PUMA COAT IN-MOLD PAINT

Introduction

In the mid-1970's, polyurethane molders began to take an interest in the concept of producing primed or colored items by spraying a thin film of paint into an open mold and then placing the casting system onto the coating. This idea became known as the IMC (in-mold coating) process. Since the IMC process is a direct competitor to post-painting, it is worthwhile to consider the relative merits of both techniques.

Merits of In-mold Painting Versus Post-mold Painting

Advantages of In-mold Painting

1. Almost perfect adhesion between the coating and the substrate.
2. Because in-mold systems are low in solids they follow the contours of the mold design very well. Therefore, very fine details on the mold will be faithfully reproduced.
3. In certain instances the presence of an in-mold coating can improve the flow characteristics of the polyurethane system resulting in fewer sub-skin defects.
4. Mold spraying is relatively straight-forward and less labor intensive than post-mold painting.
5. Paint usage is relatively low compared with post-mold painting.
6. In-mold paint increases the work-life of silicone molds.

Disadvantages of In-mold Painting

1. Complex mold shapes are difficult to spray with acceptable accuracy or speed.
2. Unlike post-mold painting where a specific area of the factory can be set aside for spray finishing, in -mold painting is generally undertaken on the molding line. This introduces a whole range of problems associated with setting up on-line spray facilities.
3. If the mass color of the polyurethane system is not a particularly good match for the paint finish, the flash or split line will stand out and may require touching up with a post-mold paint.

Advantages of Post-mold Painting

1. Paint finishes with excellent exterior durability and chemical resistance can be produced.

Disadvantages of Post-mold Painting

1. Poor adhesion between the coating and substrate is the most common failure area for post-mold paints. In order to avoid such failure extensive preparation of the substrate is necessary before painting. Such preparation includes removal of all traces of release agents by solvent washing, followed by applying of one or more primer coats.
2. The application of post-mold paints is a skilled operation. Faults in the top coat are all to easily produced (i.e. craters, orange peel, etc.). Operations to correct such faults can be costly in both time and labor. The standard of cleanliness in the spraying area needs to be high in order to avoid contamination by foreign matter on the substrate or wet paint surface.
3. Since most two-component systems use isocyanate prepolymers as a curative, the health risk is somewhat higher than that associated with fully-reacted systems.

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