

# KI INDUSTRIES, INC.

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## **KI** *New Automated Paint Line in Mexico*

Press Release

KI Industries, Inc Announces New Automated Paint Line in Mexico Queretaro, Mexico. June 2009 - Industrias KI de Mexico started operations of a new fully automated paint line capable of painting water and solvent based paints over a wide range of plastic substrates.

The machine was manufactured by Sprimag in Germany and has been running since late 2008 when the internal qualification and approval process started.

### **System Capabilities.**

The system is designed to paint a variety of part sizes and shapes with the highest quality and consistency. KI is able to paint parts up to 800mm long, 800mm wide and up to 150mm high. The system can accommodate a range of parts from large Appliance door handles to small buttons for interior Automotive applications.

The system is enclosed in a temperature and humidity controlled environment with positive air pressure to keep out airborne contaminants. There are two paint booths, each equipped with two sets of spray guns with 3-axis robots. The 3-axis system provides for the most exact application process, critical for those parts which require laser-etching of backlit graphics after painting. The dual sets of spray guns enable us to apply up to four layers or colors of paint without needing to make time-consuming changeovers.

The automated 2-component paint mix system also has the ability to apply solvent borne as well as the more environment-friendly water borne paints. The ionized air-wash and plasma pre-treatment stations insure a high quality surface appearance and adhesion on almost any material. The Intelligent Conveyor system with individual electronic read/write data tags enables us to paint different types of parts simultaneously by programming the routing of each pallet to the proper paint booth. The four (4) paint curing lines can be adjusted independently to provide cure times of 20-40 minutes to meet the required cure times as specified by the paint manufacturer even when painting different parts at the same time. And since only the rack goes into the paint booth and not the moving parts of the conveyor system, scrap caused by overspray accumulating on the conveyor being carried from booth to booth is eliminated. The Water wash cleanup system removes overspray from the booth further reducing or eliminating contamination. Since the paint is applied spraying down on the parts this maximizes the efficiency of the water wash as gravity draws the overspray down into the moving water. The self contained system is environmentally friendly meeting all regulations and generates no hazardous waste.

### **Testing Capabilities**

Understanding the high visibility of our decorative painted parts, we have established testing capabilities to ensure our customer's high quality standards will be met. Our in-house testing capabilities reach beyond the

standard gloss, adhesion, abrasion, film thickness and color qualifications. We have the ability to test a wide range of performance requirements to ensure our painted product's durability including food stain, grease, bleach and detergent resistance. Our thermal cycle chamber, allows us to expose product to a temperature range of -75° to 155° C for extended periods of time. The thermal cycle chamber allows us to perform many of our customer's specified testing requirements which require part temperatures above or below room temperature such as household product staining resistance, chemical resistance, and short and long term heat resistance. For laser etched product, our spectroradiometer allows us the capability to measure light intensity, as well as daytime and nighttime color of backlit product.

## **Part Design Considerations**

Painting plastic parts brings an almost limitless variety of color/gloss selections to injection molded plastics that yield a heightened level of consumer interest in products, and will subsequently add a higher level of perceived value..

The marriage of good design practice, proper material selection, proper tool construction and careful attention to molding parameters are imperative to successful painting, and are actually as important to excellent quality parts as is the painting process itself. Consistent wall thickness should be maintained to promote good material flow in the component to eliminate hesitation marks and other surface defects. As always in decorative finishes, preparation and condition of the base surface are of utmost importance in maintaining a high quality finish. All sharp edges should be avoided (except parting lines) and should have at least a .25mm (.010") radius added. This promotes consistent paint film thickness and minimizes paint buildup by eliminating sharp corners. Avoid recesses or grooves in painted parts that have a greater than 1:1 depth to width ratio. Recesses deeper than they are wide will promote voids or thin spots in the recess as a result of shadowing. All surfaces perpendicular to direction of ejection in the part should have at least 1 degree of draft to eliminate drag marks on the part, texture added to the surface of the molded part will drastically effect draft required, contact KI for design assistance.

Any attachment features, ribs, or other mechanical details that attach to the back of the visible surfaces must not be thicker than 50% of the primary wall they attach to OR be no more than 5x that primary wall thickness in projection from that surface, if those factors are violated there will be sink marks or visible distortion in the painted surface. Paint as plating will NOT hide surface defects, but rather will enhance them. Any flat surface on the part should be avoided due to pooling or dark reflections in the surface from inconsistent contour in the part. A flat surface in a part is never truly flat, it is a surface with no definition, so KI recommends that all flat surfaces have a minimum crown (positive distortion) of 100"radius approximately, to force reflection on that surface to be consistent and not "pool".

When inconsistency in the wall thickness is unavoidable, any transition from a heavy section to a lighter section should be gradual, with a taper reduction ratio of 5:1 or better whenever possible. Again this helps to eliminate stress as well as hesitation and sink marks in the cosmetic surface which should be avoided.

Masking of areas to achieve special effects is possible under certain conditions and is an added cost. Contact KI for design assistance.

KI offers design assistance to help promote efficient, effective part design and production. Please contact us for more information.

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