

FIGURES FOR TECHNIQUES FOR MAINTAINING A SUBSTRATE PROCESSING SYSTEM

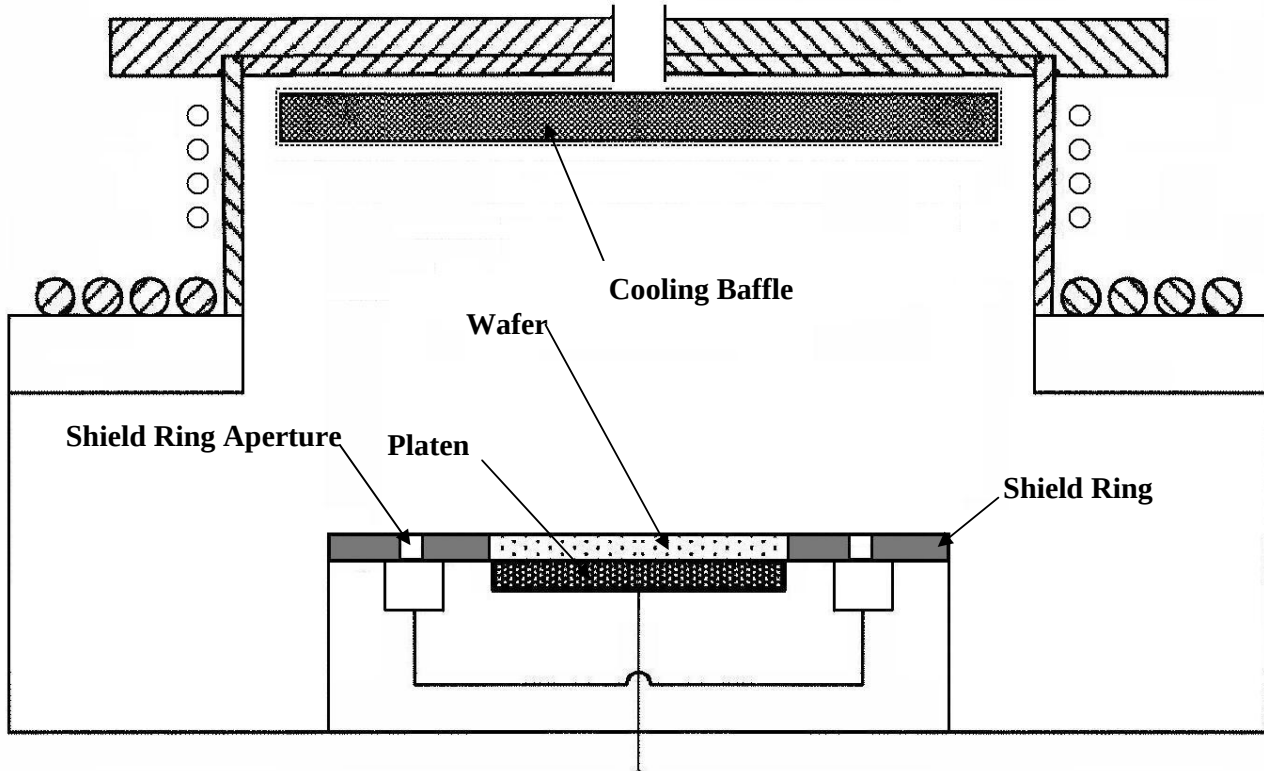


FIGURE 1 illustrates a schematic cross-sectional view of the prior art of the plasma doping chamber without process kits.

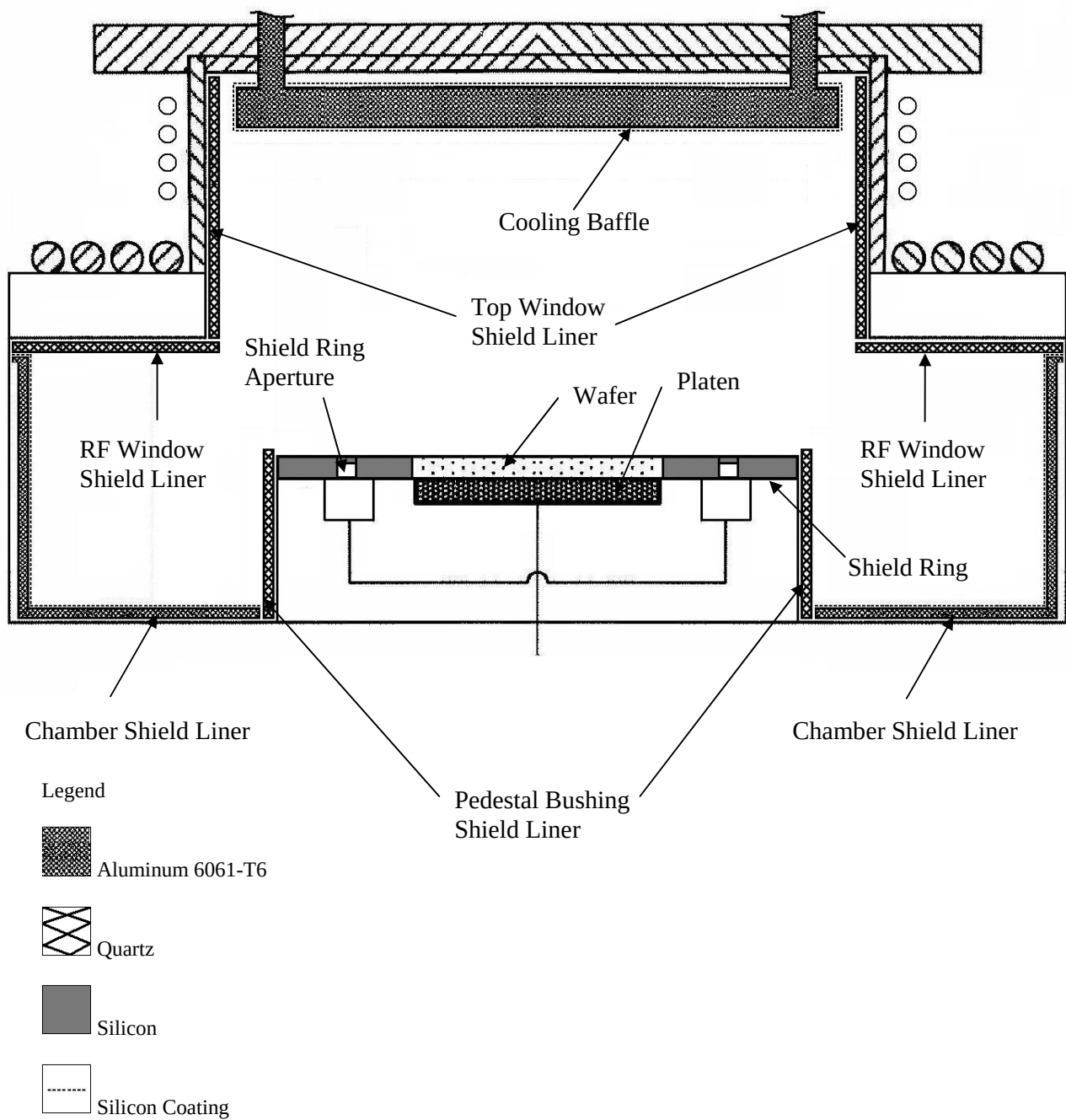


FIGURE 2 illustrates a schematic cross-sectional view of a plasma doping chamber with the process kits having textured internal surfaces according to one embodiment of the invention.

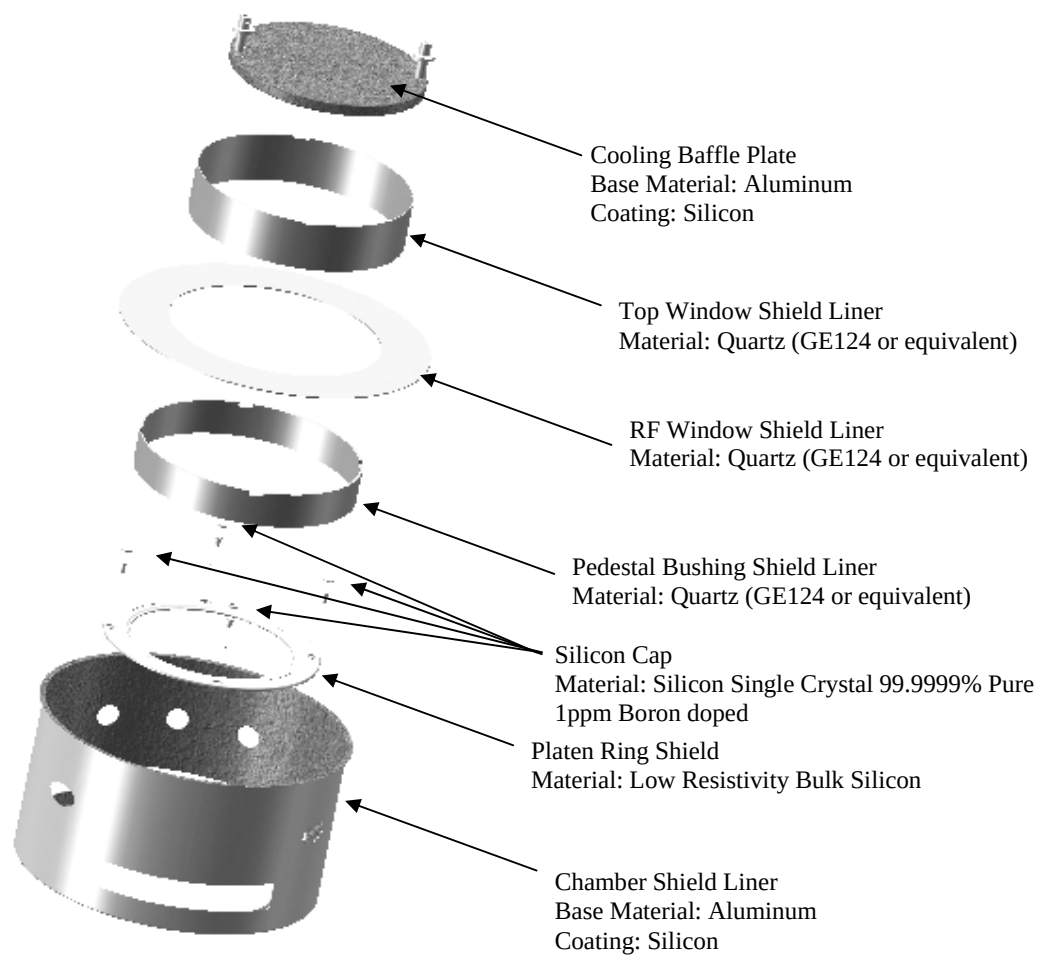


FIGURE 3 illustrates an exploded view of the process kits having textured internal surfaces according to one embodiment of the invention.

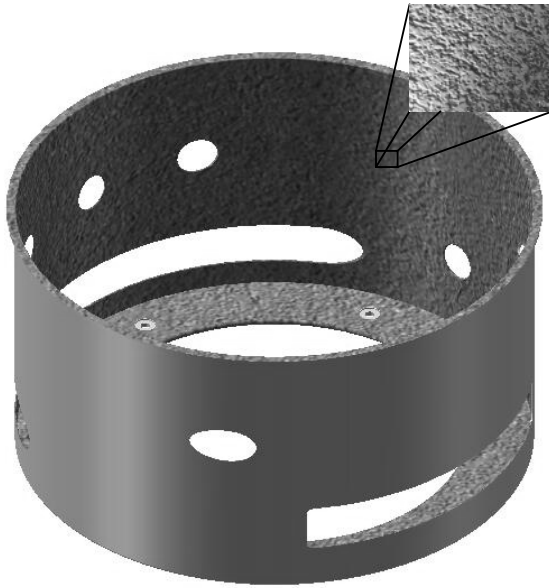


FIGURE 4 illustrates a schematic view of the chamber shield liner made of aluminum material and having the inner surface coated with silicon material according to one embodiment of the invention.

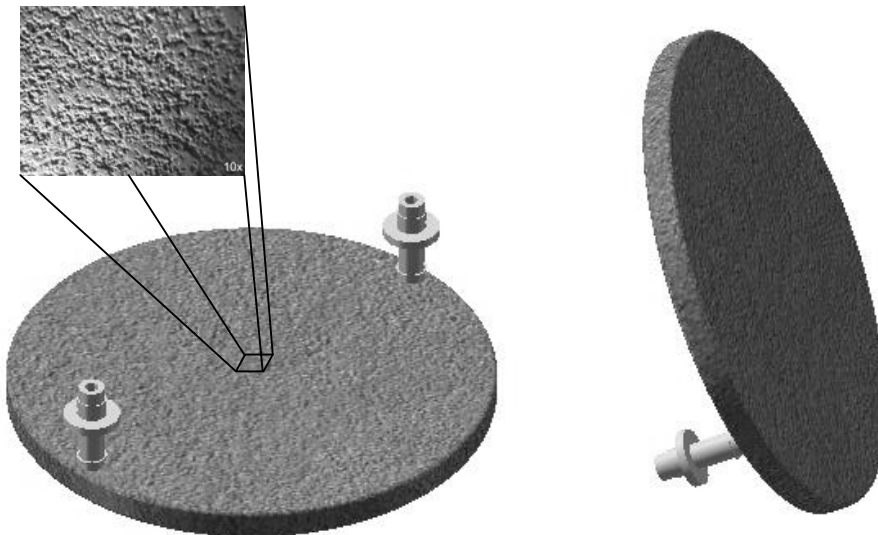


FIGURE 5 illustrates a schematic view of the cooling baffle plate made of aluminum material and having a silicon-coated textured surface according to one embodiment of the invention.

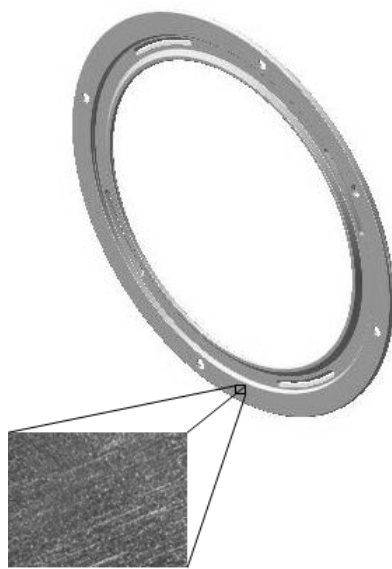


FIGURE 6 illustrates a schematic view of the platen shield ring made of silicon material and having a textured surface according to one embodiment of the invention.

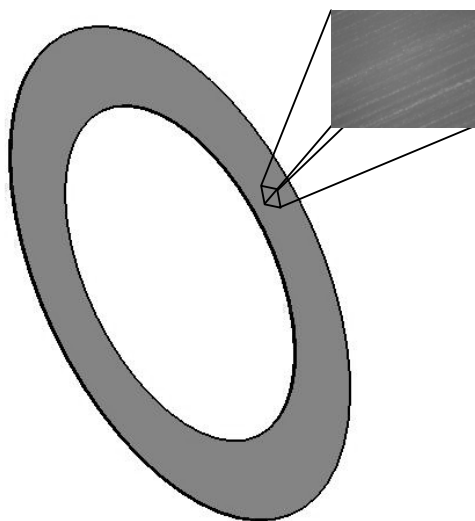


FIGURE 7 illustrates a schematic view of the RF window shield liner made of quartz and having a textured surface according to one embodiment of the invention.

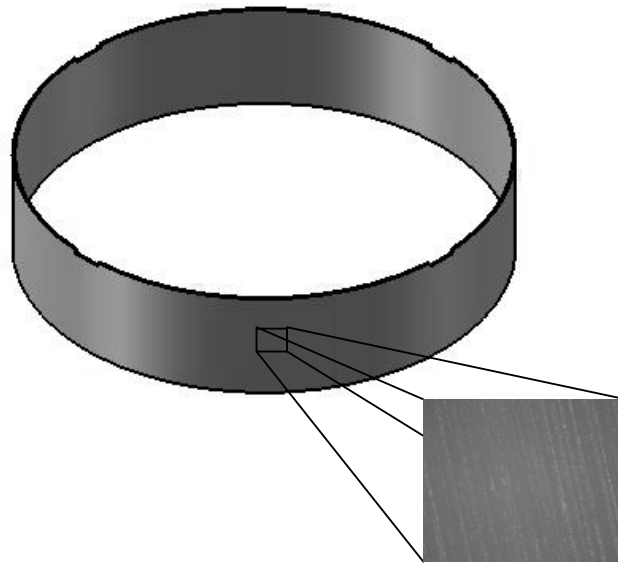


FIGURE 8 illustrates a schematic view of the top window shield liner made of quartz and having a textured surface according to one embodiment of the invention.

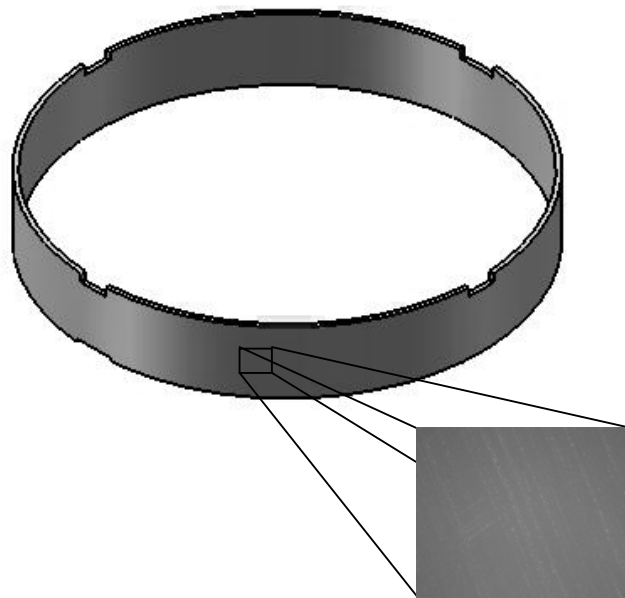
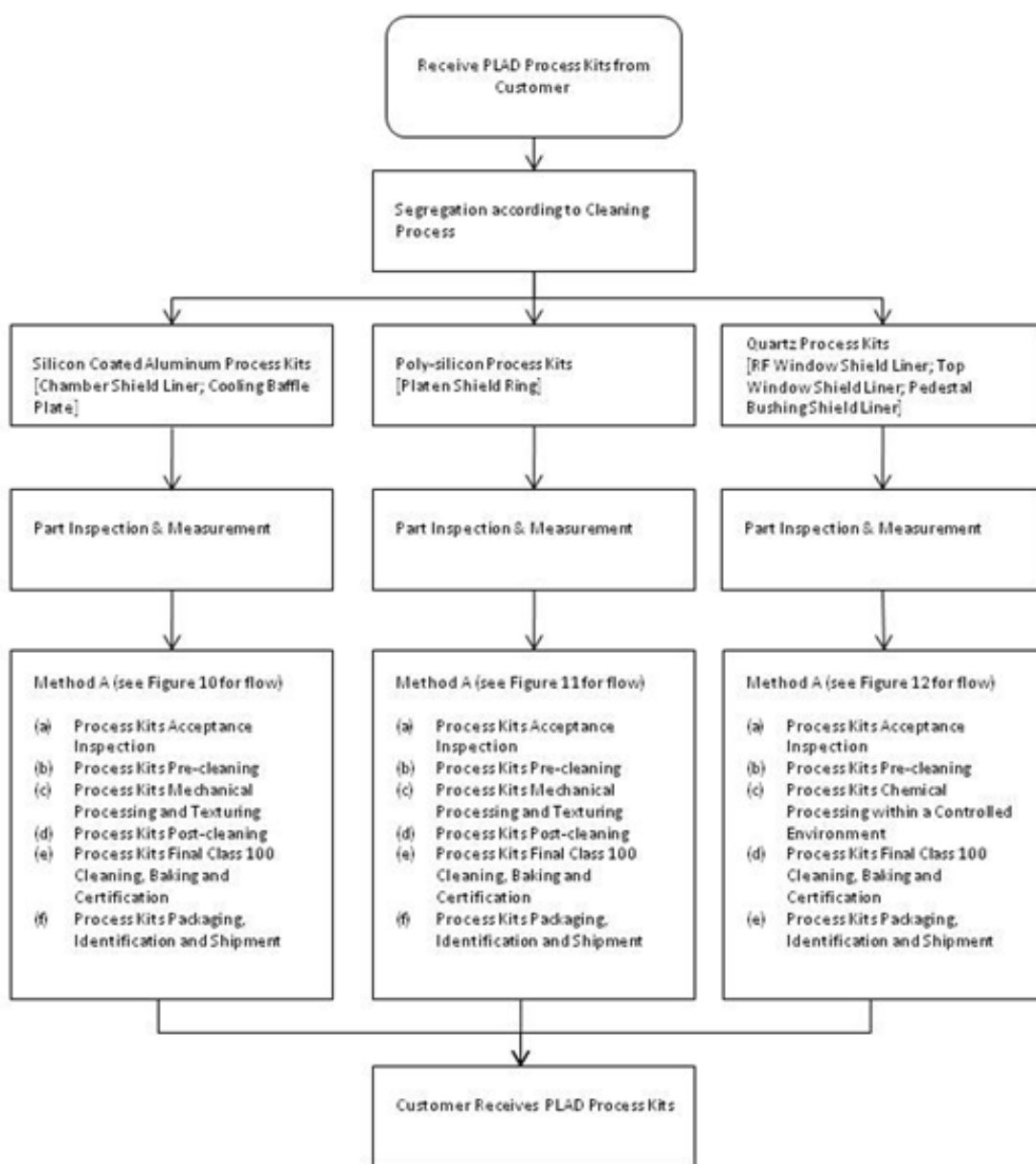


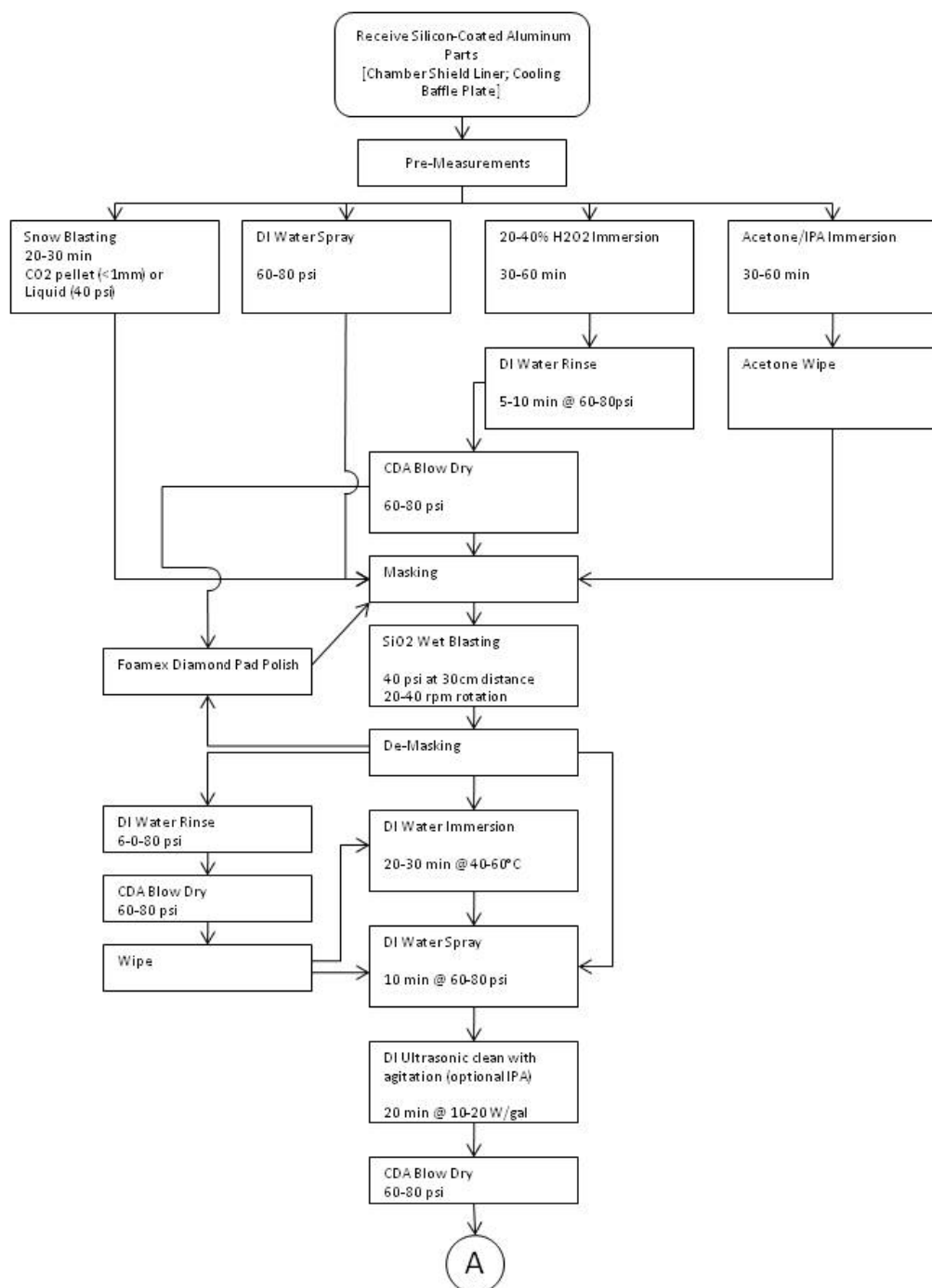
FIGURE 9 illustrates a schematic view of the pedestal bushing shield liner made of quartz and having a textured surface according to one embodiment of the invention.

FIGURE 10 illustrates a flowchart that summarizes the methods in this invention for the precision recycle cleaning and recovery of a contaminated PLAD process kit.

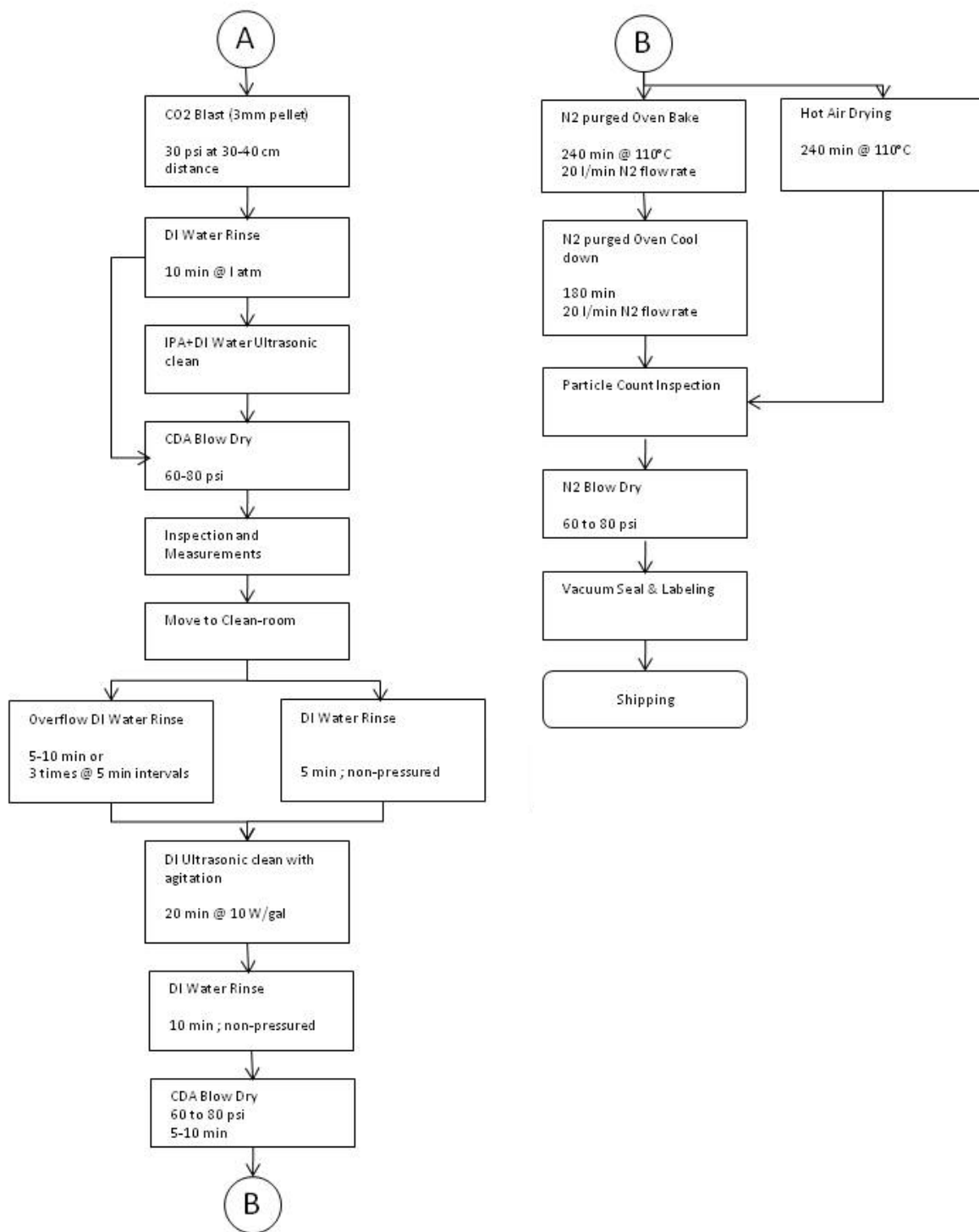


NOTE: All given process parameters in FIGURE 11, FIGURE 12 and FIGURE 13 pertaining to the present invention are for illustrative purpose only. As such, those of ordinary skill in the art will recognize that said process parameters may not be construed as non-variables.

FIGURE 11 illustrates a flowchart of a cleaning process (with valid example process parameters), in accordance with one aspect of the present invention, to remove resistant organic and metallic impurities from a partially silicon coated metal kit.

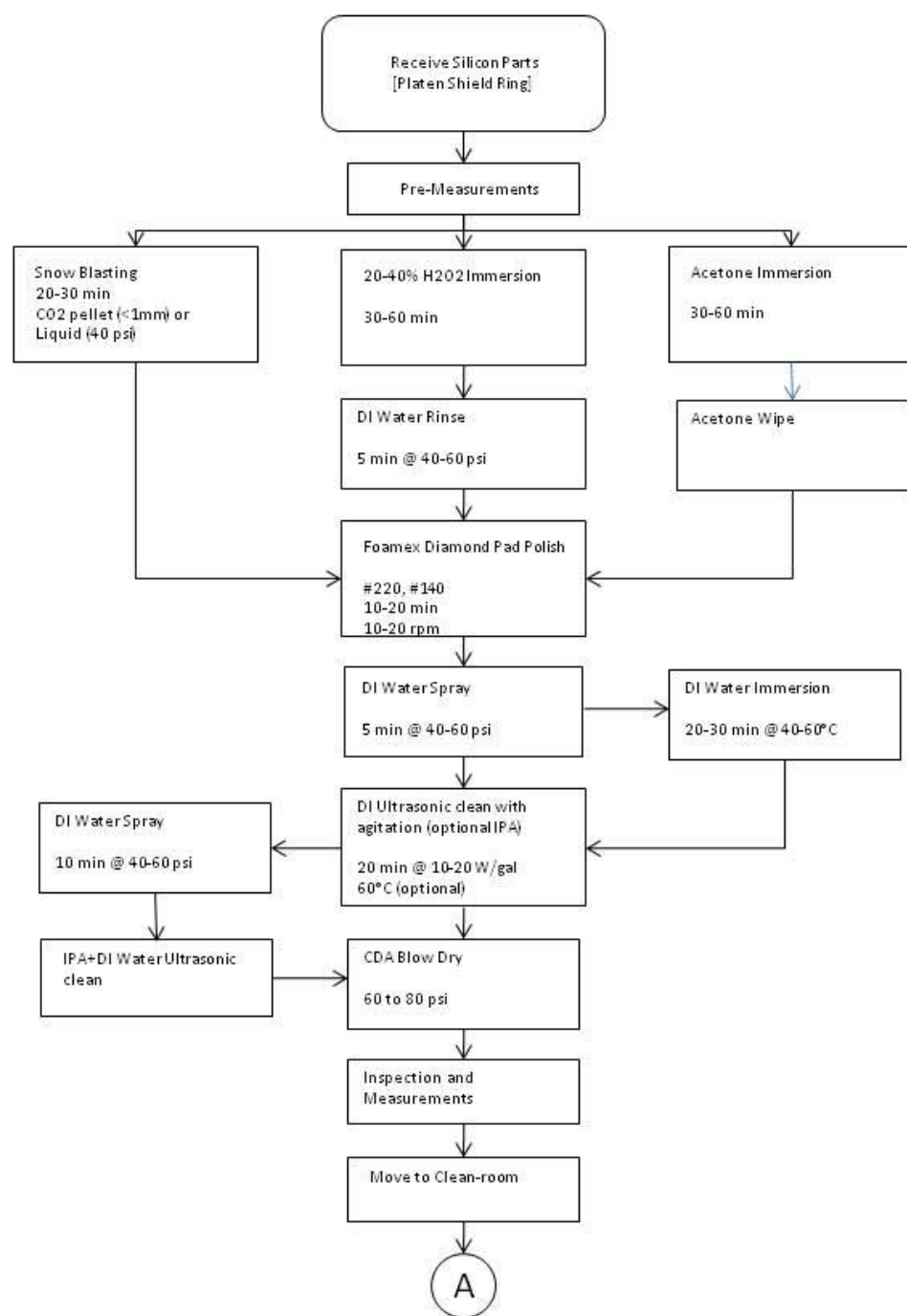


Continued on next page

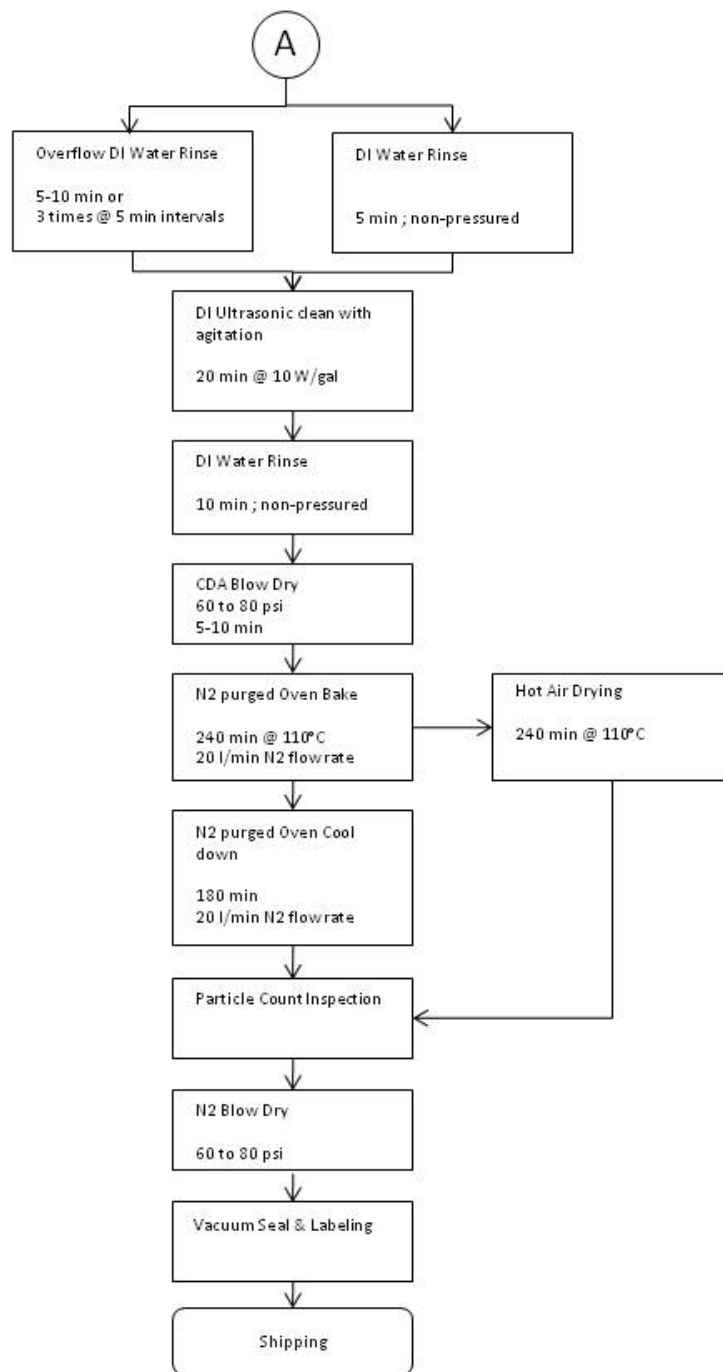


End of flowchart

FIGURE 12 illustrates a flowchart showing a cleaning process (with valid example process parameters), in accordance with one aspect of the present invention to remove particle and metallic impurities from a textured high purity poly-silicon surface.

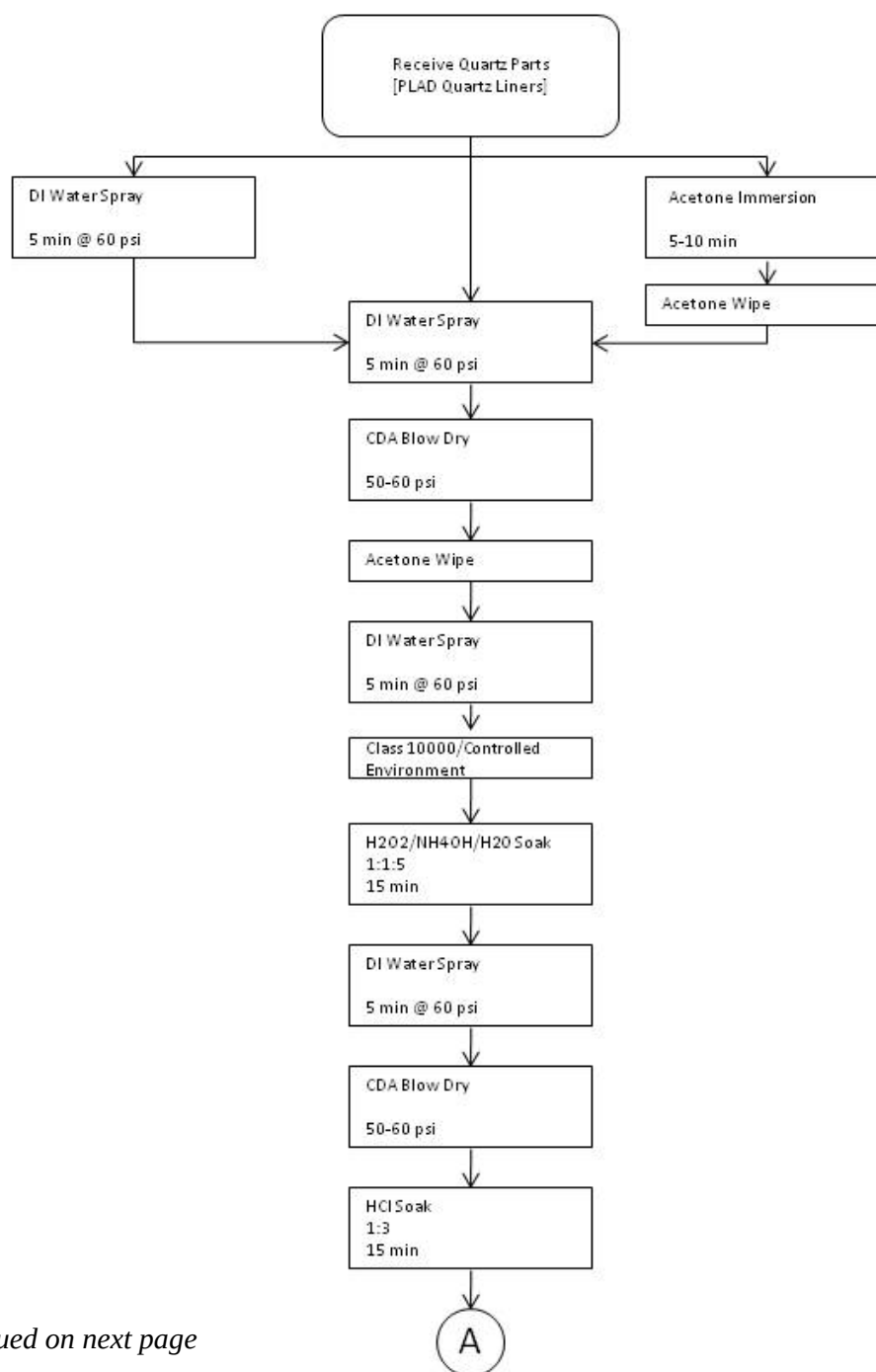


Continued on next page

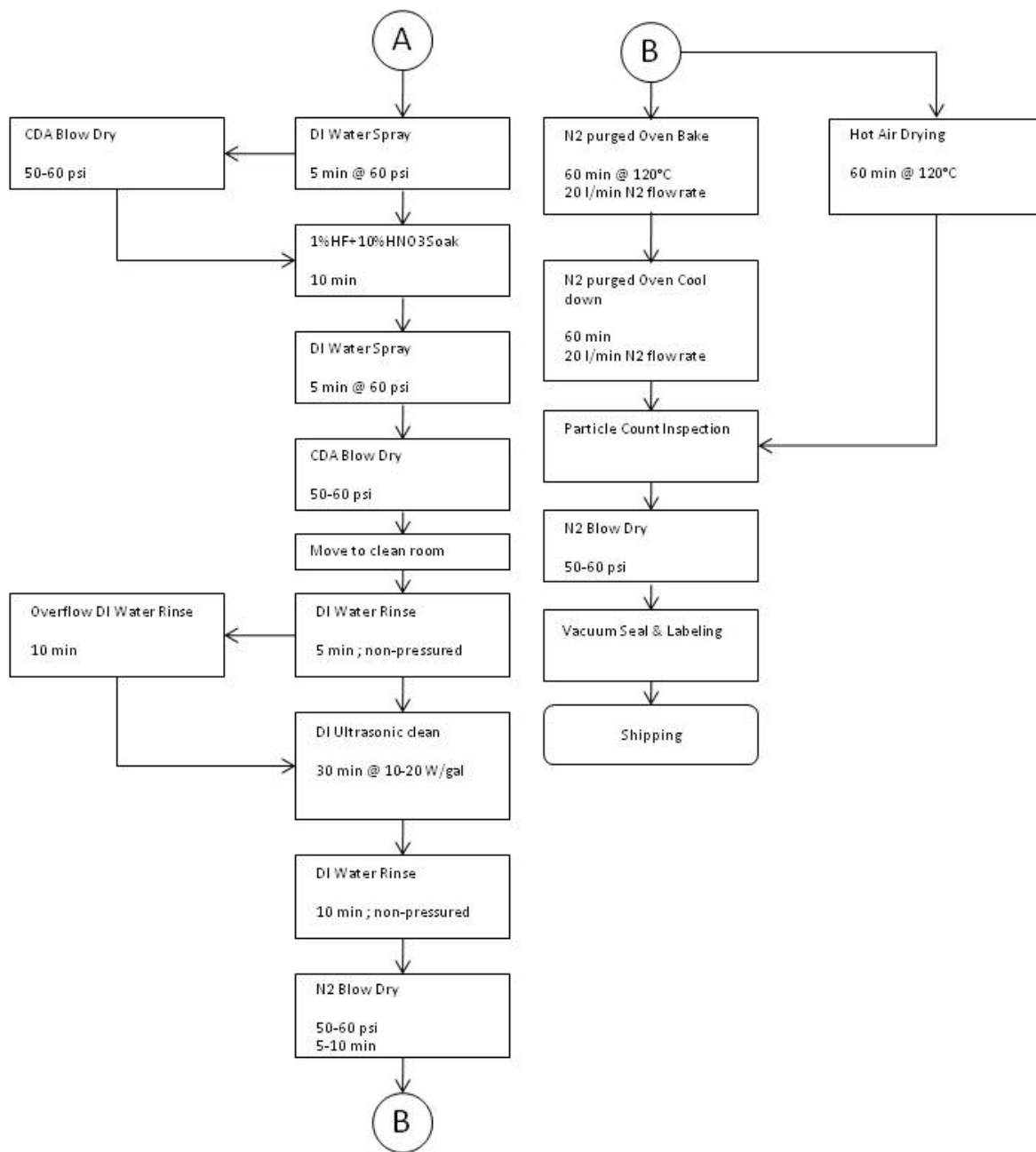


End of flowchart

FIGURE 13 illustrates a flowchart showing a cleaning process (with valid example process parameters), in accordance with one aspect of the present invention to remove particle and metallic impurities from a textured high purity quartz surface.



Continued on next page



End of flowchart

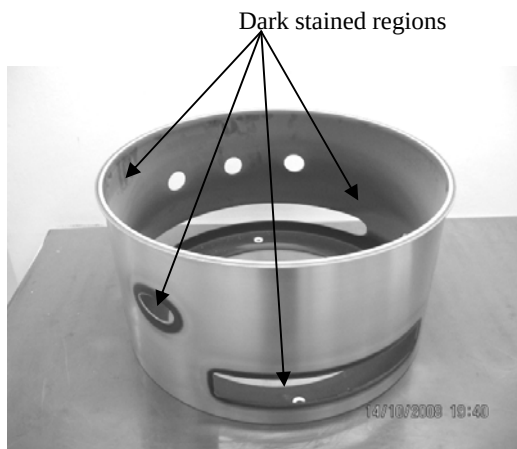


FIGURE 14B



FIGURE 14A

FIGURE 14A shows exemplary used silicon coated chamber shield liner before recovery, while FIGURE 14B shows exemplary silicon coated chamber shield liner after recovery. Dark stained regions in Figure 14A are no longer observed after recovery as seen in Figure 14B.

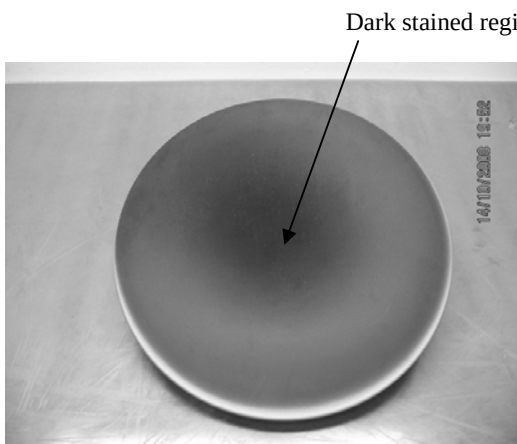


FIGURE 15B



FIGURE 15A

FIGURE 15A shows exemplary used silicon coated baffle cooling plate before recovery, while FIGURE 15B shows exemplary silicon coated baffle cooling plate after recovery. Dark stained regions in Figure 15A are no longer observed after recovery as seen in Figure 15B.

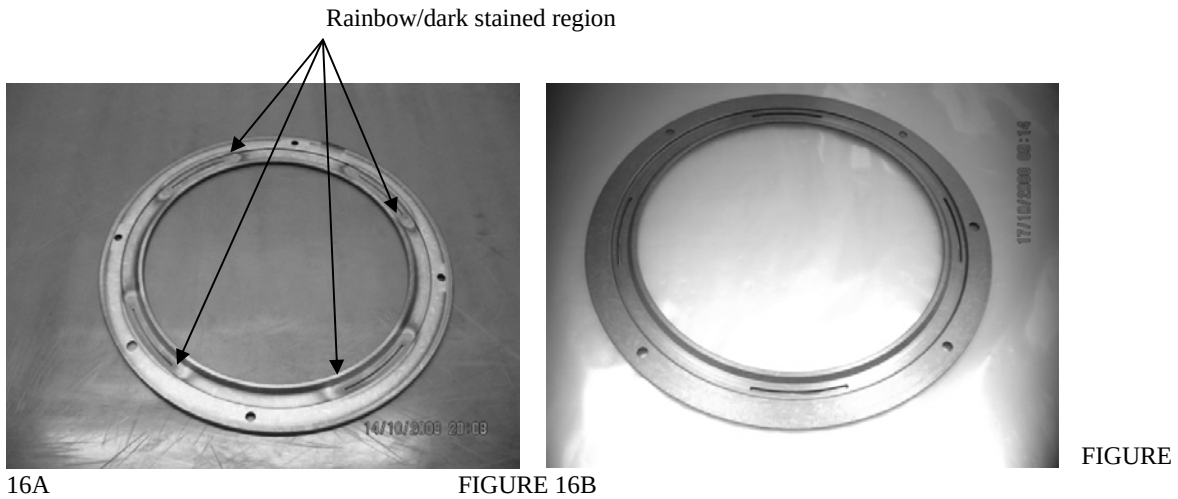


FIGURE 16A shows exemplary used platen shield ring cooling plate before recovery, while FIGURE 16B shows exemplary platen shield ring after recovery. Rainbow/Dark stained regions in Figure 16A are no longer observed after recovery as seen in Figure 16B.

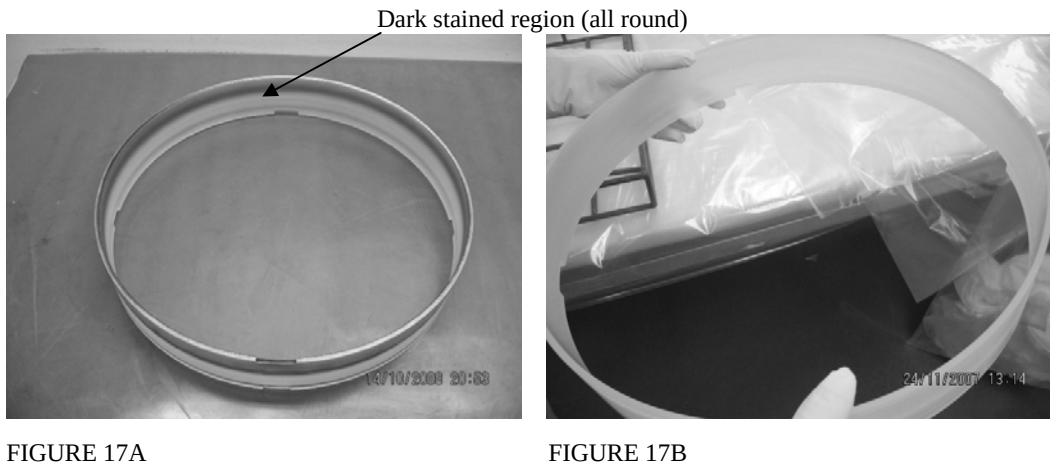


FIGURE 17A shows exemplary used quartz liner (in this case, the pedestal bushing shield liner) before recovery, while FIGURE 17B shows exemplary quartz liner after recovery. Dark stained regions in Figure 17A are no longer observed after recovery as seen in Figure 17B.

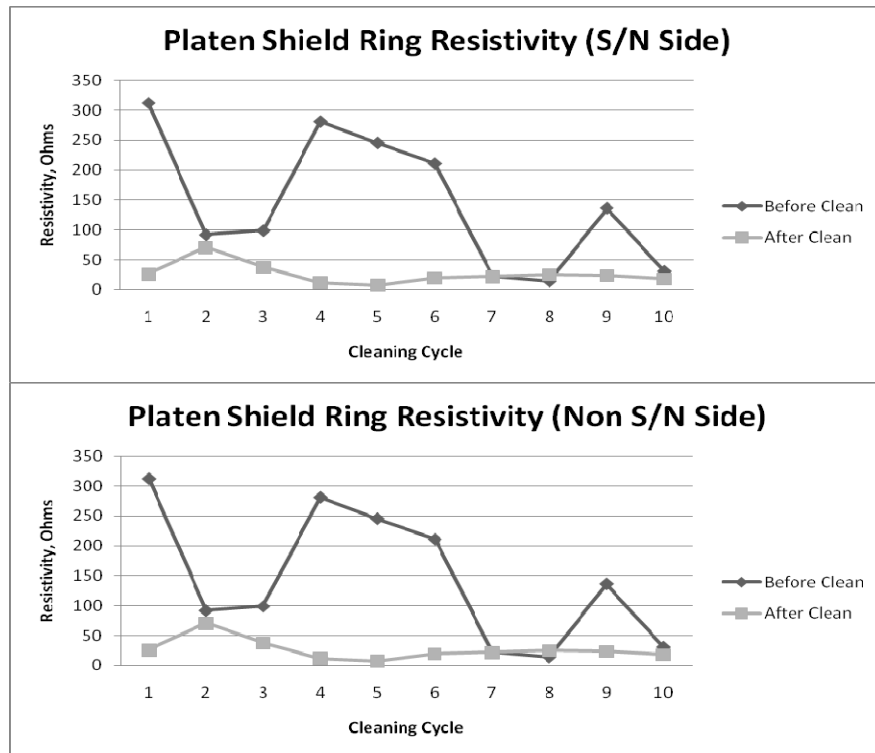


FIGURE 18 shows resistivity of the silicon surface of a ring shield liner before and after precision cleaning and recovery method of the present invention.

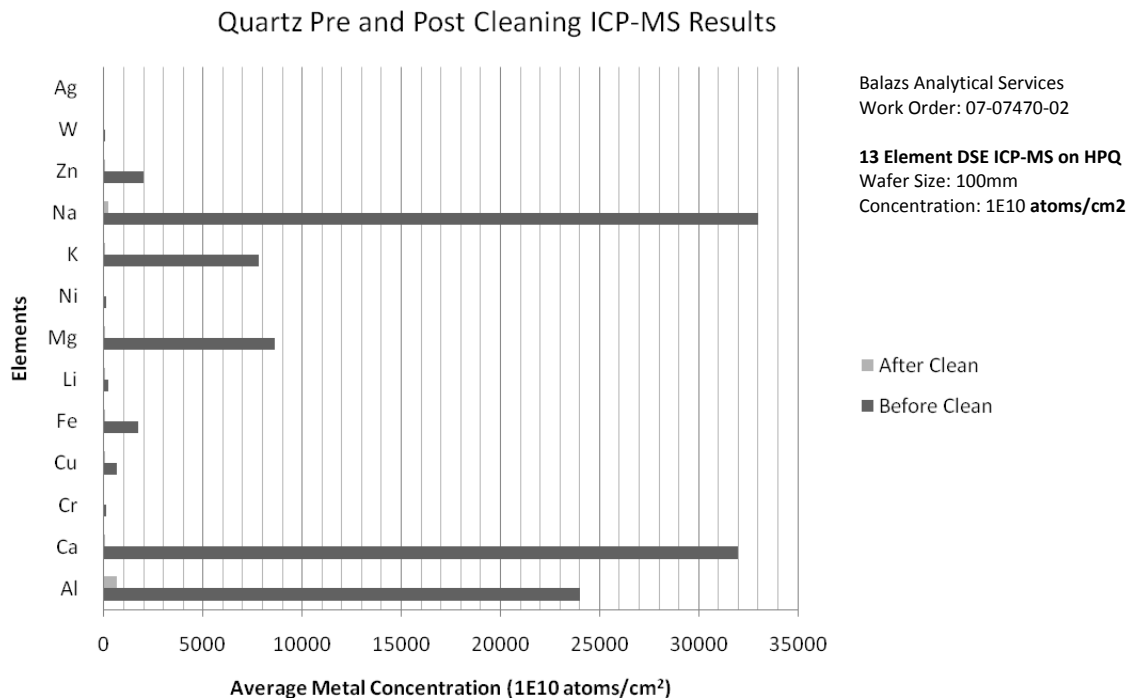


FIGURE 19 shows the cleanliness level of the quartz surface and the effectiveness of the present invention using Inductively Coupled Plasma - Mass Spectrometry (ICPMS) method.

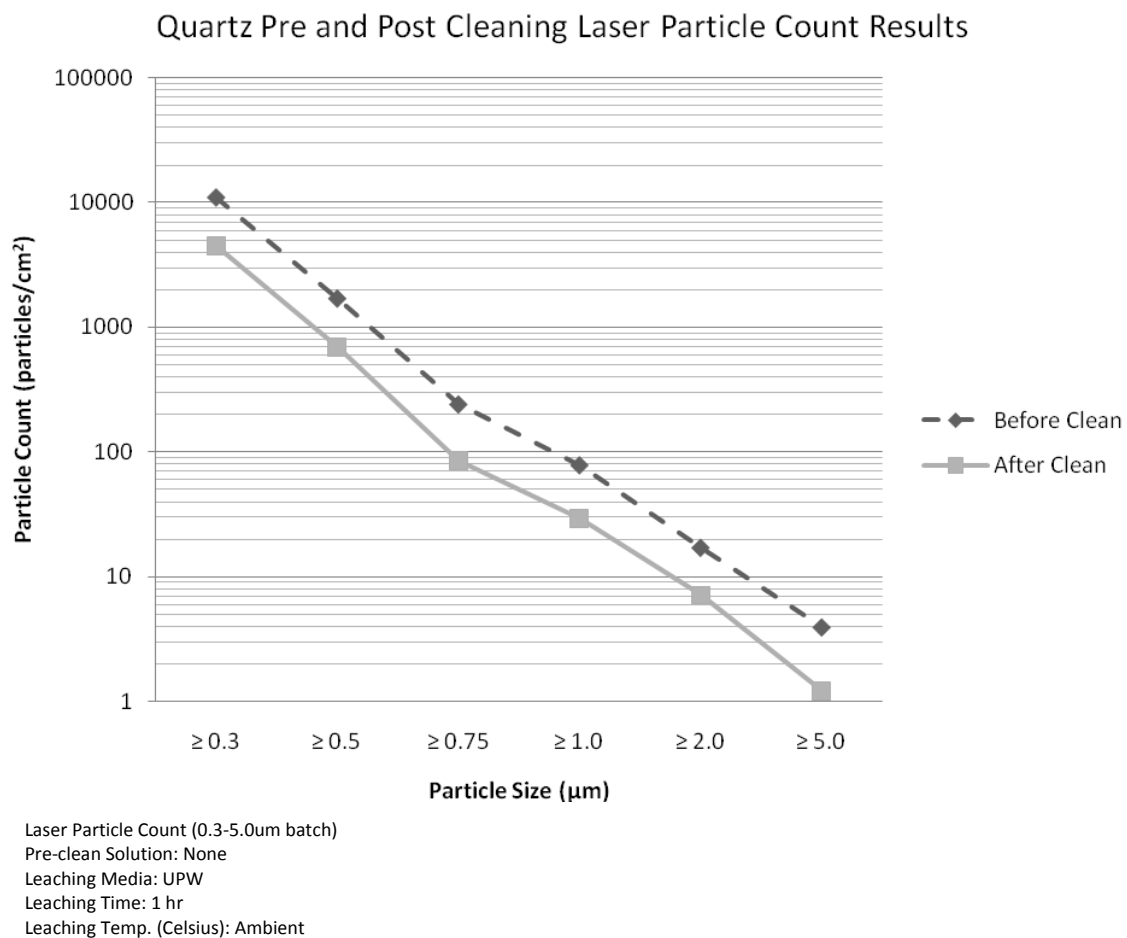


FIGURE 20 shows the cleanliness level of the quartz surface and the effectiveness of the present invention using the Laser Particle Count method.