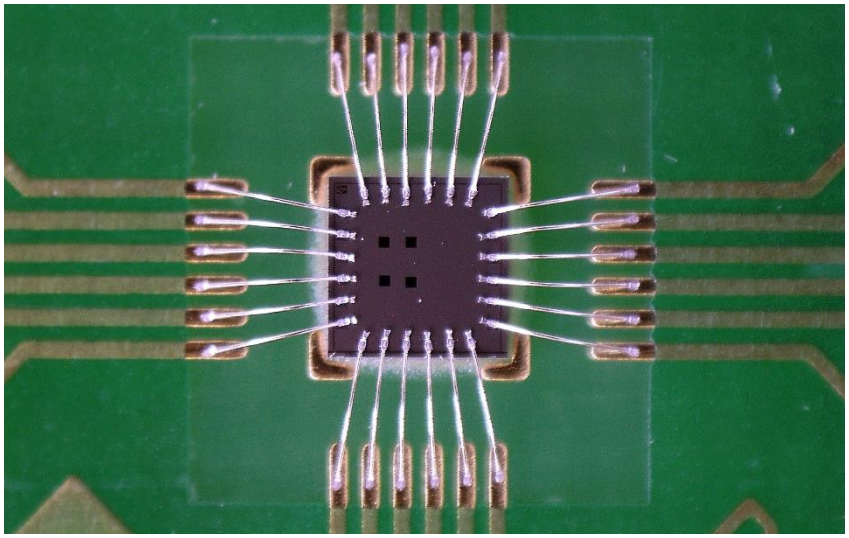
TPT HB10 wire bonder guidelines

Wires and bonding techniques available at CMi

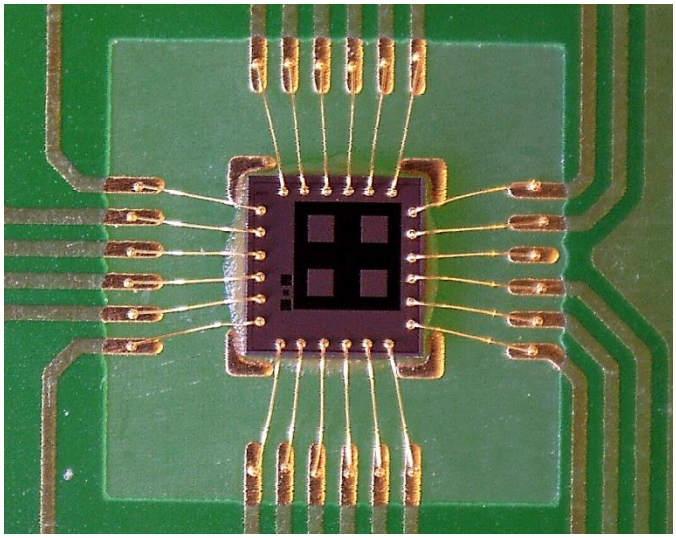
- Aluminum wire 17.5um and 33um. Wedge-wedge bonding only.
- Gold wire 20um and 25um. Wedge-wedge bonding and ball-wedge bonding.

In ball bonding, a ball is at first created at the apex of the wire by a spark from an “electronic flame off”. Because of this, electrically sensitive samples should not be bonded with this technique! The ball then deforms on the pads and intermetallic bond occurs when force and temperature, or force and ultrasonic energy, are applied.

Wedge bonding deforms the wire into a flat elongated shape of a wedge that bonds to pads through pressure and ultrasonic energy. The absence of the ball for wedge bonding allows for finer pitch. However, the shape of a wedge, in comparison to the shape of a ball, limits the orientation of the wiring.



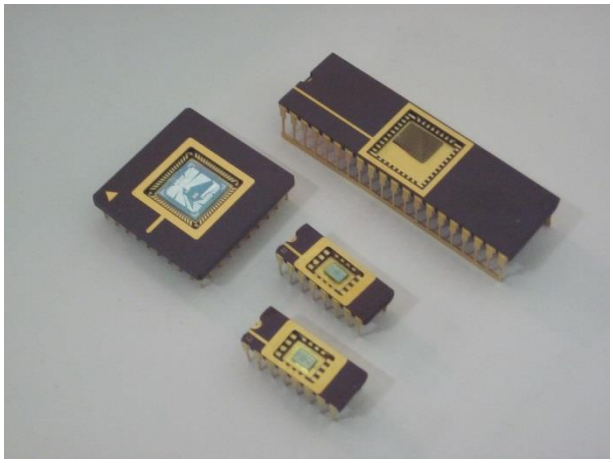
Aluminum wedge bonding



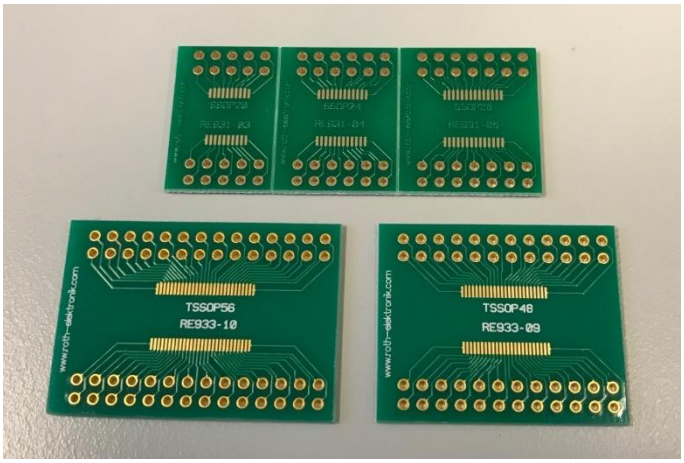
Gold ball bonding

Die attach: sample gluing onto the wiring support

Prior to bonding, the sample is attached to a wiring support that can either be a ceramic package or an epoxy based PCB board. In any case, the pads of the support must be gold. No other materials, such as copper or tin, are compatible with the CMi wire-bonding machine.



Examples of standard ceramic package

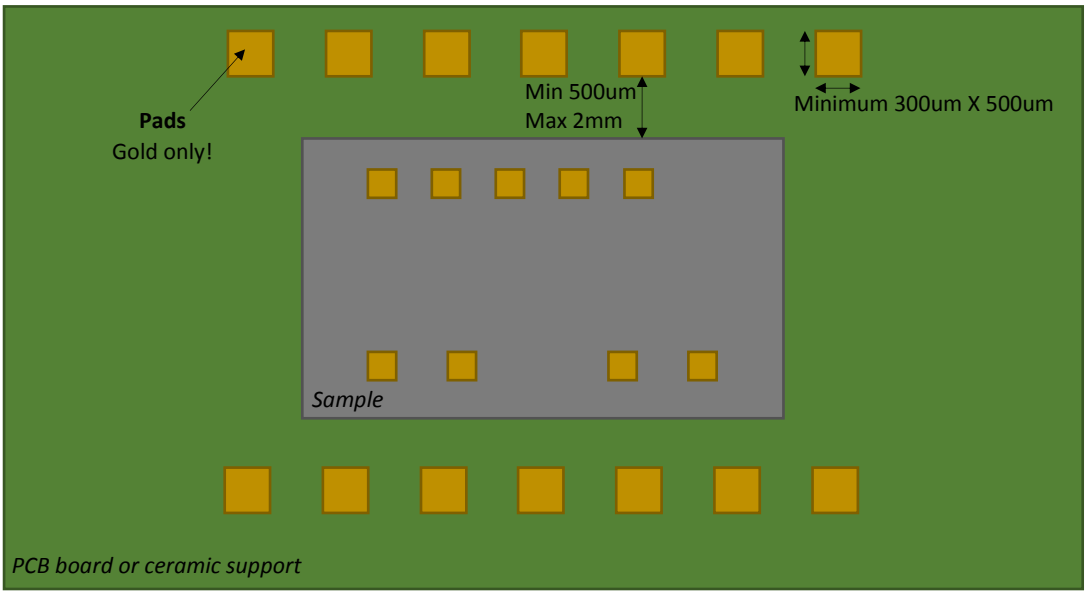


Examples of standard epoxy PCB boards

Epoxy gluing available at CMi are:

Product	**H20E-FC** Epoxy	**H70E** Epoxy
Characteristics	Electrically conductive	Electrically insulating
	Thermally conductive	Thermally conductive
Curing time/temp	45min @ 80°C	1h30min @ 80°C
or	15min @ 120°C	15min @ 120°C
or	5min @ 150°C	5min @150°C

In order to ease the manual positioning of the sample on the support, and also in order to avoid having too long bonding wires afterwards, a 500um minimum to 2mm maximum distance should be respected between the edge of the sample and the edges of the pads on the support (see image next page).



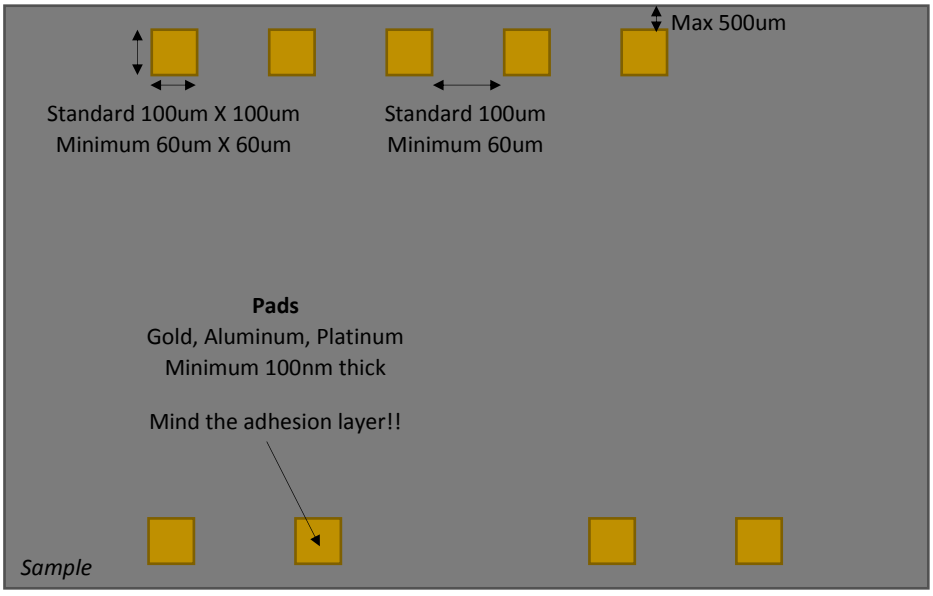
Wiring support: pads material and dimensions

Sample: design and material of the pads

For proper adhesion of the bonding and appropriate wiring result, it is important to work with specific materials and correct design of pads.

At CMi, standard materials for the pads are gold, aluminum or platinum with specific titanium or chromium adhesion layers. The thickness of the pads cannot be less than 100nm.
CMi does not guarantee results for thinner pads and/or for other materials.

Standard dimensions for the pads are 100umX100um with a 100um spacing. All these dimensions can be reduced to 60um for smaller pitch, but not more. Smaller dimensions will not be compatible with the CMi wire-bonding machine. The pads should be aligned as a single line on the edge of the sample.



Sample: pads material and dimensions

Maximum allowed distance from pads to the edge of the chip is 500um. Longer distance requires higher bonding loop (in order to avoid touching the edge of the chip) that is not compatible with the CMi wire-bonding machine. Long bonding distance also means less appropriate results in terms of wiring rigidity. Risks of wires touching each-others (i.e. short-cuts) will increase with their length.

Glob-top encapsulation

Product	**H70E-2** Epoxy
Characteristics	Thermally conductive
	Electrically insulating
Curing time/temp	1h30min @ 80°C
or	15min @ 120°C
or	5min @ 150°C