LPKF
Laser & Electronics

LPKF EasyContac
Operating Instructions

English, Version 1.1

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Item no. 110972

Preface

The system LPKF EasyContac is a mechanical and manual process used for through-hole plating of double-sided PCBs of 1.6 mm thickness. The electrical connection is produced by means of a self-acting tool. The process can be used for four different hole diameters.

This instruction gives you a step-by-step introduction of how to use EasyContac. This instruction should be read completely before initial use of EasyContac.

Hints to this manual

I. Outline

This manual is divided into the following chapters:

1. Scope of delivery
2. Preparation of the PCB in CircuitCAM
3. Inserting and Forming the rivets
4. Technical Data
5. Annex

II. Conventions used in this manual

Bold text is used to emphasise important information.

Illustrations are numered. Example: Fig. 5

> › Prompts for actions are identified with an arrow.

Italic sections are used to indicate the reactions consequent on an action.

Word printed in *italics* mark proper names.

Key inscriptions and menu terms are printed in **BOLD CAPITALS**.

III. Notes on the symbols used

Danger! This symbol is used to highlight danger to life or health.

Caution! This symbol is used to identify hazards which may cause damage.

Note: This symbol is used for notes intended to help you avoid faults in operation or to help you improve your procedures.

IV. Legend

CircuitCAM   : Software for data processing

V. Target Group

This instruction is intended for personnel familiar with the basic use of layout programmes and CircuitCAM.

VI. Intended Application

The system described in this instruction is to be used only for the production of mechanical and manual through-platings in printed circuit boards. No other type of application is permitted and in any case requires the prior approval of LPKF AG!

Contents

1.0 Scope of delivery

- 1 x   self-acting center punch with a punch tip A (small) for 0.6mm and 0.8mm rivets

- 1 x   punch tip B (big) for 1.0mm and 1.2mm rivets

- 1 x   anvil

- 1 x   tweezers

- 1000 x rivets 0.6mm (internal dia) 0.8mm (external dia)

- 1000 x rivets 0.8mm (internal dia) 1.0mm (external dia)

- 1000 x rivets 1.0mm (internal dia) 1.4mm (external dia)

- 1000 x rivets 1.2mm (internal dia) 1.6mm (external dia)

An overview of all diameter indications as well as item numbers needed for re-ordering parts is given in chapter „Technical Data" on page 12

2.0 Preparation of the PCB in LPKF CircuitCAM

For the preparation of the PCB in LPKF software CircuitCAM (version 3.2 and higher) you should take the following considerations into account.

The external diameter of the rivets to be used is by 0.2 mm larger than the internal diameter. This difference must be taken into consideration in the layout. All drill holes to be through-plated have to be enlarged correspondingly. In practice it has proven effective to choose the drill diameter by 0.1 mm larger than the external diameter of the rivet.

This results in the following formula:

New drill hole = external diameter of rivet + 0.1mm

The drill hole can either be enlarged in your layout program or later in CircuitCAM.

2.1 Enlargement of the drill holes in CircuitCAM

› Use the mouse to select a drill hole of the drill holes to be modified.

The drill hole is shown as „Txx" in the Aperture/Tool list field.

› Click with the right mouse key on the Aperture/Tool list field to open the Aperture/Tool properties display.

The following dialogue appears:
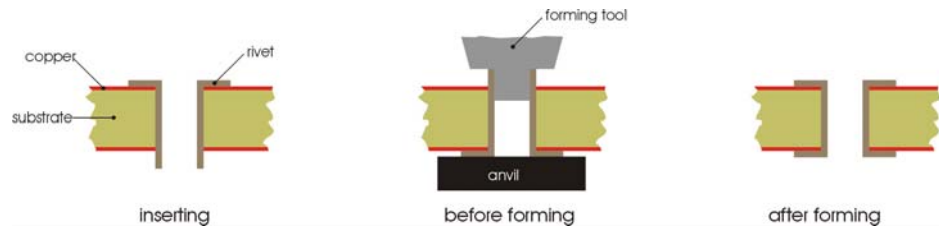
Figure 1: Aperture/Tool dialogue box
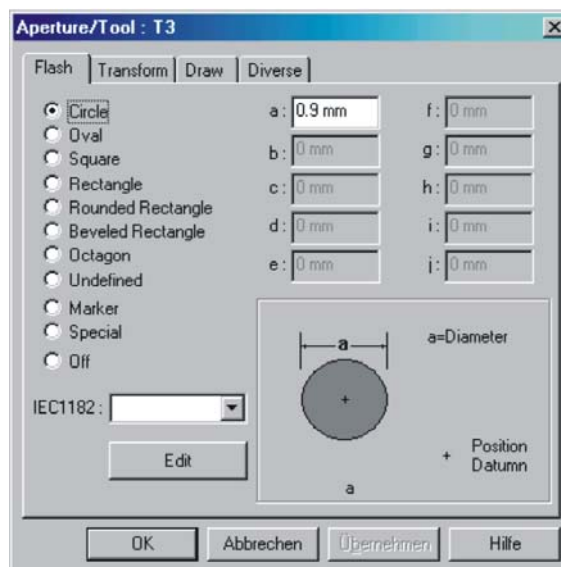
› Here you enter the diameter that was enlarged corresponding to the previous formula.

› Leave the dialogue box with **OK**.

Now all drill hole diameters in the graphics display change accordingly.

3.0 Inserting and Forming the Rivets

This is a graphical representation of the EasyContac process:

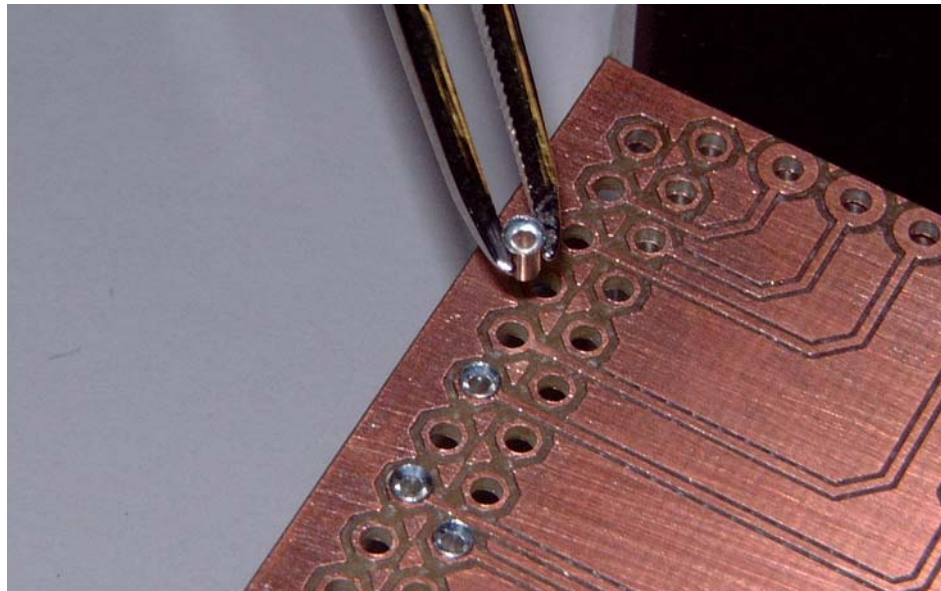Figure 2: Scheme of EasyContac

3.1 Inserting

First the PCB must have been produced with a circuit board plotter.

› Use the tweezers to insert the rivets into the PCB.

Caution!
Always insert the rivets from the component side!

Figure 3: Inserting the rivets

Having inserted all the rivets, you should protect them from falling out with an adhesive tape.

› Then turn the PCB around and place it on the anvil.

3.2 Forming the rivets

› Check which size of the punch tip is inserted in the center punch.

The center punch is delivered with an inserted small tip for an internal rivet diameter of 0.6mm and 0.8mm. The tip needs to be exchanged for internal diameters of 1.0mm and 1.2mm. As the size of the tip cannot be identified by sight, the small tip is marked with a ring around it, see following figure. This ring can also be seen when the tip is inserted in the tool.
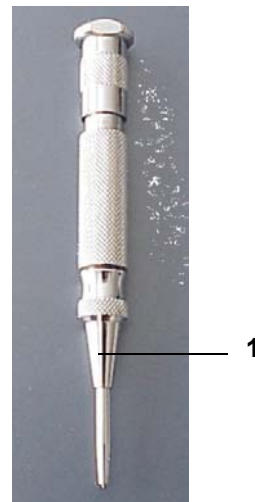
Figure 4: Tool tip marking
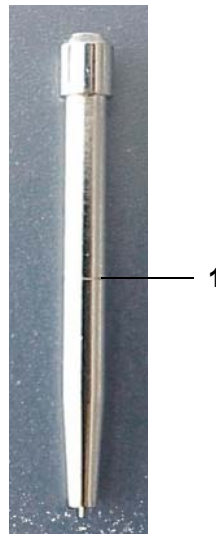
1 ring-shaped marking of tool tip A

› In order to change the tip, turn the tool tip holder **1** (figure below) off (similar as with a ball pen) and exchange the tip.

Figure 5: Center punch

› Then apply the self-acting center punch.

Figure 6: Forming the rivets

› Press down the center punch until a stroke is released.

This stroke causes the rivet to form a collar on this side, too, and thus the electrical connection between top and bottom of the PCB is produced.

The result should look like this:

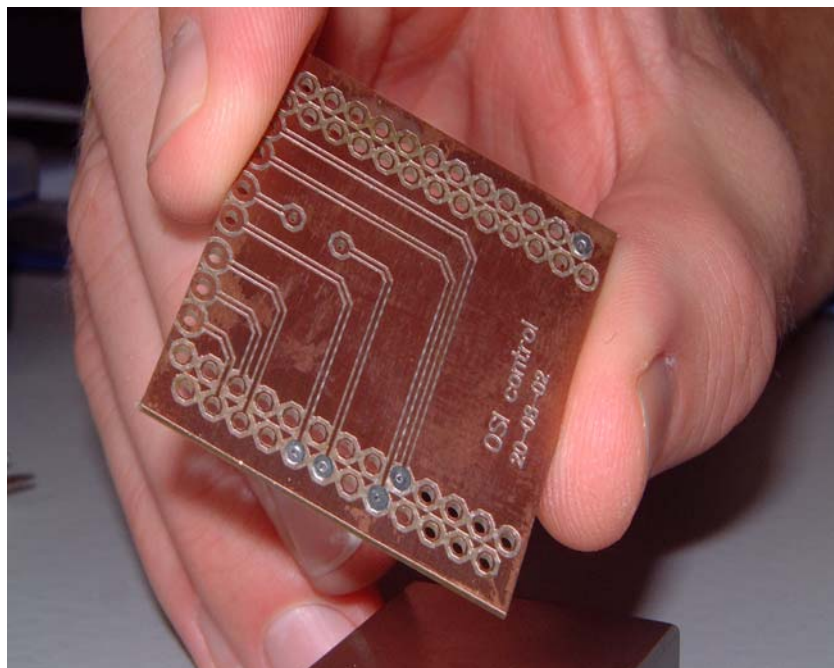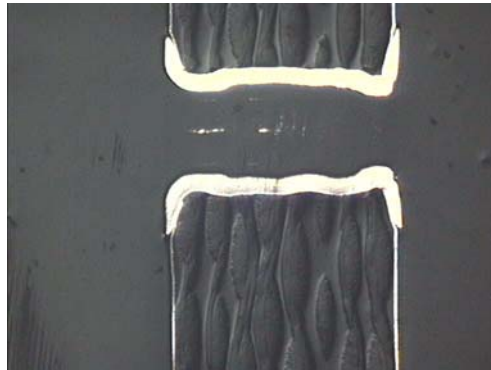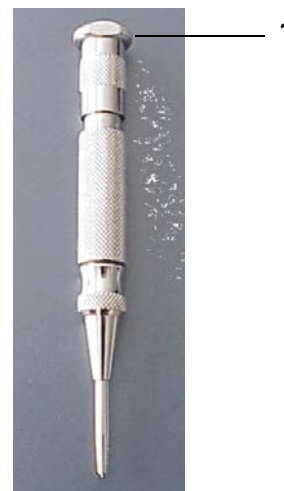Figure 7: Inserted and formed
               rivets

Figure 8: Polished section of a
through-plated drill
hole

The press force, ranging from about 50 N to 250 N, can be adjusted at
the top of the tool. If the formed collar does not have the desired shape,
increase the pressing force by turning the tip of the tool, **1** in the figure
below.

Abbildung 9:Center punch

1

The PCB can now be provided with sealing lacquer and then
components can be assembled. For the schematical representation of
these processing steps see below.

Figure 10: Further processing
steps

soldering   assembled with component
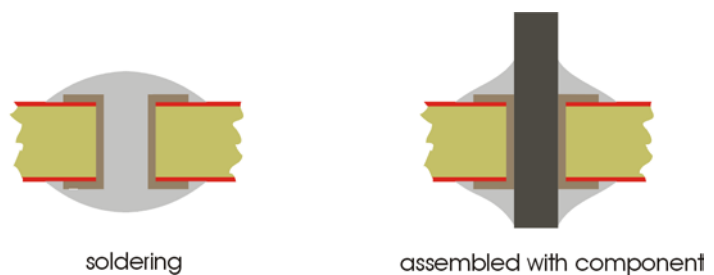
4.0 Technical Data

4.1 Diameter data of the rivets

Internal diameter	External diameter	Collar diameter	Length	Drill hole diameter
0.6	0.8	1.3	2.2	0.9
0.8	1.0	1.6	2.2	1.1
1.0	1.4	2.2	2.5	1.5
1.2	1.6	2.6	2.6	1.7

All indications in mm.

4.2 Item numbers

Designation	Item number
Center punch for EasyContac (incl. tool tip A)	110760
Tool tip A for EasyContac	110971
Tool tip B for EasyContac	110911
Anvil for EasyContac	110821
Tweezers for EasyContac	110757
Rivet with 0.6 mm internal diameter	110907
Rivet with 0.8 mm internal diameter	110758
Rivet with 1.0 mm internal diameter	110906
Rivet with 1.2 mm internal diameter	110759

5.0 Annex

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