

# Removing PCB Conformal Coatings

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The MicroCare Critical Cleaning Lab performs comprehensive trials with your sample parts to ensure coating removal success.



Conformal coatings are very important for PCBs that operate in a harsh environment. They are used on electronics that are near the ocean, in harsh weather, in dusty cities and dirty factories. For example, the PCBs that control gas station pumps and traffic lights are almost always coated to help them endure their harsh environment. Coatings keep water, dust, salt and dirt from touching delicate components and degrading the performance of the boards.

Removing conformal coatings is challenging since they are designed to be very durable and hard to remove. If rework is required, alcohol is not the best choice to remove conformal coatings. While alcohol is inexpensive and widely available, it lacks the solvent “muscle” to dissolve coatings and often requires long soaking times to dissolve the coatings. This is an expensive waste of time and money.

There are four types of conformal coatings: acrylic, silicone, epoxy and urethane. In chemistry, there is a saying that “like dissolves like”. The best way to dissolve any contamination is to use a cleaning fluid with a chemical composition similar to the contamination. So, to remove a conformal coating get a cleaning fluid that is chemically similar to the coating itself.

Let’s take a look at some good choices for more common coatings:

### Acrylic Coatings

Acrylic coatings, like Humiseal 1B31, can be difficult to remove. Your best choice is to use a heavy duty flux remover with a high Kb value. If it dries a little too quickly for this application, soak the parts in a bath of the flux remover. Put a lid on the container so the fluid does not evaporate too quickly.

### Silicone Coatings

Dow Silicones Corporation and other companies produce very popular conformal coatings based on silicones. They offer great protection while being light, durable and easy to rework. For silicone coatings choose a cleaner based on siloxane technologies, so it is chemically very similar to most silicone conformal coatings.

### Epoxy Coatings

Epoxy coatings are very difficult to remove because when cured, the molecules “cross-link” to form an unbreakable bond. There is no benchtop-safe chemical which can remove a cured epoxy coating, except physical abrasion like sandblasting which will typically damage the circuit board. If the coating has not cured (hardened) an uncured epoxy remover will be the best option. Usually, these coatings can be removed with a good, long soaking bath in the solvent. Put a cover on the bath to control solvent evaporation.

### Urethane Coatings

Urethanes are challenging to remove. Generally, a powerful, slow-drying flux remover will work best, if anything works at all. Try an uncured epoxy remover as one option. Usually, these coatings can be removed with a good, long soaking bath in the cleaner. Put a cover on the bath to control solvent evaporation.



*A heavy duty flux remover with a high Kb value is best for acrylic coatings. For silicone coatings choose a cleaner based on siloxane technologies. An epoxy remover is the best option for uncured epoxy coatings.*

## Paralene Coatings

Paralene is a military-style coating, very thin and rock-hard. It simply cannot be removed chemically.

It is essential to work with a critical cleaning partner that has specialized expertise in conformal coatings and how to remove them. MicroCare has have field engineers to conduct on-site audits to evaluate your conformal coating removal process. We can also perform comprehensive in-lab trials with your sample parts to ensure your removal and cleaning success.

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### About the Author:

*Mike Jones, retired Vice President of International Sales for MicroCare, has over 30 years of experience in the critical cleaning industry. He is a prolific writer and educator focusing on critical cleaning in general and vapor degreasing and benchtop cleaning in particular. For more information, visit [www.microcare.com](http://www.microcare.com).*



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