

Choice of Suitable Tip Style

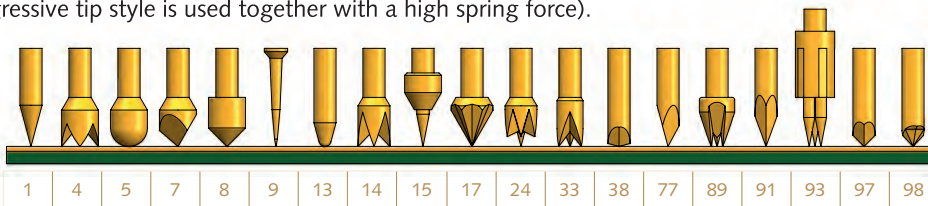
The choice of suitable tip style is one of the most important factors in choosing the right test probe. Many of the tip styles can be used for several applications. A basic classification can be made with respect to the geometry of the test points, such as pad, via, pin or posts. Furthermore, the test point can be differentiated by its size and surface condition

(oxidised, clean or contaminated by residue from the soldering process).

Depending on the DUT and test conditions, it may be necessary to try several tips styles and spring forces in order to find an optimal combination.

PADs

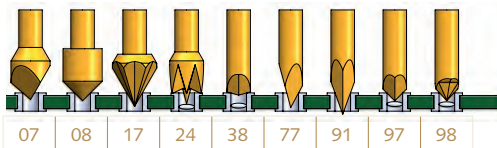
Contacting of flat test points on PCBs: To ensure the penetration of OSP or contaminated surfaces (residue from the soldering process), aggressive, self-cleaning tip styles (e.g., tip style 91: dagger) are recommended. Passive tip styles are used for clean surfaces and to avoid puncturing the surface (e.g., tip style 05, bullet-nosed). Note: In order to avoid damaging multi-layered PCBs, the penetration depth of the tip style in the external layer must be observed (especially when an aggressive tip style is used together with a high spring force).



Most commonly used tip styles

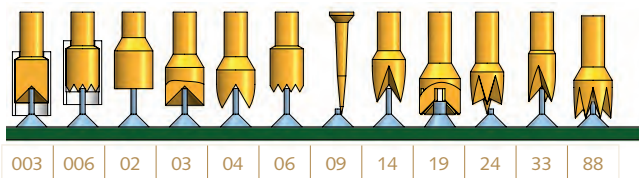
VIAs

Vias can be contacted using the edge of a tip style on the inner surface of the ring, or with the point of a crown tip style vertically on the surface of the via.



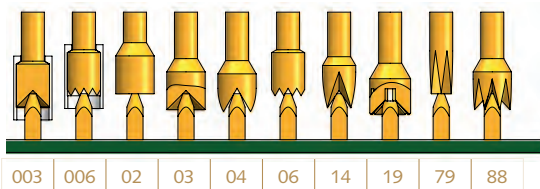
PINs

An optimally-centred inverse cone tip style is recommended for pins and component pins. Flat, pointed and tip styles with outer insulation are also possible for these kinds of test points.



POSTS, screws and bolts

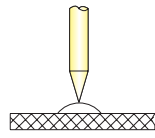
Self-centering tip styles, similar to those used for pins can be used for these kinds of test points



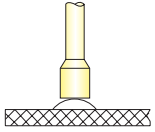
Tip style number	Contact point					Tip style			
	PAD	VIA	PIN	POSTS	clean	contaminated	passive	aggressive	self-cleaning
003			x	x	x		x		
006			x	x	x	x		x	
01	x				x	x		x	x
02			x	x	x		x		
03			x	x	x		x		
04	x		x	x	x	x		x	
05	x				x		x		
06			x	x	x	x		x	
07	x	x			x	x		x	x
08	x	x			x	x	x	x	x
09	x		x		x	x		x	x
13	x				x		x		
14	x		x	x	x	x		x	x
15	x				x	x		x	x
17	x	x			x	x		x	x
19			x	x	x	x	x	x	x
24	x	x	x		x	x		x	x
33	x		x		x	x		x	x
38	x	x			x	x		x	x
77	x	x			x	x		x	x
79				x	x	x	x	x	
88			x	x	x	x		x	x
89	x				x	x		x	x
91	x	x			x	x		x	x
93	x				x	x		x	
97	x	x			x	x		x	x
98	x	x			x	x		x	x

Detailed description of tip styles on the following pages.

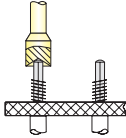
Tip Styles Overview



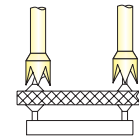
Tip Style 01 (self-cleaning 30° needle tip)
Commonly used, moderately aggressive tip for test pads.



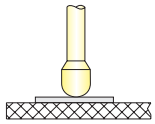
Tip Style 02 (flat)
Very passive tip, for contacting clean test points such as test pads which should not be punctured, as well as connector and plug-in card terminals.



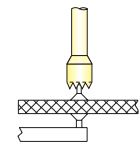
Tip Style 03 (inverse cone)
Commonly used tip for contacting connector pins and wire-wrap posts.



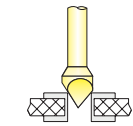
Tip Style 04 (standard 4-point crown)
One of the most commonly used tips for contacting component pins. Not recommended for unwashed PC boards, as contamination and clogging of solder-resin in the throat of the crown can occur.



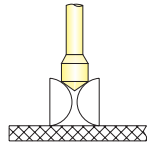
Tip Style 05 (bullet-nosed)
Most popular passive tip style for contacting clean test points such as test pads and even PCB tracks.



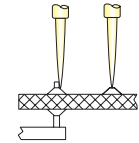
Tip Style 06 (serrated)
Universal tip style for contacting practically all types of pins including connectors, wire-wrap posts, component pins, and so on.



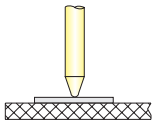
Tip Style 07 (90° 3-edged chisel)
Most common tip style for contacting both plated open vias and test pads, and is increasingly used instead tip style 01. Also used as interface probe tip in conjunction with an INGUN contact terminal (shown on page 70) for the INGUN VIN test fixtures.



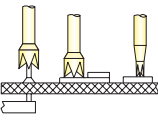
Tip Style 08 (self-cleaning 90° conical)
Used for contacting plated open vias, especially when damage to the contacting area must be avoided. Also suitable for contacting mullet-point and plug-in connectors together with low spring-forces.



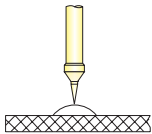
Tip Style 09 (self-cleaning flexi-needle)
Universal tip style for contacting practically all types of test points, except for plated open vias. Offers a high level of stability combined with flexibility. Often chosen for contaminated, unwashed PC boards.



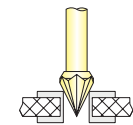
Tip Style 13 (30° rounded tip)
Rather passive tip, commonly used for test pads which must not be punctured. Also suitable for contacting PCB tracks.



Tip Style 14 (self-cleaning 4-point crown)
Most commonly used for contacting component pins, the modified 04 crown self-cleaning design prevents clogging of solder-resin in the throat of the crown.



Tip Style 15 (22° self-cleaning high-carbon tip - pressed in)
Extremely aggressive tip which offers a high degree of contact stability while providing exceptional resistance to wear.

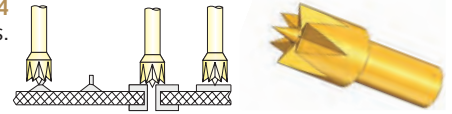


Tip Style 17 (self-cleaning hexagonal)
The six knife-shaped edges centre the tip when contacting plated open vias. Design features of this tip are similar to tip style 07, but it is much more aggressive.

(self-cleaning slotted inverse cone) **Tip Style 19**
 With this modified design of the tip style 03 an aggressive contacting contour in the centre is created by applying cross grooves. Subsequently, a maximum of contacting reliability is achieved when contacting component pins and wire-wrap posts.



(self-cleaning 6-point crown with higher middle point) **Tip Style 24**
 Universally used for practically all test points.



(self-cleaning 3-point crown) **Tip Style 33**
 A modified version of the 4-point self-cleaning crown (tip style 14), manufactured with ground flanks, which creates a more aggressive tip. Can be used both for component pins as well as test pads.



(self-cleaning 150° dagger) **Tip Style 38**
 Comparable with tip styles 97 and 98, however with even flatter tip angle, for contacting open vias and pads.



(3-edged dagger) **Tip Style 77**
 Universally used for plated open vias. Similar characteristics as tip style 91 (dagger), however with three contacting edges instead of two. More stable tip, but therefore less aggressive.



(self-cleaning hexagonal flat spade) **Tip Style 79**
 Multiblade tip style with self cleaning function.



(self-cleaning 8-point crown) **Tip Style 88**
 Self-cleaning crown with centring feature. Suitable for contaminated component pins.



(self-cleaning 3-point crown) **Tip Style 89**
 Recommended for unwashed PC boards. The unique shape of the steel tips ensures that any contaminating particles migrate away from the contacting zone around the points.



(self-cleaning dagger) **Tip Style 91**
 Universally used and by far the most popular tip style. Very aggressive thus suitable not only for plated open vias but also test pads.



(3 x 22° tri-needle, pressed-in steel points) **Tip Style 93**
 The three very aggressive HSS tips make this tip ideal for contacting unwashed PC boards and other challenging test demands.



(self-cleaning 90° 4-edged dagger) **Tip Style 97**
 A modified version of the standard dagger (tip style 91), also for universal use. Designed for plated open vias which are closed with sealing lacquer.



(self-cleaning 90° hexagonal dagger) **Tip Style 98**
 Comparable with tip style 97, also used for contacting open vias, which are closed with sealing lacquer.



(serrated, with insulated outer \varnothing) **Tip Style 006**
 Standard serrated tip with higher-set outer nylon ring, designed for component presence check. The designation "0" denotes nylon material, the designation 06 denotes the inner tip style (example: 006 230 A).

