Rapid, Molecule-Free, in-situ Rare Earth Element Abundances by SIMS-SSAMS

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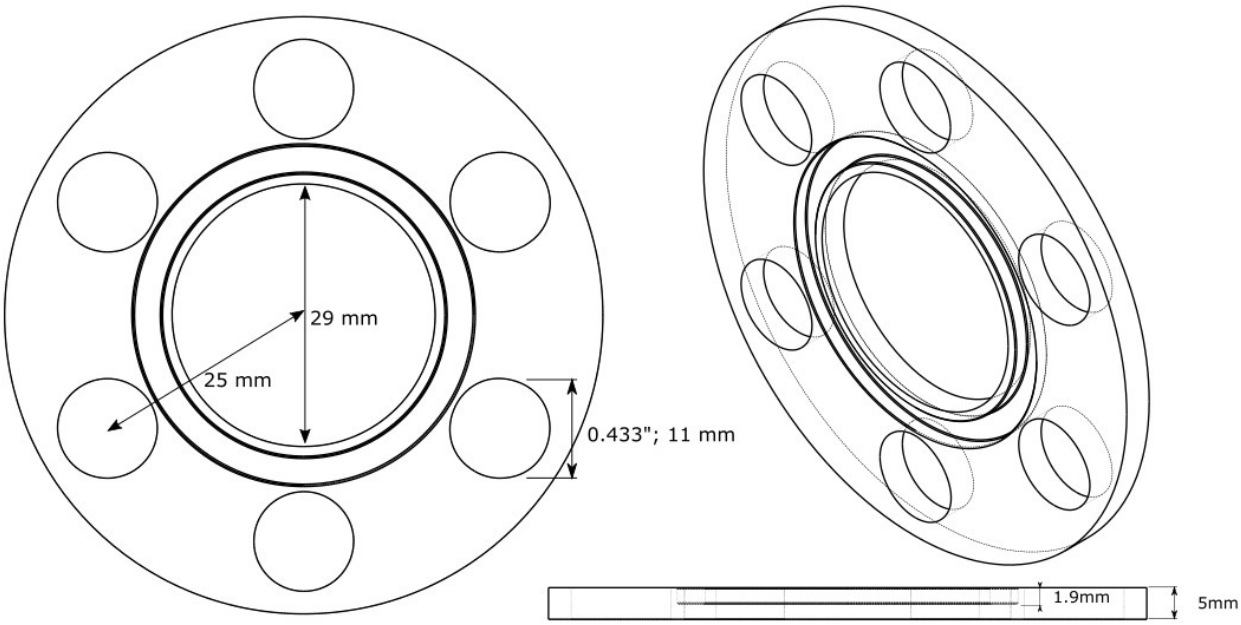
The supplementary information contains a description and design drawing of the PEEK insulators we fabricated to electrically insulate the magnet flight tube on our Cameca ims-4f secondary ion mass spectrometer.

1. Appendix

We had several insulators machined out of polyether ether ketone (PEEK) sheet and installed them between the SIMS magnet flight tube and the bellows before and after the magnetic sector on our modified Cameca ims 4f. Each insulator contains a groove for a Parker Viton 2-124 O-ring [1] with a gland depth of 0.075" and width of 0.120" (~1.9 and 3.05 mm, respectively). Gland ID and OD are 1.237" (31.42 mm) and 1.481" (37.62 mm), respectively. The gland is smoothed to 16 mil rms with 0.005" radius rounding on the edges. The central hole is 29 mm in diameter. Bolt holes are 11 mm in diameter to fit the stock M8 bolts on the 4f and Nylon top hat washers to isolate the bolts. The backside of the insulators are also smoothed to 16 mil rms in an annulus corresponding to a Parker 2-218 O-ring (ID 1.234", OD 1.512"), which sits in a groove in each of the adjacent bellows. PEEK was chosen due to its good machinability and excellent high-vacuum properties. Vacuum pressures above the ion pumps before and after the magnetic sector are 5×10^{-9} and 5×10^{-8} torr (1.33×10^{-7} and 6.66×10^{-6} Pa), respectively. The flight tube was wrapped in polytetrafluoroethylene (PFTE) tape and 0.5 mm PFTE sheets placed between the magnet pole pieces and the flight tube.



A-1: Schematic of PEEK insulator for isolating Cameca ims-4f flight tube to enable electrostatic peak switching.

References

(1) Parker Seal Company. *Parker O-ring Handbook*; Parker Seal Group, O-Ring Division, 2001.