

## **A SUMMARY THE QINETIQ HOLLOW CATHODE PROGRAMME IN SUPPORT OF THE ARTEMIS MISSION**

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A summary of the development and space qualification of hollow cathodes for the ESA Artemis mission is presented. A scaleable hollow cathode design has been developed and is now used as the basis for an extensive range of hollow cathodes being space qualified for use on a number of Hall effect thrusters and gridded ion engines.

A description of the cathode assembly is described and the results from the life testing of 4 devices (15,000 hours and 5,500 on/off cycles) and multiple cathode heater cycling tests (up to 11,000 cycles) are presented. Cathodes of this design have also been operated in deliberately poor vacuum conditions to simulate operation in low altitude orbit. This testing was performed in support of the ESA GOCE mission, which will use the QinetiQ T5 gridded ion thruster for drag compensation in low Earth polar orbit.

Environmental qualification testing and details of flight experiences on the STRV-1A and the ESA Artemis spacecraft are also presented.