

# TargetSystem



**Automatic target preparation to both visible and hidden targets - without losing samples**

**Modular, upgradable system**



*TargetMaster micropolisher with TargetDoser dosing system*

- Automatic preparation, cleaning and measuring
- Cross-sectioning and parallel polishing of mounted/unmounted samples
- Real-time alignment of visible (external) and hidden (internal) targets
- On-board laser measuring system\* provides  $\pm 5 \mu\text{m}$  system accuracy
- IPS, Intelligent Preparation System  
IPS database with removal rates for grinding and polishing surfaces  
Automatic re-calculation of removal rate and time
- Very simple operation

#### ***Your benefits:***

- No samples lost
- Drastically reduced preparation time (< 30 minutes)
- No dependency on operator skills
- Full reproducibility

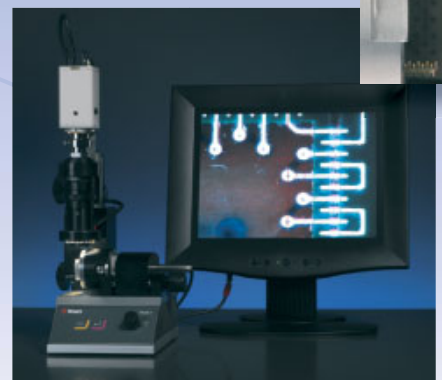
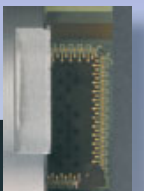
\*) International patent application pending

*BGA as seen using TargetX with x-ray*



*TargetX option for hidden targets e.g. BGA solder balls on mounted PCB*

*Microvias as seen using TargetZ*



*TargetZ option for visible targets e.g. microvias*

# System components

With a system accuracy of  $\pm 5 \mu\text{m}$ , TargetSystem is for target and other high accuracy preparation in R&D or failure analysis (FA) labs. Typical application areas are microelectronics, delayering and FA where fine cracks are to be inspected. The individual components of the system can be combined in several ways, according to requirements.

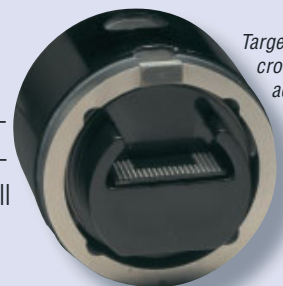


The heart of TargetSystem is the **TargetMaster**, a 200 mm micro-polisher with a closed polishing chamber to safeguard both preparation quality and operator. Removal at initial preparation step(s) is controlled by an electronic measuring system, for rapid approach to target. A second, in-line laser measuring system handles the demanding polishing steps. TargetMaster can be used either stand-alone or with one of the two set-up stations, TargetZ/-X.



**TargetDoser** is an automatic dosing station, providing preparation methods and process liquids to TargetMaster. TargetDoser comes with 7 pumps and 10 pre-programmed methods, and accommodates 200 user-defined methods.

**TargetGrip** is a tiltable specimen holder dedicated to TargetMaster. It accommodates mounted samples up to 40 mm diameter. Adapters are provided for larger specimens (TARIN), cross-sectioning (TARSC) and parallel polishing (TARPA), as well as a 40 mm to 25 mm adapter (TARAD), which serves as SEM mount, too.



TargetGrip with cross-section adapter (TA)



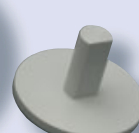
Parallel holder, (TARPA)



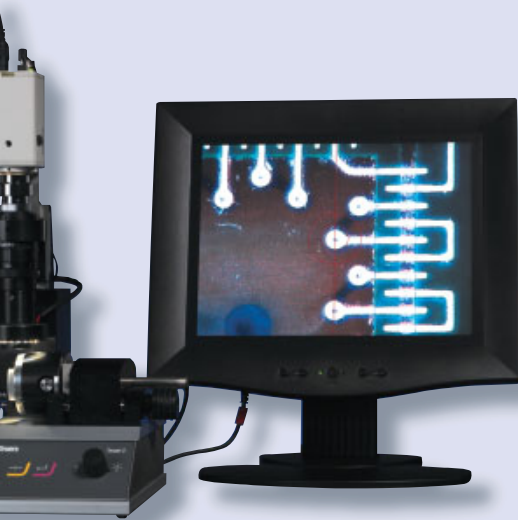
Adapter for ø40 - ø25 mm, (TARAD)



Mount insert ø40 mm, (TARIN)



# Preparation modes

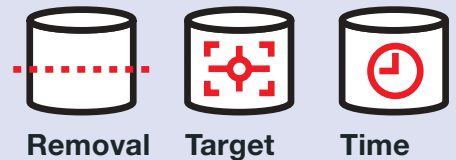


**TargetZ** is used for aligning and measuring specimens with visible (external) targets. With a powerful vision system of up to 680x magnification and its 15" TFT monitor, TargetZ makes it a simple task to map and align even minute targets.



**TargetX** is for hidden (internal) targets, and comprises a set-up station and a console. The set-up station is placed in the users x-ray (not included) and is operated from the external console, permitting real-time alignment and measuring.

TargetMaster offers three preparation modes, which can be used separately or in combination.

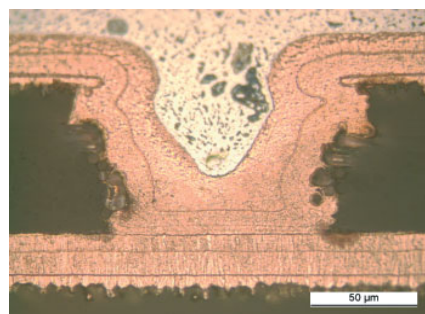


If e.g. consecutive layers of a specimen are inspected on a regular basis, **Removal mode** will take you to each of the layers with an accuracy of  $\pm 5$  microns – and automatically stop when it is there.

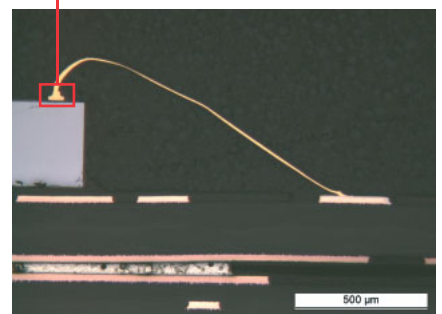
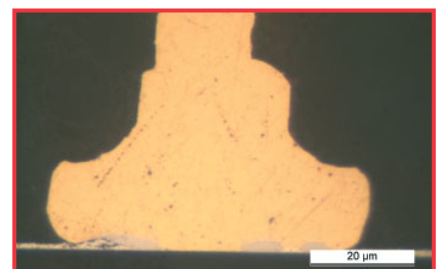
TargetSystem does away with manual target polishing, which is particularly wasteful when microscopic targets of e.g. microelectronic components are subjects of a preparation. Here TargetMaster and its **Target mode** is used in combination with a set-up station, TargetX or TargetZ. The type of set-up station is selected depending on whether hidden (internal) or visible (external) targets on a specimen are to be inspected.

Using TargetX with an x-ray device, the hidden (internal) target of your sample can be aligned in real-time and the target value (distance to target) measured. If, instead, visible (external) targets are the typical subject of inspection, TargetZ is the choice. With its powerful vision system even minute targets are precisely aligned and measured.

**Time mode** is for timed preparation, used e.g. at oxide polishing, and for manually controlled removal.



Microvia under BGA solder ball



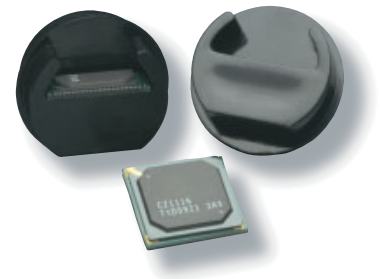
Overview and detail with 20 µm dia. Au-wirebond

## Two measuring systems

TargetMaster removal is controlled by two separate measuring systems. Grinding steps and removal until 175  $\mu\text{m}$  from target (re diagram) are controlled by an electronic measuring system, which continuously measures distance to target. In this fashion, the major part of the target distance is covered as quickly as possible.

Polishing steps and removal below 175  $\mu\text{m}$  (re diagram) are handled by a laser measuring system. The system uses a unique, relative measuring technique enabling a remarkable  $\pm 5 \mu\text{m}$  system accuracy.

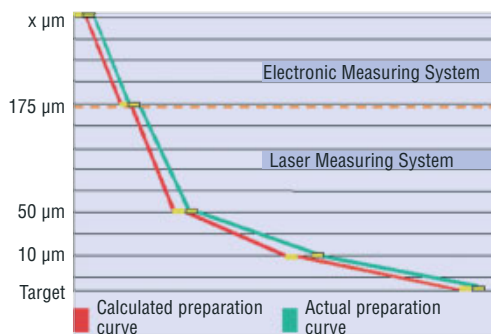
## IPS, Intelligent Preparation System



TargetMaster features a system, IPS, which automatically adapts removal time and rate according to actual properties of specimen and grinding/polishing surface. In effect, fewer measurements are necessary, meaning shorter preparation times.

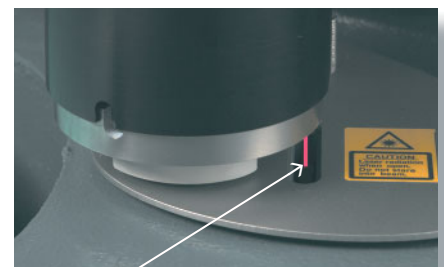
Before preparation starts, the sample height is measured and IPS calculates removal time for each of the steps (re below graph, in red). The removal times are based on the selected preparation method and base values. The base values are theoretical, conservative removal values for grinding and polishing surfaces, which are stored in the IPS database of TargetMaster.

Using the base values, preparation starts. After gaining experience with the properties of sample and surface, preparation stops and the actual amount of removed material is determined. On this basis, the actual removal rate for the first part of the step is calculated. The new, actual removal rate is then used for the remaining part of the step and so on (re graph, in green).



### IPS, How it Works

- Accuracy is secured by using relative laser measuring
- Removal rate at first part of any step originates from built-in database (base values)
- Process is interrupted, laser measurement made, and removal rate + time re-calculated
- Remaining step at new removal rate



On-board laser measuring system provides  $\pm 5 \mu\text{m}$  system accuracy



TECHNICAL DATA	
<b>TargetSystem</b>	
System accuracy	± 5 µm at 20°C / 68°F ± 2°C / 4°F.
<b>TargetMaster micropolisher</b>	
Diameter	200 mm / 8"
Speed, turntable	40 - 300 rpm in steps of 10 rpm
Speed, specimen holder	20 - 150 rpm in steps of 10 rpm
Force	10 - 75 N in steps of 5 N
Rotational direction	CW / CCW
Motor power	250 W / 0.33 HP
<i>Software and electronics</i>	
Controls	Touch pads
Memory	FLASH-ROM / RAM / NV-RAM
LC display	240 x 128 dots with back light
<i>Safety standards</i>	
EU-directives	98/37/EEC – Safety of Machinery 73/23/EEC – Low Voltage Directive 89/336EEC, 92/31/EEC – EMC Directive
Standards	EN292-1, EN292-2, EN1050, EN60204-1 (IEC204-1), EN61010-1 (+A2 ), NFPA 70, UL3101-1, CAN-CSA 22.2 No. 1010.010-030, EN50081-1, EN50082-1, EN61326-1 (+A1), FCC 47 CFR Part 15 Class A, AS/NZS 2064.1/2
<i>Noise levels</i>	
During preparation	54 dB (A)
During cleaning	72 dB (A)
<i>Working environment</i>	
Temperature	5-40°C / 41-104°F.
Humidity	35-50% RH
<i>Supply</i>	
Voltage / frequency	200-240 V / 50-60 Hz
Power inlet	1-phase (N+L1+PE) or 2-phase (L1+L2+PE) The electrical installation must comply with "Installation Category II".
Power, nominal load	700 W
Power, idle	16 W
Current, nom.	3.5 A
Current, max.	6.9 A
Pressure for tap water	1-10 bar / 14.5-145 psi
Water inlet	1/2" or 3/4"
Water outlet	ø 32 mm / 1 1/4"
Compressed air supply	ø 6 mm / 1/4"
Compressed air pressure	6-10 bar / 87-145 psi
Compressed air quality	In compliance with ISO 8573-1, 5.6.4
Air extraction	ø 32 mm / 1 1/4"
Air extraction, min. airflow	30 m³ / 1059 ft³ per hour
<i>Dimensions and weight</i>	
Width	820 mm / 32.3"
Depth	860 mm / 33.9"
Height	595 mm / 23.4"
Weight	115 kg / 253.5 lbs
<b>TargetGrip tiltable specimen holder</b>	
Specimen sizes	ø 40 mm or ø 25 mm with adapter (TARAD)
Cross-sectioning	Sample Chair, adapter for cross-sectioning (TARSC), max sample size 27x13 mm
Parallel polishing	Parallel Holder, adapter for parallel polishing (TARPA), max sample size 23x23 mm
Tilt range	± 5 degrees
Specimen holder dia.	58 mm
Weight	0.58 kg / 1.27 lb

<b>TargetDoser automatic dosing station</b>	
Capacity	4 pumps for suspension/lubricant, 1 pump for OP-suspension, 1 pump for soap, 1 pump for alcohol
<i>Dosing Levels</i>	
Suspensions	0.2-4.0 ml in 20 steps
All-in-one suspensions	0.2-12.0 ml in 20 steps
Lubricants	0.2-12.0 ml in 20 steps
OP-Suspensions	20.0-90.0 ml in 20 steps
<i>Software and electronics</i>	
Controls	Touch pads
Memory	FLASH-ROM / RAM / NV-RAM
LC display	240x128 dots with back light
<i>Network connection</i>	
Struers LAN Module	Option
<i>Safety standards</i>	
EU-directives	98/37/EEC – Safety of Machinery 73/23/EEC – Low Voltage Directive 89/336EEC, 92/31/EEC – EMC Directive
Standards	EN292-1, EN292-2, EN1050, EN60204-1 (IEC204-1), EN61010-1, EN50081-1, EN50082-1, UL3101-1, CAN-CSA 22.2 No.1010.010-30, FCC Part 15 Class A
<i>Working environment</i>	
Temperature	5-40°C / 41-104°F.
Humidity	35-50% RH
<i>Supply</i>	
Voltage	24 V DC, 1 A supplied from TargetMaster
<i>Dimensions and weight</i>	
Width	200 mm / 8"
Depth excl. bottle tray	210 mm / 8.3"
Depth incl. bottle tray	550 mm / 21.7"
Height	380 mm / 15"
Weight excl. bottle tray	8.5 kg / 18.7 lbs
Weight incl. bottle tray	10.0 kg / 22.0 lbs
<b>TargetX set-up station for hidden (internal) targets</b>	
<i>Software and electronics</i>	
Controls	Touch pads
Memory	FLASH-ROM / RAM / NV-RAM
<i>Safety standards</i>	
EU-directives	98/37/EEC – Safety of Machinery 73/23/EEC – Low Voltage Directive 89/336EEC, 92/31/EEC – EMC Directive
Standards	EN292-1, EN292-2, EN1050, EN60204-1 (IEC204-1), EN61010-1, EN50081-1, EN50082-1, UL3101-1, CAN-CSA 22.2 No.1010.010-30, FCC Part 15 Class A
<i>Working environment</i>	
Temperature	5-40°C / 41-104°F.
Humidity	35-50% RH
<i>Supply</i>	
Voltage / frequency	200-240V / 50-60 Hz
Power inlet	1-phase (N+L1+PE) or 2-phase (L1+L2+PE) The electrical installation must comply with "Installation Category II".
Power, nominal load	50 W
Power, idle	10 W
Current, nom.	0.25 A
Current, max.	1.0 A
<i>Dimensions and weight</i>	
Width	705 mm / 27.7"
Depth	385 mm / 15.1"
Height	285 mm / 11.2"
Weight	13 kg / 28.6 lbs



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TargetZ set-up station for visible (external) targets			
Software and electronics			
Controls	Touch pads		
Video display	15" TFT monitor		
Safety standards			
EU-directives	98/37/EEC – Safety of Machinery 73/23/EEC – Low Voltage Directive 89/336EEC, 92/31/EEC – EMC Directive		
Standards	EN292-1, EN292-2, EN1050, EN60204-1 (IEC204-1), EN61010-1, EN50081-1, EN50082-1, UL3101-1, CAN-CSA 22.2 No.1010.010-30, FCC Part 15 Class A		
Working environment			
Temperature	5-40°C / 41-104°F.		
Humidity	35-50% RH		
Supply			
Voltage	24 V DC, 1 A supplied from TargetMaster		
Video monitor	200-240V / 50-60 Hz		
Dimensions and weight			
Width	235 mm / 9.3"		
Depth	315 mm / 12.4"		
Height	205 mm / 8.1"		
Weight	15 kg / 33 lbs		
SPECIFICATIONS		Cat.no.	Code
TargetMaster 200 mm micropolisher for automatic target preparation. Specimen holder (TARGR) and adapter (TARAD) included. Dosing system (TARDO) are ordered separately.		05756127	TARMA
TargetGrip Tiltable specimen holder for 40 mm dia. specimens.		05756901	TARGR
TargetDoser Automatic dosing system for supply and storage of process liquids and preparation methods. With 6 pumps for suspension/lubricant, 1 pump for OP-suspension.		05756904	TARDO
TargetX Set-up station for internal (hidden) targets. For use with x-ray not included with TargetX.		05756903	TARXX
TargetZ Set-up station for external (visible) targets. With 15" TFT video monitor.		05756902	TARZZ
Struers LAN Module Network adapter and software for LAN connection.		05626101	TEGLA
Adapter Adapter for TargetGrip, ø40 mm to ø 25 mm dia. Also used as removable SEM mount.		05756905	TARAD
Sample chair Adapter for cross-sectioning (disposable). Max specimen size 27 x 20,5 mm. 50 pcs.		05756908	TARSC
Parallel holder Adapter for parallel polishing (re-usable). Max specimen size 23 x 23 mm.		05756910	TARPA
Resin barrier Metal label for use with Sample chair (TARSC). 50 pcs.		05756907	TARLA
Mould Insert ø40 Mould insert for use with ø40 mm mount cups. 50 pcs		05756912	TARIN

*Struers' products are subject to constant product development.  
Therefore, we reserve the right to introduce changes in our products without notice.*