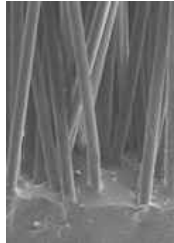


MATERIALICA Industry-News

In-Mold Flocking – The latest Development and Completion to the existing Flocking Technologies

The main reasons for valorizing surfaces by flocking, are esthetics, surface feel and function. A flocked surface improves the product characteristics and provides the impression of a higher value. Various types and dimensions of flock are available. Rayon, polyamide and polyester are the materials most used. Beside an attractive surface, flocking grants noise reduction, insulation against heat or cold, compensation of tolerances, also improved adhesion or slipping behaviour. Most different effects are desired especially with shaped parts.

In the past, shaped parts could only be refined by using direct flocking. This means a special adhesive is applied - either allover or partially - onto the surfaces of the shaped part that are to be flocked. The actual flocking is effected by dosing flock into an electrical field where the fibers are aligned, accelerated and embedded vertically in adhesive layer. This process may either be made with manual devices, or in automatic flocking lines.



- 1.) Adhesive application: The adhesive layer should be of an even thickness and is the basic requirement for a flocked surface that is as even as possible and of high quality. What sounds easy in theory, often leads to serious difficulties in practice. Such even adhesive layer can only be generated with a certain effort.
- 2.) Flocking: It is important to supervise the electrical field between the dosing unit and the part to be flocked. An even flock density and flock alignment can only be achieved with a consistent electrical field. It is especially with sharp edges in combination with depressions on a part that the electric field strength is very varying. This causes visible differences of density between the edges and the depressions.
- 3.) Flock remains: Cleaning off surplus flock from the flock finished and cured part means another challenge. All fibers that have not been perfectly anchored in the adhesive, may get loose during the lifespan of the part.
- 4.) Multiple colours: Another fact is that direct flocking on parts can be made with one flock type and colour each only in one production cycle. Multiple colours demand for flocking in several cycles at one colour each. This means time and effort. Since the aforementioned issues always result in discussions between producers and users, in the past years Fiberlok Inc. have developed the so-called LextraMax method. This patented technology minimizes the aforementioned procedural difficulties without restricting the advantages of flocking.



How does LextraMax work?

In short this means a previously flocked film is laid into an injection molding either directly or after a shaping process and is then die-casted from behind. Immediately upon removal of the injection molded part and after re-trimming, if necessary, the part is ready-to-install.

The flocked shaped film is produced as follows: A thin plastic backing film is coated with a detachable adhesive. Flock is applied onto this adhesive in a continuous process. After intermediate drying the flocked surface is cleaned and a defined layer of permanent adhesive is applied onto the tips of the flocking. The actual shaped film, mostly of PC or PC-ABS, is now applied. After another curing process the backing film is removed together with the detachable adhesive and those fibres not anchored. Now the shaped film can be punched, deep drawn and die-casted from behind. The above mentioned procedural problems are resolved as follows:



RE 1: The fact that the application of the permanent adhesive is always effected on one level, this process can be carried out very precisely. The permanent adhesive is either applied by a squeegee or in a screen printing process, however it is applied in a uniformly thick layer in either case.

RE 2: Flocking is also effected on one level only. This allows to adjust very precisely and control the electric field strength between the dosing unit and the backing film. As a

consequence, the fibers are perfectly aligned in the electric field and the flock density is even.

RE 3: The subsequent removal of the backing film allows to remove all flock fibers that were not optimally anchored in the permanent adhesive layer together with the detachable adhesive. Thus the flocked surface on the backing film is perfectly cleaned from loose flock fibers or such that were not sufficiently anchored.

RE 4: When flocking, e. g. cut sheets several flock types and colours can be applied onto one sheet without difficulty. This is usually realized with a screen printing carousel where one flock type & colour is dosed through the open areas of a flock screen. This technique allows the film producer to cover either patterns, logos or other coloured features. There are additional advantages that were not explored before. These are in detail:

1.) The adhesion of flock on the shaped film is ideal and thus the resistance to abrasion of the future product is unmatched. It is not only the esthetically attractive surface but at the same time the resistiveness of the flocked surface that is ensured and thus a long durability.

2.) Since the LextraMax film can be procured as a finished product, it has to be placed into the injection mold only. Depending on the shape the shaped film may have first to be drawn deep or otherwise deformed. This can be made with a small single machine placed beside the injection mold machine. Similar proceedings are known from other procedures of the in-mold decoration. It is news that a flocked surface can be created now in one production step of the injection moulding. Consequently, the necessary



additional work steps are omitted which normally have to be considered with a subsequent shaped part flocking.

Messrs Maag Flockmaschinen GmbH, located at 72810 Gomaringen/Germany, is a partner of Fiberlok Inc. and offers the necessary support to potential customers for the realization of future production. For more details please send us an e-mail at: info@maag-flock.com.