Gravure ink formulation pdf

The Flexo formula and Gravure ink are formulated from the following components: Volatile organic products used for solubilise polymers. The main families: alcohol, esters, ketones, glycol and water. Cellulose, vinyl, acrylic and polyamide polymers Make a binder (solvent and polymer) that largely determines adhesion on substrates, shine and mechanical, physical and chemical properties of ink. Organic or mineral pigments Organic dye pigments are selected as the function of the binder and speed required by the application. Components that allow you to get intense and very transparent ink. Products giving ink specific properties such as reology, adhesion, rub resistance and scratches, anti-foaming effect, etc. Typical Flexo - Gravure ink formulations Basic polymers In water based on ink, two types of acrylic polymers are used: - Polymers in emulsion or variance that improve drying, shine, shine, and ink Polymers in the solution that improve pigment wetting and facilitate re-soluble and cleaning. In solvent-based ink, the different family of polymers cited above are used differently or in the form of mixtures, depending on the application and finite properties required for printing. Flash Point (KK) Methyl ethyl ketone (MEK) Methyl isobutylketon (MIBK) Solvent is selected as an application function, desired drying speed and the type of polymers used. The lower the evaporation index (ether No. 1), the more volatile the solvent is and the faster the drying rate. A flash is the minimum temperature at which the solvent can ignite in the presence of a heat source (spark, bare flame, etc.). Thursday 21 October 2004 1:00:00 amI need a guide to the wording for my 100% toluene based on ink. Only toluene as a solvent. A.S. Paterson Co. Lte vous souhaite la bienvenue. La version of the Francaise de Notre Dame website website est pr'enement en construction. Votre patience pendant ce processus est grandement appr'ce. Entretemps, n'h'sitez pas et nous contacter au416-222-3333si vous avez des issues. Back to the beginning there are different types of ink, among these water-based, solvent-based, UV, and digital ink. In principle, all types of printed ink contain similar components - but depending on the printing method, the type of raw materials and the quantity are different. The ink is formulated using four main components: pigments, binders, solvents and additives. Pigments are used to create color impressions and optical effects. Binders are evenly dispersed pigments and bind them to the surface of the substrate. Dissolants increase the flow characteristics and viscosity of the ink to ensure procession depending on different technologies and printing conditions. Finally, supplements change the physical ink in different situations, such as flexibility of printed film, increasing scrub resistance or promoting adhesion. But why are there so many different formulations of ink? The answer is simple: because not every ink is suitable for every printing technology or application. Common applications, for example, include flexible packaging, narrow webs, sheets, paper and board, tobacco, packaging of liquid food or print media. And, of course, reproduction of the almost unlimited color scheme of the real world is not required. Watch our video or click on our interactive graphics to learn more about the wording of the ink in Siegwerk and the market segments in which we operate. This application is a continuation of the Ser application. No 08/977,531, filed on November 25, 1997, is now abandoned, which is a continuation in the application of Ser. No 08/614,587, filed on March 13, 1996, is currently the U.S. Pat No. 5,725,646. FIELD OF THE INVENTION Invention refers to water-based printing ink. DESCRIPTION OVER ART In an attempt to eliminate volatile organic compounds (VOCs in the press room, water-based alternatives are sought for printing ink formulations. Water-based ink is known for use in flexographic printing processes. No. 4,173,554 and The Ink Printing Guide, edited by R. H. Leach and R. J. Pierce, pages 571-576, 5th edition, (Blueprint, 1993). Water-based printing processes have also been developed to avoid the environmental and operating costs associated with solvent use. For example, the U.S. Pat. No 4,104,219 reveals ink containing polyalcyl acrylate binder scattered in a homogeneous, akaal phase. U.S. Pat. No 4,543,102, describes the composition of water-based ink containing up to 8% of water incorrectly organic solvents such as polyvinyl alcohol. The water-based engraving print ink formulations described in the U.S. Pat No. 5,098,478; 4,954,556 and 5,389,130, in which much of the solvent is replaced by water. The solvent used in gravitational ink is a temporary ingredient present solely as a means of applying the vehicle's solids to the substrate through the printed unit. Theoretically, after the application of solids of the vehicle, the solvent is removed mainly by evaporation and/or absorption, and does not take any further part in the properties of the printed film on the However, in practice this is an oversimplification, since the solvent cannot always be easily eliminated and is sometimes trapped in the grates of the substrate. In B The choice of a printing solvent is usually regulated by the resin system used; Press speed Whether a direct or indefatigable engraving process will be used; Gravel cylinder design Substrate The desired properties of end-use printing And the pigment is selected. However, the chemical nature of the resin system often severely limits the choice of solvents. With most resins, the solvent mixture will yield a lower viscosity of the ink than a single solvent. The wrong choice will produce gravure ink having poor flow characteristics. The ink of the engravers should remain liquid during the printing process, while the ink flows from the engraving cells onto the substrate. The solvent is then quickly removed during the drying cycle. Therefore, the evaporation rate of the solvent should be directed to the time it takes to remove excess ink by the doctor's blade and the point of eliminating the solvent. This time span is clearly regulated by the speed of the press. In recent years, changes made to reduce the maximum concentration of solvent vapors allowed in the atmosphere of the press room have led to the virtual elimination of solvents such as 2-ethyloxyethanol and corresponding acetate. They were replaced by glycol esters and esters and solvents based on propylene glycol. The most common solvents, used in engraved ink compounds include ethyl, iso-saw and n-saw alcohols, acetone, ethyl, iso-saw and n-propyl acetatas, methoxy and etixeous propanes, aliphatic hydrocarbons, toluene, aliphatic hydrocarbon solvents, primarily aromatic, aliphatic and mothballs, alcohols, Because the solvent component is usually 30 to 70 w. % of the composition of ink engraver, the release of volatile organic compounds (VOCs) is a serious environmental problem. In order to comply with a variety of federal, state and local environmental regulations for the installation of solvent recovery systems, which represent both significant capital and operating costs, as well as a cap on production rates. There are a number of other flaws related to the water base of gravure ink of previous art. For example, the characteristics of the press treatment of these water-based ink are uniquely different from organic solvents of base materials. Once dry, aqueous-based ink may be reluctant to overeat in water, depending on the type of resin system used in the ink. This can lead to an increase in the tick plugging and the amount of press washing. Conversely, the resin system cannot be sufficiently waterproof when drying, making the ink easily smeared in the presence of moisture. The resin system used in water ink can lead to poor distribution of points and increase missed points. These problems can be overcome, given the limited limited resins for use in water-based systems. Accordingly, the introduction of water-based systems may require changes in cylinder engravings, press and household procedures, higher press speeds and land modifications. In addition, the printed substrate can have a significant impact on the performance of these water ink. In applications such as low-surface film printing and paper-coated gravel, organic solvents still produce superior performance. Even with unpainted paper, water can cause size distortion and curling. A comparison of water-based and solvent-based gravure ink in previous art shows that in the solvent system the ink solvents are balanced in such a way as to be not volatile enough for minimal evaporation from the moment the doctor's blade removes the excess ink to the point of impression. After the impression, transfer the ink to the substrate, and the time to achieve a uniform lay, the solvent must evaporate before rewinding or laying. For comparison, in the water system of ink of the previous art the percentage of solvent is replaced not only by water (which acts as a solvent), but also by volatile amine, necessary to neutralize the acid resin. Water, being unstable and causing no problems due to evaporation from the cell, can still create difficulties at the final stage of drying depends on the amount of water present in the ink. In addition, the choice of amin and pH control is just as important as viscosity control. Premature release of amin to the point of impression can lead to a drop in pH and subsequent sediment of resin in the cells of the grature cylinder. In addition, water-based systems are not as easily reused as system solvents. Therefore, it is possible that any precipitation will not be reused as part of the next cylinder revolution in the ink duct. Therefore, if carefully monitored, pH fluctuations can result in packing in an etch gravitas cylinder and eventually for screening. The characteristics of surface tension of a water-based system should also be taken into account, as they are generally completely different from those of solvent systems. These differences can lead to poor wetting of the substrate, leading to ink theft, crawling and non-homogeneous streams of ink from cells. Surface tension can be reduced, however, by carefully selecting superficial active agents or by incorporating small amounts of alcohol. Despite extensive work on developing water-based gravel printing ink formulations, there remains a strong need for gravure printing industry for ink completely free of VOC, while maintaining standards of performance of conventional solvents based on gravure ink. No water-based engraving will eliminate the VOC usually coming from a solvent based on ink printing. So, in a way The object of this invention is to provide a solvent without the engraving of ink print that is non-VOC emission while retaining the basic benefits of conventional solvent-based engraving ink. Another purpose of the invention is to provide gravitational ink that is suitable for use in gravel printing and compatible with a wide range of substrates. Another purpose of the invention is to provide gravir ink that retains the performance characteristics of conventional solvents based on ink formulation and is compatible with standard pigments and resin systems used in gravilar printing. Another object of this invention is the provision of more economical gravel ink in terms of the cost of raw materials and control of emissions. Such goals were achieved with the help of this invention. SUMMARY OF THE INVENTION This invention is a solvent free, water-based, single liquid engraved print ink, incorporating (a) water; (b) The macromolecular binder of resin consisting of (i) binders soluble in water, regardless of the pH of water, (ii) rose salt binders soluble in water at pH from 7.5 to about 10, and (iii) axal binding emulsions; (c) Pigment; and (d) hydroxyethylyl ethylene urea re-wetting agent. According to this invention, VOC ink emissions are reduced by 100% compared to standard based solvents and gravel-printed water ink, while the stringent requirements of gravel printing, such as tone density, shine, rub resistance, viscosity and embellishment continue to comply. DESCRIPTION INVENTION Currently, the ink system for the surface of the packaging gravure is rich in VOC. However, chronic problems such as hazing and indecision have been reported. Several water-based formulations have been taken to replace the existing system, but to no avail. The main drawbacks were glitter and open time. The appearance of 2-hydroxyethylene urea allowed to overcome the above-mentioned problems. For example, adding just 0.5 percent of 2-hydroxyethylene urea overcomes problems with previous artistic formulations and increases the shine from 6 to 9 points. Improved solubility and open time have also been achieved by using a solvent free and high water washed graviru printing ink of this invention that contain 2-hydroxyethylene urea. In the broadest sense, the gravel seal of ink composition of this invention consists of pigment and vehicle. The vehicle is a liquid carrier that can be an emulsion. The current invention of the vehicle is water, which replaces the vehicle's volatile organic compounds, thereby eliminating VOC emissions. The vehicle also contains resins that stick pigment to the printed substrate. It has been surprisingly established that the performance of the engraver printing ink does not noticeably affect the complete elimination of solvent. Solvent. Resin binding systems require the addition of chemical plasticizers, in order to prevent the ink drying in the gravitas cylinder cells on the press and to provide satisfactory disgust and flexibility on the substrate. Systems based on previous water will also contain resins that can be saponified but must be volatile enough to leave water-soluble dried ink. They will also contain supplements to reduce the properties of surface tension and even more to enhance the characteristics of lying. Surface characteristics can be significantly altered by additives that contribute to the resistance of the rub and slip. The following resins and mixtures can be incorporated into the engraving ink of this invention: rosin and modified roses such as calcium, magnesium and zinc metallic resins; ester rubber band made of rosin; men's pitches and esters; Dimerized and polymerized rosins; Rosin modified fumaric resins; The shell Asphalt; phenolic resins and phenolic resins modified by rosin; resin alquid; polystyrene resins and copilamers of them; terpenes alkylate resins of formaldehyde urea; alkalatated resin formaldehyde urea; polyamide vinyl resins such as polyurethane resins; polyimide resins; polyvinyl acetate and polyvinyl alcohol; ketone resins; acrylic resins such as polyacrylic acid and polymetacleric acid; epoxy resin; polyurethane resins; cellulose resins such as nitro- and ethyl cellulose, ethyl cellulose, cellulose acetate butyrate and carboxythyl cellulose. Resin can be soluble or dispersative either in water or in aquierous emulsion, depending on the hydrophobic/hydrophilic nature of the resins. In the preferred incarnation, the resin dissolves in water. The resin link can be emulsifised by mechanical energy transmitted, for example, by co-pumping components into a tank of standard engraving printing press ink. Emulsifiers, such as surfactants, can be added to enhance the stability of the emulsion. Typically, the emulsion will remain stable during printing by circulating the ink in print well. It is unusual to find resin that will give all the desired properties to engraved ink. Thus, the formular will select two or perhaps three resins to achieve a combination of resin, giving the necessary characteristics of the ink, which include: an adequate aversion to the substrate; good solubility in water; Combined release properties with the ability to dry and give tack-free ink films; The ability to provide the required level of brilliance; Good pigment properties; Strength Adequate resistance to the rub; and flexibility to ensure that the final printed product is not cracked. Examples of suitable macromolecular binders that are soluble in water regardless of water include: carboxymethyl cellulose, hydroxyethylcellulose, hydroxypropil cellulose, hydroxybutylethyl cellulose, poly (C1 -C4) alkylene oxides, polyethylene, polyethylene, polyethylene, polyethylene, polyethylene, alcohol, polyvinyl acetate, polyvinylpirollidone, polyvinyl-oxazolydone and polyacrilamide polymers. Preferably, macromolecular resin rosin salt binders is present in ink only those that are soluble in water at a pH value of about 7.5 to about 10 and more preferably from about 2.5 to about 6.5 pH. Suitable examples of such binders include metacrilic resin rosy salts; statin-acrylic resin rosy salts; Pink resin salts; and polystyrene-sulfonic resin rosin salt. Ammonia, organic amines such as monoethanolamine or N,N-dietanolamine, mineral acid and organic acid such as acetic acid can be added to the water in order to adjust its pH in the preferred range. Suitable examples of macromolecular binders, including acrylic or vinyl emulsion polymers made from monomers selected from a group consisting of acrylic acid esters, metacrylic acid esters, acrylic acid esters from polyhydric alcohols, methyl-methyl-methyl, styrol, Pigment, as in all colored gravure ink, is the most expensive part of the formulation. Thus, the economics of pigment selection is vital. In many areas of gravel printing, pigments need specific properties to meet the requirements of printing and eventually using printed material, such as printing polyvinyl chloride wall coverings, deeply freezing plastic bags. The normal practice is to have a preferred standard range of pigments against which alternatives can be evaluated. In addition, you should take into account the tin strength of the pigment, the ease of variance and glossy characteristics. Where it is envisaged that the pigment will be used in a concentrated base circuit, it should have good flow properties at high pigmentation. Compared to the flexographic, offset and letter press, engraving printing can, if necessary, reflect the heavy enough scales of film ink, which are regulated by the depth of engraving on the engraving of the cylinder and, therefore, the volume of ink held by the cylinder cells. The pigments suitable for the formulation of the engraving of this invention are selected from a group consisting of CI Pigment Yellows 1, 3, 4, 5, 12, 13, 14, 17, 55, 65, 73, 83, 97 and 98; CI Pigment oranges 13, 16 and 46; KI Pigment Reds 2, 3, 4, 10, 12, 48, 48:1, 48:2, 53, 57:2, 81, 104, 146, 170 and 176; CI Pigment Greens 2, 7 and 36; Pigment Blues - 1, 15:1, 15:2, 15:3, 15:6, 16, 29, 56 and 61; CI Violet Pigment 3, 23 and 37; CI Pigment Black 6 and 7; and CI Pigment White 6, 7, 18 and 26. If desired, extension cords, such as porcelain clay and deposited calcium carbonate, can be used in the engraving and ink formulations of the present Extenders help to control shine levels and improve the characteristics of positive ink formulations that have high binder/pigment ratios. Because of them, they Cost, extenders can be used to effectively reduce the cost of gravure ink. For example, extension cords can be used in publishing gravure ink to help reduce tack and control color strength. Rewetting agents are also used in present gravure ink formulations to reduce screening, which occurs when ink in a second color cell is combined with dried first-color ink. To off-set the effects of screening, over-weaponing substance is used. The re-sign agent is suitable for use in the current invention of hydroxyethyl ethylene urea. Although not wanting to be linked by the theory, it is believed that hydroxyethyl ethylene urea rewetting agent also serves as a plasticizer, providing continuity of the surface of the dry film on the substrate. Water engraved ink of this invention may additionally contain other traditional additives, the effects of which must be evaluated and compensated in the printing process if necessary. These adjuvants will include plasticizers such as sucrose acetate iso-butirate, triethylcytrate, and epoxid oil soybeans, and waxes such as plastic waxes, halogen hydrocarbon waxes, amine fatty acids, surfactants, defoamine agents, catalysts, antioxidants, antioxidants, antioxidants, antioxidants, antioxidants, antioxidants, antioxidants. Ammonia or other volatile amines can also be added in trace amounts to help in the dissolution of resin. In a particularly preferred incarnation of this invention, up to 5 wt. % of non-ion surfactants is used to reduce surface tension and stabilize the variance of pigment resin. Suitable surfactants include, for example, glycol acetylenics, etixylized glycols and Sorbitan esters. It is also well known in the art to incorporate various additives into the composition of ink to enhance performance against shine, rub resistance, uniform density of print flexibility and adhesion. In the engraving compounds of this invention water is preferably present in the amount of 25 to 60 et. % of ink; and preferably 35 to 50 wt. %. It is also preferable that macromolecular binding resins should be present in the amount of 10 to 70 bc.;; and preferably 30 to 60 wt. %; and most preferably a macromolecular resin binder is a composite having up to 5 wt. % of resin binder soluble in water, regardless of the pH of water; 10 to 70 wt. % of the binding resin soluble in water at pH in the range of 7.5 to 10; and up to 20 wt. % of the aqueous binding resin emulsion. In viscosity the press uses maximum pigmentation of organic pigments, as a rule, does not exceed 15 bc, preferably 5-10 w. % pigment. However, inorganic pigments such as titanium dioxide use pigment levels of up to 25-35 w. That's why the pigment 2 to 35 w. Finally, it is preferable that hydroxyethyl ethylene urea rewetting agent to be used in the 0.5 to 10 W%. The viscosity requirements for gravure ink are starkly different from pasty ink such as lithographic ink. The viscosity of the ink should be adjusted to meet several critical factors. Too much viscosity leads to insufficient ink flow from the cylinder cells and causes a phenomenon commonly known as screening. Too low viscosity leads to a slur-out or halo occurring on the back edge of the print, appearing as a thin film of ink printing outside the design. With this in mind, the final strength and shadow adjustments to the engraving ink should be made when the proper viscosity and speed of printing have been determined. The viscosity of the engraving of this invention will fall from 14 to 90 seconds at 25 degrees Celsius (measured by Shell Cup #2) and more preferably 16 to 50 seconds at 25 degrees Celsius. The current gravure ink can, however, be used at temperatures of up to 75 degrees Celsius in this viscosity range. The engraving ink of this invention can be printed on a wide range of substrates such as paper, film and foil, and can also be used for sheet printing hard surfaces such as a board. It should be noted, however, that absorbent substrates require a lower viscosity of ink than non-binding surfaces, in fact some substrates require the addition of inhibitory solvents in order to ensure acceptable printing. Printing at high speeds requires quick drying of gravure ink and therefore low viscosity so that the ink quickly flows out of the cells at the point of impression. Although water-based, the rate of drying on water-based gravitas is the ink of this invention surprisingly fast. It should be kept in mind, however, that the rate at which the ink gravitas will dry will depend to a large extent on the drying technique used. For example, slow-speed machines have no drying systems other than cold air blowers. High-speed web machines, on the other hand, can have a complex drying system between each device that provides high-speed hot air flow. Steam-heated drums are also used to heat the cobwebs, while cold rollers are used to cool the cobwebs on the way out. The following example further illustrates the specific aspects of the watercolor gravel ink of this invention and is not intended to limit the scope of its application in any respect and should not be interpreted in this way. Throughout this specification, all parts and percentages are shown, unless otherwise stated, by weight. EXAMPLE 1 One liquid, water-based engraver ink was prepared from the following components: Water present in the ink was supplied with water contained in acrylic resin latex, hydroxypropil pulp, urea and male rosy esther components. Amount (wt. %) ____pigment 9-10ammonia 2-3water 2-3water urea (75% solids in water) .5-2.3polyester resin 7-9acrylic resin 24-26ethylene glycol surfactant 1.2-2.3Total 100.00____ EXAMPLE 2 A single fluid, water-based red gravure printing ink was prepared from the following formulation: ____ AmountComponent (wt. %)____Pigment Red 57:2 9-10polyester resin (Trigloss RD 0110).sup.(a) 7-9acrylic resin (Johncryl 68).sup. (b) 24.5-26.0ethylene gylcol surfactant (Surfynol 1.2-2.3420).sup. (c)aqueous ammonia 2.0-3.0water 55-58hydroxyethylethylene urea (SR-511).sup. (d) 0.5-2.3Total 100.00____ .sup. (a) Trigloss is a trademark of R&A Auxiliaries. .sup. (b) Joncryl ® 68 is a trademark of S.C. Johnson Corp. . Sup. (c) Surfynol ® 420 is a trademark of Air Products Corp. . Sup. (d) SR511 is a trademark of Sartomer Corp. EXAMPLE 3 Printed sample of coated paper containing ink, formulated in example 1, was produced on the Chestnut gravure printing press at a print speed of about 1,000 feet per minute (fpm) to demonstrate the use of water-based engraving of the ink print of this invention on coated paper. The printing press was launched at a temperature of 15-20 degrees Celsius. Print samples obtained from the press run were quickly dry, clear and sharp with a stable tack. There was no noticeable toning in the area, not distinctive. Optical photo-mapping print samples showed a smoother surface than print samples printed with gravitational ink formulated without hydroxyethylene urea. These print samples were fragile and had a stiffer, as can be seen from the numerous cracks on the surface of the printed film. EXAMPLE 4 Single water-based liquid red ink for engraving, prepared in example 2, were launched in a chestnut machine using a substrate of the carrier board. The print quality was better than that of a comparative solvent-based ink system and provided a 20-25% higher shine. THE EXAMPLE 5 Single water-based liquid red ink for the engraving, prepared in example 4, was launched for the teabag print. The observed print quality was comparable to the existing solvent based on the ink system containing 7-12 wt. % OF LOS. EXAMPLE 6 Single fluid, water-based red and blue gravure printing inks were prepared from the following formulations: ____ Amount (wt. %)Component Red Blue____blue base (SunChemical 52-1339).sup.(a) -- 27.0red base (SunChemical RCD-9017).sup. (a) 27.0 --polyester (Trigloss RD0110).sup. (b) 22.78 22.78acrylic emulsion (Neocryl XA-5048).sup. (c) 45.55 45.55hydroxyethylethylene urea (SR-511).sup. (d) 0.51 0.51defoamer (Foamex 805 & 3062, @1:1).sup. (e) 0.07 glycol surfactant 2.04 2.04(Surfonyl 420).sup.(f)acrylic resin (Joncryl 67).sup.(g) 0.8 0.80water 2.05 2.05Total 100.00 100.00 SunChemical ® is a trademark of Sun Chemical Corporation .sup. (b) Trigloss is a trademark of the subsidiary businesses of the RSA. .sup.c) Neocryl ® is a trademark of ICI Industries. .sup. (d) SR511 is a trademark of sartomer Corp. . Sup. (e) Foamex 805 and 3062 are trademarks of Tego Chemie Corp. . Sup. (f) Surfynol ® 420 is a trademark of Air Products Corp. . Sup. (g) Joncryl ® 67 is a trademark of S.C. Johnson Corp. Both printed ink were launched on a chestnut mill using a board substrate. The print quality was better than that of a comparative solvent based on ink and provided a 20-25% increase in shine. EXAMPLE 7 Color corresponds to one liquid, water-based engraver ink was prepared, having the following formulation: - AmountComponent (wt. %) ____acrylic resin (Vancryl 68SN).sup.(a) 10.0syn water 13.0zinc sulphide (HDS class sahtolite) 36.5CaCO.sub.3 10.0syn thesis silica flattening agent 2.5polyethlene wax (AquaPoly 250).sup. (b) 1.0polyester varnish (Trigloss Vehicle).sup. (c) 1.2acrylic emulsion (Neocryl 3XA-5048). (d) 22.5hydroxyethylethylene urea (SR-511). (e) 1.0ethylene glycol surfactant (Surfynol 420). (f.) 1.0-blade base (PMA-900). (g) 0.4blue base (PMA-525).sup. (g.)0.3yellow base (PMA-220).sup. (g) 0.6Total 100.00.sup. (a) Vancryl ® 68SN is a trademark of Air Products Corp. . Sup. (b) AquaPoly ® 250 is a trademark of Micro Powders, Inc. sup.c) Trigloss is a trademark of the subsidiary businesses of the RSA. .sup. (d) Neocryl ® is a trademark of ICI Industries. .sup. (e) SR511 is a trademark of sartomer Corp. . Sup. (f) Surfynol ® 420 is a trademark of Air Products Corp. . Sup. (g) PMA is a trademark of Sun Chemical Corp. The ink was printed on the rough side of the SBS board (available from James River Corp.) The observed print quality was comparable to comparative solvent-based ink. The EXAMPLE 8 Screen Ink System for Wallpaper has been converted into a flexo-gravure application, the blend has been modified with urea hydroxyethyletilen. Four colors of the same liquid, water-based gravure ink were prepared with the following formulation: - Amount (wt. RED YELLOW BLUE BLACK____pigment 10.5 13.5 13.5 12.3cryl resin (Joncryl 67).sup.a. 1.2 -- -- --nonic surfactant 0.9 1.20 1.80 1.80Cacia Surfactant -- -- -- 0.60aqueous ammonia 0.42 0.84 0.84 0.42water 38.0 3 5.48 34.8 8 35.9Acrital emulsion 31.15 31.15 31.15 351 (Lucidene 351).sup.((b) Hydroxyethylethylene urea 5.75 5 .75 5.75 (SR-511).sup. (c) ethylene glycol surfactant 1.03 1.03 1.03 (Surfynol 420).sup. (d)defoamer (L-493.sup.(e) 0.20 0.20 0.20thickner (RM2020 NPR).sup. (f) 3.50 3.50 3.50 3.50 3.50silica (LO-VEL 27).sup. (g) 5.60 5.6 5.60 1.75 1.75 1.75 1.75 (Acumist 12).sup.(h)Total 12).sup.(h)Total 100.00 100.00 100.00 .sup. (a) Joncryl ® 67 is the hallmark of S.C. Johnson Corporation. . Sup. (b) Lucidene is a trademark of Mobay Industries. .sup. (c) SR511 is a trademark of Sartomer Corp. . Sup. (d) Surfynol ® 420 is a trademark of Air Products Corp. . Sup. (e) L493 is a brand name for Drew Chemical. .sup. (f) RM2020 NPR is a trademark of Rohm and Haas Corp. . Sup. (g) LOVEL ® 27 is a trademark of PPG Industries. .sup. (h) Acumist ® is a trademark of Allied Signal Corp. This invention has been detailed, including the preferred incarnation of them. It would be appreciated, however, that those with experience in the arts, in considering this disclosure, could make changes and/or improvements to the invention that fall within the scope and spirit of the invention outlined in the following claims. Claims. gravure ink formulation pdf. water based gravure ink formulation. solvent based gravure ink formulation. gravure printing ink formulation pdf. water-based gravure printing ink formulation. starting formulation for gravure printing ink