CROWN INDUSTRIAL SERVICES INC. **CLEANLINESS TESTING LABORATORY**

We test to ISO 16232

Cleanliness Testing Sampling Plan: Best Practices

The objective of your cleanliness testing sampling plan is to transport your test samples to the cleanliness testing laboratory without changing the state of cleanliness from what it was at the point of sampling. So how do you accomplish that repeatedly?

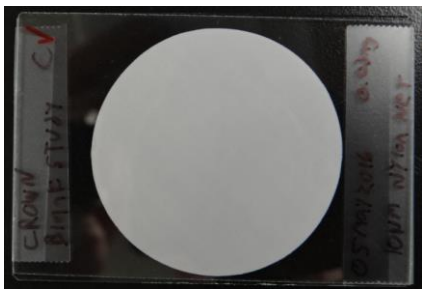
It is wise to label the clean sampling container before placing the sample therein. Typical information to include on the sampling container would be: part number; serial number if applicable; date of sampling; shift number; initials of sample taker; and any other information which will help with your tracking. The label needs to be legible and secure so that it successfully passes vital information to the cleanliness testing laboratory for inclusion on the cleanliness test report. This can be as simple as legibly hand-printing the information on the outside of the sampling container with a permanent marker or it could be a printed label generated by your part production tracking system which may even include a bar code. The key is to get the needed info to the cleanliness testing laboratory so it can be included on the cleanliness test report so you can accurately and traceably track cleanliness over time.

At the proper sampling point, as defined in the specification, **the part should be carefully placed in a properly labelled clean sampling container (often a new zip closure sample bag) by a sample taker wearing clean new disposable nitrile gloves.** The part must not be allowed to touch any clothing and must not be touched by any rags or wipes of any kind. Once picked up from the sampling point the part also must not be set down until securely inside the properly labelled clean sampling container. If the part is picked up from the sampling point and set down prior to being inside the sampling container then very likely the part will pick up contamination from whatever surface it is placed upon. Assuming the sample part(s) are both dry and at ambient temperature the sample container should be securely closed to keep the sample at the point of sample contamination level. Special corrosion prevention procedures will need to be developed if the parts being sampled are not dry and/or are not at ambient temperature but typically at “point of assembly” or “point of ship” the parts should be both dry and at ambient temperature.

Once inside the properly labelled clean sampling container the sample is ready to be transported to the cleanliness testing laboratory. **Care must be taken to ensure that the state of cleanliness is not changed during transport.** Sample parts which jostle against other sample parts or other hard objects will likely cause a change in state of cleanliness – so part against part movement and part against hard object movement needs to be prevented. Precautions also need to be taken to ensure that the integrity of the sampling container is not breached since the breach would leave the test sample parts exposed to outside

contamination. If you are sending parts via a parcel delivery service to a cleanliness testing laboratory you also want to ensure that the packing material used doesn't cling to the sampling container. Special care needs to be taken in packing the cleanliness test samples for shipment so that the packaging also doesn't allow the sample parts to jostle about within the shipping container – you want the samples not to move at all.

If you are doing the gravimetric testing at your facility and shipping filter membranes (patches) to a cleanliness testing laboratory for particle counting then your objective is to ensure that the particles which are on the membrane from your gravimetric test remain on that membrane for the particle counting. Additionally sample ID information needs to stay with each membrane while not blocking the full view of the membrane which is to be particle counted. Any membrane holder which allows the patch to move within it at all is not appropriate. **We recommend very tightly sandwiching the filter membrane between two clean 2" x 3" glass microscope slides.** The slides are held very tightly together by a strip of tape across the short ends. The tape must not have any bubble or wrinkle – it must not extend past the short ends of the very tightly sandwiched slides. On the upper side (side of membrane with contamination facing up) of the slide the sample ID should be legibly hand-written upon the tape with an extra fine point permanent marker. No writing, no tape, no label should be either over or under the filter membrane so that complete view of the filter membrane by the microscope in either reflected light (light shining down on top of filter membrane) or transmitted light (light shining up through bottom of filter membrane) is possible.



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Please feel free to give me a call – we do a lot of ISO 16232 based testing for a wide array of customers here at the Crown Cleanliness Testing Laboratory in Jackson, Michigan USA. Give me a call when you have a question about cleanliness testing or need cleanliness testing done. We offer Standard Turnaround for scheduled cyclical testing and Expedited Turnaround when you need results ASAP. We also sell Lab kits and can train your personnel to do cleanliness testing if your customer insists you do the testing in-house.

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