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# NASA TECH BRIEF



## Electrochemical Sintering Process for Producing Electrodes from Cadmium Felt and a Nickel or Silver Grid

Commercially fabricated cadmium felt electrodes are now available for testing and evaluation. The electrochemical sintering process for producing these electrodes is of interest to battery manufacturers and the electrochemical industry.

Cadmium felt is made by drawing off the solvent from a slurry of fine cadmium fibers by means of suction filtration. The layer of intertwined fibers on the fiber bed is then pressed to the desired thickness. Thermal sintering of the felt is impossible because heating at temperatures below the low melting point of cadmium does not result in permeation at contact points.

Two pieces of cadmium felt are sandwiched around a nickel screen or silver expanded metal grid, held together by mold compression, and electrochemically sintered by being put through several charge and discharge cycles at low current density (0.5–1.0 ma/cm$^2$ approximately). The pieces of felt grow together through the grid. A network of conductive current paths forms, gradually beginning at the grid and working out into the felt to more and more of active cadmium material. This causes the ampere-hour capacity of the electrode to increase. A strong finished product results.

The use of cadmium felt is a novel method of affixing active cadmium to electrode substrates. This felt serves a double function both as the active material and as the substrate. Advantages of the electrode production process are ease of quality control and speed.

### Note:

No further documentation is available. Inquiries may be directed to:

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Reference: B69-10227

### Patent status:

No patent action is contemplated by NASA.

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