

ELOPIN®





CONTACTS WITH PRESS-FIT ZONES (ELOPIN®)

MATERIAL

All common

SURFACE

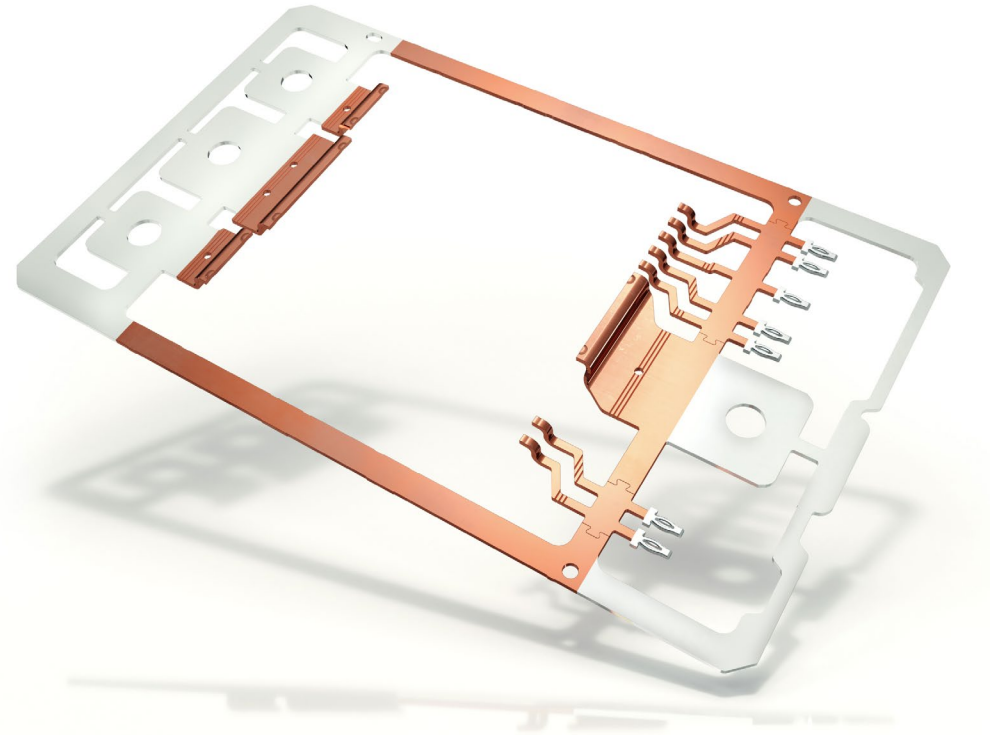
- Sn
- Ni
- Precious metal

OUTPUT

- Up to 700 strokes/min. embossed
- Up to 1000 strokes/min. cut

TECHNOLOGY

- Flat/curved on the belt
- Press-fit zone cut or embossed



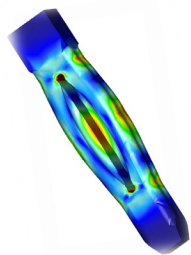
2in1: Thanks to the development of a universal tool, this punching grid can be used to produce different contact variants, for example. This means that both selectively refined solder pins and selectively coated press-fit zones can be fed in.



AT A GLANCE

GEOMETRY

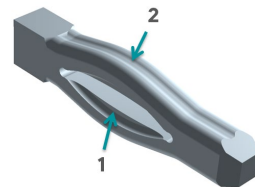
The press-fit area of the EloPin® has the proven "eye of a needle" shape. However, this has been modified at key points. This results in a controlled tin distribution during the press-fit process. In addition, only low press-in forces are required combined with high holding forces.



Example: EloPin® 06-10

OVERPRINTING OF THE ZONE BORDER

To improve stability, the inner edge of the barrel is embossed (patent granted). Pockets are also embossed to hold the displaced tin, and radii adapted to the through-hole plating ensure optimum protection of the PCB with a large contact surface (low contact resistance, high holding force due to cold welding).



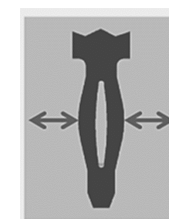
EXAMPLE: ELOPIN® 06-10Zone
inner edge embossing
Roundings and tin chambers

QUALITY THROUGH ELASTICITY

The quality of a press-fit binding is determined, among other things, by the elasticity (R = springback) of the press-fit zone.

DEFORMATION FORCE TEST WITH KLEINER

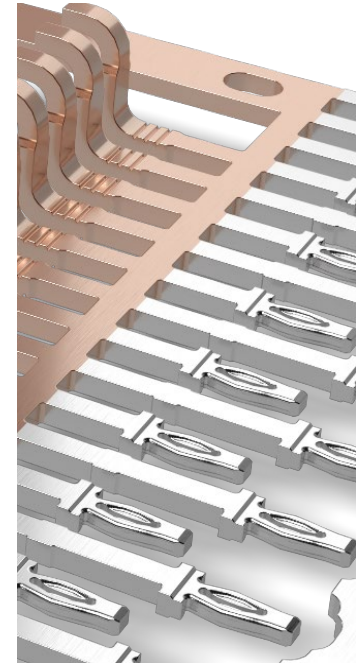
1. The deformation force of the individual pin is measured
2. The test is carried out during production on the bare pin according to TBS Sorig specifications
3. The test jaws correspond to the nominal dimensions of the PCBs





DER ELOPIN®: OUR SIZES

EloPin® Contact name	Strip thickness of the zone [mm]	Printed circuit board end hole [Ø / mm]	Printed circuit board thickness [min / mm]
04-06	0,40	0,60	1,00
06-10	0,60	1,00	1,00
08-145	0,80	1,45	1,50
08-16	0,80	1,60	1,50



THE ADVANTAGES AT A GLANCE

- Low stress on the plated-through holes including the connected conductor tracks
- For engine compartment applications in the temperature range from -40 degrees to 150 degrees
- Cost-effective assembly of PCBs on both sides
- Reliable, gas-tight connection



HOLE FRICTION FORCES AND ELASTICITY

PUBLISHED ZONE

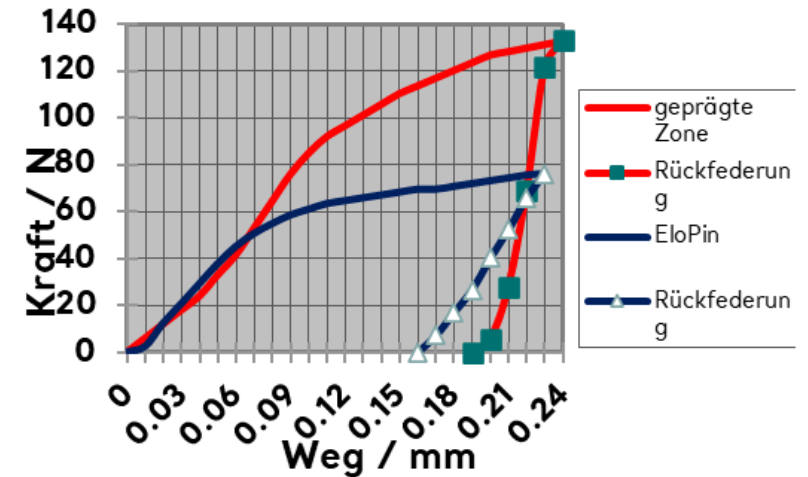
The insulation/powder coating is applied to the conductor rails in the frame using an electrostatic spraying process and annealed.

- + All-round insulation protection provided
- + Release for electrical insulation of the epoxy powder according to UL746 B; UL 1446 oder E35075
- + Can be used up to 130°C

ELOPIN®

The PVC molecules dissolved in the PVC dipping paste are gradually deposited on the hot surface of the parts to be coated.

- + All-round insulation protection provided
- + Suitable for complex geometries
- + Well scalable





MATERIAL SPECIFICATIONS

Areas of application	Automotive interior	Automotive engine compartment	Power electronics	Telecom. Industry
Material designation	CuSn6	CuNiSi	Highly conductive CU alloy	CuSn6 / CuNiSi
Electrical conductivity MS/m	9	25	46	9 / 25
Thermal conductivity W/(m*K)	75	190	320	75 / 190
Surface	Sn100 via Ni	Sn100 via Ni	Sn100 via Ni	Sn100 via Ni
Max. ambient temperature	95°C	150°C	150°C	95°C / 150°C
EloPin® 04-06	+	+		+
EloPin® 06-10	+	+		+
EloPin® 08-145		+	+	
EloPin® 08-16	+	+		+

Other materials, sizes, surfaces and areas of application on request



SURFACES

PCB PERFORATION	
Surface	Suitable for press-fit technology
HAL	o
Chem. tin	+
Chem. Ni/Au	o
Org. coating	+
Chem. palladium	+
Chem. silver	+
+ = good	Source: VDE/VDI 3711
o = medium	Base material: FR4...

PRESS ZONE:
Surfaces = Sn 100 matt
(pure Sn / thin film) over Ni
barrier layer

ALTERNATIVE SURFACES:
Ni/Au
Ag
Ni (sandwich)
without surface



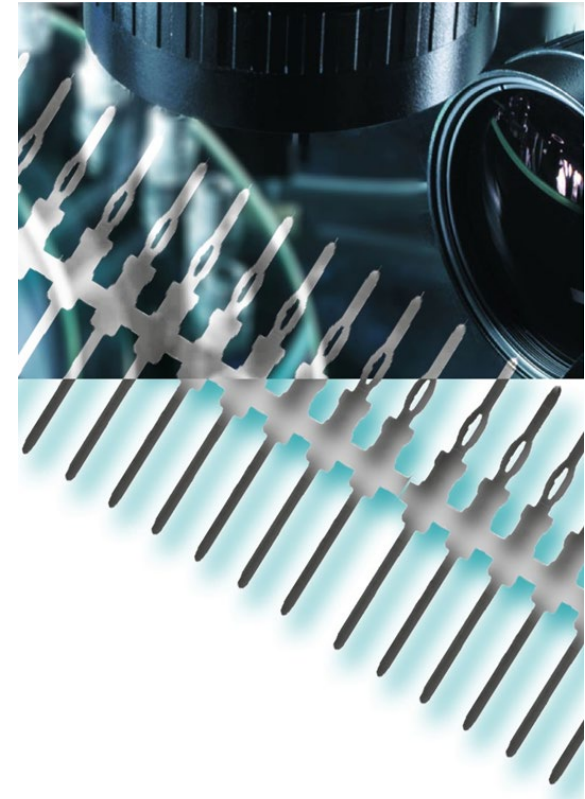
KLEINER QUALIFICATION

INSPECTIONS DURING PRODUCTION

- Deformation force test
- Gauge test
- Camera test 100%

SCOPE OF SAMPLING ELOPIN®

- Inspection for release (EMPB) and requalification effort
- Measurement of the press-in and press-out force in own or customer-provided test circuit boards
- Deformation force measurement
- Dimensional check
- Transverse and longitudinal cuts → Production of micrographs



OVERVIEW

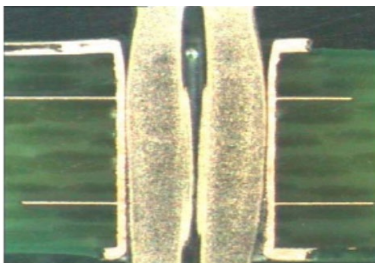


LONG SLIP

The deformation "c" of the conductor pattern of the through-metallized hole must not exceed 50 μm (TBS specification \leq conductor track thickness, but max. 40 μm^*).

Neither the metallization of the hole nor the conductor may have cracks "d". This also applies to the outer layers.

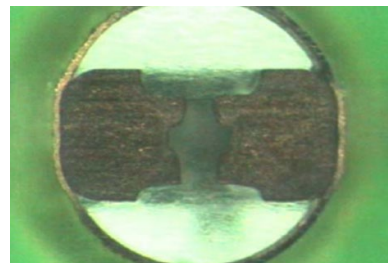
* According to SN 72225 (SIEMENS standard)



CROSS-SLIP

The deformation "a" of the outline of the hole for the through-metallized hole must not exceed 70 μm . (TBS specification = however \leq hole wall thickness*)

The smallest residual thickness "b" of the metallization must be at least 8 μm . (TBS specification \geq 15 μm^*). The metallization of the hole must not show any cracks. * According to SN 72225 (SIEMENS standard)



PRESS-IN / PRESS-OUT FORCE ACCORDING TO IEC 60352-5

During tool creation and requalification, the press-in / press-out force (per pin on the component) is determined and evaluated with various PCBs.

EXAMPLE: Cu/Sn coating
Cu/HAL coating
Customized (provided)
printed circuit boards

The test procedure is carried out in accordance with the specifications of DIN IEC 60352-5 (DIN EN 60352-5). The force specifications can be found in the respective drawings.



TECHNICAL DATA

EloPin®	04-06	06-10	08-145	08-16
Press-in force, max.	100 N	100 N	160 N	160 N
Press-in force, typical	20-60 (x1)	65 N	115 N	85 N
Ejection force, min.	20 N	30 N	40 N	50 N
Ejection force, typical	35-70 N (x1)	60 N	135 N	105 N
Contact resistance, max.	1 mOhm	1 mOhm	1 mOhm	1 mOhm
Contact resistance, typical	0,05 mOhm	0,05 mOhm	0,05 mOhm	0,05 mOhm
Current carrying capacity (x2)	not tested	approx. 8 A	approx. 25 A	approx. 25 A

x1: The large variation in the press-in/press-out force of the EloPin 04-06 is due to the relatively large end-hole tolerance of the PCB in relation to a relatively small press-in contact. The values stated refer to the maximum and minimum dimensions of the end hole.

x2: The current carrying capacity is highly dependent on the installation situation. The limiting factor is usually the printed circuit board. Further information is available on request.

KLEINER GmbH Stanztechnik

info@kleiner-gmbh.de | +49 7231 6072 0

Göppinger Str. 2-4 | 75179 Pforzheim | Germany

www.kleiner-gmbh.de

