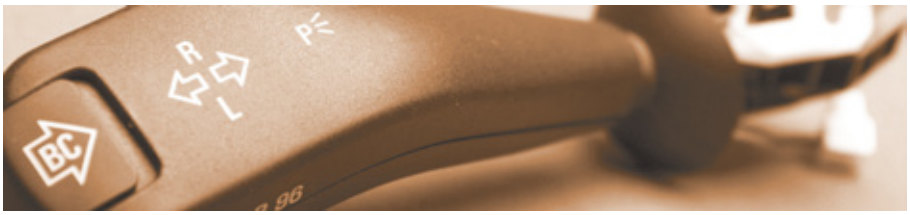
printcolor
high performance inks

TECHNICAL DATA SHEET

PRODUCT GROUP 700

Series 700-xxx

Universally useable additives for modification of Pad Printing Inks



All pad printing ink systems, be it 1-component or 2-component are already set from the beginning in such quality which only requires an individual on-site setting with thinner or eventually retarder. Hardener systems for chemically/physically bonding inks must be added according to specifications listed in the specific Technical Data Sheets. These ink settings are - under normal printing conditions - ideally to process and the desired printing result is easily achieved. Further addition of additives/auxiliaries is not necessary and in most cases also not useful. Because: the whole spectrum of offered additives (except hardener) is already formulated and contained in the ink formulation and a higher dosage is not necessary for common applications (and in unfortunate cases often also not helpful). Also here, the saying applies: much does not help much! So why does Printcolor offer a whole range of additives and auxiliary agents? Sometimes unfavorable issues are encountered, caused by printing parameters, environmental influences and/or material properties and then it is helpful to solve occurring application problems by means of an ink modification. Printcolor offers the user a clear and technically complete range of additives to solve these problems.

Measuring of additives should not be "guessed", but must be realized by means of a balance or a scaled vessel. Overdosing often leads to undesired and sometimes not reversible problems; overdosing of leveling agents can even lead to a "turnaround" of the expected reaction). Thinner and retarder must ideally be worked into by stirring. In any case and especially at an addition ratio of more than 10% by weight, dosing should be realized step-by-step since otherwise the risk of undesired reciprocal reactions like gelling / flocculation could occur.

Thinner, Series 700-017
This special thinner has been designed for universal use in all of Printcolor's pad printing inks; it has specifically been composed for the printing conditions of pad printing! Especially the various conditions of closed and open cliché systems have been considered. With an addition ratio of between 10 and 20% by weight, one can reach in both cases such viscosities which are ideally meeting the desired conditions in respect to rheology and drying. Fast drying times in connection with multi-colored-machines or wet-in-wet printing as well as longer workability of the printing motives are guaranteed – even with longer process times. Furthermore, this solvent composition is characterized by a gentle and pad protective composition which allows a longer lifetime of the printing pad / tampon.

Retarder, Series 700-018
If a slower drying behavior of the pad printing inks is desired, evaporation time of the whole system can be slowed down by adding this retarder. Thus, longer workability of the printing motives, but also less drying on the pad and on the substrate is the result. For this reason, the max. addition ratio of 10% by weight should under normal conditions not be exceeded. In such cases, a combined use of thinners and retarders is the best way to an optimal setting of the ink systems. The evaporation rate of these solvents is chosen in such way, that also without additional blow-drying / hot air ventilation at the, a proper ink taking and ink tranfering) by the pad is realized. Also here, the solvent composition is chosen in such way, that protection of the pad leads to an optimal exploitation of its maximum lifetime.

Accelerator, Series 700-019
Especially for fast drying on the substrate as well as for applications in the ongoing process, this solvent mixture has been developed. The experience shows that the accelerator Series 700-019 is exceptionally suitable for application in the closed pad printing process. Similar to the thinner Series 700-017 this solvent mixture should be added at a ratio of 10-20% by weight. Also mixtures with thinner/retarder are often useful and practicable.

High Speed Thinner, Series 700-020
For some applications a proportion of the solvent "Xylol" is indispensable for fast printing and accelerated drying behavior. Since all offered ink systems are free of this component, it is in some specific cases useful to adjust the ink setting with this universally useable solvent mixture. By adding this additive (addition ratio of approx. 15% by weight), a fast initial drying of

the transferred ink layer on the surface and at the same time good openness in the cliché is guaranteed. By the combination of Xylol with other real solvers, this thinner is characterized by an adhesive effect.

High speed Thinner, Series 700-041
For some applications a proportion of the solvent "BuAc" is indispensable for fast printing and accelerated drying behavior. Since all offered ink systems are free of this component, it is in some specific cases useful to adjust the ink setting with this universally useable solvent mixture. By adding this additive (addition ratio of approx. 15% by weight), a fast initial drying of the transferred ink layer on the surface and at the same time good openness in the cliché is guaranteed. By the combination of "BuAc" with other real solvers, this thinner is characterized by an adhesive effect.

Special Thinner, Series 10-0330
This specific solvent composition represents a solvent, specifically matching applications on polystyrene, ABS, SAN. The evaporation characteristics and addition ratios (approx. 10-15% by weight) equal to those of a solvent. By using this solvent, adhesion on polystyrene and its modifications is significantly improved.

Hardeners must always be used with special care and attention. Big divergences in the ratio ink : hardener can lead to problems which often only occur at a later stage during a long term end-application. These could be reduced resistance, brittleness and loss of adhesion. A rest-period of approx. 15 minutes should be considered after mixing in of hardeners and following dilution (this mixing sequence is very important) so that optimal wetting (of the substrate) and expected leveling can result. High humidity and warmth lead to reduction of pot time of mixed systems. They can also lead to a "self-bonding" reaction of the hardener component, so that cans containing hardener shall only be opened quickly for withdrawal of hardener and must afterward immediately be closed. Addition ratios of hardeners are specifically to the relative ink series and more details can be viewed from Printcolor's Technical Data Sheets.

Hardener, Series 700-HDA
This reactive hardener system is characterized by it yellowing-free properties and is suitable for long-term outdoor use. It convinces by its inks- and gloss finish as well as its resistance against embrittlement. Compared to the HDI-variation, this product is slightly less resistant and it takes more time or temperature for implementation with the relevant ink system. Advantageous are the higher flexibility and elongation as well as the in many cases longer pot time. Process temperatures for this ink-hardener-mixture are at least 20°C, ideally higher. Best partners for outdoor use to this hardener system are the pad printing ink systems Series 752, Series 784, Series 792 and Series 711.

Hardener, Series 700-HDI
This highly reactive bonder component is characterized by its high resistance against chemical and mechanical influences. It has been developed for technical/industrial applications for indoor use and results in hard and extremely durable ink layers Due to its chemical composition it tends under unfavorable conditions and during long-term outdoor use to yellowing. Its high reactivity allows a fast curing of the ink systems and therewith rapid further processing. Also here, processing temperature are at least 20°C, ideally higher. Its active potential quickly reacts with humidity so that residues at the side wall of the can are usefully to be removed before re-sealing and already opened cans must always be stored with closed lid. Ideal bonding partners to this hardener system are the pad printing inks of Series 750, Series 752, Series 784 and also the settings of Series 711 and Series 712.

Hardener, Series 700-HDS
This highly reactive hardener based on aliphatic components ideally combines the characteristics of the above hardener systems. It is totally outdoor resistant, yellowing-free and results in highly resistant ink films. The solvent-free hardener shows – in combination with relevant ink systems – a fast bonding and high gloss. Flexibility is very good and sensitivity against humidity is similar as with hardener of Series 700-HDA. Important to this hardener is a minimum bonding temperature of >23°C, however if possible higher. This hardener, Series 700-HDS, represents the most modern and effective bonder component based on Isocyanate. Because of its solvent-free composition, it is especially user-friendly. Almost all ink systems can be further bonded with this reactive agent and thus increase its end resistance.

Hardener, Series 700-HDF
This highly reactive hardener system persuades by its yellowing-free properties and is predicted for long-term outdoor use. It convinces by its color and gloss persistence as well as by its embrittlement resistance.

Its higher flexibility and elasticity is advantageous against all other systems. Due to its high reactivity, pot time must be considered in some individual cases.

Bonder, Series 700-GL
This special system has specifically been designed for epoxy-cross linkings (i.e. Series 750) and allows an extremely resistant and adhesive bonding onto glass materials or hard to be printed metal surfaces, i.e. chrome or brass. The high reactivity requires lowest addition of approx. 5% by weight (max. 10% by weight). Changes in color shade or loss of opacity will barely result. This bonding agent develops its full effectiveness during oven curing whereas the conditions should ideally be at approx. 140-160°C and duration of approx. 20-30 minutes. Despite of its pot time, this additive is more likely defined as bonder than a hardener!

Adhesion Promoter, Series 700-PP
This additive has specifically been designed for application onto polypropylene, mostly not pre-treated. Significant adhesion improvements on PP materials are achieved in combination with the ink systems Series 711, Series 712, Series 752 and Series 784. The ideal addition ratio lies at 10-20% by weight. No pot time results, however in unfavorable cases it can lead to reduced resistance values. Since often recycled materials are blended especially with polypropylene materials, this additive is often the solution to occurring problems, however only after pre-tests.

Surface Additive, Series 700-RCA
Series 700-RCA is a specific purpose additive to improve abrasion- and scratch resistance in the field of pad- and screen printing. Meeting the ASTM F2357-04 regulations (American Society for Testing and Material), by adding this paste, surface resistance of the ink film (especially against mechanical influences) is considerably increased. This special paste is universally useable and is added in concentrations of 10-30% by weight.

Next to the certainly necessary additives like thinner / retarder and hardener, Printcolor also offers additives in a concentrated form. These highly effective agents are the so called spices of an ink; however also here the rule applies: too much (overdosing) can lead to an "inedible" end result. Therefore the reason of the problem should always carefully be checked before adding any additives/auxiliaries. This will make sure that the problem on hand can be overcome with the specifically correct modification.

Leveling Agent, Series 700-VMT
This highly concentrated silicone additive is characterized by its leveling improving effect and a certain enhancement of gloss. Also foaming effects can be avoided by controlled adding of the latter. Typical problems like bubbling, pinhole or orange-peel effects can be rectified. Often also wetting of the substrate is changed – an influence which can positively be used when properly implemented. Addition ratios lie in the range of 0.5% up to max. 1% by weight. The liquid leveling agent must properly be blended into the relevant ink system. Please be cautious, especially when the modified systems will afterwards be over-lacquered. Fewer problems will be experienced with similar types of application methods like screen- and pad printing than with the more traditional application techniques like spraying, rolling and molding. In unfavorable cases this could lead to wetting problems.

Wetting Agent, Series 700-BMT
Leveling- or adhesion problems are often caused by the substrate to be printed. Be it release agents on extruded plastics, silicone residues by release papers, oxidations on metals, anti-adhesives of protection foils or more; the ink shall flow and adhere well in an unchanged condition. In such immoderate cases it is appropriate to reduce the interfacial energy of the ink to be able to ignore the "substrate-initiated" problems. This highly effective additive should be applied in the range of 0.5% – 1% by weight, max 2% by weight. Also here it is important that the liquid additive is well being worked into the system to be modified.

Antistatic Agent, Serie 700-AMT
The phenomenon and therewith resulting disturbances of static charge mainly occur when printing plastic materials.
They can be seen in uneven ink deposit, splashing of the applied ink film (spider-webs), bad ink transfer from pad and others. Especially when using polymer clichés, this effect can be observed. The reason is that many different plastic materials act as collectors of energy and that the electric charge, mostly caused by sheer stress, cannot discharge itself. This unpleasant fact is supported by low humidity (<60% relative humidity) and higher temperatures (>30°C). To act from the "ink-side", the anti-

static agent Series 700-AMT could be built into the relative ink system. Useful addition ratios lie in the range of 0.5% - 1% by weight.

The aforementioned additives are a very effective and useful assortment to the user. In case of problems, the user can work out practicable solutions fast and efficient. It is however in most of the situations essential to start with small amounts (hand-tests) of modified ink before going into production. Of course the technical staff of Printcolor will at any time be at your side to discuss your specific problems with you and try to find a solution to the problem on hand. Next to the pure additives, Printcolor's auxiliary agents program for pad printing inks is being complemented by two highly effective, but different cleaners. These are again applicable for all pad printing ink systems and are characterized by its high cleaning efficiency. Utensils, clichés and other ink contaminated tools can be cleaned residue-free. The pad itself is to be cleaned as usual with a Tesa stripe and if needed to be maintained with the silicone activator Series 10-03775. Both further below described cleaners can also be used in appropriate, partially regenerating laundering facilities.

Cleaning Agent, Series 700-URT
This specific solvent mixture stands for high cleaning efficiency at residue-free evaporation of the solvents after the cleaning process. It is designed for 1- and 2-component pad printing inks (flash point >21°C). It is free of greasing or disturbing highly evaporating solvents and is therefore useable without "after-cleaning". It is furthermore free of acid or alkaline materials, does not contain any chlorinated or fluorinated components and is not regarded as poisonous according to present health and safety regulations. All hazardous, environmental and transport data are shown in the Material Safety Data Sheet (MSDS).

Cleaning Agent, Series 700-BRT
A label free (according to present health and safety regulations) solvent mixture of excellent cleaning efficiency. This also applies to 1- and 2-component pad printing inks. Evaporation rate of this mixture is higher than with Series 700-URT and it needs a little more evaporation time (which can be reduced by ventilation) after cleaning of utensils and printing materials. The cleaner Series 700-BRT is an ecologically and physiologically practical alternative to the usual (not always safe) cleaning agents. Its composition is well suited to the requirements of pad printing.

Please be aware, that also these above mentioned cleaning agents are not suitable for skin. We would furthermore like to point out again, that cleaning of skin with solvents may be done quickly, but its aggressive and drying properties would have a significant effect on skin and body. Printcolor also offers suitable and gentle cleaning products for daily skin hygiene. Please do not hesitate to contact us and it will be our pleasure to give you more information.

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