



DEK Typhoon

Maximum flexibility and speed for the Under Stencil Cleaning

AGENDA - THE HIGH-SPEED AND FLEXIBLE USC

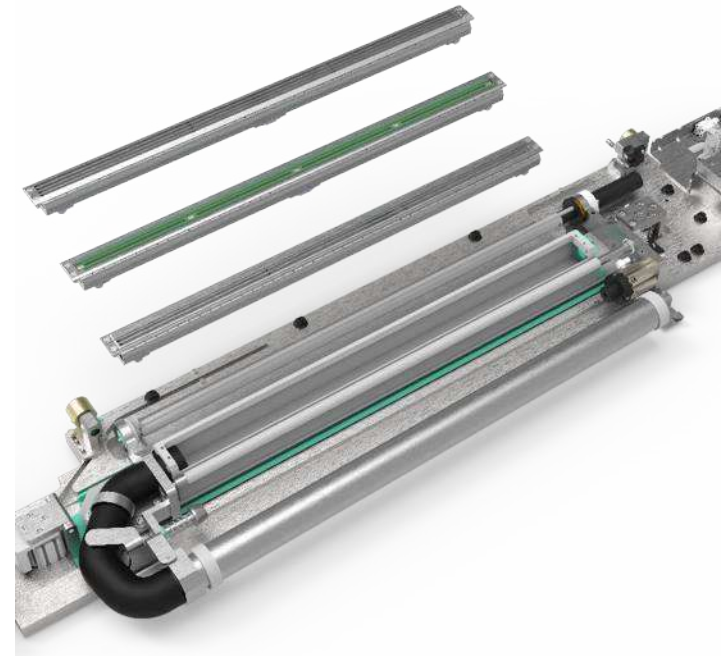
Introduction to DEK NeoHorizon and DEK Typhoon

Features and Benefits of New DEK Typhoon

DEK Platform and Feature Comparison

Industry trends and testing

Summary



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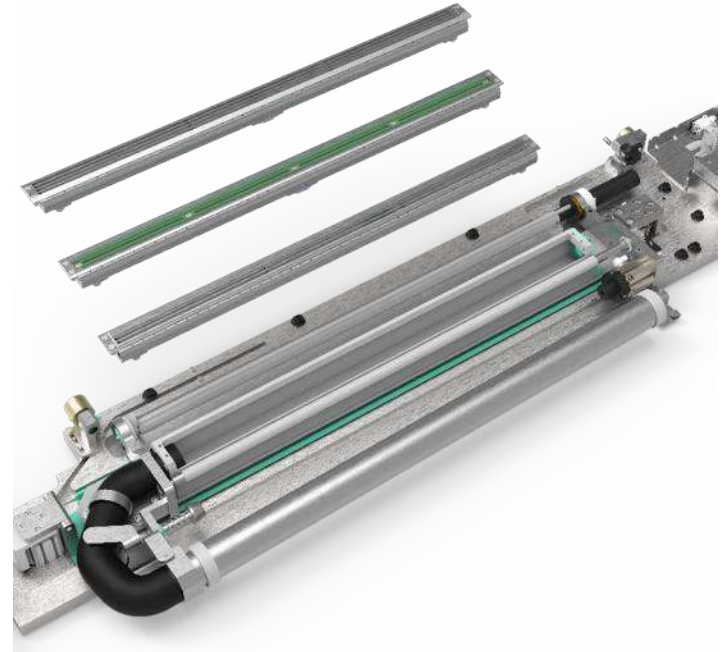
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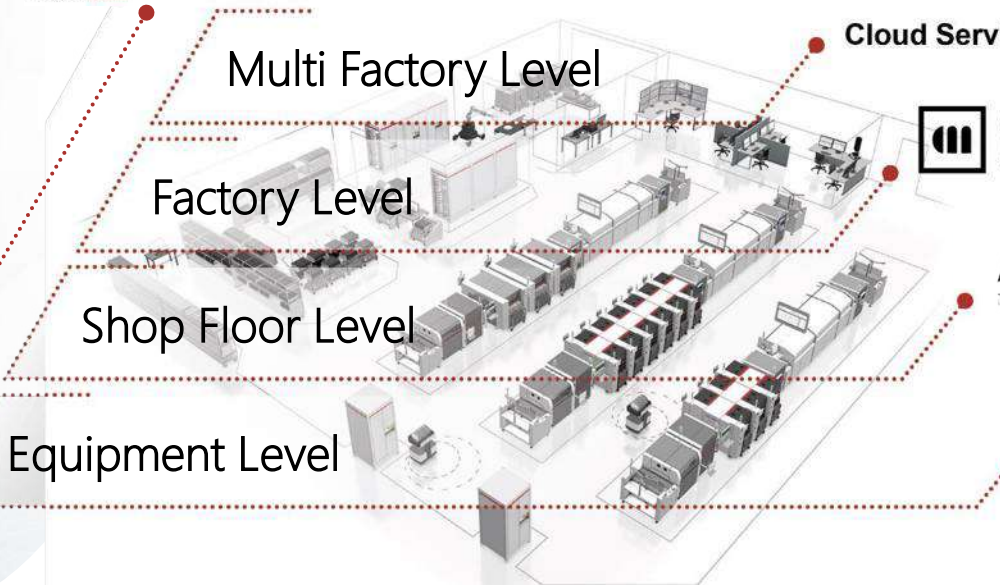
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OUR MISSION: THE INTEGRATED SMART FACTORY



Cloud Services

Multi Factory Level



Critical manufacturing
an ASM PT company

Factory Level

ASM WORKS
THE SMART FACTORY SUITE



Shop Floor Level

ASM 
BEST-IN-CLASS EQUIPMENT

Equipment Level



IPC-HERMES-9652

UNMATCHED PRINTING KNOW-HOW



DEK

With its brand DEK ASM is one of the leading printer equipment supplier for the SMT and Chip Assembly



ASM is the world's largest stencil manufacturer (all types and technologies)



ASM is the only printer partner offering all materials around the print process from high quality PCB support solutions to all process support products



ASM ProcessLens is the most advanced SPI solution and with ProcessExpert, the first solution for fully automated print process optimization

ASM Printer portfolio

Flexible Performance



DEK NeoHorizon 03iX

8 sec / ≤ 215 PCB/h
620 x 508.5 mm
Wet print accuracy:
2 C_{pk} @ $\pm 25 \mu\text{m}$ (± 6 Sigma)



DEK NeoHorizon 01iX

6.5 sec / ≤ 244 PCB/h
620 x 508.5 mm
Wet print accuracy:
2 C_{pk} @ $\pm 20 \mu\text{m}$ (± 6 Sigma)



High performance & flexibility

DEK TQ L

6.5 sec
Max. PCB size: 600 x 510 mm



Maximum Performance

DEK TQ

5 sec
Max. PCB size: 400 x 400 mm



Main requirements by segments

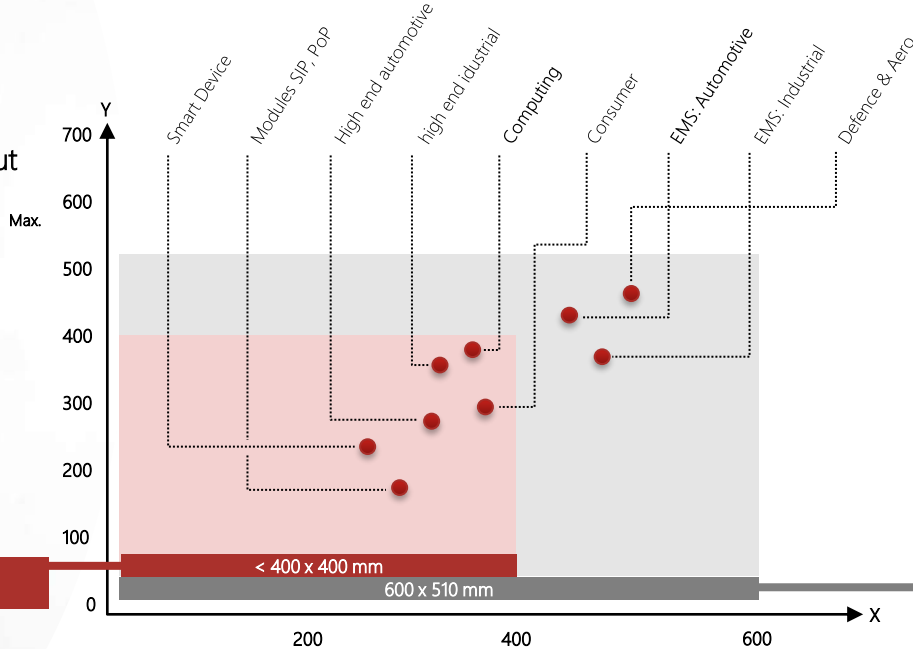


DEK TQ
Maximum throughput

5 sec / \leq 262 PCB/h
PCB size: 400 x 400 mm
Max print area: 400 x 400 mm
 $> 2 c_{pk}$ @ $\pm 17,0 \mu m$ (± 6 Sigma)



Maximum performance



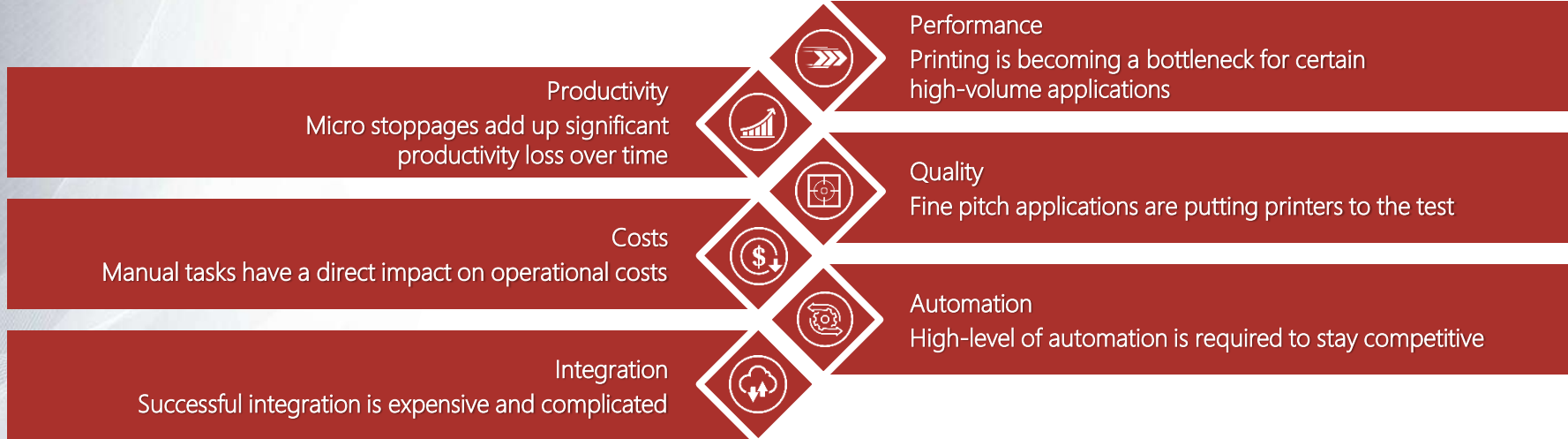
DEK TQ L
High throughput

6.5 sec / \leq 244 PCB/h Max.
PCB size: 600 x 510 mm Max print
area: 560 x 510 mm
 $> 2 c_{pk}$ @ $\pm 17,0 \mu m$ (± 6 Sigma)



High performance

General Challenges in High Volume Production



GENERAL CHALLENGES IN HIGH MIX PRODUCTION

Frequent NPI's
Sometimes new options are required on the printer



Fast setup changeover
Changing setups is a time-consuming manual task



Integration
Successful integration is expensive and complicated



Component mix
The mix of big and small components offers special challenges to maintain a high-quality print process



Automation
Manual tasks have a direct impact on operational costs



DEK UNDER STENCIL CLEANER

Next generation: High Flexible + High Speed

DEK Interchangeable USC (iUSC)



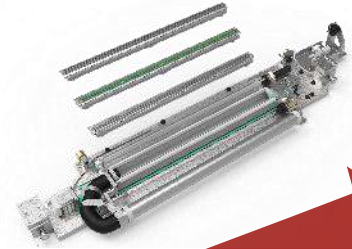
High Flexible

DEK Cyclone USC



High Speed

DEK Typhoon USC

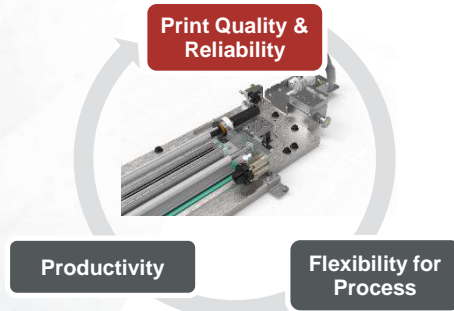


DEK under-stencil cleaner solutions – flexible, high speed and maximum cleaning performance

FOCUS OF TYPHOON DEVELOPMENT

To develop a new

- high-speed AND high-flexible under stencil cleaner
- for the next generation of SMT requirements like
 - Step-stencils
 - stencil coating
 - for mixed components...

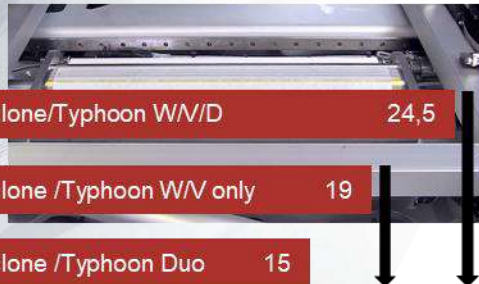


DEK Typhoon USC



DEK TYPHOON USC – BENEFITS AT A GLANCE

Comparison of DEK USC cleaning times in seconds



- 21% - 39%

- 61%

- Print Quality** → Further improved cleaning quality and reliability
- Flexibility in size** → Chamber sizes of 300, 400, 460 and 515mm
- Process Flexibility** → Flexible inserts types from poly blades to Duo
- Productivity** → Minimal down time with maximum speed
- Costs & Automation** → Much higher flexibility at same costs
- Speed** → Software configurable also with Duo mode

AGENDA - THE HIGH-SPEED AND FLEXIBLE USC

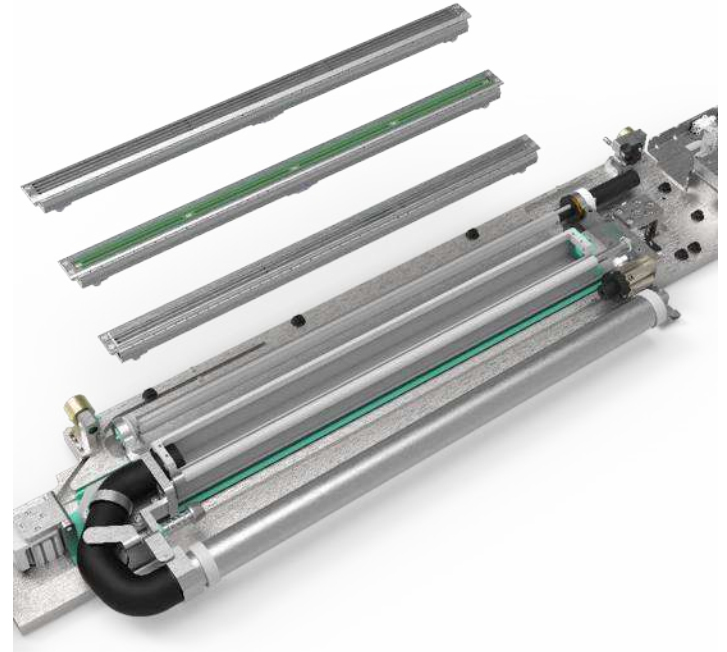
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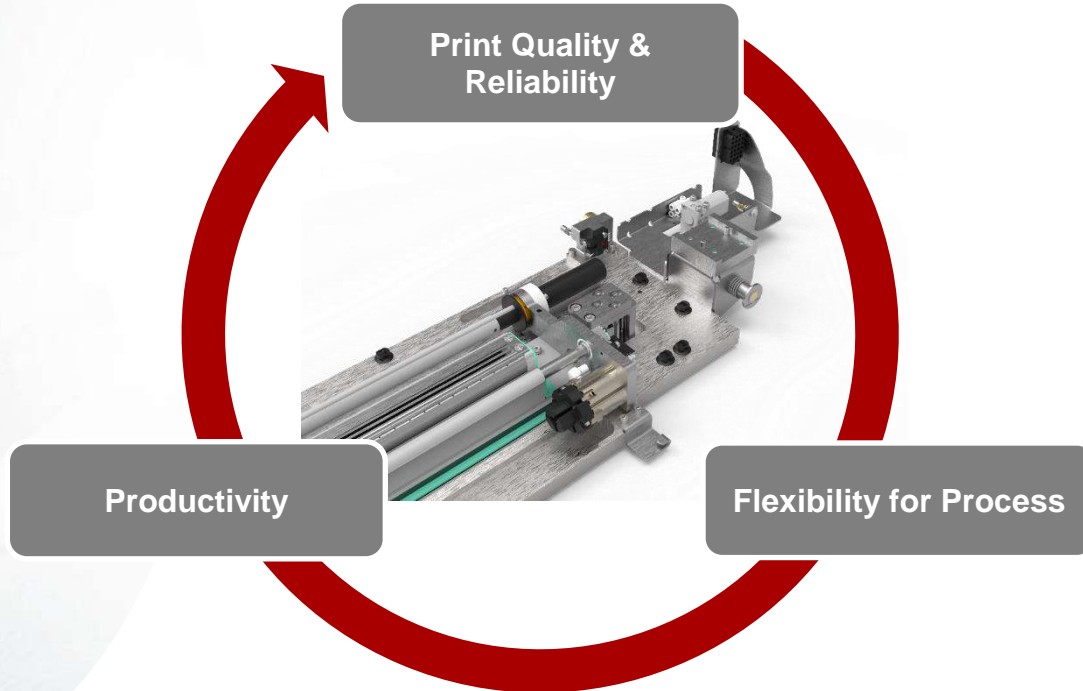
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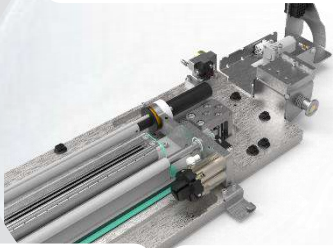


DEK TYPHOON – THE HIGH-SPEED AND FLEXIBLE USC



DEK TYPHOON – FEATURES FOR IMPROVED CLEANING QUALITY AND RELIABILITY

Print Quality & Reliability



Productivity

Flexibility for Process



Guide Cylinders

- Enable perfect and parallel contact to stencil for best and reliable cleaning quality

Fully-lined Index Roller

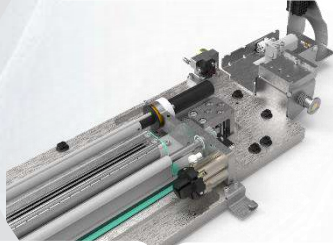
- Ensures fabric movement detection, minimizing false lows

Integrated Fabric Roll Clamp

- Eliminates fabric unspooling, improving MTBA

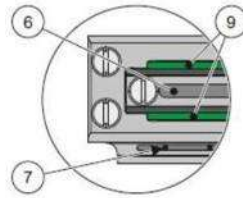
DEK TYPHOON – FLEXIBLE INSERT TYPES FOR OPTIMUM CLEANING PERFORMANCE

Print Quality &
Reliability



Productivity

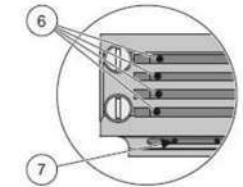
Flexibility for Process



Polyblades (like iUSC or Blue Cleaner)

- Offers good sealing and very soft contact to the stencil during cleaning

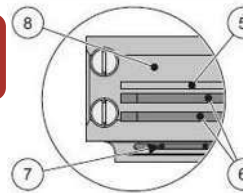
Perfect for step stencils or longer stencil lifetime



Slotted Plenum (like Cyclone)

- Offers wide vacuum and contact area to the stencil for maximum and fast cleaning

Perfect for fast cleaning of all standard stencils



Duo Plenum (like Cyclone Duo)

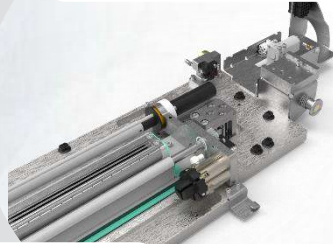
- Enables high speed cleaning by Wet and Vacuum within the same cleaning stroke

Perfect for high throughput requirements

(5): Separation slot between wet and dry/vacuum area (6): vacuum area (7): solvent spray bar (8): Wet clean area (9): Poly (rubber) blades

DEK TYPHOON – HIGH SPEED AND FLEXIBLE USC

Print Quality & Reliability



Productivity

Flexibility for Process

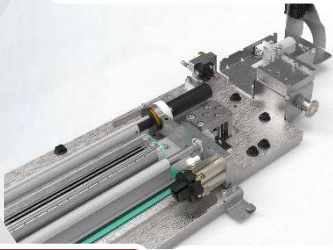
Chamber / Insert size	Fabric size	Recommended std. Stencil Width
300mm	300mm	≥ 23" (584)mm
400mm	400mm	≥ 23" (584)mm
460mm	515mm	≥ 23" (584)mm
515mm	515mm	29" (736)mm

Choice of chamber lengths allow a perfect fit to the required print area

Exchangeable inserts offer an easy cleaning of the spray bar within washing machine for fast maintenance

DEK TYPHOON – FAST AND EASY MAINTENANCE OF INSERTS

Print Quality &
Reliability



Productivity

Flexibility for Process



Removable inserts enable fast and easy cleaning of body and spray bar outside the printer for fast maintenance

Insert and spray bar can be easily cleaned outside the printer by hand, washing machine or ultrasonic cleaner

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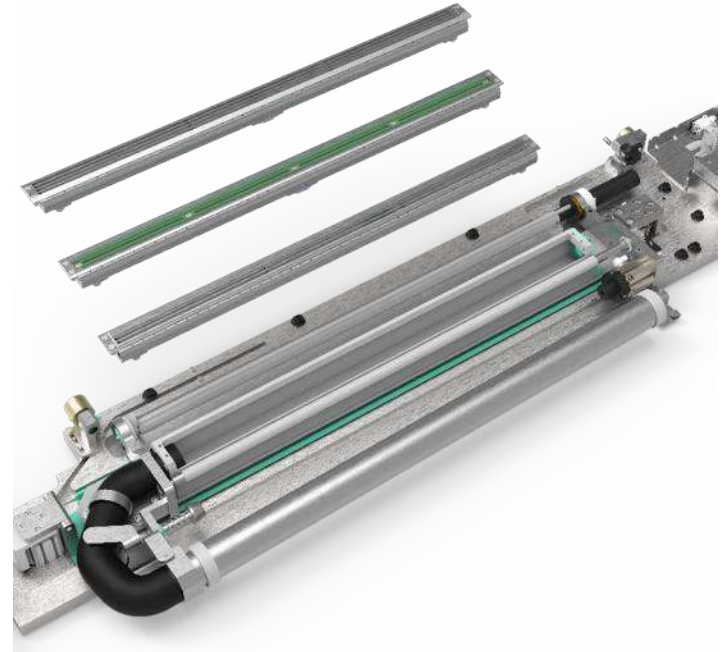
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FEATURE OVERVIEW DEK USC CLEANER

Key Features by USC type	Blue	iUSC	Cyclone	Typhoon	TQ Cleaner
Interchangeable Sizes	✗	✓	✓	✓	✗
Polyurethane Blades Top	✓	✓	✗	✓	✗
Standard Metal Top	✗	✗	✓	✓	✗
'Duo' Metal Top	✗	✗	✓	✓	✓
Vacuum cleaning both directions due to Fabric Brake	✗	✗	✗	✓	✓
Any stencil can stay in printer while replacing fabric	✗	✗	✓	✓	✓
Oscillation	✗	✗	✓	✗	✗
Offline roll preparation (cassette system)	✗	✗	✓	✗	✗

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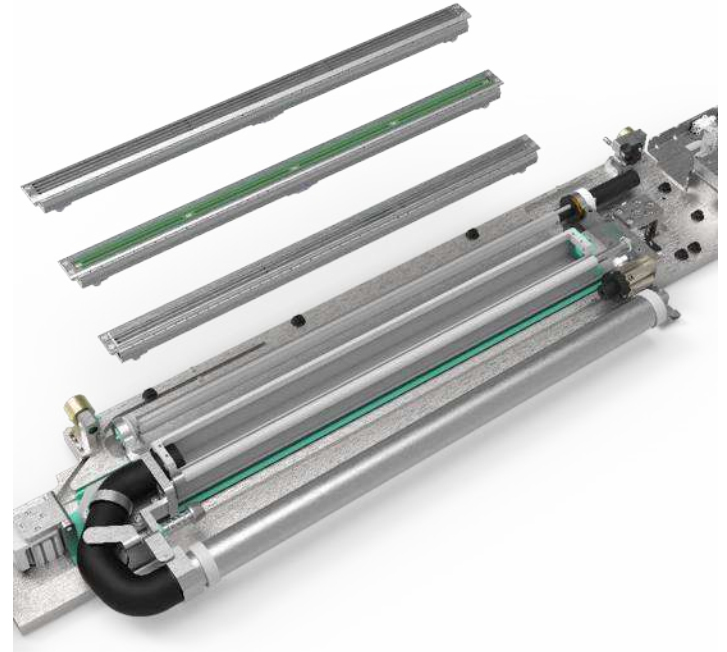
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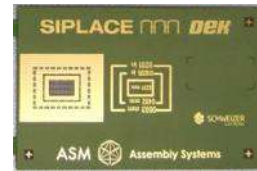
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INDUSTRY TREND

Increasing heterogeneous board layouts leading into growing demand for thinner, stepped and coated stencils.



Today's and future USC requirements:

1. Thickness: 150µm to 125µm to 100µm, 80µm and under... - $\leq 80\mu\text{m}$ is almost standard in stencil thickness
2. Multi-level (stepped): top and bottom sides

Oscillation increases risk of linting at step stencil areas on bottom side of stencil

3. Stencil Coatings

Oscillation dramatically reduce the lifetime of stencil coating by ripping off the coating very quickly

These requirements were leading into a new USC development with better cleaning performance without oscillation!

COMPARISON: DEK TYPHOON VS. USC WITH OSCILLATION (SPI 01005)

Oscillation vs. new Typhoon USC

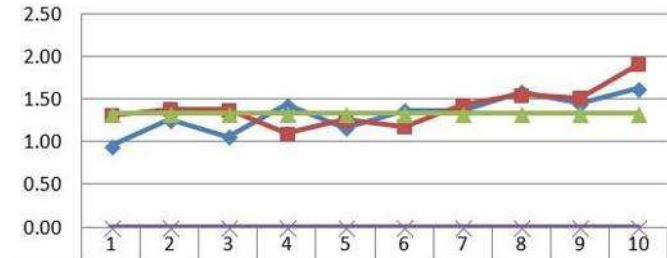
Baseline (green) is 1.33 C_{pk}

Run 1 (red): without oscillation

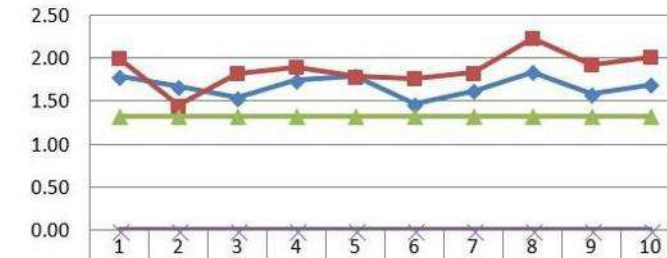
Run 2 (blue): with oscillation

Conclusion: No difference between oscillation and natural test variation.

01005 Height: Run 1 Vs Run 2 Vs Run 3

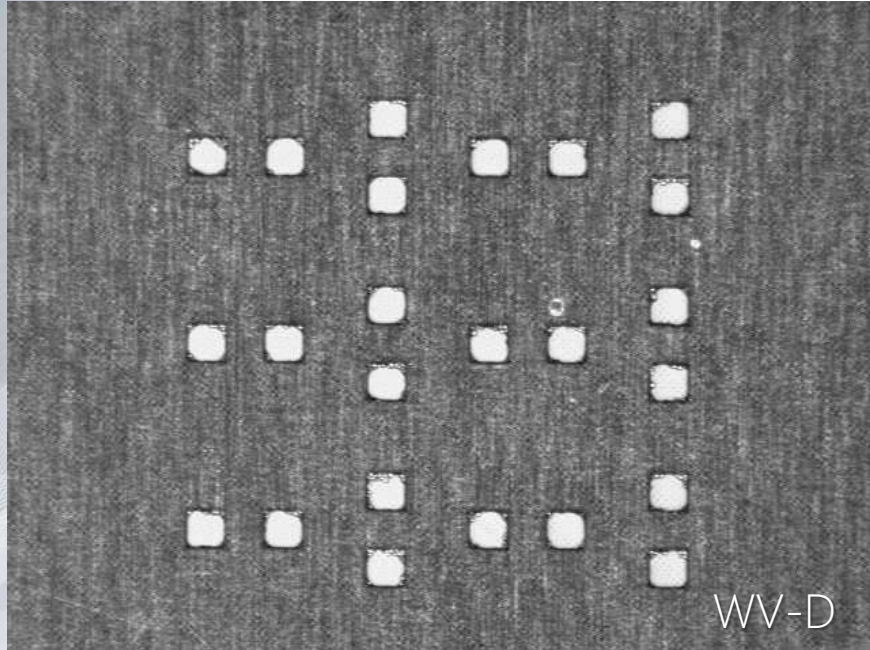


01005 Volume: Run 1 Vs Run 2 Vs Run 3

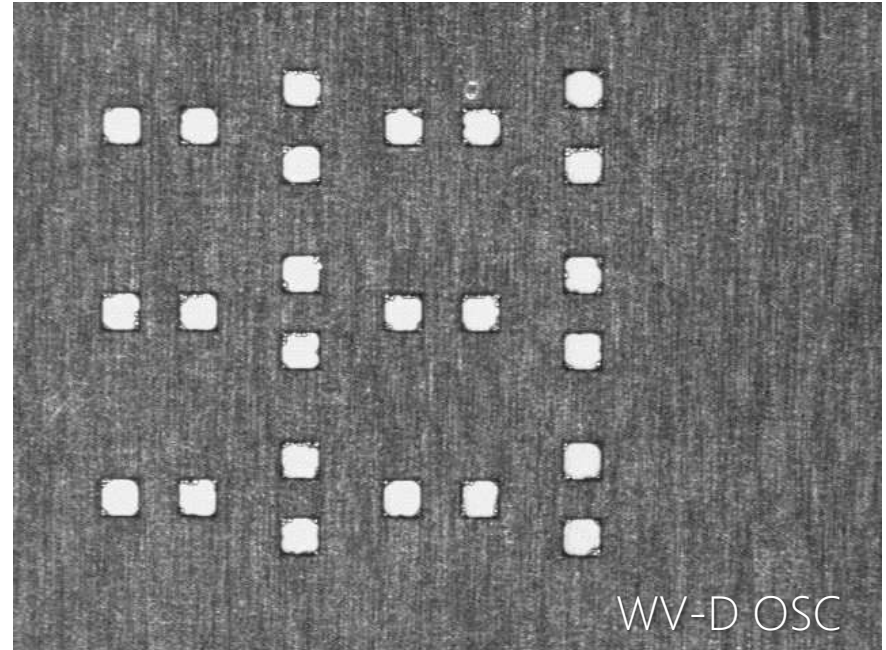


COMPARISON: DEK TYPHOON VS. USC WITH OSCILLATION(01005)

DEK Typhoon cleaner

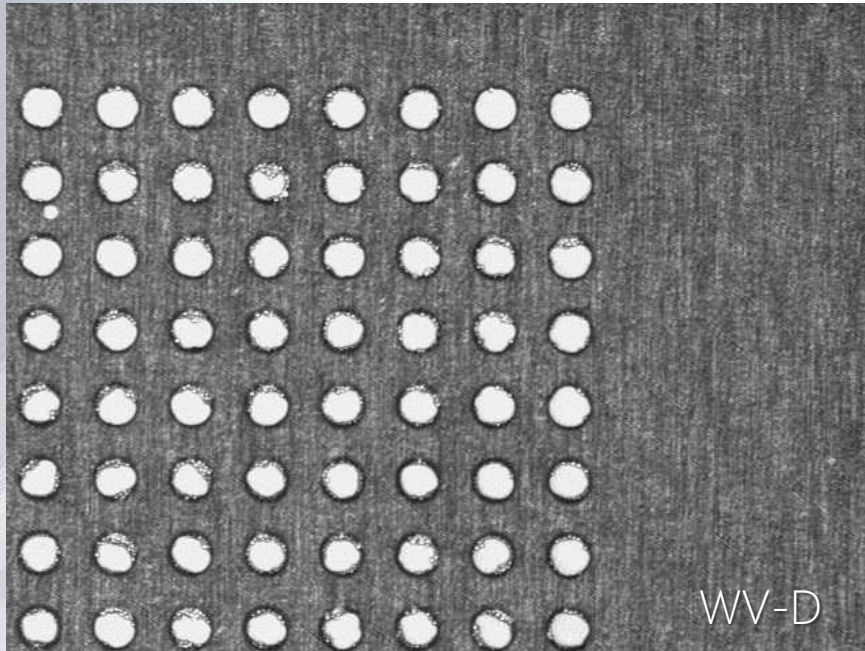


Cleaner with Oscillation

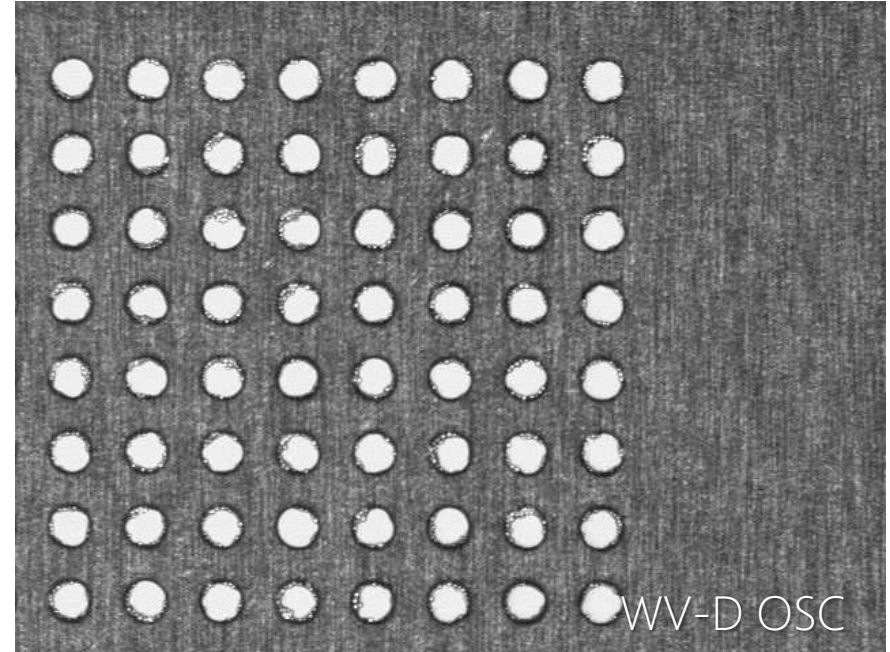


COMPARISON: DEK TYPHOON VS. USC WITH OSCILLATION(0.4MM CSP)

DEK Typhoon cleaner



Cleaner with Oscillation



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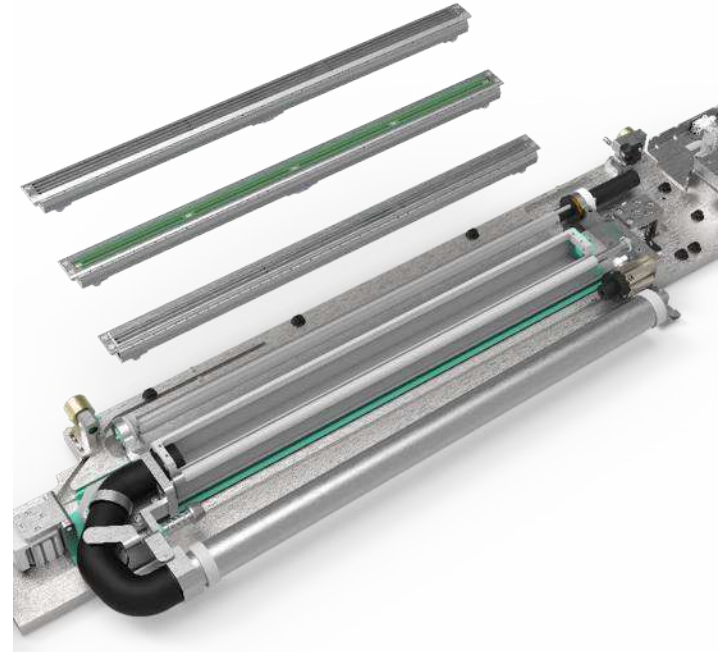
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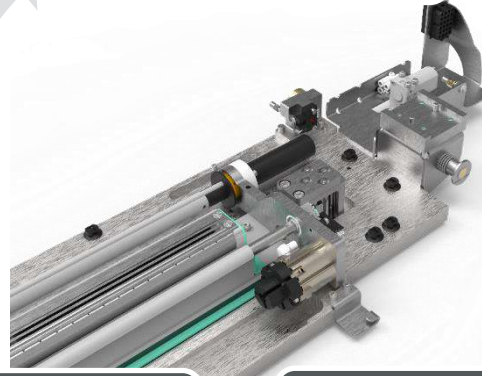
Typhoon and TQ non-oscillation vs. DEK Cyclone oscillation

Summary



SUMMARY DEK TYPHOON – THE HIGH-SPEED AND FLEXIBLE USC

Removable inserts enable fast and easy cleaning of body and spray bar outside the printer for fast maintenance



Print Quality & Reliability

Improved stencil contact, reliability and MTBA

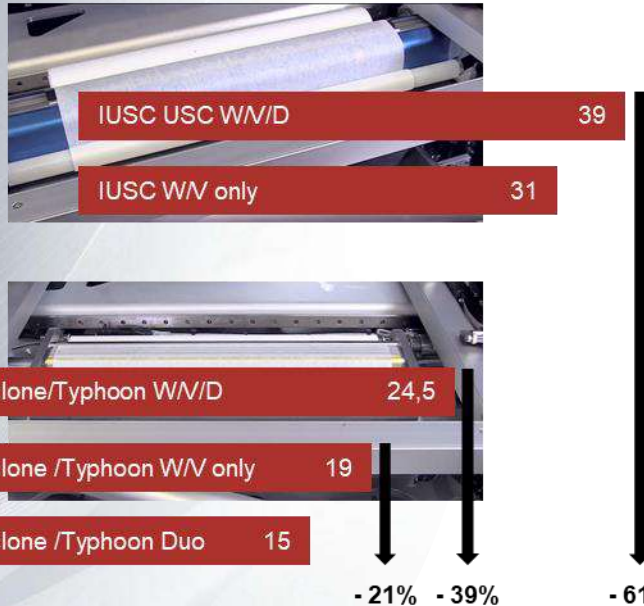
Flexible insert types and chamber lengths for optimal cleaning performance for every process and stencil

Productivity

Flexibility for Process

DEK TYPHOON USC – SUMMARY

Comparison of DEK USC cleaning times in seconds



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- Speed** → Software configurable also with Duo mode

ADDITIONAL UPGRADABLE OPTIONS



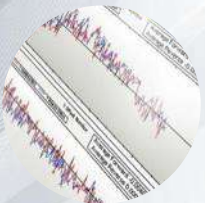
DEK SmartStencil

A smart verification and validation tool for stencil lifetime tracking to reduce defects.



DEK Paste Management

Closed-loop process control while reducing operator assists at the line.



Camera Barcode Reading

Barcode verification with onboard fiducial camera for PCBs, stencils, tooling and clamps



DEK Tooling

Proper tooling ensures a more stable process with higher yield



DEK High Flow Vacuum

Specifically aimed at smartphone manufacturers for printing on separated boards within a carrier.



DEK Temperature Control Module

Provides a highly stable and accurately controlled air temperature inside the machine.



THANK YOU!