PRESS-FIT TECHNOLOGY

A COST-EFFECTIVE ALTERNATIVE TO SOLDERING PROCESSES

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COMPLIANT PRESS-FIT TECHNOLOGY

BASIC TECHNOLOGY

Press-fit technology, which has been around for some 25 years now, is a solderless connection method. It consists in force fitting an oversized contact pin into the plated through hole of a printed circuit board (PCB). The high radial pressure produces a deformation, resulting in a gas-tight electrical connection of high quality.

This difference in pin cross section and hole diameter results in a deformation of either the PCB hole or the cross section of the pin during the insertion process of pin into PCB hole. There are two major types of press-fit sections:

A compliant pin which compresses as a result of insertion into the PCB through hole (Fig.A): With radial elasticity in the contact zone, the deformation takes place on the contact side.

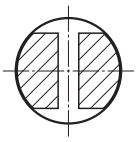


Fig.A: Cross-section compliant pin

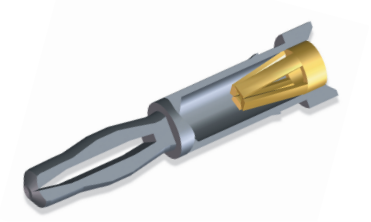
COMPLIANT PRESS-FIT TECHNOLOGY BY PRECI-DIP

We have been producing contacts, sockets and connectors with press-fit terminations for over ten years.

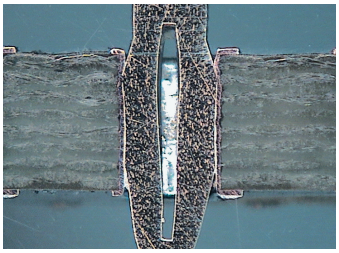
The specific design of our compliant pin is based on a «modified eye of a needle» principle with particular attention paid to material geometry, elasticity characteristics, and surface finish. Its main features are:

- Elastic deformation over the total range of the hole tolerance
- High retention force, in spite of the low insertion force (well below generally admitted maximum values)
- Gas-tight contact zone without any damage (chipping) to hole metallisation
- Low, constant electrical contact resistance
- Complies with IEC60352-5 standard

They are available for plated hole diameters of 0.6, 0.7, 0.9 and 1.0 mm, according to IEC standards. They are compatible with PCB finishes in tin, copper, or gold over nickel.



PRECI-DIP compliant press-fit pin based on a «modified eye of a needle» principle



Micrograph cross section of an inserted compliant pin

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TECHNICAL SPECIFICATIONS

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ADVANTAGES OF PRESS-FIT OVER SOLDER-BASED TECHNOLOGY

The basic advantages of press-fit technology are obvious, in particular when it comes to adding contacts or connectors to a soldered SMD board:

- Efficient, reliable and quick assembly of connectors, without any mounting accessories (screws, brackets, etc.)
- No soldering problems (such as thermal load on PCB and components, degassing, hole filling on multilayer, bridging, cold soldering joints...)
- No residues on PCB and connector contact area, affecting reliability
- Complete reparability (connectors can be easily exchanged)

Press-fit connections are easily added to an SMD board after reflow soldering of the components, as the hole metallisation is not affected by this process.

ASSEMBLY WITH THE PRINTED CIRCUIT BOARD

Assembly of press-fit connectors and sockets with the PCB requires only simple tooling which can be installed on a small press: a base plate with holes corresponding to the hole pattern of the PCB and an upper tool.

More sophisticated equipment (semi-automatic or automatic for volume production) is also available on the market.

RoHS COMPLIANCY

Exception No. 6 of Directive 2002/95/EC allows tin-lead plating for press-fit contacts.

GENERAL SPECIFICATIONS

OPERATING TEMPERATURE RANGE	-55 to +125 °C
PIN MATERIAL	Bronze CuSn4Pb4Zn4 (C54400)
PIN PLATING	Tin over Nickel
PRESS-FIT CHARACTERISTIC MEASURED ACC. TO IEC 60352-5 (SINGLE PIN)	
PRESS-IN FORCE	90 N max. (at min. hole diameter) / 65 N typ
PUSH-OUT FORCE	30 N min. (at max. hole diameter) / 50 N typ.
PUSH-OUT 3RD CYCLE	20 N min. (at max. hole diameter)

PCB HOLE SPECIFICATIONS: DIMENSIONS

NOMINAL HOLE DIAMETER	DIAMETER FINISHED HOLE	DIAMETER DRILLED HOLE
0.6 mm	0.6 +/- 0.05 mm	0.7 +/- 0.02 mm
0.7 mm	0.7 +0.07/-0.05 mm	0.8 +0.03/-0.02 mm
0.9 mm	0.9 +0.07/-0.05 mm	1.0 +/- 0.02 mm
1.0 mm	1.0 +0.09/-0.06 mm	1.15 +/- 0.025 mm

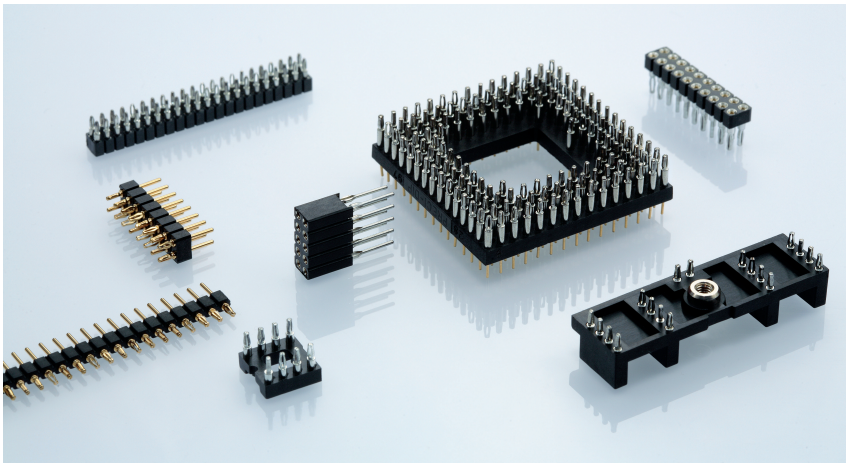
PCB HOLE SPECIFICATIONS: PLATING

PCB SURFACE FINISH	TIN	COPPER	GOLD OVER NICKEL
THICKNESS - COPPER	min. 25 µm	min. 25 µm	min. 25 µm
THICKNESS - TIN	5 - 15 µm	–	-
THICKNESS - NICKEL	–	–	2.5 - 5 µm
THICKNESS - GOLD	–	–	0.05 - 0.2 µm

... FROM OUR CATALOG

Socket and pin contacts with compliant press-fit terminations are currently available in our catalog as single contacts and for a multitude of sockets and connectors, in standard or customised versions, such as:

DIL SOCKETS	Pitch 2.54 mm (Series 146)
PGA SOCKETS	Interstitial or 2.54 mm grid (Series 546)
PCB CONNECTORS	
SOCKETS	Pitch 2 mm , standard or with polarization (Series 831-833) Pitch 2.54 mm with mating pin ø 0.47 mm (Series 346/356 and 801/803) Pitch 2.54 mm with mating pin ø 0.76 mm (Series 801/803)
PINS	Pitch 2.54 mm, connecting pin ø 0.47 mm (Series 356/456) Pitch 2.54, connecting pin ø 0.76 mm, standard or shrouded version (Series 800/802/804)



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