

WEILBURGER Graphics GmbH

„ Data sheet regarding the general processing of dispersions varnishes“

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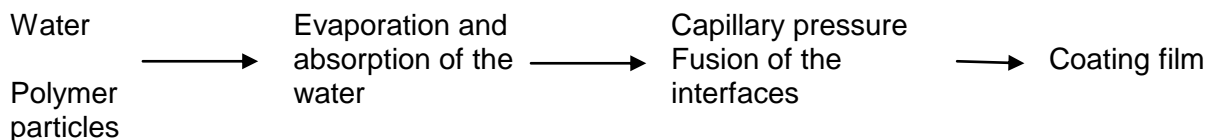
Information and tips about the subject:

SENOLITH® DISPERSION COATINGS of WEILBURGER Graphics GmbH

Structure of SENOLITH® DISPERSION COATINGS

Polymer dispersion	Water soluble resins	Water	Additives
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Film formation



Dispersion coatings are based on various polymer dispersions. These are modified acrylates that can be called "hard" or "soft" depending on their molecular structure. Dispersions are coarsely dispersed particles which give milky or cloudy appearance. In addition special resins are used which are made water-soluble by the action of ammonia. Generally, only water is used as a solvent. Additives are various ingredients which influence the different characteristics such as surface tension, wetting, slip, rub resistance, film formation etc.

In contrast to the classical oil-based Litho varnish which dries by oxidation, a dispersion coating dries by means of absorption and/or evaporation of the water. In this way, dispersion particles are drawn very tightly together resulting in a high capillary pressure which causes the interfaces to fuse and starts film formation.

Application of SENOLITH® DISPERSION COATINGS

SENOLITH® DISPERSION COATINGS can be applied with the following application units:

1. Coating units of offset presses, conventional roller units or chambered doctor blade systems
2. Damping units of offset presses
3. Offline coating machines
4. Flexographic presses
5. Gravure presses
6. Ink duct units of offset presses
7. Coating units of web offset presses



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Drying of SENOLITH® DISPERSION COATINGS

In order to achieve good drying and an even flow it is recommended that the machine be equipped with a long drying line. This makes it possible to work with high gloss systems and run high speed processing. Suitable drying facilities should also be available. Hot air dryers have proved to be excellent. The use of medium wave IR radiating systems is recommended to speed up drying of the underlying printing inks.

There are also cooling systems on the market, to cool down the printed and coated sheets to room temperature.

Generally the stacking temperature should not exceed 35°C to prevent printing ink set-off and blocking in the pile. If the stacking temperature is too high, the printing ink loses on viscosity and penetrates the coating layer.

Good drying also includes a suitable exhauster in the delivery area. If such a device is not available or doesn't function right, there is the risk of a so-called "washhouse" effect in the delivery area. This means that after the machine has been running for some time, the air blown in by the dryer is full of moisture. This humid air then precipitates onto the print sheets and leads to drying problems and blocking of the stacks.

Note:

The amount of air blown into the machine by the dryer has to be aspirated as a minimum. It is also possible to process dispersion coatings with older machines that do not have suitable dryers. However, if that is the case, gloss and machine speed are limited.

Drying of dispersion coatings is physical, meaning through absorption into the printing substrate or through evaporation. The surface of the coating should be rub-proof approx. 10 seconds after the sheets are removed. The complete build-up reaches its final properties regarding adhesion and scratch resistance only after the underlying printing ink is thoroughly dried. This is dependent on substrate.



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Requirement profiles for SENOLITH® DISPERSION COATINGS

Liquid coating	Processing	Dry coating film
<ul style="list-style-type: none">• High solid matter• Suitable processing viscosity (adjusted to the coating application aggregate)• Stable viscosity• As frost resistant as possible• Film formation even at low temperatures• Need not be labelled• Biodegradable• Correct surface tension• Free of organic solvents• Odour free	<ul style="list-style-type: none">• No set-off in the pile• No blocking• No surface drying in the coating unit• Little foam formation• Good wetting of the substrate• Can be pumped• No use of powder if possible• Low consumption• Odour free• Easily cleaned	<ul style="list-style-type: none">• Gloss• Rub resistance• Blocking resistance (wet and dry)• Elasticity (Grooving and creasing ability)• Resistance to heat sealing• Odour free• Can be glued• Does not yellow• Slip• Clear films• Can be foil blocked• High film adhesion• Recyclable

Based on the strongly varying requirement profiles shown above, a wide spectrum of coatings is offered. The required parameters should be collected ahead of time, to make selection of the right coating easier and unproblematic.

Working with SENOLITH® DISPERSION COATINGS

1) Viscosity

The coating has to be stirred well before the viscosity is measured with a DIN 4mm flow cup. The viscosity is indicated on the respective Safety Data Sheet of the product and was measured at a coating temperature of 20°C. The viscosity will change if the temperature varies greatly from 20°C. Therefore it is recommended that the coating drums are stored at room temperature or otherwise they should be transferred to the printing machine in time to warm up to room temperature. To measure the viscosity, the measuring cup is immersed completely into the coating, taken out again and then the time is clocked until the coating stream breaks at the spout of the measuring cup. In case measurement is done during printing, it has to be ensured that no foam gets into the measuring cup, as this distorts the result.

The dilution of dispersion coatings with water should only be made in exceptional cases and merely with a maximum of 2 % water.



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2) Starting the coating pump

After taking the measurement just described, the coating is pumped into the coating unit. Care should be taken that no waste water or leftovers of other varnishes (i.e. UV lacquers) are left in the coating circulation. Coating rollers and sheet separators or chambered doctor blades have to be adjusted correctly, to prevent coating from running out or overflowing. However, if it should happen, the supply of coating must be stopped immediately, the dirty parts must be cleaned and the cause has to be eliminated.

3) Cleaning the coating unit and the anilox roller

Dispersion coatings can be cleaned with water, preferably with warm water. Some alcohol can be put into the water.

If the accumulation of the dirt is persistent, a suitable cleaning solvent can be used or the coating can be removed mechanically.

For cleaning anilox rollers we offer our **SENOLITH® CLEANING AGENT FOR DISPERSION COATINGS 372051**. The anilox roller should be cleaned by hand once a week, after the shift is finished.

4) Coating application by means of a rubber blanket

If the coating is to be applied to the entire surface it is best to use a compressible rubber blanket. Calibrated offset sheets are to be used as backing. A second rubber blanket or a soft backing cloth can be put underneath printing machines with sufficient tail edge. The backing has to be slightly smaller than the printing material both in width and length, otherwise the coating builds up and dries on the impression cylinder.

5) Coating application by means of photo polymer plates

If coating is to be applied partially using photo polymer plates (BASF, DuPont), it is absolutely necessary that a soft backing is used. Special backings are offered on the market. If the recess in the form cylinder is deep enough, a rubber cloth can be used also. For further information see point 6.

Note:

Cleaning agents that do not contain mineral oil must be used for these plates, otherwise the surface of the plate corrodes.
We recommend **SENOLITH® CLEANING AGENT 373008**.

6) Print feed adjustment in the coating unit

All necessary printing adjustments in the coating unit have to be kept to a minimum, otherwise crushed edges and build up of ink on the rubber cloth or the coating plate can occur. When using the above mentioned photo polymer plates a kissprint should be done after the plate is clamped down to determine an optimal print adjustment between print cylinder and form cylinder as well as between application roller and form cylinder.



7) Problems during coating application

a) Wetting problems

Wetting problems are disturbances of the coating acceptance characteristics of a printing material or a printing ink. The coating does not create a coherent film. It actually looks like water that rolls off a silicon layer. The disturbances appear with cast-coated materials and foils. They also appear after offline coating on printed material, mostly on the printing ink, if the printing materials were stored for longer periods of time before usage. The addition of **SENOLITH® WB WETTING AGENT 372014**, 0.5 % to 3 %, corrects this problem. An overdose can lead to foam formation and an increase in viscosity. Wax-free or wax- reduced printing inks should be used when coating offline.

b) Wrinkling

Wrinkling occurs when the coating film cracks. It looks like an old oil painting. The cracks are first visible on areas with a thick coat of ink. Mostly, wrinkling only occurs when the sheets are taken out, because then the drying happens shock-like. It is not evident anymore when they are stacked, because then the sheet dries of slowly. In order to check this, five sheets are taken out of the machine, laid one on top of each other for 1 - 2 minutes and then they are uncovered. If the sheets still wrinkle, drying (IR, HL) should be reduced. The next step would be the addition of **SENOLITH® RETARDER 373009** (0.5 % - 2 %). However, retarder can only be added in accordance with the drying facilities available in the machine. An overdose can cause blocking in the pile.

c) Ink build up on the rubber cloth

The printing adjustments and the backing on the form cylinder have to be checked. As already mentioned above the pressure during operation should be as low as possible and the form cylinder application as soft as possible. Also the water distribution in the preceding printing units as well as the choice of the exact colour sequence is important. If possible, the surfaces should not be printed in the printing unit in front of the coating application unit. Often it is sufficient, to work with a little bit more coating, which counteracts the ink build up.

d) Foaming

Foaming is only a problem in roller units, if it is visible in the roller nip or in the coating tray. Piling and transfer disturbances can occur. With chambered doctor blades foaming is first visible on the edge of the roller, the coating starts to pile and transfer disturbances happen. In both cases anti-foaming agent can be added. The recommended adding quantity should be observed. In general, slight foaming on the coating surface in the drum itself isn't a problem. Attention should be paid, that the return flow of the coating doesn't hang in the coating drum, because unnecessary air can get into the coating. The speed of the coating pump should be set only so high, that it sufficiently fills and empties the coating unit with coating.



e) Drying problems

If the coating dries too slowly, although the temperature and viscosity parameters are ok and the drying unit in the machine and extraction is also satisfactory, it is possible to accelerate drying by adding a water- ethanol/isopropanol mixture. The mixing ratio should be 1:1. The amount to be added should be between 0.5 % - 3 %. If overdosed the coating starts to crinkle and the viscosity goes down.

f) Problems with rub resistance and slip

If problems occur with the above mentioned parameters, in most cases, the drum has not been stirred. The contained wax additives, which are responsible for rub resistance and slip, are not completely mixed in anymore. This can be recognized on the dried coating surface, which has no slip and feels cold and damp. Stirring the coating manually before using it should be enough. The coating is kept in motion by the circulation of the coating pump during processing.

g) Colour changes after coating

Since dispersion coatings are alkaline adjusted, the pH value is approx. 8, solvent and alkaline resistant printing inks according to ISO 2836 should be used. This should be especially observed with original or mixed inks.

Note:

If additives have to be added constantly in order to work reasonably, please contact us. We will adjust the formulation accordingly.

Under no circumstances work according to the motto: The more, the better !!!

8) Double-sided coating

It is absolutely vital that a suitable coating system is used for double-sided coating. It should have very high wet blocking resistance, otherwise blocking of the print sheets could occur after the reverse side has been printed. The coating should be applied as thinly and as evenly as possible (when using chambered doctor blade approx. 9 ccm dip volume). Sufficient drying time between printing the front and reverse side is advantageous, but not absolutely necessary. Another important point is powder spraying. Sufficient powder must be applied, especially when printing the reverse side. Too little powder is very often the reason for blocking. Not every kind of powder is suitable for double-sided printing and coating. Furthermore the stack temperature during and after printing has to be observed. It should be as low as possible, approx. 35°C. Preferably hot air should be used for drying, as IR radiation heats up the stack too much. Ventilating the stacks after the printing process is always advantageous.



9) Matt coatings

When using matt coatings consideration must be given to the fact that matt coated products are considerably more sensitive to scratching and rubbing than gloss coated products. This can cause problems in subsequent processing procedures! Also the degree of matt should be determined before coating, as it is possible to have different gradations of matt. Due to the formulation of matt coatings a so-called “small tree structure” can appear, especially with roller units. This problem can be corrected with the addition of gloss coating, considering the degree of matt that is desired. However this is not the case with chambered doctor blade systems. The dip volume should stay at approx. 9ccm.

10) Dispersion calender coatings

Dispersion calender coatings are used in the high quality finishing sector (cosmetics, pharmaceuticals). These coatings can be processed on offset printing presses with integrated coating unit, on gravure presses as well as on separate coating machines. After coating the printed sheet is hot-calendered after an appropriate drying period. In-line calendering, i.e. coating and calendering in one process is possible, if the coating is applied using a coating machine.

There are two different types of calender: **Roto Calender + Band Calender**

Different coating systems are required for each! In order to achieve a good calendering result, the application quantity of the coating has to be as high as possible! This has to be especially considered when processing on an offset press, as with gravure printing or on a coating machine more coating is applied anyway. The amount of powder has to be kept as low as possible, as it has a negative effect on the gloss. Moreover, enquiries should be made through the ink supplier to ensure that the inks can be calendered. All printed areas on print sheets have to be over-coated in order to avoid problems during calendering. Calender temperatures have to be selected according to the calender process (Roto /Band Calender) and material. Our technical data sheets contain appropriate information. The higher the temperature and the longer the dwell time on the calender, the better the gloss result.

The temperature however has to be adjusted in such a way that the sheet can easily be released from the calender. When processing in-line (coating machine-calender) care must be taken that the coating isn't over-dried in the drying channel. This prevents adhesion of the sheet to the calender. If the coating has not been dried sufficiently, it is difficult to release the sheet from the calender. If possible the drying section following the application aggregate should be switched off in order to achieve a clean flow.

Important:

Stir the coating thoroughly before use!

