ViaSampling System

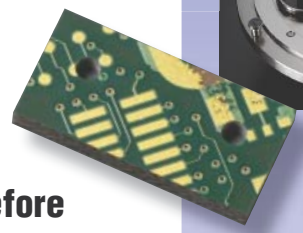
Struers

Automated PCB coupon preparation system, for 100 µm microvias

Modular, upgradeable system

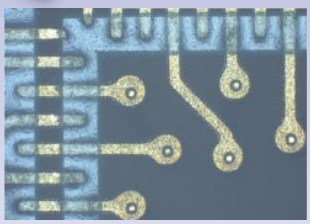
ViaSampler

ViaKit – sample preparation toolbox



Struers ViaSampling System takes board quality inspection to another level. Extract coupons from anywhere on production panels, more precisely and faster than ever before

- Custom designed for the PCB Industry
- Representative samples from most board types, rigid and flex
- No blocking of production routers, no lost samples
- Guaranteed, repeatable results
- High-precision preparation of microvias down to 100 µm
- System precision better than ± 20 µm



ViaSampler: Fully automatic, low-impact coupon extraction from anywhere on the board

ViaKit: High-precision preparation of up to 36 coupons at a time

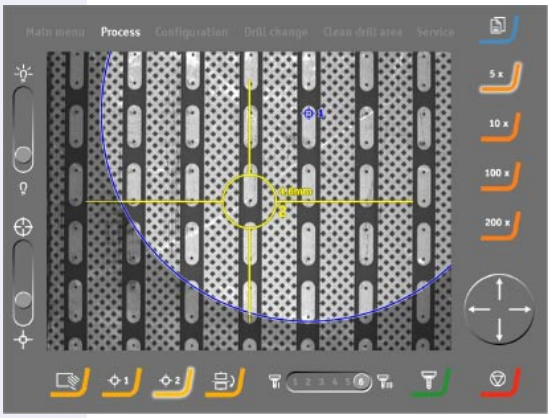
ViaFix: Fast curing, 2-component acrylic resin for vias and microvias

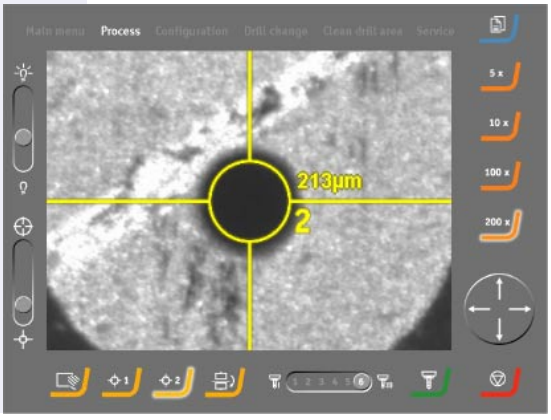
According to leading industry standards, the quality of a PCB plated through-hole has to be inspected metallographically. For this purpose a test coupon is produced and prepared so the exact centre of the plated through-holes can be inspected in a microscope.
With the advent of HDI technology and microvias, board inspection has become a complex task. The coupon preparation process consists of a long series of steps, each adding to the challenge of maintaining system precision. Struers ViaSampling System takes up the challenge and will not only increase precision, but also your productivity.

ViaSampler - automated coupon extraction
ViaSampler is a dedicated coupon extraction station with a precision router-cutter (milling tool) for drilling two positioning holes and extracting 10 x 20 mm test coupons. Drilling and routing is carried out automatically in one operation, so no tool change is necessary. With its advanced vision system, ViaSampler allows quick and accurate pin-pointing of test coupons. The large routing table allows you to extract coupons from the entire board, providing you with increased flexibility – and more representative coupons.

Application range
ViaSampler has a wide application range and can be used for both HDI and standard boards (unmounted), rigid and flex (adapter provided) type.

Vias to be inspected are first pointed out at low magnification (5 or 10 x). Here shown in 5 x mag.





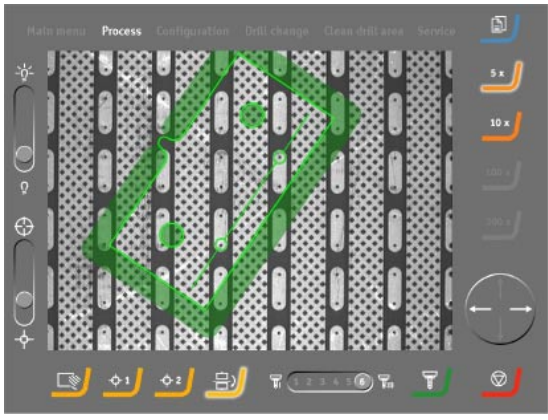
.. and – if necessary – at very high magnification (100 or 200 x). Here shown in 200 x mag.

ViaSampler handles boards with a thickness up to 6 mm and dimensions up to 635 mm x 635 mm (25" x 25").

Flexible positioning
With the large routing table, you are no longer limited to inspecting coupons from the edge of the board, since ViaSampler allows coupon extraction from anywhere on the board. After visual positioning of the coupon, you can flip it or slide it sideways to optimize the location. This extraordinary feature minimizes the number of damaged customer panels.

Pin-pointing to perfection
Using the intuitive touch-screen interface, even microvias are precisely pin-pointed at an on-screen magnification of up to 200 times.
The **AutoTrack** feature allows the routing table to follow your on-screen movements and automatically track the new position. This makes it much easier and faster to pin-point accurately.
Use the adjustable cross-hairs to determine the actual diameter of the via to be inspected.

Dust removal
During the process some milling dust is produced. ViaSampler is prepared for easy connection to an external exhaust system. Dust is efficiently removed during coupon extraction and improves the working environment.



After pin-pointing the two inspection vias, an outline of the finished coupon is displayed on screen. Prior to extraction, optimize coupon location by flipping it or sliding it sideways.

ViaKit - Coupon preparation toolkit

Struers has developed a toolkit, ViaKit, which makes your coupon preparation process much easier. ViaKit is designed to be used with the ViaSampler and includes all you need for pinning, mounting and preparing coupons:

ViaInserter – combined pin inserter and mount extractor
The precise positioning of the pins is essential for a good preparation result. ViaInserter provides accurate positioning of up to 6 coupons on one set of pins allowing high precision preparation of up to 36 coupons at a time.
The ViaInserter can also be used as a mount extractor – a dual-function that makes it easy to unmount the samples and avoid damages to the mounting ring.

ViaInserter – for pin insertion and mount extraction

ViaMount – Precision mould with tear-off end cap

ViaHolder – Specimen holder with calibration-free diamond stops

ViaMount – precision mould with tear-off end cap
The stainless steel moulds, ViaMount, keep the sample 100% dimensionally stable during preparation. ViaMount has a special lining, for easy un-mounting of the mounts. ViaMount has a tear-off end cap that is removed after curing.
The lower part of the mould stays on the sample after curing and locks the sample onto the sample holder. This ensures precision and increases the general ease-of-use.

ViaHolder – with calibration-free diamond stops
A special specimen holder, ViaHolder, has been designed for the grinding/polishing stage. ViaHolder can hold up to 6 samples, enabling preparation of up to 36 coupons at a time.

The factory-calibrated diamond stops ensure full control of material removal and do not wear, not even on grinding discs with diamonds, providing calibration-free preparation. The simple, pre-defined preparation process ensures well-defined removal through an easy 3-step method, to which additional steps may be added at will.

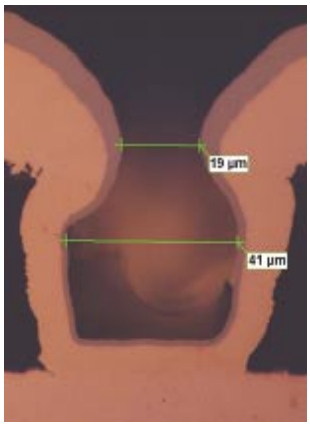
ViaHolder is equipped with the same coupling as Struers' other sample holders, providing seamless integration with Struers' ø300 mm grinder/polishers.

TegraSystem – Table-top grinder/polisher suitable for use with ViaKit

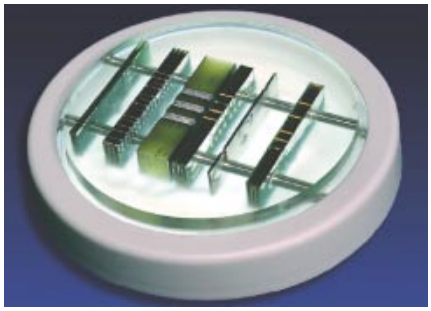
ViaFix
Fully cured samples in less than 30 minutes

Struers has developed a 2-component, acrylic resin with short curing time, ViaFix, which is especially well-suited for vias and microvias. The resin produces sample mounts of high hardness and density and high-quality edge retention.

For optimum results, ViaFix is cured under pressure. It has a short curing time at room temperature and can be used for all types of fragile and porous specimens. Due to its low viscosity, it is ideal for filling microscopic holes, voids and cracks in e.g. printed circuit boards.



Detail of microvia

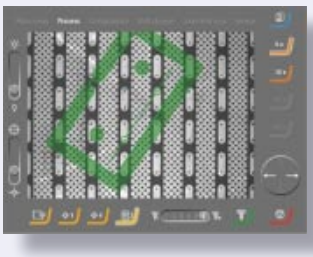


PCB coupons mounted in ViaFix

Using the ViaSampling System

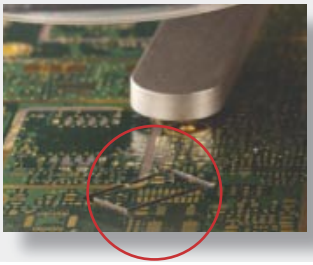
Coupon extraction and preparation in a few, simple steps

1



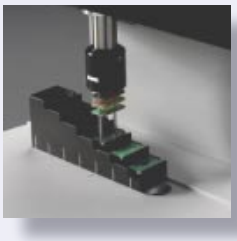
Point out
ViaSampler:
At high magnification pinpoint the area to be inspected

2



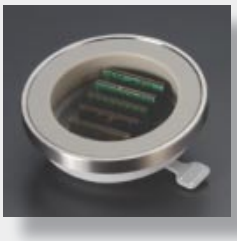
Extract
ViaSampler:
Drill holes for positioning pins, and extract coupon

3



Pin
ViaKit:
Precisely pin up to 6 coupons on two positioning pins

4



Mount
ViaKit + ViaFix:
Mount pinned coupons in fast curing resin

5

Uncover
ViaKit:
Tear off the end cap

6

Unmount
ViaKit:
Extract the mount from the mould

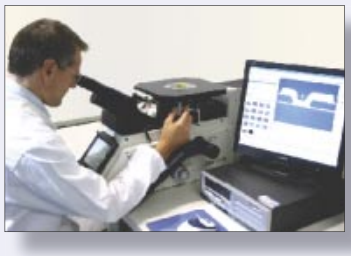
7

Attach
ViaKit:
Click-on the mounts to the base of the sample holder

8

Grind/polish
ViaKit + Grinder/Polisher:
Use automatic grinder/polisher for sample preparation

9



Inspect
Inspect the coupon under microscope

Automatic Struers grinder/polishers recommended for use with the ViaSampling System:
TegraSystem and AbraPol-10
Please refer to separate brochures for details.

TECHNICAL DATA

ViaSampling System

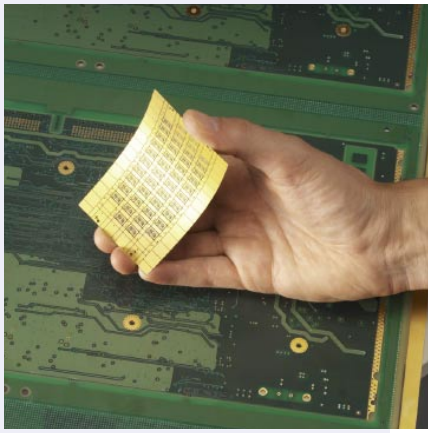
System precision	Better than ± 20 µm at 20ºC / 68ºF ± 3ºC / 5.4ºF
Routing table	
Width	600 mm / 23.6"
Depth	575 mm / 22.6"
Board capacity	
Max.	635 x 635 mm / 25 x 25"
Min. without clamping plate	170 x 70 mm / 6.7 x 2.7"
Min. with clamping plate*	80 x 80 mm / 3.1 x 3.1"
Thickness*	0.5-6 mm
Routing tool	
Type	Up-cut chipbreaker with fishtail
Size	Ø1.98 mm / 0.078" +5 µm/-0 µm
Shaft diameter	Ø3.175 mm / 0.125"
Speed	16,000 rpm.

*Smaller formats require support and/or lamination

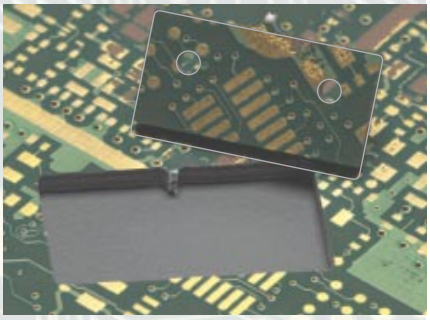
PC requirements	
Type	Intel® Pentium 3, 1.5 GHZ minimum
OS	Microsoft® Windows® 2000 or Windows XP
Graphics	XGA (analog, 15 pin D-sub connector) 4 MB (or more), 32-bit PCI graphics card with at least a 256-color palette for 1024x768 32-bit true colour RGB display. DDI-compatible PCI graphics card is recommended.
Ports	One free RS232C (COM1 to COM4 useable) One free USB 1.1
Additional slots	One free full height PCI slot on the motherboard (for video capture card, included with ViaSampler. Video card dimensions: 10.7 x 17.5 cm / 4.2" x 17.5").
Software and controls	
Software	PC/Microsoft® Windows® based (not included)
Controls	Touch screen and/or mouse
Display	15" LCD, 800 x 600 dots
Supply	
Voltage /frequency	200-240V / 50-60Hz
Power inlet	1-phase (N+L+PE) or 2-phase (L1+L2+PE) The electrical installation must comply with "Installation Category II"
Power, nominal load	180 W (excl. PC)
Power, idle	28 W (excl. PC)
Current, nominal	0.9 A (excl. PC)
Current, maximum	1.3 A (excl. PC)
Power outlet	Switched 200-240V / 50-60Hz (Same as input) Max. 4A
Air extraction	Ø32 mm / 1¼"
Air extraction, min airflow	130 m³ / 4591 ft³ per hour
Noise levels	
Routing 1.6 mm / 0.06" PCB, at distance 1.0 m / 39.4" from machine with vacuum	81 dB (A)
Working environment	
Temperature	5-40º C / 41-104º F. Must be calibrated at a temperature close to daily use temperature. Max. difference ± 3ºC / 5.4ºF
Humidity	0-95% RH
Safety standards	
EU-directives	98/37/EEC - Safety of Machinery 73/23/EEC - Low Voltage Directive 89/336/EEC, 92/31/EEC - EMC Directive
Standards	EN292-1:1991, EN292-2:1991/A1:1995, EN418:1992, EN1050:1996, EN954-1:1996, EN60204-1:1997, EN50081-1:1992, EN50082-1:1997, NFPA70:2002, FCC 47 CFR Part 15 Class A.
Dimensions and weight	
Width (± monitor)	600/880 mm / 23.6/34.6"
Depth	750 mm / 29.5"
Height	700 mm / 27.5"
Weight	95 kg / 209 lbs.

SPECIFICATIONS

	Cat. no.	Code
ViaSampler Routing station for extraction of PCB test coupons, incl. 2 router-cutters. PC necessary, but not included. Video capture card included.	05716127	VIASA
Router-Cutter Router-cutter tool for ViaSampler.	40300077	VIARO
ViaKit Toolkit for preparation of PCB coupons, complete with pin inserter (VIAIN), specimen holder (VIAHO), mounting rings (VIARI), end caps (VIACO), positioning pins (VIAPI), silicone oil (SILIC), and cleaning tool (VIATO)	05726101	VIAKI
ViaKit Basic Toolkit for preparation of PCB coupons, complete with AccuStop specimen holder (ASTIF), pin inserter (VIAIN), mounting cups with flange (MAXMI), positioning pins (VIAPI)	05726102	VIABA
ViaInserter For insertion of two positioning pins in up to 6 coupons	05726901	VIAIN
ViaHolder Adjustable precision specimen holder with diamond stops. For up to 6 x 6 PCB coupons.	05726903	VIAHO
ViaKit Mounting Rings Stainless steel precision mould with non-stick lining. For use with ViaKit End Caps (VIACO). 6 pcs.	40300055	VIARI
ViaKit End Cap End caps for use ViaKit Mounting Rings (VIARI). 250 pcs.	40300056	VIACO
ViaKit Positioning Pins Positioning pins, 1.98 mm dia., length 43 mm. 500 pcs.	40300057	VIAPI
ViaKit Cleaning Tool Cleaning tool for ViaKit Mounting Rings (VIARI)	40300075	VIATO
Silicone oil Silicone release agent	40300076	SILIC



ViaKit Basic
Entry-level coupon preparation toolkit



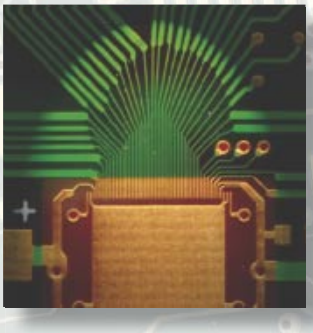
Struers also offers ViaKit Basic, which is designed for preparation of fewer coupons - and still provides all the advantages of ViaKit.

ViaKit Basic uses an AccuStop specimen holder to ensure precisely controlled material removal. Around the outside of the holder there is an adjustment ring with a wear-resistant ceramic base. The holder can be relocated in relation to the adjusting ring so that grinding will stop at a preset depth in the specimen.

AccuStop

Using ViaInserter, up to 6 coupons are pinned at a time, mounted in Struers' ø40 mm Flangeform, and inserted into the AccuStop.

The preparation process can be automated by using a specimen mover plate (PEDAF/PEDAC) and a specimen mover (TEF05), where up to three AccuStop 40 can be accommodated simultaneously.



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ISO 9001

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