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# The MY600 Jet Printer

## **The fastest way to the perfect solder joint**

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**MYCRONIC**

When passion meets innovation ●

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# High-mix thinking for a higher volume world

**Nearly a decade ago, the first Mycronic Jet Printer opened up entirely new possibilities for the SMT industry. With its highly accurate, on-the-fly solder jet printing, it allowed the most demanding manufacturers to achieve optimal solder joints of any shape and size – on demand. With total design freedom. No compromised paste volumes. And no waiting on stencils.**

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Today times have clearly changed. The challenges of small-batch production that jet printing was engineered to solve have now risen into the heart of consumer and industrial electronics manufacturing. Not only because batch sizes are shrinking in all industries, but also due to the growing demand for broadband and mixed technology boards, flexible substrates and cavities, miniaturization and highly complex, densely populated boards. In the face of these growing challenges, it's easy to see why solder paste jet printing has earned a reputation as the state-of-the-art solution for modern SMT manufacturing.

## **SUPERIOR QUALITY, UNMATCHED VERSATILITY**

Without a doubt, the key to this success has been the ability to deliver flawless solder paste deposits for every component pad on a PCB. Whether used in-line or stand-alone. With a screen printer or without. Based on a completely software-driven

platform, Mycronic's jet printing solutions allow you to prepare jobs off-line, optimize for individually challenging components and watch production flow seamlessly – with no operator intervention. Whatever the job or production environment, there's simply no better way to deposit precise solder paste volumes for the most challenging boards.

## **RISING TO TOMORROW'S CHALLENGES**

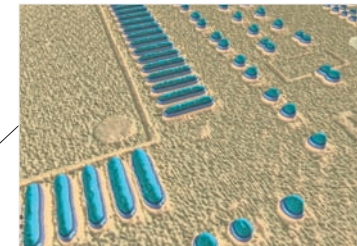
As today's high-volume manufacturers struggle to overcome the speed bottlenecks of traditional dispensers, our unique non-contact jet printing platform is once again rising tomorrow's challenges. Allowing you to achieve greater automation and higher speed solder paste application for a growing range of advanced components. With no parameter fine-tuning and less risk for human errors than ever before.

“Jet printing is our answer to the challenges of today's increasingly complex, automated production environments.”



# The MY600 Jet Printer

## Millions of dots ahead of its time



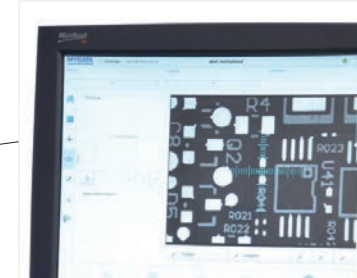
### COMPLETE VOLUME CONTROL

Achieve superior dot consistency, accurate solder paste volumes, tomized 3D build-ups with high precision for a wide range of applications.



### HIGH-PERFORMANCE PLATFORM

The 2 000 kilo gram casted granite base, together with a rigid, lightweight carbon fiber beam, supports the extremely high accelerations of a state-of-the-art motion system with high-precision linear encoders.



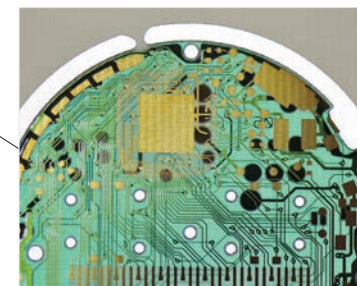
### 100% SOFTWARE-DRIVEN

Prepare a new job off-line in minutes from any CAD or Gerber data, and run jobs with minimal operator intervention. Jet printing can be integrated into a fully automated production line, allowing product changes down to batch size one with no human intervention.



### HIGH-SPEED NON-CONTACT JET PRINTING NOZZLE

With 3G acceleration and speeds of more than one million dots per hour, the completely non-contact jetting nozzle achieves micrometer accuracy at maximum speed.



### MORE COMPONENTS, MORE POSSIBILITIES

A highly accurate, fully software-driven and non-contact platform, the MY600 is optimal for handling challenging applications such as flexible substrates, board cavities, package-on-package, QFNs and new components with small process windows.



# Perfect precision at more than one million dots per hour

**Ensure micrometer accuracy at the industry's highest speeds. With no parameter fine-tuning and flawless dot consistency. When it comes to achieving the ultimate in board quality and line utilization, solder paste jet printing is in a class of its own. Helping you to produce more boards, and millions of perfect solder joints, every day.**

Screen printing has certainly served the industry well, giving manufacturers nearly limitless throughput speeds for long series production. But not without trade-offs. In fact, a significant majority of all PCB defects can be traced back to the screen printing process. And for every quality challenge solved with traditional dispensers comes a new bottleneck in-line utilization. With solder paste jet printing, these compromises are a thing of the past.

## **IMPORT, OPTIMIZE AND PRINT ON DEMAND**

Used to replace a screen printer, jet printing allows you to respond rapidly to customer demands and changes while achieving superior accuracy for every solder joint. There's simply no time wasted ordering, changing or storing stencils, and far less risk for human error due to a minimal need for operator intervention. Just import CAD or Gerber data, optimize for individually challenging components and cut response time to hours or minutes instead of days.

## **HIGH SPEED AND HIGH PRECISION - WITHOUT COMPROMISE**

As an add-on technology, it relieves your high-volume line for on-the-fly revisions, small-batch jobs or difficult boards or components. Up to ten times faster than a dispenser, the MY600 Jet Printer is capable of shooting on the fly with high accuracy at speeds of more than one million dots per hour. Key to this performance is a state-of-the-art ejector head that travels over the board with 3G acceleration forces. Using advanced software control, high-resolution optical encoders and a unique non-contact jet printing nozzle, it eliminates the need for z-axis movement to significantly boost print speed. To withstand these extreme forces, the machine's robust platform includes a 2 000 kilo gram casted granite ballast, direct drive motors and a lightweight carbon fiber beam.

- Achieve optimal solder joints for every component, pad and package on your PCB.
- Ensure faster response times in a broad range of production environments.
- Handle the most difficult applications with micrometer precision.





# Make every pad count. With total volume control.

When it comes to optimizing solder paste volumes, nothing comes close to the accuracy and flexibility of jet printing. Full software control allows you to ensure the optimal volume, shape and position of solder paste deposits for every individual pad, component or package on your PCB.

The ability to control dot volume, diameter and deposit repeatability is critical to ensure that each pad receives the ideal amount of paste. Because jet printing allows operators to adjust dot sizes according to the mix of components, placing a smaller component like an Q201 next to a D-PAK has never been easier, or more precise.

### CONSISTENT QUALITY WITH NO LIMITS

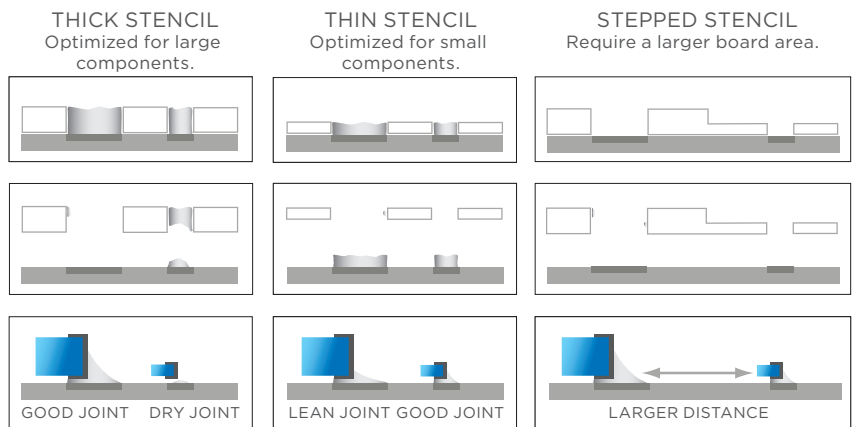
Thanks to its ability to build up volume sizes with single dots without touching the board, jet printing ensures superior consistency and the possibility of 3D build-up – with almost no limitations regarding keep-out areas. Simply run the default volume settings for each component pad based on CAD data,

or fine-tune each deposit according to volume, position, area coverage or height of the paste. Built-in process controls take care of the rest, with no operator intervention. All of this can be prepared off-line, and any amended settings are saved for future use.

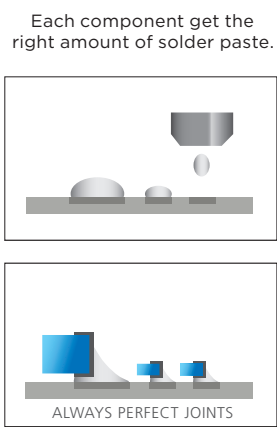
### THINK BIGGER, BUILD SMALLER

No matter how complex or densely populated your boards may be, this opens up entirely new possibilities to combine design freedom with total quality control. For many manufacturers, the result is a wider range of components within a smaller board area, thanks to far greater control of every solder paste deposit.

### COMMON ISSUES WITH SCREEN PRINTING



### SOLVED WITH JET PRINTING



- Gain full control of volume, shape and position of solder paste deposits for every individual pad.
- Built-in process controls ensure superior consistency and repeatability with no risk for human error.
- Prepare data off-line and automatically save settings for future use.



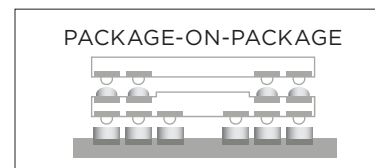
# Engineered for tomorrow's most difficult boards

**Mixed components? Broadband technology? 3D cavities? QFNs? Now you can make quick work of them all. Without sacrificing joint quality or yield. Jet printing makes it possible to handle the latest challenging designs and components while getting the most from your existing production line – day in, and day out.**

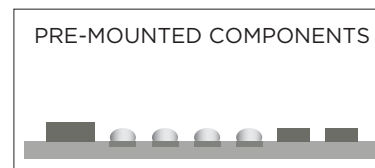
The MY600 Jet Printer makes it possible to boost speed, quality and design freedom for some of the industry's most difficult applications. For flex or warped boards, board alignment and stretch are measured with advanced sensors and compensated for in real time. For pin-in-paste components, three-dimensional solder structures can be printed above the hole, using the software to automatically program the correct amount and shape for each pin. The result is a comprehensive range of new design possibilities, putting manufacturers in full control of every solder joint – from package-on-package and cavities to populated boards and more.

## REMOVE THE GUESSWORK FROM ANY JOB

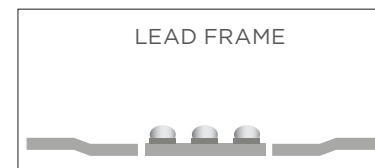
Whatever your newest packages may be, our goal is to help you achieve the perfect results – with zero risk of operator error. This is why we've ensured that every default setting and graphic interface is designed with the most difficult jobs in mind. This includes handling a wide range of fluids including leaded and lead-free solder pastes, low-temperature pastes and surface mount adhesives. Always with superior accuracy, and with the highest possible level of automation.



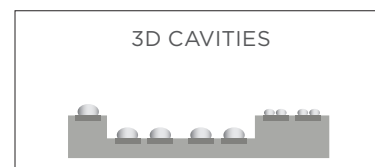
Apply solder paste to stacked components (PoP).



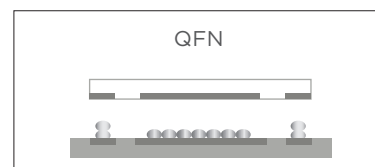
Apply solder paste to boards with previously mounted components.



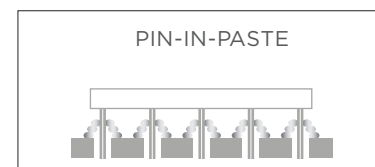
Apply solder paste to curved lead frames.



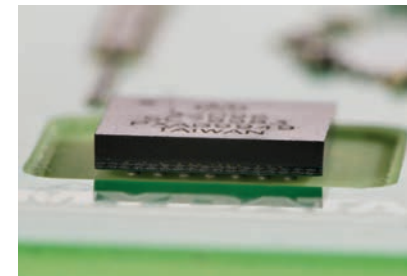
You can jet paste at different board levels or into cavities.



Floating QFNs are eliminated thanks to jet printing.



Jet printing optimizes paste volumes for pin-in-paste.



Achieve high-quality solder joints when mixing component sizes, placing components in cavities, pin-in-paste or an array of other more difficult applications.





**NO RISK FOR OPERATOR ERROR**

With the MY600's user-friendly graphical editor, data can be prepared quickly, with zero errors. An automatch function, together with a self-learning data preparation system, ensures the highest quality standards are maintained from job to job, day in and day out, for years to come.

# Smarter software for intelligent automation

**At the heart of jet printing is an advanced self-learning data preparation system. One that stores your process knowledge to improve speed and quality with every job. In today's digitally driven production environment, there's no better way to boost performance across your entire factory floor.**

Screen printing has certainly served the industry well, giving manufacturers nearly limitless through-put speeds for long series production. But not without trade-offs. In fact, a significant majority of all PCB defects can be traced back to the screen printing process. And for every quality challenge solved with traditional dispensers comes a new bottleneck in-line utilization. With solder paste jet printing, these compromises are a thing of the past.

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- WITHOUT COMPROMISE**

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# Your high-precision work-horse. In any production environment.

**Are you prepared for the new industry challenges that lie ahead? From high-mix to mid- and high-volume production, more and more manufacturers are finding a powerful answer in jet printing. Rather than stretching the limits of conventional solutions, they've decided to bridge the technology gap – to achieve uncompromising solder joints for years to come.**

Whatever your current solution, the promise of jet printing is simple: improve the quality of any PCB, with greater control and fewer errors for a vast range of challenging applications. It's a promise we've been fulfilling for the most demanding manufacturers around the world for nearly a decade.

## THE MARKET'S MOST VERSATILE SOLUTION

Now, with the MY600 Jet Printer, we aim to further boost your capabilities with improved software and

higher speeds than ever before. For some, it means no more waiting on stencils. For others, it's a robust way to replace as many as a half dozen dispensers, or even to off-load a high-speed line. Of course, in the world of high-mix, it's the only way to deposit precise solder paste volumes for the toughest boards – faster, more consistently and with change-over times that are next to zero. With versatility like this, only one question remains: How can jet printing best benefit your operations?



The MY600 Jet Printer is just one of a range of seamless Mycronic solutions for agile SMT production.

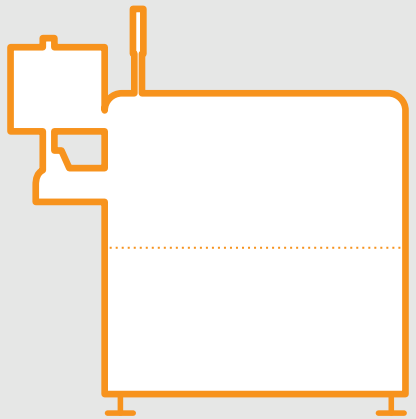
## 1 The ultimate in rapid-fire precision.

**For a growing number of high-tech manufacturers, the focus is simply to efficiently produce the highest quality boards, regardless of the technology or production run. After all, whether it's extremely advanced satellite components or the latest automotive control system, no solder joint can be left to chance. This is where jet printing rises to the challenge – and where the old categories of high-mix or high volume no longer apply.**

### SERVING TOMORROW'S HIGH-TECH INDUSTRIES

Those at the forefront of high-tech electronics are driven to constantly meet the most stringent quality demands. At the same time, they're coping with the same trends facing the rest of the industry – from broadband and miniaturization to shorter lead times and shrinking margins. Faced with these converging challenges, jet printing remains the most profitable way to ensure superior quality solder joints with full software control.

team. Allowing solder joints to be optimized for every pad, component and board – with total re-vision and quality control capabilities. NPI or large batches. In-line or stand-alone. Whatever the situation demands.



MY600 JET PRINTER

### SEAMLESS DESIGN CONTROL

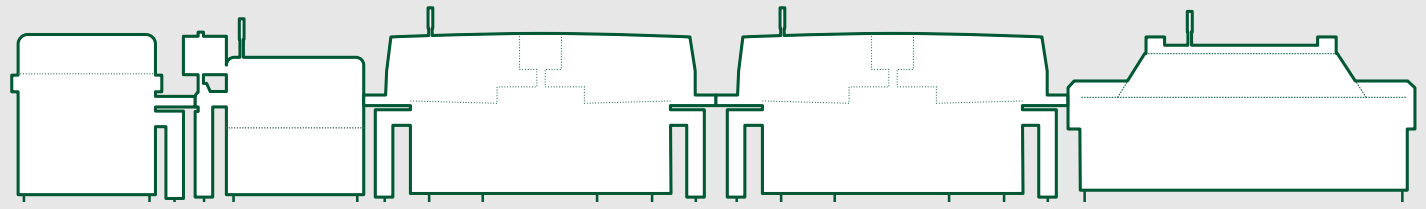
In these highly sophisticated applications, jet printing provides seamless control from design engineer to operator and through to the entire SMT production

## 3 Higher volume meets higher yield.

**Placed in-line after a screen printer, the MY600 allows you to add extra paste – exactly where and when you need it most. It might be larger components one day, mounting shields, repairs or cavities the next. Whatever your your most challenging applications demand, the typical dispenser set-up is simply no match for a MY600 in terms of throughput or yield.**

### BOOST QUALITY AND PRECISION

Thanks to the jet printer's rapid on-the-fly jetting, it's ideally suited for high-throughput environments where needle dispensers have far slower dispense rates.



STENCIL PRINTER

MY600 JET PRINTER

PICK-AND-PLACE

PICK-AND-PLACE

REFLOW OVEN

## 2 No screens. No waiting. No worries.

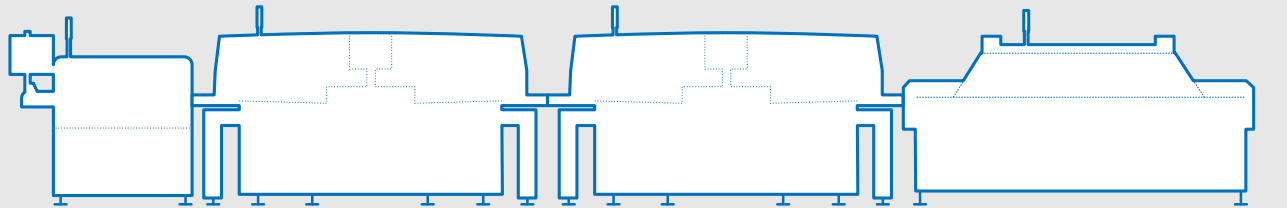
**In many ways, stencil-free operations are a customer's dream. Above all, they mean a massive reduction in lead times, where some of the biggest physical limitations of production – from specifying and ordering to storage and delivery of stencils – are completely eliminated. Just send your digital files in the morning, and receive your finished boards in the afternoon.**

### SHORTER LEAD TIMES, MINIMAL DISRUPTION

Because jet printing is completely software controlled, last-minute design changes are just as quick and simple to resolve. Revisions, emergency boards or prototype jobs can be prepared off-line and run on-demand, with minimal disruption to ongoing production. And since changeovers take less than a minute, the entire production process – from order to delivery – can be timed with exact precision.

### STREAMLINE YOUR HIGH-MIX PRODUCTION

For most electronics manufacturers, response times are just the beginning. With jet printing, there are also no costs associated with cleaning, storing or retrieving stencils. And no more volume compromises with one-size-fits-all stencils. Just the perfect solder joint volumes with optimal line utilization – however complex or densely populated your boards may be.



MY600 JET PRINTER

PICK-AND-PLACE

PICK-AND-PLACE

REFLOW OVEN

Wherever random dots or multiple volumes are necessary, the difference is even more dramatic. As extensive testing has shown, screen printing and jet printing paste can be combined on the same board – without affecting solder joint quality. The result is a highly flexible in-line solution that opens up new design possibilities for all types of higher volume applications.

### REMOVE PRODUCTION BOTTLENECKS

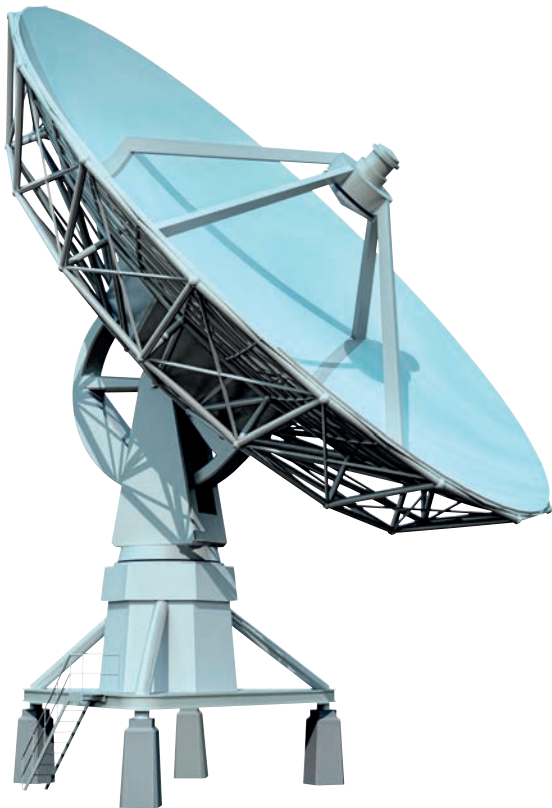
Of course, even the biggest volume operations will have to cope with the occasional short run or prototype. But not everyone has the excess capacity to spare. By adding a MY600 in-line, you gain the flexibility to run small batches while solving some of the most complex component and board designs. Used to off-load other lines, it allows you to boost utilization, handle more short batches and respond more quickly to changing demands.





“EMS companies are increasingly looking for flexible SMT equipment that’s capable of handling the constantly changing product mix.”

Helge Schimanski, Process specialist, Fraunhofer ISIT, Germany





mycronic.com