

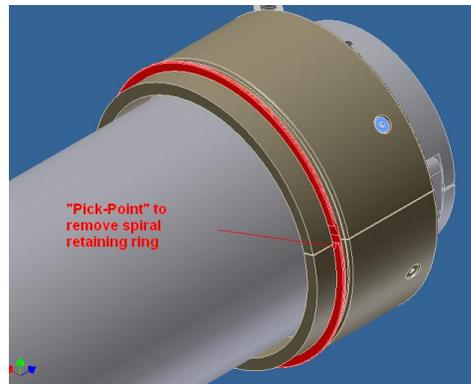
Debris Shield Removal and Cleaning

The debris shields main function is to capture any back-sputtered or gas phase scattered target material that would otherwise return to the target surface. If the debris shields were not in place, this scattered material could lead to arcing on the target surface, debris on the substrates and even conductive electrical paths leading to ground, causing a short.

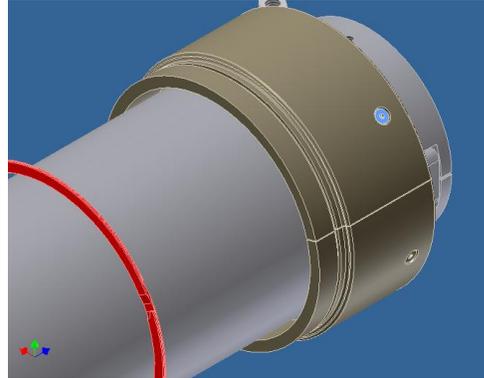
The debris shields are designed for easy removal and cleaning without the removal of the target from the chamber or removal of the target from the cathode body. Depending on the amount of usage and deposition rate of the target material, the debris shields may need to be cleaned as often as every 1-2 weeks. The following procedure will show how to remove and install the debris shield assemblies.

Safety:

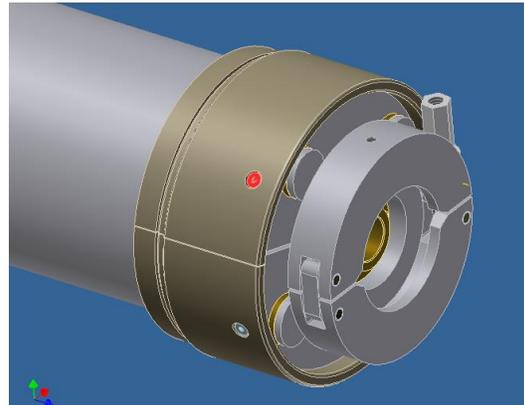
- *To prevent electrical shock, assure that power to the cathode is OFF.*
 - *To avoid possible burns from working around a hot target surface, allow the target to rotate for at least 15 minutes, with cooling water flow, AFTER turning the power supply OFF.*
 - *To avoid the entrapment of tools, clothing and other materials which may cause either human or equipment damage, turn the target rotation OFF.*
1. To prevent the possibility of condensation on the target surface and reduce pumping times, turn OFF the cooling water flow through the cathode.
 2. If not accessible, rotate the target so that the debris shield spiral retaining rings can be removed. Use of a small blade screwdriver will allow the user to easily remove the retaining ring from the debris shields. Unless requiring replacement or cleaning, these retaining rings can rest on the target. It is recommended to



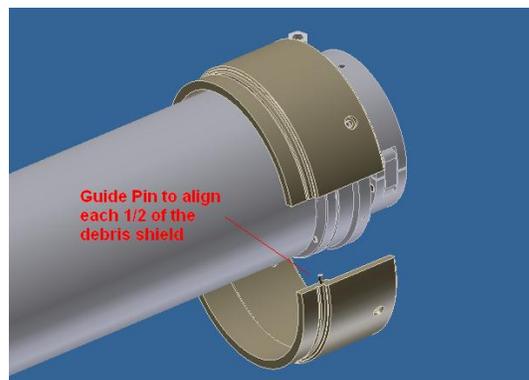
“roughen” the surface of the retaining rings by light bead blasting so they will resist flaking of the deposited target material. To remove the retaining rings for cleaning wait until the debris shields have been removed and then they can be slid off the end of the target assembly.



3. If not accessible, rotate the target so that the debris shield mounting screws (#10-32 x 1/2" Low Head SHCS) are facing you and remove all 4 screws on each end of the target. At this time it is best to examine the screws and determine if they will need to be replaced when reattaching the debris shields



4. With the mounting screws removed, the debris shield can be separated and fully detached from the target assembly. For separating the debris shields, pull each side straight away from the other so as not to bend the guide pins. These pins align and position each side to one another. At this time the debris shields can be grit blasted for material removal. Many users have spare replacement debris shields assemblies that can be pre-cleaned and readily installed to reduce system “down-time”.

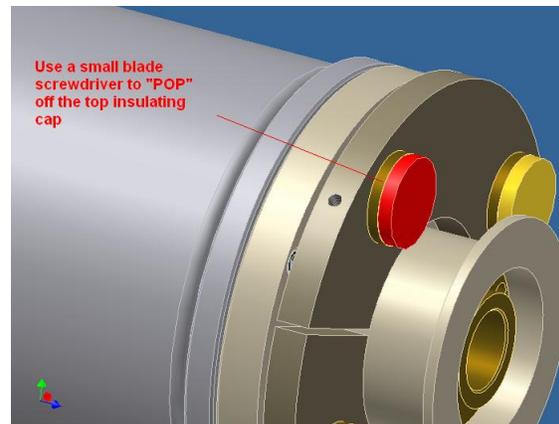


5. For reassembly of the debris shields onto the target assembly, reverse the procedures 1-4 above. To check successful reassembly, use an ohm-meter to check conductivity between the debris shield and the target surface. This should be an OPEN (no contact) circuit. Check each debris shield also to the chamber or system ground. This also should be OPEN circuit.

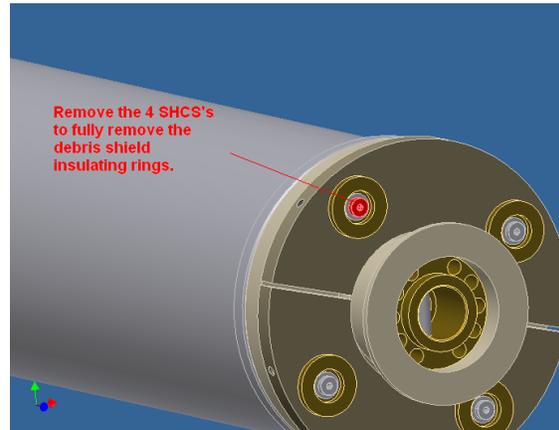
For normal cleaning of the debris shields, the procedure is complete. If there is any conductivity found in step #5, remove the debris shield and recheck the conductivity between the debris shield insulating ring and both the target/ground.

Proceed to step #6 if it is desired to clean the insulating ring or electrical conductivity is found between the insulating ring and the target/ground. In order to remove the debris shield insulating ring it will be necessary to remove the target from the cathode. Refer to the procedure for "Target Removal" before proceeding.

6. The insulating ring is attached to the target end caps by 4 screws, and, electrical isolation is achieved by the use of (Ultem) insulators. Access to the mounting screws is achieved by removing the top Ultem insulator by inserting a small blade screwdriver under the cap and "POP"-ing it off. Repeat this procedure for all four insulating assemblies. If desired, the Ultem insulator can be cleaned at this time.



7. The four screws (10-32 x 3/4" Low Head SHCS) can now be removed which will allow full removal of the debris shield insulating rings from the target assembly. The insulating rings can be cleaned by lightly grit blasting them. If there was an electrical short, check for debris trapped between the insulating ring and the target end cap. Also, inspect the Ultem insulators to assure there has been no arcing or burning of



the material. If signs of arcing or burning are found, replace the insulator as necessary.

