ViaSampling System

Struers

**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

- Guaranteed, repeatable results - no lost samples

- High-precision preparation of microvias down to 100 µm

- System precision better than ± 20 µm

- Reduce preparation costs to a minimum

- Continuous routing feature for highest productivity

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

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

ViaKit Basic: Entry-level coupon preparation toolkit.
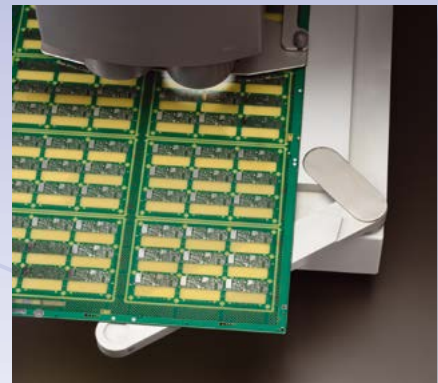
Support arm

ViaHolder for precision preparation of single mounts

*Design your own coupon format -with or without positioning holes*

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 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 test coupons. Drilling and routing are 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.
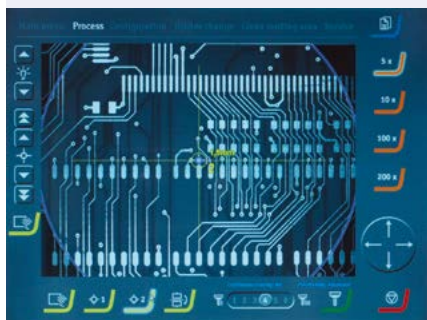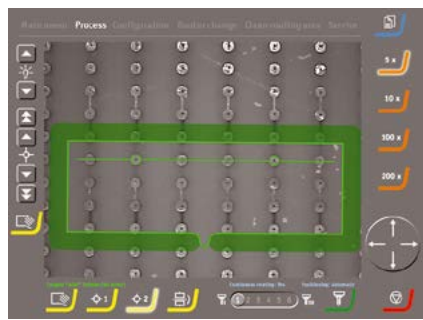
Application range

ViaSampler has a wide application range and can be used for both HDI and standard boards (unmounted), rigid and flex type. 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.
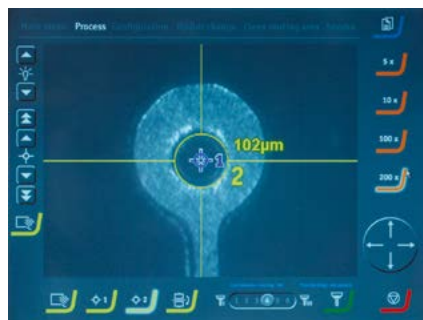
Pin-pointing to perfection

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 crosshairs to determine the actual diameter of the via to be inspected.

Continuous routing

This feature lets you extract multiple coupons from a panel - in a single process. Minimizing the machine operations between coupons, valuable time is saved. After completing one coupon, the router

keeps spinning and the safety hood stays in its lower position, while a new coupon location is identified.

Flexible coupon size

Extract the standard 10x20 mm coupon size for automatic grinding and polishing with the ViaKit, or design the coupon according to your requirements - with or without positioning holes.
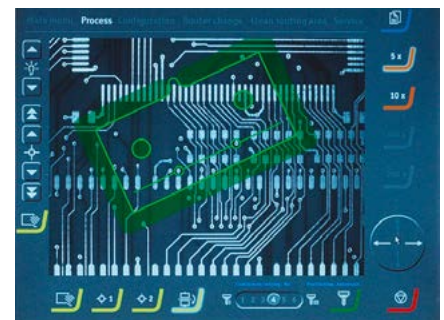
Manual Positioning

For less demanding non-microvias, use the fast Manual Positioning mode: Position the panel in relation to an on-screen crosshair, clamp and extract the coupon.

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.

Manual Positioning

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.

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.

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 unmounting 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.
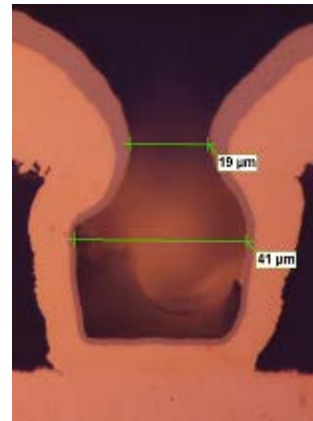
Detail of microvia

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

Remote diagnostics and software updates

ViaSampling System can be connected to a Local Area Network and can thus be accessed via the Internet. This enables Struers service engineers to remotely check the condition of ViaSampling System and detect any errors. Possible software updates can also be carried out remotely, reducing machine downtime to an absolute minimum.
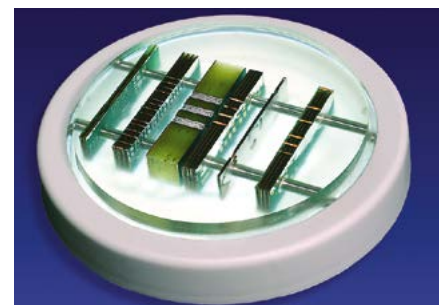
ViaInserter – For pin insertion and mount extraction

ViaHolder – Specimen holder with calibration-free diamond stops

ViaMount – Precision mould with tear-off end cap

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

Mounted PCB coupons

Using the ViaSampling System
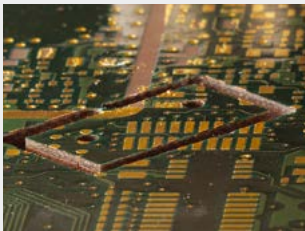## Coupon extraction and preparation in a few, simple steps

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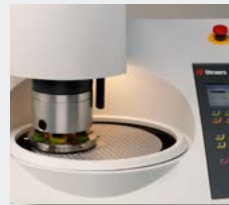
8 **Grind/polish**
ViaKit + Grinder/Polisher:
Use automatic grinder/polisher
for sample preparation

9 **Inspect**
Inspect the coupon
under microscope

Automatic Struers grinder/polishers
recommended for use with the
ViaSampling System:
Tegramin and AbraPol-20
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.*	80 x 80 mm / 3.1 x 3.1"
Thickness*	0.5-6 mm / 0.0197"- 0.2755"

*Smaller formats may require support and/or lamination

Routing tool
Type	Up-cut chipbreaker with fishtail
Size	Ø1.96 / Ø1.97 / Ø1.98 mm / 0.0771" / 0.0775" / 0.0779" +5 µm/-0 µm
Shaft diameter	Ø3.175 mm / 0.125"
Speed	16,000 rpm.

PC platform, Software and controls
Dedicated PC	Industrial PC (delivered with the ViaSampling System)
Software	Microsoft ® Windows ® Embedded Standard
Controls	Touchscreen and/or mouse
Display	15" Touchscreen
Options	Struers Remote Service

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

Dimensions and weight
Width (± monitor)	600 / 882 mm / 23.6/34.7"
Depth	750 mm / 29.5"
Height	710 mm / 28"
Weight	136 kg / 300 lbs

Struers' equipment is in conformity with the provisions of the applicable International Directives and their appurtenant Standards. (Please contact your local supplier for details).

SPECIFICATIONS

	Cat. no.
ViaSampler Routing station for extraction of PCB test coupons. Industrial PC with video capture card and 3 router-cutters included.	05716128
Router-Cutter Router-cutter tool for ViaSampler, 1.98 mm dia.	40300077
Router-cutter tool for ViaSampler, 1.96 mm dia.	40300078
Router-cutter tool for ViaSampler, 1.97 mm dia.	40300079
ViaKit Toolkit for preparation of PCB coupons, complete with pin inserter (05726901), specimen holder (05726903), mounting rings (40300055), end caps (40300056), positioning pins (40300057), silicone oil (40300076), and cleaning tool (40300075)	05726101
ViaKit Basic Toolkit for preparation of PCB coupons, complete with ViaHolder Single Sample specimen holder (05726905), Pin inserter (05726901), Mounting rings (40300055), End caps (40300056), Positioning pins (40300057), Silicone oil (40300076), and Cleaning tool (40300075).	05726103
ViaInserter For insertion of two positioning pins in up to 6 coupons	05726901
ViaHolder Adjustable precision specimen holder with diamond stops. For up to 6 x 6 PCB coupons.	05726903
ViaHolder Single Sample Adjustable precision specimen holder with diamond stops. For up to 6 coupons in a single mount.	05726905
ViaKit Mounting Rings Stainless steel precision mould with non-stick lining. For use with ViaKit End Caps (40300056). 6 pcs.	40300055
ViaKit End Cap End caps for use ViaKit Mounting Rings (40300055). 250 pcs.	40300056
ViaKit Positioning Pins Positioning pins, 1.98 mm dia., length 43 mm. 500 pcs.	40300057
ViaKit Cleaning Tool Cleaning tool for ViaKit Mounting Rings (40300055)	40300075
Silicone oil Silicone release agent	40300076
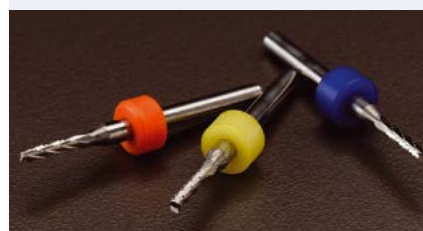
High precision Router-cutter for ViaSampler

ViaKit Basic
Entry-level coupon preparation toolkit
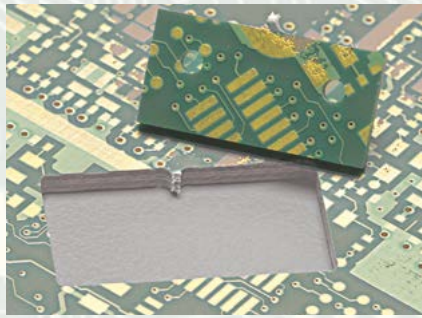
Struers also offers ViaKit Basic, which is designed for preparation of fewer coupons - and still provides all the advantages of ViaKit.
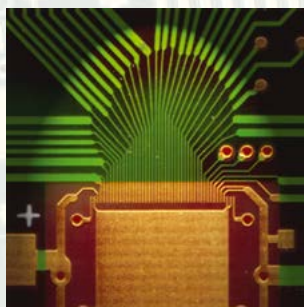
ViaKit Basic is centered around ViaHolder Single Sample with 5 diamond stops. The stops accurately control material removal in steps of 50 μm.

Both versions of the ViaHolder use the following methodology: The coupons are prepared in 3 simple steps - A, B and C, plane grinding, fine grinding and polishing. Intermediate steps can be added at will.

Using ViaInserter, up to 6 coupons are pinned at a time, mounted in Struers' Mounting Rings, and precision polished in ViaHolder Single Sample.

Controlled removal in steps of 50 μm