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## ***Appendix: Routine and Scheduled Maintenance – Turbo Pumped Systems***

Routine and scheduled maintenance for a research system can vary primarily with the amount of use the system sees, and in some cases by the types of materials and thickness deposited. There are however a few items on the system that require maintenance at designated intervals. It may be convenient to establish other routine maintenance intervals after the system has been in service for a while and these intervals can be predicted.

### **Scheduled Maintenance**

Turbo pumped systems have very little maintenance. Many turbo pumps will have lubrication and rebuild intervals. Consult the pump manual for details.

If a rotary vane pump is used for backing the turbo, the oil level should be checked on a regular basis and the oil changed according to the manufacturer's recommendations. Typically a maintenance plan for the roughing pump can be found within the enclosed manual. If a dry pump is used to back the turbo typically there are overhaul intervals specified in the enclosed manual also.

### **Routine Maintenance**

One common routine maintenance item on this vacuum deposition system will be the removal and cleaning of the chamber debris shields. After a lot of material has been deposited inside a chamber the material has a tendency to flake and peel off of the inside walls and off internal shielding. Minor flaking debris can be cleaned up with a vacuum cleaner until the flakes get very large or become a nuisance. This flaking can eventually fall into or onto the sources and contaminate the deposition. They can get stuck on seal faces and lower the base pressure. The system is supplied with two sets of debris shields so that one set can be cleaned while the other is in place in the chamber. The debris shields are held in place with either ¼-28 socket head cap screws or clips, and they can typically be removed through the front door or the back door of the chamber is so equipped. Note that the debris shield mounting screws are vented. Do not replace these with none vented screws or virtual leaks could be created in the blind holes in the chamber walls.

**NOTE: IT IS THE CUSTOMERS RESPONSIBILITY TO SAFELY CLEAN ANY DEBRIS SHIELDS OR INTERNAL SHIELDS IN A PROTECTED ENVIRONMENT ACCORDING TO LOCAL LAWS. PROPER PROTECTION SHOULD BE WORN BY ANYONE CLEANING DEBRIS SHIELDS. CONSULT YOUR HEALTH AND SAFETY REPRESENTATIVE FOR DIRECTION.**

## **Shield Cleaning**

One of our customers has had success cleaning shields in water and detergent. They feel the key is to start with aluminum deposited on the shields first. The detergent they use is Deconex 12 however anything similar may work. The shields are soaked and the material is then very easily wiped off. Some additional light scrubbing with Scotchbrite may be required but the overall effect is shields that look like new. As noted above depending on the nature of the materials deposited this procedure may be best performed in a fume hood.

## **Inficon**

The Inficon deposition software will store all the process parameters the user inputs. These deposition 'recipes' and tooling factors usually represent a fair amount of time invested and should be backed up to a network or a CD for safe keeping on a regular basis. The crystals that read the deposition rates must also be replaced on a regular basis. The crystals are very quick and easy to replace, and are inexpensive. The user can view the crystal life in the view / sensor readings box in the Inficon deposition software. Most operators will replace a crystal at approximately 50% life or less. If you are going to do an important deposition run, replace the crystals first! You do not want a crystal to fail in the middle of a deposition, causing the system to abort the deposition. If this occurs the operator will need to vent the system up to atmosphere and open the chamber to replace the crystal, and then pump the chamber down again before they may begin again.

## **A note on Calibration**

Many of the measuring instruments on systems including MFC's, MFC controllers and capacitance manometers require periodic calibration throughout the life of the instrument. If your process requires repeatability or you are documenting specific flow and pressure settings then it is important to have these instruments calibrated on an annual basis to ensure consistency of measurement. Consult the manuals for instruments in question or customer service at Angstrom Engineering for further information.