

Conductive screen printing inks

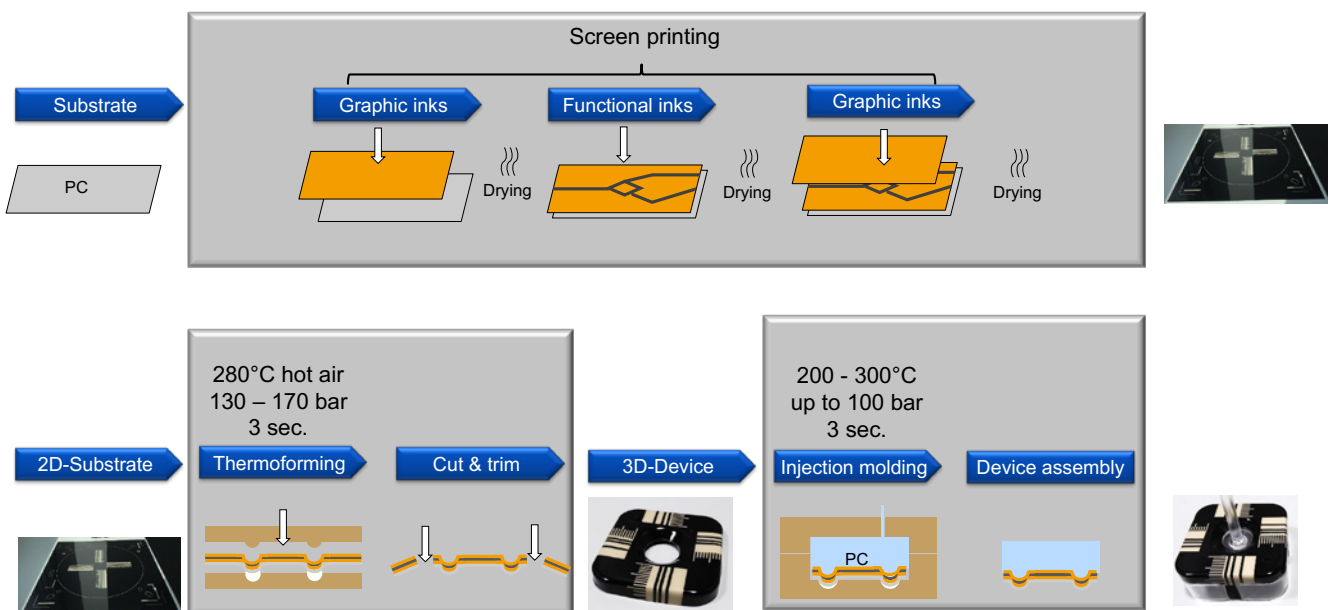
for in-mold electronics

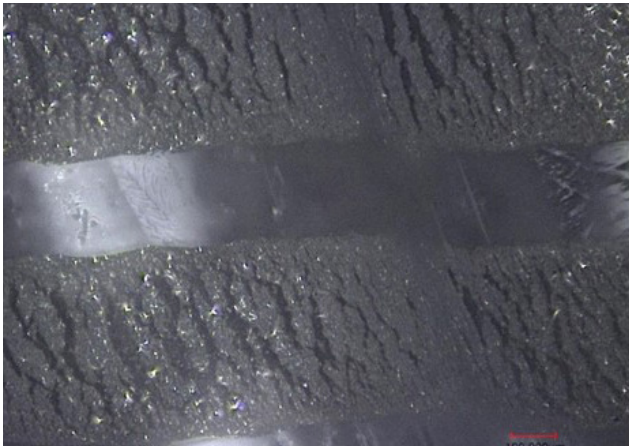
In-Mold Electronics (IME), or Smart Surface, is a new area of the Human Machine Interface (HMI).

In-Mold Electronics combines printed electronics with the In-Mold Decoration (IMD) technology. First of all, the screen printing process is used to print 2-D conductive tracks as leads for LEDs or sensors on e.g. polycarbonate films. Then these printed films are thermoformed and finally back-injected molded with e.g. polycarbonate.

The advantage of this technology is that, for example, mechanical pushbuttons consisting of many small components can be replaced by touch sensors integrated in films. In this way, costs can be reduced by up to 30% through simplified process steps and reduced component complexity, and the weight of the components can be reduced by up to 70%. The thermoforming of the surfaces also enables a new freedom of design. A further advantage is the closed surface which is easier to clean and therefore more hygienic than conventional control elements.

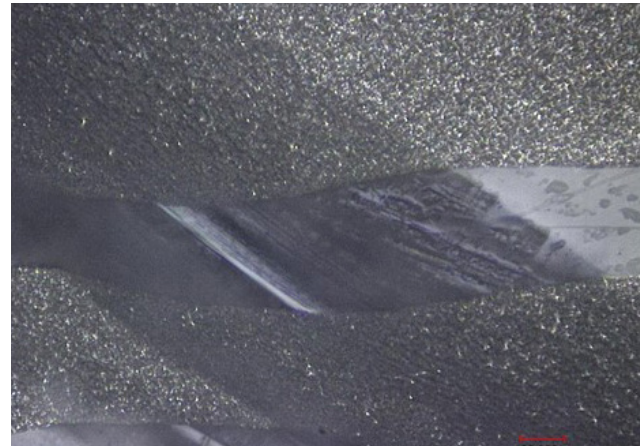
The following figure illustrates this IME process:





Conventional silver screen printing ink

- Cracks appear at moderate forming
- No or unpredictably low conductivity after thermoforming



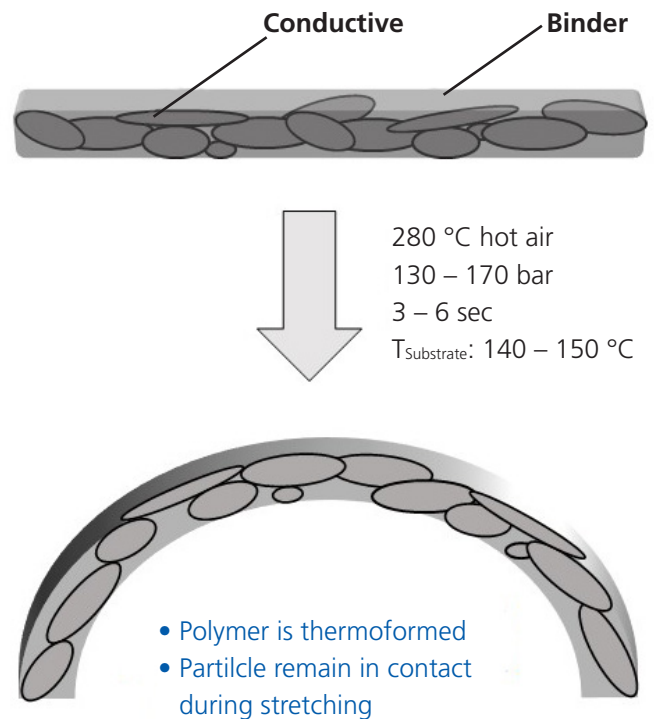
Bectron® CP 6680

- Free of cracks after thermoforming
- Variation of the conductivity dependent on the degree of thermoforming

ELANTAS Europe has developed conductive inks for in-mold electronics that have been specially optimized for the thermoforming process. The following graphic compares the thermoformable conductive silver screen printing ink Bectron® CP 6680 (right picture) with a conventional conductive silver screen printing ink (left picture). A clear difference can be seen with regard to the cracking of the ink layers caused by thermoforming.

For excellent thermoforming results, as with the silver screen printing ink Bectron® CP 6680, the pigments for the ink must be carefully selected (morphology and coating), a highly thermoformable binder must be used, and the silver ink must have excellent printability on the substrate prior to thermoforming.

In addition to the excellent thermoformable silver screen printing ink Bectron® CP 6680, ELANTAS also has an excellent thermoformable carbon screen printing ink Bectron® GP 9580 for printing resistors or for protection on the silver screen printing ink in areas with mechanical stress, e.g. at contact points, as well as a highly conductive but only slightly deformable silver screen printing ink Bectron® CP 6681 for printing supply lines in the non-deformed or only slightly deformed area.



Contact us, convince yourself and do not hesitate to ask for a sample. For questions about the choice of appropriate materials or application-specific topics, please feel free to contact us.

ELANTAS Europe is a leading manufacturer of insulating and protective materials for the electrical and electronics industry. The Product Line Printed Electronics offers a wide range of conductive, insulating and functional screen printing inks for applications such as membrane switches, touch surfaces, in-mold electronics, hybrid electronics, sensors, RFID antennas and electroluminescent lighting.

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