Inks Encyclopedia Article

Inks

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Inks

According to local tradition, a Chinese inventor by the name of Wei Tang who lived about 1,500 years ago developed the first ink suitable for both brush writing and block printing. His ink was prepared from the soot of lamp black mixed with **water**.

Modern printing inks contain four basic components: pigments, **solvents**, resinous binders, and performance additives. In most printing inks, the solvents are oil-based, with petroleum-based oils most commonly used for this purpose. Vegetable-based inks, in which vegetable and petroleum oils are mixed, frequently consist in part of soybean, corn, cottonseed, or linseed oil. Printing inks made with vegetable oils release fewer volatile organic compounds in the printing plants, thereby enhancing occupational safety. (Although most inks are oil-based, some printing inks used in corrugated packaging, magazines, and newspapers are water-based.)

Most newspapers use soy ink for **color** printing. Because the price of color soy ink for newsprint is competitive to that of petroleum-based color ink, newspapers favor soy ink because of its superior performance, environmental friendliness, and vibrant colors. Soy ink can be used on virtually any lithographic press with no modifications or special cleaning agents.

Soy ink is very similar to petroleum-based printing ink, except that it contains varying amounts of soybean oil instead of petroleum oil. Soybean oil is non-toxic, as evidenced by its use in cooking oils, margarine, and salad dressings.

Research aimed at making soy-based inks more technologically competitive with petroleum-based inks has targeted the following objectives: increase the soy oil's **molecular weight**; improve the oil's viscous properties; increase the degree of **conjugation** in the oil; modify the oil by placing hydroxyl groups along the fatty acid **chains**; and chemically modifying the oil to add more acid groups to the **molecule**.