

RFID Helps Achieve Lead-free Compliance

By Mathieu Bégin

The transition to lead-free represents a challenge in the electronic manufacturing industry. Most assemblers will have to process lead-free materials, meaning more material to deal with and more human intervention. This translates into an increased number of errors and recalls. How companies handle these logistical challenges could seriously impact their productivity. Although the crucial date for lead-free compliance is July 1, 2006, conversion schedules may vary. Some manufacturers will convert certain products to lead-free, while some will have to manage two processes throughout a transitional period.

Many assemblers will experience difficulty locating and differentiating lead-free from lead-based materials, incorrect materials used in production and excessive effort require to demonstrate compliance with customers' orders that include lead-free materials. The typical cause of these problems on the shop floor can originate from non-standardized identification of materials, lack of material-tracking procedures and systems and excessive human intervention.

Steps to Achieve Lead-free Control

OEMs and EMS providers must reduce errors; perform quick line setup; and identify, track and separate lead-free from lead-based products. These companies will have to provide documentation that proves products are built according to new regulations.

1. Manage lead-free material to correctly identify lead-free vs. tin/lead products. Material and tools should be identified using bar-code labels or RFID tags.
2. Separate lead-free and tin/lead products to reduce the risk of errors. This can be achieved by separating them physically; however, this does not eliminate errors because it may be difficult or impossible to distinguish them visually. The transition to lead-free increases the importance of being able to track your complete inventory both on and off the assembly line.
3. Validate line setup before you start production to avoid errors, waste and costly

recalls. The increasing complexity of managing lead-free materials and tools will increase the potential of human error and the time required to perform setup.

Readiness Self Assessment

During your preparation for lead-free compliance, conduct a self assessment:

- How much time and resources are wasted to track and segregate lead-free material?
- Are significant resources allocated to determine material and tool locations?

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- How much time and effort is required to handle recalls?
- How often is incorrect material used in the line?
- How much waste is generated due to mistakenly mixing lead-free and lead-based materials?

Lead-free Solutions

Bar-code labels and readers. This solution is widely used in the electronic manufacturing industry. Bar-code labels are fixed onto materials and tools. Handheld scanners or fixed scanners read the labels to track the material and validate the setup. Therefore, companies can track material when it changes location and prevent ramping up production until all material has been validated. This is a cost-effective way to track material, but requires human intervention and does not eliminate the risk of errors completely. It also requires labor-intensive procedures to keep track of the location of materials throughout the shop floor. The business impact of this approach is a lack of confidence that the material is in

the same location as the system indicates.

RFID tags and antennas. RFID tags are fixed onto the various material and tools you need to identify, track, trace and control. Then, antennas capable of reading RFID tags are mounted permanently within the locations where you need to track the material and validate the setup. RFID smart feeders for an SMT placement machine and RFID screen-printer-retrofit kits are two examples. These solutions ensure full error proofing, provide close-loop validation and allow complete automation of the tracking process. Industry experts recognize that they represent a suitable way to ensure that the right material is used during production.

Leading organizations are using RFID-based technologies to help solve specific business problems:

- Track, segregate and locate all materials as they are moved.
- Error-proof line setup to reduce waste, improve quality and productivity.
- Provide real-time visibility of the quantity and location of material on the shop floor in real time without the risk of error associated with bar-code-based scanning.
- Produce complete “as-built” history.

The lead-free transition is a real challenge and must be taken seriously. Most EMS providers and OEMs do not have automated systems to handle lead-free. RFID technology eliminates material handling and most human intervention. The question is not should you or should you not use RFID, but rather where, when and how much? RFID technology is flexible, reliable, cost effective and can provide an effective way to segregate, track and trace lead-free materials on and off the shop floor. **SMT**

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