

Benchtop Cleaning with IPA: 3 Reasons to Stop Now

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IPA is easily contaminated during use.

PCBs (Printed Circuit Boards) need effective cleaning for them to perform consistently and reliably. Selecting the right cleaning fluid involves many considerations - performance, safety and environmental sustainability to name a few. IPA (Isopropyl Alcohol) has typically been the popular choice for electronics cleaning. However, IPA might not be the best option. Here's three reasons why.

#1 - Cleaning Power

IPA isn't a very good PCB cleaner. It has a Kb (Kauri-butanol) value of about 50, meaning that it isn't strong enough to clean some of the tougher-to-remove lead-free and no-clean flux residue often found on PCBs today. It also doesn't clean oils and greases well, so it is not very effective at removing fingerprints. In addition, IPA is often mixed with water to reduce costs. For instance, rubbing alcohol purchased at the drug store is typically 20-30% water to reduce the price. However, this dilutes the IPA's cleaning power.

IPA is also hygroscopic. This means it attracts moisture to itself which, like with rubbing alcohol, dilutes the IPA's cleaning strength. The IPA continues to absorb moisture until it simply no longer cleans effectively.

In addition to water, IPA also pulls other contaminants from the air, or from its container. These contaminants then stay on PCB surfaces as the IPA dries. Some fabricators combat this by using 99.9-percent reagent grade IPA. However, no matter how pure the IPA is when purchased, it is quickly contaminated the first time it gets transferred into a pump bottle or an uncovered container. At that point it is impossible to know the purity or the cleaning strength of the IPA. A better option is to use an engineered cleaning fluid in a hermetically sealed container, like those offered by MicroCare. The sealed container, whether a can or pen, keeps the cleaning fluid contaminant-free at all times. It also won't spill if tipped over and helps limit worker exposure to cleaning fluid fumes.

Using weak water-filled IPA is inefficient. It makes cleaning more labor intensive and slower. It often requires multiple IPA applications, long soak times and extra scrubbing to remove stubborn contaminants. MicroCare cleaning fluids are engineered specifically to target difficult flux residue and other specific contaminants. They are stronger than alcohol, so they clean PCBs faster and with less fluid waste. They have the power to remove lead-free and no-clean residue quickly and efficiently with just one application, minimal soaking and less scrubbing. The best answer is to replace the IPA with an HFC or HFE-based cleaner from Microcare for better, faster cleaning results.

#2 - Facility Safety

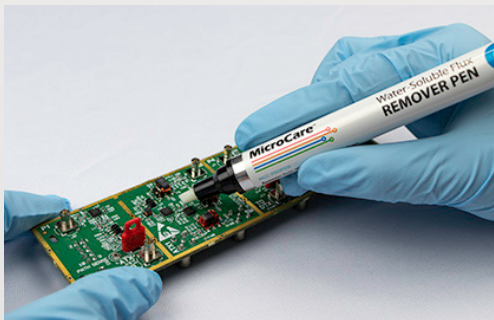
IPA is flammable and is considered a significant safety hazard. It has a relatively low flash point of about 15° C, about room temperature, and can easily cause a fire. Because of this, IPA requires special storage and handling. Never use IPA in open-topped degreasers. Do not use it in uncontrolled aerosol sprays, and do not use it in open trays where it might spill, or even worse, generate vapors that can easily ignite from a spark. Be sure only to use IPA in an area with good ventilation and keep fire extinguishers available in every area where they are used. Also, keep it away from heat and spark sources.



Tech Article



MicroCare offers a line of nonflammable benchtop cleaners to help boost worker and facility safety.



Sealed containers, whether a can or pen, keep the cleaning fluid inside contaminant-free.

All cleaning equipment, like ultrasonic tanks or any other electrical-powered equipment used to assist the cleaning process, should be explosion-proof. For an added measure of safety, all surrounding electrical equipment and outlets should be explosion or fire-proof too.

In addition, IPA must be compatible with all other chemicals used in the PCB assembly process. Chemical reactions can occur with certain substances. Safety Data Sheets (SDS) for all chemicals should be referenced to ensure full compatibility and safety protocols.

IPA's flammability also makes it difficult and expensive to ship. It often requires special labeling, careful handling and expensive hazardous freight charges. Instead of using flammable IPA, choose a MicroCare nonflammable cleaning fluid for worker and facility safety. These fluids are typically more expensive than IPA, but they are engineered specifically for fire safety. They are also classified as nonhazardous and nonregulated. This makes them easier and less expensive to ship anywhere around the globe via ground, sea or air.

#3 - Environmental Impact

From an environmental perspective, IPA is a VOC (Volatile Organic Compound). This means it produces low-altitude smog. Many areas in the United States and across the globe have strict regulations limiting or even prohibiting the use of VOC substances. Before introducing IPA into a cleaning process, it is important to check with the appropriate regulating agencies to ensure IPA can be used legally without violating any clean-air legislation in the area.

A better option is to choose an environmentally-sustainable PCB cleaning fluid from MicroCare. One that has a very low or zero ODP (Ozone Depleting Potential) to meet the current VOC standards and regulations of today. Most modern cleaning fluids are formulated to adhere to evolving environmental standards, not only for now, but well into the future.

Better Cleaning Choices

Many PCB fabricators today are choosing to replace IPA with alternative PCB cleaning fluids for benchtop cleaning. MicroCare has high-performance cleaners and flux removers that clean better, are safer to use and are more environmentally-friendly than traditional IPA. The key is to evaluate the type of contaminant and substrate to be cleaned and then determine which cleaner works best for the particular application. The MicroCare Applications Experts can recommend the benchtop cleaning fluids to make switching to a better cleaner easier for you.



About the Author:

Emily Peck is a Senior Chemist at MicroCare which offers benchtop and vapor degreasing critical cleaning solutions. She has been in the industry more than 6 years and holds a MS in Chemistry from Tufts University. Peck researches, develops and tests cleaning-related products that are used on a daily basis in electronics, medical, fiber optic and precision cleaning applications. For more information, visit www.microcare.com.



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