
Cathode spot path optimization to increase cathode uniform excavation of vacuum arc vaporizer

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The cathode excavation profile of the vacuum arc vaporizer with arch like magnetic field and controlled cathode spot movement path was analyzed. The dependencies of the cathode excavation inequalities were obtained. Cathode excavation profile with fixed cathode spot movement path was approximated with Gauss curve. Total cathode excavation profile was determined as the sum of excavation profiles of single paths which was obtained as shifted to a fixed step. The optimal step value of cathode spot movement path shifting was obtained as 1/3 of cathode excavation width of fixed cathode spot path position. This showed the inequalities of cathode excavations as 3 %.

Keywords: vacuum arc, cathode spot, evaporator, excavation, resource, material efficiency.

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