



## PCB Makers Choose Vertrel® XMS Over Co-Solvent Defluxing System

### Synopsis

A California-based manufacturer of high-power radio frequency (RF) power amplifier systems for application-specific and scientific, medical, and wireless applications chose Vertrel® XMS for defluxing applications because it is compatible with the components, it avoided problems with water cleaning, and lowered their total cost-per-part-cleaned.

### Background

American Microwave Technology, Inc. (AMT) is a Brea, California based manufacturer of high-power radio frequency (RF) power amplifier systems for application-specific and scientific, medical, and wireless applications. Its customers are original equipment manufacturers worldwide. Due to the critical nature of the components and the high-tech applications, extreme cleanliness of all the electronic subassemblies is essential.

Circuit board assemblies containing RMA flux must be cleaned as part of their manufacturing process. Any flux residue that is left on the circuit board assemblies can eventually result in failures. The chip capacitors are especially vulnerable. Due to the high power involved in the application of these units, heat can build up in areas where flux residue remains. In the case of a chip capacitor, the flux can cause the capacitor to crack.

### Previous Process

AMT had been using a co-solvent process in a Detrex AVD 212 vapor degreaser. They were using Solvating Agent #24 with PFC 5060 from 3M Corp. as the rinsing agent. The relative amounts were 30%/70% respectively on a weight basis.

Although the cleaning performance of this system was satisfactory (and an improvement over the previously used 1,1,1-trichloroethane system), there were concerns about the excessive consumption of the rinsing agent. The odor of the solvating agent was a secondary issue. Additionally, there was concern that the solvating agent was getting trapped under components and not easily rinsed out. The circuit boards had to be oriented very carefully to ensure that pockets that could trap solvent were eliminated. Fluid entrapment also was a concern under the Teflon® sleeving used on custom-designed subassemblies. Lastly, another concern with the co-solvent system was that wire assemblies that are attached to some of the boards were not being cleaned effectively.

**MicroCare Corp.**  
595 John Downey Drive  
New Britain, CT 06051 USA  
Tel: (860) 827-0626  
or in North America, dial (800) 638-0125  
TechSupport@MicroCare.com

**MicroCare Europe bvba**  
Erasmuslaan 10  
B-1804 Cargovil (Zemst), Belgium  
Tel: 00 +32 2 251 95 05  
eurosales@microcare.com



### **Alternative Chemistry Solution**

In an effort to eliminate some of the concerns with the co-solvent system, AMT began to investigate alternative chemistries. They chose to evaluate DuPont's Vertrel® cleaning agents because these products offered many advantages over the co-solvent system. Tests were conducted at the DuPont Applications Laboratory in Wilmington, DE. Both Vertrel® SMT and Vertrel® XMS were tested on circuit board assemblies.

The test was more stringent than typical production because the flux had been allowed to age on the boards for approximately nine days. Both products performed significantly better than the existing co-solvent process, with Vertrel® XMS showing a slight advantage.

The boards were inspected under high magnification for the presence of flux residue. There was no residue and no fluid entrapment under the Teflon® sleeving used on custom-designed subassemblies, which had been a recurring problem in the existing system.

The switch to Vertrel® solvents was fast and easy because the vapor degreaser did not need to be modified to switch from the co-solvent process to the solvent process; just a few thermostats needed to be adjusted.

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