



CLEANING RECOMMENDATIONS

SUMMARY

There is no substitute for a rigorous board cleaning program. Proper cleaning definitely extends the life of a burn-in board by removing contamination, debris, and corrosion products. Obviously, the particular environment will dictate the optimum period of time between cleanings, but a good rule of thumb is that a board should be cleaned after every 240 hours of use. Also, it is a good practice to clean a board that has been out of use for more than one month before it is put back into use. Today, with the fine pitches between contacts in sockets and close spacing between traces on boards, it is important to keep in mind that damage can easily be done to these fine features and components by overly aggressive scrubbing. A gentle touch will usually do the job without doing damage.

There are two contemporary and popular equipment choices for board cleaning—ultrasonic cleaners and spray--rinse cleaners (which look like heavy duty dishwashers). LIC recommends the following board cleaning methodologies for the two types.

ULTRASONIC

EQUIPMENT NEEDED

1. Ultrasonic cleaning machine with a tank of sufficient size to completely submerge the burn-in board(s).
2. Bristle brush with high-density, short, fine bristles. Usually nylon bristles are a good choice, but check for compatibility of the bristles and brush handle with the cleaning solvent. This brush should provide moderate abrasion to dislodge loosely or moderately adhered contamination/corrosion. LIC recommends the Eraser Co. #BR-9 or equivalent brush for flat surfaces and the BRO/F brush for the sockets.

MATERIALS NEEDED

1. BioChem Bio T 200A or Omega Aqua Clean LPH, or an equivalent aqueous cleaning solution.
2. Protective garb. At a minimum, rubber gloves, face shield and apron. Operators must follow all solvent manufacturer's recommendations and cautions.



CLEANING RECOMMENDATIONS

PROCEDURE

1. De-gas the solution and allow it to reach a circulating pump temperature as recommended by the manufacturer (usually about 50°C). Note that the equipment space should be well ventilated.
2. Before immersing the burn-in boards, brush the board and the DUT cavity of the sockets of the dry board. The objective is to dislodge any loosely adhered contamination/corrosion products. Use care in brushing the socket DUT cavity especially on surface-mount sockets to avoid damaging (snagging or bending) the contacts. This is a skill which most technicians will quickly learn.
3. Place the burn-in boards fully immersed in the ultrasonic cleaner and run for 5 minutes. Most ultrasonic tank cleaners are tuned to operate at fixed frequencies between 25—80 KHz. 40 KHz is a very common and effective operating frequency. If the cleaner has a sweep frequency option, use it. 40 KHz with sweep will typically vary the frequency from about 39—41 KHz. It is best if the boards can be situated vertically (i.e. on their sides) and the covers of clamshell sockets be left open. Note that even if space considerations do not allow the socket covers to be open, LIC sockets have channels through which contamination may be flushed away. Also keep the boards separated as much as possible to allow good cleaning action.
4. At the end of the ultrasonic agitation, remove the boards and while they are still wet brush again as described in step 2. Return the boards to the ultrasonic cleaner and run for an additional 1-2 minutes followed by a rinse in ultra pure or de-ionized (DI) water or Isopropyl Alcohol (IPA), or, preferably DI water followed by IPA.
5. Remove the burn-in boards and allow to thoroughly dry prior to putting them back in service.

SPRAY—RINSE

EQUIPMENT NEEDED

1. Spray Rinse cleaning machine of sufficient size to accommodate the burn-in boards.
2. Bristle brush as described above for the ultrasonic process.

LORANGER INTERNATIONAL BURN-IN-BOARD/SOCKET CLEANING RECOMMENDATIONS



MATERIALS NEEDED

1. Armakleen E-2001P aqueous cleaner or equivalent.
2. Protective garb as described above for the ultrasonic process.

PROCEDURE

1. Dry brush the boards and sockets as described above for the ultrasonic process.
2. Load the boards in the Spray-Rinse cleaner vertically in the racks. If space allows, leave the covers of clamshell sockets open. Follow the manufacturer's recommendations for setting the spray-rinse cycles. In general, spray wash for 20 minutes. Then follow with 5 spray rinse cycles where the rinse (DI) water is drained on each cycle. If the machine monitors the resistivity of the effluent, set it to repeat rinse cycles until the effluent reaches 2 M Ω -cm (assuming the DI supply is >2 M Ω -cm as required). Follow the rinse cycles with a 20 minute heated air dry cycle.
3. Remove the boards and allow to continue to air dry until completely dry prior to putting them back in service.

OTHER CLEANING CONCERNS

1. All sources of contamination should be cleaned monthly to minimize potential contamination to the burn-in boards. Pay particular attention to the monthly cleaning of the burn-in chamber and the board storage racks as suggested below.

STORAGE RACK CLEANING

1. The storage rack must be cleaned monthly with a mild detergent. This should be followed by a thorough water rinse. The rack must be allowed to completely air dry before wiping it down with IPA. After the rack has air dried again it is ready to accept burn-in boards.



CLEANING RECOMMENDATIONS

BURN-IN CHAMBER CLEANING

Proper cleaning of the interior chamber assembly is absolutely essential after a maximum of 700 hours use. Corrosion from materials brought into the environment should be minimized by cleaning also to reduce contamination (E.G. semiconductor devices should be cleaned prior to loading into the sockets). For best results, follow the recommendations below.

EQUIPMENT NEEDED

1. Contamination-Free "Lab Wipes" cleaning cloths.
2. Bristle brush with high-density, short, fine bristles. Usually fiberglass or nylon bristles are a good choice, but check for compatibility of the bristles and brush handle with the cleaning solvent. This brush should provide moderate abrasion to dislodge loosely or moderately adhered contamination/corrosion. LIC recommends the Eraser Co. #BR-9 or equivalent brush for flat surfaces and the BRO/F brush for the sockets.

MATERIALS NEEDED

1. BioChem Bio T 200A or Omega Aqua Clean LPH or an equivalent aqueous cleaning solution.
2. Protective garb. At a minimum, rubber gloves, face shield and apron. Operators must follow all solvent manufacturer's recommendations and cautions.

PROCEDURE

1. Brush the rack and inner chamber using the brush in a dry condition. The objective is to dislodge any loosely adhered contamination/corrosion products. Pay particular attention to brushing the edgeconnectors.
2. Wipe all surfaces with a "Lab Wipe" soaked in the chosen aqueous cleaning solution.
3. Scrub all surfaces again immediately with the brush wetted in the chosen aqueous cleaning solution.
4. Wipe the entire surface again with fresh DI water and allow it to air dry.
5. Wipe the entire surface again with IPA and allow it to thoroughly dry before placing the inner rack back in the chamber.