Increasing service life of an elecrohydraulic system electrode assembly by moving the positive electrode insulator away from the discharge region

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Low service life of electrode assemblies limits the application of electrohydraulic effect in the industry and laboratory practice. The insulator is the weakest link in the electrode assembly design. Increasing the electrode assembly service life involves searching for new materials and new design options. We suggest an assembly design with the insulator moved away out of the region where the discharge channel forms. We use polycarbonate as the insulator material. A design feature in the shape of a circular groove in the insulator surrounding the electrode allowed us to eliminate unwanted streamer growth from the metal-dielectric interface. We define a criterion for estimating discharge efficiency from the magnitude of the discharge current in the first discharge half-wave, based on discharge current oscillograms obtained in experiments. Furthermore, we determine the conditions leading to a stable, recurrent, highly efficient discharge. We state the directions for further investigations in the field of increasing electrode assembly service life. We show that the electrode assembly design based on moving the insulator away out of the discharge channel region and using polycarbonate as the insulator material ensures an adequate service life of the discharge assembly.

Keywords: *elecrohydraulic effect, pulsed discharge, liquid, polycarbonate, service life, electrode assembly.*

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