

2019

Phone

Tel: +1 408 982-9108

Web

www.h-square.com

info@h-square.com

Address

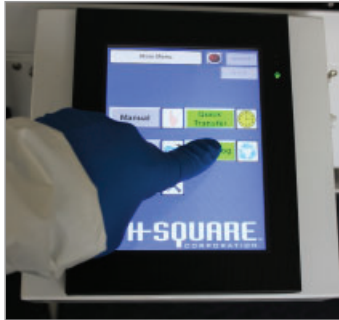
3100 Patrick Henry Drive
Santa Clara, California
95054 United States

H-SQUARETM

C O R P O R A T I O N

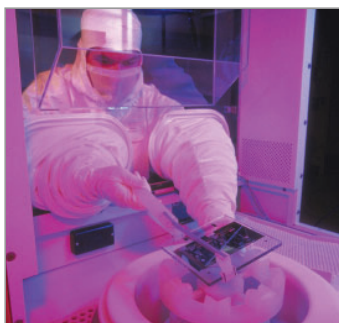
products

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H-Square Corporation is a world leading equipment supplier supporting the semiconductor industry, Opto/LED, MEMS, flat panel display, photo-voltaic, hard disk drive and medical electronics industries. For 44 years, the core activity is to design, manufacture and distribute leading-edge substrate handling products installed in cleanroom facilities throughout the world.

H-Square's philosophy has always been to provide products of unsurpassed quality developed with the highest degree of engineering excellence and manufactured with craftsman-like workmanship.



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With home-grown highly configurable components, H-Square Automation offers advanced handling solutions for wafer sorting, loading, tracking, packing and inspection applications. These fully robotic wafer handling systems are available in a variety of wafer sizes (76-300mm), thickness (50-1600µm), materials (silicon, glass, compound or other fragile wafers), and cassette and tooling configurations. These products support lot tracking (barcode, OCR, 2D-Matrix) and fab level protocol communication (SECS/GEM).

Advanced components like SoftTouch edge-grip robot end-effectors, vortex / Bernoulli SoftTouch end-effectors, advanced standard and thin wafer pre-aligners, SCARA robots, macro inspection tilt stations, EFEM load ports, and SMIF load ports allow H-Square Automation to provide cost-effective, turn-key solutions for the most complex automation requirements.

ST Series



Wafer Sorter / EFEM H-Square Automation

Automated wafer transfer tools are critical to any wafer fabrication or material handling facility as they eliminate the manual handling of wafers and allow fab operators both to track each wafer throughout the manufacturing process and to completely eliminate any risk of damage and particle contamination. H-Square Automation offers a complete line of options and wafer sizes. Please contact us for more information.

Ordering Part Number

300mm Loadport+200mm	ST-12-2
300mm+200mm	ST-12-4
200mm SMIF	ST-09-4
200mm	ST-08-2
200mm SMIF+150mm	ST-07-4
150mm	ST-06-2
100mm	ST-04-2
76mm	ST-03-2

PK Series



Wafer Packer H-Square Automation

The semiconductor industry manufactures silicon wafers that need to be sorted, documented and packed (or unpacked) for shipment to different manufacturing facilities – front-end, back-end, or external customers. A wafer pack-out sorter automatically sorts, packs and unpacks silicon wafers, without damage, with complete traceability.

Ordering Part Number

300mm	PK-12-2
200mm SMIF	PK-09-2
200mm	PK-08-2
150mm	PK-06-2
100mm	PK-04-2
76mm	PK-03-2

Visit www.h-square.com for additional product information

Microscope Loader

LD Series

H-Square Automation

A wafer inspection loader automatically transfers silicon and compound semiconductor wafers from the cassette to the microscope stage for inspection. The microscope loader allows fab operators to track each wafer throughout the manufacturing process and to inspect the wafer three ways - wafer ID verification, macro inspection and micro inspection, while completely eliminating any risk of damage and particle contamination.

Ordering Part Number

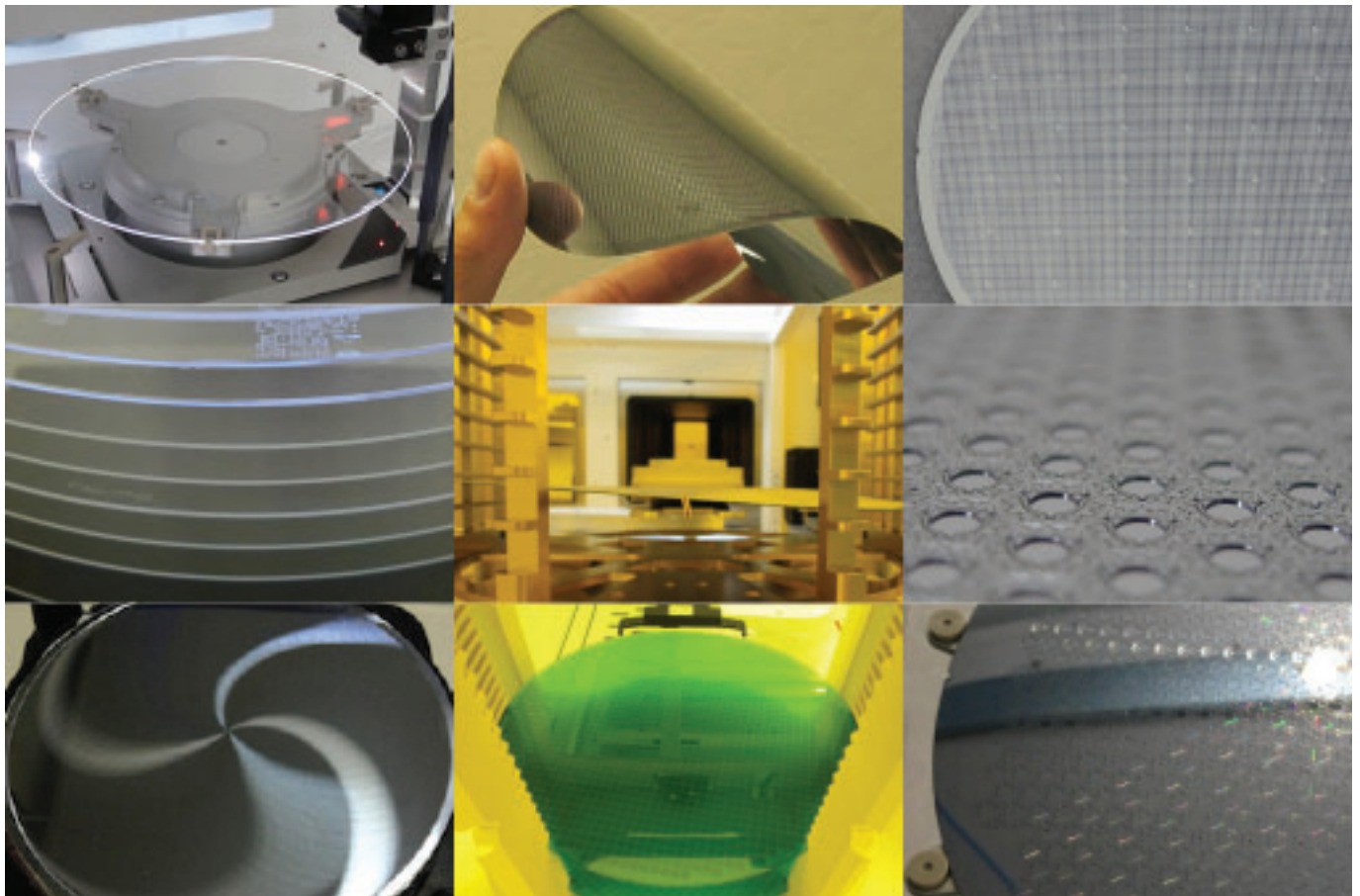
300mm	LD-12-1
200mm SMIF	LD-09-1
200mm	LD-08-1
150mm	LD-06-1
100mm	LD-04-1
76mm	LD-03-1



The SoftTouch Advantage

By integrating the SoftTouch mechanism in place of the industry standard pneumatic edge-grip method, the automation overcomes any potential problems associated with special wafer handling such as sideways shifting or rotation. H-Square Automation's SoftTouch offers an advantage in handling unique or fragile wafer types:

- Thin Wafers
- Compound Wafers
- Transparent Wafers
- Taiko Wafers
- Warped Wafers
- Bonded Wafers
- Perforated Wafers
- ...

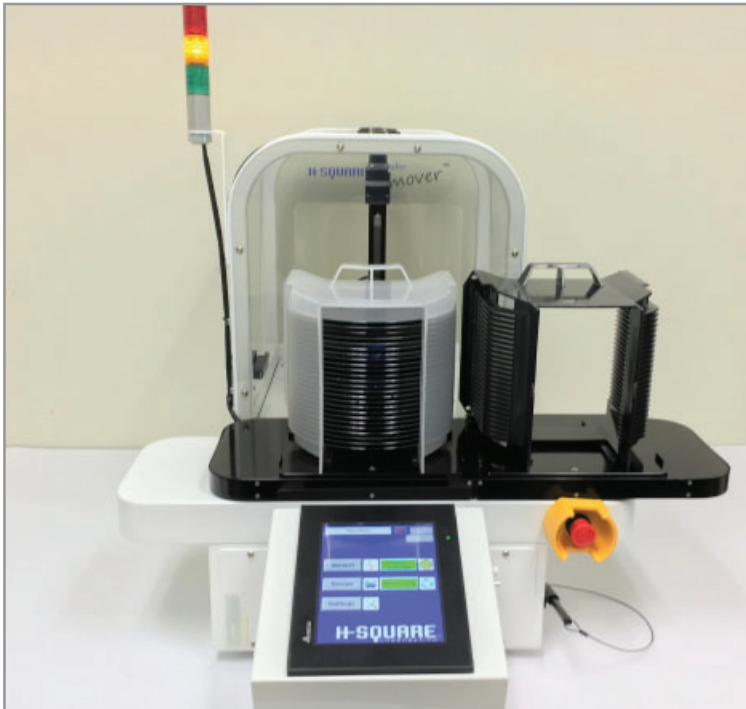


Wafer Movers Single Wafer Transfers

Economical, automatic single wafer transfer systems. Engineered for production, metrology, R&D, test-assembly packaging, and application labs to move wafers between two SEMI compliant process, shipping or metal cassettes. The Wafer Mover offers a simple, safe method for transferring single wafers between two cassettes in a RECIPE or MANUAL mode of operation. A wafer mapping end-effector scans each cassette and detects wafers for safe accurate wafer movements.

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AWM2 Series



76-200mm Wafer Mover

A tabletop automatic 76mm-200mm single wafer transfer / simple sorter. The Wafer Mover features a two cassette stage configuration. Compatible with industry standard shipping, process and metal cassettes. A cost-effective automation tool designed to reduce wafer breakage and scratches due to manual wafer handling practices.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic Construction
Specify cassette model number(s) with order

	Ordering Part Number
Base Unit	AWM2 (include one AWM2KIT)
76mm	AWM2KIT-3
100mm	AWM2KIT-4
150mm	AWM2KIT-6
200mm	AWM2KIT-8

WS Series



300mm Wafer Mover

Standalone automatic single wafer transfer. This edge-grip 300mm Wafer Mover / simple sorter is compatible with all SEMI compliant FOUP, FOSB and metal cassettes. A cost-effective automation tool to reduce wafer breakage and scratches due to manual wafer handling practices.

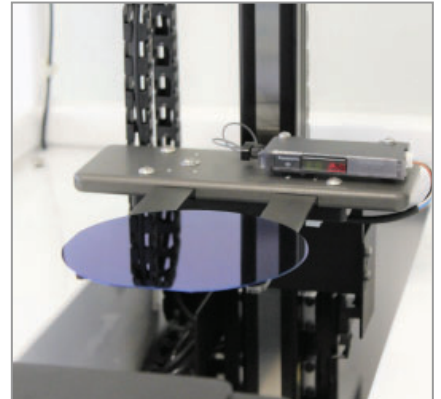
Designed for ISO Class 5 (FS209E Class 10)
Antistatic Construction

	Ordering Part Number
300mm	WS300M

Visit www.h-square.com for additional product information

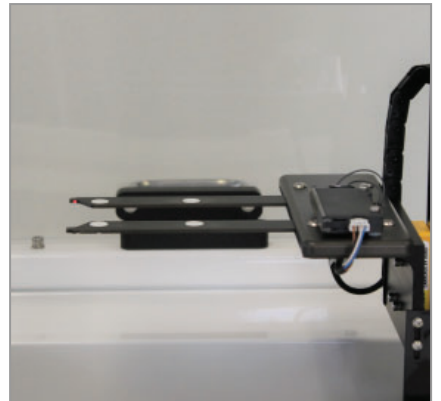
Applications

- Scratch reduction - eliminating manual wafer handling
- Pitch change transferring (example 25 to 12 slot cassettes)
- "Fill" loading / removing test wafers from a parent lot
- Combining wafer lots / splitting lots / odd-even
- Thin wafer handling (up to 2mm warpage)
- MEMS or Taiko® (wafer edge end-effector option)
- Compressing wafers within a cassette
- Flipping / Inverting wafer (special stage configuration)



No Stress End-Effector

The AWM2 features a mapping gravity end-effector with Kalrez 8575® touchpads. This unique low-stress end-effector is able to handle compound materials or thin wafers without applying vacuum holding stress to the structure of the wafer. The touchpads keep the wafer from moving on the end effector even during high-speed settings.



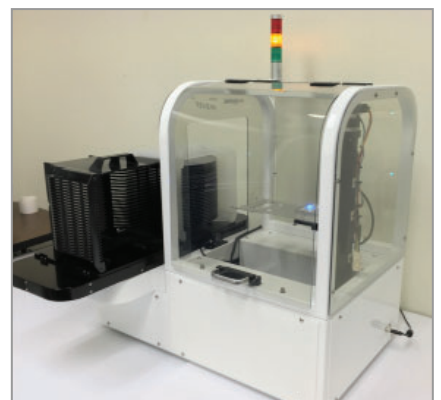
Easy Control

The AWM2 touchscreen monitor control system is loaded with a range of software APPS providing the ideal input interface. With support for a wide range options including, customer-specific recipe programs, GUI quick transfer programs and a manual wafer-by-wafer movement program, the Wafer Mover provides a highly flexible control system, that any operator can use with minimal training.



Safety Systems

- Mapping end-effector identifies all wafer locations
- Mapping for loading errors - cross slotting, double-stack
- Wafer protrusion sensor - detects errant slide-out wafer positions
- Cassette-in-place sensors - detects errant placed cassettes
- Wafer recovery software will reset wafer after power failure
- ESD-safety - antistatic ground path to cassette stages
- ESD-safety - antistatic ground path to end-effector



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Wafer Transfers **Automatic Low-Contact**

H-Square is a global leader in cassette-to-cassette bulk wafer transfer tools, offering both automatic and manual solutions to wafer processing customers around the world. The Low Contact Transfers (LCT) are the most advanced, cleanest, most reliable and fastest method for transferring standard or fragile wafers between two cassettes. The 300mm version is compatible with all industry standard FOUP, FOSB and SEMI compliant metal and plastic open cassettes.

LCT2 Series



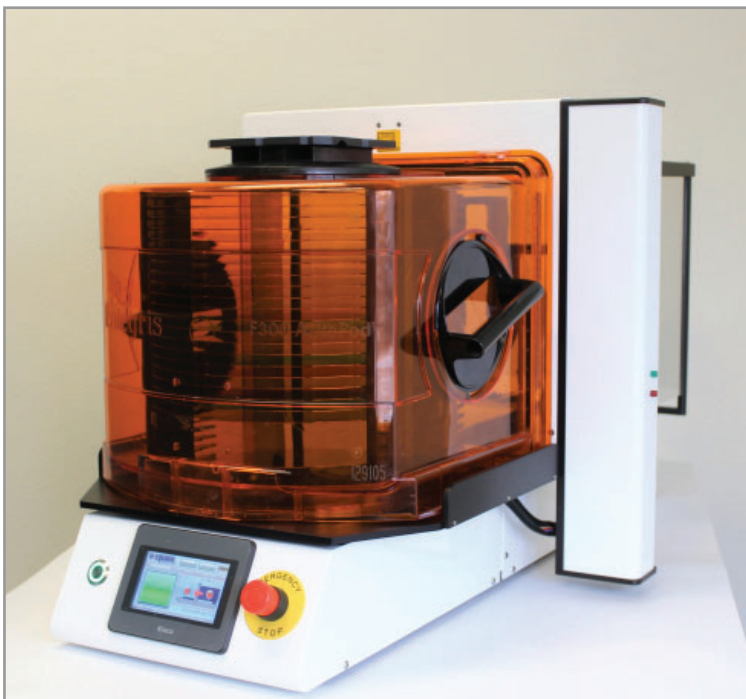
76-200mm Low Contact Wafer Transfers

Tabletop, automatic high value, thin wafer, compound wafer transfer tool. Wafers are gently bulk- lifted midpoint in the cassette slots before being extracted or loaded. This is to minimize contact with the cassette eliminating chances of particulation or wafer edge chipping. High reliability and low maintenance. Small footprint saves valuable cleanroom space..

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction
Specify cassette model number(s) with order

	Ordering Part Number
Base Unit	LCT2 (include one LCT2KIT stage kit)
76mm	LCT2KIT-3
100mm	LCT2KIT-4
150mm	LCT2KIT-6
200mm	LCT2KIT-8

LCT Series



300mm Low Contact Wafer Transfers

Tabletop automatic FOUP to FOSB wafer transfer tool. Wafers are mapped, then gently bulk-lifted in the cassette; minimizing contact with the cassette eliminating the chance of particulation, abrasion, or wafer edge chipping. High reliability and low maintenance . Small footprint saves valuable cleanroom space.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction
Specify cassette model number(s) with order

	Ordering Part Number
300mm	LCT1AS12

Visit www.h-square.com for additional product information

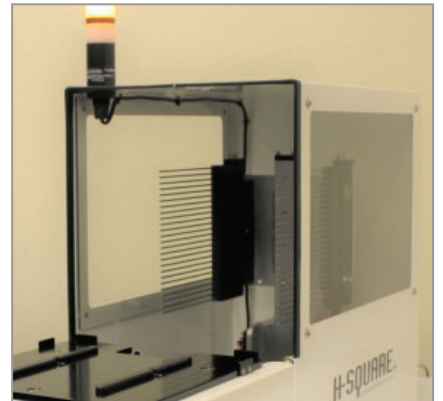
User-Friendly

The green START button on the front panel operates the LCT transfer tool. The touchscreen display shows the status of the tool during transfer operation. The password protected touchscreen also acts as a maintenance portal for event logging, speed control, height adjustments and PM service interval tracking. The LCT software will auto recover wafers stranded if power is interrupted during the transfer cycle. Transfer cycle time is less than one minute.



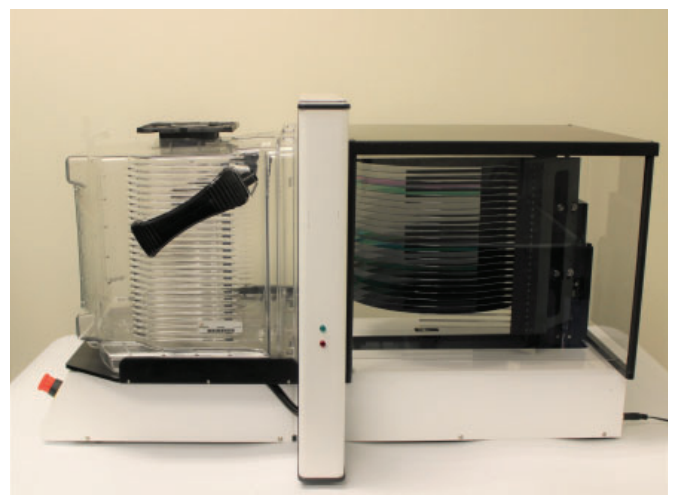
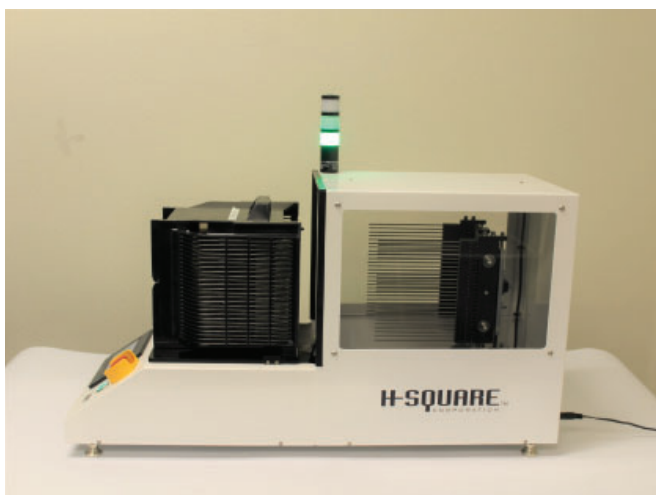
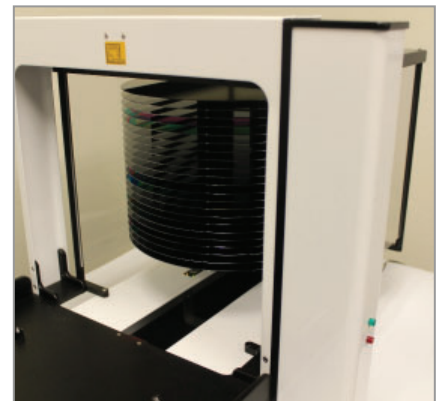
Unique Transfer Head

H-Square's LCT systems lift all 25 wafers simultaneously without abrasion or contact with the cassette slots. Contact with the backside of the wafer is minimal - a pair of rods support each wafer during the transfer; Rods are sleeve coated with PVDF Kynar® material for cleanliness and to prevent any position movements during the transfer. Ideal for high-value wafers, metal cassette transferring, compound wafer transfers, and any thin wafer transfer application. The LCT can be adjusted to handle warped wafers.



Safety Mapping

The 300mm LCT system features a mapping tower which automatically checks the cassette to ensure the pod door has been removed and accurately positioned in the cassette. The mapper detects for cross-slotting, double-cross slot and double stack wafer positioning errors

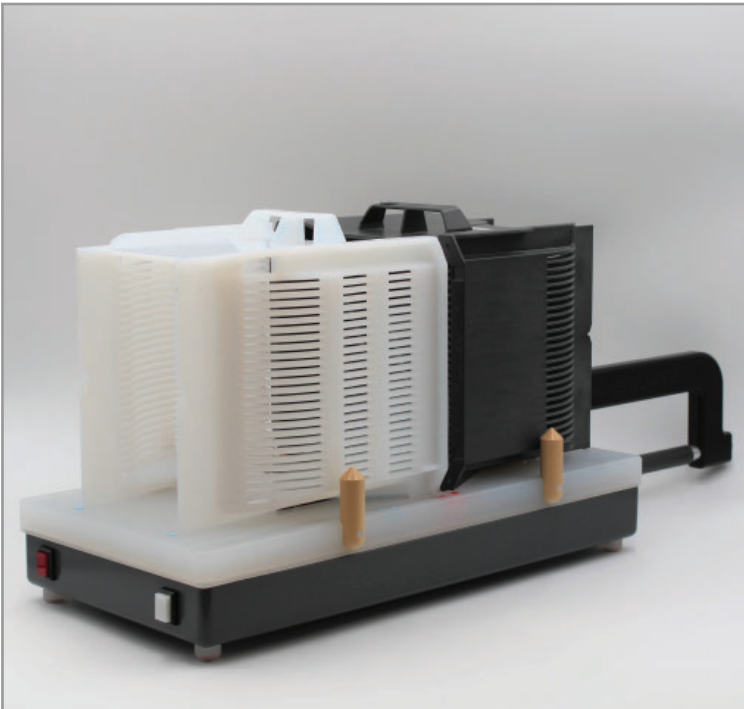


Wafer Transfers Bulk Cassette-to-Cassette

H-Square's automatic AWT and AVT bulk transfer tools safely bulk-transfer wafers between two SEMI compliant high, or low-profile process, shipping, or metal cassettes. Safety sensors ensure that cassettes are loaded correctly and wafers are transferred consistently. The AVT vertical transfer stages can be configured to accept quartz, graphite, silicon-carbide, or clamshell- type tray carriers.

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AWT Series



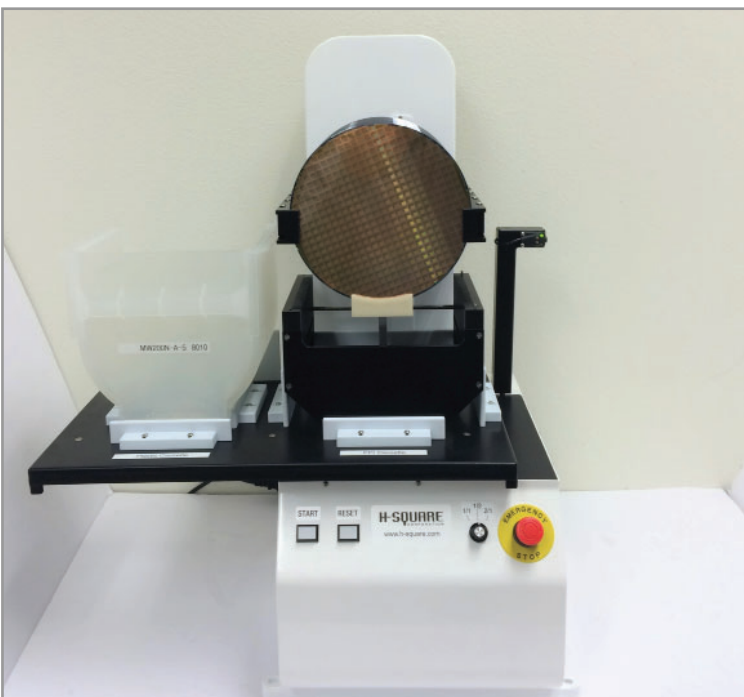
Automatic Transfers

Tabletop automatic bulk wafer transfer tool. Wafers are horizontally "slide-transferred" between two cassettes. The AWT is compatible with both high and low profile SEMI compliant process, and shipping cassettes. CIP switches, consistent speed control and transfer arm impediment monitoring make the AWT reliable and an upgrade over the WT Series transfer.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant
Specify cassette model number(s) with order

	Ordering Part Number
76mm	AWT2HL3
100mm	AWT2HL4
150mm	AWT2HL6
200mm	AWT4HL8

AVT Series



Vertical Transfers

Tabletop automatic two-cassette vertical bulk wafer transfer tool. Transfers wafers between various combinations of plastic, metal and quartz cassettes. Cassettes move, rather than wafers, for safer, cleaner transfers. Single-button operation makes the tool user-friendly. The AVT is a high reliability, low maintenance system.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction
Specify cassette model number(s) with order

	Ordering Part Number
Base Unit	AVT (include one AVTKIT stage kit)
76mm	AVTKIT-3
100mm	AVTKIT-4
150mm	AVTKIT-6
200mm	AVTKIT-8

Visit www.h-square.com for additional product information

Ordering Guidelines: specify cassette / carrier model numbers when ordering. H-Square product designs are based on SEMI industry standards. Customers with non-standard cassette or wafer attributes (diameter and thickness) should contact H-Square to inquire if the standard configuration will meet the requirement, or if custom engineering is required.

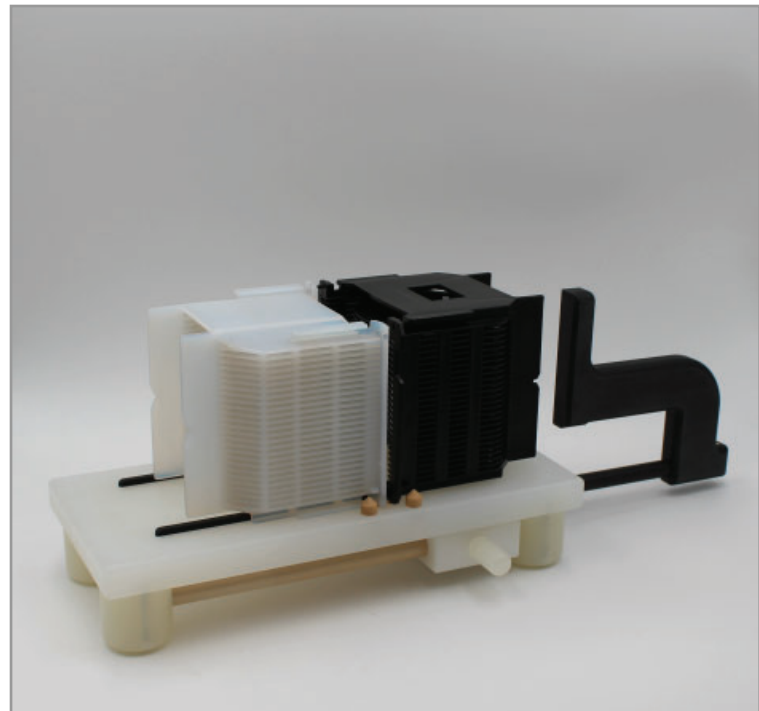
Manual Transfers

Tabletop manual bulk-wafer transfer tool. Wafers are horizontally "slide-transferred" between two cassettes. H versions are compatible with only high profile cassettes; HL versions are compatible with both high and low profile cassettes. The WT Series is a very low maintenance product.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction, chemical resistant
Specify cassette model number(s) with order

	Ordering Part Number
76mm	WT3HAS
100mm	WT4HAS
125mm	WT5HAS
150mm	WT6HAS, WT6HLAS
200mm	WT28HAS, WT28HLAS

WT Series



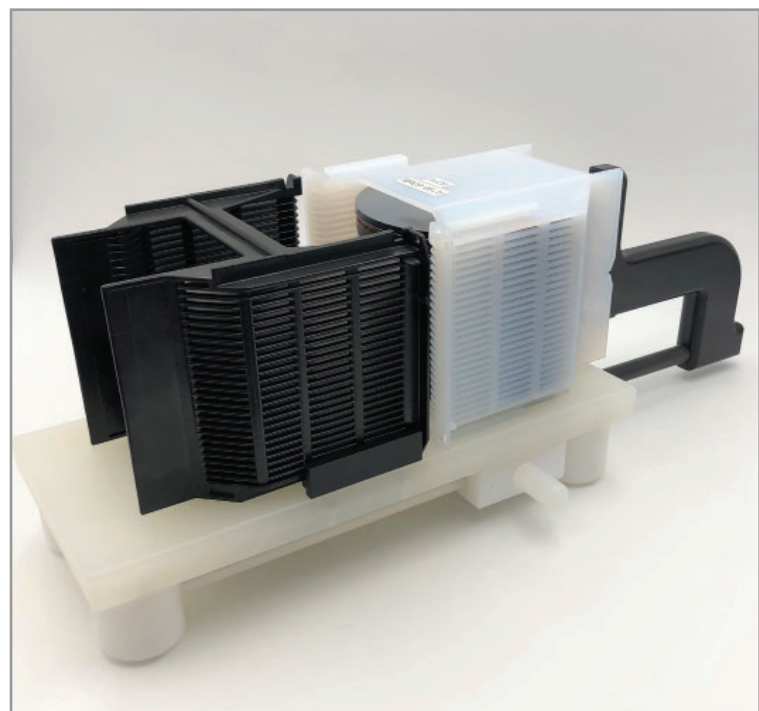
Special Invert / Flip Transfers

A special application version of the WT series transfer tool. The custom stage allows for both the SEND and RECEIVE cassettes to be loaded h-bar up or h-bar down. When a transfer is made the wafers are reverse orientated 180° in the cassette.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction, chemical resistant
Specify cassette model number(s) with order

	Ordering Part Number
100mm	WT4HAS-007
150mm	WT6HAS-003
200mm	WT28HAS-018

Contact H-Square to verify cassette compatibility before purchasing



Vacuum Wands 300mm Wafer Handling

H-Square's 300mm vacuum wands are available as a house-facilities setup (tip + wand + coil cord + holder + ground adapter), or as a portable battery-operated Freedom Wand™ providing the flexibility to go anywhere in the fab and to be used for wafer rescue applications. 300mm vacuum wand tips are available in two materials - Antistatic PEEK, or Antistatic PEEK with a UHMW touchpad. Both materials are offered as straight (most common) or in a 45° offset orientation.

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VWSET



300mm Vacuum Wand Sets

A common vacuum wand set for handling a 300mm silicon or glass wafers.

- T3PKAS1 (vacuum tip)
- NO3AS1 (wand handle)
- CC11SDS (coil vacuum cord)
- HSU3 (shutoff holder)
- CTA12 (grounding adapter)

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant

This is a fixed set; no part substitutions

	Ordering Part Number
300mm	VWSET-A

FWCR Series



300mm Cordless Freedom Wands™

Self-contained 300mm cordless battery powered vacuum wand allows freedom from vacuum lines. Designed for wafer rescue or light-production. This standard handling kit ships complete with FWCR wand, 2-meter charging cord, charging stand, T3PKAS1 ESD safe PEEK vacuum tip for handling 300mm SEMI standard wafers.

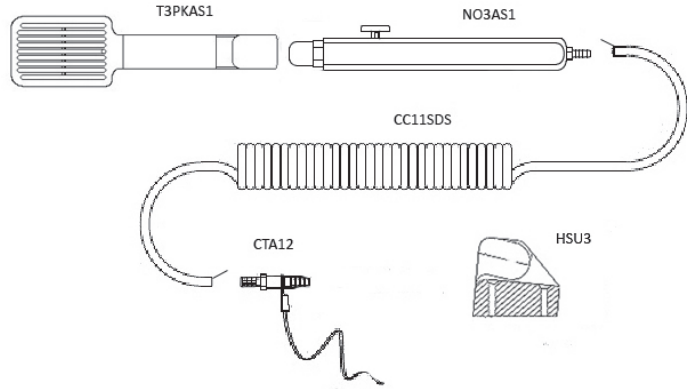
Designed for ISO Class 3 (FS209E Class 1)
T3PKAS1 vacuum tip included

This is a fixed kit; no part substitutions

	Ordering Part Number
300mm	FWCR3

Visit www.h-square.com for additional product information

NO3AS1 features a normally open (NO) flow valve. A shutoff holder is required. Setup designed to operate with 22"-24" hg of vacuum at approximately 0.5cfm (0.24 liters/sec) flow, facilities input.



300mm High Temperature Wands

Vacuum wand assembly, 300mm, special high temperature wafer handling for loading/unloading 300mm rapid thermal process tools. Assembly includes quartz tip, offset stainless steel tubing and wand handle. For use up to 800° C.

Designed for ISO Class 3 (FS209E Class 1)

	Ordering Part Number
300mm	NOP191-003
Holder	HSUPT
Coil Cord	CC11SDS

HSUPT holder and vacuum cord CC11SDS shown; purchased separately



RTP

300mm Freedom Wands™

Self-contained 300mm table-top battery powered vacuum wand allows freedom from vacuum lines. Designed for heavy-duty production. Features antistatic ESD-safe construction and SGI - safe grip indicator, green LED light shows operator wafer is safe to handle. Ships with external batteries (2) and a stand-alone charger unit. 300mm vacuum tip T3PKAS1 is included with purchase.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant
T3PKAS1 vacuum tip included
This is a fixed kit; no part substitutions

	Ordering Part Number
300mm	FWA3AS2

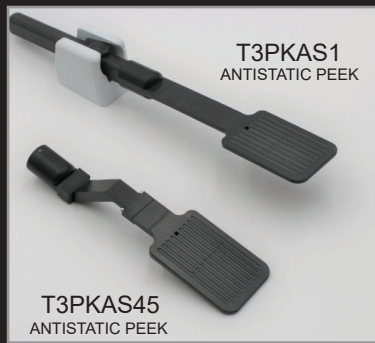


FWA Series

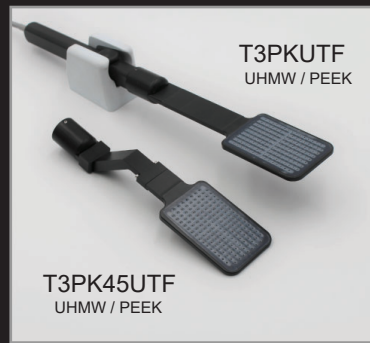
Vacuum Wands 300mm Wafer Handling

H-Square's vacuum wands are installed by combining five items - vacuum tip, normally open (NO) vacuum wand handle, shutoff holder (table-mount or pedestal tabletop), vacuum cord, and grounding adapter or quick disconnect. Advanced plastics are incorporated for cleanliness, longevity, and ESD safety. A vacuum test gauge VTG2 should be used to test installation performance periodically.

STANDARD TIP



UHMW / THIN TIP



HANDLES



VACUUM TIP PART NUMBERS

DESCRIPTION

T3PKAS1 *	300mm standard vacuum tip, straight, antistatic PEEK
T3PKAS45	45° 300mm tip / adapter assembly, offset, antistatic PEEK
T3PKUTF	300mm vacuum tip, straight, PEEK with UHMW touchpad
T3PK45UTF	45° 300mm tip / adapter assembly, offset, PEEK with UHMW touchpad

VACUUM WAND PART NUMBERS

DESCRIPTION

NO3AS1*	press-fit, wand handle, normally-open flow, antistatic PVDF
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HOLDER PART NUMBERS

DESCRIPTION

HSU3 *	table / wall mount, normally-open wand shutoff holder, Polypropylene
HSU3PT	tabletop weighted pedestal, normally-open wand shutoff holder, Polypropylene

VACUUM CORD PART NUMBERS

DESCRIPTION

CC11SDS *	heavy-duty, vacuum coil cord, wire, antistatic Polyurethane
CC11ESD1	heavy-duty, vacuum coil cord, wire + ground adapter, antistatic Polyurethane
CC11S	heavy-duty, vacuum coil cord, internal spring, antistatic Polyurethane
SRTAS	straight 6' (1829mm), vacuum cord, internal spring + ground adapter, Silicone

GROUND ADAPTER PART NUMBERS

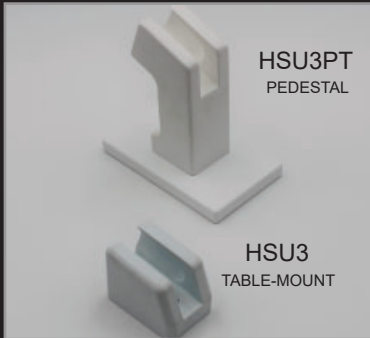
DESCRIPTION

CTA12 *	dual hose barb with grounding wire
HBQDM	quick-disconnect, male, metal
CQDM	quick-disconnect, female, metal

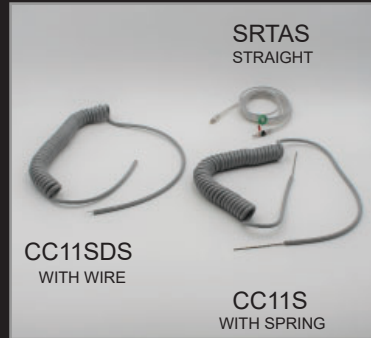
* common selection for 300mm wafer handling

Visit www.h-square.com for additional product information

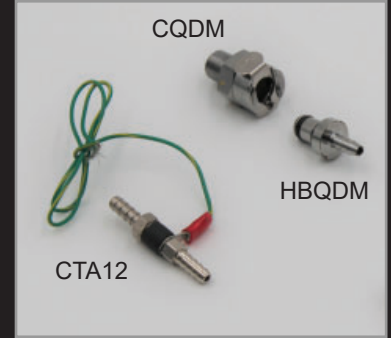
HOLDERS 300mm



COIL CORDS



GROUND ADAPTERS



Thin Wafer Packout Wands

Special application offset-angle "hoop" vacuum wand used for handling fragile thin wafers <math><350\mu</math> from a cassette, open-sided stage or shipping pack-out container. The end-effector is PFA Teflon® coated heat-treated aluminum. This product is antistatic and includes the complete assembly - tip, adapter, wand, holder and coil cord. The MISC1400 is designed for thin wafer handling and is not tested / certified with SEMI standard thickness wafer substrates.

Designed for ISO Class 3 (FS209E Class 1)

Ordering Part Number

200-300mm 90°	MISC1400-004
150-200mm 90°	MISC1400-005
200-300mm 45°	MISC1400-011
100-150mm 90°	MISC1400-012



Vacuum Test Gauges

Wafer Size: 50-300mm. A standalone weighted base table-top vacuum testing gauge tool for checking vacuum strength (Hg") to determine vacuum wand tip and overall setup performance. Operator places the vacuum tip on the right side of the tower to quickly check the health of the vacuum wand tool. VTG2 features secondary tubing adapter for directly checking the input vacuum hose if necessary.

Designed for ISO Class 3 (FS209E Class 1)

Ordering Part Number

50-300mm	VTG2
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Vacuum Wands 100-200mm Wafer Handling

H-Square's 100-200mm vacuum wands are available as a house-facilities setup (tip + wand + coil cord + holder + ground adapter), or as a portable battery-operated Freedom Wand™ providing flexibility to go anywhere in the fab and to be used for wafer rescue applications. Vacuum sets are divided into two categories; Press-Fit NOASPF2 handle using molded press-fit antistatic PEEK vacuum tips, or Quick-Lock NOASQ2 handle using a machined vacuum tip, available in high-performance materials.

VWSET



100-200mm Vacuum Wand Sets

A common vacuum wand set for handling standard silicon or glass wafers.

- T693PKAS3 (vacuum tip)
- NOASPF2 (wand handle)
- CC11SDS (coil vacuum cord)
- HSU (shutoff holder)
- CTA12 (grounding adapter).

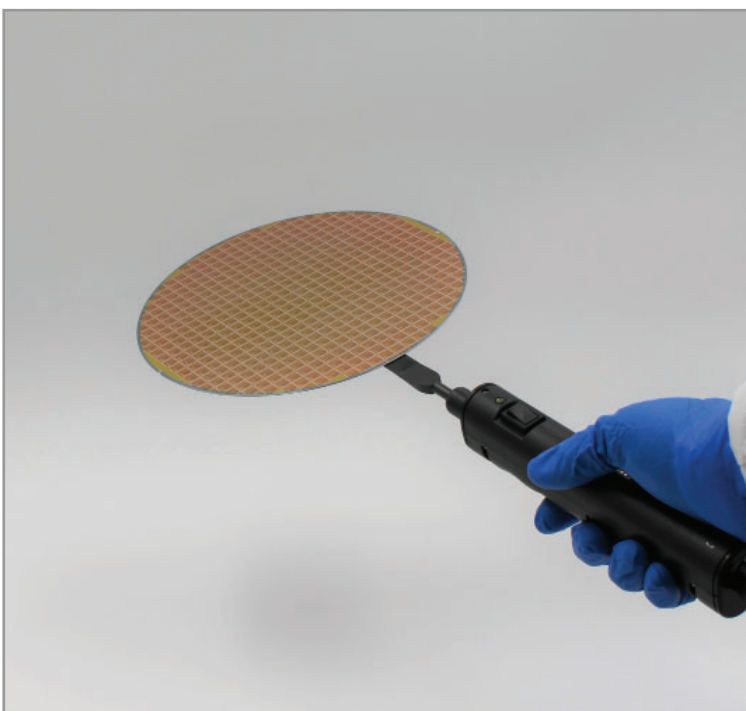
Designed for ISO Class 3 (FS209E Class 1)

Antistatic construction, chemical resistant

This is a fixed set; no part substitutions

	Ordering Part Number
100-200mm	VWSET-B

FWCR Series



100-200mm Cordless Freedom Wands™

Self-contained cordless battery-powered vacuum wand allows freedom from vacuum lines. Designed for wafer rescue or light-production. This standard handling kit ships complete with FWCR wand, 2-meter charging cord, charging stand, T693PKAS3 ESD-safe PEEK vacuum tip for handling 100-200mm SEMI standard wafers.

Designed for ISO Class 3 (FS209E Class 1)

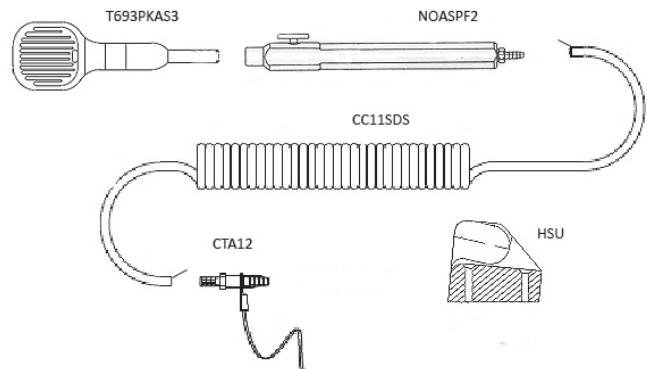
T693PKAS3 vacuum tip included

This is a fixed set; no part substitutions

	Ordering Part Number
100-200mm	FWCR2

Visit www.h-square.com for additional product information

NOASPF2 features a normally open (NO) flow valve. A shutoff holder is required. Setup designed to operate with 22"-24" hg of vacuum at approximately 0.5cfm (0.24 liters/sec) flow, facilities input.



100-200mm Thin / Compound Vacuum Wand Sets

A common vacuum wand set for handling thin silicon or compound wafers (150mm GaAs).

- T693PKAS3-001 (vacuum tip)
- NOASPF2 (wand handle)
- CC11SDS (coil vacuum cord)
- HSU (shutoff holder)
- CTA12 (grounding adapter).

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant
This is a fixed set; no part substitutions

	Ordering Part Number
100-200mm	VWSET-C

VWSET



100-200mm Freedom Wands™

Self-contained tabletop battery-powered vacuum wand allows freedom from vacuum lines. For handling 200mm and smaller wafers. Designed for heavy-duty production. Features antistatic ESD-safe construction and safe grip indicator (SGI); green LED shows operator wafer is safe to handle. Ships with external batteries (2) and a stand-alone charger unit. Vacuum tips are not included with the FWA-HAS2.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant
Vacuum tips sold separately

	Ordering Part Number
100-200mm	FWAHAS2

FWA Series



Vacuum Wands 100-200mm Wafer Handling

H-Square's vacuum wands are installed by combining five items - vacuum tip, normally open (NO) vacuum wand handle (Press-Fit or Quick-Lock), shutoff holder (table-mount or pedestal tabletop), vacuum cord, and grounding adapter or quick disconnect. Advanced plastics are incorporated for cleanliness, longevity, and ESD-safety. A vacuum test gauge VGT2 should be used to test installation performance periodically.

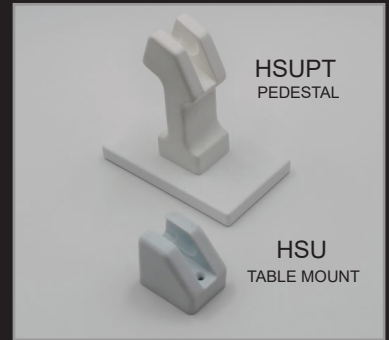
STANDARD TIP



UHMW TIP



HOLDERS



THIN / COMPOUND TIP



STOP INSERTION TIP



HANDLES



UHMW THIN TIP



PLATEN 100-200mm TIP



COIL CORDS



HEAVY / BONDED TIP



PLATEN 100-150mm TIP



GROUND ADAPTERS



Visit www.h-square.com for additional product information

VACUUM TIP PART NUMBERS

DESCRIPTION

T693PKAS3 *	standard vacuum tip - silicon / glass,3°straight,antistatic PEEK
T693PKAS-002	vacuum tip - silicon / glass,30°down bend T693PKAS3,antistatic PEEK
T693PKAS3-001 *	standard vacuum tip - compound / thin,3°straight,antistatic PEEK
T693PKAS3D-001	vacuum tip - compound / thin,30°down bend T693PKAS3-001,antistatic PEEK
T696PK-002	vacuum tip - silicon / compound / thin,3°straight,antistatic PEEK with UHMW touchpad
T696PK-003	vacuum tip - 30°down bend T696PK-002,antistatic PEEK with UHMW touchpad
T695PKAS	vacuum tip - silicon / glass / bonded / heavy,4°straight,antistatic PEEK
T695PKAS3D-001	vacuum tip - 30°down bend T695PKAS,antistatic PEEK
T696PK	vacuum tip - silicon/glass,3°straight,antistatic PEEK with UHMW touchpad
T696PK-001	vacuum tip - 30°down bend T696PK,antistatic PEEK with UHMW touchpad
T693PKAS3-007	vacuum tip - silicon/glass,3°straight, with backside bump, antistatic PEEK
T75051PKAS	vacuum tip - silicon / glass / compound,quicklock, lift spatula, antistatic PEEK
T75051V	vacuum tip - silicon / glass / compound,quicklock, lift spatula, Vespel SP1®
T75083PKAS **	vacuum tip - 150mm, silicon / glass,quicklock, knife-edge, antistatic PEEK
T75040V **	vacuum tip - 150mm,silicon / glass,quicklock, knife-edge, Vespel SP1®
T75082Q (not pictured)	vacuum tip - high temperature, silicon / glass,quicklock, with tubing, quartz

WAND HANDLE PART NUMBERS

DESCRIPTION

NOASPF2 *	press-fit, wand handle, normally-open flow, antistatic
NOASQ2	quick-lock, wand handle, normally-open flow, antistatic

HOLDER PART NUMBERS

DESCRIPTION

HSU *	table / wall mount, normally-open wand shutoff holder
HSUPT	tabletop pedestal, normally-open wand shutoff holder

VACUUM CORD PART NUMBERS

DESCRIPTION

CC11SDS *	heavy-duty, vacuum coil cord, wire
CC11ESD1	heavy-duty, vacuum coil cord, wire + ground adapter
CC11S	heavy-duty, vacuum coil cord, internal spring
CC9SDS	medium-duty, vacuum coil cord, wire
CC9ESD1	heavy-duty, vacuum coil cord, wire + ground adapter
SRTAS	straight 6' (1829mm), vacuum cord, spring + ground adapter

GROUND ADAPTER PART NUMBERS

DESCRIPTION

CTA12 *	dual hose barb with grounding wire
HBQDM	quick-disconnect, male, metal
CQDM	quick-disconnect, female, metal

* common selection for 125-200mm vacuum wand installations

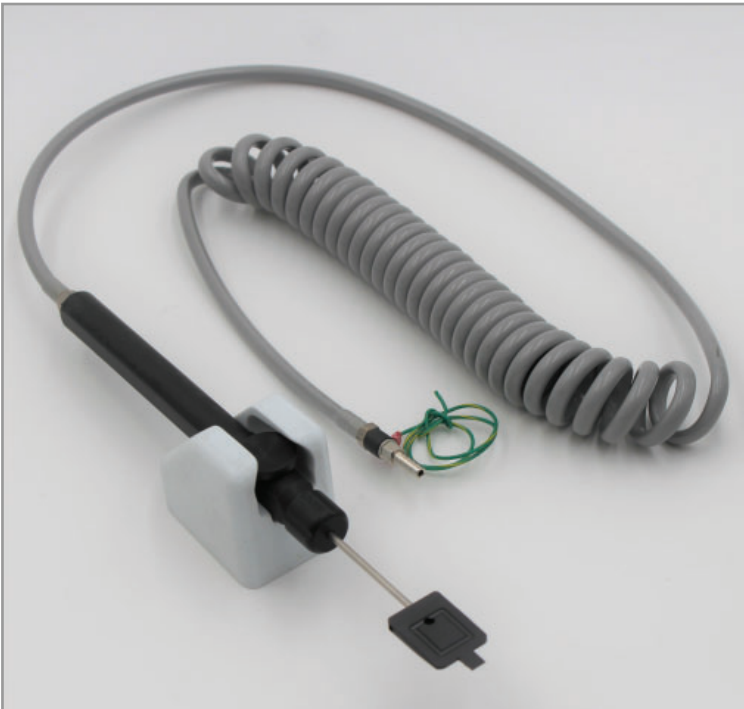
** not compatible with 200mm wafers

Vacuum Wands 50-100mm Wafer Handling

H-Square's 50-100mm vacuum wands are available as a house-facilities setup (tip + wand + coil cord + holder + ground adapter), or as a portable battery-operated Freedom Wand™ providing flexibility to go anywhere in the fab and to be used for wafer rescue applications. Vacuum sets are divided into two categories; Press-Fit NOASPF2 handle using molded Press-Fit antistatic PEEK vacuum tips, or Quick-Lock NOASQ2 handle using a machined vacuum tip, available in 4 high-performance materials.

© H-SQUARE CORPORATION 2019

VWSET



50-100mm Thin / Compound Vacuum Wand Sets

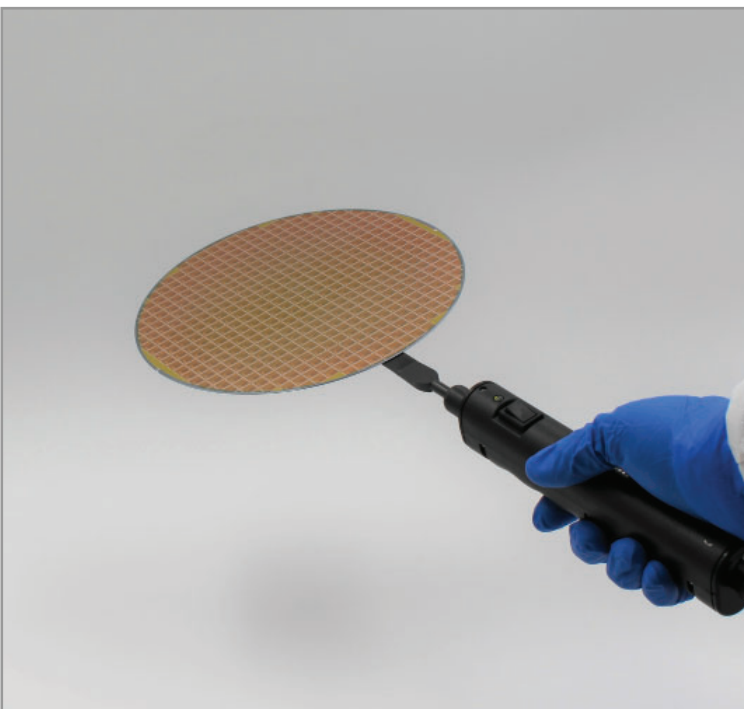
A common vacuum wand set for handling small GaAs, InP, Si, and SiC wafers.

- T75072PKAS (tip)
- NOASQ2 (wand handle)
- CC9SDS (coil vacuum cord)
- HSU (shutoff holder)
- CTA12 (grounding adapter).

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant
This is a fixed set; no part substitutions

	Ordering Part Number
76-100mm	VWSET-D

FWCR Series



100-200mm Cordless Freedom Wands™

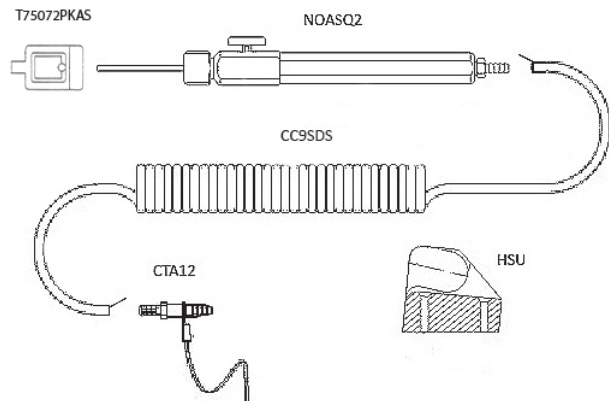
Self-contained cordless battery-powered vacuum wand allows freedom from vacuum lines. Designed for wafer rescue or light-production. This standard handling kit ships complete with FWCR wand, 2-meter charging cord, charging stand, T693PKAS3 ESD-safe PEEK vacuum tip for handling 100-200mm SEMI standard silicon wafers.

Designed for ISO Class 3 (FS209E Class 1)
Vacuum tip T693PKAS3 included
This is a fixed set; no part substitutions

	Ordering Part Number
100-200mm	FWCR2

Visit www.h-square.com for additional product information

NOASQ2 features a normally open (NO) flow valve. A shutoff holder is required. Setup designed to operate with 22"-24" hg of vacuum at approximately 0.5cfm (0.24 liters/sec) flow, facilities input.



50-100mm Thin / Compound Vacuum Wand Sets

A common vacuum wand set for handling small GaAs, InP, Si, and SiC wafers.

- T794PKAS (vacuum tip)
- NOASPF2 (wand handle)
- CC9SDS (coil vacuum cord)
- HSU (shutoff holder)
- CTA12 (grounding adapter).

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant
This is a fixed set; no part substitutions

76mm-125mm **Ordering Part Number**
VWSET-E

VWSET



50-200mm Freedom Wands™

Self-contained tabletop battery-powered vacuum wand allows freedom from vacuum lines. For handling 200mm and smaller wafers. Designed for heavy-duty production. Features internal battery pack and an external charging power supply. Vacuum tips are not included with the FWTTA1.

Designed for ISO Class 3 (FS209E Class 1)
Chemical resistant
Vacuum tips sold separately

50-200mm **Ordering Part Number**
FWTTA1

FWTT Series



© H-SQUARE CORPORATION 2019

Vacuum Wands 50-100mm Wafer Handling

H-Square vacuum wands are installed by combining five items - vacuum tip, normally open (NO) vacuum wand handle, shutoff holder, vacuum cord, and grounding adapter or quick disconnect. Advanced plastics are incorporated for cleanliness, longevity, and ESD safety. A vacuum test gauge VTG2 should be used to test installation periodically.

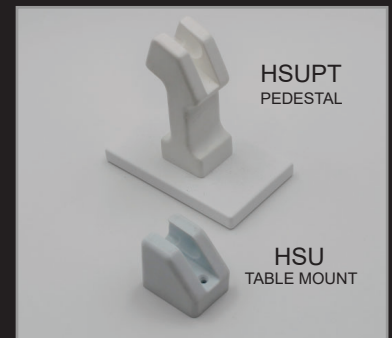
STANDARD TIP



PLATEN TIP



HOLDERS



COMPOUND WAFER TIP



PLATEN TIP



HANDLES



COMPOUND WAFER TIP



HIGH-TEMP PLATEN TIP



COIL CORDS



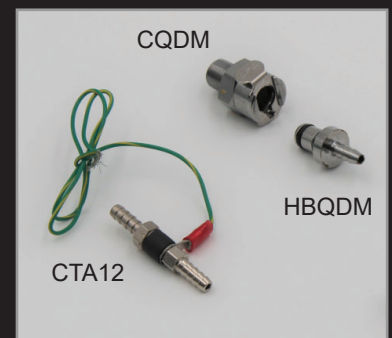
UHMW / ULTRA-THIN TIP



SILICON / GLASS TIP



GROUND ADAPTERS



Visit www.h-square.com for additional product information

VACUUM TIP PART NUMBERS

DESCRIPTION

T75072PKAS *	standard vacuum tip - silicon / glass / compound,quicklock, lift spatula, antistatic PEEK
T75072V *	standard vacuum tip - silicon / glass / compound,quicklock, lift spatula, Vespel SP1®
T791PKAS	vacuum tip - compound / thin,straight,antistatic PEEK
T791PKAS3D	vacuum tip - compound / thin,30° down bend T791PKAS,antistatic PEEK
T794PKAS *	standard 76-100mm GaAs vacuum tip - compound / thin,straight,antistatic PEEK
T794PKAS3D-001	vacuum tip - compound / thin, 30° down bend T794PKAS,antistatic PEEK
T691PK	vacuum tip - silicon / compound / thin,straight,antistatic PEEK with UHMW touchpad
T691PK3D	vacuum tip - 30° down bend T691PK,antistatic PEEK with UHMW touchpad
T75070V	vacuum tip - high temperature, quicklock, with knife-edge,Vespel SP1®
T75055V	vacuum tip - high-temperature, quicklock, with long-blade spatula,Vespel SP1®
T75049V	vacuum tip - high-temperature, quicklock, with short-blade Spatula,Vespel SP1®
T75033QV	vacuum tip - high-temperature, quicklock, with tubing, quartz with Vespel SP1®
T694PKAS	vacuum tip - silicon / glass,straight,antistatic PEEK
T694PKAS-001	vacuum tip - silicon / glass,30° down bend T694PKAS,antistatic PEEK

WAND HANDLE PART NUMBERS

DESCRIPTION

NOASPF2 *	press-fit, wand handle, normally-open flow, antistatic
NOASQ2 *	quick-lock, wand handle, normally-open flow, antistatic

HOLDER PART NUMBERS

DESCRIPTION

HSU *	table / wall mount, normally-open wand shutoff holder
HSUPT	tabletop pedestal, normally open wand shutoff holder

VACUUM CORD PART NUMBERS

DESCRIPTION

CC9SDS *	medium-duty, vacuum coil cord, wire
CC9ESD1	heavy-duty, vacuum coil cord, wire + ground adapter
SRTAS	straight 6' (1829mm), vacuum cord, internal spring + ground adapter

GROUND ADAPTER PART NUMBERS

DESCRIPTION

CTA12 *	dual hose barb with grounding wire
HBQDM	quick-disconnect, male, metal
CQDM	quick-disconnect, female, metal

* common selection for 50-100mm vacuum wand installations

Vacuum Wands Small Device / Die Handling

H-Square's small device vacuum wands are available as a house-facilities setup (cup / tip + hub needle + wand + coil cord + holder + ground adapter), portable battery operated Freedom Wand™, or as a self-contained portable pencil system. Small device handling cups (flexible) and tips (rigid) are available in a variety of sizes and materials.

VWSET



Small Device Vacuum Wand Sets

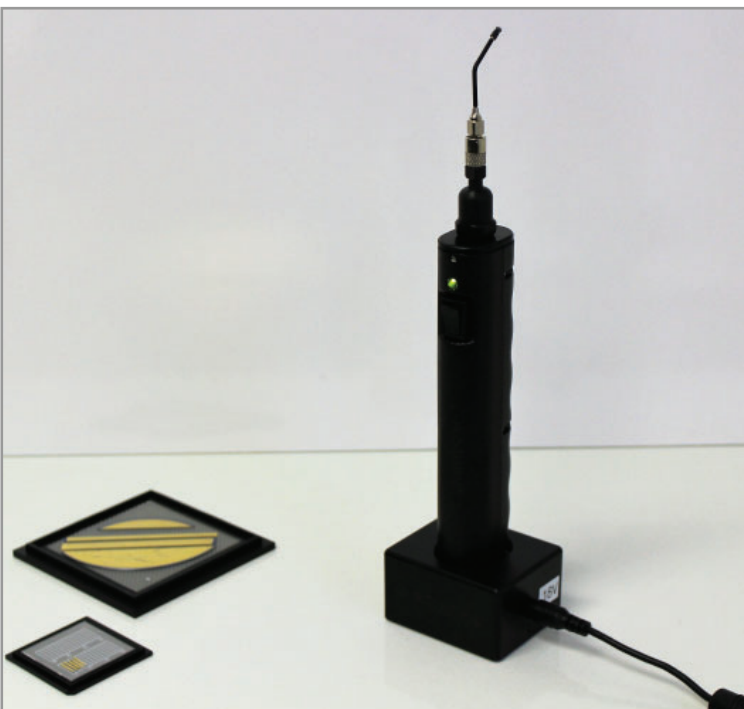
A common vacuum wand set for handling small device substrates, die, packages, and optics.

- DPNOAS2LA (wand handle)
- HSU (shutoff holder)
- CC4SDS (coil vacuum cord)
- CTA06 (grounding adapter)
- VCAS125 (0.125" vacuum cup)
- BCHN-16 (hub needle).

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction, chemical resistant
This is a set; no part substitutions

	Ordering Part Number
Small Device	VWSET-F

FWCR Series



Small Device Cordless Freedom Wand™

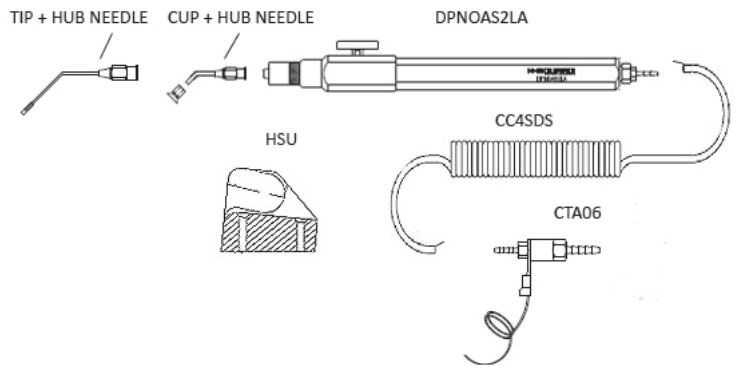
A self-contained cordless battery-powered vacuum wand allowing freedom from vacuum lines. Designed for small device and die handling. This special die handling kit ships complete with FWCR wand, 2-meter charging cord, charging stand, Luer-lock adapter AASPFLLHNF, hub needle BCHN-16 and SCHN-16, hard vacuum tip VCC-020, and soft vacuum cups VCAS125 and VCAS246.

Designed for ISO Class 5 (FS209E Class 10)
This is a set; no part substitutions

	Ordering Part Number
Small Device	FWCR-4

Visit www.h-square.com for additional product information

DPNOAS2LA features a normally open (NO) flow valve. A shutoff holder is required. Setup designed to operate with 22"-24" hg of vacuum at approximately 0.5cfm (0.24 liters/sec) flow, facilities input.



Small Device Self-Contained Pencils

A small hand-held self-contained vacuum squeeze bulb die pencil allows for freedom from vacuum lines. This ESD-safe die handling kit ships complete with FWP pencil wand, two static-dissipative vacuum cups (BNCSD-25 and BNCSD-38) and two short hub needles. Operator should use ground strap to insure static discharge.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction
This is a set; no part substitutions

	Ordering Part Number
Small Device	FWP

FWP



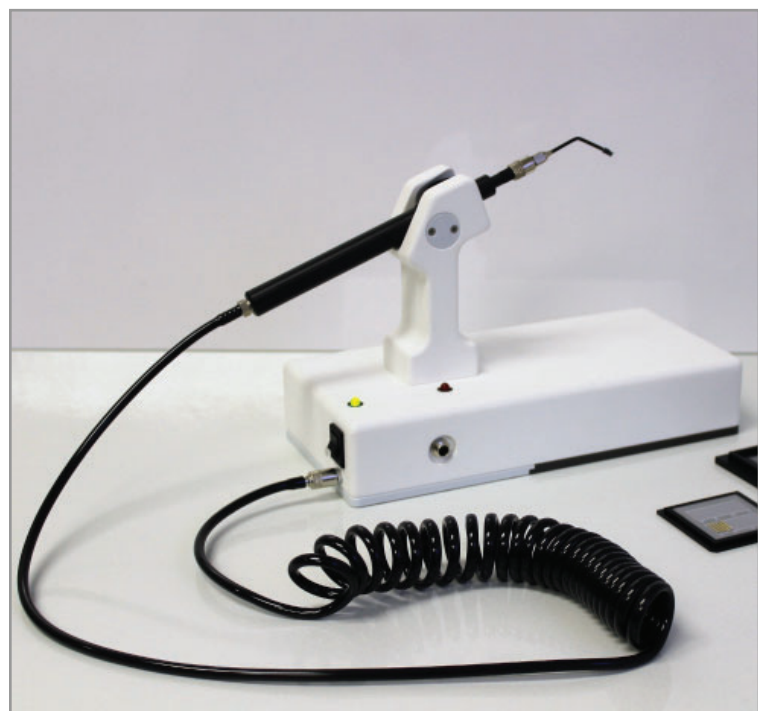
Small Device Freedom Wand™

Self-contained table-top battery-powered vacuum wand allows freedom from vacuum lines. Features internal battery pack and an external charging cable. This special die handling kit comes complete with two bent hub needles (BCHN-16S and BCHN-21), and two vacuum cups (VCAS125 and MBNCSD-12) to make a complete die and package Freedom Wand™ starter package.

Designed for ISO Class 5 (FS209E Class 10)
Chemical resistant
This is a set; no part substitutions

	Ordering Part Number
Small Device	FWTTA1-AC-005

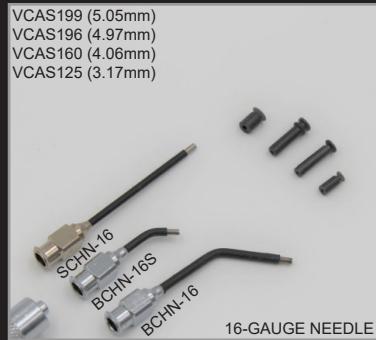
FWTT Series



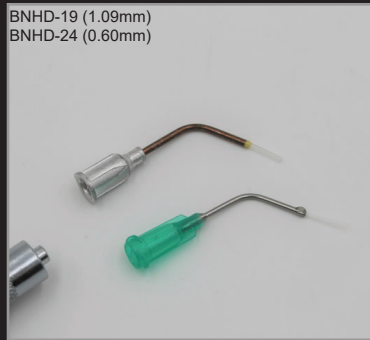
Vacuum Wands **Small Device / Die Handling**

H-Square's small device vacuum wands are installed by combining six items - vacuum cup or tip, hub needle (bent or straight), normally open (NO) vacuum wand handle, shutoff holder (table-mount or pedestal tabletop), vacuum cord, and a grounding adapter. Advanced plastics are incorporated for cleanliness, longevity, and ESD safety. Wand handles are available in two types - "LA" - luer-lock fitting- twist and locks the hub needle in place on the end of the handle, or "NA" - NST fitting- the hub needle slips over the tapered end of the NST fitting - keeping it on the end of the handle.

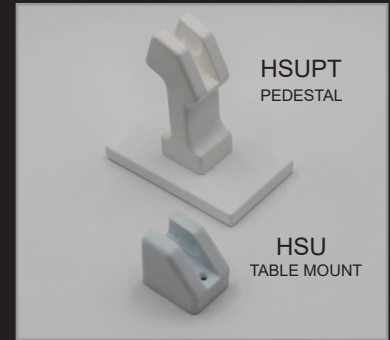
VCAS VINYL CUPS



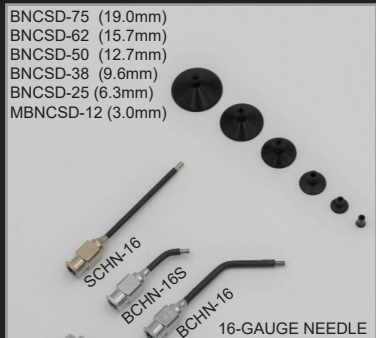
BNHD HUB+ TEFLON TIP



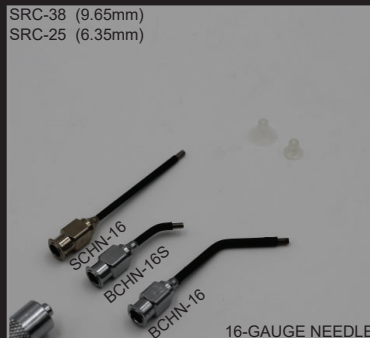
HOLDERS



BNCSN NITRILE CUPS



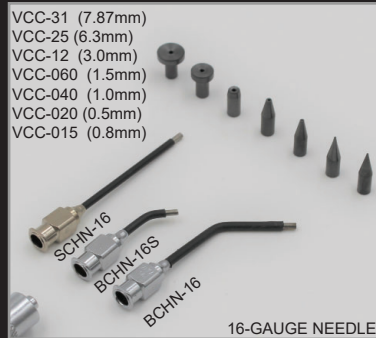
SRC SILICONE CUPS



HANDLES **SMALL DEVICE**



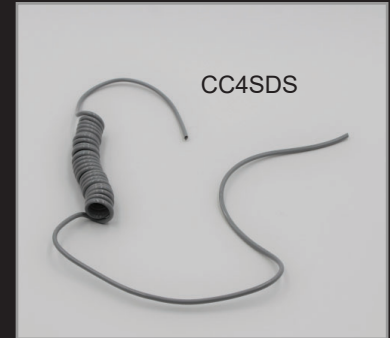
VCC VESPEL TIPS



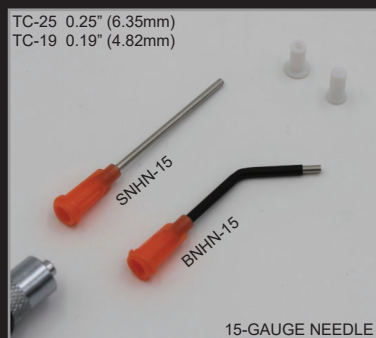
VCAS58 NST MOUNT CUP



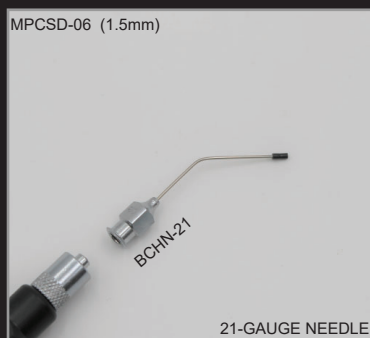
COIL CORDS



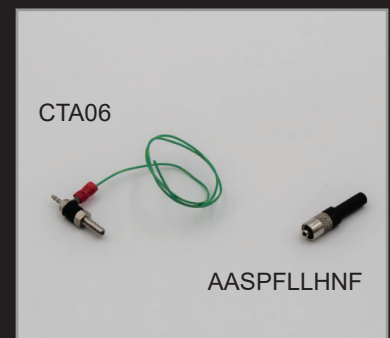
TC PTFE TIPS



MP POLYURETHANE TIP



ADAPTERS



VACUUM CUP PART NUMBERS**DESCRIPTION**

VCAS125	5-pack antistatic rubber vinyl cup, use 16-gauge hub needle
VCAS160	5-pack antistatic rubber vinyl cup, use 16-gauge hub needle
VCAS196	5-pack antistatic rubber vinyl cup, use 16-gauge hub needle
VCAS199	5-pack antistatic rubber vinyl cup, use 16-gauge hub needle
VCAS58	5-pack antistatic rubber vinyl cup, use NST vacuum wand
MPCSD-06	10-pack Antistatic rubber polyurethane tip, use 21-gauge hub needle
MBNCSD-12	10-pack antistatic rubber Nitrile Buna-N cup, use 18-gauge hub needle
BNCSD-25	10-pack antistatic rubber Nitrile Buna-N cup, use 16-gauge hub needle
BNCSD-38	10-pack antistatic rubber Nitrile Buna-N cup, use 16-gauge hub needle
BNCSD-50	10-pack antistatic rubber Nitrile Buna-N cup, use 16-gauge hub needle
BNCSD-62	10-pack antistatic rubber Nitrile Buna-N cup, use 16-gauge hub needle
BNCSD-75	10-pack antistatic rubber Nitrile Buna-N cup, use 16-gauge hub needle
VCC-015	1-pack antistatic Vespel® tip, use 16-gauge hub needle
VCC-020	1-pack antistatic Vespel® tip, use 16-gauge hub needle
VCC-040	1-pack antistatic Vespel® tip, use 16-gauge hub needle
VCC-060	1-pack antistatic Vespel® tip, use 16-gauge hub needle
VCC-12	1-pack antistatic Vespel® tip, use 16-gauge hub needle
VCC-25	1-pack antistatic Vespel® tip, use 16-gauge hub needle
VCC-31	1-pack antistatic Vespel® tip, use 16-gauge hub needle
TC-19	1-pack PTFE Teflon® tip, use 15-gauge hub needle
TC-25	1-pack PTFE Teflon® tip, use 15-gauge hub needle
BNHD-19	5-pack, bent, plastic hub needle with epoxy mounted PFA Teflon® tube tip
BHHD-24	5-pack, bent, plastic hub needle with epoxy mounted PFA Teflon® tube tip
SRC-25	10-pack rubber silicone cup, high-temperature, use 16-gauge hub needle
SRC-38	10-pack rubber silicone cup, high-temperature, use 16-gauge hub needle

WAND HANDLE PART NUMBERS**DESCRIPTION**

DPNOAS2LA *	luer-lock fitting, wand handle, normally-open flow
DPNOAS2NA	NST fitting, wand handle, normally-open flow

HOLDER PART NUMBERS**DESCRIPTION**

HSU *	table / wall mount, normally-open wand shutoff holder
HSUPT	tabletop pedestal, normally-open wand shutoff holder

VACUUM CORD PART NUMBERS**DESCRIPTION**

CC4SDS *	light-duty, vacuum coil cord, wire
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GROUND ADAPTER PART NUMBERS**DESCRIPTION**

CTA06 *	dual hose barb with grounding wire
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ADAPTER PART NUMBERS**DESCRIPTION**

AASPFLHNF	adapter , convert press fit wand / Freedom Wand™ to hub needle mount
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Breeze Manual Bernoulli Wafer Handling

H-Square Breeze provides a state-of-the-art touchless solution for manually transferring wafers while introducing little to no stress to the substrate. The Breeze wand is a non-contact wafer handling system that employs Bernoulli lift attraction principles. Ideal for wafer handling of thin, warped, thick, SEMI standard, or a variety of substrate sizes with special features such as etched cavities, Taiko® and TSV wafers.

H2BST Series

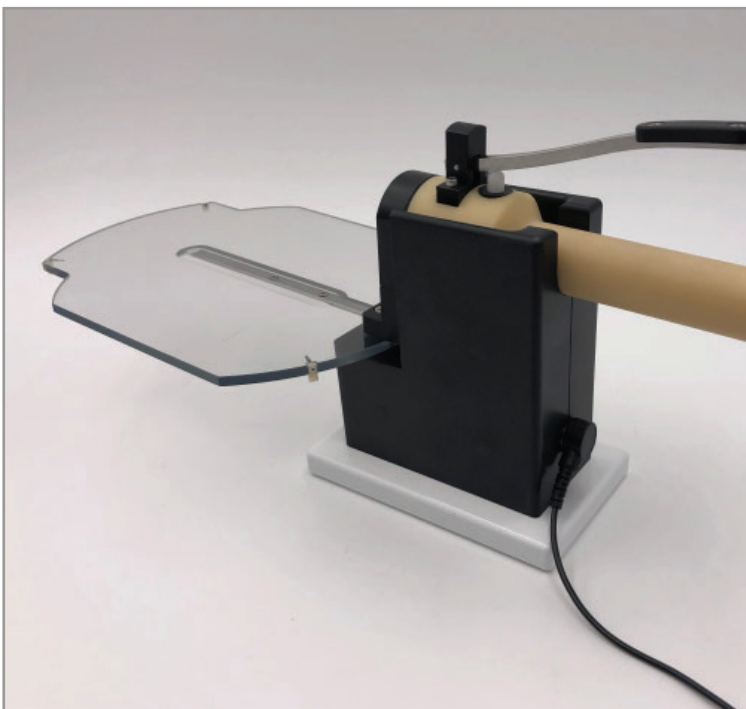


Bernoulli Offset Breeze

Designed for special application horizontal offset Bernoulli wafer handling where thin, SEMI standard or thick wafers are being moved. The H2BST configuration can be used to load / unload stages, platens, single-wafer shippers, stack shipping carriers and many industry process cassettes.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction
H-H2BST holder sold separately

	Ordering Part Number
76mm	H2BST-3
100mm	H2BST-4
150mm	H2BST-6
200mm	H2BST-8
300mm	H2BST-12



HOLDERS for H2BST

A weighted, movable tabletop holder for storing H2BST style H-Square Bernoulli Breeze tools. Designed to keep the H2BST particle-free and protect the Breeze corral pins from damage between use.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction

	Ordering Part Number
76-200mm	H-H2BST
300mm	H-H2BST-12

Visit www.h-square.com for additional product information

The Breeze uses compressed facility gases (Nitrogen (N²) or clean dry air (CDA), to stream air flow from a center sparger cap or sparger tube to the perimeter of the wafer. Wafers are lifted from a surface, platen, cassette, or shipping container without touching the top or bottom surfaces of the wafer. In accordance with Bernoulli's principle pressure differential the wafer is "floated" on the wand apparatus at approximately 200µm from the surface of the Breeze plate. Corral pins limit sideways movement of a retained wafer.

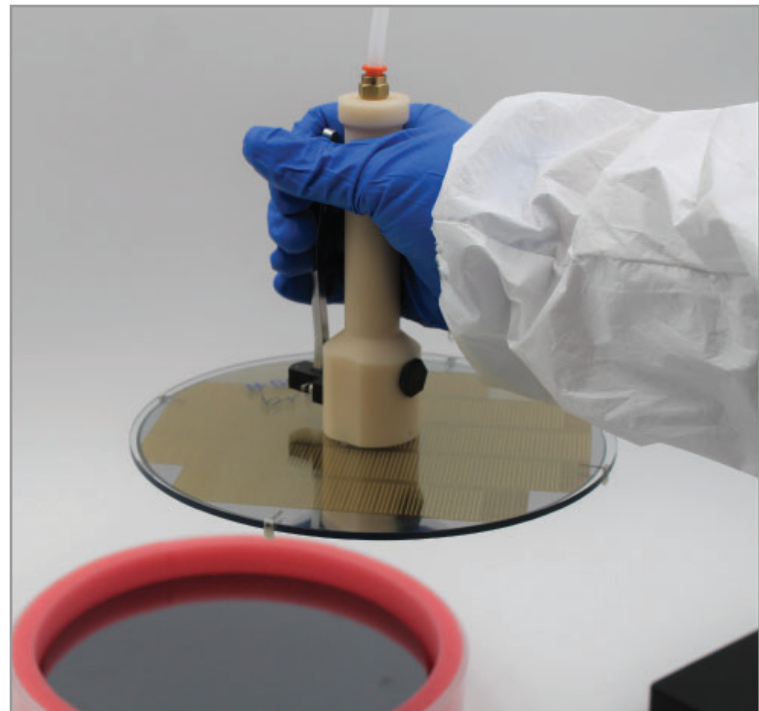
Bernoulli Perpendicular Breeze

This is a special application perpendicular Bernoulli wafer handling tool for moving thin, SEMI standard, or thick bonded wafers. The H2B is used to load / unload stages, platens, single-wafer shippers, stack-shipping carriers. The H2B design is not compatible with cassettes.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction
H-H2B holder sold separately

	Ordering Part Number
50mm	H2B-2
76mm	H2B-3
100mm	H2B-4
150mm	H2B-6
200mm	H2B-8
300mm	H2B-12

H2B Series

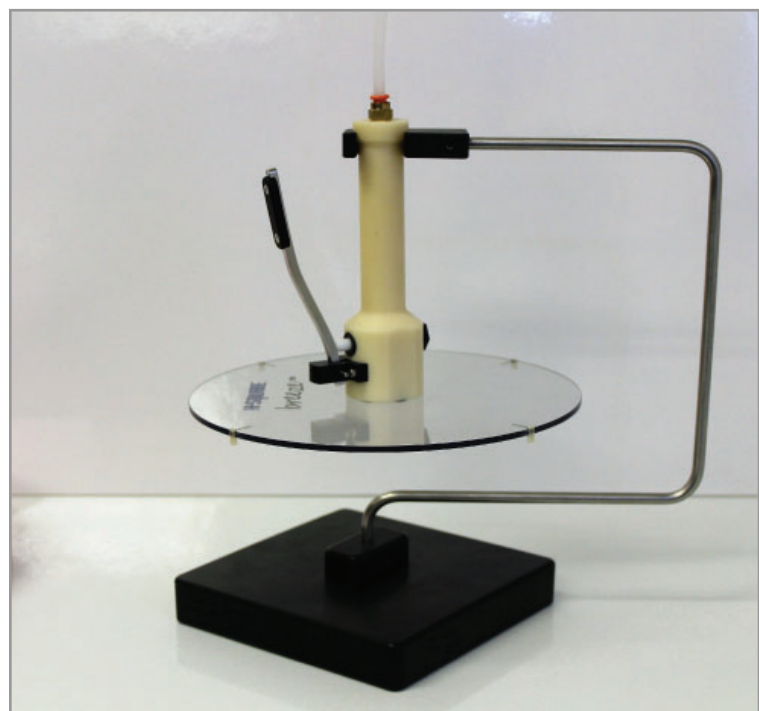


Holder for H2B

A weighted, movable tabletop holder for storing H2B style H-Square Bernoulli Breeze tools. Designed to keep the H2B particle-free and protect the Breeze corral pins from damage between use.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction

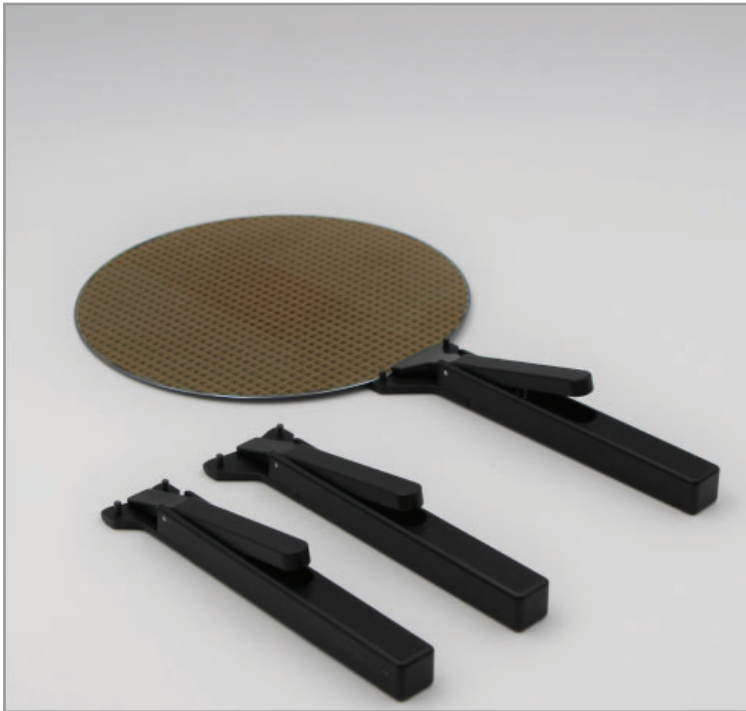
	Ordering Part Number
50-300mm	H-H2B



Mechanical Wafer Picks Edge Handling

H-Square wafer picks are ergonomic, consistent-force, mechanical tools providing fab operators clean, scratch-free handling of wafers. Advanced materials are incorporated in the designs for chemical resistance, ESD-safety control, lower abrasion and less tool maintenance. Wafer picks can be used for general wafer handling or for wafer rescue applications.

MCP2 Series



50-200mm Edge Picks

An edge-grip normally closed (consistent-force) edge exclusion mechanical pick for handling round substrates from the wafer edge. Base material is ESD-safe polypropylene for longevity, antistatic properties, and general chemical resistance. Wafer contact pad is per-fluorinated O-ring strip for grip / hold on the wafer without scratching or leaving out-gassing behind.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction, chemical resistant

	Ordering Part Number
50-76mm	MCP2-23
100-125mm	MCP2-45
150mm	MCP2-6
200mm	MCP2-8

MCP2-S Series



50-200mm Edge Spatula Picks

An edge-grip normally closed (consistent-force) edge exclusion mechanical pick for handling round substrates from the wafer edge; features a knife-edge spatula tip for lifting the wafer from a flat surface or single wafer carrier. Wafer contact pad is per-fluorinated O-ring strip for grip / hold on the wafer without scratching or leaving out-gassing behind. The knife-edge gripper is replaceable.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction, chemical resistant

	Ordering Part Number
50-76mm	MCP2-23-S
100-125mm	MCP2-45-S
150mm	MCP2-6-S
200mm	MCP2-8-S

Visit www.h-square.com for additional product information

Compound Wafers - The standard product MCP2 and ODP are design-engineered to handle silicon and the unique crystalline structures of compound wafers like SiC, GaAs and, InP. The normally-closed holding of the wafer ensures that every operator handles the wafer with the same consistent-force applied. On the MCP2, the clean per-fluorinated contact pad inside the gripper will not scratch or chip the wafer edge. This resolves historic issues of wafer edge scratching from tweezers which resulted in compound wafers breaking down-process.

300mm Edge Picks

An edge-grip normally closed (consistent-force) edge exclusion mechanical pick for handling 300mm round substrates from the wafer edge. Base material is ESD-safe PEEK gripper and trigger with antistatic Semitron ® 225 handle for longevity. Wafer contact pad is per-fluorinated Kalrez ® O-ring strip for grip / hold on the wafer without scratching or leaving out-gassing marks. Designed for application labs and for wafer rescue.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction, chemical resistant

	Ordering Part Number
300mm	MCP-12-001

Outside Diameter Mechanical Picks

A 3-point mechanical pick for handling wafers from the tangential edge (no front or back wafer contact). Grippers are Teflon® PTFE. For single-wafer chemical processing, or wafer rescue. Features an adjustable tensioner screw to adjust the amount of force put on the wafer. A single wafer presenter (WPR or HL) is used to access wafers from a cassette.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction, chemical resistant

	Ordering Part Number
50mm	ODP-2-002
76mm	ODP-3-009
100mm	ODP-4-011
125mm	ODP-5-001
150mm	ODP-6-010
200mm	ODP-8-016

MCP Series



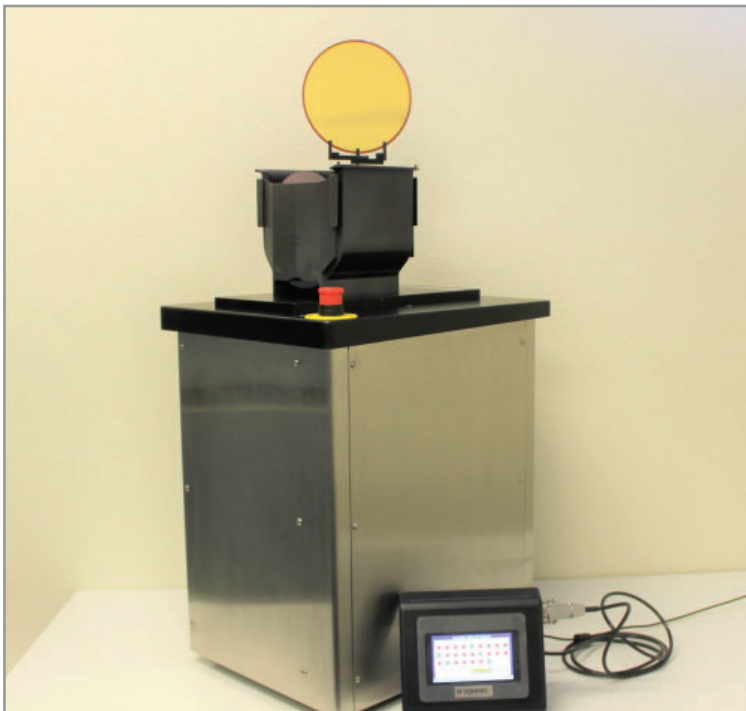
ODP Series



Wafer Presenters **Single Wafer and Escalators**

H-Square wafer presenter tools are engineered for fab operators to access wafers in a cassette for safer handling or macro-inspection applications. These tools reduce wafer scratching and particle contamination. Advanced materials are incorporated in the designs for ESD-safety control, lower abrasion, longer life, and less tool maintenance. Wafer presenter tools are compatible with most industry SEMI compliant wafer cassettes.

WPR Series



Single Wafer Presenters - Rotation

Table in-set, or tabletop, automatic single-wafer presenter designed to present a wafer to an operator for removal from the cassette or for macro inspection applications. The WPR features a rotating lift blade allowing full front side and backside wafer inspection from one operator position. The WPR can be used for wafer flipping (inverting) the wafer 180° degrees for backside applications.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction
Specify cassette model number with order

	Ordering Part Number
Base Unit	WPR (include one WPRKIT stage kit)
100mm	WPRKIT-4
150mm	WPRKIT-6
200mm	WPRKIT-8

AET Series



Escalator + Aligners

Tabletop automatic notch finder / escalator aligns and escalates wafers 0.200" (5mm) steps for ID mark reading. Cost-effective design provides full-lot wafer tracking at a fraction of the cost of fully automated OCR systems.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction
Specify cassette model number with order

	Ordering Part Number
150mm - Flat	AETWFA6
150mm - Notch	AETWNA6
200mm - Flat	AETWFA8
200mm - Notch	AETWNA8

Visit www.h-square.com for additional product information

Ordering guidelines: specify only one cassette / carrier model number per wafer presenter or escalator order. H-Square product designs are based on SEMI industry standards. Customers with non-standard cassette or wafer attributes (diameter and thickness) should contact H-Square to inquire if the standard configuration will meet their needs, or if custom engineering is required.

Single Wafer Presenters

Tabletop, manual single-wafer presenter designed to present a wafer to an operator for removal from the cassette or for macro inspection applications.

Designed for ISO Class 5 (FS209E Class 10)
Specify cassette model number with order

	Ordering Part Number
76mm	HL-3
100mm	HL-4
150mm	HL-6
200mm	HL-8

HL Series



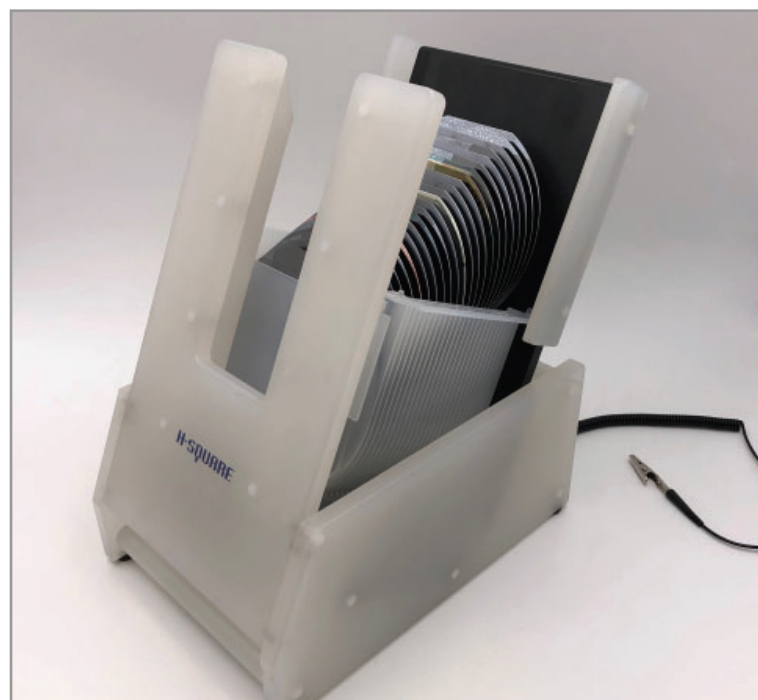
Escalators

Tabletop manual wafer escalator. Escalates wafers in 0.200" (5mm) steps for ID mark reading. Cost-effective design provides full-lot wafer tracking at a fraction of the cost of fully automated OCR systems. ETAS1 features a front safety guide; SQ21541 is open in the front. Advanced plastics are used for ESD-safety and abrasion resistance.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction, chemical resistant
Specify cassette model number with order

	Ordering Part Number
76mm	ETAS1-3-002
100mm	ETAS1-4 or SQ21541-13
125mm	ETAS1-5
150mm	ETAS1-6 or SQ21541-2
200mm	ETAS1-8 or SQ21541-10

ETAS1 Series



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Wafer Aligners Notch and Flat Finders

H-Square EZ Guide™ wafer aligners provide a fast, clean, and accurate method of wafer batch alignment to any angle. Engineered for both accurate wafer placement and for lot-integrity verification applications. Models are constructed with advanced ESD-safe materials, open design laminar flow stages and feature a quick-disconnect roller assembly for easy cleaning and maintenance. The ANFEZ and AFEZ can be preordered with an added program installed for macro-edge inspection applications - for rotating the wafer slowly under a light source.

ANFEZ Series



AFEZ Series



Notch Aligners

Tabletop automatic EZ Guide™ aligner bulk aligns wafer notches to +/- 1° accuracy. 16-position notch location switch allows for positioning at common industry final notch locations. ESD-safety controlled with static dissipative materials grounding both the wafer and cassette. Features quick-disconnect roller assembly for simple maintenance and cleaning.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction
Specify cassette model number(s) with order

	Ordering Part Number
150mm	ANFEZQ6
200mm	ANFEZQ8
300mm	Please Contact H-Square

Flat Aligners

Tabletop automatic EZ Guide™ aligner bulk aligns wafer flats to +/- 1° accuracy. 16-position flat location switch allows for positioning at common industry final flat locations. ESD-safety controlled with static dissipative materials grounding both the wafer and cassette. Features quick-disconnect roller assembly for simple maintenance and cleaning.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction
Specify cassette model number(s) with order

	Ordering Part Number
76mm	AFEZ-3
100mm	AFEZ-4
125mm	AFEZ-5
150mm	AFEZ-6
200mm	AFEZ-8

Visit www.h-square.com for additional product information

Ordering guidelines: specify cassette / carrier model numbers when ordering. H-Square product designs are based on SEMI industry standards. Customers with non-standard cassette or wafer attributes (diameter and thickness) should contact H-Square to inquire to find out if the standard configuration will meet their requirements, or if custom engineering is required.

Notch Aligners

Tabletop manual top-bottom (180° - 0°) EZ Guide™ aligner accurately bulk aligns wafer notches. ESD-safety controlled with static dissipative materials grounding both the wafer and cassette. Features quick-disconnect roller assembly for simple maintenance and cleaning.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction
Specify cassette model number(s) with order

	Ordering Part Number
150mm	NFEZQ6
200mm	NFEZQ8
300mm	Please Contact H-Square

NFEZ Series



Flat Aligners

Tabletop manual top-bottom (180° - 0°) EZ Guide™ aligner accurately bulk aligns wafer flats. ESD-safety controlled with static dissipative materials grounding both the wafer and cassette. Features quick-disconnect roller assembly for simple maintenance and cleaning.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction
Specify cassette model number(s) with order

	Ordering Part Number
76mm	MFEZ3
100mm	MFEZ4
150mm	MFEZ6
200mm	MFEZ8

MFEZ Series



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Wafer Aligners **Manual Flat Aligners**

H-Square FFTB top-bottom wafer flat aligners provide an inexpensive and accurate method of wafer batch alignment. All wafer flats are first aligned to the bottom position by rotating the spinner knob. Pressing the lift bar and rotating the spinner knob aligns the flats to the required position. The FFTBAS-456 is antistatic, compatible with multiple wafer sizes, and is not compatible with metal cassettes. The FFTB1 series is non-antistatic, wafer size specific, and is compatible with most industry metal cassettes. Please specify cassette model number when ordering.

FFTBAS Series



Flat Finders Antistatic

Tabletop multiple wafer size manual top-bottom (180° - 0°) aligner accurately bulk aligns wafer flats. This antistatic model is compatible with most standard 4" (100mm), 5" (125mm), and 6" (150mm) plastic wet / dry process carriers, storage and shipping containers. Constructed of ESD-safe and chemical resistant antistatic polypropylene.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant
Not compatible with most metal cassettes
Specify cassette model number(s) with order

	Ordering Part Number
100-150mm	FFTBAS-456

FFTB1 Series



Flat Finders

Tabletop manual top-bottom (180° - 0°) economy flat aligner accurately bulk aligns wafer flats. The FFTB1 is constructed of precision-machined, hard clear anodized, 6061 T-6 aluminum alloy for durability and long-life use. Each FFTB1 is size specific and is adjustable for different flat lengths.

Designed for ISO Class 5 (FS209E Class 10)
Compatible with AMC and SSC metal cassettes
Specify cassette model number(s) with order

	Ordering Part Number
50mm	FFTB1-2
76mm	FFTB1-3
100mm	FFTB1-4
125mm	FFTB1-5
150mm	FFTB1-6
200mm	FFTB1-8

Visit www.h-square.com for additional product information

Bright Light Macro Inspection

Bright-light reflection containment chamber with a 250-watt halogen full spectrum light source. The system includes an integrated automatic on / off motion sensor switch and an oversized aluminum heat sink which keeps the lamp cool without the need of a cooling fan. Substrates are manually placed into the black anodized light absorbing chamber and viewed under the concentrated light source. The enclosed table-top design provides the operator with a controlled macro light inspection while capturing and diffusing most deflected light. Available in two sizes.

Bright-Light Inspection Medium Boxes

Tabletop automatic on / off motion detection bright light view box. Light absorbing matte black anodized finish 12" x 12" x 12" box with 250-Watt pure white halogen bulb. Optional yellow filter lens included with the order. Ideal for photomask or macro-wafer inspections.

Designed for ISO Class 5 (FS209E Class 10)
Wafer sizes to 200mm; Mask sizes to 7" x 7"

	Ordering Part Number
110-120VAC	MISC2500-007
220-240VAC	MISC2500-018

Bright-Light Inspection Large Boxes

Tabletop automatic on / off motion detection bright light view box. Light absorbing matte black anodized finish 24" x 24" x 24" box with 250-Watt pure white halogen bulb. Optional yellow filter lens included with the order. Ideal for photomask or macro-wafer inspections.

Designed for ISO Class 5 (FS209E Class 10)
Wafer sizes to 450mm; Mask sizes to 14" x 14"

	Ordering Part Number
110-120VAC	MISC2500-015
220-240VAC	MISC2500-016

MISC2500 Series

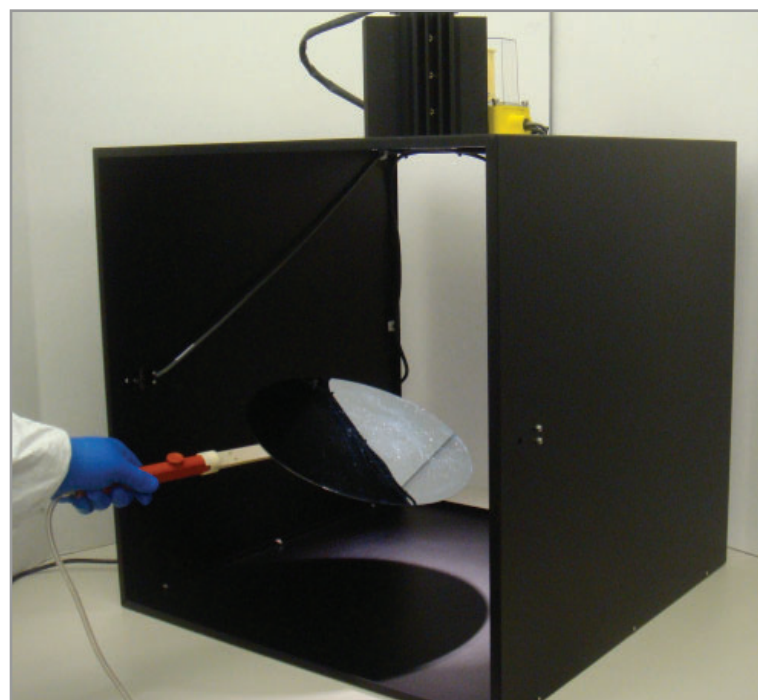
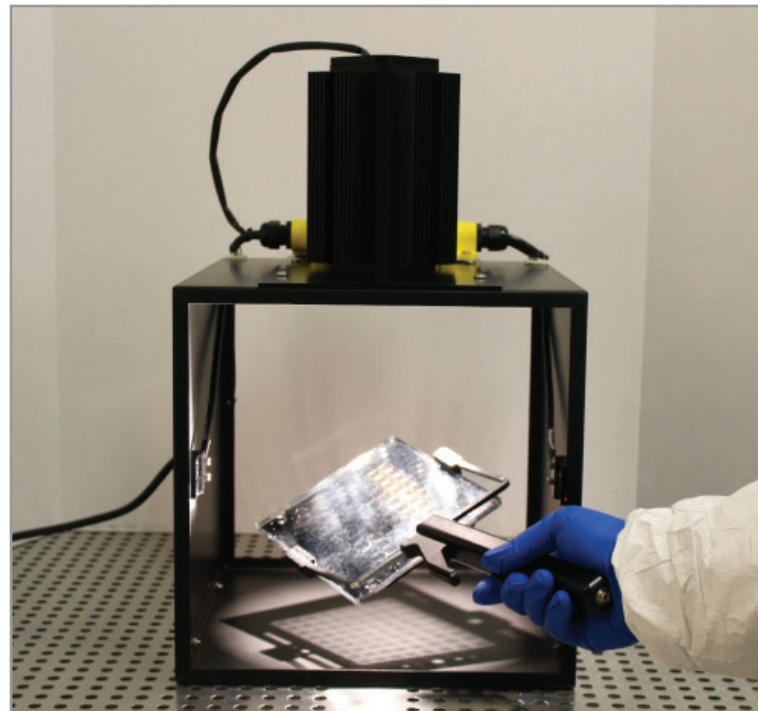


Photo-lithography Mask Picks

H-Square's line of photomask picks are the result of years of work with semiconductor companies and mask shops to provide a non-contaminating secure means of handling photomasks. Picks can reduce contamination by eliminating direct contact of mask by operator's hands. With the stringent cleanliness requirements for sub-micron applications today, mask picks have become indispensable. Advanced materials are incorporated in the designs for ESD-safety control, lower abrasion and less tool maintenance.

MPS Series



Side Grip Photomask Pick

Industry standard antistatic photomask picks handle the mask reticle from the SIDE tangential edges of the mask to reduce contamination by eliminating direct contact of mask chrome. MPS tools are designed with a 15° angle handle allowing for mask placement into photo process, metrology or storage containers.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant

5" x 5" x 0.090"	MPS1-50-014
6" x 6" x 0.250"	SQ21457-25
6" x 6" x 0.250" EUV	MPS3-63AS-002
7" x 7" x 0.120"	MPS1-71-001
9" x 9" x 0.120"	MPS1-001

Please contact H-Square for additional sizes

MPH Series



Horizontal Grip Photomask Pick

Horizontal antistatic photomask picks handle across the mask, contacting the tangential edges of the mask to reduce contamination by eliminating direct contact with the mask chrome area. MPH tools are designed with a 15° angle handle allowing for mask placement into photo process, metrology or storage containers.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant

5" x 5" x 0.090"	MPH151DW-005
6" x 6" x 0.250"	SQ21457-6
7" x 7" x 0.120"	MPH172DW-003
9" x 9" x 0.120"	MPH3-92AS-003

Please contact H-Square for additional sizes

Visit www.h-square.com for additional product information

Features:

- Tangential edge-grip only; no front or back face of chrome or pellicle contact.
- Minimal moving parts for simple cleaning and low particle generation.
- Lightweight, economical and easy-to-use with trigger-type gripping mechanism.
- V-type grippers allow masks with beveled edges to be loaded from flat surfaces.
- Antistatic construction for ESD-safety control of the chrome architecture.

Nikon Cartridge Photomask Pick

Special 4-gripper horizontal antistatic photomask picks for handling 6" reticles to / from a Nikon mask cartridge box. Please contact your H-Square representative for drawings. Ordering part number is based on pellicle size and location - grippers are positioned to avoid contact with pellicle frame. (typically loaded into the Nikon cartridge pellicle down).

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant

6" x 6" x 0.250"	SQ21518-1
6" x 6" x 0.250"	SQ21518-16
6" x 6" x 0.250"	SQ21518-32
6" x 6" x 0.250"	SQ21518-37
6" x 6" x 0.250"	SQ21518-46



NIKON Series

Mask Pick Holder

An all electro-polished (EP) 304 stainless steel tabletop holder for storing mask picks when not being used. The HMP protects the mask grippers from damage and contamination.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic Construction

1 Mask Pick	HMP1
3 Mask Picks	HMP3
4 Mask Picks	HMP4

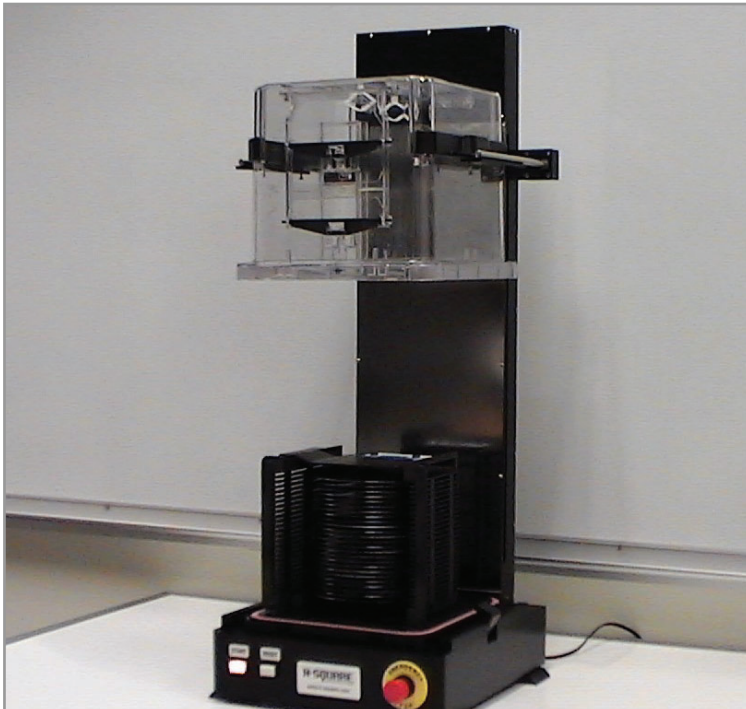


HMP Series

SMIF Pod Openers M200 and RSP200

Automatic M200 (200mm cassette) and RSP200 (reticle) SMIF openers provide easy access to substrates stored inside mini-environment pods. H-Square's automated openers unlock, open and store the pod lid with minimal operator involvement. Simple one-button operation. Openers are compatible with standard M200 and RSP200 pod designs. Smooth, reliable lift automation for reliability and cleanliness. For the SMIFPO8 (M200) version please specify the desired orientation of the pod when ordering.

SMIFPO Series



M200 Pod Opener

Tabletop automatic M200 style SMIF pod opener. SMIFPO8 automatically unlocks the center SMIF pod mechanism and lifts and stores the pod lid, allowing easy access to the inner wafer cassette. Simple one-button operation to open or close the pod. Customer to specify stage pod orientation when ordering - M200 front towards the operator (standard), or M200 front away from operator.

Designed for ISO Class 3
Antistatic construction
Specify stage orientation when ordering
Specify pod model number with order

	Ordering Part Number
M200	SMIFPO8

SMIFPO Series



RSP200 Pod Opener

Tabletop automatic RSP200 style reticle SMIF pod opener. SMIFPO8-E-002 unlocks the center SMIF pod mechanism and lifts and stores the pod lid, allowing easy access to the inner photomask. Simple one-button operation to open or close the pod.

Designed for ISO Class 3
Antistatic construction
Specify stage orientation when ordering

	Ordering Part Number
RSP200	SMIFPO8-E-002

Visit www.h-square.com for additional product information

Manual Pod Openers - The SMIFMAN8 manual swing-arm pod opener provides clean, easy access to wafers or photomasks in any M200 or RSP200 reticle storage pod. The SMIFMAN8 allows the operator to manually open the center mechanism on the pod, lowering the base and releasing the lid. This allows access to the inner cassette (M200) or mask tray (RSP200). H-Square's design features a clean low-contact pin raised storage area for the lid to be stored while pod is open. Antistatic materials are used to insure ESD safety and cleanliness.

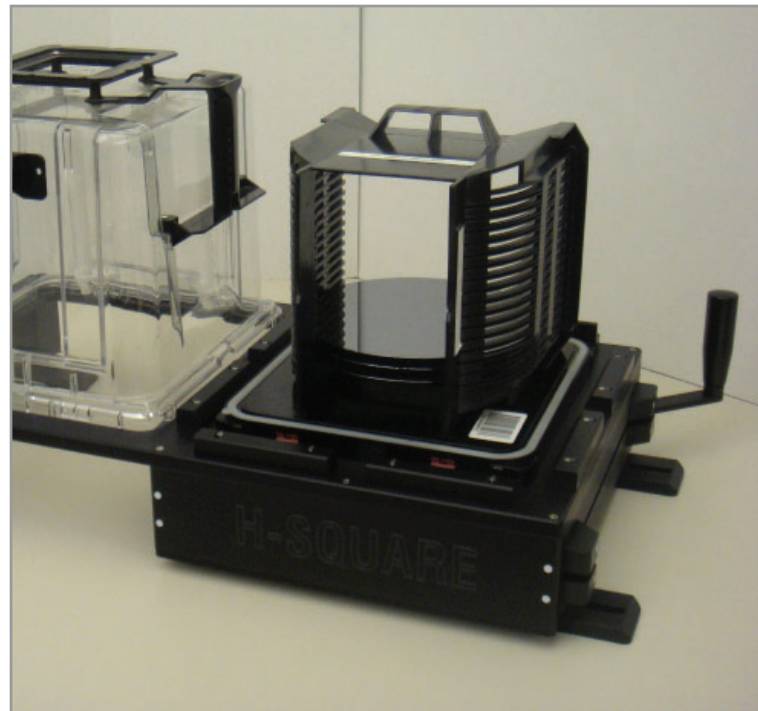
M200 Pod Opener

Tabletop manual M200 style SMIF pod opener. The secondary lid storage area keeps the lid seal clean when removed from the base.

Designed for ISO Class 5
Antistatic construction
Specify pod model number with order

M200 **Ordering Part Number**
 SMIFMAN8

SMIFMAN Series



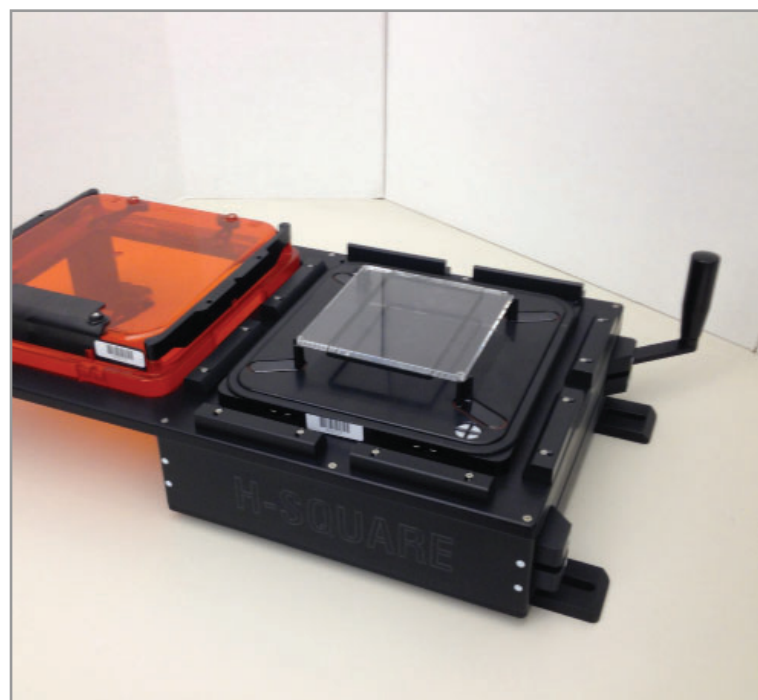
RSP200 Pod Opener

Tabletop manual RSP200 style reticle SMIF pod opener. A secondary lid storage area keeps the lid seal clean when removed from the base.

Designed for ISO Class 5
Antistatic construction
Specify pod model number(s) with order

RSP200 **Ordering Part Number**
 SMIFMAN8

SMIFMAN Series



Pod Openers RSP150 and FOUP

Automatic RSP150 photomask SMIF openers provide easy access to reticles stored inside mini-environment pods. H-Square's automated openers unlock, open and store the pod lid with minimal operator involvement. Mask protrusion sensors ensure masks are correctly loaded into the RSP150. Automatic FOUP door openers provide clean, managed access to wafers inside a 300mm FOUP.

SMIFPO Series



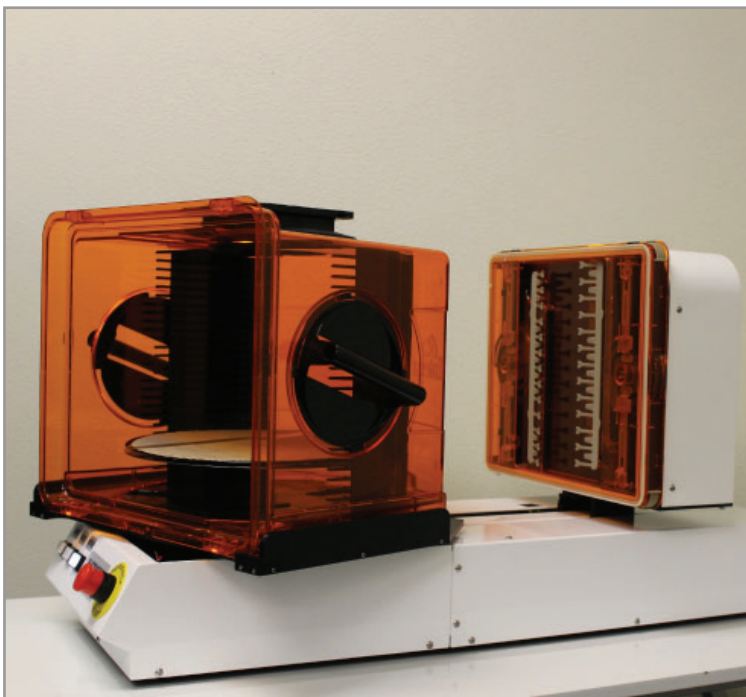
RSP150 Reticle Pod Opener

Tabletop automatic RSP150 style reticle SMIF pod opener. SMIFPO16 unlocks 4-mechanism RSP150 pod base and lifts and stores the pod lid, allowing easy access to the inner masks. Simple one-button operation to open or close the pod. Safety features include Z-axis break system and a mask protrusion sensor. Compatible with all industry standard single and multi-stack RSP150 pods.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction

	Ordering Part Number
RSP150	SMIFPO16

AFO Series



300mm FOUP Opener

This tabletop automatic 300mm FOUP door opener unlocks, removes and stores the FOUP door when accessing the wafers inside a FOUP. A rotating base mechanism below the FOUP allows for 360° degree rotation to position the open FOUP in the best ergonomic access position for the operator. Commonly installed at FOUP wash stations to disassemble and reassemble pods.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction

	Ordering Part Number
300mm FOUP	AFO

Visit www.h-square.com for additional product information

The SMIFMAN6 provides clean, easy access to photomasks in any RSP150 reticle storage pod. The opener allows the operator to manually unlock the four tabs on the pod tray, lowering the base and releasing the lid. H-Square's design features a clean low-contact pin raised storage area for the detached lid to be stored on while the pod is open. Antistatic materials are used to insure ESD-safety and cleanliness.

The manual 300mm FOUP opener, FOMH, provides clean access to the FOUP without damaging the door mechanism or allowing for inside-door contamination when the door is removed from the FOUP. The ergonomic pistol-grip design is comfortable for operators and helps to prevent handling mistakes.

RSP150 Reticle Pod Opener

Tabletop manual RSP150 style reticle SMIF pod opener. A simple arm mechanism unlocks the RSP150 pod mechanism allowing for easy release of the pod lid. A secondary lid storage area keeps the lid seal clean when removed from the base. A simple reverse motion of the arm mechanism closes the pod. Compatible with all industry standard single and multi-stack RSP150 pods.

Designed for ISO Class 5 (FS209E Class 10)
Antistatic construction

	Ordering Part Number
RSP150	SMIFMAN6

300mm FOUP Opener

Hand-held manual pistol-grip 300mm FOUP door opener. 90° rotating handle unlocks the SEMI standard FOUP door without damaging the inner door mechanism (a common problem with FOUP "keys"). The FOMH acts as a door tripod when removed from the FOUP; keeping the inner door cleaner when off of the FOUP. A reverse motion of the rotating handle closes the FOUP pod door.

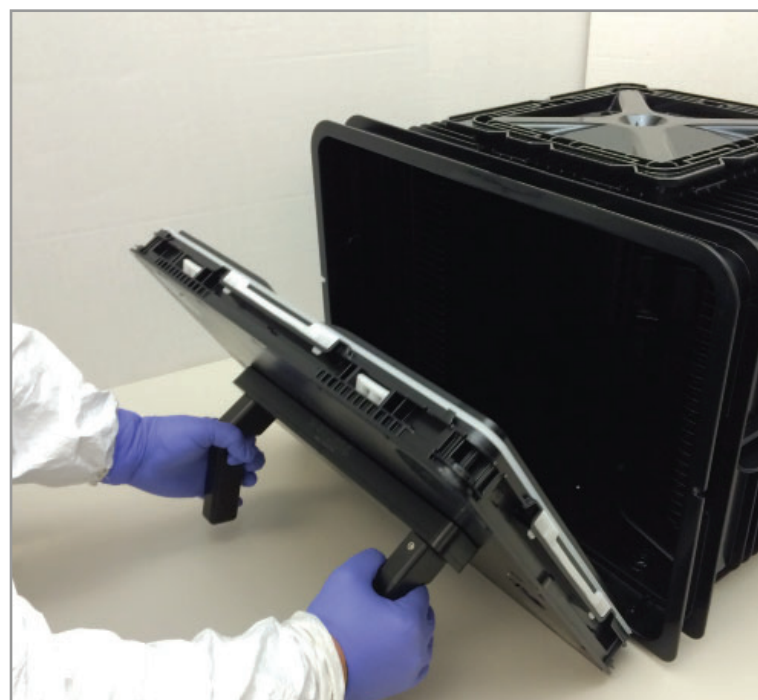
Designed for ISO Class 3 (FS209E Class 1)

	Ordering Part Number
300mm FOUP	FOMH
450mm FOUP/MAC	FOMH450

SMIFMAN Series



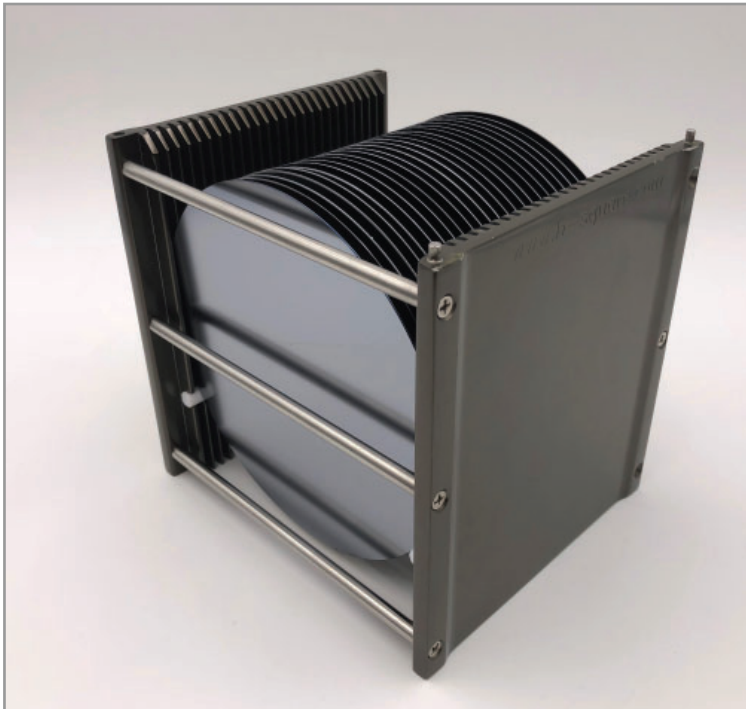
FOMH Series



Thermal Process Cassettes **Aluminum**

H-Square is the oldest and most experienced manufacturer of semiconductor high-temperature aluminum wafer cassettes. The AMC cassette (formerly 2851 and MC1) has proven to provide the best reliability, performance, service life, and value compared to any competitor's product. Cassettes can be ordered in a variety of sizes, slot configurations, wafer stop materials and surface finish, giving users many options to meet their specific requirements.

AMC Series



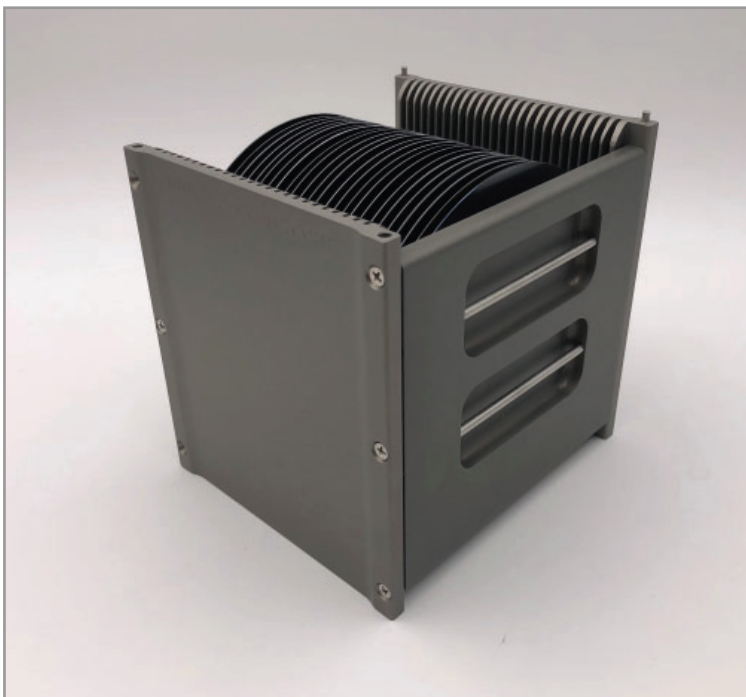
76-200mm Aluminum Open End Wall

Conventional 25-slot aluminum metal cassettes used in semiconductor manufacturing operations. Typically used in areas where wafer positioning is important or where elevated temperatures cause warping to other carriers. Features open end wall, Teflon PTFE wafer stops and hard clear (HC) anodization surface finish for abrasion resistance and longevity.

Designed for ISO Class 3 (FS209E Class 1)
Thermal environments up to 250° C

	Ordering Part Number
76mm	AMC75-25-SPSHC
100mm	AMC100-25-SPSHC
150mm	AMC150-25-SPSHC
200mm	AMC200-25-SPSHC

AMC Series



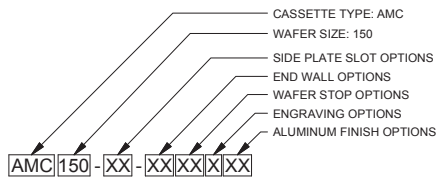
100-200mm Aluminum Closed End Wall

Conventional 25-slot aluminum metal cassettes used in semiconductor manufacturing operations. Typically used in OEM CVD and etch systems where wafer positioning is important or where elevated temperatures cause warping to other carriers. Features closed end wall, Teflon PTFE wafer stops and hard clear (HC) anodization surface finish for abrasion resistance and longevity.

Designed for ISO Class 3 (FS209E Class 1)
Thermal environments up to 250° C

	Ordering Part Number
100mm	AMC100-25-PPSHC
150mm	AMC150-25-PPSHC
200mm	AMC200-25-PPSHC

Visit www.h-square.com for additional product information



* EXAMPLE CASSETTE SHOWN: AMC150-25-SPSHC

SIDE PLATE SLOT OPTIONS	
OPTION:	CODE:
* STANDARD 25 SLOTS	25
25 WIDE SLOTS (THICK WAFER)	25T
12 SLOTS, BI-PITCH	12

END WALL OPTIONS	
OPTION:	CODE:
* STANDARD OPEN END	S
END WALL PLATE	P

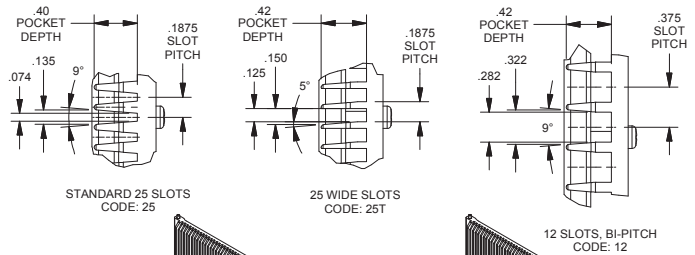
WAFER STOP OPTIONS		
SHAPE OPTION:	MATERIAL OPTION:	CODE:
* D-SHAPE	PTFE	P
D-SHAPE	PEEK NATURAL	PK
TRAPEZOIDAL	ALUMINUM	ZA
TRAPEZOIDAL	VESPEL	ZV
V-GROOVE	ALUMINUM	VA

ENGRAVING OPTIONS	
OPTION:	CODE:
* STANDARD ENGRAVING	S
LASER ENGRAVING	L
MECHANICAL ENGRAVING	M

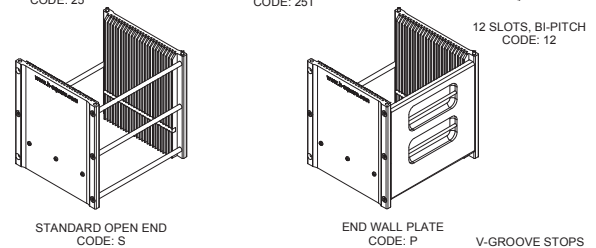
ALUMINUM FINISH OPTIONS (SIDE PLATES AND WAFER STOPS)	
OPTION:	CODE:
* ANODIZED HARD CLEAR	-HC
ELECTROLESS NICKEL	-EN
ANODIZED HARD BLACK	-B
ANODIZED HARD CLEAR WITH IMPREGNATED PTFE	-HCP
PFA COAT	-PFA
POLISHED	-P
CHEMICAL CLEANING	-CC
ANODIZED RED	-R
ANODIZED BLUE	-BL

AMC cassettes are customizable. Special bi-pitch 12-slot or expanded-slot 25T (thick substrate) side plates are available; A variety of surface finishes, wafer stop materials and engraving options ensure the best match for the end-user's application. Please contact your H-Square representative for guidance on AMC configuration options. Custom cassettes require minimum quantity ordering.

SIDE PLATE SLOT OPTIONS



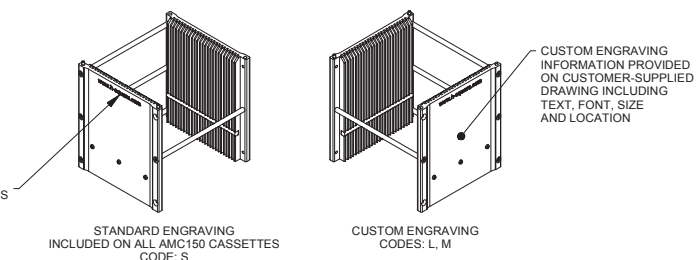
END WALL OPTIONS



WAFER STOP OPTIONS



ENGRAVING OPTIONS



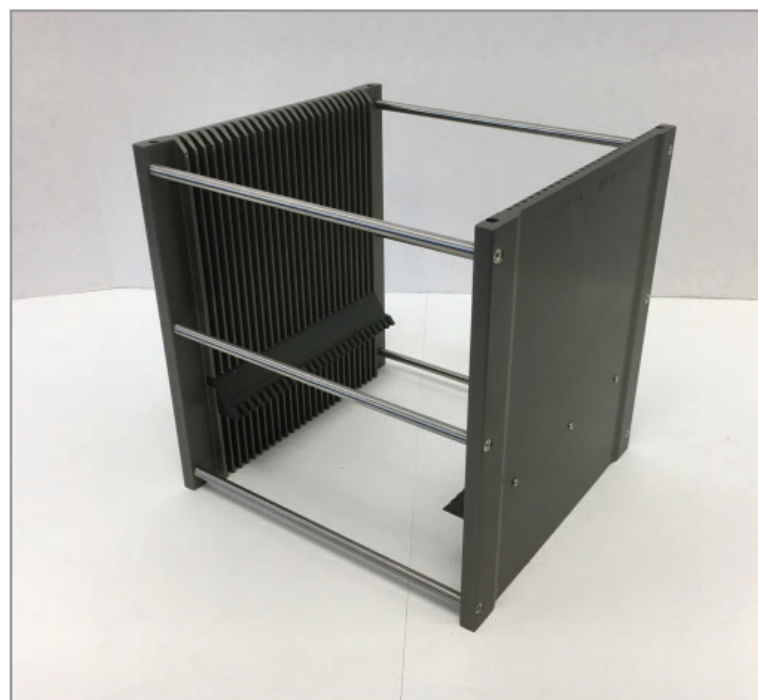
76-200mm Aluminum High Temperature

AMC Series

Special high-temperature 25-slot aluminum metal cassettes used in semiconductor manufacturing operations. Typically used for thermal applications between 250°-350°C where elevated temperatures cause warping to other carriers. Features open end wall, aluminum v-groove wafer stops and hard clear (HC) anodization surface finish for abrasion resistance and longevity.

Designed for ISO Class 3 (FS209E Class 1) Thermal environments up to 350° C

	Ordering Part Number
76mm	AMC75-25-SVASHC
100mm	AMC100-25-SVASHC
150mm	AMC150-25-SVASHC
200mm	AMC200-25-SVASHC



Thermal Process Cassettes **Stainless Steel and Aluminum**

This cassette is made for high-temperature wafer processing applications or specialty applications, including mega-sonic and cleaning processes. This all-welded type 316 stainless steel electro-polished cassette has outside dimensions similar to SEMI standard plastic process cassettes. SSC cassettes are transfer and automation compatible. Corrosion Resistance: 316SST offers better resistance than 302 and 304 SST; resists many industrial chemicals and solvents including: sodium and calcium brines, hypo chlorite solutions, phosphoric acid, sulfite liquors, and sulfurous acids.

SSC Series



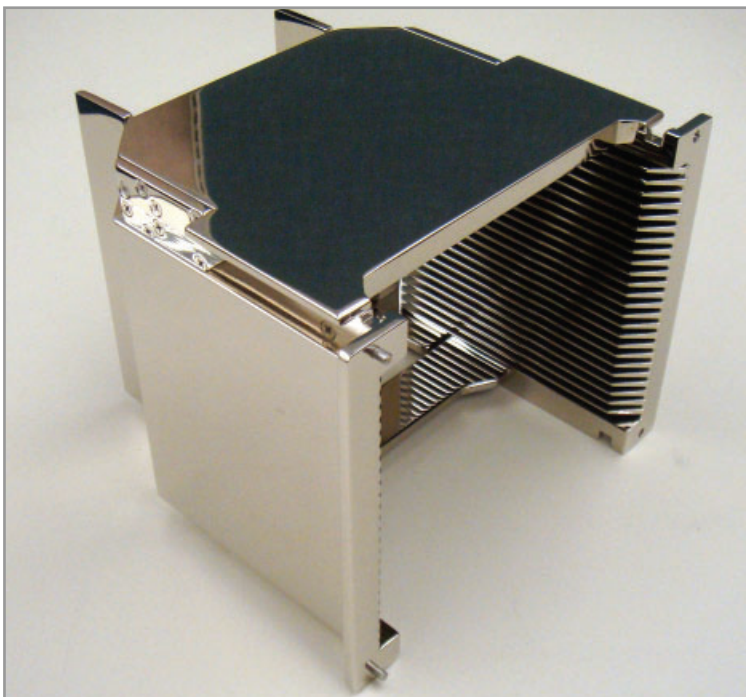
76-200mm Stainless Steel Cassettes

Industry standard open side wall high temperature 25-slot all-welded stainless steel metal cassettes used in semiconductor manufacturing operations. Typically used for high thermal processes, polyimide bake, and for ultrasonic cleaning applications.

Designed for ISO Class 3 (FS209E Class 1)
Thermal environments up to 550° C

	Ordering Part Number
76mm	SSC75-25-SSNSS
100mm	SSC100-25-SSNSS
150mm	SSC150-25-SSNSS
200mm	SSC200-25-SSNSS

MCF Series



150-200mm Process Aluminum Cassettes

A special application all-aluminum metal cassette used in place of a plastic cassette in load-locks, OEM applications and advanced wafer handling applications. Finish coating is electroless nickel (EN) or bare polished aluminum (HV) with vacuum vented screws.

Designed for ISO Class 3 (FS209E Class 1)
Thermal environments up to 350° C

	Ordering Part Number
150mm	MCF6EN (formerly SQ21140-2)
200mm	MCF8EN
200mm	MCF8HV

Visit www.h-square.com for additional product information

H-Square's unique aluminum MC12-25HC1 300mm cassette design is SEMI automation compliant, lightweight (less than a FOUP), ergonomic, and able to withstand the thermal stresses of high-temperature processing without the need for maintenance or periodic replacement. The heat-treated all-welded T6061 aluminum construction provides dimensional stability over time and temperature cycling. The cassette features kinematic coupling positioners, info pad, and a wafer retaining lock-bar for safe inner-fab transportation. The higher temperature SSC300 model has the same dimensions and features as the MC12-25HC1; engineered for 350-550° C environments.

300mm Stainless Steel Cassettes

The SSC300 is a special application 25-slot all-welded type 316 stainless steel 300mm metal cassettes for thermal applications between 350-550° C. This heavy-duty cassette is designed for high thermal bake processes where H-Square's standard aluminum MC12-25HC1 design cannot be used.

Designed for ISO Class 3 (FS209E Class 1)
Thermal environments up to 550° C
Weight 19.0 lbs. (8.6kg)

	Ordering Part Number
300mm	SSC300

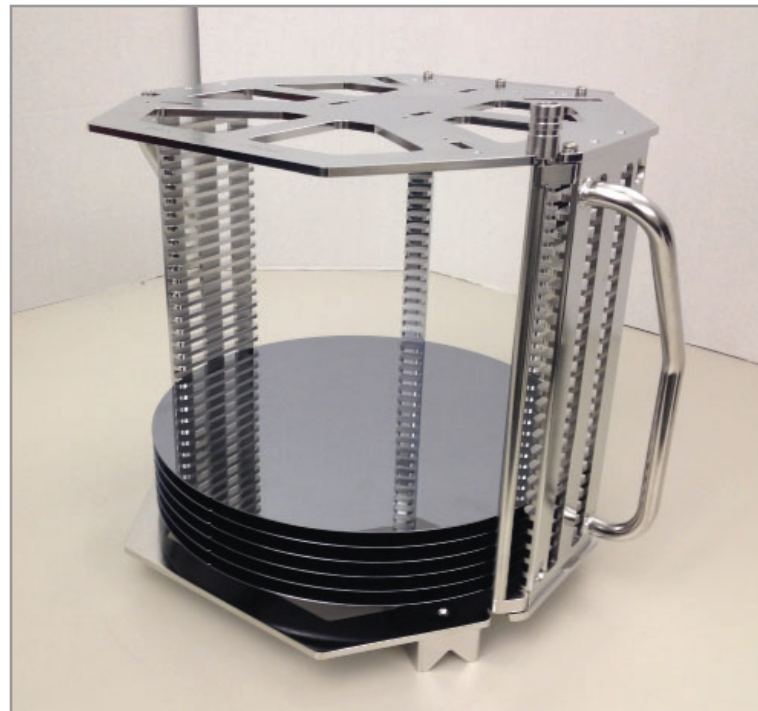
300mm Aluminum Process Cassettes

Automation compatible 25-slot all T6061 aluminum construction thermal process cassette used in semiconductor manufacturing operations worldwide. 300mm SEMI compliant design attributes. Weight reduction architecture with side handles for operator ergonomic comfort and safety. Features wafer retaining lock bar to prevent wafers from sliding out during transport. Hard clear (HC) anodization surface finish. All welded construction to reduce thermal expansion/contraction issues and preserve dimensional stability.

Designed for ISO Class 3 (FS209E Class 1)
Thermal environments up to 350° C
Weight:7.2 lbs. (3.2kg)

	Ordering Part Number
300mm	MC12-25HC1

SSC Series



MC12 Series



Fuji Bakelite Plastic Process Cassettes and Cases

Fuji Bakelite Co. Ltd Japan manufactures a unique product line of higher-end quality cassettes and WIP storage cases with new FB-0431 material specifically designed for the semiconductor industry. FB-0431 is an antistatic cyclic olefin copolymer with milled carbon fiber; specially compounded, and developed as an upgraded material to PP, PC, and PBT and a lower-cost alternative to PEEK. FB-0431 performance is comparable to antistatic PEEK at a fraction of the cost and with superior abrasion resistance.

FB Series



200mm Thin Wafer Process Cassettes

Industry standard 200mm thin wafer process cassette for handling wafers thinner than 350 microns. 13-slot bi-pitch configuration. The FB20A106H01 features an end wall handle, extended support slots to help minimize warping. Material is FB-0431 antistatic (E7-E8) cyclic olefin copolymer. Superior overall dimensional stability and abrasion resistance with sharp edge wafers compared to all other cassettes in the market.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant
Thermal environments up to 80° C
Minimum order quantity: 10 pieces

	Ordering Part Number
200mm	FB20A106H01

FB Series



150mm Thin Wafer Process Cassettes

Industry standard 150mm thin wafer process cassette for handling wafers thinner than 350 microns. 13-slot bi-pitch configuration. The FB15A101H01 features an end wall handle, extended support slots to help minimize warping. Material is FB-0431 antistatic (E7-E8) cyclic olefin copolymer. Superior overall dimensional stability and abrasion resistance with sharp edge wafers compared to all other cassettes in the market.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant
Thermal environments up to 80° C
Minimum order quantity: 10 pieces

	Ordering Part Number
150mm	FB15A101H01

Visit www.h-square.com for additional product information

Fuji Bakelite products are tomorrow's standard for semiconductor wafer handling

- Automation setup - superior dimensional stability; exact repeatability from cassette to cassette
- Micro-contamination - unmatched abrasion resistance; lower particle generation
- ESD-safety - consistent resistivity throughout the product
- ROI Investment - FB cassettes are less expensive than PEEK; outperforms PEEK, PC and PP materials
- Yield improvements - FB cases eliminate the high particle shedding common with all competitor cases

Advanced Process Cassettes

Fuji Bakelite semiconductor 25-slot wafer carriers are engineered for use over a long period of time. The anti-abrasion properties and outstanding dimensional stability set these cassettes apart from the competitor's products. The FB-0431 material reduces particles from generating and wafer chipping from occurring. Please contact H-Square for cassette configuration options and material performance information.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction, chemical resistant
Thermal environments up to 80° C
Minimum order quantity: 10 pieces

	Ordering Part Number
100mm	FB10A100H02
150mm	FB15A100H01
200mm	FB20A102H01

Advanced WIP Storage Box Cases

Fuji Bakelite's cases feature antistatic transparent covers and abrasion resistant bodies, which are dramatically cleaner than conventional PP and PBT cases on the market. Since even tiny particles matter a lot on a cutting-edge production line, we recommend this quantum leap in resistance to abrasion. Please contact H-Square for case configuration options and material performance information.

Designed for ISO Class 3 (FS209E Class 1)
Antistatic construction
Minimum order quantity: 10 pieces

	Ordering Part Number
100mm	FB10C000
150mm	FB15C000
200mm	FB20C000
200mm	FB20C007

FB-A Series



FB-C Series

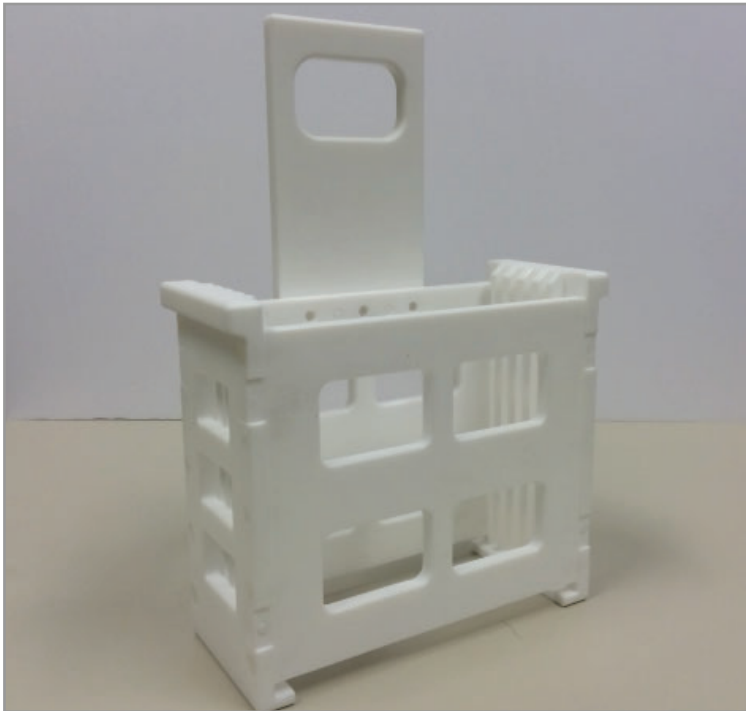


Machined PTFE Custom Teflon® Process Cassettes

H-Square designs and manufactures custom plastic cassettes and inserts for use in handling unique substrates and photomask cleaning applications. PC designs utilize PTFE grade and PFA grade Teflon® parts for excellent chemical and wear resistance. Designs are offered with either fixed or detachable PTFE handles. Contact your local H-Square representative for more information.

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PC Series



Photomask Cleaning Cassettes

Four-slot fixed handled photomask cleaning cassettes allow for a mask to be lowered into a wet bench for periodic cleaning requirements. Cassette construction is PTFE virgin Teflon® with PFA fasteners.

Designed for ISO Class 3 (FS209E Class 1)
 Chemical resistant
 Thermal environments up to 80° C
 Minimum quantity order: 2 pieces

Ordering Part Number

2 slots 6" x 6", 2 slots 5" x 5"	PC-076
2 slots 7" x 7", 2 slots 5" x 5"	PC-025
4 slots 7" x 7"	PC-012
4 slots 9" x 9"	PC-005

PC Series



Custom PTFE Cleaning Cassettes

H-Square designs and manufactures custom wet bench cleaning cassettes for special non-standard substrate sizes or applications. Cassette construction is PTFE virgin Teflon® with PFA fasteners. All designs are quoted to a custom scope-of-work document and have a MOQ minimum quantity per order. First articles require a NRE engineering fee for design and documentation.

Designed for ISO Class 3 (FS209E Class 1)
 Chemical resistant
 Thermal environments up to 80° C
 Minimum quantity order: 5 pieces

Contact H-Square for more information

Visit www.h-square.com for additional product information

Mock Wafers Aluminum Setup/Test Wafers

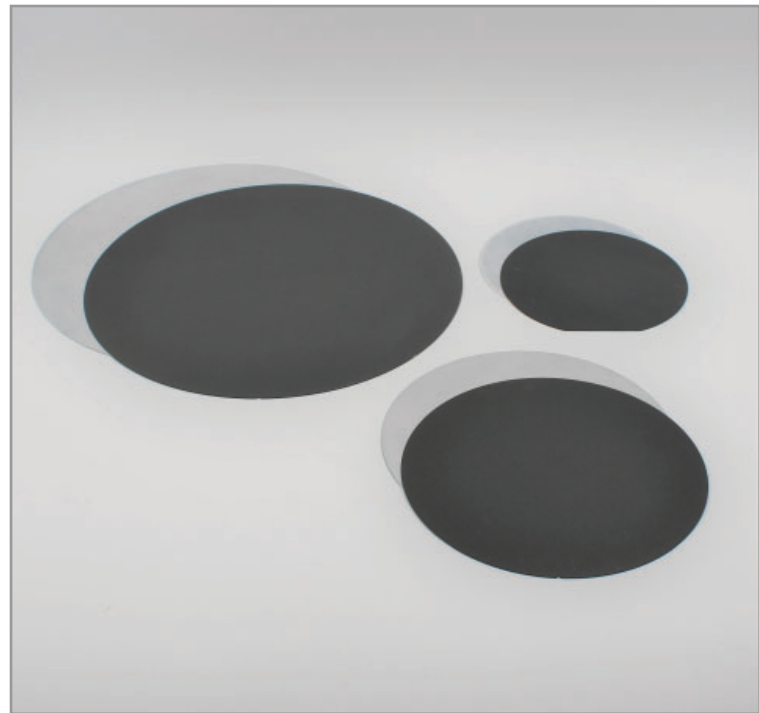
Mock Wafers

Used as durable, shatterproof replacements for semiconductor wafers in training, robotic calibration, particle shield, identification, and equipment demonstrations. Mock wafers are precision manufactured from 6061 T-6 aluminum alloy. Each wafer is chemically etched and heat-treated to improve flatness and surface hardness and durability. Mock wafers are available in bare aluminum or hard clear (HC) anodized.

Designed for ISO Class 3 (FS209E Class 1)

	Ordering Part Number
150mm, Bare	MW-6NP
150mm, Anodized	MW-6HC
200mm, Bare	MW-8-NNP
200mm, Anodized	MW-8-NHC
300mm, Bare	MW-12-NNP
300mm, Anodized	MW-12-NHC

MW Series



Contacts Sales and Service Channel Partners


CA, NV, IL, IN, OH, KY, MI, MO, WI, MN, IA, ND, SD, MA, ME,
 NH, RI, UT, CO, MT, ID United States, Canada, Mexico, South America

H-Square Corporation
Santa Clara, California

General e-mail: info@h-square.com
 Phone: +1 (408) 982-9108
<http://www.h-square.com/>

Sales Department
 email: sales@h-square.com

Service Department
 e-mail: service@h-square.com



OR, WA
 United States

InnerSkil
Willsonville, Oregon

Contact: Rick O'Malley
 e-mail: rick@innerskil.com
 Phone: +1 (503) 863-6270
<http://www.innerskil.com/>



AZ, NM
 United States

Jack Kriegel & Associates
Gilbert, Arizona

Contact: Jack Kriegel
 e-mail: jackkriegel@cox.net
 Phone: +1(480) 813-4600
<http://www.jkriegel.com/>



TX - North, AR, LA, OK
 United States

NetMercury North
Dallas, Texas

Contact: Ed Dahir
 e-mail: edahir@netmercury.net
 Phone: +1 (972) 783-1501
<http://www.netmercury.net/>



TX - South
 United States

NetMercury South
Round Rock, Texas

Contact: Mark Lariviere
 e-mail: mlariviere@netmercury.net
 Phone: +1 (512) 989-0600
<http://www.netmercury.net/>



PA, DE, NY, NJ
 MD, CT, VT, D.C.
 United States

Harrington Pure Northeast
Lafayette Hill, Pennsylvania

Contact: Jay Conway, John Pirozzi
 e-mail: jconway@es-technologies.com
 Phone: +1 (610) 730-0920
<http://www.es-technologies.com/>



NC, SC, VA, GA
 AL, TN, MS
 United States

Harrington Pure Southeast
Durham, North Carolina

Contact: Dave Freedman
 e-mail: dfreedman@es-technologies.com
 Phone: +1 (919) 665-7997
<http://www.es-technologies.com/>

Visit www.h-square.com for additional product information



JAPAN

Nagase Techno-Engineering Co., Ltd

Contact: Hitomi Watanabe
e-mail: hitomi.watanabe@nagase.co.jp
Phone: +81-45-541-0208
<http://www.nagase-nte.co.jp/>



PR CHINA,
HONG KONG

Shanghai Nagase Trading Co., Ltd.

Contact: Johnson Cheng
e-mail: mengmeng.cheng@nagase.cn
Phone: +86 189-1712-5613
<http://www.nagase.cn/>



KOREA

K-Pross

Contact: S.Y. Steve Ha
e-mail: steveha@k-pross.co.kr
Phone: +82-31-262-8405



SINGAPORE
MALAYSIA (East)

Power Team Technologies (S) PTE LTD.

Contact: KC Chong
e-mail: kcchong@ptt.com.sg
Phone: +65-6348-6380
<http://www.ptt.com.sg/>



MALAYSIA (Mainland)
THAILAND
VIETNAM

S.P.S.. Asia

Contact: Chin San Lim
e-mail: chinsan.lim@sps-europe.com
Phone: +65 911 30 172
<http://www.sps-asia.com/>



TAIWAN

Ever Team International

Contact: Cindy Ma
e-mail: cindy_ma@everteam.com.tw
Phone: +1 886-3-572-9545
<http://www.everteam.com.tw/>



THE PHILIPPINES

PULSE INTEGRATED TECHNOLOGY, INC.

Contact: Verna Montano
e-mail: verna@pulse-technology.com
Phone: +63-2-809-3716
<http://www.pulse-technology.com/>



AUSTRALIA

M.M.R.C. Pty Ltd.

Contact: Michael Young
e-mail: myoung@mmrc.com.au
Phone: +(613) 9885-1752
<http://www.mmrc.com.au/>



THE NETHERLANDS, DENMARK,
FINLAND, , NORWAY, NORTHERN
GERMANY, SWEDEN, GREECE,
TURKEY, RUSSIA

S.P.S. B.V.

Contacts: Cristian de Groot, Rein de Groot,
Cor Rozema, Florian Goebel
e-mail: info@sps-europe.com
Phone: +31-341-360-590
<http://www.sps-europe.com/>



SPAIN, PORTUGAL,
FRENCH SPEAKING
SWITZERLAND

S.P.S. B.V.

Contact: Pierrick Four
e-mail: Pierrick.Four@sps-europe.com
Phone: ++33 4 78 96 46 06
<http://www.sps-europe.com/>



BELGIUM, LUXEMBOURG

S.P.S. bvba

Contact: Eric Jager
e-mail: eric.jager@sps-europe.com
Phone: +32 3 440 0895
<http://www.sps-europe.com/>



FRANCE

S.P.S. France

Contact: Eric Puchois
e-mail: eric.puchois@sps-europe.com
Phone: +33 4 72 31 78 35
<http://www.sps-europe.com/>



AUSTRIA, SOUTHERN GERMANY,
SWITZERLAND, CZECH REPUBLIC,
SLOVAKIA, CROATIA, HUNGARY,
ROMANIA, BULGARIA

S.P.S. Vertriebs GmbH

Contact: Roland Scheuerer
e-mail: roland.scheuerer@sps-europe.com
Phone: +49-841-37053-0
<http://www.sps-europe.com/>



ITALY

S.P.S. Italy

Contact: Sergio Moroni
e-mail: sergio.moroni@sps-europe.it
Phone: +39 3457 357 177
<http://www.sps-europe.com/>



IRELAND, UNITED
KINGDOM, INDIA, DUBAI

S.P.S. LTD.

Contact: Peter Summers
e-mail: peter.summers@sps-europe.com
Phone: +44-1750-725712
<http://www.sps-europe.com/>



ISRAEL

M.Y.G. TECH. CO., LTD.

Contact: Moshe Gabai
e-mail: mosheg@myg-tech.co.il
Phone: +972-8-9760620
<https://www.myg-tech.co.il/>

Common Spare Parts

Vacuum Wand Replacement Parts

PARENT	SPARE ITEM	PART
NOASQ2	tubing 2.5"	ST-2.5KQ
NOASQ2	button assembly	BPVPASNO
NOASPF2	button assembly	BPVPASNO
NO3AS1	button assembly	BPVNO3AS
NO3AS1	male wand / tip adapter	401979
T3PKAS1	female wand / tip adapter	BPVNO3AS
DPNOAS2LA	button assembly	BPVPASNO
DPNOAS2NA	button assembly	BPVPASNO
FWCR3	filter change kit	FWCR2FA
FWCR2	filter change kit	FWCR2FA
FWCR-4	filter change kit	FWCR2FA

Bright Light Replacement Parts

MISC2500	bulb, halogen,MR16	603258
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Power Supply Replacement Parts

FWCR3	power supply, 18V	602726
FWCR2	power supply, 18V	602726
FWCR-4	power supply, 18V	602726
FWTTA1	power supply, 12V	603280
SQ22949	power supply, 12V	603280
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FWAHAS2	battery 10V,NIMH	602526
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AWT	power supply, 12V	603280
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SMIFPO	power supply, 24V	603898
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all	outlet cord,EUR 220V	602299
all	outlet cord,UK 220V	602300

Wafer Aligner Replacement Parts

PARENT	SPARE ITEM	PART
ANFEZQ8	main roller	PRA8
ANFEZQ8	notch catch roller	NFNRQ
ANFEZ all	roller bearing,UHMW	A000-730
ANFEZ all	switch bulb, LED,12V	600433-12
ANFEZQ6	main roller	PRA23456
ANFEZQ6	notch catch roller	A000-1078
AFEZ all	roller bearing,UHMW	A000-730
AFEZ all	switch bulb, LED,12V	600433-12
AFEZ-3	main roller	PRA23456
AFEZ-4	main roller	PRA23456
AFEZ-5	main roller	PRA23456
AFEZ-6	main roller	PRA23456
AFEZ-8	main roller	PRA8
MFEZ all	roller bearing,UHMW	A000-730
MFEZ-3	main roller	PRA23456
MFEZ-4	main roller	PRA23456
MFEZ-6	main roller	PRA23456
MFEZ-8	main roller	PRA8
NFEZ all	roller bearing,UHMW	A000-730
NFEZQ8	main roller	PRA8
NFEZQ8	notch catch roller	NFNRQ
NFEZQ6	main roller	PRA23456
NFEZQ6	notch catch roller	A000-1078
FFTBAS-456	main roller	A000-379-2
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FFTB1-2	wafer support	A000-103-1
FFTB1-3	main roller	A000-152-1
FFTB1-3	wafer support	A000-103-1
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