High-tech risk management: Sophisticated inspection procedures & equipment for counterfeit detection

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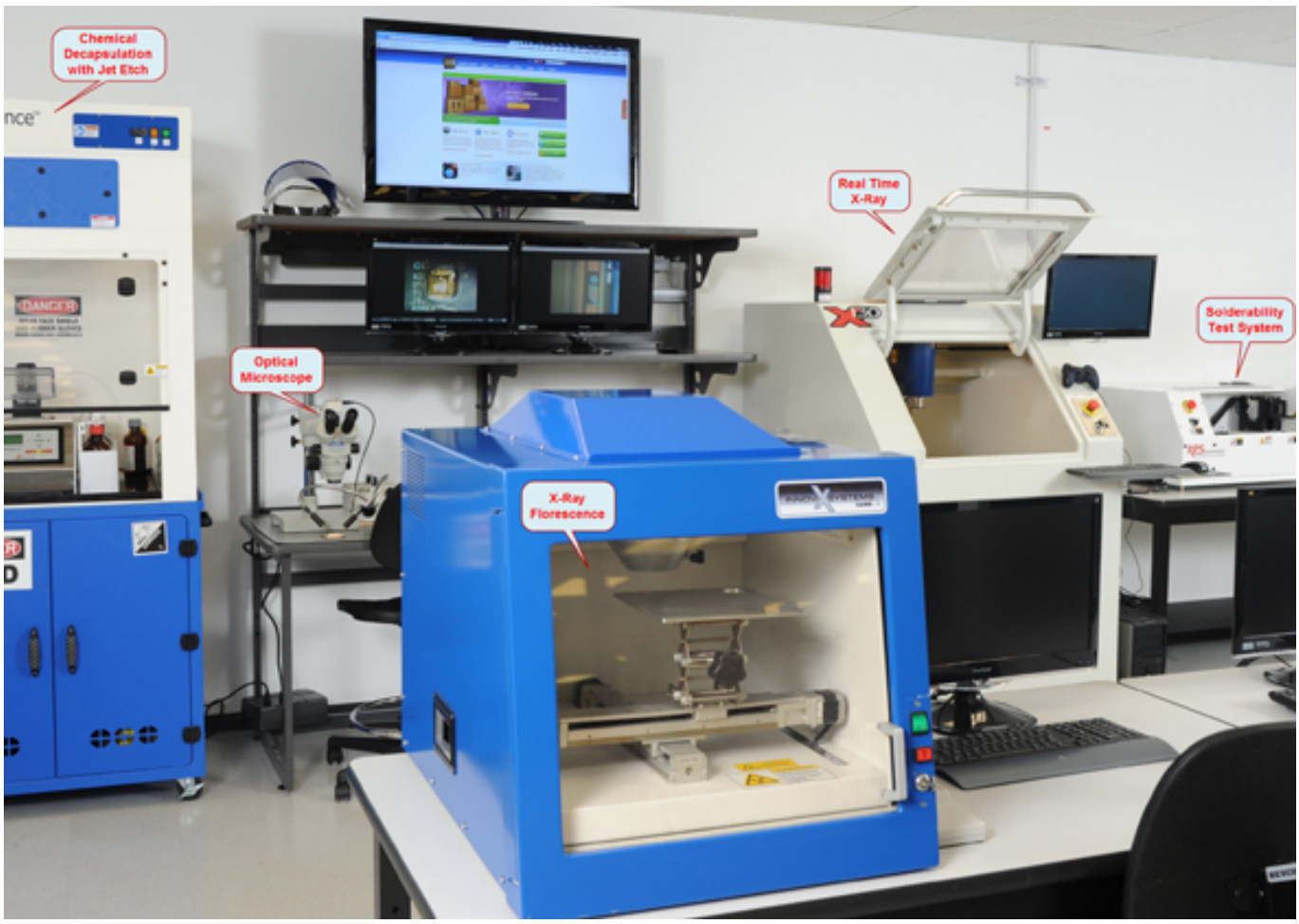
A successful and effective anti-counterfeiting strategy must be implemented when an end-product manufacturer purchases components from an independent distributor. Documented processes, quality procedures, meticulous inspection checklists, trained inspectors, and the employment of sophisticated equipment along the supply chain are essential to mitigating the risks associated with sub-standard or counterfeit components. When an end-product manufacturer cannot support this investment, it must approve and collaborate with an independent distributor that has these capabilities.

Visual Inspection & Component Testing Labs
In choosing an independent distributor, end-product manufacturers, such as Rockwell Automation, consider the independent distributor's commitment to invest in essential equipment and to constantly train and certify their in-house inspectors. Beyond equipment and professionally trained personnel, a well-equipped anti-counterfeiting lab should also have a historical, digitized database for parts, packaging, and other data to verify incoming product. Once products (components and/or electronic products) arrive at a distributor's warehouse the process of anti-counterfeit detection begins with professionally trained, industry certified inspectors conducting rigorous visual inspections to confirm quality product. The inspectors follow detailed check-lists and then make the results available to the customer. Based on the specific customer requirements, the independent distributor performs various component tests (structural and functional). Should any counterfeits or nonconforming parts be detected, the inspection team should immediately quarantine and report the status of the part(s); upon settlement and resolution, the parts must then be properly transferred to disposition.



Component tests may include functionality tests, various sampling methods, and physical tests (e.g., destructive sampling tests). It is recommended that in-house laboratories and inspectors perform these tests to limit risks and be IDEA-ICE-3000 and IDEA-STD-1010A, or equivalent, certified.
Independent distributor Smith & Associates provides a good example of a comprehensive anti-counterfeiting offering to customers who are able to seamlessly verify product quality and authenticity. Modern anti-counterfeit laboratory equipment and processes should include the following:

• C-SAM Scanning Acoustic Microscope (ultrasonic non-destructive microscopy)
  o Collect pulse echo images from top and bottom simultaneously
  o Detect voids, cracks, and delaminations
  o Penetrate black topping on components to expose original marking
• Counterfeit IC Detector
  o Measure the unique electrical signature (PinPrint) of components
• Capability to compare known authentic components against suspect components
• Jet Etch Decapsulation System
  o Verify die size & manufacturers' logos
  o Confirm part numbers
  o Inspect architecture of the die
• INspexX130 X-Ray Machines (Real Time – non-destructive)
  o Verify no voids formed
  o Confirm leads and bond wires
  o Compare OEM parts to X-ray images
• Luxo Scopes (optical microscopes)
  o Microscopic examination of parts
  o Detect blacktopping, sanding, oxidation & retinning
• Dynasolve Chemical Testing
  o Identify blacktopping
  o Detect sand marks & texture differences
  o Expose signs of counterfeiting
• Hawk I X-Ray Florescence (non-destructive)
  o RoHS analyses & substances of concern
  o Verify material content
• Solderability Test System
  o Verify solderability of component leads
  o Determine coating durability
  o Check usability/aging of product (corrosion/oxidation)
• Functionality Testing
  o CPU, Memory, HDDs, LCDs, Board Level, Peripherals, etc.

Collaboration and meticulousness are keys to successful anti-counterfeit strategies

A strategy is only as good as the team's ability to execute it appropriately and effectively. It is important to understand that the heart of counterfeiting is opportunism. A solution is found in diligent collaboration and the implementation of proactive, meticulous, and effective anti-counterfeiting procedures, which must include the use of specialized lab equipment operated by qualified personnel. Information sharing is critical both within and across organizations so that if counterfeit or substandard product is found, the proper reporting is performed, the suspect product is permanently removed from the supply chain and investigations are made into how the breach occurred, and any non-conforming parts are properly disposed of.

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For additional information on Rockwell Automation, please visit www.rockwellautomation.com; [2] for equipment questions for Rockwell Automation, please contact Robert W Chesla rwchesla@ra.rockwell.com [3]

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