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Goddard Space Flight Center



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Screening Method Improves Performance of Nickel-Cadmium Batteries

Methods for selecting and screening nickel-cadmium cell materials used in batteries can be used for improving battery performance and reliability. Test results show the weight of a single plate within a batch can be used as a criterion for selecting those plates which have a uniform, high plate ampere hour capacity. A statistical analysis of these results shows high weight-to-capacity correlations, and gives a reliable means of predicting the capacity of a plate from its weight alone.

The battery plates were fabricated by sintering nickel powder onto a screen (or perforated sheet substrate) to form an 80% porous plaque structure. The plaque was then impregnated with the active material; i.e., nickel hydroxide for the positive plate and cadmium hydroxide for the negative plate.

In five out of six groups tested, plates with the lowest weight had the lowest ampere hour capacities, and those with the highest weight had the highest capacities. These results lead to the conclusion that, when the substrate and plaque weights are uniform, the observed current capacity differences are dependent on the quantity of the active material in the plaque.

Additional testing of plates and other battery materials is continuing in order to improve the screening methods and control techniques.

The use of this screening method on a recent Orbiting Astronomical Observatory (OAO) resulted in a reduction of cell capacity spread from $\pm 7\%$ to $\pm 3\%$, or a 50% improvement in tolerance.

Note:

Requests for further information may be directed to:

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No patent action is contemplated by NASA

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