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PET LINER AS SOLUTION FOR INKJET PRINTER INK COMPATIBILITY ISSUE

HP INC

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Ink compatibility test is the assessment of the ability of a polymeric material to maintain its original properties after being exposed to an indicated chemical reagent environment for a specified period. It is a critical test that will be conducted by all the printer parts that will interact with inks, be it before the pen firing event in which inks are stored inside the ink tank, ink tube, ink cartridge or after the pen firing in which waste ink will spit onto spittoon and paper path platen ribs which act as full bleed printing overspray zone.

A method on how to address ink compatibility issue is provided. Compact design and competitive cost are always the key challenges of new product design. In the current inkjet printer architecture, most of the waste ink spittoon design and paper path platen ribs are integrated in such a way that it has become part of the printer base's body. Typically, printer base will be among the biggest part of all the plastic parts assembled inside the printer. Most common plastic material that are used in printer base molding is HIPS (High-impact Polystyrene). Nevertheless, HIPS is not recommended when it is exposed to the high internal residual stress and interact with concentrated inks.

There are 2 critical parameters in the ink compatibility test, namely concentrated ink, and high internal residual stress. Typically, there are two type of ink compatibility test could be done. The most common one is environmental stress cracking test (ESCR), and another type is ink soak test to monitor on the part weight change whether it is fall between allowable specification. Both of test will be using material that are formed into tensile bar shape. However, it will be very challenging for molding vendor to produce high internal residual stress part and more particularly it need to appear near to the targeted region on a big part like printer base. As a result, it's going to be tough to establish boundary/conduct worst case study for ink compatibility assessment and come out with convincing test result.

Some of the prior solution to address part ink compatibility concern would be come out a separated spittoon module and paper path platen rib structure which will be added part and overall product cost. There is another approach in which perform spray paint on the part as secondary process after injection molding. It is a challenging process control to make sure spray paint can be

applied evenly on all edges and surfaces. Additionally, entire printer base material also can be changed to ink compatible material like PPO, PET+GF in which typically the resin cost will be more costly than HIPS material that is commonly used in molded printer base.

PET liner would be an individual spittoon separated from printer base. PET material is known to have excellent chemical resistance and very light in weight. It can be designed in the form of load/unload design feature in which R&D team has the flexibility to add in and remove the part without bringing much impact to other parts inside the printer. Part can be located without additional agent like adhesive or screw fastening.

Here is the summary of the advantages by using PET liner to resolve ink compatibility issue: -

- Light weight – will not affect total product weight or dynamic drop
- Thin in size – maintain similar ink storage capacity without the need to claim for additional real estate
- Replaceable spittoon – ease for printer refurbish or maintenance work
- Minimum hardware change to resolve ink compatibility issue hence low cost – thermoforming part can form complex spittoon shape
- Quick turnaround with short lead time on tooling fabrication
- Tooling cost for thermoforming part will be much lower as compared to injection molding tool

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