

RECOMMENDATIONS FOR PRINTING NON-ABSORPTIVE SUBSTRATES

Suitable printing systems

Printing substrates that lack porosity require special care for printing. Due to their physical properties, it is advisable that they be used in systems where ink drying is fast and there is no contribution from the substrate. These printing systems employ inks low in thickness, liquids that, after being applied to the substrate, rapidly volatilize their solvents via drying devices and deposit the ink film, now dry, on the substrate. There are even systems that use inks that dry in fractions of a second when, once applied to the substrate, they pass through lamps that emit energy at a determined frequency, activating the radicals responsible for a polymerization reaction. These systems are flexography, rotogravure, typography and offset in combination with ultraviolet ink drying.

Ink anchorage on plastic substrates

The main challenge presented by this type of substrate consists in the correct anchorage of ink on its surface, which is extremely smooth. To this end, when using certain plastic materials it is advisable to carry out preliminary tests prior to the final print run, in order to assure adequate drying, adherence, and resistance to rubbing of the printed film.

For the most part, plastic substrates require a pre-print treatment that imparts a certain roughness to the surface for printing in order to obtain the proper ink adherence. This treatment involves adding energy, whether by raising the temperature or by electronic bombardment (crown treatment), to the surface of the substrate, which has already been treated with chemical components that allow for maintenance during a more or less variable, yet sufficient, time of the appropriate surface stress values obtained in this treatment. Some substrates whose surfaces must be subjected to chemical or electronic treatment prior to printing are polyester (PET), polypropylene (PP) and polyethylene (PE). In other plastic substrates, such as PVC, no treatment is necessary.

These substrates are usable as such, with modification to their formulations, or even forming complexes that unite their individual properties. For example, bi-oriented polypropylene coextruded with polyethylene unites the characteristics of both materials, making it more easily printable than bi-oriented polypropylene and lowering the sealed temperature (very common in potato chip packages). The famous Tetra-Brick is another complex, in this case polyethylene, paper and aluminum.

Recommendations for wet offset printing with traditional drying

When a non- or low-absorptive substrate is subjected to a process of conventional wet offset printing, we are faced with the problem of the drying of printed inks. In this case it is necessary to use special oxidative inks, and as with other printing systems, it is recommended that a test be carried prior to the print run in order to monitor proper drying, adhesion, and rub resistance. Some recommendations for printing this type of substrate in wet offset are:

- ✦ In the wetting solution, the pH of the humidifying water should be around 5.5. An excessively low pH may cause delays in drying. Drying agents (2%) can be added, and the amount of water applied must be minimal and uniform (the matt or gloss of the reproduction gives us an idea of the amount of water applied). “Water-alcohol” systems foster drying through more rapid evaporation and lower applied quantity.
- ✦ Use of anti-set-off agents (the finest on the market), pulverized as uniformly as possible.
- ✦ The more contact there is with oxygen in the air the better the oxidation, which is the basis for the drying of these inks. Therefore, optimal aeration of the printer’s is advisable.
- ✦ Avoid mechanical rub off. Form moderate stacks, avoid or reduce the action of roller fans, eliminate swinging movements of the jogger of the machine stack, and do not use wedges.
- ✦ Monitor the setting of the ink film. Due to the extreme smoothness of this type of substrate, this tends to be difficult.
- ✦ Oxidative (low-solvent) inks are not very machine stable and during long pauses can dry in the rollers and ink fountains, with a film beginning to form.
- ✦ Ink tack can be modified and drying time accelerated with the proper use of auxiliary products such as drying and accelerator reducers.
- ✦ Remember, the best advice for the use and application of an ink is provided by the ink manufacturer.



Technical knowledge

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It goes without saying that the drying times with this type of substrate are longer than those with paper. Whether the printing has been carried out in a one-, two- or more color machine must therefore be kept in mind, in addition to environmental conditions at the time of printing, the effect of which is more pronounced when these materials are used.

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