

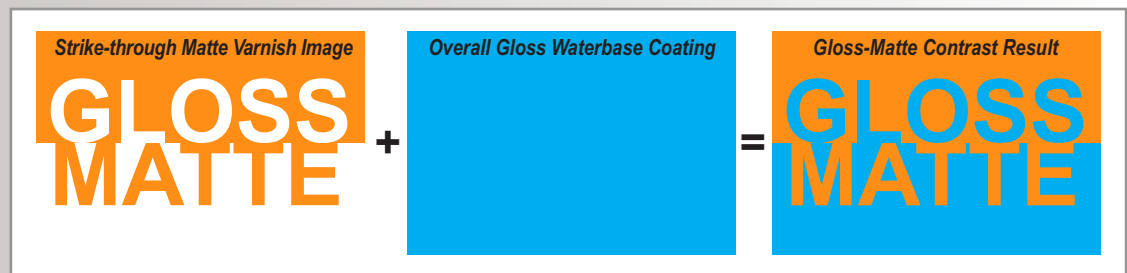
Waterbased Coating - Strike-Through OPV v1.1

Printers are continually seeking out new ways of differentiating themselves from the competition by offering their customers unique and innovative printing techniques. These techniques can help to enhance a brand image or attract consumers to products with exciting and exotic packaging designs. In many cases, the exploration into new and unique printing techniques requires an investment into new equipment technology and substantial resources being dedicated in the interest of R&D to perfect the process. For Printers who do not have the capabilities or resources to explore exotic print techniques, one proven application that continues to be very popular and adds enhancement to a printed piece is the use of a Strike-Through Over-Print Varnish(OPV) to create a visual gloss-matte contrast.

Strike-Through Varnish Use

Application/ Technique

Strike-through effect varnishes are specially formulated conventional lithographic over-print varnishes that can be used in conjunction with a compatible gloss waterbased coating product to create a visual/measurable gloss-matte contrast on a printed piece. The varnish is applied to the printed sheet using a printing unit and litho-plate that carries the desired spot matte image. Once the matte image has been applied to the printed sheet via the printing unit, an in-line flood/overall area of gloss waterbased coating is applied using a coating blanket/plate by the coating unit. The extended interaction between the wet strike-through varnish film and semi-dry gloss waterbased coating film results in the coating film becoming matte in appearance in the applied varnish areas. The surrounding areas of gloss coating which do not contain the strike-thru varnish remain glossy, creating a visual contrast between the areas with and without varnish applied. A measurable gloss contrast of 30-40 gloss units using a 60° meter is typical when using a high-gloss waterbased coating and strike-through effect varnish.



Requirements

The strike-through varnish contrast technique is a relatively simple and repeatable process. Most printers who are properly equipped can perform this effect and achieve good results without issue during their first attempt. The following is required for producing this technique:

- Press with an available printing unit for strike-thru effect varnish application via litho process
- Litho plate with desired matte image for printing unit
- Coating unit with coating blanket/plate material for application of a gloss waterbase coating that is compatible with strike-through varnish to achieve a contrast result. Both anilox and non-anilox/roller-nip application systems are suitable for this technique.
- Press drying system equipped with IR(infrared lamp), HAK(hot-air knife) and Air-extraction for proper drying of printing inks, strike-through varnish and waterbased coating.

Strike-Through Varnish Use - *continued*

Advantages

Traditionally, in order to achieve a gloss-matte contrast effect, the use of individual gloss and matte litho varnishes would be applied to the sheet in spot applications with their respective images. The difficulties encountered with this process include registration issues as the printer can have trouble differentiating between the two varnish plates when making adjustments which can result in a visual mis-registration once the varnishes dry as well as extended drying times as both litho varnishes must be completely dried prior to printing the second-side or moving to the finishing processes. In many cases, both varnishes will be dry-trapped over the printing inks due to the availability of press printing units which adds additional press passes to the job. In situations where the first-side varnish films are not completely dry prior to the second-side varnish films being applied, chemical/gas "ghosting" is a common result which can potentially ruin the job. Other problems such as varnish set-off, blocking, scratching/scuffing, excessive spray powder use and poor rub protection are also very common. The use of a strike-through varnish/gloss waterbased coating combination can eliminate many of the above mentioned problems:

- Using an overall/flood application of gloss waterbased coating means registration of one varnish plate.
- Waterbased coating dries quickly providing short-term protection of varnish and under-lying inks for quicker turn-around times for second-side printing or finishing processes.
- Waterbased coating provides improved protection of sheets in the delivery-pile preventing set-off, blocking, scratching/scuffing.
- Waterbased coating allows for reduced spray powder application.
- Waterbased coating provides excellent rub protection through the finishing processes and on finished pieces.

Best Practices/ Considerations

- Strike-through varnish is designed for use with a gloss waterbased coating to provide rub protection. Strike-through varnish is NOT intended for use without a topcoat gloss waterbased coating being applied as the strike-through varnish alone does not have suitable rub protection.
- The degree of gloss-matte contrast will be affected by the type of ink, fountain solution, amount of fountain solution contained in the ink, substrate/paper type, substrate/paper hold-out/absorbency and the respective amounts of strike-through varnish and gloss waterbased coating being applied.
- For optimum contrast results, a thicker varnish film thickness and thinner coating film thickness is desired. Contrast will continue to develop as the varnish film dries. The immediate contrast effect off-press is normally less than what will be achieved during several hours after printing.
- The job image area will contribute to the visual gloss-matte contrast. To capture the highest degree of visual contrast, the varnish areas that will appear as "matte" should be applied over dark-color ink areas. If the job image area contains only light-coverage/light-color ink areas or ink-free/paper-only areas, the contrast will be less evident than image areas that contain heavy-coverage/dark-color ink areas.
- A lower viscosity waterbased coating can improve the gloss-matte contrast rate and overall visual/measurable contrast result.
- Strike-through varnish/waterbased coating applied in-line over cured UV inks can provide the best results.
- Strike-through varnish is a conventional varnish and is not compatible with EPDM roller compounds. EPDM roller manufacturer/supplier should be consulted prior to use to determine possible negative effects.
- Strike-through varnishes contain flattening agents that can cause litho plate wear the same as other matte or dull over-print varnishes. Consult with your plate manufacturer or supplier to determine the best plate selection for this application. The use of plate materials manufactured to withstand wear for long press run lengths is recommended. Avoid using plate materials that are prone to wearing easily.
- Printing presses equipped with ink fountain liners can suffer from wear of the liner between the ink fountain roller and fountain zone metering cylinder. This should be monitored to avoid excessive fountain liner wear resulting in varnish leakage and contamination of the ink fountain zone assemblies and ink fountain motors.

Strike-Through Varnish Use - *continued*

Best Practices/ Considerations *(continued)*

- The strike-through process generally requires more allocated drying time prior to additional processes/finishing compared to a 'typical' job with waterbased coating applied due to:
 - Strike-through varnish is a conventional varnish and requires oxidative-drying to fully cure
 - The strike-through effect is a migration-process that requires aging after printing/coating to produce the full contrast result
- The strike-through process typically uses a high-gloss waterbased coating over-printing the ink/varnish areas. This can slow the overall drying process of the printed/coated sheet due to:
 - High-gloss waterbased coatings can be inherently slower setting/drying for improved film flow-out/leveling to create the smoothest film possible to optimize specular reflectance and visual/measurable gloss
 - A waterbased coating over-printing the ink/varnish films creates a layer of reduced permeability for oxygen which slows the oxidation process of the beneath conventional ink/varnish layers. This can cause extended drying-times for the beneath ink/varnish films.
- Additional factors such as running an excessive varnish film or maintaining a poor varnish-water balance can result in the need for extended drying times prior to second-side printing/coating and/or finishing processes.
- It would be advised to develop a SOP for use with strike-through jobs as it relates to drying-time allocation after printing/coating and prior to finishing processes to ensure that the printed/coated sheets are suitable for handling/machining to prevent quality-defects.