



SOY-BASED PRINTING INKS

Soy oil offers improved pigment dispersal, lower odors and renewability for printing industry.

SOYBEAN USAGE POTENTIAL

U.S. market expansion opportunities exist for soybean oils in the various types of printing methods, particularly gravure and the fast-growing inkjet market. When it comes to newsprint, soybean oil is dominant in both color and black inks. However, poor economic conditions resulting in diminished advertising efforts have significantly reduced the volume of soybean oil in news inks. In addition, most major newspapers are available free of charge in many electronic applications. As a result, the volume of soybean oil used in news inks may have dropped from 100 million pounds to as low as 50 million pounds.

Raw material cost increases and availability are drawing attention to certain key products such as nitrocellulose, gum rosin and acrylic acid. Researchers are investigating whether the biosustainability and environmental friendliness of soybean oil can replace, at least in part, these key ink ingredients. Major ink companies are closely following any research projects that pertain to altering soybean oils, particularly anything that increases the drying abilities or ultraviolet (UV) reactivity of soybean oil or its derivatives. Small amounts of soy/acrylate chemistry are also used in radiation-cured inks to improve pigment dispersion and wettability properties.

PROJECTED TIME OF MARKET ENTRY

Modified soy oils have already entered the market. Additional penetration in gravure for packaging applications and inkjet ink for solvent-based, wide-format printing is foreseen in the 2014 time frame. Also, faster-curing resins, now in the research stage, enter the market in graphic art formulations. High-energy, soy-containing ink using UV, electron-beam and ultrasonic cure could enter the market in 2013, while water-soluble materials could replace certain acrylics somewhat later.

CURRENT RESEARCH STATUS

Research projects are in progress to improve the properties of soybean oil and to penetrate some of the fastest-growing ink market segments. SFC Consulting, in partnership with Northhampton Community College and Polymer Phases, Inc., is beginning to introduce newly developed soy-based resins for use in the ultraviolet curing of graphic art films. A project by Niemann & Associates has been recently funded in the field of gravure inks to determine the technical feasibility of using soybean oil and its derivatives so they can receive the soy seal of approval. Resinall Corp, a major supplier of resins for the gravure ink industry, is running trials in their laboratories. Print Recovery Concepts, Inc., in partnership with Niemann & Associates, is being funded by the USB to explore the technical feasibility of using modified soybean oils in inkjet printing — predominantly commercial inkjet printing.





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ABILITY TO ACHIEVE BROAD MARKET ACCEPTANCE

Research concerning ultraviolet- and electron-beam-cured inks, sponsored by the United Soybean Board (USB), is making progress in the field of energy-cured systems. Industrial partners have approached USB-funded researchers to provide guidance for advanced development and commercialization. Modified soy oil continues to show promise in both pigmented and unpigmented UV-curable lithographic inks, gravure inks for packaging and inkjet printing.

At the 2009 Coatings, Inks and Solvents TAP, a new initiative for biorenewable content in inks was identified. A voluntary labeling program was established in 2008 by the National Association of Printing Ink Manufacturers to satisfy the printer's need for more biorenewable and sustainable inks. An effort will be made to locate a project with an ink formulator or resin supplier to increase soy content in printing inks. Since that time, many of the major ink companies — such as INX, Flint Ink and Sun Chemical — have adopted greater use of soybean oil in their ink formulations.

ISSUES AFFECTING COMMERCIAL SUCCESS

Key issues remain in the development of rapid-cure resins based on soy that can provide reduced volatile organic compound emissions (possibly water-based) and competitive cost advantages compared with petroleum-based products. Benefits are improved pigment dispersal, lower odors, use of a renewable resource and the possible advantages of modified soy oil as a unique printing ink intermediate.

ABOUT USB

The 69 farmer-directors of USB oversee the investments of the soy checkoff to maximize profit opportunities for all U.S. soybean farmers. These volunteers invest and leverage checkoff funds to increase the value of U.S. soy meal and oil, to ensure U.S. soybean farmers and their customers have the freedom and infrastructure to operate, and to meet the needs of U.S. soy's customers. As stipulated in the federal Soybean Promotion, Research and Consumer Information Act, the USDA Agricultural Marketing Service has oversight responsibilities for USB and the soy checkoff.

FOR MORE INFORMATION, VISIT: SOYNEWUSES.ORG

