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Spotlight Series: Why Selective Soldering Is Transforming Component Manufacturing

From enterprise technology to the latest consumer electronics, as technology has rapidly evolved over the past decade, electronic components have become higher spec, higher performing, and much smaller.

As a result, manufacturing tools and processes have had to become even more precise. This is never more apparent than with selective soldering. While not a new concept, it's been in use since the 1980's, advancements in the technology make selective soldering an increasingly attractive proposition to deliver highly accurate, cost-effective components across enterprise and consumer electronic scenarios.

At Extel, we use the latest Kurtz Ersal technology to produce electronic components via selective soldering. In this blog, we'll explore why it delivers precise, efficient results versus other soldering methods.

Work smarter not harder.

In many cases, when delicate work is essential, human touch is required for soldering. While a careful eye and steady hands are beneficial, human touch does have its drawbacks.

We're humans - we get tired, we lose concentration, and we make mistakes. For soldering this translates into the risk of recalls and errors, and most commonly slow speed of delivery. Selective soldering almost completely removes humans from the process by automating the production - from flux preparation, to preheating and soldering.

This ensures the same quality is produced every time from the first board to the last. For example, working closely with clients, Extel optimises design for manufacturing and testing, then configures the selective soldering production run - then it's hands off. Human touch can't replicate the process control and consistent repeatability of automated manufacturing.

Efficiency and consistency.

When comparing two common mass production soldering methods - wave soldering and selective soldering, there are obvious differences.

Firstly, wave soldering, preferred for mass consumer electronic production, typically requires a mask or aperture to be fitted to each component before soldering begins. This is ideal for large volume production, however, inherently has some trade-offs.

Unlike wave soldering, selective soldering does not require masking on every component as its fountain method is highly accurate, meaning fewer errors, less wastage of flux, and reduced time preparing components for solder. In many cases, the process from beginning to end can be faster.

Secondly, where wave soldering literally creates a wave of liquid solder which is exposed to a circuit board, selective soldering relies on precise heads which use less solder and minimizes the risk of wastage and error. For producers, this means less rework or loss due to poor quality, and a consistent end product.

Compliance of the highest order.

Across the medical and scientific sectors, through to defense and aerospace engineering, meeting the highest quality standards is critical. Devices in these industries operate in sensitive or harsh environments and the consequences of part failure are significant. Therefore, each and every component needs to be ultra reliable.

Selective soldering ensures critical components are produced with a minimum amount of flux dust, reducing or even eliminating the need for washing of soldered components at the end of the process - reducing the risk of part failure. Manual or wave soldering simply can't replicate the consistency or quality of automated selective soldering.

Optimized design layout.

Selective Soldering delivers precise, consistent results. The level of customization available for every production run means manufacturers can create the most efficient design for their needs. To achieve this customization, Extel works with all our customers to develop designs for testing (DFx) and manufacturing (DFm). Together, we develop solutions that ensure products are optimized for performance, consistency and reduced production costs. Any time you can fine tune a design for Surface Mount Technology followed by a secondary stage selective soldering process reduces human touch and provides a far more cost-effective outcome.

Wrapping up.

There are of course different soldering methods designed for different scenarios. However, selective soldering combines highly accurate and consistent production with efficiency. While this is ideally suited to medium volume, high-grade components, selective soldering can be an excellent solution for many scenarios.

Combining the latest production methodologies with over 30 years' experience, Extel Technologies can help your business design and produce electronic components that are produced efficiently and perform reliably. If you'd like to explore how selective soldering could transform your products, get in touch with us today.

More information.

For more information on how we can help you ensure your device design and manufacturing meet your needs, please contact our USA or Australian offices.

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