NESCHEN

Processing Instructions
Protection and Mounting Films

Definition of terms

Enhancing	general term for the processing of self-adhesive and hot-sealing films
Laminating	the processing of one-sided adhesive products; also protecting and enhancing (filmolux ® products)
Hot sealing	the embedding of an image with a hot-melt film (polyester film with a heat activated adhesive) = encapsulation
Mounting	the application of images onto various substrates with a double-sided adhesive product (gudy ® products)

1. Basic data on enhancement, protection and mounting films

1.1 Adhesive systems

All of the adhesives on products manufactured by Neschen for laminating pictures and inkjet prints are based on aqueous dispersions.

The acrylates have been in use for many years and are proven in practice. The adhesives are age-resistant, do not yellow, become brittle or bleed through and have a neutral pH value. The adhesives are produced in an environmentally non-harmful way.

1.2 Film systems

We only use high-quality raw films which are age-resistant and retain their colours in accordance with our technical data sheets.

The majority of the films contain components for UV-resistance and are designed for outdoor applications, can be wiped clean and are resistant to a great number of solvents. We can supply roll-widths for all standard printing systems up to 2 m.

We recommend to stick together similar medias. That means, e.g: PVC polymeric print media with a polymeric PVC lamination film etc.

Every raw material shows different characteristics regarding shrinkage, heat resistance and so on. Similar base material show similar characteristics.

Technical details about our adhesives and films are to be found in our technical data sheets - please refer to our homepage www.neschen.com.

1.3 Remarks on UV protection

- Protection films should only filter in the UV range which is not visible to the human eye. The colour carrier can, however, also be harmed by the visible range of the spectrum, which naturally cannot be covered by protection films. These would have to be coloured and would falsify the impression the picture wants to give. For this reason, we recommend the use of high-quality, UV-resistant, light-fast inks as well as high quality printable materials for all printing systems. Inks and media have a great influence on the life-span of pictures.
- The best possible UV protection can be achieved using our PVF-film (filmolux ® UV-E)
- The life-span of a picture can generally be prolonged several-fold through the application of a UV-protection film. Contributing factors which influence light-resistance are the media used, inks, toner and place of application. The time-span can be very short if the inks and toner are very unstable - in extreme cases as little as a few days. It would, therefore, be misleading to make a general statement about the life-span measured in months and years. Employees of our company are at all times prepared to help with information about individual projects.

2. Explanation of the different pictures

2.1 InkJet print

Dyes or pigment inks are applied in liquid form via jets onto the carrier. The liquids used are water, glycol or similar moisture retainers.

The drying process of the inks starts on the outside of the paper and moves inwards. The picture can be regarded as dry to the touch after a short time, but there is a remainder of moisture in the paper and the inkjet coating, which would evaporate when heated (e.g. hot lamination) and result in the formation of little blisters between the protective film and the surface of the picture. Same true for prints with solvent, UV curable and latex inks. For inkjet prints, we recommend the cold lamination system.

Drying times and further processing instructions are also comment in the technical information of the respective print media – please refer to our homepage www.neschen.com

2.2 Classic photographs

In the classic development process of a PE photo, the photo paper runs through a development, fixative and water bath. After the water bath there are still residues of chemicals in the surface of the picture; these might react under heat and could result in a change in the colouring.

For this reason, we only recommend the cold laminating system, which is also the most preferred method used.

We recommend, without exception, the cold lamination system.

3. Cold and hot lamination

3.1 Processing instructions

Please note the following points before beginning with lamination:

- For the clean, fast and bubble-free application of double-sided adhesive mounting films or one-sided adhesive protection or enhancement films we recommend the use of a laminating machine.
- When laminating, cleanliness is the first rule.
- Whilst most manufacturers of mounting boards employ some type of lubricant during the manufacturing process, all boards should be cleaned to ensure a proper bond.
- For cleaning synthetic or plastic boards (i.e. Forex, Simona, Kömacel, Polystyrol ...) methyl alcohol, benzine or special plastic cleaners may be used. Aluminium, Alucobond and Dibond plates should also be thoroughly cleaned before lamination.
- Fine dust or dirt can be removed from boards, photos, posters, prints and plots with a PCR-Roller.

  Important*:* After a board or plate has been cleaned a short time is required for the evaporation of any residue before lamination can begin.

Assembly on or behind plexi-glass

- Plexi-glass can stretch or shrink up to 3% due to changes in temperature or relative humidity. These dimensional changes frequently lead to problems when pictures have been applied to plexi-glass or when slides have been fixed behind it; wrinkles and blisters form between the glass and the adhesive. The problem can be solved by tempering plexi-glass for 24 hours at a temperature of 70° C to eliminate any moisture. After it has been tempered the glass must be stored dry to prevent it from absorbing any new moisture. We recommend the application of our gudy ® ultra clear which follows the normal dimensional changes of plexi-glass.
- Pay attention to the following when using screws with plexi-glass: The drill holes must be at least 2 mm larger than the diameter of the screw so that the stretching and shrinking of the glass does not tear the screws out of the wall. Instead of drilling a round hole, a square hole is recommended.

Assembly of boards outdoors

- Edges and joints must be sealed for outdoor use; this is to prevent the penetration of moisture which can cause the formation of wrinkles and a peeling off from the board.
  1. Protecting the edges by folding the film around the back of the board
  2. Protecting the edges by sealing edges and seams with clear varnish. The seams must be sealed above all when pictures are being presented on the floor; this is to prevent aggressive detergents from finding their way between the image and the lamination films.

Removing of adhesive residues

Our Products are made for permanent bonding. If, nevertheless, a lamination should be removed from the underground (e.g. glass), possibly arising adhesive residues can be removed with help of denatured alcohol or benzine.

3.2 Working material

The following materials should be available to ensure professional lamination:

- a knife and a straight edge for cutting pictures, films and boards
- cleaning fluid and a soft cloth for working surfaces, laminating-machines, etc. we recommend Ethanol for cleaning mounting boards
- PCR Roller for anti-static dusting of pictures before lamination
- PCR cleaning pad for cleaning PCR Rollers
- a cutting pad as a base for cutting
- adhesive tape as a fixing aid and for taping rolls
- a supplementary board for one-sided lamination (procedure for preparation of a supplementary board, please refer page 5)
- gloves should always be worn when handling prints
- a laminating machine for professional, bubble-free lamination

3.3 Cold lamination

Advantages of cold lamination

- one-sided lamination possible
- very high level of UV resistance in cold-lamination films,
- best possible UV protection (Tedlar® = filmolux ® UV-E) can only be produced as a cold-lamination film (hot-sealing films are made out of polyester - this has a lower level of UV resistance)
- flexible use because no warm-up time is necessary for the laminating-machine and protection films can be processed meter-wise and not only from the roll
- suitable for all standard ink systems
- large selection of enhancement films
- low outlay costs for the laminating-machine
- low percentage of rejects
- for smaller number of pieces, cold lamination is less expensive in the total costs calculation
- fewer work-stages - a picture can be protected and laminated with a double-sided mounting film in one run. Two runs would be necessary using the hot-seal method

One-sided lamination of images

Procedure:

1. Preparation of a supplementary board: A board with a smooth surface is required (e.g. PVC, polystyrene, plexiglass or aluminium). We recommend a 3 mm thick polystyrene board. Cut the board to the width of the laminating-machine; the length is irrelevant. Next, apply a double-sided adhesive material to the board (gudy ® products, e.g. gudy ® 802 or gudy ® 808). Cleanly cut off the overlapping edges of the film and leave the backing paper on the board. The backing paper rejects adhesives (siliconised) which means that images can be laminated with wider films on this board and removed without leaving any residues of adhesive.
2. Laminating the picture. The picture on the “siliconised“ supplementary board is fed through the laminating rollers.
3. Removal of the picture from the supplementary board.
4. Rest the picture on the cutting-pad and cut off the overlapping edges of the film. Caution: Do not cut on the supplementary board – marks on the board would become visible on all subsequent pictures after lamination.

Aids: *laminating-machine, board cleaner, cotton gloves, PCR roller, PCR cleaning pad, knife, cutting-pads for work-table*

Laminating of images and mounting on boards

Procedure:

1. **Rendering self-adhesive**
   First the substrate (board) must be covered with a double-sided self-adhesive material (gudy® products). For selection of the most suitable materials our application table could be helpful – please refer to our homepage www.neschen.com
2. **Using a fixing strip**
   Peel the backing paper back approx. 3 cm and crease it leaving free an adhesive strip the width of the material. Avoid touching the adhesive.
3. **Pre-fixing**
   Lay the image to be laminated on the board and push it carefully over the crease, aligning it with the edge of the board, and press lightly on the board edge. This is designed only to hold the picture in place.

   Please note: Strong hand pressure is neither sensible nor necessary as it can lead to air bubbles. The laminating machine does the job for you with a much higher pressure.
4. **Mounting a picture**
   Set the proper roller pressure and gap and push the board forward until it starts to feed between the laminating rollers. Allow it to feed until the rollers reach the edge of the image to be laminated. Lay the image over the top laminating roller and peel back the backing paper 20-30 cm. Let the board feed through the rollers. With one hand hold the picture steady while peeling off the rest of the backing paper with the other. Always try to keep the laminating speed steady.

Laminating of images and mounting on boards

5. Laminating of protection films

Mount the roll of protection film as instructed in the laminating machine manual. The laminating process proceeds analogous to the mounting process described in steps 2-4. See the table on page 24 for the appropriate material. During the laminating procedure, it is important that the top-side of the picture carrier is kept clean and dustfree to avoid dirt inclusions - this is best done using a soft cloth, or a PCR roller.

The adhesive film should always be somewhat wider than the image to be laminated

Plastic films have quite different grades of dimensional stability, depending on the type of plastic and the production process. Due to this fact it is not recommended to glue several lengths of material joined to each other. The lengths might get smaller after gluing, caused by climatic and processing influences.
This can lead to cracks between the material - which will make the finished graphic look undesirable.
If the material is glued with an overlap, please consider the fact that not all ink types will allow for a good adhesion and therefore the overlapping length might detach.
Neschen recommends to overlaminate or glue with one continuous piece of material for the optimum results.

Important:

- the lamination process must be completed without interruption because otherwise indentation marks from the roller will be visible
- Please only use same widths and batches for big orders. The films are not 100% reproducable. Especially the lamination films which use cheaper raw materials whose reproducability is not warranted.
- Please note that due to the multiple areas of application of this material (combined with various films, sheets for PVC or other application substrates) physically-determined dimensional fluctuations might occur that can possibly be triggered by fluctuations in temperature during processing and/or during actual application. For this reason, all specifications on our technical information are meant as references, and explicitly not intended as a basis for warranty or guarantee. Because it is impossible to test every possible print- application combination, we recommend customers conduct their own tests to see if the material is qualified for actual end-use.

Aids: *laminating-machine, board cleaner, cotton gloves, PCR roller, PCR cleaning pad, knife, cutting-pads for work-table*

Double-sided lamination

Requirements:

- Laminating-machine with bottom lamination
- Series of pictures requiring the same adhesive products on the front and reverse side, for example: menus and maps

Procedure:

1. Always load protection and enhancing films (filmolux ® products) in the upper part of the laminating machine because surface protection films require special attention.
2. Always load double-sided adhesive films (gudy ® products) in the lower part of the machine (bottom lamination).

   Caution: Ensure that the two material rolls are parallel and that the films are correctly and accurately threaded to avoid wrinkles.
3. During the laminating procedure, it is important that the top-side of the picture carrier is kept clean and dustfree to avoid dirt inclusions - this is best done using a soft cloth, or, even better, a PCR roller.

   Caution: The lamination process must be completed without interruption because otherwise indentation marks from the roller will be visible. The adhesive films should always be somewhat wider than the item to be laminated.

Tip: When films are being processed in series, it is important that films out of the same batch are used, when possible, because present technology cannot reproduce the surface texture 100% from batch to batch.

Aids: *laminating-machine, cotton gloves, PCR roller, PCR cleaning pad, knife, cutting-pads for work-table*

3.4 Hot encapsulation

Procedure:

Set the temperature according to the thickness of the film to be processed.

Notice:
The risks of hot sealing inkJet prints

Dyes or pigment inks are applied in liquid form via jets onto the carrier. The liquids used are water, glycol or similar moisture retainers. The drying process of the inks starts on the outside of the paper and moves inwards. The picture can be regarded as dry to the touch after a short time, but there is a remainder of moisture in the paper and the inkjet coating, which would evaporate when heated (e.g. hot lamination) and result in the formation of little blisters between the protective film and the surface of the picture. The boiling point of ink varies between 70° C and 100° C.

Hot-sealing films, as a rule, are processed between 85° C and 120° C. If the temperature of the machine is reduced there can be no guarantee that the processing of the film will be completely successful. It can take days before a picture is completely dry - a fact which is completely unacceptable in a rational production sequence. Additionally, it is not possible to tell which ink has been used for a printed picture and consequently considerable processing risks would have to be taken.

The mounting of sealed prints could be made amongst others with double-sided cold-lamination (gudy ® products)

4. Storage and sending of enhancement, protection and mounting films

- All rolls of material should be stored vertically. Materials should never be stored horizontally for long periods as this may lead to deformation, marking and dull patches
- In order to assure perfect product functionality, we recommend protecting all material from prolonged UV exposure. Please store the material protected from light (e.g. in the transport box provided) when not in use. This also applies to pre-laminated material (e.g. mounting boards).
- Storage should be at room temperature (18° C to 25° C) and at 40% to 65% relative humidity.
  These are also the optimal conditions for shipping.
  In general, but especially at the transport to different climate areas, we recommended a shipping in temperature controlled trucks or Reefer containers.
- The material should acclimatise in the same ambient conditions as the processing for approx. 48 hours. When the rolls are thoroughly cooled out (e.g. after truck transport in winter) it can take a long time before the inside spool reaches room temperature and the roll can be processed trouble-free.
- Regarding the storing time for each product, please refer to our technical data sheets - please refer to our homepage www.neschen.com.

5. Sending and storage of self-adhesive and laminated pictures

Sending of self-adhesive and laminated pictures

- Images (photos, inkjet prints etc.) which are laminated with a protection film should be rolled with the picture side outside. The rolls should not be rolled too tight (roll diameter approx. 20 cm).
- Images with a mounting film should not be send rolled up.

Storage in layers:

- The surfaces of soft PVC films (especially glossy) like filmolux ® photo gloss are sensitive to heavy pressure, which can lead to changes in the film surface.
- If laminated pictures are to be stored on top of each other, embossed papers should not be placed between the layers - it could lead to indentations in the film. We recommend storing laminated pictures on top of each other with a sheet of tissue paper between.

Caution: Siliconised paper is not to be recommended between unprotected pictures; the emulsion layer may react with the silicone and the pictures might be discoloured.

6. On-the-spot assembly

6.1 Assembly on or behind plexi-glass

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- After it has been tempered the glass must be stored dry to prevent it from absorbing any new moisture.
- We recommend the application of our gudy ® ultra clear which follows the normal dimensional changes of plexi-glass.
- Pay attention to the following when using screws with plexi-glass: The drill holes must be at least 2 mm larger than the diameter of the screw so that the stretching and shrinking of the glass does not tear the screws out of the wall. Instead of drilling a round hole, a square hole is recommended.

6.2 Assembly of boards outdoors

- Edges and joints must be sealed for outdoor use; this is to prevent the penetration of moisture which can cause the formation of wrinkles and a peeling off from the board.
    1. Protecting the edges by folding the film around the back of the board
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