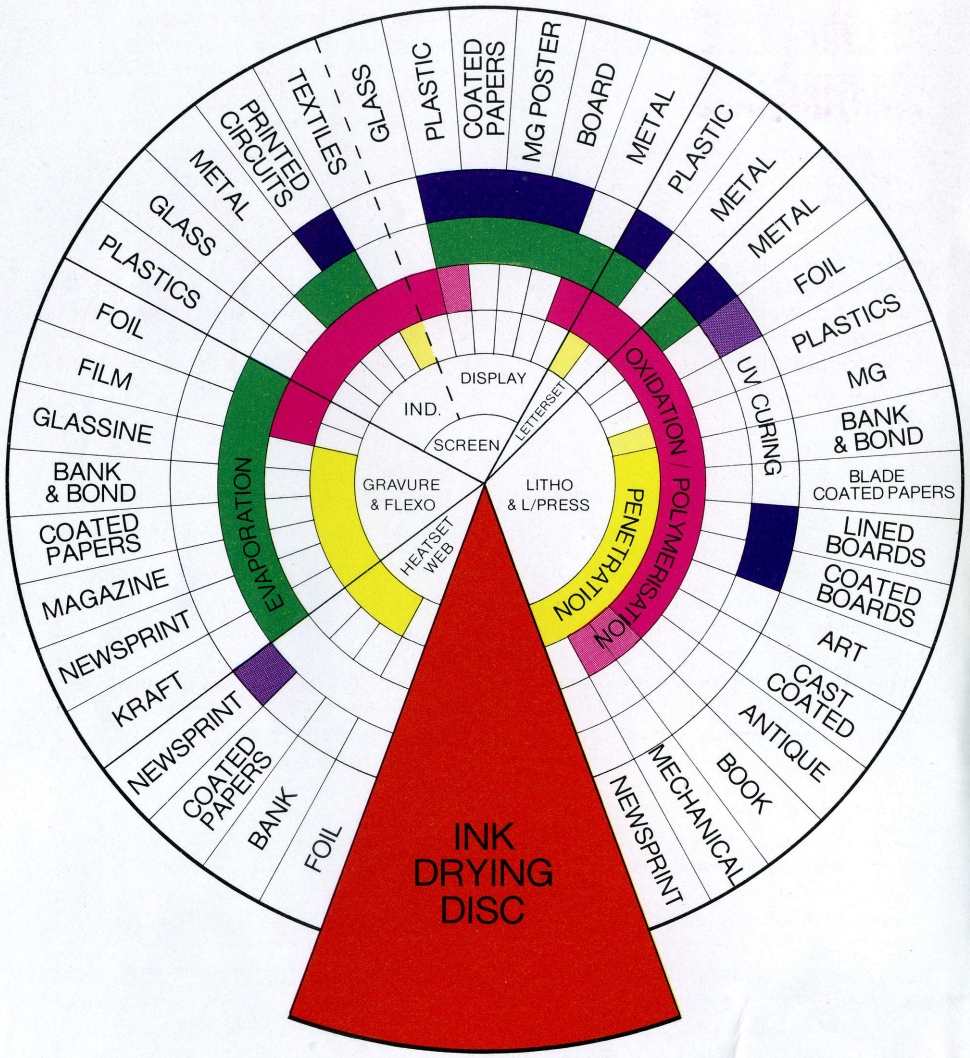


The Ink Drying Disc relates the principle drying methods to the various printing processes and the principal substrates used. Dotted areas are used to indicate where a particular drying method has only limited application.

DRYING METHODS OF PRINTING INKS

Any discussion of ink drying must begin with an understanding of the term 'drying' in the context of the graphic arts industries. The printer may use the term loosely to describe the point at which the print he is producing can first be passed on to the next handling stage, whether it be cutting and creasing, slitting or bag making. As far as he is concerned the sooner this point is reached, the better, *providing other factors are not influenced.*

The ink chemist looks at the process of drying as the means by which a liquid can be converted into a solid. Most printing processes require the ink to be applied in a liquid form and although not essential in some cases, it is usually desirable to convert this into a solid to withstand handling. In many cases, the rate at which this conversion proceeds can be varied between fairly wide limits. It is one job of the ink chemist to modify the drying of an ink to satisfy the printers' requirements *without influencing other factors.*

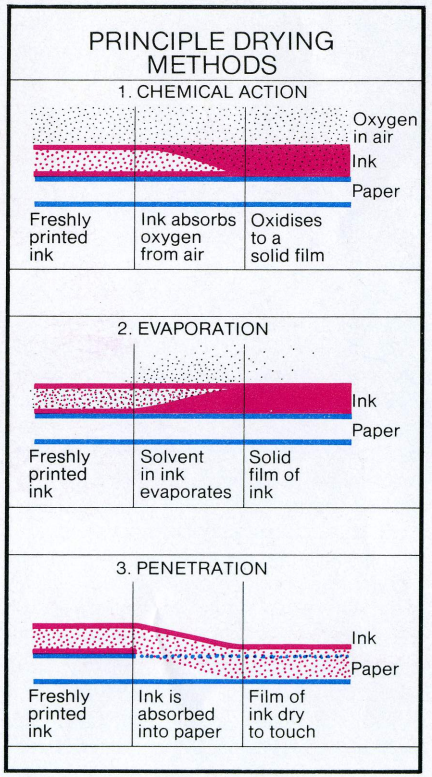
The important thing to remember is that ink drying is nearly always a compromise to satisfy the demands both of the press and on the print. The 'ideal' ink will remain stable in the can indefinitely, can be left on the machine for long periods without drying but will dry instantly on the stock. No such ideal exists although inks cured by UV radiation come very close. For processes such as flexo and gravure, the ideal is unlikely to ever be achieved as instant drying is a far more important property than stability on the press.

The ink chemist is involved in a constant battle to balance the press stability demanded by the print process with the requirements of rapid drying. This article will look at the major print process in turn, analyse the drying methods available to each and discuss the problems each method poses.

Principal Methods

Firstly, it is advisable to look briefly at the three established methods by which printing inks can dry. These are:

(a) Chemical action.
(b) Evaporation and,
(c) Penetration or absorption.

(a) Chemical action can itself be divided into distinct areas:

OXIDATION – oxygen is taken up by the ink film which then undergoes a chemical reaction to form a solid end product. This traditional method is still widely used for most letterpress and lithographic applications. The inherent disadvantage of oxidation is its slowness and the inkmaker has developed methods which overcome this to varying degrees. These will be discussed.