold labels, we find that the same products over time were using labels and fixing them using self-adhesive on the packages. The packages are manufactured through three production stages and when they are recycled, the packages must be separated from the labels and the package covers, but recently local companies resorted to use the technology of in mold labelling, in order to save production cost, as well as reduce production stages, increase the level of quality and protect the identity of the product and the packaging.

Important recommendations

1.   Start of the field of label packaging using the technology of in mold labels because of its advantages in terms of time and cost reduction as well as labor.

2.   The thickness of the labels should be reviewed, as it is not less than a certain percentage, which is from 57-67 microns, in order to ensure that the labels are stable inside the injection mold and do not melt or do not stick well to the surface of the packages.

Keywords:

in mold labels ‹Labels injection ‹nanotechnology ‹self adhesive labels .