

What is capacitor discharge welding?

Capacitive discharge welding, particularly for large-scale systems, is typically done using film-type capacitors. These capacitors store energy along alternating plates separated by a dielectric film. Charge is stored statically along the lengths of the plates. The basic configuration of the film capacitor is provided in Figure 1.

Are electrolytic capacitors a viable alternative for large capacity CD welding systems?

Electrolytic capacitors (E-caps) offer a potential alternative for large capacity CD welding systems. E-caps incorporate an electrolyte impregnated into a separator. The separator is then sandwiched between anodic and cathodic foils. A dielectric is also used to prevent direct contact of the foils with the electrolyte.

Can electrolytic capacitor arrays be made available?

Current estimates based on this work are that electrolytic capacitor arrays can be made available at a price point nominally 80% of that for the current film variants. Table 2.

Can electrolytic capacitor arrays be used for balancing resistors?

The application of such electrolytic capacitor arrays is, of course, not without design considerations. One challenge is the design of arrays that can uniformly balance voltages across series capacitors during repeated charging cycles. In this work, that was accomplished through the use of balancing resistors (~100 k?).

Does a film capacitor provide a similar voltage tolerance for CD welding?

Performance was evaluated based on current range behavior and metallographic response. Conclusions from this work include: to film capacitors - An array was developed to provide similar voltage tolerance and system capacitance to a standard film variant conventionally used for CD welding.

Are welds made with E-Cap metallographic data similar?

Similar results for the welds made using the E-cap array with the 213:1 turns-ratio are provided in Figure 15. Comparative metallographic data from welds made using the film capacitor(3) are provided in Figure 16. The micro-structural response from welds made with the two capacitor types is again nearly identical.

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