



# X-ray Tube with Magnetic Electron Steering

## POTENTIAL MARKET APPLICATIONS

Agriculture

Food Sterilization

Destruction of Pathogenic Microorganisms

Testing and Inspection of industrial tools and systems

Water Purification

Medical

## BENEFITS

Increases the proportion of electrons emitted from the cathode that contribute to X-ray production in a compact geometry.

Provides increased X-ray generation efficiency by increasing the number of electrons that reflect back on the anode

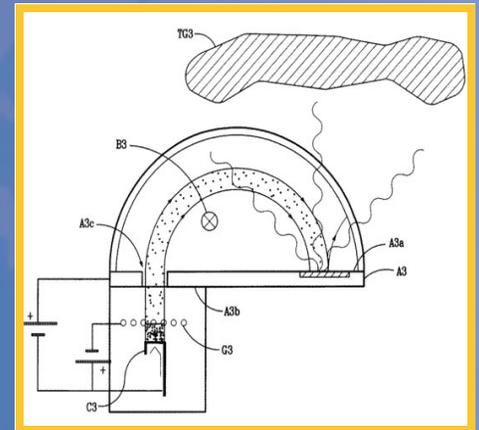
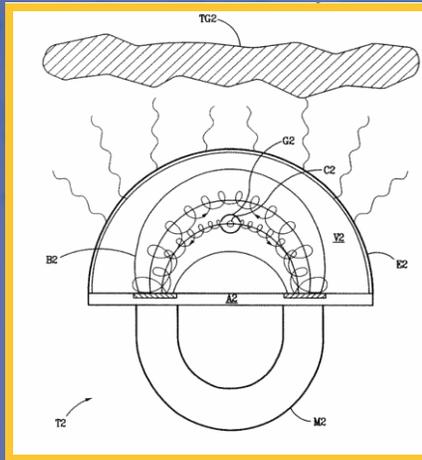
## INTELLECTUAL PROPERTY

US PATENT #6,151,384  
SD# 6081

## TECHNOLOGY SUMMARY

Sandia National Laboratories has created an improved efficiency compact X-ray source to address a wide range of applications. The high average power large area X-ray tube provides increased X-ray generation efficiency through the use of magnetic steering to reduce the number of electrons that do not contribute to X-ray production.

This invention consists of a cathode and anode mounted within an evacuated envelope. A magnetic field generator imposes a magnetic field that urges electrons toward the anode. This reduces the number of electrons that would escape the anode and cause electron heating of the tube. The magnetic field also urges electrons toward areas of the anode that will produce X-rays that are not shadowed. This improves the useable X-ray pattern.



These drawings depict a schematic view of an x-ray tube according to the present invention.

## TECHNOLOGY READINESS LEVEL

Sandia estimates this technology at approximately TRL 5. Key elements have been demonstrated in relevant environments.

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Sandia National Laboratories

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