

Public Abstract

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Title:Flashover Prevention on Polystyrene High Voltage Insulators in a Vacuum

Increasing performance of vacuum insulator barriers is a common goal in large pulsed power systems. Insulator performance is continually being improved while new methods are developed. Triple point shielding techniques have been shown to increase flashover voltage, but the role of cathode vs. anode shielding is still not fully understood. Magnetic flashover inhibition has been considered but has not been experimentally confirmed for 45 degree coaxial insulators.

Open circuit flashover characteristics were obtained for a coaxial geometry to view the effects of triple point shielding for this geometry. The tests included applying various combinations of triple point shields on zero degree and +45 degree insulators. Shielding was tested at the cathode triple point outside of the dielectric and at the anode triple point inside the dielectric.

Magnetic flashover inhibition was considered for 45 degree coaxial insulators. An experiment to test magnetic flashover inhibition was developed. The method could provide insight on how to configure a system to take advantage of magnetic flashover inhibition.

The role of anode versus cathode triple point shielding was examined. Flashover voltage was observed to increase when either a cathode or anode triple point shield was applied; however adding a shield to both regions lowered the flashover threshold. Both triple point regions were found to be important and dependant on each other for some coaxial geometries.