

**folex**<sup>®</sup>

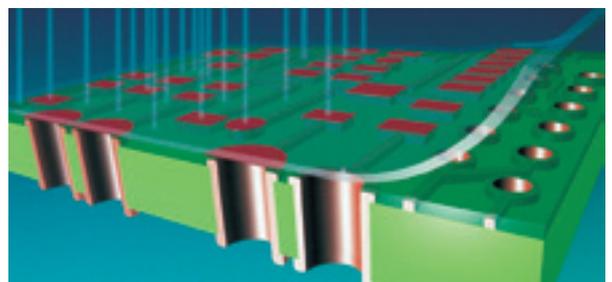
DENSOTRANS<sup>®</sup>

PCB Diazo photo tooling film



the fine art of coating

ELECTRONICS  
INDUSTRY



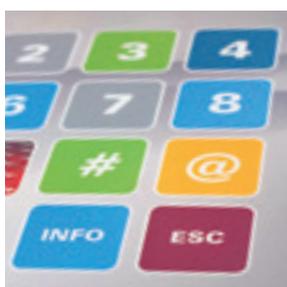
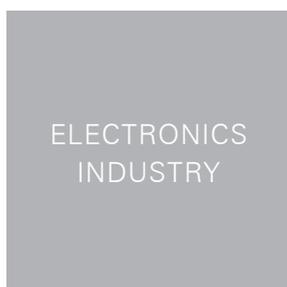
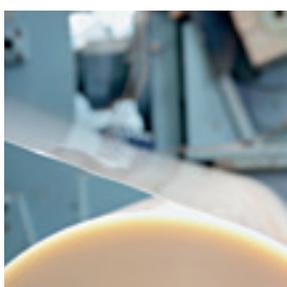
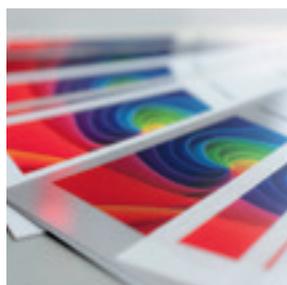
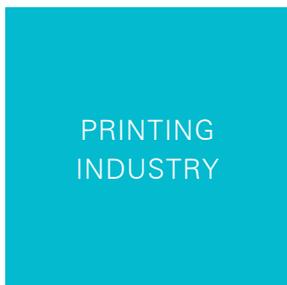
# ABOUT FOLEX

## HIGH EXPERTISE IN COATING

The Folex Group specialises in the finishing and coating of films and specialities and has production companies based in Switzerland and Germany that offer high-quality products and tailor made services for a wide variety of markets.

Folex dynamically adapts its portfolio to changing customer needs and technical developments. Based on its core competence, coating, Folex constantly works on optimising existing products to develop new potential applications for different technologies. Today Folex offers solutions for many sectors, from the printing industry or digital and large-format printing, the office and home sector, all the way to primary products for the electronics industry. In addition to which, Folex has also developed extensive skills in membrane separation technology.

As a family-owned company with a long-standing tradition, we feel committed to a clearly defined set of values based on integrity, dependability, quality, a love of innovation, and awareness of our responsibilities. As our customer, you can also benefit directly from this competence and our innovation. For instance, we can offer you consulting services during the development phase, or develop new solutions on your behalf. For soldermask surfaces and liquid/dry film pattern exposure.



# PRODUCTS

## PRODUCT PROPERTIES

Manufactured and pre-conditioned close to user's working environment. Pre-conditioning with humidity controlled interleaving paper. High dimensional stability. Improved ageing characteristics, therefore lowest possible D-min. High and safe UV-density (D-max) for high power UV-lamps. Good resistance to film cleaners, monomers and thinners of photoimageable liquid solder mask.

## TECHNICAL INFORMATION

Densotrans range of films are visually transparent amber (yellow-orange) and provide high UV-density > 4.3 (X-Rite 369) and a low D-min. < 0.13. The nominal density just after development, measured with a X-Rite 369 is approx. 4.5. After the first few exposures steps the density readings are > 4.0.

## PROCESSING – PRE-CONDITIONING

Although all films are pre-conditioned, it is highly recommended to stabilise material to ambient conditions for a minimum of 15 hours prior to exposure within the same working room conditions (avoid exposure to UV-light and any chemical vapours such as ammonia).

## EXPOSURE

Ensure contact of the photo master to Densotrans® is emulsion to emulsion. Folex diazo films need ca. 500 mJ/cm<sup>2</sup> at 400 nm and ca. 1000 mJ/cm<sup>2</sup> at 350 nm. These energy levels are guidelines for exposure time evaluation, which has to be performed for each machine individually. A Stouffer step-wedge can be used to determine the correct exposure time. Basically step one should be fully exposed and completely clear.

## DEVELOPMENT

DENSOTRANS® is developed in a warm, dry diazo developing machine with concentrated ammonia (25% resp. 24 Baumé). At approx. 80°C within the developer chamber and 35 – 40°C on the film surface. The film cannot be over developed, however we recommend at least two passes. After each pass the film should be turned 90 or 180° for complete consistency and safe development. Under-developing causes unstable and low density. To ensure utmost image accuracy before use, allow one hour after processing for the film to re-adjust to the working conditions.

## DIMENSIONAL STABILITY

Effects of temperature change: 1.7 x 10<sup>-5</sup> mm / m / °C (PET base)

Effects of humidity change: 1.1 x 10<sup>-5</sup> mm / m / % RH (PET base)

## ULTIMATE RESISTANCE AGAINST SCRATCHES AND CHEMICAL

Folex diazo films feature a high scratch resistance and a high resistance against chemical substances. Although the films have to be handled with care, the Folex diazo has a good scratch resistance. Especially, resistance against chemicals is very good. PCB manufacturers use Folex diazo film for an extended time in the production. The ratio of cost per exposure is surprisingly low.

# PRODUCTS AND ENVIRONMENTAL

## DENSOTRANS® HCP

Single side semi-matt, amber, high contrast for fast vacuum draw down. Good solvent resistance. For matt soldermask surfaces and pattern exposure.

Densotrans® HCP			
Semi-matt	20 x 24 inch	0.508 x 0.609 m	46447.180.85001
	24 x 30 inch	0.609 x 0.762 m	46447.180.86001

## DENSOTRANS® HRP

Clear, amber, high contrast, less pigments to avoid blocking. Good solvent resistance. For glossy Soldermask surface and pattern exposure.

Densotrans® HRP			
Glossy	20 x 24 inch	0.508 x 0.609 m	46547.180.85001
	24 x 30 inch	0.609 x 0.762 m	46547.180.86001

Please, contact your local Folex dealer, if you request other sizes.

## STORAGE

Unused film in un-opened film bags can be stored in a conditioned environment with 10 – 20°C, however 15°C is the optimum condition. Due to our high performance sealed bags the humidity is not a significant issue for storage. Nevertheless, we recommend a day storage below 60% relative humidity. Shelf life is guaranteed in its original packaging for approximately 12 months. High temperature and high humidity with open bags may cause premature ageing.

## ROHS AND ISO

All DENSOTRANS® film complies in the tested parameters to the requirement of the ElektroG and is therefore in these tested parameters conforming to the EC-directive 2011/65/EC (RoHS-directive). Our manufacturing process has been controlled by the strict and internationally approved quality management system ISO 9001:2008 since 1993.

## ENVIRONMENTAL

Substantial investment in emission purification has made Folex AG a leading advocate in environmental protection. All material safety data sheets are available on request.



# PACKAGING

## PACKAGING

To underline the quality as well as to ensure that dealers and end users will receive premium and genuine products, Folex Densotrans® diazo films are protected by an especially designed security seal.

The diazo film bags as well as the boxes are sealed with a special security seal. Therefore, you are able to detect any opened material immediately. In order to improve traceability and reduce the possibility of forgery, the control number is now printed on each interleaved paper liner. Therefore the control number on the interleaving paper will be identical to the control number on the label.

In case of any of the following label damages, please contact: [pcb@folex.ch](mailto:pcb@folex.ch)

*folex* 0031534

Print example of the control number on the interleaved paper liner.

### SECURITY SEAL



✓ Correct



✗ Manipulated



✗ Manipulated

### NEW BAG DESIGN



### NEW BOX DESIGN





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