



provide **complete** solutions

for electronic assembly



[www.pbtworks.com](http://www.pbtworks.com)

## PROVIDING PRODUCT RELIABILITY SINCE 1992

### WHY...

- ◆ clean electronics?  
**To avoid potential failures**

### WHAT...

- ◆ is the danger?  
**Electrochemical corrosion**

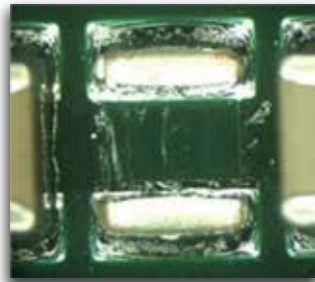
### BECAUSE...

- ◆ cleaning increases your product reliability & value  
**It is becoming standardised manufacturing step**

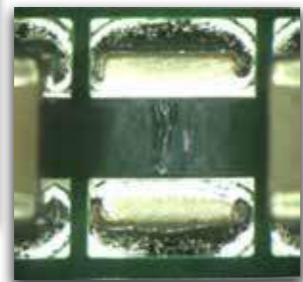
### DO...

- ◆ consult your process  
**Match cleaning agent and flux optimally**

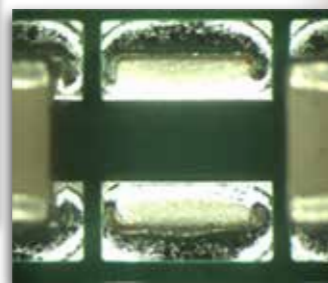
### NOT CLEANED



### HALF CLEANED



### CLEANED



## ABOUT PBT WORKS

- ◆ Established in 1992
- ◆ More than 800 installations worldwide
- ◆ Over 60 employees
- ◆ 2500 m2 of company facility
- ◆ ISO 9001 and ISO 14001 certification for production and design
- ◆ Extensive experience with most challenging cleaning projects
- ◆ State-of-art cleaning evaluation test & process recommendation
- ◆ Collaboration with world class providers of cleaning chemicals
- ◆ Close collaboration with universities and research institutes
- ◆ Own design team converts research ideas into the most up-to-date equipment
- ◆ Complete in-house mechanical, hardware and software design
- ◆ Flexibility to meet specific customer requirements
- ◆ Global sales and service network of over 50 partner companies



- ◆ Vertical spray bars
- ◆ Linear movement
- ◆ Highest orthogonal spray impact
- ◆ Balanced spray
- ◆ No shadows
- ◆ No blind corners
- ◆ No stencil bending
- ◆ Best for low stand-off components



- ◆ Closed loop wash system
- ◆ Instant filtration
- ◆ Fully separated processes
- ◆ No drain after cycle needed
- ◆ Low drag over
- ◆ Low liquid consumption



- ◆ Vertical spray bars
- ◆ Synchronized rotation
- ◆ Constant speed
- ◆ Orthogonal spray impact
- ◆ No stencil bending
- ◆ No shadows
- ◆ Mitigated blind corners



- ◆ Closed loop rinse system
- ◆ Continuous water regeneration
- ◆ Filtration by Carbon and Mixbed
- ◆ Cleanliness control by resistivity
- ◆ Short rinse time



- ◆ Horizontal spray bars
- ◆ Parts swing between bars
- ◆ Tangent spray impact
- ◆ Uniform cleaning of entire area
- ◆ High volume cleaning



- ◆ Online concentration measuring
- ◆ Dosing from concentrate
- ◆ Automatic concentration adjustment
- ◆ Automatic care of tank level
- ◆ Stable chemical process
- ◆ Operator influence eliminated



- ◆ Vertical heated air knife
- ◆ Linear movement or rotation
- ◆ Orthogonal blow-off effect
- ◆ Constant speed
- ◆ No stencil bending
- ◆ Rapid drying of complex parts



- ◆ Data logging of all parameters
- ◆ Bar code reader
- ◆ LAN connectivity
- ◆ Full traceability of each single part



- ◆ Heated chamber
- ◆ Reduced pressure
- ◆ Water boils at 85°C
- ◆ Accelerated drying
- ◆ Dry gaps under components
- ◆ Dry open components



- ◆ Fully automatic transloader
- ◆ Any sequence of processes
- ◆ Unique lid handling
- ◆ Basket buffers
- ◆ Barcode control
- ◆ High throughput
- ◆ Operator influence eliminated



- ◆ Double sided ultrasonic
- ◆ 40 kHz to 160 kHz
- ◆ Automatic frequency sweep
- ◆ Amplitude power control
- ◆ Gentle to sensitive components



- ◆ Harmonic basket oscillation
- ◆ Uniform exposure of ultrasonic
- ◆ Accelerated wash and rinse



- ◆ Patented double flow
- ◆ Primary flow in pump loop
- ◆ Secondary vortex in the chamber
- ◆ Uniform cleaning of entire batch



- ◆ Air distributed by pattern of nozzles
- ◆ Soaking of heavy contaminated parts
- ◆ Gentle alternative to ultrasonic

# CLEANING MACHINES OVERVIEW

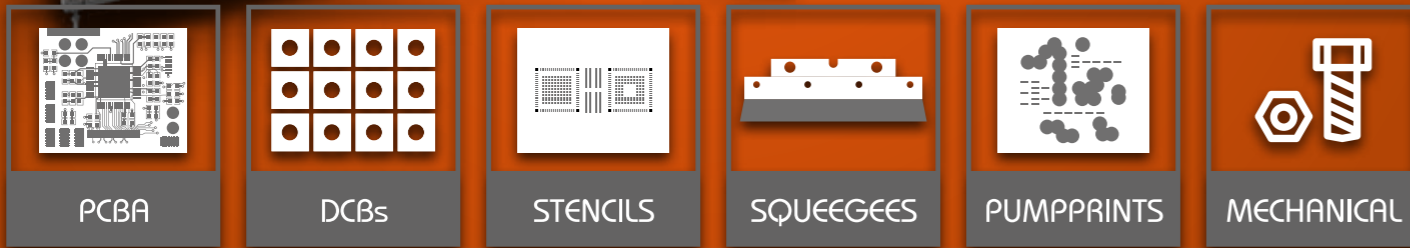
	SuperWASH		HyperSWASH			MiniSWASH	CompaCLEAN	UniCLEAN	FluxCLEAN T	FluxCLEAN SD/HD
	Single	Twingo	Single	Twingo	Combo					
Usable space of chamber: W x L x H (mm) (W-left/right, L-front/back, H-height) Including fixtures and clamping	835 x 80/150 x 816	835 x 50 x 740 835 x 50 x 740	890 x 215 x 850	890 x 60 x 850 890 x 60 x 850	890 x 170 x 850 890 x 170 x 850 890 x 170 x 850	820 x 80 x 740	480 x 500 x 500	optional	450 x 650-850 x 470-620	277 (rinse 155) x 500 x 500 / 740 (rinse 437) x 586 x 550
PCBA, HDI, DCB, BGA, PoP, SiP, CSP, BTC, QFN, MELF hybrids, etc.	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Eurocards pcs/cycle (100x160mm)	20	40	20	40	168	20	140	360 - 480	✗	✗
Cycle time/min	20 - 40	20 - 40	20 - 40	20 - 40	20 - 40	20 - 40	30 - 60	10 - 30	15 - 30	60
Metal & plastic stencils (paste, glue)	✓	✓	✓	✓	✗	✓	✗	✗	✗	✗
Stencils/pcs/cycle	1	2	1	2	✗	1	✗	✗	✗	✗
Cycle time/min	7 - 10	7 - 10	7 - 10	7 - 10	✗	10 - 15	✗	✗	✗	✗
Maintenance parts from soldering process (solder pallets, filters, carriers, etc.)	✗	✗	✗	✗	✗	✗	✓	✗	✓	✓
Solder pallets/pcs/cycle 500x500x40mm (other sizes optional)	✗	✗	✗	✗	✗	✗	6	✗	6	2 / 4
Cycle time/min	✗	✗	✗	✗	✗	✗	20-40	✗	10 - 20	60
Cleaning agent volume (RtU)	66 l	66 l	80 l	80 l	80 l	70 l	80 l	64 - 158 l (optional)	300-375 l	80 / 315 l
Max cleaning temperature	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C	room
Max rinsing temperature	40 °C	40 °C	40 °C	40 °C	40 °C	50 °C	40 °C	40 °C	60 °C	room
Max drying temperature	110 °C	110 °C	110 °C	110 °C	110 °C	90 °C	110 °C	110 °C	110 °C	room
Machine dimensions W x L x H (mm) (W-left/right, L-front/back, H-height)	1700 x 1300-1500 x 1735	1700 x 1300-1500 x 1735	1900x1400x1960	1900x1400x1960	1900x1400x1960	1600x800x1200 (I, II) 1600x1400x1200 (optional 1600) (III)	940 x 1700 x 2140	3900-5020 x 1700- 2045 x 2500	2450 x 1200-1650 x 2370-2700	760 x 730 x 1350 / 2200 x 804 x 1263
Machine weight without liquid	520-630 kg	520-630 kg	1000 kg	1000 kg	1000 kg	220-450 kg	455-485 kg	1600-2200 kg	860-920 kg	54 / 170 kg

◆ Actual configuration and features may vary depending on design and innovation



## CLEANING APPLICATION

- ◆ Defluxing - removing soldering residues after reflow
- ◆ Cleaning contamination from handling and board manufacturing, removing FOD
- ◆ High density electronic assemblies with low standoff components like BGA, CSP, BTC, QFN, MELF, small chips
- ◆ Cleaning of power electronics
- ◆ Electronic assemblies requiring extra short process time
- ◆ Second side misprints on complex assemblies
- ◆ Cleaning before conformal coating and wire bonding
- ◆ High volume stencil cleaning



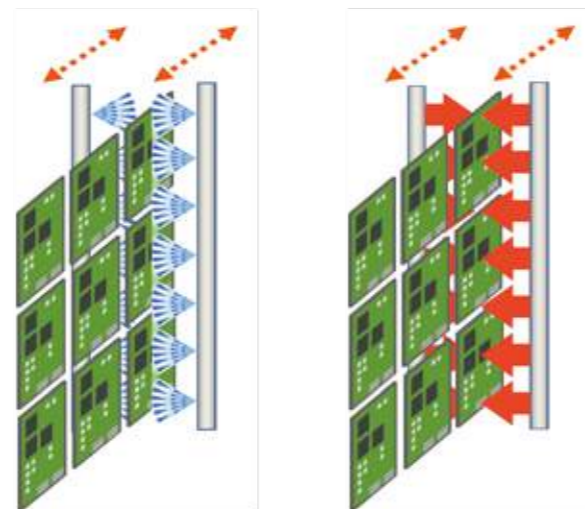
## UNIQUE FEATURES

- ◆ Fully automatic spray-in-air closed loop zero drain system
- ◆ Double capacity configuration TWINGO
- ◆ Linear direct spray for equal washing of entire surface
- ◆ Compatible with wide range of chemistry from various suppliers
- ◆ 100% filtration of entire spray volume
- ◆ Optional triple rinse
- ◆ Hot air knife direct dry technology
- ◆ Double flow exhaust fan or exhaust flap - system controlled
- ◆ Illuminated glass door chamber for visual process control
- ◆ All process steps with up to 5 substeps for highest flexibility
- ◆ Wide range of standard and customized PCBA fixtures
- ◆ Clamping for all types of stencils
- ◆ Anti-collision sensor
- ◆ Up to 3 fully separated liquid loops
- ◆ Low consumption of chemicals and water
- ◆ Proportional level sensors in all processes
- ◆ Outstanding options of water utilization



Linear Direct Spray Bars

Linear Direct Air Knife



## CONTROL FEATURES

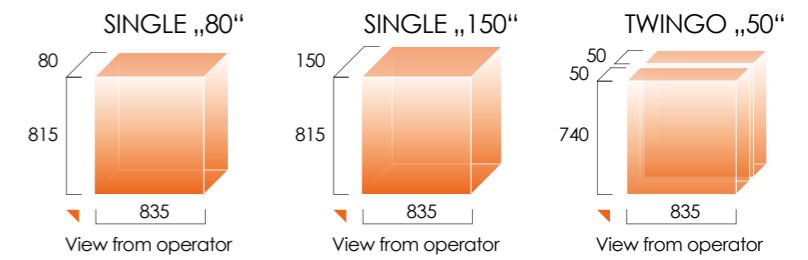
- ◆ Intuitive touchscreen interface with Windows OS
- ◆ Adaptive rinse water quality control
- ◆ Dosing of up to 2 additives
- ◆ AAD Automatic adaptive dosing with concentration sensor ZESTRON® EYE or KYZEN ANALYST™
- ◆ Complete datalogging, LAN connectivity
- ◆ Bar code traceability
- ◆ Personalised password security
- ◆ Multi language selection

## CAPACITY AND SIZE OPTIONS

- ◆ SINGLE – single frame
- ◆ TWINGO – double frame
- ◆ Modification between options in 10 minutes

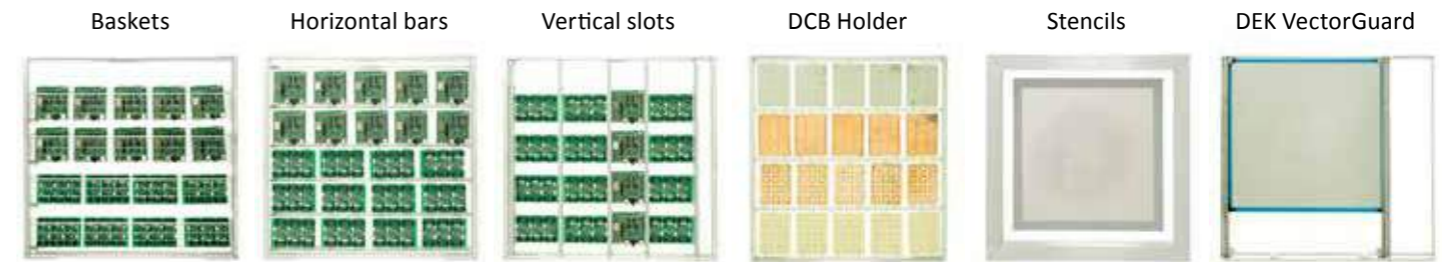
## USABLE SPACE OF CHAMBER

Including fixtures and clamping



## CLAMPING OPTIONS

- ◆ Wide range of standard fixtures and adaptors for any types of PCBAs and stencils
- ◆ Customization is available for any clamping fixtures
- ◆ Framed stencils fit right into the machine chamber

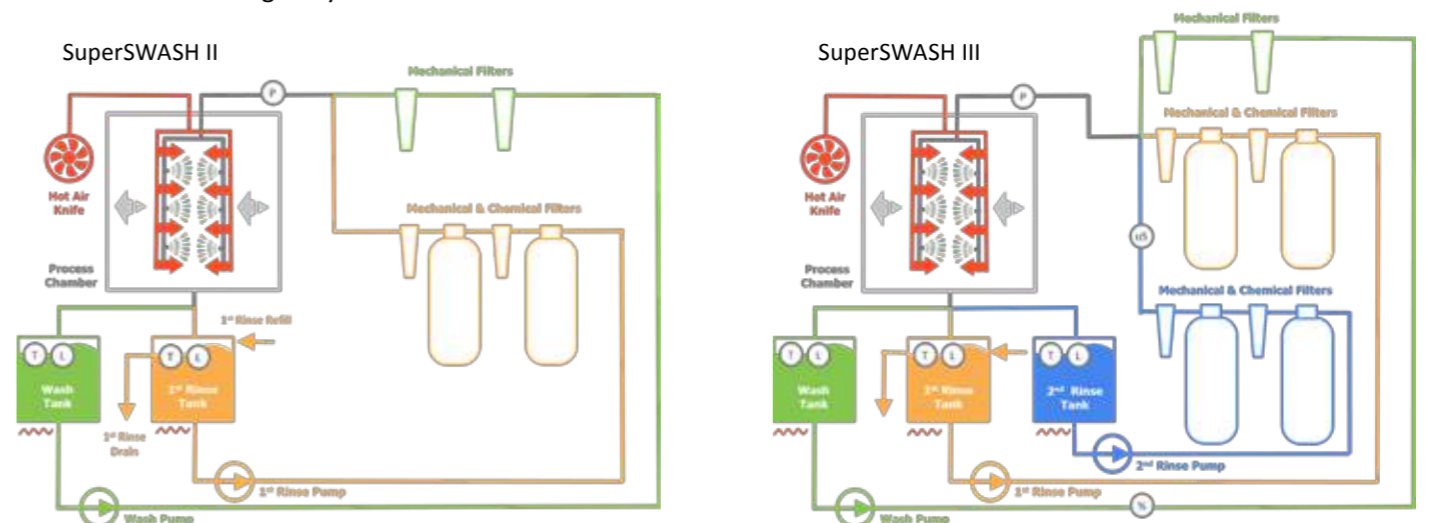


## VERSIONS BY APPLICATION

- ◆ SuperSWASH II Wash + Rinse + Drying **stencils, squeegees, misprints, PumpPrint™ stencils**
- ◆ SuperSWASH III Wash + Rinse I + Rinse II + Drying **PCBA after soldering, PCBA before coating**
- ◆ SuperSWASH IV Wash + Rinse I + Rinse II + Rinse III + Drying **power electronics, prior to wire bonding**

## FILTRATION OPTIONS

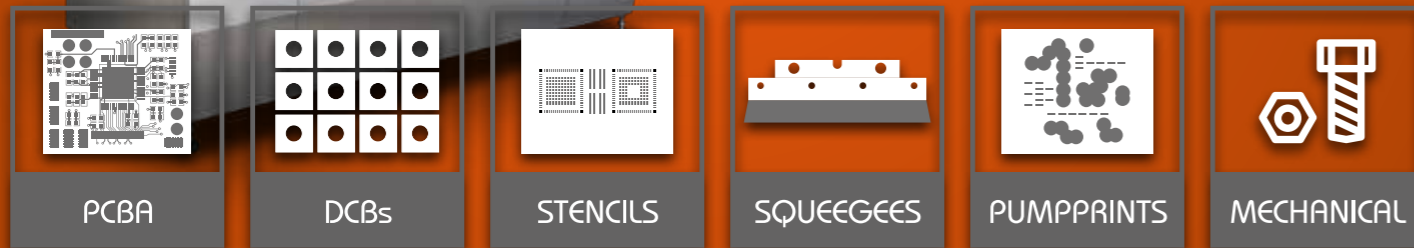
- ◆ First rinse filtration fully separated from second rinse filtration
- ◆ Integrated 16l chemical filters
- ◆ External carts with up to 39l of mixed and 39l active carbon
- ◆ Cascade filtration regularly refills fresh DI water from external source to second rinse tank
- ◆ External source regularly refills fresh DI water into first rinse tank





## CLEANING APPLICATION

- ◆ Defluxing – removing all kind of solder residues
- ◆ Cleaning of micromechanical components
- ◆ Cleaning contamination from handling and board manufacturing, removing FOD
- ◆ Highly populated electronic assemblies with low standoff components such as BGA, CSP, BTC, QFN, MELF
- ◆ Cleaning of power electronics
- ◆ Electronic assemblies requiring extra short process time
- ◆ Second side misprints on complex assemblies
- ◆ Cleaning before conformal coating and wire bonding

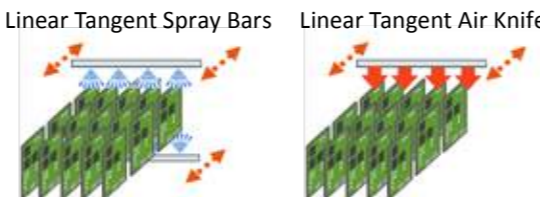
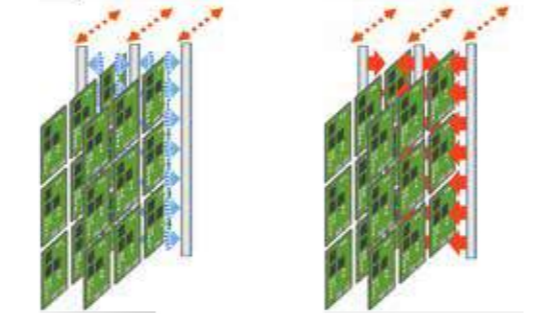


## UNIQUE FEATURES

- ◆ Fully automatic spray-in-air closed loop zero drain system
- ◆ Double capacity configuration TWINGO
- ◆ Multiple capacity in COMBO configuration
- ◆ Linear direct spray for equal washing of entire surface
- ◆ Compatible with wide range of cleaners from various manufacturers
- ◆ 100% filtration of entire spray volume
- ◆ Double rinse option
- ◆ Possible to use two different cleaners
- ◆ Hot air knife direct dry technology
- ◆ Illuminated glass door chamber for visual process control
- ◆ All process steps with up to 5 substeps for the highest flexibility
- ◆ Wide range of standard and customized PCBA fixtures
- ◆ Clamping for all types of stencils
- ◆ 3 fully separated liquid loops with possible cascade
- ◆ Low consumption of chemicals and water
- ◆ Proportional level sensors in all processes
- ◆ Outstanding options of water utilization



Linear Direct Spray Bars      Linear Direct Air Knife



## CONTROL FEATURES

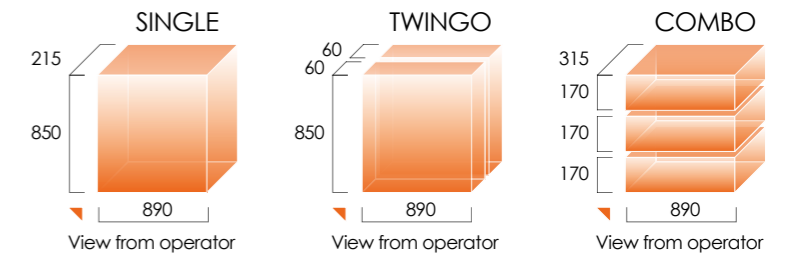
- ◆ Intuitive touchscreen interface with Windows OS
- ◆ SPC for all parameters in graphical interface – trends, limits
- ◆ Adaptive rinse water quality control
- ◆ AAD Automatic adaptive cleaner dosing with concentration sensor ZESTRON® EYE, or KYZEN ANALYST™, integrated in machine OS
- ◆ Dosing of up to 2 additives
- ◆ Complete datalogging, LAN connectivity
- ◆ Bar code traceability
- ◆ Unlimited recipe library
- ◆ Personalised password security
- ◆ Multi language selection

## CAPACITY AND SIZE OPTIONS

- ◆ SINGLE – single frame
- ◆ TWINGO – double frame
- ◆ COMBO – multi-level basket
- ◆ Modification between options in 10 minutes
- ◆ Custom designed nozzle system available

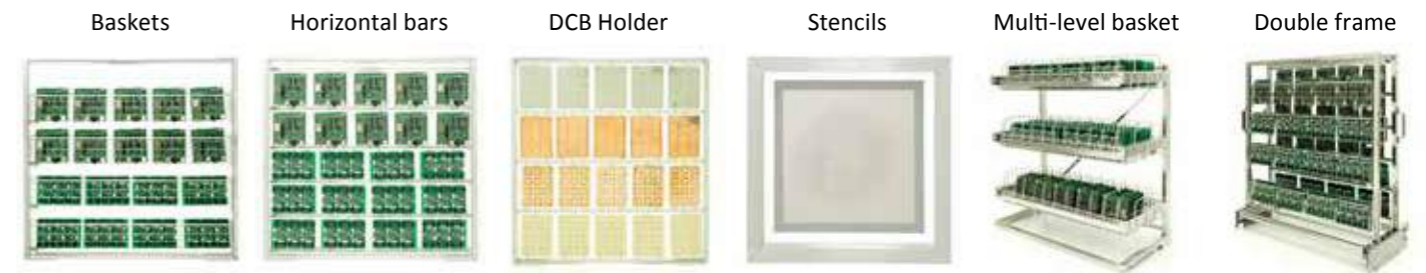
## USABLE SPACE OF CHAMBER

Including fixtures and clamping



## CLAMPING OPTIONS

- ◆ Wide range of standard fixtures and adaptors for any types of PCBAs and stencils
- ◆ Customization is available for any clamping fixtures
- ◆ Framed stencils fit right into the machine chamber



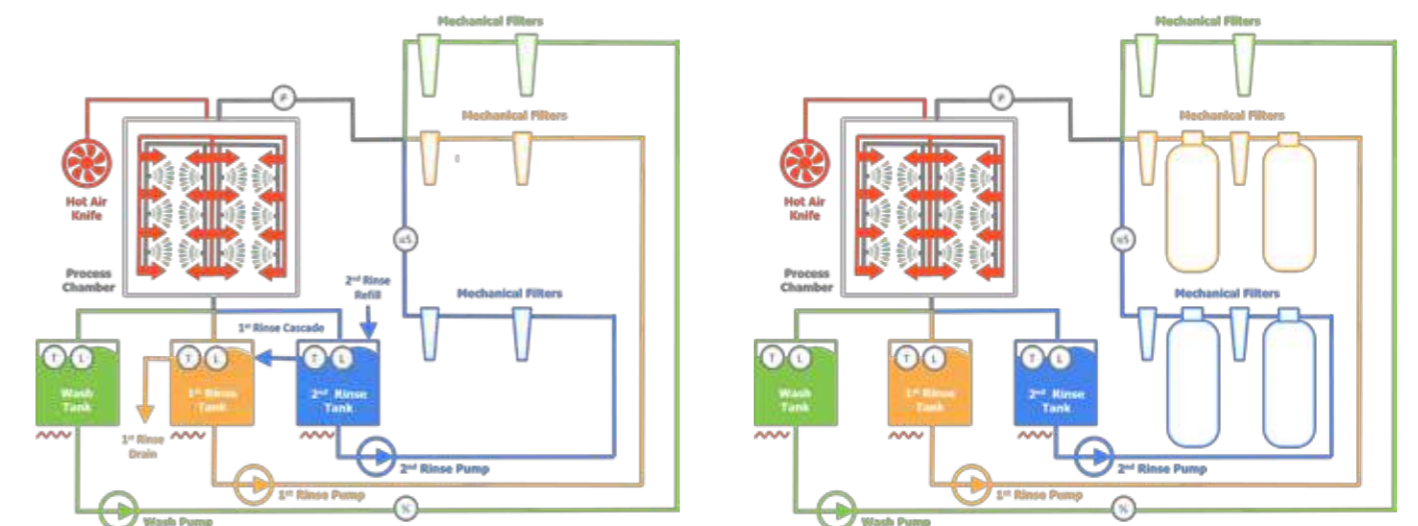
## VERSIONS BY APPLICATION

- ◆ HyperSWASH      Wash + Rinse I + Rinse II + Drying

PCBA after soldering, PCBA for coating, power electronics, micromechanics

## FILTRATION OPTIONS

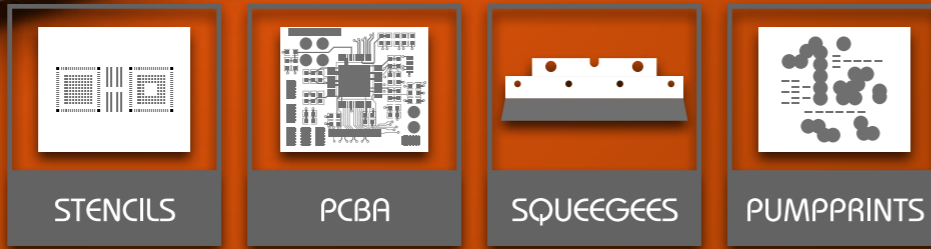
- ◆ Zero drain concept - close loop, cascade or open loop can be set by software only
- ◆ Special filtration strategy for the highest flow
- ◆ First rinse filtration fully separated from second rinse filtration
- ◆ External carts with up to 39l of mixed bed and 39l active carbon





## CLEANING APPLICATION

- ◆ Cleaning solder paste from any type of stencils, screens and printer squeegees
- ◆ Removing SMT Glue residues from any type of stencils, screens or PumpPrint stencils
- ◆ Defluxing, removing all kinds of soldering residues from high density PCBs
- ◆ Cleaning contamination from handling and board manufacturing
- ◆ Cleaning second side misprints on complex assemblies



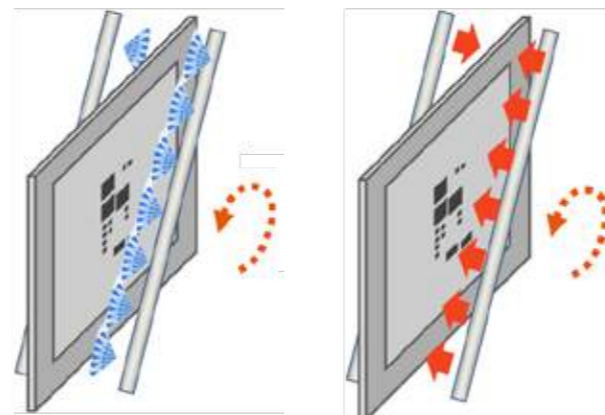
## UNIQUE FEATURES

- ◆ Fully automatic spray-in-air closed loop zero drain system
- ◆ Synchronous, double-sided, constant speed motor-driven nozzle manifold
- ◆ Hot air knife direct dry technology
- ◆ Anti-collision system
- ◆ Synchronized motion check
- ◆ Compatible with wide range of chemistry from various suppliers
- ◆ Heating in cleaning medium, optionally in rinsing
- ◆ Clamping for all types of stencils and squeegees
- ◆ Advanced adjustable frame fixing system
- ◆ Wide range of PCBA fixtures
- ◆ Two fully separated liquid loops, up to 2-step rinsing
- ◆ Low consumption of chemicals and water
- ◆ Outstanding options of water utilization



Rotary Direct Spray Bars

Rotary Direct Air Knife



## CONTROL FEATURES

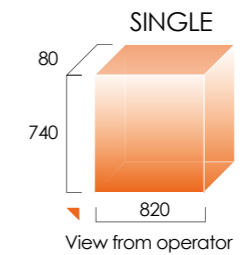
- ◆ Intuitive touchscreen interface
- ◆ PLC control
- ◆ Full barcode traceability, LAN connectivity
- ◆ Unlimited recipe library
- ◆ Adaptive rinse process control for stable quality
- ◆ Multi language selection

## CAPACITY AND SIZE OPTIONS

- ◆ SINGLE – single frame

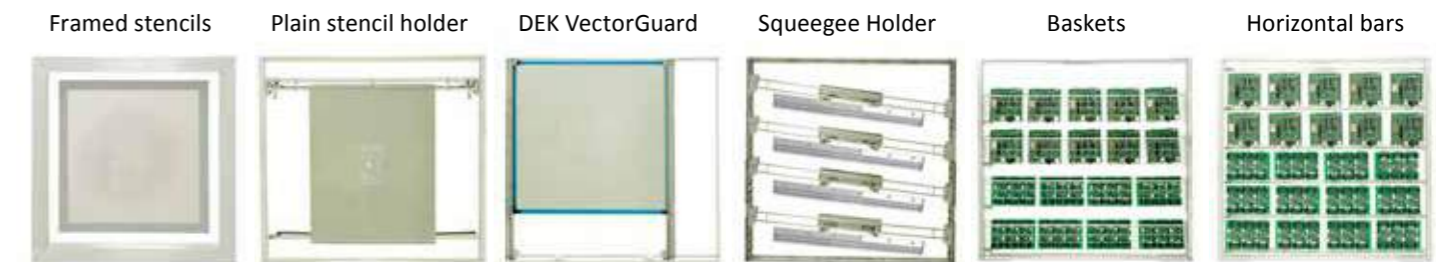
## USABLE SPACE OF CHAMBER

Including fixtures and clamping



## CLAMPING OPTIONS

- ◆ Conventional framed stencils and screens fit directly into the built-in adjustable clamping
- ◆ Wide range of standard fixtures and adaptors for other types of stencils and PCBAs
- ◆ Customization is available for any clamping fixtures



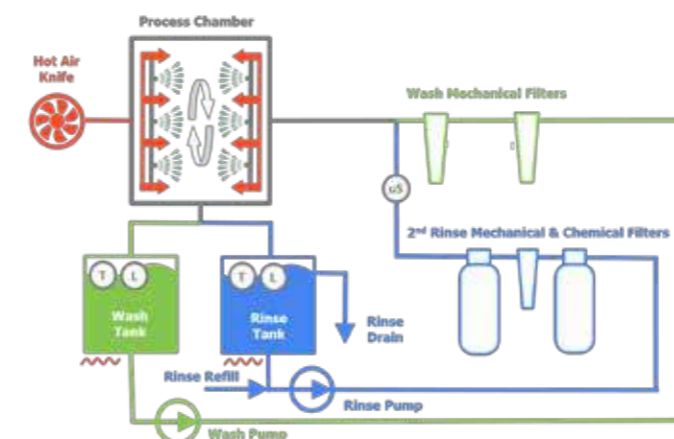
## VERSIONS BY APPLICATION

- ◆ MiniSWASH I Wash + Drying **stencils, screens, squeegees, PumpPrint™ stencils**
- ◆ MiniSWASH II Wash + Rinse + Drying **PCBA, stencils, screens, misprints, squeegees, PumpPrint™ stencils**
- ◆ MiniSWASH III Wash + Double Rinse + Drying **PCBA after soldering, PCBA before coating**

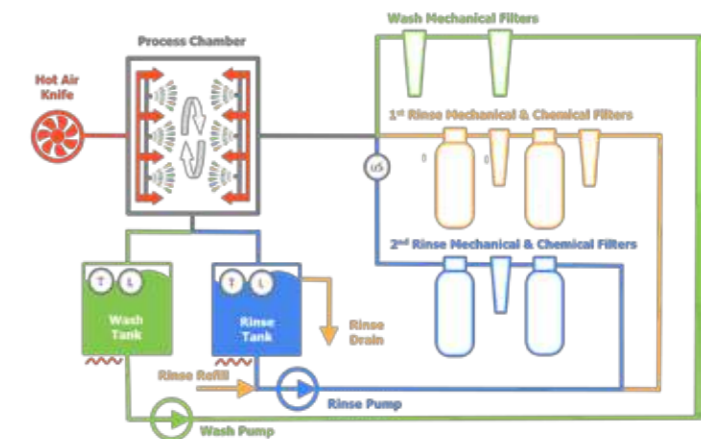
## FILTRATION OPTIONS

- ◆ Easily connected to water supply and drain
- ◆ External filter carts with up to 25l of mixedbed and 25l active carbon
- ◆ Optional double rinse

MiniSWASH II



MiniSWASH III





## CLEANING APPLICATION

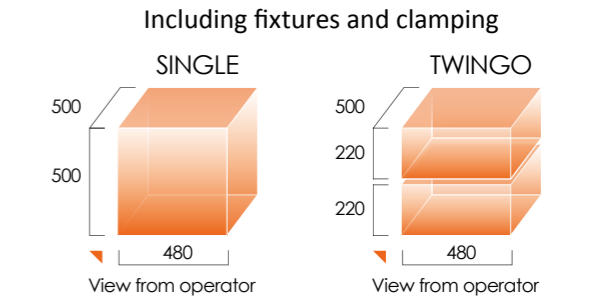
- ◆ Defluxing of good or moderately soluble solder residues
- ◆ Removing contamination from handling and board manufacturing
- ◆ Removing FOD
- ◆ Second side misprints on complex assemblies
- ◆ Cleaning before conformal coating
- ◆ Cleaning soldering pallets
- ◆ Fine degreasing of mechanical parts



## CAPACITY AND SIZE OPTIONS

- ◆ SINGLE – single rack
- ◆ TWINGO – double rack

## USABLE SPACE OF CHAMBER



## CLAMPING OPTIONS

- ◆ Wide range of standard fixtures for any types of PCBAs, electronic assemblies and soldering pallets
- ◆ Customization is available for any clamping fixtures



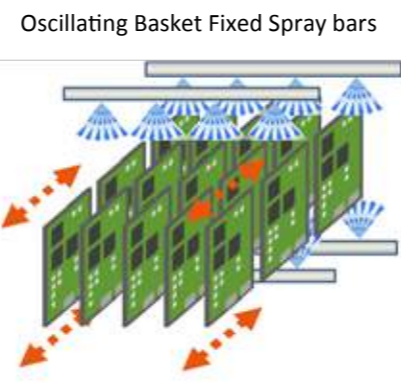
## UNIQUE FEATURES

- ◆ Fully automatic spray-in-air closed loop zero drain system
- ◆ High volume batch size
- ◆ Double capacity rack available
- ◆ Uniform spray coverage with high stroke oscillating rack
- ◆ Fixed nozzle system
- ◆ Powerful hot air dryer
- ◆ Cascade filtration
- ◆ Compatible with wide range of chemistry
- ◆ 100% filtration of entire spray volume
- ◆ Double rinse option
- ◆ Optional illuminated glass door chamber for visual process control
- ◆ Wide range of standard and customized PCBA fixtures
- ◆ Up to 3 fully separated liquid loops
- ◆ Outstanding options of water utilization



## CONTROL FEATURES

- ◆ Intuitive touchscreen interface with Windows OS
- ◆ Simple programming
- ◆ Complete datalogging and optional bar code traceability, LAN connectivity
- ◆ Dosing of up to 2 additives
- ◆ Automatic adaptive cleaner dosing with concentration sensor ZESTRON® EYE or KYZEN ANALYST™ integrated in machine OS
- ◆ Adaptive rinse water quality control by cleanliness threshold
- ◆ Week program with automatic start
- ◆ Personalised password security
- ◆ Multi language selection

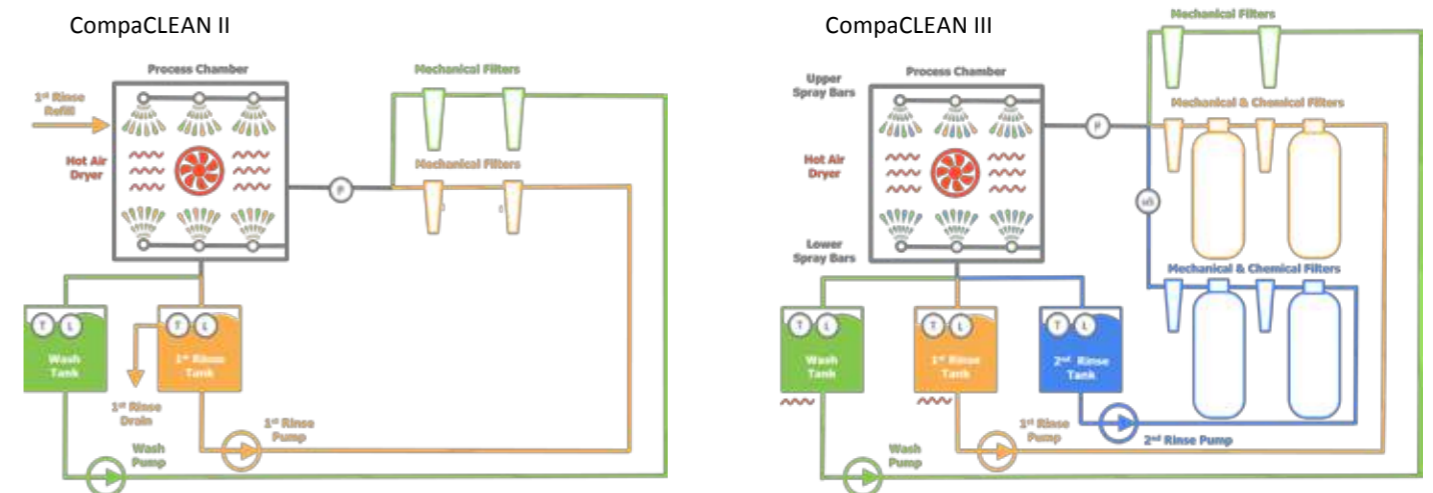


## VERSIONS BY APPLICATION

- ◆ CompaCLEAN II Wash + Rinse I + Drying **soldering pallets**
- ◆ CompaCLEAN III Wash + Rinse I + Rinse II + Drying **PCBA after soldering, PCBA before coating**

## FILTRATION OPTIONS

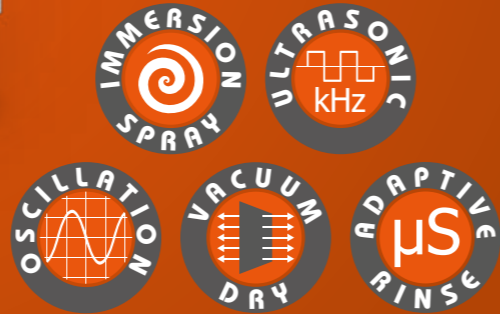
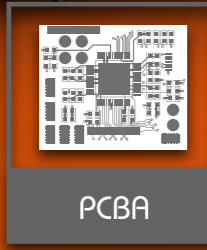
- ◆ Integrated 16l chemical filters keep the machine footprint as small as possible
- ◆ First rinse filtration fully separated from second rinse filtration
- ◆ External carts with up to 39l of mixed and 39l active carbon
- ◆ Cascade filtration regularly refills fresh DI water from external source to second rinse tank
- ◆ External source regularly refills fresh DI water into first rinse tank



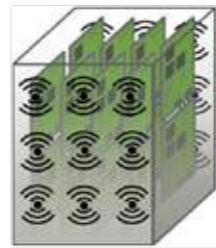
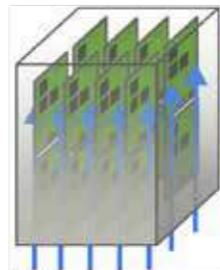


## CLEANING APPLICATION

- ◆ Water-based process
- ◆ Semi-aqua process
- ◆ Compatible with wide range of cleaning chemistry
- ◆ Cleaning of complex PCBA with low standoff components BGA, CSP, QFN, small chips
- ◆ Cleaning of any kinds of solder residues, even hardly soluble
- ◆ Cleaning before wire bonding
- ◆ Cleaning active components before packaging
- ◆ Fine cleaning of mechanical parts

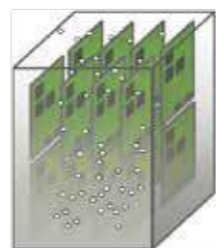
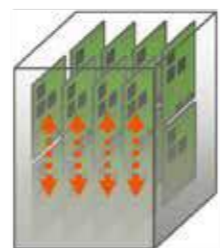


Immersion Spray Double Flow      Ultrasonic Double Sided



Basket Oscillation

Air Bubbler



## UNIQUE FEATURES

- ◆ Combination of different agitation methods
- ◆ Cleaning capacity comparable with in-line mesh belt systems
- ◆ Configuration according to process and capacity needs
- ◆ Up to 6 chambers for various combinations of Wash, Rinse, Dry
- ◆ 5-axis robotic transfer for baskets and chamber lids
- ◆ Input / Output conveyor buffers
- ◆ Low consumption of energy and liquids
- ◆ Small footprint
- ◆ Zero drain system
- ◆ DI water reclaim plant integrated
- ◆ Highly efficient vacuum drying
- ◆ Designed especially for electronic applications
- ◆ Fully ESD complying, cleanroom compatible
- ◆ Various fixtures and clamping

## CONTROL FEATURES

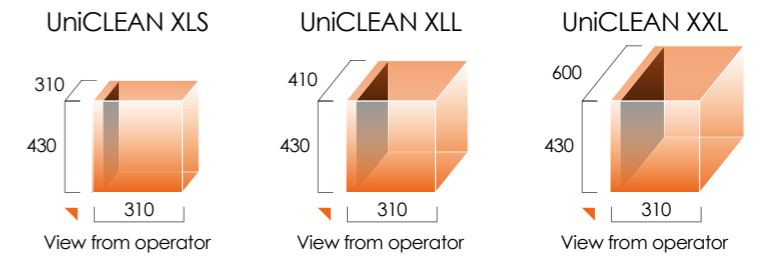
- ◆ WINDOWS OS with 21.5" touchscreen interface
- ◆ Complete datalogging, process traceability and optional bar code control
- ◆ Adaptive rinse water quality control
- ◆ Automatic adaptive dosing with digital concentration sensor ZESTRON® EYE or KYZEN ANALYST™
- ◆ LAN connectivity and data communication
- ◆ Personalised password protection in three access levels

## CAPACITY AND SIZE VERSIONS

- ◆ 4-6 chambers according to configuration
- ◆ Any combination of Wash, Rinse, Dry

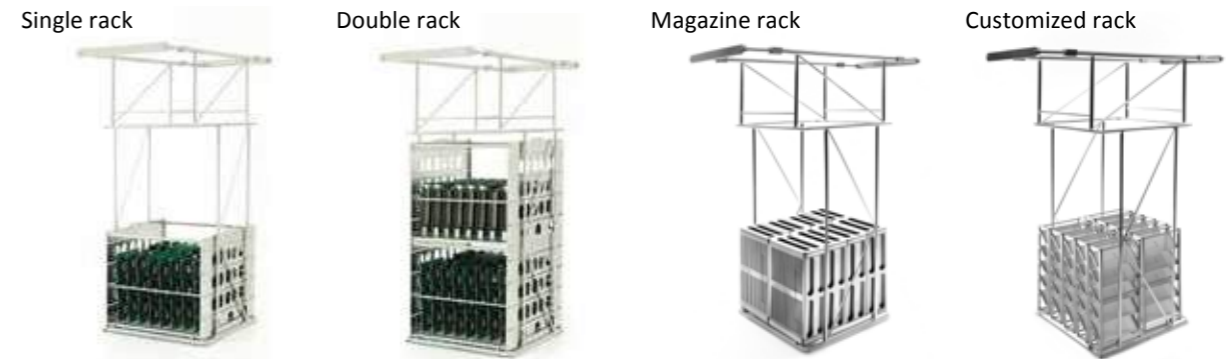
## USABLE SPACE OF CHAMBER

Including fixtures and clamping



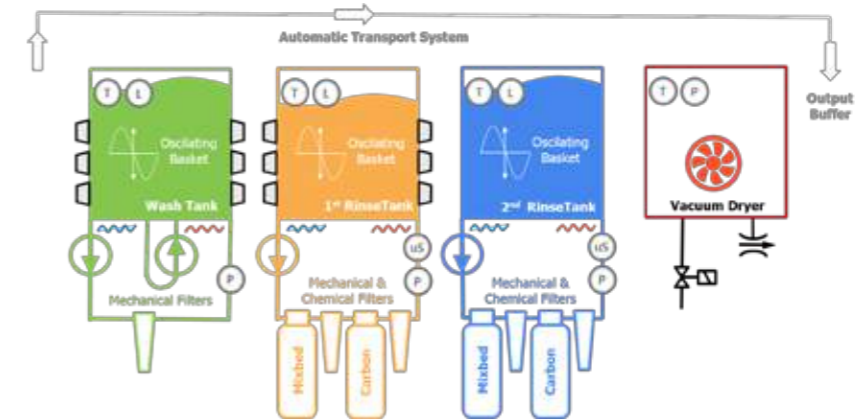
## CLAMPING OPTIONS

- ◆ Wide range of standard fixtures and adaptors for any types of electronic assemblies
- ◆ Customization is available for any clamping fixtures
- ◆ Cleaning in SMT magazine racks

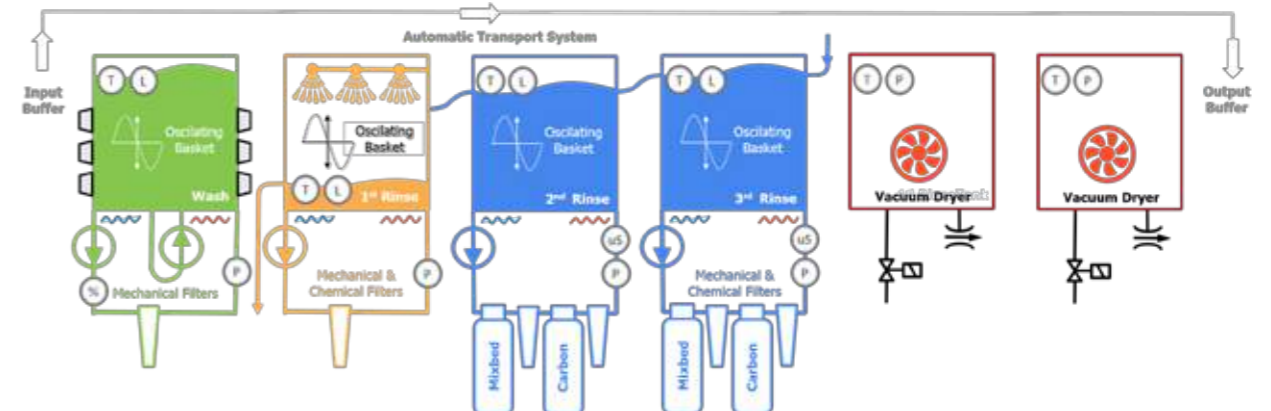


## APPLICATION MODEL

- ◆ Ultrasonic Wash + Basket oscillation + Rinse I + Rinse II + Vacuum drying



- ◆ Spray under immersion + Ultrasonic + Basket oscillation + Chemical stop SiA + Rinse I + Rinse II + 2x Vacuum drying





- ◆ Do you have a need for a customized solution based on one of our cleaning machines?
- ◆ PBT Works is available to provide custom solutions to assist you with your special projects.
- ◆ PBT Works is committed to deliver world class, high performance and reliable products and services. Through innovative engineering, design and a solid commitment to customer satisfaction, we can create truly effective customized solutions in various industrial fields.

### MODULECLEAN ROBOT

- ◆ Ultrasonic, Spray in Air, Immersion Spray, Vacuum Dry



### UNICLEAN MEOPTA

- ◆ Ultrasonic, Immersion Spray, In-Line Dryer



### UNICLEAN SUI

- ◆ Immersion Spray



### UNICLEAN WF

- ◆ Water Free Immersion Spray



### CLEANING APPLICATION

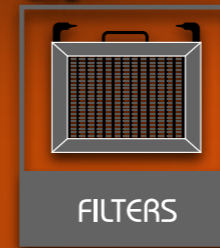
- ◆ Solder pallets, condensation traps and other maintenance cleaning
- ◆ Mechanical parts cleaning
- ◆ High throughput

### UNIQUE FEATURES

- ◆ Unique spray under immersion washing process
- ◆ Separate filtration pump
- ◆ Heated spray-in-air rinsing
- ◆ Fully automatic operation system
- ◆ Pull-out trolley for easy transport of baskets
- ◆ Comfortable and fast handling

### CONTROL SYSTEM

- ◆ PLC control system with touch screen
- ◆ Week program for automatic start-up/shut down
- ◆ Three level password protection



### CLEANING APPLICATION

- ◆ Simple and cost effective solution
- ◆ Solder pallets, condensation traps and other maintenance cleaning
- ◆ Mechanical parts cleaning
- ◆ Small and middle size production

### UNIQUE FEATURES

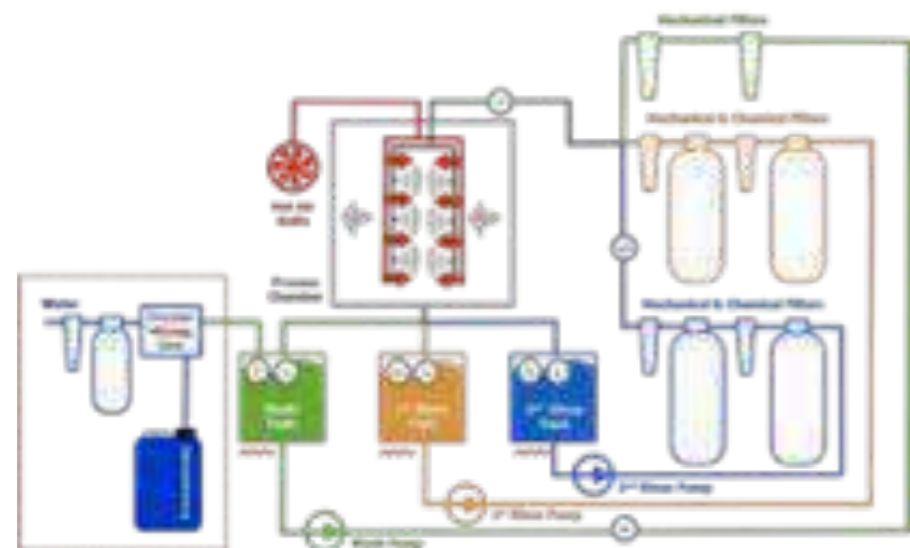
- ◆ FLUXCLEAN SD (standard duty) - Polypropylene baths & metal frame
- ◆ FLUXCLEAN HD (heavy duty) - stainless steel
- ◆ Cleaning, rinsing and drying baths
- ◆ Air In Immersion (bubbling) process in cleaning and rinsing baths
- ◆ Baths dimension and additional accessories can be modified upon customer request



## AAD - AUTOMATIC ADAPTIVE DOSING

- ◆ Control and programming from main machine control system
- ◆ Applicable for external control of wash process
- ◆ Adaptive concentration control and dosing of cleaning agent
- ◆ Integrated ZESTRON® EYE or KYZEN ANALYST™ management
- ◆ Adaptable system ensures stable concentration of cleaner
- ◆ Available for SuperSWASH, HyperSWASH, CompaCLEAN, UniCLEAN
- ◆ DI water source integrated for diluting concentrate
- ◆ Capable to dose up to 2 additional additives

**KYZEN ANALYST™**



## PBT WORKS MACHINES WORK WITH VARIOUS CLEANING AGENTS

- ◆ Water based solvents
- ◆ Semi-aqua solvents
- ◆ Saponifiers
- ◆ Detergents

Majority of cleaning processes require dedicated, carefully selected cleaning agent. Cleaning applications demand perfect balance between chemical action and fluid mechanics.

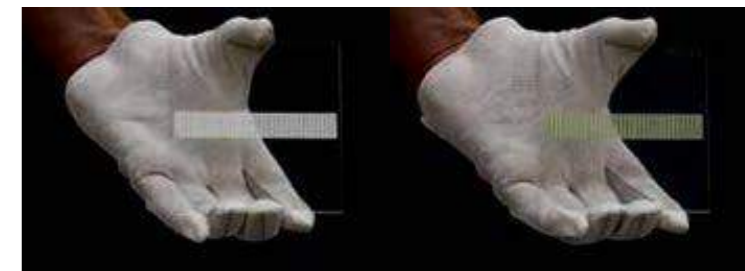
PBT Works cooperates with leading global manufacturers of cleaning chemicals. Our machines are available for trials in several technical centers around the world. Up to date machine design knowledge and latest developments in cleaning chemicals are regularly shared between our engineers and partners to ensure optimal machine-chemical compatibility for the best cleaning results.

Cleaning agents today are sophisticated blends of many substances carrying out the challenging task of diluting wide range of organic residues while not attacking another group of very similar organic materials on assemblies and components.

PBT Works thoroughly tests durability of all potentially sensitive machine components using partners' cleaning agents to ensure long machine lifespan.

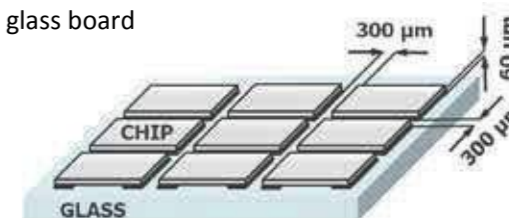
## INTENDED FOR:

- ◆ Process qualification - flux /cleaner matching
- ◆ Process changes verification
- ◆ Machine capability studies
- ◆ Process capability studies
- ◆ Process optimisation



## GLASS-CERAMIC TEST COUPON FOR CLEANING RESULTS EVALUATION

- ◆ Transparent - easy evaluation of residual under chips thanks to glass board
- ◆ Stand-off 60 +/-5µm
- ◆ 100x100 mm glass board
- ◆ Enables to interrupt, evaluate and continue in testing
- ◆ Reusable – up to 20 cycles
- ◆ Chips mounted by patented process

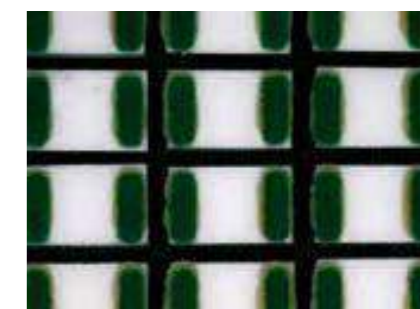


## VISUAL EVALUATION

- ◆ Easy and reliable evaluation by magnification only



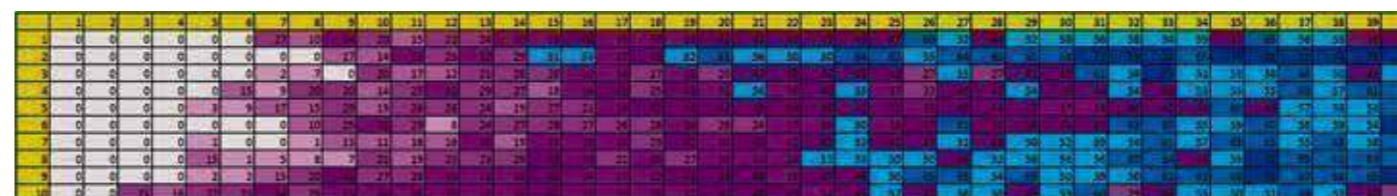
50% residues under chips



100% cleaned

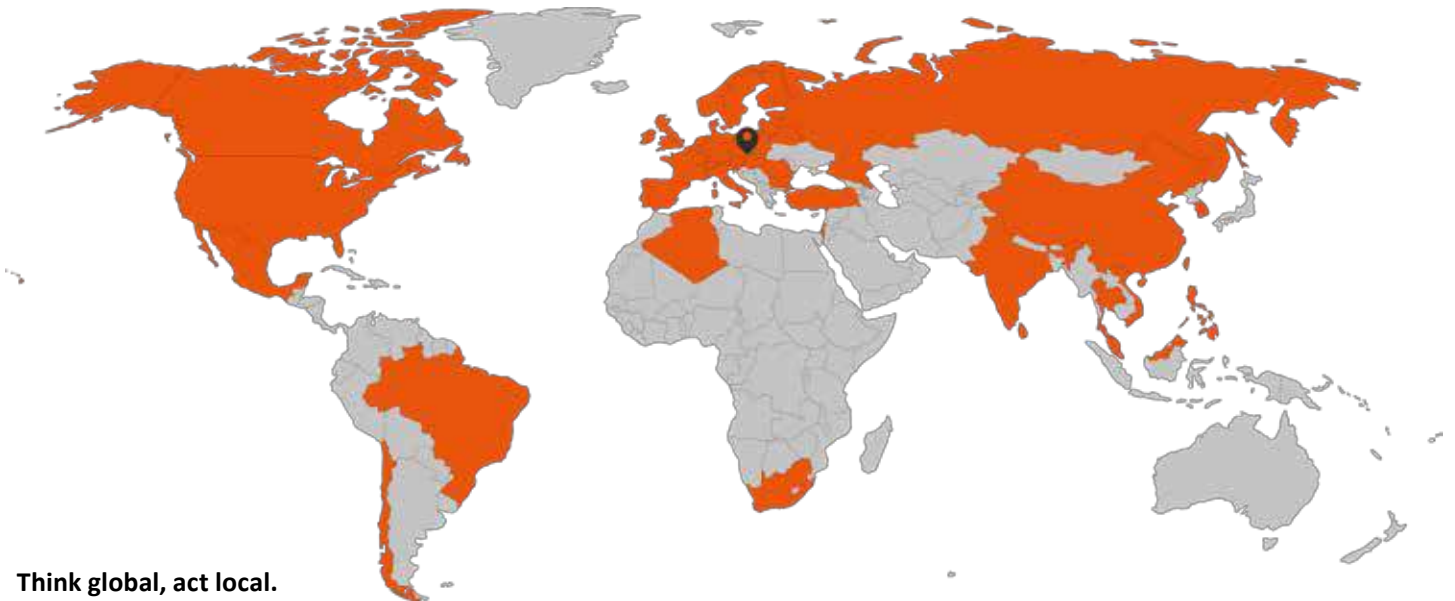
## AUTOMATIC EVALUATION BY 2D SPI

- ◆ VERIMA 2D SPI
- ◆ Adapted for substrate evaluation
- ◆ Numeric depiction
- ◆ Accurate results





**GLOBAL SUPPORT | WORLDWIDE REPRESENTATION**



**Think global, act local.**

That is why we work with distributors and representatives. We support and provide our colleagues in many countries worldwide not only with technical information about machine details, but also with highly-valued knowledge of the whole cleaning process. We can help you to choose the optimal cleaning solution and verify it by trials.

We supply spare parts and consumables globally as well as provide service and consulting.



EUROPEAN UNION

European Regional Development Fund  
Operational Programme Enterprise  
and Innovations for Competitiveness



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