

Janus Effect[®] Screen Printing Inks

Technical guidelines

Janus Inks[®] are unique in that they change color depending on the orientation of the card. These inks have been specially formulated for the production of translucent, laminated cards. Cards may be overprinted with other inks but some area must be left clear to allow light to penetrate the core of the card in order to generate the Janus[®] effect.

These inks are similar in structure and body to conventional solvent screen inks; however, the highly technical dyes used in their production necessitate special consideration in their storage and use. While each screen printing operation has its own differences and nuances, Janus Inks[®] are formulated to work around these differences. This bulletin outlines procedural guidelines that should be followed to obtain the optimum, desired results.

General Considerations

Janus Inks must be printed and dried in a clean environment. Always be sure that the screens, squeegees, knives, spatulas, or any other equipment that comes into contact with the inks are clean and dry, completely free of all solvents or other matter. In addition, the sensitivity of the inks to UV light and high temperatures and specific chemicals should always be considered.

Ink Storage Conditions and Shelf Life

It is recommended that Janus Inks be used as soon as they are received. Prolonged storage of these inks for more than 3 months could cause deterioration of certain dyes contained in the inks with a corresponding change in the original color. Short term storage of these inks should be in a temperature controlled environment, with the temperature being 18°C to 30°C. **Do not refrigerate or freeze.**

Janus Inks should be stored out of direct sunlight, to minimize the impact of UV light on the inks. If the inks are transferred to another container, that container must be opaque.

Thinning

Thinning of Janus Inks[®] to reduce the viscosity is not suggested. If thinning is required to meet a preferred viscosity goal, testing must be performed to determine the appropriate screen mesh requirements. Cyclohexanone is the preferred solvent for thinning with complete mixing being of critical importance to insure homogeneity of the resulting ink.

Mixing of Janus Inks

It is highly recommended that the inks be thoroughly mixed/stirred prior to use.

It is not recommended to mix Janus Inks with any other ink. The dyes contained in the inks may react negatively with components in other inks causing them to either react or precipitate.

Print Equipment

Janus Inks are press ready inks formulated to work on hand or automatic (rotary or flat-bed), sheet or web-fed screen printing equipment.

Squeegee: It is preferable to use a medium or medium-hard (65 durometer) rounded edge squeegee.

Screen: A US 330-mesh (125 metric) polyester monofilament screen is recommended. The intended mesh should be tested, with the final test card analyzed for opacity prior to finalizing the process conditions and moving forward with full scale production.

IMPORTANT: When using Janus Inks,[®] a dedicated screen should always be used. Using a screen that has been used with pigment inks (e.g. pearlescent inks) can cause insufficient transfer of the Ink to the substrate due to screen blockages. The solvent base of the Janus Inks can dissolve inks used previously with a non-dedicated screen, resulting in discoloration of the printed substrate.

When the Janus inks are used in combination with other products (colorants, IR inks, or etc) their effect will decrease and in some cases nullified.

Drying/Lamination

Drying through use of racks or forced air at a temperature of 50°C is standard with Janus Inks. It is important that the printed stock be completely dry before laminating. If the printed ink is not allowed to dry completely or properly (e.g. drying is performed too quickly, and/or at too high a temperature, or printed sheets are not racked for a sufficient amount of time) the potential to “skin over” is a real concern. In this situation the top layer is dry but the ink remains wet under the surface with the print appearing dry to the eye and touch; however, upon sitting, the wet ink below the surface will re-dissolve the surface layer resulting in a tacky or wet print surface. This is a primary cause of “blocking” during storage and can result in poor lamination with a reduction of print clarity in the final card.

Lamination temperatures of approximately 150°C are compatible with Janus Inks[®]. These inks are capable of withstanding higher temperatures with an appropriate decrease in the overall exposure time. Prolonged exposure at higher temperatures may decrease the efficiency of the dyes in the ink.

UV Light:

Excessive exposure to UV light can degrade the dyes contained in the ink thereby causing a decrease in their efficiency. If the screen printing equipment contains UV curing lamps, it is imperative that these lamps be disabled/turned off when processing Janus Inks[®].

Chemical Interactions:

Laminating adhesives containing ammonia, ammonia containing compounds or amine compounds can decrease the efficiency of these inks. These types of chemicals are common in some water based laminating adhesives. In general, a laminating adhesive is not required when using the Janus Inks[®], as the base varnish is a laminating varnish; however, it has been seen that even using these types of adhesives, on alternate core layers, can negatively impact the efficiency of these inks.

Printed Sheet Storage and Shelf Life

In general, once printed the Janus dyes are extremely stable. Printed sheets (core stock) should be maintained in a humidity, temperature, and light controlled environment. A temperature of 23°C or below is preferable, with the printed sheets being covered to minimize the impact of UV light on the ink. Under these conditions, there is no reason that a six (6) month shelf life, or greater, should not be achievable.

Printed sheets should not be stored in the direct presence of solvents or other chemicals. One should be certain that the inks are completely dry prior to stacking, and stacking should be kept to a minimum. If the inks are not completely dry prior to stacking, this will result in “blocking” where sheets stick to adjacent sheet causing a transfer of ink with the potential to ruin the sheets. If the sheets are stored in an environment where solvents are used on a regular basis, the printed inks can absorb these solvents with the potential to cause “blocking”.

Note: The information in this applications bulletin (and otherwise supplied to users) is based on our general experience and is given in good faith. It is the user's responsibility to evaluate the feasibility of using the Janus Inks by carrying out trials under actual production conditions before proceeding with a print run.