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Bio/Renewable Content Program 2018

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- Upcoming Events - 2018

- Annual Convention
- April 20-23
- Sonoma, CA

- NPIRI Summer Course
- July 10-15
- Sonoco Institute
- Clemson University

- NPIRI Technical Conference
- October 10-12
- Pheasant Run Resort
- Chicago, IL

Bio/Renewable Content Registration Program

- Organized in April of 2008 to address sustainability issues
- Identified a need for a labeling program that went beyond just soy oil content
- Began with vegetable oil and expanded to all bio-derived/ renewable materials

Why?

- NPIRI Board discussions on Sustainability
  - "Green and Sustainability" Driving many new initiatives
  - 2008 and 2009 Technical conference Themes
  - Green washing and confusion in marketing materials seen.
  - Soy Seal Confusion – http://www.soyink.com/
  - Soy is not the only renewable raw material.
  - Company-based self-certification less credible.
  - We need a system with credibility and verification.

Task Force Members

NPIRI INK ENVIRONMENTAL IMPACT TASK FORCE MEMBERS

Last Name	First Name	Company
Jayasuriya	Sunil	BASF
Castillo	Marc	Braden Sutphin
Anderson	Doug	Central Ink
LieBerman	Bob	Cognis
Polykarpov	Alex	Cognis
Whalen	Wallace	Color Resolutions
Wiesemann	Rudy	Color Resolutions
Waldo	Roslyn	Cytec
Barricklow	Chris	Flint Group
Ness	Duane	Flint Group
Duchene	Keith	Gans
DeLegge	Dan	Ink Solutions

Last Name	First Name	Company
Notti	Pete	Ink Systems
Cichon	Joe	INX
Chase	Bob	Kramer
Gerkin	Mike	Kustom
Cansler	Greg	Premier Ink
Ashton	Jeffery	Quality Inks
New	Aaron	Siegwerk
Donvito	Tom	Sun Chemical
Truncellito	Jeannette	Sun Chemical
Czarnecki	Rich	Superior
Ganesh	Sumathy	Toyo
Ishii	Hiroyuki	Toyo
Wichtendahl	Bob	Toyo

American Soybean Association®

- The National Soy Ink Information Center is now closed. Due to the success of the soy ink industry, we feel there is no longer a need to continue our work promoting soy ink and its acceptance through the National Soy Ink Information Center. In short, the soy ink industry is such a success that you don't need us anymore!

  The center was created and funded by the Iowa Soybean Association (ISA). Iowa farmers believed in soy ink and committed many resources to promoting its usage. Now that it is a success, ISA is moving those resources to fund exciting new innovations and programs that will build new markets for our soybeans.

  ISA is making this change to the National Soy Ink Information Center because there is now a general awareness and acceptance of soy ink worldwide. People understand and value it as a renewable resource and alternative to petroleum-based inks.

  If you have questions about soy ink, we urge you to visit soygrowers.com or Toll Free: 800-688-7692
  Phone: 314-576-1770
  Fax: 314-576-2786
  Email: membership@soy.org

Soy Oil Lifecycle Analysis

LCA Case Studies

Streamlined LCA of Soy-Based Ink Printing

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DOI: http://dx.doi.org/10.1065/lca2000.11.040

Abstract. This study provides a benchmark of the life cycle environmental impact characteristics associated with a typical soy-based ink used for sheetfed lithographic printing. The scope included a streamlined Life Cycle Inventory (LCI) and Impact Assessment (LCIA). Materials, processes, and life cycle stages that are the same between different printing inks, or were less than one percent by mass of the printing system input materials, were excluded. The LCIA included identification of specific processes in the life cycle of soy-based ink printing that make the greatest contribution to the overall environmental hazard potential in 13 impact categories for the baseline printing system selected. The LCIA approach included both regional scaling for areas that differ in sensitivity to certain impact indicators and normalization against a reference value. Reduction in the use of tall oil rosin and switching from conventional to low or no-till farming appear to be promising opportunities for reducing the environmental hazard potential.

Keywords : Impact categories; LCI; LCIA; Life Cycle Impact Assessment (LCIA); Life Cycle Inventory (LCI); lithography; sheetfed printing; soy-based ink; soybean oil

Introduction

Soybean oil has been demonstrated to be a viable alternative to petroleum-based middle distillate oils as a vehicle for carrying pigment in many types of printing inks, although soy-based inks still constitute only a small portion of the total potential market for printing inks. According to the United States (U.S.) census of printing inks, the quantity of lithographic and offset inks sold in 1992 amounted to a total of 378.6 million kg, including 48.9 million kg of sheetfed inks. Use of soy oil in inks is limited to paste inks, which are primarily news inks and lithographic inks. Current consumption of soy ink is estimated to be over 23 million kg per year. In order for printers and publishers to display the SoySeal ™ on sheetfed material, the American Soybean Association (ASA) requires use of inks containing at least 20% soy oil.

A variety of studies have been conducted on the environmental impacts of selected components of lithographic printing and soy-based ink printing, including evaluations of blanket washes by the U. S. Environmental Protection Agency (EPA 1996) and Tillotson and Demers (1994), an evaluation of shop towel use in printing (Pullman et al. 1997), a comparison of soy-based versus petroleum-based ink mileage (Rosinski 1995), and a waste reduction evaluation of soy-based ink use at a sheet-fed printer (Simpson et al. 1994). In addition, a comprehensive review of all types of printing and typical formulas for printing inks, including soy-based inks, are described in 'The Printing Ink Manual' by Leach and Pierce (1993). Pollution prevention opportunities for the commercial printing industry, including lithography, have been identified by many different studies, for example EPA (1990). However, no Life Cycle Assessment (LCA) has been conducted on an entire printing ink system in the U.S., including extraction of raw materials, manufacturing of printing materials (e.g., ink, solvents, fountain solution, shop towels, paper), printing operations, and disposal of wastes.

From an environmental standpoint, there is an interest in using biologically based products from renewable resources (e.g., soybeans) instead of non-renewable resources (e.g. petroleum), which may become unavailable to future generations. Also, soy-based ink has very low emissions of volatile organic compounds (VOCs) during printing, compared to many petroleum-based ink formulations. Releases of VOCs during printing are a concern for human health in the print shop, as well as creation of photochemical smog, which can cause human health impacts over a broad area.

Prior to the start of this study, no publications were available that focused on an LCA of printing systems using soy-based ink. Although there is still no published LCA that focuses on sheetfed printing using soy-based ink, a recently published LCA on newspaper printing by Rafenburg and Mayer (1998) includes evaluation of an improved printing system (including soy-based ink) as a potential alternative to the baseline printing system using petroleum-based ink.

1 Goals and Scope

The purpose of this study was to document the life cycle environmental impact characteristics associated with the use of soy-based inks by evaluating a typical ('generic') soy-based ink formula currently used in significant quantities for sheetfed printing. This typical soy-based ink printing system will serve as a benchmark for future comparison with alternative ink formulations and other combinations of printing system materials. The Life Cycle Impact Assessment

Regulatory Issues

- **S. 716 (103rd): Vegetable Ink Printing Act of 1994**

(b) VEGETABLE-BASED INKS-
(1) IN GENERAL- Notwithstanding any other law, beginning on the date that is 180 days after the date of enactment of this Act, all lithographic printing performed or procured by a Federal agency that uses oil in its ink shall use the maximum amount of vegetable oil and materials derived from other renewable resources that are technologically feasible and result in printing costs that are cost-competitive with printing using petroleum-based inks.
(2) MINIMUM PERCENTAGES- Except as provided in paragraph (3), in no event shall a Federal agency use any ink that contains less than the following percentages of vegetable oil in its ink used for lithographic printing:
(A) In the case of news inks, 40 percent.
(B) In the case of sheet-fed inks, 20 percent.
(C) In the case of forms inks, 20 percent.
(D) In the case of heat-set inks, 10 percent.

https://www.govtrack.us/congress/bills/103/s716

NPIRI Environmental Impact Task Force Phase I

- This phase of the program does not purport to address sustainability, carbon footprint or life cycle analysis of the raw materials or manufacturing processes. The bio-derived renewable content is only one factor and should not be used as the sole basis for determining environmental friendliness, as a full life cycle analysis must be taken into consideration. These additional issues will be considered in Phase II and Phase III of the program.

NPIRI Environmental Impact Task Force Phase II & III

- Goals and objectives for Phase II (Environmental impact of Ink Making)
  - Raw material refining & manufacturing
  - Impact of agricultural products (fertilizing, tractor use, harvesting, refining, etc)
  - Energy usage for transporting raw materials, finished ink, and waste materials
  - Energy usage for ink manufacturing
  - Air and water emissions from the manufacture of raw materials and printing inks
  - What other factors will be considered or not considered
    - Transportation of employees to work place
    - Generation of waste from individual employees at work site (i.e. lunch waste, coffee cups, toilets, etc)
    - Recycling of office waste
- \- Coordination with Sustainable Green Printing Partnership
- Start list of items for Phase III (Impact of use of Printing inks)
  - On press emissions
  - Printing plant waste – recycling of ink, paper, press room chemicals
  - Package or product design (i.e. down sizing printed products and packaging)
  - Recycling of printed products and packages

Are Printing Inks Biodegradable???

- **ASTM D5338 - 15**

Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions, Incorporating Thermophilic Temperatures

- **OECD GUIDELINE FOR TESTING OF CHEMICALS** PROPOSAL FOR REVISED INTRODUCTION TO THE OECD GUIDELINES FOR TESTING OF CHEMICALS, SECTION 3 PART 1: PRINCIPLES AND STRATEGIES RELATED TO THE TESTING OF DEGRADATION OF ORGANIC CHEMICALS

Resources

- Soy ink market
- Calculation spreadsheet
- Inks/Min. Enviro Impact
- Heavy Metals
- Realistic Appraisal - Soy

napim Bulletin

No. 08-04

DATE: January 11, 2008

TO: Official Representatives – Ink Companies

ESTIMATED 2006 SOY INK MARKET SHARE

Executive Summary

There has been a renewed interest in "environmentally friendly" products and processes due to the curren t issues of sustainability and printing green. Previous marketing, publicity and the establishment of soy oil based inks guidelines with labels provided by the American Soy Association has resulted in an emphasis on soy inks as a way to address these issues from an ink perspective, although there are other options as outlined in NAPIM Bulletin 07-15.

NAPIM has experienced an influx of requests for data on the size of the soy ink market and as a result we have prepared an estimation based on NAPIM total ink market values along with assumptions using input from member companies. All listed data and percentages are in pounds of ink.

The resulting estimate shows that approximately 9.4% of the total pound of ink (letterpress, lithographic, flexo and gravure) sold in the U.S. are printing inks containing soy oil.

Input Data

Soy oil is used almost exclusively in oil based inks, letterpress and lithographic. The largest volume of soy oil is used in news ink colors that represent approximately 40% of the total news ink volume. Second are sheetfed inks which also utilize a variety of drying oils (linseed, chinawood, safflower, etc), with soy oil being used in approximately 10%. Heatset inks are only able to sustain a minimal amount of drying oil as it will slow the drying to an unacceptable level.

Listed below is the data used for the NAPIM estimations.

TYPE OF INK	2006 LBS (in millions)	% of Ink Containing Soy Oil	LBS OF SOY INK (in millions)
News Ink Black	273.0	0.0	0.0
News Ink Colors	181.0	100.0	181.0
Sheetfed	106.5	10.0	10.7
Heatset	495.5	2.0	9.9
Total Oil Based	1,056.0	19.1%	201.6
All Others	1,088.1	0.0	0.0
Total All Inks	**2,144.1**	**9.4%**	**201.6**

If you have any questions, please contact the NAPIM office.

National Association of Printing Ink Manufacturers, Inc. / 581 Main Street
Woodbridge, New Jersey 07095-1104 / Phone: 732-855-1525 / Fax: 732-855-1838

napim Bulletin

No. 07-15

DATE: November 8, 2007

TO: Company Representatives – Members and TAM's

FROM: John Daugherty

A Realistic Appraisal of Soy Oil Printing Inks - 2007

An updated version of the NAPIM document, "A Realistic Appraisal of Soya Inks" issued in 1991

Executive Summary

Printing with inks formulated with soybean oils as a replacement for petroleum based oils is one of a number of approaches aimed at reducing the environmental impact of printed products. Generally, this objective can be accomplished by reducing air pollutant emissions (volatile organic compounds or VOC's), using raw materials based on renewable resources and minimizing the impact of the entire life cycle of the ink from the production of the raw materials through the disposal or recycling of the finished printed product. This report details how the choice of oils, whether it be petroleum or naturally sourced, will address each of these factors.

Introduction

The current attention in the public media of being environmentally friendly has triggered renewed interest in using printing inks that have the least impact on the environment. To many people, this means replacing petroleum oil with soybean oil, largely due to the marketing effort of the American Soybean Association. Another reason for the emphasis on soybean oil is that it is largely domestically produced, although it can be sourced in other parts of the world. There are a number of alternatives to soy with a variety of plant derived or vegetable-type, "renewable" oils suitable for use in printing inks. Linseed, tung (chinawood), oiticica, safflower and sunflower in addition to soy oil have been utilized by the printing ink industry for decades. These oils are differentiated by drying rate, film forming properties, cost and availability. The oil of choice is highly dependent on the printing process, ink drying mechanism, end use requirements and pricing structure of that particular type of ink.

The entire life cycle of the production of the oil must also be taken into consideration. This would include CO_2, NO_x, SO_x and particulate emissions from the agricultural equipment used to plant, maintain and harvest the crops as well as the emissions from the processing and refining of the oil.

napim Bulletin

No. 08-05 (Revised February 2009)

DATE: January 30, 2008

TO: Representatives – Ink & TAM

FROM: George Fuchs

Metals in Printing Inks©

There is currently a renewed interest in the environmental impact and safety of a whole range of manufactured materials including printing inks. The recent media attention concerning the detection of toxic metals in pigmented coatings (paints and inks) applied to imported products has led to a plethora of published information as well as posted information on a variety of internet sites. In many instances this information is incorrect, inaccurate or misleading as there is a tendency to make generalizations about metals of all types. The objective of this report is to provide current and accurate information regarding the origins, presence and usage of metals in printing inks currently manufactured in the United States.

NOT TO BE REPRODUCED FOR USE BY NON-MEMBERS
WITHOUT PERMISSION OF NAPIM

NPIRI Bulletin

No. 08-12

DATE: July 3, 2008

TO: Company Representatives – Members and TAM's

FROM: George Fuchs & John Daugherty

Formulating Printing Inks to Minimize Environmental Impact©

Executive Summary

This document addresses printing ink compositional factors that have the potential to impact the environment. These include the use of bio-derived renewable raw materials, the amount of volatile organic compounds (VOCs), presence of hazardous air pollutants (HAPs), heavy metal content and toxic/carcinogenic ingredients. In addition, printing ink manufacturers must take these environmental factors into account, while also providing a product that meets both the customer performance expectations on the printing press and the end use requirements of the printed product.

Introduction

At present, there is no regulatory or industry consensus that defines how to minimize the environmental impact of manufactured products. The USDA defines "environmentally preferable" to mean "products that have a lesser or reduced effect on human health and environment when compared with competing products that serve the same purpose". In the commercial context, it is generally accepted to mean the formulation of products with chemicals and other materials that have a relatively minimal adverse impact on the environment through the manufacture, use and disposal/recycling of the product. Printing inks as formulated chemical mixtures, have quantifiable properties that can be used to make technically sound assessments of environmental impact. In some cases these properties can be modified/adjusted to minimize the environmental impact throughout the products lifecycle.

All printing inks go through a conversion from a wet phase to a dry, durable film by a variety of physical and/or chemical processes that include oxidation, evaporation, substrate absorption or exposure to an ultraviolet light /electron beam source. Each type of ink has limitations in terms of the level of volatile content and ability to utilize renewable raw materials. (see Table 1).

BIO-DERIVED RENEWABLE RAW MATERIAL WORKSHEET

COMPANY NAME:
INK IDENTIFICATION NUMBER:
INK NAME:
SUBMITTED BY:
DATE:

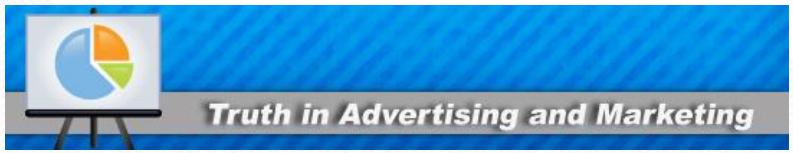
MATERIAL	Column 1 TOTAL % of Component in Ink Formula	Column 2 % of BRC Material in Component	Column 3 % BRC in INK Formula (Calculated) Cols. 1@2
Cellulose Derived Materials			
Cellulose acetate butyrate (CAB)			0.00%
Cellulose acetate propionate(CAP)			0.00%
Cellulose based polymers - EHEC, HEC, etc			0.00%
Nitrocellulose			0.00%
Gums (do not include mined gums)			
Arabic			0.00%
Dammar			0.00%
Sandarach			0.00%
Resins			
Gum rosin based resins			0.00%
Mastic resin			0.00%
Rosin maleates			0.00%
Tall oil rosin based resins			0.00%
Wood rosin based resins			0.00%
Plant Derived Materials			
Alcohols - plant derived			0.00%
Alkyd resins- plant derived			0.00%
Arabinogalactan			0.00%
Butyl Lactate			0.00%
Camphor			0.00%
Ethyl Lactate			0.00%
Fatty acid amides			0.00%
Fatty acid esters			0.00%
Glycerol (bio-based) as a building block for polyesters			0.00%
Gluten			0.00%
Latex (natural)			0.00%
N Propyl Lactate			0.00%
Polyamide protein includes casein, peanut, soy, zein (corn)			0.00%
Polyamides based on TOFA			0.00%
Polybutylene succinate - plant derived			0.00%
Polyglycholic acid			0.00%
Polyhydroxyalkanoates (PHA)			0.00%
Polylactic Acid (PLA)			0.00%
Polysaccharide derivatives			0.00%
Polyurethanes based on natural oil polyols			0.00%
Proteins			0.00%
Rubber - natural			0.00%

BRC Labeling

Program Released February 2009

- Bio-derived Renewable Content.
- Does include Water.
- Basically does not count minerals or items made from fossil fuels.
- Referee Method – ASTM D6866
  - **ASTM D 6866 Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis**
  - *Note: ASTM D6866 can be done at the University of Georgia for a fee of $75.*

BRC Labeling



ftc
eco in the market
green packaging claims

Green Guides

https://www.ftc.gov/news-events/media-resources/truth-advertising/green-guides

FAQ's

https://www.ftc.gov/tips-advice/business-center/guidance/ftcs-endorsement-guides-what-people-are-asking

Typical BRC Limits

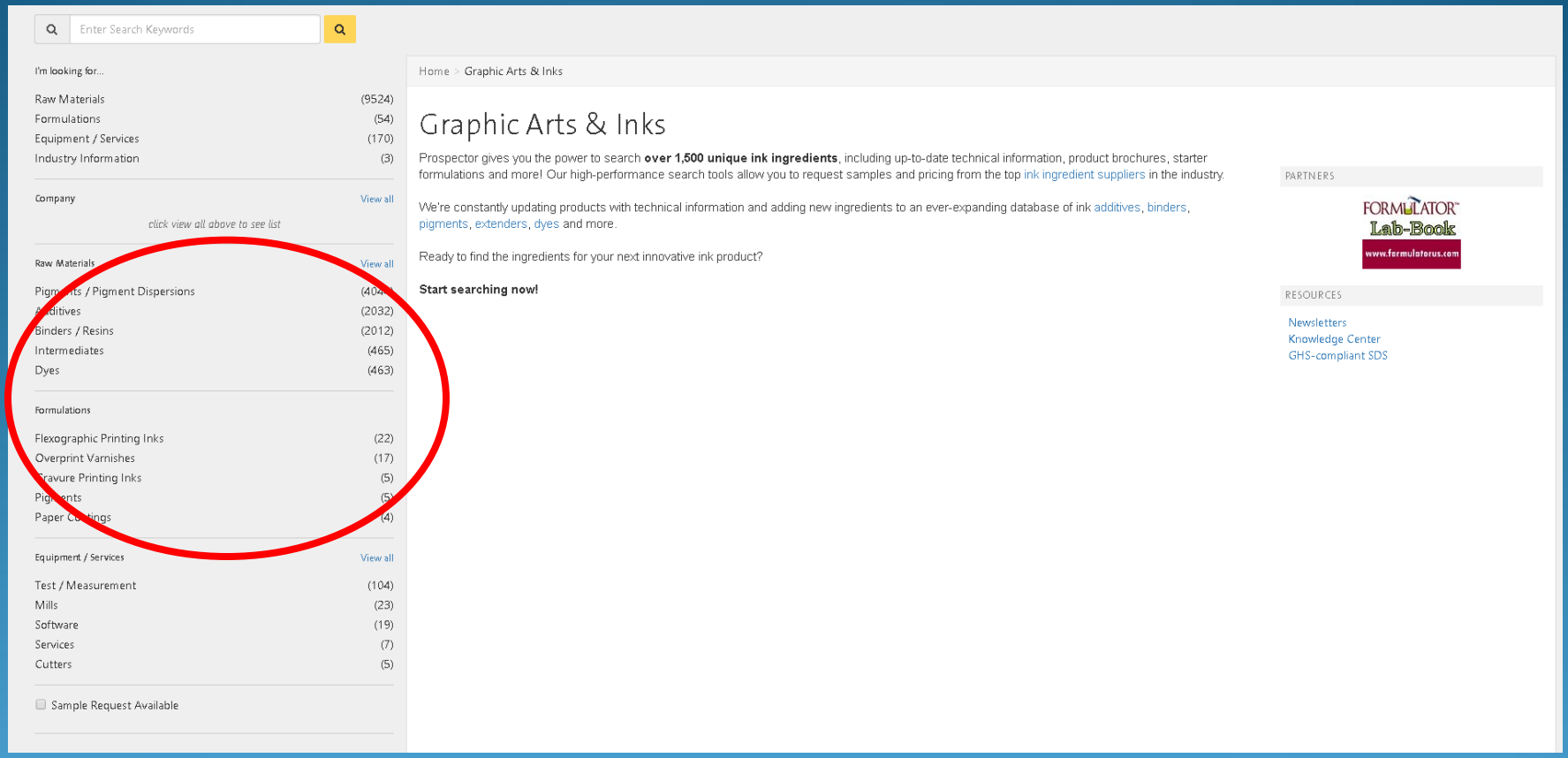
Ink	Products	Typical BRC	Chemistry	Drying Method	Volatiles	Typ. VOCs Range	Potential BRC Range
Offset Sheetfed	Brochures, labels annual reports	Vegetable oils, Wood-based Resins	Oleo resinous	Oxidation	Aliphatic hydrocarbons	0-20	30-80
Offset Heatset	Magazines, catalogues	Vegetable oils, Wood-based Resins	Oleo resinous	Evap.	Aliphatic hydrocarbons	35-45	0-35
Offset Coldset	Newspapers, directories	Vegetable oils	Oleo resinous	Substrate absorp.	Aliphatic hydrocarbons	2-20	30-80
Energy Curable	Various	Chemically treated vegetable oils	Acryl'd mon/olig	Polymerzn	Unknown	0-5	0-30

Records and Tracking

- Publicly – Once registered
  - WWW.Napim.org
  - http://napimresources.org/Technical/BRCProgram
- Records maintained internally
- Recertification Required
- Testing – coming soon

Information Resources

https://www.ulprospector.com/en/na/Inks



Use of the BRC Label

By Ink Supplier on Product

By our Customers

For Use by Ink Manufacturers and Raw Materials Suppliers

Coalescent	Overprint Varnish
Coldset-News Offset	Photoiniator
Defoamer	Polyamid Ink Resin
Dispersant-Wetting Agent	Raw Material
Energy Curable Ink Resin	Resin
Extender - Ink	Sheetfed letdown varnish
Flexo Solvent Ink	Sheetfed Offset
Flexo Water Base	Solvent
Flexo Water Base Color Base	Surfactant
Flexo Water Base Extender	UV Flexo
Gravure	UV Litho
Heatset letdown varnish	UV Soy Ink Coating
Heatset Offset	Varnish
Heatset Varnish	Varnish Intermediate
Ink Jet Waterless, Solid Ink	Vehicle
Nitrocellulose	Web Offset

How to Register

Registrant

Determine the BRC of your product – No minimum concentration

Complete the User Agreement

Complete the Registration Spreadsheet

Submit to NAPIM

NAPIM/NPIRI

Verify that all information has been submitted

Review/verify the formulation information

Request additional info/Approve

Register product/issue graphics

Sustainable Green Printers

http://sgppartnership.org/

- What it is
- Why its an opportunity

Thanks for listening!