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MANUFACTURING PROCESS SHIELDING

Shielding of plastic parts typically involves applying a paint specially formulated with suspended metal (copper or zinc) particles. From a processing stand point, the most important issues involve even dispersion of the copper shavings and adequate coverage of the paint to ensure adhesion and cohesion to the substrate. On that note, we at PEI hold UL certification for the application of the copper shielding paint for the two UL rated substrate materials we use (Royalite R59 and Kydext T). As such, we can provide a completely UL approved product with regard to the materials and application of the shielding.

As for the process itself, we can have the shielding applied at three different manufacturing points.

Pre-Shielding

The first is what we call the 'Pre-shielded' method, which we have found to be the least costly and most frequently used by our customers. It involves applying the shielding to the flat sheets of plastic prior to routing or other manufacturing steps. In addition to being cost effective, this method also reduces the lead-time for delivering finished product. Because the sheets can be shielded prior to the release of the job, the schedule is usually not affected by this process step. Additionally, for very short lead-times, the actual material being used may be one for which we maintain a minimum stock level in pre-shielded form, further reducing the chance for extended delivery dates due to shielding requirements. For those situations where we do not stock the material in pre-shielded form, we can usually have it applied while the job is waiting in our scheduling queue or being designed by one of our engineers.

In-Process Shielding

We call the second method of shielding 'In-process shielding' and it involves applying the coating to panels that have been CNC routed to some degree but have not undergone down-stream assembly processes. Under this method, the coating is applied to cut surfaces such as bend grooves, slots, recesses, etc. While our experience has been that most customers do not require this higher level of shielding coverage, some prefer to pay the extra cost to ensure that continuity is maintained among all assembled panels. This method, while potentially more effective than the pre-shielding method, is both more costly and will add time to the overall manufacturing process. In particular, the cost comes from the added labor of masking some areas and then (typically) setting up the CNC machines a second time for final cutting after shielding. As for the additional manufacturing time required, it is due to having to break into the CNC and assembly operations to perform a consecutive process as opposed to doing it during pre-release or while another process is being performed.

Post Shielding

We refer to the third shielding method as 'Post-shielding.' Under this method, the shielding is applied after the enclosure has been completely cut and assembled, which is the same process used for injection molded or thermoformed parts. This process is also more costly than the pre-shielded method due to the labor-intensive masking and multiple surface painting requirements. On the latter issue, the other two methods primarily involve applying the coating to flat sheets or panels, which are relatively easy to layout and spray. This post-shielding method requires that the painter properly apply the paint to multiple surfaces and to ensure that all such surfaces are evenly coated.

While we are not experts in the field of electronics, we do have extensive experience in the application of shielding coatings used for controlling RFI/EMI as well as providing grounding and continuity throughout a plastic housing. With that in mind, we are always available to share our wealth of knowledge with customers who are struggling with this subject of determining the need for applying a

barrier treatment. If you find yourself questioning whether to include shielding or which application method to use, please feel free to use PEI as an added source of information in your decision process.

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