Conventional Wisdom

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The leading manufacturer of cleaning and cleanliness testing products.

Conventional Wisdom Defluxing Processes and Chemicals

Myth: Military specifications require specific defluxing processes and chemicals.

Fact: There are no military or IPC specifications requiring specific defluxing methods, technologies, or chemicals.

Neither WS6536, MIL-STD 2000A, nor IPC-001 (or any other defluxing specification) requires the use of a specific defluxing technology or chemical. Instead, these and other specifications specify the required cleanliness result (< 10 µg NaCl/in2).

The History of Defluxing

In 1987, governments entered into an agreement to phase out, and ultimately ban the use of CFC-based products. At that time, defluxing was most frequently accomplished with the use of Freon TMS or 111 Trichloroethane. Because of the extremely low boiling points associated with these solvents, vapor degreasers were used in the defluxing process.

During the early part of the CFC phase out, there was a push to find suitable solvent-based defluxing chemicals. While vapor-degreaser based chemicals lost all popularity, semi-aqueous solvent blends became popular. The move to semi-aqueous based solvents was short lived due to the fact that their cleanliness results were generally considered to be less than the emerging aqueous-based chemistries. In addition, semi-aqueous chemicals normally required multiple cleaning machines including one machine for wash and another for rinse. Other issues such as flammability, material compatibility, odor, VOC levels, and discharge restrictions contributed to the demise of semi-aqueous popularity.

Defluxing Today

Today, military and other high reliability manufacturers use aqueous-based defluxing methods. Aqueous processes remove all flux types including RMA, No-Clean, and Water Soluble (OA) fluxes. There are no flammability issues associated with the majority of aqueous-based processes. VOC levels, material compatibility, easy or zero-discharge, and superior cleanliness levels are all associated with aqueous-based defluxing processes.

Perhaps one of the greatest advantages of aqueous-based processes if the number of compatible equipment manufacturers. Unlike semi-aqueous equipment which very few manufacturers still offer, aqueous-based defluxing equipment is readily available. From batch defluxing systems available in low and high throughput configurations, to high-speed inline defluxing systems, there are multiple suppliers and configurations available.

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Aqueous Technologies has been designing and manufacturing defluxing equipment for more than 17 years. Our customers include Northrop Grumman, Raytheon, NASA, US Navy, US Army, Orbital Sciences, and countless military, medical, and other high reliability assemblers.

Contact Aqueous Technologies to arrange for a one-on-one webinar on the advantages of Aqueous Technologies' equipment and processes.

Michael Konrad is an SMT Advisory Board member and president of Aqueous Technologies Corporation. Konrad also is an IPC SMEMA Council APEX Tradeshow Committee Member. Contact him at (909) 291-1141; e-mail: konrad@aqueoustech.com.