



AquaPress® CA LT and HT

Water-based Two-Component Screen Printable Adhesion Promoter for Film Lamination Applications and IMD/FIM Technology (back molding of screen printed films)

Area of Application

AquaPress® CA is designed for screen printing on PVC films, PC films such as Makrofol® and PC-Blends such as Bayfol®. AquaPress® CA bonds the films during the lamination process.

AquaPress® CA can be back molded with the following plastic resins (IMD/FIM-process):

- Polycarbonate, e.g. Makrolon® 2405
- PC/ABS Blends, e.g. Bayblend® T 65
- ABS, e.g. Novodur® P2H-AT

Characteristics

AquaPress® CA offers:

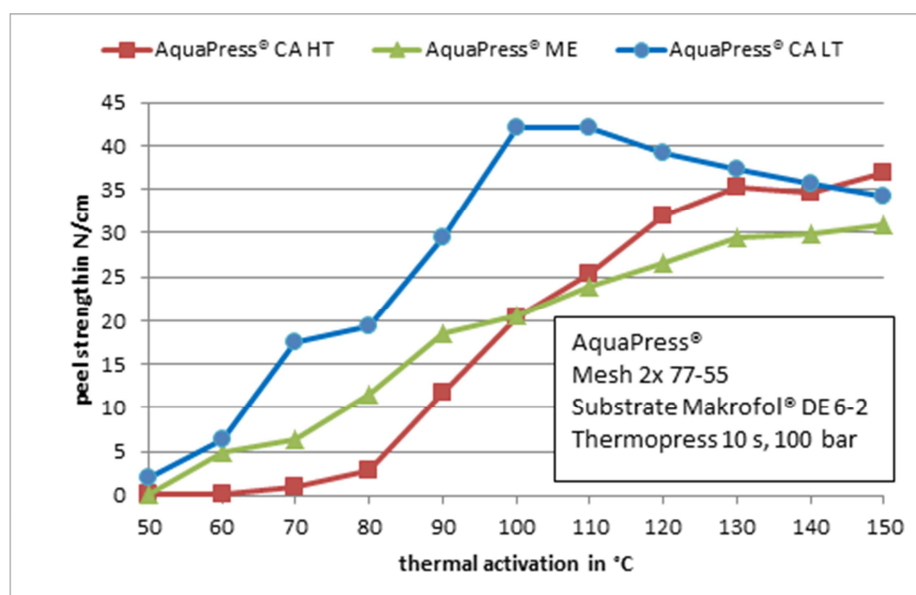
- excellent adhesion to many plastic surfaces
- high flexibility and good forming properties
- good lamination properties and therefore good peel strength

Activation Temperatures for Lamination

Prints with AquaPress® CA LT are fully activated at 100 °C (210 °F), but even at 90 °C (195 °F) the peel strength is acceptable. Prints with AquaPress® CA HT are fully activated at 130 °C (265 °F).

The following figure shows the peel strength of AquaPress® CA LT and HT depending on the activation temperature. The green line shows the former product AquaPress® ME for comparison.

The graphs demonstrate that AquaPress® CA LT is used for lower activation temperatures from 100 till 120 °C (210 till 250 °F) and AquaPress® CA HT is used for higher temperatures up from 130 °C (265 °F).



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Color

Milky white liquid. The dried ink film is colorless.

Auxiliaries

All auxiliaries must be added one at a time and stirred homogeneous into the mixture.

Auxiliaries must be added in the following sequence: defoamer, hardener and, as needed, thinner.

Defoamer

Before printing, add 0.5 % Defoamer L 54131 and stir well.

Hardener

AquaPress® Hardener CA

Using 2 – 3 % AquaPress® Hardener CA offers the following durability benefits for the finished part:

- improved temperature resistance
- improved resistance against water and humidity
- improved long-term strength of the laminate

Note:

See section **“Crosslinking”** of this Technical Information for details.

Thinner

AquaPress® CA is a “press-ready” formulation. If required, it can be thinned by adding max. 5 % distilled water.

Printing AquaPress® CA LT and HT

Important

AquaPress® CA is a dispersion with very small polymer particles. Dried AquaPress® CA in the printing screen is not solvable with water.

Processing AquaPress® CA is different from processing solvent based inks.

In addition, please refer to our technical leaflet “Printing with Water-based Screen Printable Adhesion Promoter”, which may be downloaded from our website www.proell.de (click Downloads ⇒ IMD/FIM Ink Systems & Adhesion Promoters ⇒ AquaPress®).

Fabric

Polyester fabrics with 77 to 100 threads per cm (195 to 255 threads per inch).

Stencil

Water resistant emulsions must be used. Excellent results during long production runs are achieved by using Pröll Diazo-UV-Polymer Emulsion Norikop 10 HQ. Sufficient drying of the emulsion is essential, residual moisture before exposure reduces print run resistance.

Squeegee

Vulkollan® squeegees with an average hardness of 65° up to 70° Shore A.

Triplex or RKS squeegees are not recommended.

Flood Bar

Use a round edge bar and adjust to achieve a flood-ink-thickness of approx. **2 mm (0.1 inch)** on the screen.

Printing Process

The humidity in the printing room should be higher than 50 % to avoid drying of AquaPress® CA in the screen.

Preparations

- 1) Prepare the adhesive by stirring well and adding hardener, defoamer and, as needed, thinner.
- 2) Moisten the stencil first by spraying water.**
- 3) Pour the adhesion promoter into the screen.
- 4) Always keep the screen flooded during the print run.

During long printing runs if the printing room temperature is above 25 °C (75 °F), spraying water onto the area where the adhesive is not moving to avoid skinning.

Printing breaks

- Short printing stops:
Cover stencil with a thick film of AquaPress® CA and spray water on it.
- Long printing stops:
Remove AquaPress® CA immediately from the screen and clean stencil and utensils with **Aqua-Jet® Liquid Cleaner L 47603** or thinned **Cleaner Concentrate 6953**.

Cleaning of Screens and Utensils

- 1) When printing is finished immediately spray Aqua-Jet® Liquid Cleaner L 47603 or thinned Cleaner Concentrate 6953 onto the stencil.
- 2) Take the squeegee out of the press and clean.
- 3) Remove the residual adhesive from the screen and do not place residues of the adhesive into the original container.
- 4) Take screen out of the machine and clean it. If immediate cleaning is not possible, submerge the screen in water. The screen can then be cleaned at any time.
- 5) Dried adhesive residues may be removed using a cleaner such as **Cleaner 6614**.

Drying

AquaPress® CA dries quickly by evaporation of the water in tunnel dryers. The suitable temperature range is from 70 – 90 °C (160 – 195 °F).

The belt speed depends on the efficiency of the dryer. Generally, the speed range from 3 m/min. to 7m/min. produces good results.

Oven drying is not recommended; long exposure to temperatures above 60 °C (140 °F) will increase the required laminating temperature.

Hints for Using AquaPress® CA LT and HT during IMD/FIM or Lamination

Layer Thickness

The greater the thickness of printed AquaPress® CA layers the higher the peel strength. For this reason, printing two layers is recommended, using a mesh with 77-55 threads/cm (195-55 threads/inch).

Lamination Temperatures

The temperatures mentioned in the diagram on page 1 are benchmarks for the activation of AquaPress® CA. Higher temperatures up to approx. 200 °C (390 °F) are possible for a short time.

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Lamination Parameters

The results of the lamination process not only depend on the lamination temperature and material, but also on other influences, such as:

- duration of lamination process, lamination speed and pressure (approx. 8 bar in the case of rotary laminators)
- thickness of film and thermal transfer
- type of decorating ink printed

The compatibility of AquaPress® CA with other material types as well as the suitable lamination conditions for this must be tested in advance.

Peel Strength according to decoration ink

The peel strength level strongly depends on the decoration ink type as well as its pigmentation.

If AquaPress® CA is printed on decoration inks with little adhesion to the substrate and/or on offset inks with high area coverage, the peel strength cannot be improved.

Crosslinking of AquaPress® CA LT and HT

Crosslinking

Temperature resistance and long-term bond strength of AquaPress® CA can be improved by adding **AquaPress® Hardener CA**.

Furthermore, the use of the hardener may increase the peel strength because of the crosslinking process, but this depends on the substrate.

Mixing

To ensure that AquaPress® Hardener CA will be dispersed homogeneously within the AquaPress® CA system, a stirrer at approx. 600 rotations per minute together with an effective propeller should be used. Stirring by hand may result in granular separations especially with low viscous, thinned AquaPress® CA.

Pot Life

The mixture should be used within 6 – 8 hours. The pot life depends on temperature and ink mixture quantity.

Time frame between Printing and Lamination

The chemical reaction of the two component system proceeds after screen printing, even if the films are stacked or rolled up. The curing process is influenced by the quantity of hardener, the drying time and drying temperature. It is finished within 3 – 8 days at room temperature.

Important information:

The activation temperature of fully cured (crosslinked) AquaPress® CA is higher, so it has to be tested within how many days and at which temperature the lamination has to be done.

AquaPress® CA LT has to be laminated within 3 days at a lamination temperature of 90 °C (195 °F).
AquaPress® CA HT has to be laminated within 6 days at a lamination temperature of 130 °C (265 °F).

The peel strength improves, if lamination takes place as soon as possible after screen printing and drying.

Shelf Life

The shelf life stated on the label assures the quality of the product. It refers to unopened original cans stored in a dry place at temperatures between 5 °C (40 °F) and 25 °C (75 °F).

Important

Allow AquaPress® CA as well as all the auxiliaries to be added to adjust to room temperature in the closed container before use.

To assure suitability for its intended use, each part or combination of materials must be systematically examined using proper testing procedures (climatic test, resistance test, etc.) before starting production. Materials presumed to be identical may vary from producer to producer or from batch to batch. They may also have been treated with additives which impair the adhesive properties of AquaPress® CA. Systematic testing is, therefore, an absolute must.

Safety Precautions for Handling

Always wear safety gloves and eye protection. In case of contact with the skin, the affected area should be rinsed with a sufficient amount of water.

This is a test product which is still in development. For this reason, no assurances are currently given as to type conformity, processability and long-term performance characteristics. Therefore the customer uses the product entirely at his own risk with no guarantee.

The suitability of AquaPress® CA and processing conditions for back molding must be determined individually for each combination of film, decorating ink and molding resin.

The information contained in the technical information/instruction sheets or other product information sheets is based on product testing conducted by Pröll. Because printing and environmental factors critically affect each individual ink application, the above mentioned information and instructions represent only general recommendations concerning product characteristics and directions for use and should not be construed as representing express warranties regarding the product. The information and instructions in no way release the purchaser from his obligation to verify and test the inks and their application for the specific request, regarding: product characteristics, weather resistance, mixing proportions, gloss, thinning, special mixtures, printability, drying speed, cleaning, effects on or of other materials to be contacted and safety precautions. All details contained in the instruction sheet "General Information on Screen Printing Inks" are to be considered. The further manufacture and use of products containing our inks by the purchaser takes place beyond our control, and the responsibility for further application and use of our product resides solely with the purchaser. Pröll disclaims any warranties, express or implied.

This information supersedes all previous technical information.