

Total Solutions for SMT



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Foreword

Dear reader,

We are living in an increasingly complex world, shaped by pandemics, geopolitical tensions, and the rapid emergence of new technologies. While few of us can influence these global developments directly, we continue to adapt and look for opportunities to turn challenges into advantages.

Traditionally, our local market has been strongly focused on industrial applications. However, we are seeing a rapid shift driven by the growing demands of sectors such as defense, semiconductor manufacturing, and medical technology.

At the same time, the global supply chain remains under significant pressure. The unprecedented demand for components and PCBs required to build AI data centers has created bottlenecks throughout the electronics industry. Combined with supply chain and logistics disruptions resulting from ongoing military conflicts, this can almost be described as a perfect storm.

Despite these challenges, the Benelux market is performing well. We are seeing a clear increase in order intake, and our project pipeline continues to grow. Encouragingly, all of our suppliers are reporting positive growth and many have introduced innovative products and services that we are pleased to share with you in this newsletter.

ASMPT has launched its brand-new SIPLACE V placement platform and the latest DEK TQ stencil printers, both designed to deliver significant improvements in SMT production performance, efficiency, and reliability.

Nordson's N-Intelligence™ machine learning software is simplifying programming and operation across its X-ray inspection and component counting equipment portfolio, and we are pleased to report several successful installations.

We have also expanded our portfolio with exciting new product lines. Inovaxe offers intelligent storage solutions that dramatically reduce stockroom footprint while delivering exceptional picking efficiency. Imagine storing over 3,500 reels per square meter while achieving more than 30 picks and returns per minute. The impact on productivity and space utilization can be substantial.

Our newest partner, BSC, provides tabletop vapor phase soldering systems that offer a reliable and cost-effective solution for prototype assembly. Gen3 has introduced several new reliability testing products and expanded its in-house testing services for customers who prefer to outsource these activities.

In addition, we have broadened Partnertec's own capabilities with advanced tooling solutions and laser-cut products on a global bases that extend well beyond the applications traditionally associated with these technologies.

There is far too much to cover in a short introduction, so I invite you to explore the articles in this newsletter and discover the latest developments for yourself.



Enjoy the read.

Maurits van der Laken
Managing Director, Partnertec

Electronics manufacturing in transition



More performance, greater process reliability and new solutions for demanding SMT applications

The requirements in SMT manufacturing continue to rise. More powerful processors, larger PCBs and higher quality expectations call for production solutions that combine performance, process reliability and investment protection. With the new SIPLACE V placement platform, the ASMPT DEK TQ printing platform and solutions for modern AI server boards, ASMPT shows how SMT lines can be prepared to meet the challenges of today and tomorrow.

Performance for everyday production

What matters is not the performance figure on a data sheet, but the output achieved in day-to-day production. This is exactly what the new SIPLACE V placement platform was designed for. A more rigid machine frame, optimized axes and a new generation of placement heads enable fast and precise processing, even for complex assemblies. Depending on the application, productivity gains of up to 30 percent are possible under real-life production conditions.

Compatibility was another key focus. Existing SIPLACE X feeders can continue to be used, as can proven software and automation solutions. This allows manufacturers to modernize existing lines step by step. At the same time, the platform's internal Gigabit Ethernet communication with its high bandwidth and low latency provides the technical basis for future extensions and data-intensive applications.

Quality starts with the solder paste printing

Stable SMT production starts with stencil printing. Even small deviations in solder paste volume or alignment can affect all subsequent process steps. This is why ASMPT has continued to develop the DEK TQ printing platform.

Alongside high printing precision, the focus is on automation and process stability. High-speed under stencil cleaning, intelligent paste management and, in the future, automated stencil and squeegee changeovers reduce operator assists and increase machine availability. Together with closed-loop control and open interfaces such as IPC-HERMES-9852 and IPC-CFX, the printing process can be seamlessly integrated into modern SMT lines, where it is continuously optimized automatically.

New requirements for AI server board production

Modern AI server boards are creating new challenges for SMT manufacturing. Processor BGAs with dimensions of up to 150 × 150 mm, weights of more than 500 grams and connection counts in the high four digits are becoming part of everyday production. Future generations are expected to require BGAs with more than 20,000 balls. At the same time, PCB dimensions are increasing, while thousands of miniaturized components must be placed with high precision. As individual high-performance processors can have a material value of US\$10,000 or more, comprehensive inline quality control is essential.

SIPLACE placement machines already provide the technologies needed for these applications. Heavy-duty conveyors transport large-format PCBs safely through the placement process. The SIPLACE Smart Pin Support automatically stabilizes the boards and helps prevent deflections and vibrations during the placement process. Integrated inspection functions check critical areas directly inside the placement machine before the processor is placed. The concept is complemented by specially adapted nozzles, optimized motion profiles and optional 3D coplanarity inspection. This makes it possible to process even large, heavy and expensive processor BGAs with a high degree of process reliability.



Readiness for the future comes from the complete line

As complexity increases, the interaction between all process steps becomes even more important. What counts is the consistent coordination of the entire SMT line – from solder paste printing and placement to integrated quality control. ASMPT platforms are designed with precisely this interaction in mind. They help electronics manufacturers master current production tasks reliably while creating the foundation for future technologies.

More info on ASMPT's advanced Stencil Printer and Pick & Place platforms and intelligent software can be found at ASMPT SMT Solutions.

ASMPT enabling the digital world

www.asmpt.com

The particle you can't see

Why Foreign Object Debris is quietly driving your defect rate — and what to do about it

Ask any process engineer on a high-reliability SMT line what keeps them up at night, and contamination rarely tops the list. Stencil alignment, reflow profiles, component sourcing — these get the attention. Yet industry data consistently shows that particulate contamination, known formally as Foreign Object Debris (FOD), is the single biggest controllable contributor to assembly defects. It is also one of the most overlooked.

FOD is not a new concept. The term originated in aerospace, where a stray fastener inside a jet engine is catastrophic. In electronics assembly, the stakes are lower per incident but the volume is far higher — and the consequences, in automotive, aerospace, and medical applications, are increasingly unacceptable under zero-defect contracts.

Glass-fibre dust from routing. Carbonised residue from laser marking. Fibres and skin particles from handling. Manufacturing residues carried in from the board fabricator. None of these are dramatic individually. Collectively, they are why solder paste print — the very first active process step — accounts for roughly 60% of all downstream defects on a typical SMT line.



Figure 1: FOD removal sits ahead of solder paste print — the single most consequential point in the line to intercept it.

That is the uncomfortable truth about FOD: it rarely fails the board outright at the point of contamination. Instead, it sets up a failure mode that surfaces downstream — sometimes on the test bench, sometimes in the field, months after shipment. Solder bridges from particles obstructing stencil apertures. Voids and lifted leads from debris trapped beneath components. Electrochemical migration from ionic contaminants that took weeks to do their damage. Each is a defect with a contamination origin that the AOI camera never saw.

60% of SMT defects trace to contamination at solder paste print	20-50% typical AOI defect reduction after FOD removal	6-9 mths typical payback period on an inline board cleaner
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The acceptance standard most engineers will know is IPC-A-610, which sets class-dependent criteria for visible foreign matter on finished assemblies. But IPC-A-610 measures what's acceptable after the fact. For sectors working to AEC-Q004 and IATF 16949's zero-defect philosophy, that's the wrong place to be drawing the line. The goal isn't passing inspection — it's making sure FOD never reaches the inspection stage.

Germany's VDA 19 Part 2 takes this further, demanding a documented, risk-based contamination control programme across the entire assembly environment: clean zones, personnel discipline, validated cleaning steps, and ongoing monitoring. It is, in effect, the industry codifying what good engineers already suspected — that contamination control has to be designed in, not inspected for.

Removing FOD at source, before the printer, is mechanically simple but engineering-intensive to do properly. Contact cleaning — elastomer rollers lifting loose particles onto an adhesive capture roll — has been the industry's answer for over three decades. What has changed is the precision now demanded of it: strain control to protect components (IPC/JEDEC J-STD-9704 sets a 200 microstrain limit), ESD-safe operation to ANSI/ESD S20.20, and full line connectivity via IPC-HERMES-9852 so every board cleaned is traceable.



Teknek's latest platform, the Tek-BC 40, was engineered against exactly that brief: sub-200 microstrain Advanced Load Control, static-dissipating rollers, Kevlar-reinforced conveyor belts, and out-of-the-box MES integration. It is, in effect, FOD removal designed for a generation of boards too dense and too critical to tolerate the older brush-and-vacuum approach.

None of this replaces good process discipline elsewhere on the line — contact cleaning won't fix a poorly designed stencil, and it doesn't remove ionic flux residue, which still needs wet cleaning. What it does is close off an entire category of defect causes before they ever enter the process. For lines chasing genuine zero-defect status, rather than just a good yield number, that distinction is the whole game.

Teknek's Tek-BC 40 inline board cleaner, positioned ahead of solder paste print.



www.teknek.com



ZESTRON® EYE

The global leading concentration management device

Since its launch in 2013, Zestron's automatic and digital real-time concentration measurement and monitoring device for PCBA cleaning agents has been successfully integrated into more than 1.000 cleaning systems.

Over the years, the unit has undergone continuous development, and the importance of real-time process monitoring, seamless traceability of process parameters and consistent cleaning results is greater than ever before. All this can be ensured by integrating the ZESTRON® EYE into the cleaning machine.

Other key factors to consider include the easy installation and setup, the precise concentration measurement with both fresh and loaded cleaning baths, the uncomplicated integration with an automated dosing system and to read and save the data onto the controller which might be important for ISO audits.

The ZESTRON® EYE can be integrated in an existing system or ordered directly alongside a new cleaning system that comes ready for use with the concentration measuring device. For example, the MBtech NC25 PCBA cleaning system can be ordered with the ZESTRON® EYE and an automatic top-up system.

With the ZESTRON® EYE Mobile we also offer a portable version of the ZESTRON® EYE. As it is not permanently installed in a cleaning system, it is the ideal solution for monitoring the concentration levels of up to 10 different cleaning systems using a single, independent device.



www.zestron.com



A stable alternative to 3M Novec: Techspray's Precision-V

With the global discontinuation of 3M Novec, electronics manufacturers are increasingly searching for a reliable and future-proof alternative for precision cleaning and degreasing. To support this transition, Techspray has introduced Precision-V, a new family of high-performance solvents engineered to match the capabilities of the 3M Novec products.

Precision-V is created for applications where high cleaning performance and material safety are essential, particularly within electronics production and service environments. The solvents offer fast evaporation, minimal residue, excellent material compatibility and strong cleaning performance. This makes Precision-V a practical and easy replacement for discontinued 3M Novec products.

Why Precision V?

The discontinuation of 3M Novec created challenges for manufacturers who relied on those products. Techspray understands how hard it can be to replace a chemistry that has been part of your process for years. That's why instead of introducing solvents with a completely different behaviour, Techspray chose to develop products that follow the same cleaning principles:

- **Stable performance**
Precision-V provides consistent cleaning characteristics that fit directly into existing 3M Novec workflows, allowing manufacturers to continue production without process changes.
- **High purity chemistry**
Ultra-low residue levels ensure safe use on sensitive electronics, connectors, sensors and high-density PCB assemblies.
- **Environmentally responsible**
Precision V meets modern environmental and regulatory standards, ensuring the products not only support your process but also contribute to a more sustainable future, while remaining fully safe for use across the EMEA region.
- **Multiple variants**
For the discontinued 3M Novec products, we offer both a 1 to 1 replacement and an advanced alternative, allowing you to select the option that best aligns with your operational requirements.

A future-proof solution

With Precision-V, Techspray provides a stable and high-performance alternative at a moment when the industry needs it the most. Manufacturers can continue their processes without compromise, supported by Techspray's long-standing expertise in precision cleaning.

Want to know which product you need? Look at the 3M Novec selection guide.
The Novec Solvent Replacements you need. | Techspray



www.techspray.com



Modi PackTrace

Optimizes Manual Packing Processes

MODI PackTrace brings speed, accuracy, and full transparency to manual packing operations.

Designed to optimize outbound logistics workflows, the solution combines intelligent software with modern hardware to create a secure and highly efficient packing process.

By seamlessly integrating with ERP and WMS systems, PackTrace automatically retrieves packing lists and records each package "on the fly" during the packing process. This significantly accelerates order fulfillment while enabling automated shipping notifications.

A standout feature of PackTrace is its automated photo documentation, which records every packing layer to provide 100% traceability and shipment transparency. This minimizes packing errors, improves quality assurance, and creates complete documentation for every shipment.

In addition, real-time controls and smart statistics functions help companies gain valuable operational insights and strengthen negotiations with logistics carriers.

Key benefits:

- Faster and more efficient manual packing processes
- Seamless ERP and WMS integration
- Automated shipping notifications
- Photo-based documentation of every shipment
- Reduced error rates and enhanced traceability
- Real-time monitoring and performance analytics



www.moditrace.net/en/outgoing-goods

Affordable vapor-phase soldering, BSC just solder, now available

As electronics assemblies become increasingly complex, achieving consistent, high-quality solder joints while protecting sensitive components is more important than ever. To help our customers meet these challenges, Partnertec has expanded its portfolio with the vapor-phase soldering systems from German manufacturer BSC Solder Systems, available throughout the Benelux region.

A Proven Technology for Modern Electronics Manufacturing

BSC Solder Systems specializes in vapor-phase soldering equipment designed for prototyping, engineering laboratories, and small-batch production. Manufactured in Dortmund, Germany, the JUST SOLDER product line combines professional soldering performance with user-friendly operation and an unbeatable price level.

Unlike conventional convection reflow ovens that transfer heat using hot air, vapor-phase soldering uses the condensation of a heated process fluid. Heat is transferred uniformly across the entire PCB assembly, eliminating thermal shadowing effects and ensuring that all components, regardless of size or mass, are heated consistently.

Why Choose Vapor-Phase Soldering?

One of the key advantages of vapor-phase technology is its inherent temperature control.

The maximum soldering temperature is physically limited by the boiling point of the process fluid, typically **Galden® LS-230** for lead-free applications. This means that assemblies cannot overheat, making the technology exceptionally safe for temperature-sensitive components.

Additional benefits include:

- **Uniform and reliable solder joints** through highly efficient and homogeneous heat transfer.
- **Excellent process repeatability**, ensuring consistent production results from run to run.
- **Oxygen-free soldering environment**, reducing oxidation and improving solder wetting and joint quality.
- **Gentle treatment of components and PCBs**, thanks to the controlled maximum process temperature.
- **Effective soldering of complex assemblies**, including boards with mixed component technologies, large thermal masses, and challenging package types.
- **Energy-efficient operation**, resulting from efficient heat transfer and relatively low process temperatures.

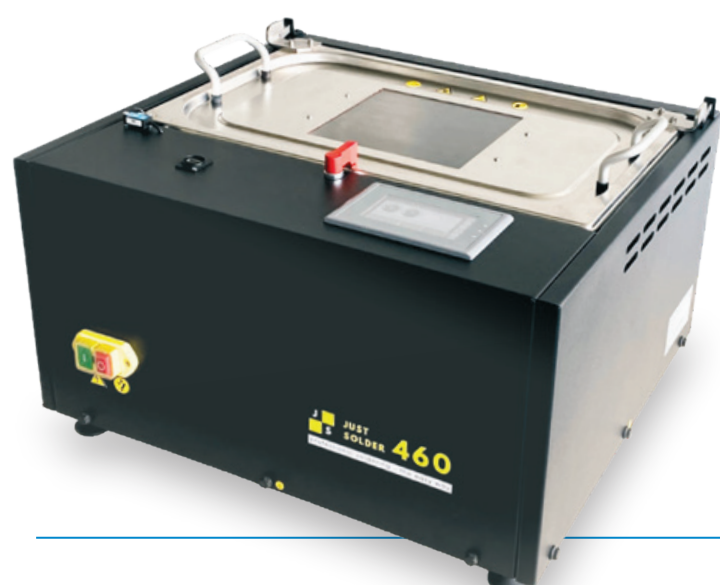
Component Desoldering & PCB Rework Solution

The systems can also be equipped with an optional desoldering tool, enabling safe removal and replacement of complex SMD components for rework and repair applications. A major advantage of this desoldering process is that, in most cases, neither the component nor the PCB requires cleaning from solder residues. Separation is so clean and uniform that flat, even surfaces remain on both the board and the component.

Precision Through Process Control

To ensure optimum results, the JUST SOLDER systems incorporate thermocouple-based process monitoring. Users can measure both board and chamber temperatures and fine-tune soldering profiles according to IPC requirements and solder paste manufacturer recommendations. This provides a level of process visibility and control typically associated with much larger production systems.

For more information or a demonstration, please contact Partnertec. We will be pleased to discuss how vapor-phase soldering can support your manufacturing requirements.



www.just-solder.de



New GEN3 products and services enhance electronics reliability testing

GEN3 is strengthening its position as a global leader in electronics reliability testing with the introduction of two innovative additions to its portfolio.

Firstly, GEN3 has become the exclusive worldwide distributor of the revolutionary **HATS2™ (Highly Accelerated Thermal Shock) Tester**, developed by reliability expert **Bob Neves of Reliability Assessment Solutions (RAS)**. This advanced system provides rapid, convection-based thermal shock and reflow simulation, enabling manufacturers to accelerate PCB and interconnect reliability testing, significantly reduce test times, and increase confidence in product performance.

In addition, GEN3 has launched the **AutoCHT™ (Condensation Humidity Tester)**, the world's first platen-based system capable of generating a precisely controlled condensation layer on electronic test assemblies. Designed to integrate seamlessly with the **AutoSIR2+**, the AutoCHT enables engineers to replicate real-world moisture conditions and quickly identify coating defects, electrochemical migration, and other humidity-related failure mechanisms.

Together, the **HATS2™** and **AutoCHT™** represent the next generation of reliability testing technology, reinforcing GEN3's commitment to helping electronics manufacturers improve product quality, durability, and long-term reliability.

Beyond supplying industry-leading equipment for reliability, solderability, and contamination testing, GEN3 also provides a comprehensive range of analytical testing services through its state-of-the-art Technical Centre in the UK.



For more information on GEN3's products and services, contact Partnertec.



www.gen3systems.com



Why soldering process profiling is no longer optional

How Solderstar helps electronics manufacturers improve quality, reduce costs and gain complete process visibility

This article describes why Soldering Process Profiling is so important and how a single profiler can do the job across multiple production processes, while maintaining efficiency and reducing operating costs.

Process visibility drives quality

The reality is simple: you cannot control a process you cannot measure.

Modern SMT and THT production environments demand increasingly tighter process control. Product designs are becoming more complex, component densities are increasing, and customers expect near-zero defect levels. Soldering Process Profiling provides manufacturers with accurate insight into what is actually happening inside the soldering process, allowing engineers to verify that every assembly receives the correct thermal energy and process conditions.

Solderstar's latest solutions go beyond traditional temperature measurement. Systems such as the new Reflow Shuttle O₂ and WaveShuttle O₂ can capture multiple process parameters during a single pass, including:

- Temperature profile
- Oxygen concentration (ppm)
- Conveyor speed
- Vibration and machine conditions
- Flux Sensing
- Vacuum Stage Verification

This provides a much more complete picture of the actual manufacturing process and helps identify issues before they lead to costly defects.

Looking beyond temperature

Historically, thermal profiling focused primarily on verifying temperatures through a soldering process. While temperature remains the most important factor in achieving reliable solder joints, modern production lines involve many additional variables that directly influence product quality.

Factors such as oxygen concentration, conveyor speed, vibration and machine stability can all impact soldering performance. Understanding how these parameters interact gives engineers a far clearer picture of what is actually happening inside the process.

Modern profiling technology allows multiple process variables to be measured simultaneously during a single production pass. Instead of relying on assumptions, manufacturers gain real process data that can be used to identify issues, validate machine performance and maintain process stability.

When quality issues arise, access to detailed process information dramatically reduces troubleshooting time and enables faster corrective action.

Lower costs through a unified platform

One of the most compelling reasons to invest in Solderstar technology is its flexible platform concept. Instead of requiring different dataloggers for each soldering process, Solderstar enables manufacturers to use a common profiling platform with interchangeable fixtures and accessories for reflow, wave, selective and vapor phase applications.

For manufacturers, this means:

- Reduced capital investment
- Fewer calibration requirements
- Lower maintenance costs
- Simplified operator training
- Faster deployment across production lines

A single adaptable system can support multiple manufacturing processes while maintaining measurement consistency throughout the factory.

Faster process optimization

Introducing new products or changing board designs often requires extensive process validation. Solderstar's profiling and optimization software helps engineers establish optimized process settings more quickly, reducing trial-and-error adjustments and speeding up product introduction. The result is less machine downtime and faster time-to-production.

Supporting industry 4.0 and continuous improvement

Today's manufacturing environments require data-driven decision-making. Thermal profiling is no longer just a maintenance activity performed occasionally. It has become a critical process verification tool that supports quality systems, traceability requirements and continuous improvement initiatives.

By capturing and analyzing process data, manufacturers can identify trends, prevent process drift and maintain consistent soldering quality over time. Advanced profiling solutions provide the evidence needed for customer audits, quality certifications and process validation.

The business case for thermal profiling

When evaluating process improvement investments, many manufacturers focus primarily on equipment acquisition costs. However, the true cost of poor process visibility is often much greater. A single process issue can lead to:

- Increased rework
- Higher scrap levels
- Production delays
- Customer complaints
- Warranty claims
- Reduced throughput

Effective thermal profiling helps minimize these risks by providing the information needed to make informed process decisions and maintain stable production conditions. In many cases, the return on investment is achieved not through the profiling system itself, but through the defects, downtime and inefficiencies that are avoided.

Conclusion

The most successful electronics manufacturers understand that process control is built on accurate measurement.

Thermal profiling delivers the visibility required to achieve consistent soldering quality, optimize machine performance and maintain confidence in every stage of the manufacturing process. By measuring more than just temperature and embracing a comprehensive process verification strategy, manufacturers can reduce risk, improve yields and strengthen their competitive advantage.

At Solderstar, we believe thermal profiling should be more than a measurement exercise. It should be the foundation of a robust process control strategy that drives quality, efficiency and manufacturing excellence.

Partnertec supplies the complete Solderstar portfolio for reflow, wave, selective and vapor phase soldering applications. Contact us to discuss how advanced thermal profiling and process verification can help improve your production performance and product quality.

More info on Solderstar -
thermal profiling and process solutions



www.solderstar.com

New: Modi TopScan Pro

Flexible incoming goods scanning for every workstation

Not every incoming goods department has the space or need for a dedicated scanning table. That's why MODI developed the TopScan Pro – a compact and flexible incoming goods scanning solution that can be integrated into virtually any existing workstation.

The system transforms a standard workbench into a powerful identification station without requiring major changes to the workplace layout. It automatically captures barcodes on incoming material and seamlessly transfers the data to ERP, MES, or warehouse management systems, enabling fast and reliable goods receipt.

A key feature of the TopScan Pro is its automatic height adjustment with integrated autofocus. With a vertical adjustment range of 200 mm, the camera automatically maintains the perfect focus regardless of reel size or package height, ensuring consistently sharp images and reliable barcode reading.

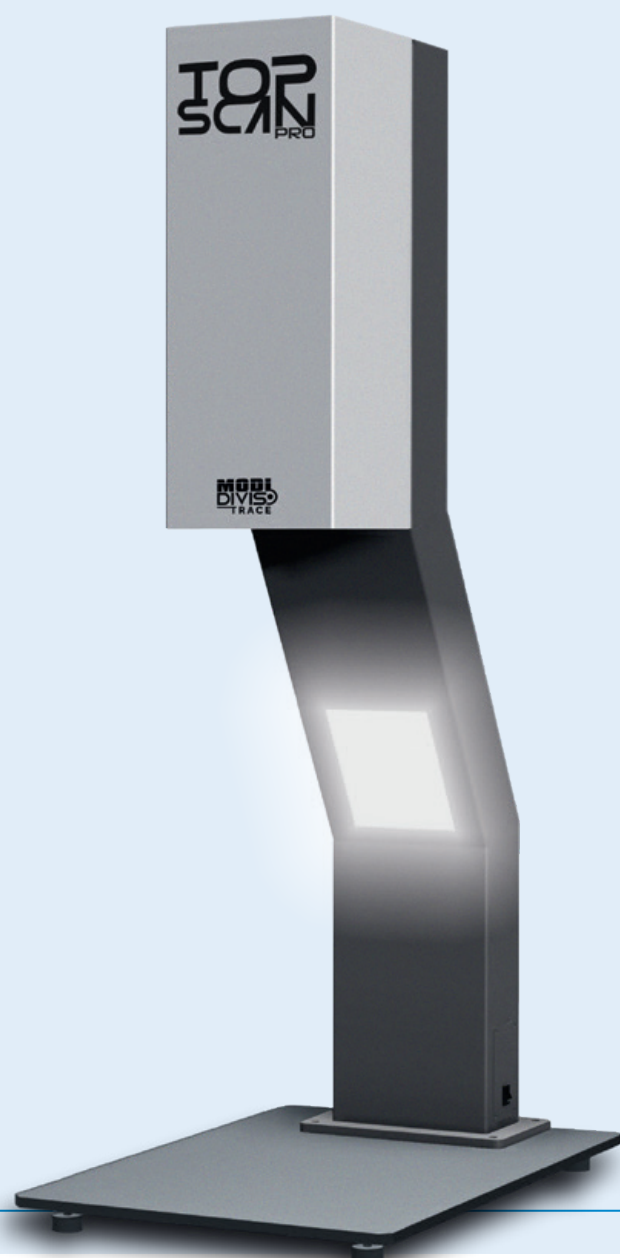
The integrated sensor can also classify reel widths and reel size, making the TopScan Pro the ideal front-end solution for automated storage systems and intelligent material handling.

To guarantee reliable image quality under all conditions, the system features integrated glare-free LED illumination, providing consistent lighting while eliminating reflections from labels and packaging.

Key benefits:

- Easily integrates into existing incoming goods workstations
- Automatic 200 mm height adjustment with continuous autofocus
- Reliable barcode reading and OCR with consistently sharp images
- Automatic reel width & diameter classification for automated storage systems
- Integrated glare-free LED illumination
- Fast ERP/MES integration for efficient goods receipt and complete traceability

With the TopScan Pro, companies can automate their incoming goods process without redesigning their workstations - combining flexibility, accuracy, and seamless traceability in one compact solution.



MODI
Vision for Identification

www.moditrace.net



MEK introduces new PowerSpector JSAz 350 Desktop AOI

MEK has introduced the redesigned PowerSpector JSAz 350, bringing the proven technology of the larger JSAz 550 into a more compact and cost-effective desktop AOI platform.

The new JSAz 350 is no longer based on a separate mechanical design. Instead, it is a smaller version of the successful JSAz 550, utilizing the same highly accurate and stable X-Y positioning system. This ensures the same inspection precision and mechanical stability that users have come to expect from the larger platform, while reducing the footprint required on the production floor.

A key design enhancement is the fixed PCB stage. During inspection, the PCB remains stationary while the optical head moves across the board. This approach improves inspection stability and delivers the same robust scanning performance found in the JSAz 550.

In addition to inheriting the precision mechanics of the larger model, the new JSAz 350 now includes laser measurement capability for selective 3D height inspection. This feature allows users to perform accurate height measurements on selected components and assemblies, providing an additional level of process verification for applications where component coplanarity, lead height, or assembly dimensions are critical.

The system combines this new 3D measurement capability with MEK's powerful AOI technology, including:

- Up to 9 cameras for comprehensive defect coverage.
- Multi-angle lighting and DOAL illumination for reliable solder joint inspection.
- Support for taller assemblies with up to 60 mm top-side clearance.
- Integration with the MEK Catch System for quality monitoring and process control.

For manufacturers looking for the performance of the JSAz 550 in a smaller package, the new PowerSpector JSAz 350 offers an ideal solution, delivering high-accuracy inspection, advanced measurement capability, and a compact footprint suitable for space-conscious production environments.

More info:



mek
marantz electronics ltd

www.marantz-electronics.com

Why strong cleaning matters: The foundation of reliable electronics

A tutorial on spray-under-immersion post soldering cleaning

As electronic assemblies become increasingly complex and component spacing continues to shrink, the importance of effective post-solder cleaning has never been greater. Flux residues left behind after soldering can lead to leakage currents, electrochemical migration, corrosion, poor conformal coating adhesion, and ultimately premature product failure. These risks are particularly critical in high-reliability industries such as aerospace, automotive, medical, defense, and industrial electronics.

While no-clean fluxes were originally developed to reduce or eliminate the need for post-solder cleaning, they often leave residues that are more difficult to remove than traditional rosin-based fluxes. During the reflow process, these residues can polymerize and form highly resistant deposits underneath low-standoff components, bottom-terminated devices, power modules, and densely populated assemblies.

In many applications, products that were previously left uncleaned now require cleaning due to increasing reliability requirements, stricter cleanliness standards, the widespread use of conformal coatings, and the growing adoption of electronics in mission-critical systems. As a result, manufacturers need cleaning systems capable of removing stubborn residues completely and consistently, even from the most difficult-to-access areas beneath today's compact components.

The effectiveness of a cleaning process is therefore no longer determined solely by the cleaning chemistry. Equally important is the ability of the cleaning system to apply sufficient mechanical force and deliver fresh filtered cleaning agent chemistry to every contaminated surface of the substrate. It should continuously remove dissolved residues from the process, and prevent recontamination during both cleaning and rinsing.

This is where MBtech's patented Spray-under-Immersion technology makes a difference. Since 1993, MBtech, a French specialist in electronics cleaning equipment, has developed a unique cleaning approach that has set a new benchmark for cleaning performance, efficiency, and sustainability.

The secret: spray-under-immersion technology

Unlike traditional spray-in-air cleaning systems, MBtech fully immerses assemblies in a cleaning bath before applying mechanical cleaning action. Boards, wafers, lead frames, and power modules are positioned vertically in adjustable or dedicated carriers and submerged in the cleaning fluid.

A moving spray bar then cleans the products from both sides while the carrier simultaneously moves up and down, ensuring complete and uniform exposure to fresh cleaning chemistry.

This combination of immersion and targeted spray action offers several key advantages:

- Complete contact between the cleaning fluid and all product surfaces.
- Elimination of shadowing effects that can occur when products are stacked or positioned at angles.
- A 90-degrees impact, forces the cleaning agent under low stand-off component to remove flux residues underneath.
- Consistent cleaning performance across the entire assembly.
- Effective removal of even the most challenging flux residues.

Separate subsequent cleaning, rinsing, and vacuum drying tanks allow parallel processing and improve throughput. As a result, flux residues can typically be removed in a total cycle time of just 10 to 15 minutes, including rinsing and complete drying.

Continuous filtration for maximum cleanliness

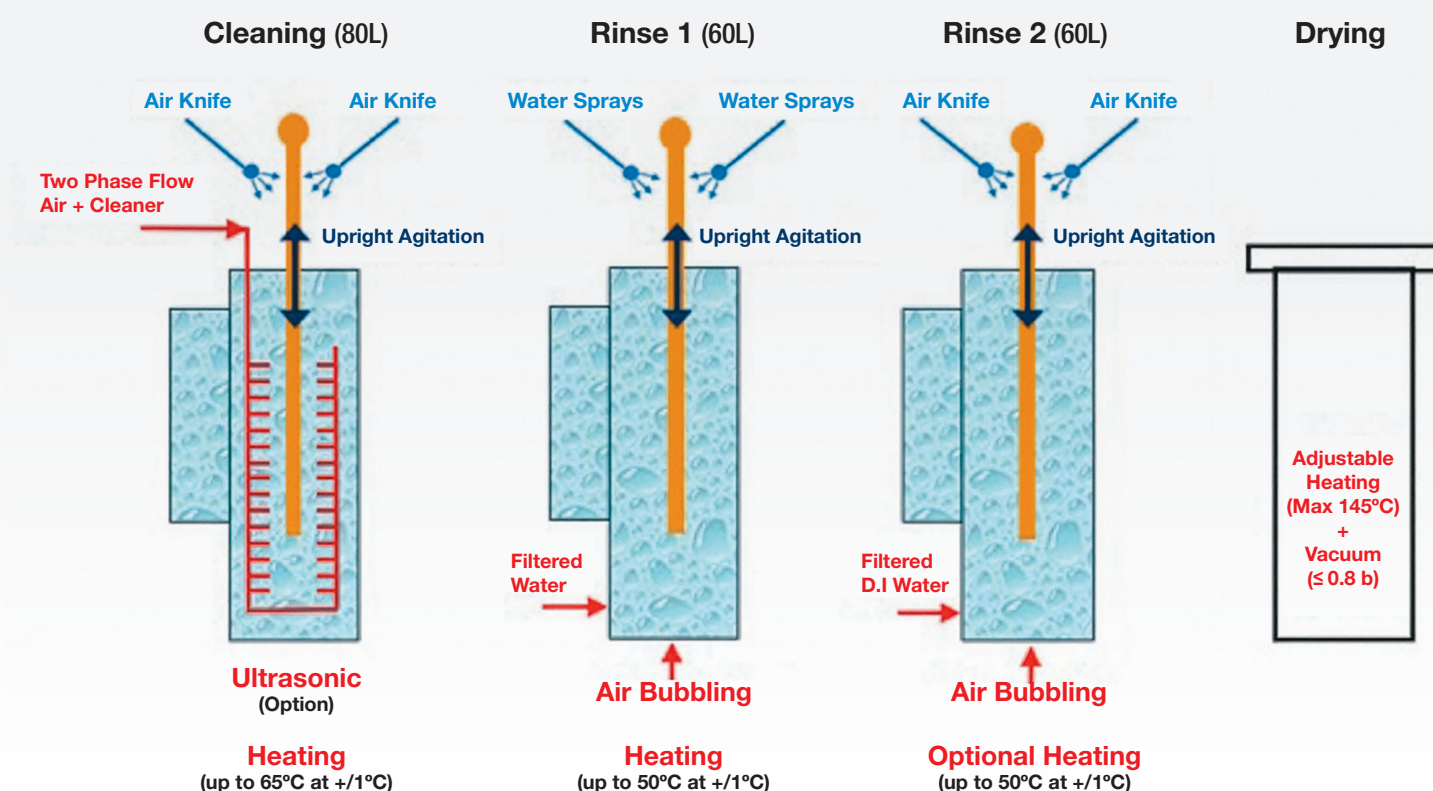
MBtech systems continuously remove contamination from the cleaning chemistry throughout the cleaning process. Heavy particles are filtered from the lower section of the cleaning tank, while lighter floating contaminants are removed from the liquid surface by an overflow into a smaller tank, from where they are filtered and returned to the main bath. The cleaning fluid is continuously purified through micron filters and returned to the process via the spray bars.

This continuous filtration approach maintains cleaning efficiency, extends bath life, and minimizes the risk of redepositing contaminants onto cleaned assemblies.

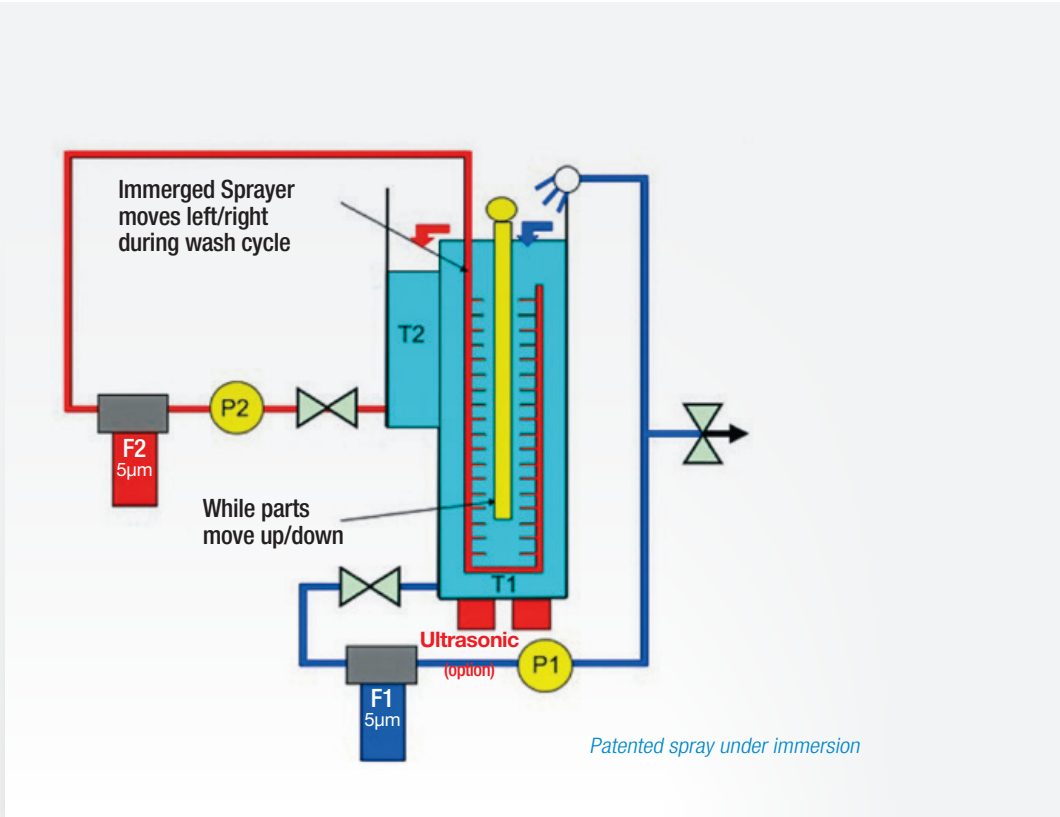
Enhanced rinsing and vacuum drying

After cleaning, products are automatically transferred to dedicated DI-water rinse stages. The closed-loop rinsing system continuously monitors deionized water quality and uses resin and activated carbon filtration to maintain optimum performance.

The final step is vacuum drying in a separate chamber. By lowering the pressure, moisture is removed at reduced temperatures, shortening drying times, lowering energy consumption, and minimizing thermal stress on sensitive electronic components.



Unique construction & transfer



More efficient than conventional spray-in-air systems

Many conventional cleaning systems operate much like industrial dishwashers, spraying cleaning chemistry onto products placed in baskets. This arrangement can create shadow areas where the cleaning fluid cannot effectively reach contaminated surfaces. In addition, rinsing is often performed in the same chamber used for cleaning, meaning that not only the products but also the entire process chamber must be rinsed. This increases rinse-water contamination and decreases overall process efficiency.

MBtech’s vertical product positioning and immersion-based process, combined with dedicated cleaning and rinsing tanks, eliminate these limitations. Only the carrier and the assemblies themselves require cleaning and rinsing.

The result is:

- Faster and more effective cleaning.
- Improved rinsing performance.
- Up to five times lower cleaning-agent consumption.
- Reduced evaporation and heat losses.
- Lower pump energy consumption.
- Less cleaning agent cross-contamination into the rinsing water
- Increased throughput and shorter overall cycle times.

Designed for sustainable manufacturing

Sustainability is built into the MBtech concept. All systems operate in a fully closed-loop configuration, continuously filtering and reusing both cleaning chemistry and rinse water. No process liquids are discharged to the sewer, helping manufacturers reduce their environmental footprint while lowering operating costs.

Vacuum drying consumes significantly less energy than conventional hot-air or blower-based drying systems, further improving the overall sustainability of the process.

Proven worldwide

Today, close to 600 MBtech flux-cleaning systems are installed worldwide. Leading manufacturers, including several well-known companies in the Benelux, rely on MBtech technology for their high-reliability cleaning requirements.

Known for their robust construction, long service life, and low maintenance requirements, MBtech systems continue to be a trusted solution for demanding electronics manufacturing environments. MBtech’s Spray-under-Immersion technology combines superior cleaning performance, lower operating costs, and sustainable operation, making it one of the most advanced flux-removal solutions available to today’s electronics manufacturing industry.



New: CoolClean option for Centurion reflow oven

Enhanced cooling zone contamination control for improved reliability and reduced maintenance

In nitrogen reflow soldering, managing flux residues is critical to maintaining oven performance and product quality. While traditional systems rely only on heat exchangers to collect contaminants, they often may require maintenance and cause unplanned machine downtime. Vitronics Soltec’s new CoolClean option offers a more advanced solution for nitrogen reflow ovens equipped with CATHOX technology. Unlike conventional methods, CoolClean actively extracts contaminated gases from the slot exhaust and the first cooling zone, condensing them on a heat exchanger located outside the process area.

This design minimizes flux residue buildup inside the oven, prevents dripping onto PCBs, and significantly reduces overall contamination. During the reflow process, flux residues—along with solvents, organic acids, and solder mask by products—tend to accumulate, especially in cooling zones. Traditional systems often struggle to manage these contaminants effectively, resulting in unplanned maintenance and potential disruptions. CoolClean addresses this challenge by relocating the condensation process outside the oven, ensuring cleaner operation, enhanced reliability, and reduced maintenance needs

Designed for compatibility with CATHOX-equipped nitrogen ovens, CoolClean is also field-upgradeable, making it a simple and effective way to boost uptime and process efficiency.

Key features and benefits summary:

- Removes contaminated gases before they drip onto PCBs or build up inside the oven.
- Extends maintenance intervals and reduces the requirement for frequent cleaning.
- Compatible with nitrogen reflow ovens using CATHOX technology
- Compatible with all solder paste types.
- Equipped with temperature and flow sensors to predict and detect maintenance needs.
- Easy access.
- Field upgradeable.



www.itweae.com

Partnertec: More than just stencils for printing applications

For years, Partnertec has built a strong reputation as a trusted supplier of high-quality laser-cut stencils for the electronics industry. Known for precision, reliability, and fast delivery, our stencil solutions support manufacturers in achieving consistent and accurate SMT assembly results. But did you know that Partnertec offers much more than stencils?

Expanding precision beyond electronics

While laser-cut stencils for solder paste printing remain at the core of our business, our advanced manufacturing capabilities allow us to support customers with a wide range of precision-engineered products and custom solutions.

Fast-turn prototype stencils

In today's fast-paced product development environment, speed matters. Partnertec supplies prototype stencils with short lead times, enabling engineering and development teams to move quickly from design validation to assembly. Customers benefit from the same high level of precision and quality used in our production stencils, ensuring reliable results from the very first build.

Large-format framed stencils

Not every application fits within a standard stencil size. That is why Partnertec also manufactures framed laser-cut stencils for larger and more demanding production environments. With sizes available up to an impressive 1800 × 740 mm, these solutions provide enhanced stability, durability, and ease of handling for specialized manufacturing processes.

Precision shims and custom laser-cut components

Our expertise in laser processing extends well beyond stencil production. Partnertec manufactures precision shims and a broad range of custom laser-cut parts according to customer specifications.

Whether used for spacing, alignment, mechanical positioning, or specialized technical applications, our laser-cut components are produced with exceptional accuracy across various materials and thicknesses. This allows customers in electronics, industrial manufacturing, engineering, and other high-tech sectors to source complex precision parts from a single trusted supplier.

Your partner for custom precision solutions

At Partnertec, our mission is simple: deliver precision products that help our customers perform at their best. From prototype and production stencils to large-format framed stencils, precision shims, and custom laser-cut components, we combine advanced laser technology with years of manufacturing expertise to provide solutions that meet the highest industry standards.

So, while many companies know us as the stencil specialists, our capabilities extend much further.

PARTNERTEC IS READY TO HELP.

Contact our team to discuss your next project and discover how our expertise can support your manufacturing challenges.

www.partnertec.nl

The evolution of service: from reactive support to strategic partnership

The role of service within the SMT and PCBA industry has undergone a significant transformation over the past decades. What was once primarily focused on repairing equipment after a breakdown has evolved into an essential component of the business strategy of both equipment suppliers and manufacturers.

In the early years of the electronics industry, the primary focus was on acquiring equipment. Service was largely reactive: when a machine stopped operating, a technician was called in to resolve the issue. As production lines became more complex, components became smaller, and requirements for quality, traceability, and delivery reliability increased, the cost of unplanned downtime grew significantly. As a result, service evolved from a supporting function into a specialized discipline that combines technical expertise, process knowledge, and customer focus.

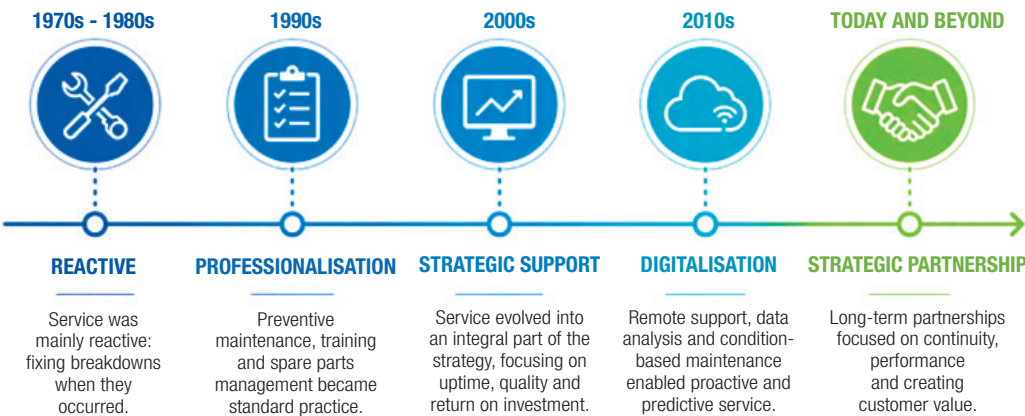
The professionalization of service introduced new disciplines such as preventive maintenance, spare parts management, operator training, and process support. Digitalization has further accelerated this development. Remote support, data analytics, and condition-based maintenance enable faster response times and allow potential issues to be identified at an earlier stage. As a result, the focus has increasingly shifted from solving problems to preventing them.

Today, service is far more than a technical necessity. It has become a strategic pillar that directly contributes to productivity, quality, sustainability, and customer satisfaction. Organizations recognize that the value of a machine is not determined solely by its performance on the day of installation, but by the support, knowledge, and expertise available throughout its entire lifecycle.

At Partnertec, this evolution has not gone unnoticed. In response to the growing demand for predictability, continuity, and operational peace of mind, we have continued to professionalize our service offering. Through our Service Agreement, customers benefit from scheduled preventive maintenance with comprehensive reporting, a guaranteed on-site response within 48 hours, proactive replacement of wear-and-tear parts, and free access to our helpdesk support. In addition, maintenance costs become more predictable and easier to budget. Customers also receive a 25% discount on labor and travel costs for services performed outside the agreement. In this way, we help our customers maximize the availability, performance, and return on investment of their production equipment.

An important aspect of modern service delivery is collaboration across the entire service chain. Suppliers, distributors, service partners, and customers together form an integrated network. That is why Partnertec actively invests in long-term relationships with manufacturers that have mature service organizations, strong support structures, and high spare-parts availability. Ultimately, the quality of service is determined by the strength of the entire chain, because a chain is only as strong as its weakest link.

Looking ahead, we expect service to continue evolving toward predictive maintenance, smart machine connectivity, and data-driven support services. At the same time, the demand for specialized expertise, process optimization, and strategic advice will continue to grow. Technology may change, but one element remains constant: successful service is built on craftsmanship, trust, and long-term collaboration between customers, suppliers, and manufacturers.



partnertec®

www.partnertec.nl

High reliability, low voiding: the Indium Durafuse® HR Advantage



As electronics operate at higher power and under more demanding conditions, solder-joint reliability is increasingly critical. Automotive electronics, high-performance computing, and 5G infrastructure require solder materials capable of extended thermal cycling beyond traditional SAC alloys. At the same time, high-reliability alloys can present challenges such as increased voiding, particularly in bottom-terminated components (BTCs).

Durafuse® HR was developed to help address both challenges. Its mixed-alloy technology combines low-voiding and high-reliability alloy constituents during reflow to support solderability and produce a robust, high-reliability solder joint.

Lower voiding than SAC305

A study compared SAC305 with **Durafuse® HR** using QFN68 assemblies on an **industry-standard Jabil test board**. Under a traditional SAC305 reflow profile, Durafuse® HR demonstrated lower average overall voiding than SAC305:

- **Fresh Cu-OSP boards:** 16.7% with Durafuse® HR vs. 19.3% with SAC305
- **Pre-baked Cu-OSP boards:** 18.2% with Durafuse® HR vs. 22.5% with SAC305
- **Modified ramp profile:** 16.1% with Durafuse® HR vs. 21.7% with SAC305

Under the modified ramp profile, Durafuse® HR also reduced the average largest single void to **1.9%**, compared with **3.1% for SAC305**.

Optimized processing drives voiding even lower

Further reflow optimization demonstrated the potential for even lower voiding with Durafuse® HR. Three profiles with peak temperatures of approximately 249°C–256°C produced average overall voiding of about 13% or less.

The best-performing condition achieved **12.5% average overall voiding** and an **average largest single void of 1.7%**, meeting the study target of less than 15% average overall voiding.

These results highlight the importance of optimizing the entire soldering process including reflow conditions, flux chemistry, and surface finish to maximize performance.

A flexible platform for low voiding and high reliability

The study demonstrates that Durafuse® HR can combine **extended thermal-cycling performance with low voiding**. Under optimized process conditions, Durafuse® HR achieved average overall voiding as low as **12.5%**.

Voiding performance depends on the interaction of alloy technology, flux chemistry, surface finish, and reflow conditions. **Durafuse® HR can also be paired with other suitable flux vehicles to optimize low-voiding performance for specific applications and process requirements.**

For demanding automotive, computing, telecommunications, and other high-reliability applications, Durafuse® HR provides a flexible mixed-alloy platform. It enables manufacturers to balance solder-joint reliability, process compatibility, and low-voiding performance.

Following the success demonstrated in this study, ongoing work is evaluating Durafuse® HR under standard reflow profiles and with additional surface finishes. This work aims to expand low-voiding process options across a broader range of applications.

This article summarizes findings from the Indium Corporation technical study, "Enhancing PCB Reliability: Voiding Reduction with a Mixed-Alloy Solder Paste," authored by Thuy Nguyen and presented at APEX 2025. Commercial product names have been used to connect the experimental materials described in the study with their corresponding Indium Corporation technologies.


www.indium.com

A real alternative to Carousel systems

The smartest SMT storage ever built

INOVAXE introduces InoHD — the next generation of high-density smart storage for SMT materials. Engineered for electronics manufacturers, this motorized reel management system delivers an industry-leading 3,500+ reels per m² and unmatched picking productivity.

With 30+ reels picked or returned per minute, InoHD is a true high-performance alternative to carousel systems such as Kardex, Hänel, or Modula — at a fraction of the cost and with far greater flexibility.

Key features and benefits summary:

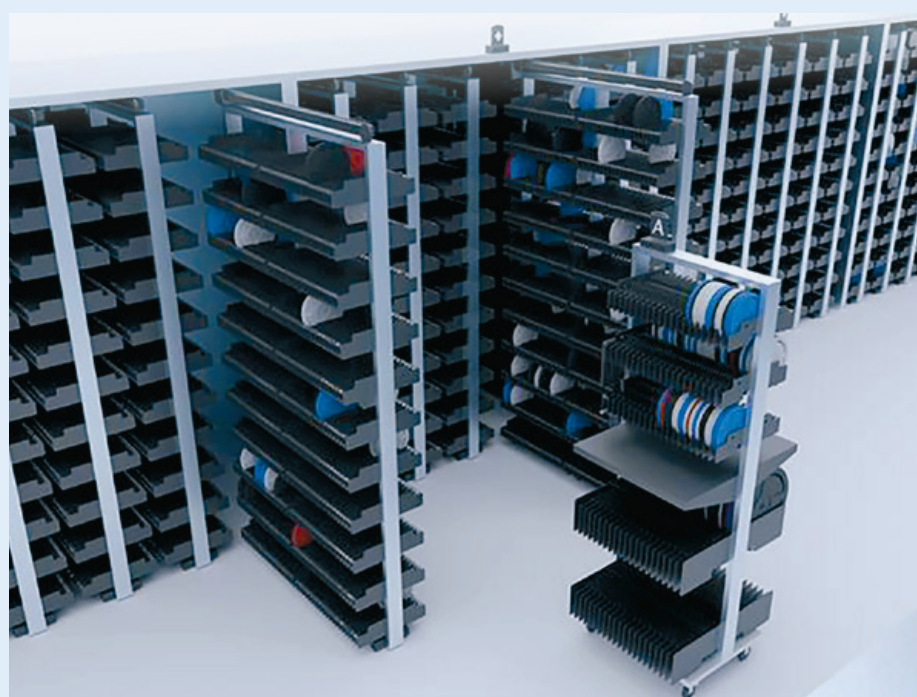
- Lower operating costs
- Superior flexibility and breakthrough throughput
- 95% stockroom space reduction
- Slashing material handling costs by up to 80%
- 3,500+ reels per m² stored
- Freeing your production lines to run at full speed
- 30+ reels per minute picked / returned
- 3–6 months typical ROI

Three models. One standard.

Available in three configurations to match any reel size requirement. All models support 8, 12, 16, 24, 32, 44, and 56mm reel widths and are fully scalable.

Built for peak performance

- **Unmatched speed:** Retrieve any reel in under 4 seconds. Return in under 8 seconds. Servo-driven shelving opens only where access is needed.
- **100% Pick accuracy:** Smart sensing and pick-to-light guidance eliminate picking errors and provide real-time inventory verification.
- **Space revolution:** Up to 95% stockroom space reduction. Fit 10,560 reels into just 32 sq.ft. No aisles. No wasted space.
- **Seamless integration:** Connects with your existing MES and ERP systems via InoAuto software. No air supply required. ESD compliant.
- **Modular & scalable:** Start small and grow. Single- or double-entry configurations — add modules as demand increases.
- **ROI in 3–6 months:** Up to 80% reduction in material handling labor costs. Lower installation and maintenance costs vs. carousel towers.


www.inovaxe.com



Tim's tips & tricks

Five ways to optimize your stencil printing process

Stencil printing is one of the most critical steps in SMT assembly. The right settings can have a significant impact on print quality, yield and productivity. Here are five key parameters to consider.

1. Apply the five-ball rule when selecting solder paste

The largest solder particle should be no more than 1/5 of the smallest stencil aperture width. For example, Type 4 solder paste can contain particles up to 38 µm. This means the minimum recommended aperture is approximately: $38 \mu\text{m} \times 5 = 190 \mu\text{m}$. Using the correct paste-to-aperture ratio helps ensure reliable paste release and consistent deposits.

2. Choose the Correct Squeegee Size

The squeegee should cover the PCB properly without extending too far beyond the supported area. A squeegee that is too narrow may result in insufficient paste filling at the PCB edges. One that is too wide can cause stencil or blade deflection, leading to gaps, smearing and inconsistent deposits.

3. Select the Right Print Speed

Print speed should follow the solder paste manufacturer's recommendations and be balanced with the rest of the production line. When cycle time is not critical, slower print speeds generally provide more consistent results. Higher speeds can be useful when additional time is needed for stencil cleaning, SPI or other process checks. The goal is to find the right balance between print quality and productivity.

4. Apply the Correct Squeegee Pressure

Use the lowest pressure that completely cleans the stencil surface. Too little pressure can result in incomplete aperture filling and inconsistent deposits. Too much pressure can increase the risk of bridging and accelerate wear of both the stencil and squeegee. Print speed and pressure are closely related, so both should be optimized together.

5. Optimize Separation Speed

For many applications, a separation speed of up to 20 mm/s provides good results. However, the ideal setting depends on the solder paste, aperture dimensions, stencil technology and PCB design. If deposits show a conical or "dog-ear" shape, adjusting the separation speed may help. In practice, testing different settings is often the best way to find the optimum.

Need help finding the right settings?

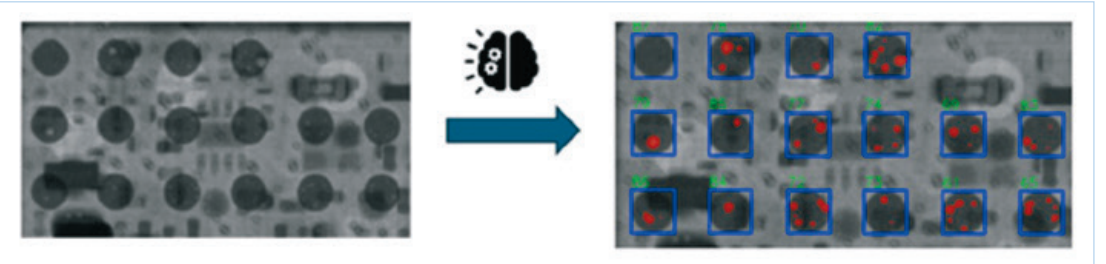
Every stencil we manufacture includes a DFM Health Check to help identify suitable printing parameters. We also offer on-site process optimization to improve print quality, stability and yield.

Tim van Dortmont

Process & Stencil Design Engineer, Partnertec

www.partnertec.nl

Using Transfer Learning in X-ray Void Detection



Ensuring the quality of electronic products often depends on the reliable detection of voids—small air pockets or gaps—in solder joints and other critical areas. Traditionally, void detection in X-ray images has relied on algorithms that require significant expertise and manual tuning, making them less accessible and time-consuming to set up.

Operators often need to understand complex computer vision concepts, and even then, traditional methods can struggle with artifacts, intensity shifts, or irregular void shapes.

Nordson Test & Inspection has recently released a white paper that introduces a new approach: using deep learning and transfer learning to automate and simplify void detection in X-ray images. Transfer learning allows AI models to be pre-trained on large, relevant datasets and then quickly adapted to new products or inspection tasks with minimal additional data. This reduces the need for extensive manual labeling and parameter adjustment, making the inspection process more intuitive and efficient for operators.

The Nordson Test & Inspection team developed and tested this approach in collaboration with Harman, a leading electronics manufacturer. Their method involves labeling a small number of sample images, fine-tuning a pre-trained model, and then deploying it for inspection. The process is fast—training typically takes only a few minutes—and the resulting models can be reused across different product batches and even different products, thanks to the flexibility of transfer learning.

In their experiments, the team focused on two main inspection targets: BGA (Ball Grid Array) balls and solder joints. They trained models on one batch of samples and tested them on others, finding that the models maintained high accuracy (typically between 0.93 and 0.98) even without retraining. This demonstrates that a single model can be shared across multiple products, significantly reducing the effort required when new products are introduced.

The paper also discusses the importance of subjective labeling—different annotators may have different standards for what constitutes a void. By collaborating closely with industrial partners and standardizing labeling practices, the team ensured that their models met real-world requirements.

Overall, the results show that deep learning with transfer learning is not only effective for void detection but also highly practical for industrial environments. The approach minimizes setup time, reduces the need for expert intervention, and allows for ongoing improvement and adaptation as more data becomes available. This makes it a scalable and future-proof solution for manufacturers facing evolving inspection needs.

Nordson recently launched N-Intelligence, its Deep Learning and Advanced AI software solution for both MXI (Manual X-ray Inspection) and AXI (Automatic X-ray Inspection) systems. By combining the expertise of human inspectors with the consistency and speed of automated inspection, N-Intelligence enables faster, more accurate, and more reliable defect detection.



For more details and access to the full white paper, scan the QR-code. For direct inquiries, contact your regional Nordson Test & Inspection representative Partnertec BV.

Nordson
TEST & INSPECTION

www.nordson.com

partnertec tools

More than just tooling for selective soldering

For many years, Partnertec Tools has been a trusted partner in developing and producing tooling for selective soldering machines. Building on this expertise, we have evolved into a specialist in custom-engineered solutions for the electronics industry. Today, we support customers with soldering pallets, precision laser-cutting, and cleaning pallets for complex PCB assemblies and flexible electronics.

Cleaning pallets for complex PCBs and flexible electronics

Our custom cleaning pallets are designed for complex PCBs, Flex-PCBs, flex-foil applications, and sensitive components. Intelligent fixing and support systems prevent deformation and damage during cleaning. The open-frame design optimizes cleaning flow, minimizing shadowing and improving overall performance. Pallets are available in Aluminum, Stainless Steel 316, Titanium, and Durostone®.

High-precision laser-cutting

With an accuracy of up to $\pm 2 \mu\text{m}$, we manufacture complex geometries with exceptional reliability and repeatability. Our laser-cutting solutions are suitable for prototypes, volume production, and second-source manufacturing programs. Benefits:

- Short lead times
- Rapid prototyping
- No tooling costs for design changes
- Consistent quality

Your partner in smart manufacturing solutions

From selective soldering tooling to cleaning pallets for complex PCBs and flexible electronics, and from prototypes to high-precision laser-cut components, Partnertec Tools delivers solutions that contribute to a stable, efficient, and future-ready manufacturing process.

www.partnertec.nl/tooling

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