

PRESS-FIT ZONES

PART OF A SUCCESSFUL CONNECTION



HÄRTER PRESS-FIT TECHNOLOGY

HÄRTER press-fit zones are supplemented by the use of the EloPin®.

HÄRTER press-fit zones offer solderless connection technology to produce gas-tight and mechanically reliable electrical connections between printed circuit boards and metal contact elements.



HÄRTER press-fit zones

With the HÄRTER press-fit zones the HÄRTER Group offers an innovative, solderless connection technology for a wide variety of requirements worldwide. Not only in the automotive sector, but also throughout industry the trend to replace conventional soldering technology with press-fit technology is becoming ever more pronounced. The basis of a high level of process reliability are the punching tools constructed and produced in our

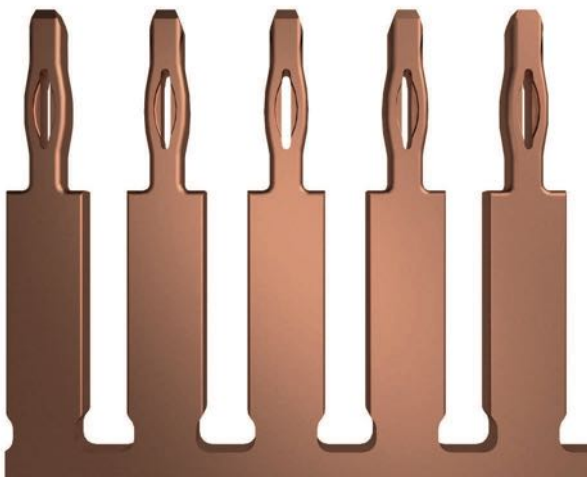
own tool production facility. In serial production, continuous process monitoring is carried out with state-of-the-art camera systems and 3D measuring machines. Other important components of our comprehensive quality concept are the control plans agreed with the customer and and HÄRTER Compliant Press-Fit Zone HCP and EloPin® HCP long-term studies (trend analyses) of selected features.

About press-fit technology

Press-fit technology is a special connection technique used to produce electrical connections without soldering. In this case, contact parts or entire assemblies are inserted with press-fit zones into metallised holes of a printed circuit board. Between the press-fit pin and the

hole wall, a gas-tight and very conductive contact is created. The press-fit pin must have a larger diagonal than the hole diameter of the circuit board. The inserted pin and the printed circuit board creates a gas-tight and mechanically reliable electrical connection.

Advantages of press-fit technology compared to conventional soldering technology



- no soldering errors, no flux problems
- high level of reliability
- no additional washing required
- no thermal stresses on the printed circuit board and the electronic components
- quick and cost-effective assembly of the printed circuit board
- two-sided loading of the printed circuit board
- recycling possible through simple pressing out

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HÄRTER Compliant Press-Fit Zone HCP and EloPin® - HCP

We currently manufacture our flexible press-fit zones, „HÄRTER Compliant Press-Fit Zones - HCP“ in material thicknesses of 0.6 mm and 0.8 mm, and the „EloPIN® - HCP“ in material thicknesses of 0.4 mm, 0.6mm and 0.8mm. Further versions are planned. Depending on the requirements for the operating temperature and the electrical conductivity, different materials are used. The „HÄRTER and EloPIN® Compliant Press-Fit Zones“ can be used in printed circuit boards with plated-throughholes according to the new IPC 9797 standard for press-fit

zones, and according to DIN EN 60352-5, as well as in accordance with customer specifications.

Our „HÄRTER press-fit product management system“ supports our customers from the manufacture of the prototypes through to series production. Prior to series production sample parts featuring HÄRTER press-fit zones can be produced in series production quality on existing tools in our own prototype manufacturing facility, and the prototypes can be matched to customer requirements.



HCP TYPE	HCP 06-10	HCP 06-20	HCP 06-25	HCP 08-10	HCP 08-20
Material thickness	0,6 mm	0,6 mm	0,6 mm	0,8 mm	0,8 mm
PCB end hole	1,0 mm	1,0 mm	1,00 mm	1,45 mm	1,45 mm



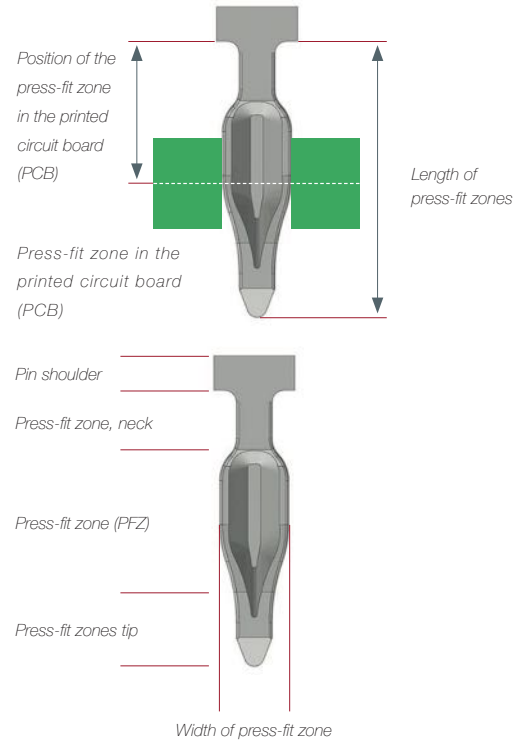
HCP TYPE	EloPIN® 04-10 HCP	EloPIN® 06-30 HCP	EloPIN® 08-30 HCP	EloPIN® 08-40 HCP	HCP 06-AB	HCP 08-AB
Material thickness	0,4 mm	0,6 mm	0,8 mm	0,8 mm	0,6 mm	0,8 mm
PCB end hole	0,6 mm	1,0 mm	1,45 mm	1,60 mm	1,0 mm	1,45 mm

Certification of the press-fit connection

In our press-fit zone laboratory we can do all the main-tests for evaluating the press-fit connection. The laboratory operates according to the rules specified in the new IPC 9797 standard for press-fit zones, and the rules in DIN EN 60352-5 as well as according to customer specifications. The scope of testing, the procedures and the parameters to be used are agreed with the customer depending on the application. The vibration and noxious gas tests are carried out with the aid of external partners.

The following tests can be carried out in our laboratory:

- Visual and dimensional testing
- Press-in and push-out force
- Micro-sectioning (including analysis)
- Contact resistance
- Rapid temperature changes (thermal shock)
- Climatic sequence (dry heat, cold, humid heat on cyclical basis)
- Whisker test



Type of press-fit zone	Press-in force F_{in}^*	Push-out force F_{out}^{**}	Width of press-fit zone	Length of press-fit zone
HCP 06-10	$\leq 120 \text{ N}$	$\geq 40 \text{ N}$	$\geq 1,2 \text{ mm}$	$\geq 4,0 \text{ mm}$
HCP 08-10	$\leq 160 \text{ N}$	$\geq 50 \text{ N}$	$\geq 1,6 \text{ mm}$	$\geq 4,4 \text{ mm}$
HCP 06-AB	$\leq 120 \text{ N}$	$\geq 40 \text{ N}$	$\geq 1,3 \text{ mm}$	$\geq 3,4 \text{ mm}$
HCP 08-AB	$\leq 160 \text{ N}$	$\geq 50 \text{ N}$	$\geq 1,7 \text{ mm}$	$\geq 4,7 \text{ mm}$
EloPIN [®] 04-10 HCP	$\leq 65 \text{ N}$	$\geq 20 \text{ N}$	$\geq \varnothing 0,7 \text{ mm}$	$\geq 2,1 \text{ mm}$
EloPIN [®] 06-30 HCP	$\leq 100 \text{ N}$	$\geq 30 \text{ N}$	$\geq \varnothing 1,24 \text{ mm}$	$\geq 3,5 \text{ mm}$
EloPIN [®] 08-30 HCP	$\leq 160 \text{ N}$	$\geq 40 \text{ N}$	$\geq \varnothing 1,67 \text{ mm}$	$\geq 4,15 \text{ mm}$
EloPIN [®] 08-40 HCP	$\leq 160 \text{ N}$	$\geq 50 \text{ N}$	$\geq \varnothing 2,0 \text{ mm}$	$\geq 4,15 \text{ mm}$

Depending on the design of the printed circuit board, the sleeve structure, the press-fit contact and the process parameters, the specific values may vary and differ from the guide values.

* in the case of PCB thickness $\geq 1.6 \text{ mm}$ ** after $\geq 24 \text{ hrs.}$ (following storage at room temperature)



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