



Water-based Coatings Guideline Handling

FlintGroup

Water-based Emulsion Coatings

- ❑ **Modern day printing presses are generally equipped with coating units and drying aids. The two drying aids found are:**
 - Hot Air Knives – (Industrial sized hair driers).
 - Infer Red Lamps (I.R. Lamps)

- ❑ **A common mistake made is to use the wrong drying aid to dry the water-based emulsions. Water-based emulsions dry by absorption and evaporation. For the emulsions to evaporate they have to be exposed to warm circulating air. This is generated by the hot air knives.**

- ❑ **If the emulsion coatings are over exposed to IR Lamps (too much heat) stack temperatures increase. If this occurs coatings struggle to dry as they begin to sweat. Set off or crazing can also occur.**

Water-based Emulsion Coatings

- ❑ **The optimum press settings for emulsion coatings are:**
 - **1st Side:** 10 – 30% IR lamps (dependent on ink coverage) and 60 – 80% hot air knives (try to achieve a stack temperature of max 34°C).
 - **2nd Side:** Reduce IR Lamps to between 5 and 20% (again this is dependent on ink film weights). Hot air lamps to be set at 70 – 90%. By reducing the IR lamps the stack temperature should drop to around 30°C.

- ❑ **Many new machines have both automatic and manual drying settings. With automatic settings you program / pre set the machine to achieve a stack temperature. This can prove to be suitable however commonly the machine uses more IR Lamp power and less hot air resulting in a slower setting film of coating.**

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- ❑ **If the machine is set to manual the user can take full control of these aids and will be able to process work at faster speed. If there is little or no ink coverage why use IR Lamps?**
- ❑ **The overall purpose of a water-based coating is to provide protection to the underlying wet ink. As long as the film weight of coating is suitable and the coating is dry the inks will be protected. Therefore hot air is the most important drying aid.**

WB Storage and Usage Recommendations

- ❑ **In order to preserve our range of water-based coatings and to get the best out of them, to help ensure they are at optimum conditions ready for press use the following guidelines on storage and transport should be followed where possible:**

- ❑ **Storage**
 - Protect against frost – avoid conditions below 5°C and store on pallet racking away from cold floors.
 - Store in original packaging between 5-30°C ideally
 - Higher temperature storage can cause premature evaporation of water content leading to an increase in viscosity.
 - If possible store coatings for minimum of 24hours at pressroom conditions to “acclimatize” the coatings to press temperatures.
 - Shelf life for the majority of coatings is 12 months from date of manufacture – however, please check technical datasheet for each product for confirmation as this can vary depending on the product in exceptional cases.

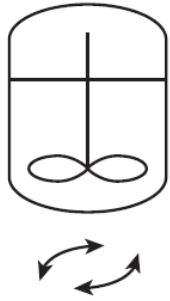
WB Storage and Usage Recommendations

❑ Frozen coatings

- Storage below 5°C can result in the freezing of some or all of a water-based coating in its drum.
- Should this happen it is important to move the affected drums to a warmer area and they should be allowed to slowly thaw out over time – DO NOT FORCE HEAT – as this can cause over-evaporation of the water content and change the viscosity profile of the coatings. It is highly important to stir the coating well after it has thawed to ensure all constituents are evenly distributed as some materials are more affected by frost than others. Always test the first few sheets when running a previous frozen coating, to ensure they meet their typical standards required.

WB Storage and Usage Recommendations

❑ Viscosity changes



- When water-based coatings are stored for several months without being used, they can occasionally appear to thicken within the drum. This is exacerbated by storing in extreme warm or cold temperatures, but can also occur rarely during ideal storage conditions. If this appears the case – ensure the coating has been stirred well and not contaminated with anything and check viscosity.
- If it still measures high in viscosity, then it is possible to dilute with water (1-3% recommended depending on reading) – adding 1% water will reduce the viscosity by approx. 5 seconds in viscosity (Din4@25C), for the majority of coatings with a standard viscosity of 30-60 seconds. This will in no way affect the properties of the coating as long as clean equipment is used to mix the water and the water is a natural source without pressroom chemical contaminants in.

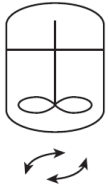
WB Storage and Usage Recommendations

❑ Transport

- In terms of transport then the same rules apply as for typical pressroom storage – avoid excesses of heat and cold. For winter months in certain countries it may be required to select shipping with special heated vehicles to guard against cold. For exceptionally warm countries then air conditioned transport may be a consideration, however, both add to the costs of typical shipping. Therefore it is highly important to follow these storage and recommendation guidelines should the coatings be exposed to extremes beyond our recommendations.

WB Storage and Usage Recommendations

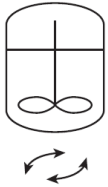
❑ Recommendations for Use



- **STIR WELL BEFORE USE** – always stir coatings before use to ensure consistency throughout the drum. Many pipeline coating systems recirculate the coating during use which helps with the continual mixing theory. Some companies offer mechanical automatic stirring devices are used, however, a simply drill with plaster mixing attachment is more than adequate to quickly and efficiently stir most coatings into a homogenous solution. If not available then even shaking before use is better than nothing.
- Once opened use the coating as soon as possible. If for any reason a drum is part used then replace lids tightly avoiding contamination of other pressroom chemicals and to protect against evaporation.
- Check Coating pipelines and Anilox are cleaned regularly and when starting afresh ensure no contaminants are in the coating system that could affect printing conditions.
- Inks should ideally be wax-free and alkaline resistant for best results. Test ink suitability prior to production runs and that inks are suitable for use with water-based coatings.

WB Storage and Usage Recommendations

❑ Recommendations for Use (2)



- Maintain stack temperature between 27-34°C for best results to avoid re-wetting the coating and or insufficient drying of the sheets.
- Ensure return pipes are positioned correctly to avoid unnecessary aeration of the coating prior to use. Down the side of the barrel and slightly beneath the coating surface is ideal – also check no holes are evident in the pipeline.
- As a measure of best practice and if possible avoid coating glue folds as a greater bond can usually be achieved over unprinted paper/board.
- For Gluing/Foiling/Laminating/UV Varnishing best results are a combination of many factors so always test initial acceptance for any given job and allow the prints to completely dry before conducting these – minimum 24hours later.
- Avoid polluting the coating with washing fluids or other coatings. Flush coating system with water and cleaning agents when changing from one coating to another.

WB Storage and Usage Recommendations

❑ Recommended Anilox Roller Sizes

- The recommended Anilox cell size determines the amount of coating being transferred to the printed sheet and can have a significant influence on the results in terms of drying, rub and scuff resistance, slipperiness, gloss and overall protection to the design, therefore the correct choice of Anilox is an important factor to consider when applying water-based coating.
- Many presses already have their own standard Anilox size fitted which may not be as we suggest below, however, these are meant for guidelines and to be used as best practice to get best results, and it is important that the customer/printer understands this is not a strict recommendation and other sizes can still work well.

WB Storage and Usage Recommendations

❑ Recommended Anilox Roller Sizes

Product type	Hexagonal Anilox Cell volume	Tri-helical Cell Volume
High Gloss Coatings	15-20cm ³ /m ²	13-18cm ³ /m ²
Gloss/Matt WB coatings including non porous boards	9-15cm ³ /m ²	11-13cm ³ /m ²
Blister pack/Barrier/Calendar coatings	13-22cm ³ /m ²	11-20cm ³ /m ²
Inline/Offline primers and anti slip coatings	13-16cm ³ /m ²	11-14cm ³ /m ²
Drip Off coatings	9-11cm ³ /m ²	8-10cm ³ /m ²
Pearlescents	13-20cm ³ /m ²	11-18cm ³ /m ²

Coating Unit Cleaning Procedure

- ❑ **This procedure applies to both standard roller coat systems along with Anilox coaters.**
- ❑ **Drain all remaining coating from coating pan / Anilox chamber and all pipe work.**
 - For a coating change over, pump clean water through the unit for approximately 5 minutes.
 - If a deep clean is required the use either a 50:50 mix of water and C713 or pure C713. Pump around the system for a period of at 20 minutes.
- ❑ **Wash and wipe clean with a lint free cloth both the blanket and steel roller.**
 - If you have either or both an Anilox roller and doctor blade ensure these are also clean. Regular cleaning and maintenance of the Anilox is key for a consist result. On a weekly program we recommend cleaning the Anilox with the C700 jelly. This is to be applied and left for a minimum 30 minutes. It will help to soften any dried coating from the cells and ensure more accurate application. After time remove the gel using either water or emulsion cleaner. For severely filled Anilox rollers we recommend the removal and cleaning via an ultrasonic system.

Coating Unit Cleaning Procedure

- Ensure the washing water / mix is fully drained from the coating system.
- Once clear begin to pump the water-based emulsion through the pipe work but ensure the return feed is still within a waste container.
- Monitor the material and once you are confident the return material is coating and not waste water return the feed to the coating container.

Please be advised that small amounts of water or wash can dramatically reduce the viscosity of the coating and can result in application issues. It is therefore important that no waste water enters the coating barrel.

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Rely on us.

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