

MIRRI

PRINTER TECHNICAL RESOURCE FOR MIRRORBOARD + MIRRORPAPER:

This section has been specially developed for our printer customers.

Lamination & Varnishing

In this section we have attempted to address some of the more common finishing problems. Fortunately, many of these can be eliminated at the design stage by forethought and correct specification of materials. Occasionally, however, some problems occur in production due to technical issues. Unfortunately these are not so easy to anticipate, control or eliminate.

Inks

Light tints using the following pigments are particularly sensitive to bleaching when in contact with UV varnishes, water based laminating adhesives and water based coatings (including sealers).

- Reflex Blue
- Rhodamine Red
- Pantone Purple

Since all three pigments are integrated into the PANTONE matching system and they cannot be replaced within that system by alternative stable pigments, it has proven impossible to eliminate their specification or use on work to be varnished or laminated.

The varnish, coatings and adhesives industry has also been unable to manufacture materials that are guaranteed not to bleach these sensitive pigments. Given that the risk cannot be eliminated, the only option is to develop routines and practices that seek to minimise that risk.

Critical factors that we have found to be crucial to ink bleaching are:

Tint strength

Bleaching or colour change is often more severe if there is a small amount of sensitive pigment in the ink.

This is the complete reverse of the natural assumption that it will not matter too much if there is only a little of the pigment present.

Print drying

Bleaching becomes visible more quickly and is more severe if the print is not hard dried at the time of varnishing or laminating. We have identified this factor because of the number of problems we have seen while bleaching has occurred as a ghost of images on the other side of the sheet. This is due to retarded ink drying in the backed up areas.

Stack temperature

Since most chemical reactions are promoted by warmth it is not surprising to find that high stack temperatures, such as result from UV varnishing are a factor in bleaching. We have seen badly stacked pallets where portions of sheets outside the body of the stack are not bleached while the remainder is severely affected.

Also where our own processed sample sheets, which have not been exposed to stack conditions, do not match the bleaching found on the job.

Varnish/adhesive type

Bleaching is promoted if the finisher uses highly aggressive varnish/adhesive formulations. Celloglas and their associate companies take exceptional care in selection of our raw materials and this is a prime requirement of any material before we approve it for use.

Varnish/adhesive quantity

It is also promoted when more varnish or adhesive is applied to the ink. We have found that spot UV varnishing – which applies 8–10 gsm of varnish to the print – is more likely to bleach than rollercoat UV at 4–6 gsm.

Similarly prints on rough substrates that require high coating weights of adhesive are more likely to bleach than those on smooth paper where the quantity of adhesive can be reduced.

Time

An important feature of pigment bleaching is that it takes time to occur. If several or all of the previous factors combine then noticeable bleaching can occur within a few hours of processing. If circumstances are less extreme, bleaching may take months to appear and it is not unusual for a problem to remain unidentified until a file copy is exhumed for a repeat order.

RECOMMENDATIONS

Wherever possible avoid the use of these sensitive pigments. If you cannot avoid them, particularly in tints, then warn your finisher of their presence. Allow prints time to achieve a hard dried state (this differs from them being set enough to travel).

We have found that proofing a job to see if it will bleach seldom reproduces the fault because there are so many factors that have to conspire to produce the problem. Proofing does, however, delay production of the bulk job and this single action is usually successful in saving the job.

An apparent colour change can also occur to a print after lamination or varnishing because either the eye is tricked by the change in gloss of the print or by the slight milky of a matt film laminate or coating. There is no solution to this other than to make an allowance for the optical change at proofing. Applying either gloss or matt Sellotape to the print can reproduce these effects.

Metallic Inks

We actively try to dissuade designers from specifying metallic inks on lamination or varnishing work for the simple reason that their performance can be extremely erratic and often appears uncontrollable.

There are two common problems associated with metallic inks.

Poor cohesion between the flakes of metal near the surface of the print, caused by a lack of the resin that should be present to bind the flakes together. Laminates and varnishes applied to such a loosely bound surface inevitably show poor adhesion, which can often result in lift of a laminate at the trimmed edge or poor scratch resistance of the varnish or laminate. The failure occurs within the body of the ink, i.e. a cohesive split.

Lubricants, which are used when the flakes of metal are produced by grinding or milling, can migrate to the surface of the drying print in sufficient quantities to cause poor trapping or reticulation of varnishes in the same way as waxes in conventional pigmented ink.

RECOMMENDATIONS

If you have no choice but to use metallic inks we suggest that you choose an unabsorbent paper with good hold out and print using the minimum film weight of ink. Not only is this good economics but also it is effective in reducing the risk of both potential problems.

If the completed dry print shows poor rub resistance it is likely to give problems. The simplest test is to draw a finger over the print. If your finger removes quantities of metal we would suggest proofing the job either with a laminate or varnish.

Proofs that give a defective varnish result can sometimes be laminated acceptably provided the metallic ink does not bleed over trims or fall in creased or embossed areas.

Print Drying

Inks are formulated to set rapidly on the paper surface and to allow work to be backed up or processed in other ways, with minimum delay. Setting time should not be confused with drying time, which can be significantly longer. Both setting and drying times are affected not only by ink formulation but also by substrate, how the print is made and the design and layout of images.

Problems associated with prints that are not sufficiently dry at the time of processing include:

- Print set off after transport to us but before we have processed the work
- Marking of the print during processing
- Reticulation and/or poor adhesion
- Print set off after processing by us

All these problems tend to affect heavily printed four colour builds particularly where they are backed up by similar images and are also likely to be variable in occurrence and severity throughout the job.

In each case allowing a little extra time for the print to dry can usually avert the problem.

Even when the print appears to have dried sufficiently it is possible for an effect, termed "sweat back", to soften an ink. This occurs when ink solvents, which would normally dissipate into the paper and then into the atmosphere, are driven back into the dried ink film causing it to soften to a point where set off can occur.

The presence of an impermeable laminate or varnish on one side of a sheet can hinder escape of ink solvents. Their only escape route is into and through the inks on the reverse of the sheet, thus increasing the risk of set off from the reverse side onto a laminated or varnished face side.

RECOMMENDATIONS

It is impossible, in any practical sense, to predict many of the problems caused by fresh, semi-dried inks and therefore preventative action needs to be taken at source, and applied to all work, if it is to have any positive impact on the problems.

Printers have ownership of the work and usually control the materials and techniques used in any job up to the finishing stage. Print drying, and the problems caused by the lack of it, are therefore solely within the control of the printer.

Finishers have to be aware of the potential risks when processing each and every job. They must be vigilant and maintain a system of regular inspection during processing so that print set off is found if it has already happened, and ink marking or varnish reticulation is identified and eliminated before it becomes a serious defect.

The most difficult problems tend to be those that happen after the job has been processed, e.g. set off after lamination. Often both the printer and laminator are confident that they have not done anything unusual in their own processing of the work and the resolution to the problem is usually confined to economics, with the result that both value and trust are stripped from our industry and little thought is given to preventative action for future jobs.

Paper Grades

Most types of paper and board can be film laminated if they are supplied flat but the best results are always achieved on smooth gloss or satin coated materials. Uncoated sheets and the rougher matt coated grades can be problematical in some circumstances.

U.V. varnishing is more demanding of paper quality than lamination. Smooth coated papers, which also have high holdout to prevent absorption of the varnish, are required to produce acceptable glossy results. This is particularly true of rollercoat U.V. varnishing.

If you have any doubts about the suitability of your chosen substrate, simply supply us with a few samples and we will be happy to produce proofs for you.

Paper Shape

All printed sheets should be supplied flat and well protected from the elements. Tight or wavy edges caused by moisture loss or gain after printing or in transit can make it impossible to process the sheets due to creasing as they pass through our lamination or varnishing nips.

This requirement is crucial if we are required to spot varnish to a tight register on large sheets of a lighter weight stock. For similar reasons spot varnishing of lighter weight HSWO work is rarely satisfactory due to the shape problems that are inevitable following this process.

The graining service provided by Celloglas Theale exerts very great stresses on the sheets because they are passed through a male/female nip under pressure. The resulting curl and size change become worse as paper weight is reduced or as the depth of the grain is increased. Graining also significantly reduces paper stiffness.

Sheets laminated on one side become sensitive to curling if exposed to extremes of humidity. This is because the film does not expand or contract in the same manner as paper when moisture is gained or lost.

RECOMMENDATIONS

Paper choice is critical in achieving the best results in both lamination and varnishing. If there is any doubt in a paper's suitability please arrange a proof with us. Usually 2-3 A4 sheets are sufficient to provide a good idea of acceptability. Please protect pallets in transit to us with stretch film and ensure that they are properly secured.

Sheet Planning and Layout

When we receive a job, we are usually able to easily identify the print grip and side lay edges so that we can ensure that these are not overhung by film that could give register or handling problems in the next process. On some sheets these edges are not easy for us to identify, so it is always useful to mark them. This becomes crucially important if we are spot varnishing a job for you.

Margins for lamination should be a minimum 5 mm on side lay and back edges and a minimum 10 mm on the grip edge.

Work that has been trimmed to a finished size cannot be laminated, but it can be rollercoat varnished or indeed spot varnished if the images fall within the body of the sheet without bleeding and there is enough room for us to take a 15 mm grip. This grip edge may be slightly marked.

It is common for larger sheets (B1 or SRA1) to be printed work and turn and then sent to us for spot varnishing as a half sheet (B2 or SRA2). Unless care is taken during splitting of the sheet it is easy to lose register on the half sheet opposite the side lay. It is also crucial to keep the two resulting sheets separate and to identify them as cut A and B.

If two badly cut sheets are mixed it becomes impossible for any subsequent process to maintain register. Please leave at least a 20 mm gutter between the two halves of the sheet.

If the work and turn job involves both matt lamination and spot U.V. varnishing, it is sometimes preferable to leave the sheet unsplit and to strip laminate on two sides followed by spot varnishing on two sides. Please discuss this option with your local factory.

If this option is chosen it is most important that the laminated areas of the sheet fall on the face side of half sheet B and the reverse side of half sheet A. This will allow us to laminate and separate the sheets automatically without resort to hand work.

Anti Set off Spray

Spray has traditionally been the bane of our lives as print finishers because too much of it on the sheet surface can interfere very noticeably with both the visual quality of the job and the adhesion of the film to the sheet. Of recent times our change to water based adhesives and the increasing use of print sealers has reduced the numbers of problems to more manageable levels.

We still however see many jobs affected by irregular clumps of spray particles that we term 'spray bombs'. These are caused by clogged spray nozzles or by spray falling from gripper bars or machine parts in the print delivery.

It is very difficult to clean a job once it is contaminated by spray bombs, and the usual resolution is to run it and sort after cutting into singles.