

### Procedure for making a printed circuit:

A carefully prepared design of a PCB layout made on white paper with drawing ink or as a computer printout, transfer onto the TES-200 FILM, what can be done by means of any photocopier that uses a TONER.

**Those who have a computer and a laser printer can directly print the PCB layout design on the TES-200 FILM to obtain the highest quality PCB with 0.1 mm minimal width of track.**

*To make a PCB observe the order of the following steps:*

1. Cut the copper clad board to dimensions a little bigger than the designed PCB (you have to use an epoxy glass board – it doesn't deform under the influence of temperature).
2. Cut out the printed PCB layout design from the sheet of the film.
3. Fix the film on the copper clad board in at least two points by means of e.g. self-adhesive paper labels.
4. Place the copper clad board on heated to **135-155°C** heating plate (an electric cooker or an iron turned upside down).
5. After heating the copper clad board to required temperature, the film becomes elastic and starts to adhere to the surface of the board. Now transfer the toner from the film onto the copper by means of a photographer's rubber roller or a scrap of linen; pay special attention to wipe carefully the whole surface of the film.
6. Put the board aside for cooling it down (when the board will reach a room temperature put it in refrigerator for several minutes).
7. Take the film away from the board carefully; on the board will remain an acidproof layout of the PCB.
8. Immerse the board in **any etching solution** (due to high efficiency of etching we recommend **the B327 etcher**, but through lack of it you may use a common ferric chloride).
9. When all copper is etched, take the board out and wash it off with acetone or a nitro-solvent.

### CAUTION!

- Prior to starting above mentioned operations you have to tarnish the copper surface with fine abrasive paper (waterproof) and to degrease it.
- The board temperature should not exceed **160°C**.
- The board must be heated equally from the bottom. Heating the board in the oven doesn't work.
- The ink and needle printers are not fit to be used for direct printing on the TES-200 FILM.
- Prior to making the final PCB, make some trial PCB to become skilled at this work.
- The best quality PCBs can be obtained in maximal limit temperature of the board i.e. about 160°C, at which the film doesn't yet deform (sometimes it is above 160°C), while using **the printout made on laser printer!**
- If the temperature is too low, the "graininess" can occur and after cooling down and taking the film away from the board some parts of PCB layout will not be transferred onto the board.

- The **TES-200 FILM** is the excellent solution for the SMD technology and for double sided PCBs.

You can find additional description of this product in the “Elektronika Praktyczna” magazine No. 6/98 on page 18.

The packaging contains 10 pcs. of the A4 format film