Procedures and Practices for Flexo News Inks

SAFETY RULES:

The same safe handling and practices for household cleaners apply for Aqua News® inks. Because of their alkaline pH, some eye or skin irritation can occur if proper handling procedures are not followed. Material Safety Data Sheets (MSDS) are supplied to each pressroom that list all safety precautions.

RAW INK:

Aqua News inks are supplied to the customer at a raw or virgin viscosity. There are several reasons for this:

1. Stability - High viscosity flexo inks have much better stability. In fact, virgin Aqua News inks are stable for up to 6 months when stored in tightly closed containers in a room temperature environment.
2. Economics - There is no need to ship diluted ink across the country.
3. Flexibility - Raw ink can be diluted to a desired press viscosity either with water or press wash water. Using press wash water reduces disposal problems.

PRESS-READY INK:

Aqua News inks are designed to perform optimally at a viscosity of 18-20 seconds on a Shell #2 cup. However, if press conditions warrant, deviations of ± 2 - 3 seconds on a Shell #2 cup may be desirable for optimum printing performances. It usually takes about 30 lbs. of water to bring 100 lbs. of raw ink to press viscosity. However, inks are available which will take higher dilutions of water. The "dilution ratio" of ink is expressed as 100/30 (D/R = 100/30).

DILUTING THE INK TO PRESS VISCOSITY:

Strict attention must be given when diluting an ink to press viscosity. Inks should always be agitated prior to any water addition. The ink should be allowed to circulate through the press

system before any final viscosity adjustment is made. It is advisable to adjust the ink 2 - 3 seconds (Shell #2 cup) higher than the targeted running press viscosity. Press-ready ink tends to lose 2 - 3 seconds of its viscosity under the high shear of pumps, anilox and doctor blade system. The optimum press viscosity for a particular ink may vary from site to site depending on the parameters (i.e., anilox rollers, plates, impression settings) used in the press system. It is advisable that while adjusting the ink to press viscosity, proper care should be taken not to over dilute the ink. An over diluted ink tends to lose its stability even when brought back immediately to the correct viscosity. The result is often ink separation and printability problems.

FALSE VISCOSITY (THIXOTROPY):

Left unagitated, raw and press-ready ink may build up to a false viscosity. This may result in a slight change in the dilution rate. However, it can lead to excessive amounts of water needed to dilute the ink to press viscosity. This can be a real problem when using automatic viscosity control equipment.
Because of thixotropy, it is a good practice to dilute the ink after initial agitation and continue agitating during the actual adjustment. Once the ink is mixed, this false viscosity usually disappears. For this reason, it is recommended that the ink be adjusted initially to a slightly higher viscosity (2 - 3 seconds Shell #2) than the actual running viscosity.

AUTOMATIC VISCOSITY CONTROL:

A good automatic viscosity control system should effectively monitor the ink's press viscosity. However, if not properly checked through a routine maintenance schedule, problems can develop. It is always advisable to periodically check the ink's press viscosity manually with a Shell #2 cup.

PRESS-READY INK STORAGE:

Press-ready ink tends to have less long-term stability than virgin ink. However, in order to prolong the shelf life of the ink, the following precautions should be taken:

1. The ink should never be over diluted. Obviously, the higher the viscosity of the press-ready ink, the better its stability.
2. The ink should not be contaminated with paper fibers or other foreign material. These contaminants can be removed by proper installation of filtering equipment before returning to the storage tank. Other contaminants such as cleaning additives, waste ink, etc., should not be introduced.
3. Storage of press-ready ink in the ink management system should be under "timed" agitation, never allowing the ink to remain in the unmixed state for prolonged periods. For example, it is common that most pressrooms have agitation in their press-ready tanks set between 5 - 15 minute intervals every hour. Ink not contained in the ink handling system should be stored in sealed containers at room temperature.
4. All press-ready ink should be monitored for microbiological activity and corrective procedures should be implemented immediately before problems occur. All press-ready inks should be monitored monthly with a bacteria indicator. If the indicator exceeds 10^5 bacteria, 10^3 mold, contact US Ink regarding its Preventative Bacteria Control Program. These handling practices will aid in prolonging the shelf life of press-ready ink. However, inventory of press-ready ink should always be kept to a minimum. Also before diluting more ink, current supplies of press viscosity ink should be checked and used first.

INK CONTAMINATION:

The chemistry of flexo ink is much more complex than that of letterpress ink. As a result, flexo ink is more sensitive to any type of contamination. Therefore, proper housekeeping practices must be strictly adhered to in the pressroom to insure that the ink is free of contamination. Flexo ink can be made totally unusable by contaminants such as oil, paper dust and fiber, cleaning agents, etc.

Press-ready ink should be continuously filtered through proper mesh strainers to insure removal of paper fibers that are inevitably picked up by the printing plates.

WASH WATER USE:

Using wash water to cut virgin ink to press viscosity is a common practice. However, due to the sensitivity of flexo ink, special precautions should be considered to insure that the wash water is free from contaminants, otherwise ink spoilage and printability problems can result:

1. Wash water should be filtered before pumping it into the storage tank.
2. Wash water should be used up as soon as possible. If prolonged storage cannot be avoided, a biocide recommended by the ink supplier should be added to it. Maintaining the proper level of biocide is very important.
3. The wash water tank should be checked periodically for any sludge sedimentation, surface residue or odor. When in doubt, if any of these conditions exist and are affecting the wash water, biocide should be added and the ink supplier should be contacted.
4. All wash water tanks should have proper agitation to prevent any sedimentation from occurring.

MICROBIOLOGICAL CONTAMINATION:

All water-based inks are subject to bacteria and/or mold contamination. However, when a proper plant hygiene program is established, the probability of microbial contamination is greatly reduced.

Plant hygiene means a comprehensive program of adequate biocide introduction in combination with a routine schedule involving sanitization of equipment. Biocide alone will not guarantee protection if improper plant hygiene is followed.

Microbial contamination can be accelerated by the following:

1. Elevated temperatures.
2. Use of contaminated wash water.
3. Improper storage of ink (i.e., ink in uncovered containers, unfiltered ink).
4. Inadequate mixing or circulation of ink.
5. Flat bottom tanks.

FOAMING AND ANTIFOAM:

All water-based inks will foam if they do not contain special additives called antifoams or defoamers. These terms are often used interchangeably.

Antifoams are very specific to a formulation with regard to efficiency. One which works very well is on formulation may prove totally ineffective in another. This is why a recommendation from the ink supplier is essential when using them in the pressroom.

Most antifoams are insoluble in water since they would not be as effective if they were soluble. Because of this insolubility, only small amounts of antifoam are incorporated into the ink. Usually 0.1% - 1.0% is the optimum range.

Antifoams must be thoroughly mixed or agitated into the ink by a high speed mixer. Otherwise, separation may occur. If antifoam has to be added to the ink in the pressroom, the following procedures are recommended:

1. Estimate the total volume of ink that has to be adjusted.
2. Calculate the volume of antifoam needed to obtain the desired concentration in the ink. It will usually be 0.1% - 1.0%.
3. Dilute the antifoam with some water and mix thoroughly.
4. Take 2 - 3 gallons of ink to be adjusted in a separate bucket and add the diluted antifoam mixture slowly while mixing thoroughly.
5. Before adding this mixture to the rest of the ink, make sure that everything is blended thoroughly. Also, observe if there is any separation or increased viscosity in the small batch of ink before adding the rest of the ink. If such conditions occur, this may be incompatibility and the ink supplier should be notified.

REMEMBER:

1. Excessive amounts of antifoam can be extremely detrimental to an ink formulation. Separation and a variety of printability and runability problems can result.
2. An oily sheen or film on the ink surface is not a problem. However, any build-up or an oily residue or agglomeration on the ink surface should be removed and the ink supplier should be notified.
3. A small amount of foam on the ink surface is not a problem unless it starts accumulating to significant levels in the container. Large to medium size bubbles which break on the surface are not a problem. However, microscopic bubbles which appear stable and have the appearance of "shaving cream" are a problem. This is known as "microfoam" and can be a real problem.
4. High shear (violent pumping or using the same ink over and over again) can eventually destroy the efficiency of the antifoam. In this case it will have to be replenished.

[The information provided here is general in nature and you may need to change the methods or practices discussed here to fit your particular circumstances. The information is US Ink's only based on its past experience, and it shall not be responsible for any results obtained from using this material without consulting a qualified technician experienced in the particular subject and with the particular printing conditions to be applied.]

Do's and Don'ts

ALWAYS:

1. Before taking the viscosity, agitate or mix the ink thoroughly.
2. Cover the ink containers since water-based inks tend to dry quickly causing flaking and build-up of dried ink.
3. Dilute the raw ink to a viscosity 2 - 3 seconds higher than the actual press viscosity. Water-based ink viscosity usually drops slightly upon shearing and/or pumping.
4. Check the viscosity of press-ready ink after circulating through the ink fountain for approximately 30 minutes.
5. Check and clean (if needed) filters regularly.
6. Watch doctoring of the anilox, impression settings and doctor blade pressure very carefully. Improper settings will lead to a host of problems (i.e. second impression set-off, pipe roller build-up, halftones fill-in, etc.)
7. Keep the anilox cylinder rotating and constantly rewetted by ink during press stops. This will prevent any ink from drying in the cells of the anilox.
8. Keep water-based inks free of contamination especially oil, cleaning solutions, grit or any material with a high level of bacteria.

9. Maintain viscosity of press-ready ink at the recommended level by adding ink and/or water while mixing. When running from a stutz position it is advisable to premix the ink to the desired viscosity before adding to the stutz.

10. Develop a proper hygiene program for the prevention of microbial activity in the ink management system before printing problems develop.

NEVER:

1. Leave water-based ink in an open container.

2. Add anything to ink before consulting with the supplier.

3. Overcut the ink while bringing it to press viscosity. Water-based ink is easily shocked. Adding more virgin ink will not fix an overcut ink.

4. Add any defoamer unless absolutely necessary. Adding excessive amounts of defoamer can lead to printing problems.

5. Blend inks from different suppliers in the storage tank before compatibility tests are done.

6. Take or adjust viscosity if the ink is very foamy.

7. Contaminate water-based ink with oil, paper, dust, paper fiber or wash water that has developed an offensive odor. These materials at high levels will cause printing problems to develop.

8. Panic if surface foam develops. Instead observe it carefully: if the foam grows or becomes "micro foam" a small addition of defoamer may be necessary.

9. Add defoamer directly to the ink or press. Instead add the defoamer to a kit of ink press side stirring vigorously before adding to the ink on press.

10. Refill the press-ready ink tank during the production run. This can lead to increased filter maintenance.

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