# Grace DAKASEP Alkaline Battery Separator

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The Grace DAKASEP separator was originally developed as a wicking layer for nickel-zinc alkaline batteries. DAKASEP is a filled non-woven separator which is flexible and heat sealable. Through modification of formulation and processing variables, products with a variety of properties can be produced. Variations of DAKASEP have been tested in Ni-$H_2$, Ni-Zn, Ni-Cd and primary alkaline batteries with good results.

Table I shows properties of DAKASEP which are optimized for Hg-Zn primary batteries. This separator has high tensile strength, 12 micron average pore size, relatively low porosity at 46-48% and consequently moderately high resistivity. Versions have been produced with greater than 70% porosity and resistivities in 33 wt% KOH as low as 3 ohm cm.

Performance data for Hg-Zn E-1 size cells containing DAKASEP with properties shown in Table I are more reproducible than data obtained with a competitive polypropylene non-woven separator. In addition, utilization of active material is in general considerably improved.

*Person to whom inquiries about DAKASEP should be addressed.

Table I

GRACE DAKASEP Alkaline Battery Separator Characteristics*

| Production Run Number | 47 | 48 |
|---|---|---|
| Ream Weight (pounds/3000 $ft^2$) | 74.2 | 71.7 |
| Thickness (mils) | 11.5 | 11.5 |
| Tensile strength (pounds/$in^2$) | 1260 | 1190 |
| Tensile (pounds/in) | 14.5 | 13.7 |
| Maximum pore size (micron) | 21.1 | 21.1 |
| Average pore size (micron) | 12.0 | 12.2 |
| Porosity (volume percent) | 46 | 48 |
| Wetout time (sec in 33% KOH) | <3 | <3 |
| Resistivity (ohm cm) | 15.0 | 14.8 |

*Note that properties of DAKASEP can be tailored to customer specifications.

GRACE DAKASEP Alkaline Battery Separator Development

- Grace has developed a separator for alkaline batteries.

- DAKASEP is a filled non-woven (flexible and heat sealable) separator.

- Properties of DAKASEP can be tailored to battery manufacturers specifications.

- Variations of DAKASEP have been tested in Ni-$H_2$, Ni-Zn, Ni-Cd and primary alkaline batteries with promising results.

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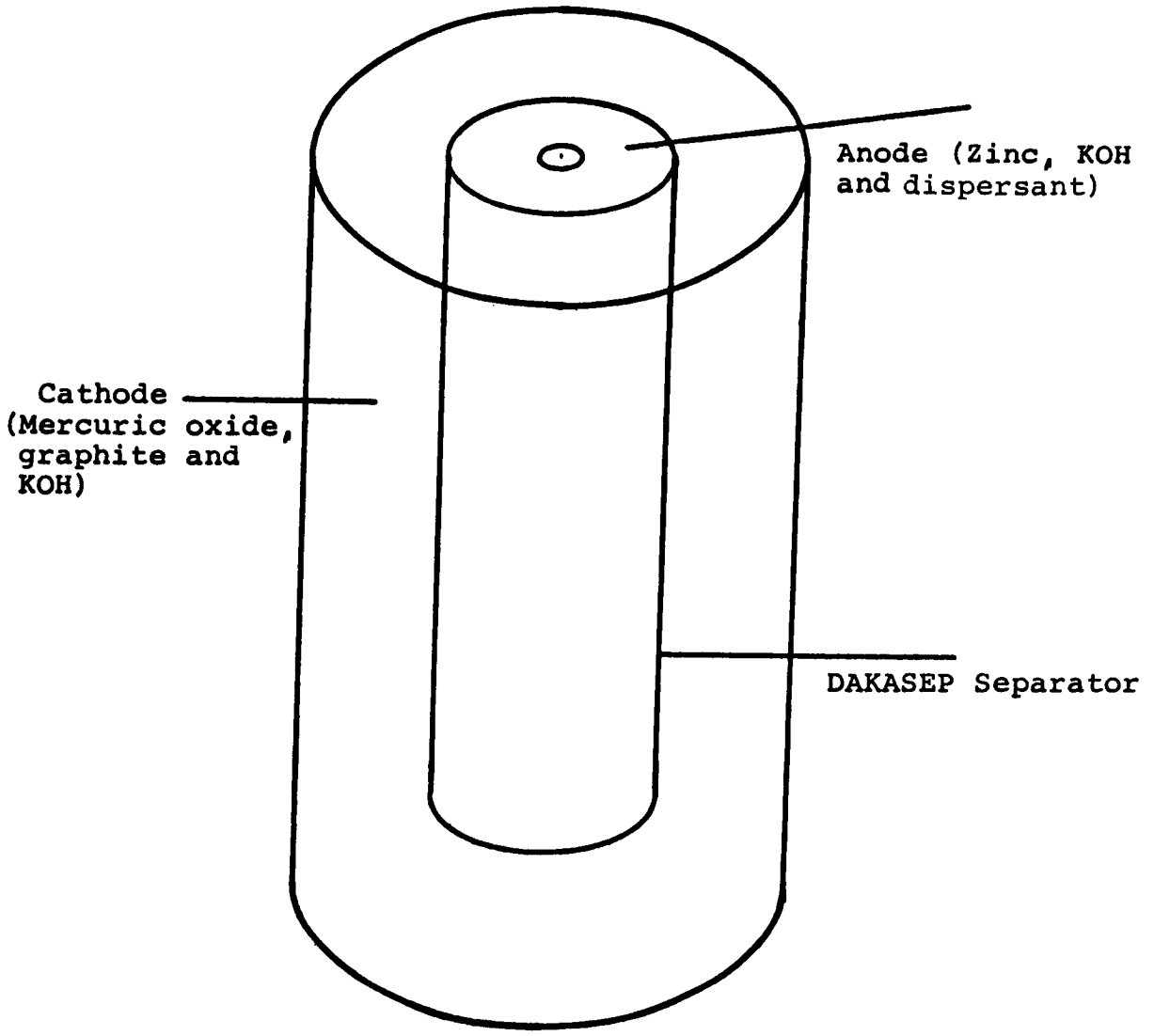
Figure 1. GRACE DAKASEP Alkaline Battery Separator Characteristics.*




Schematic Representation of a Hg - Zn Cell

Figure 2.

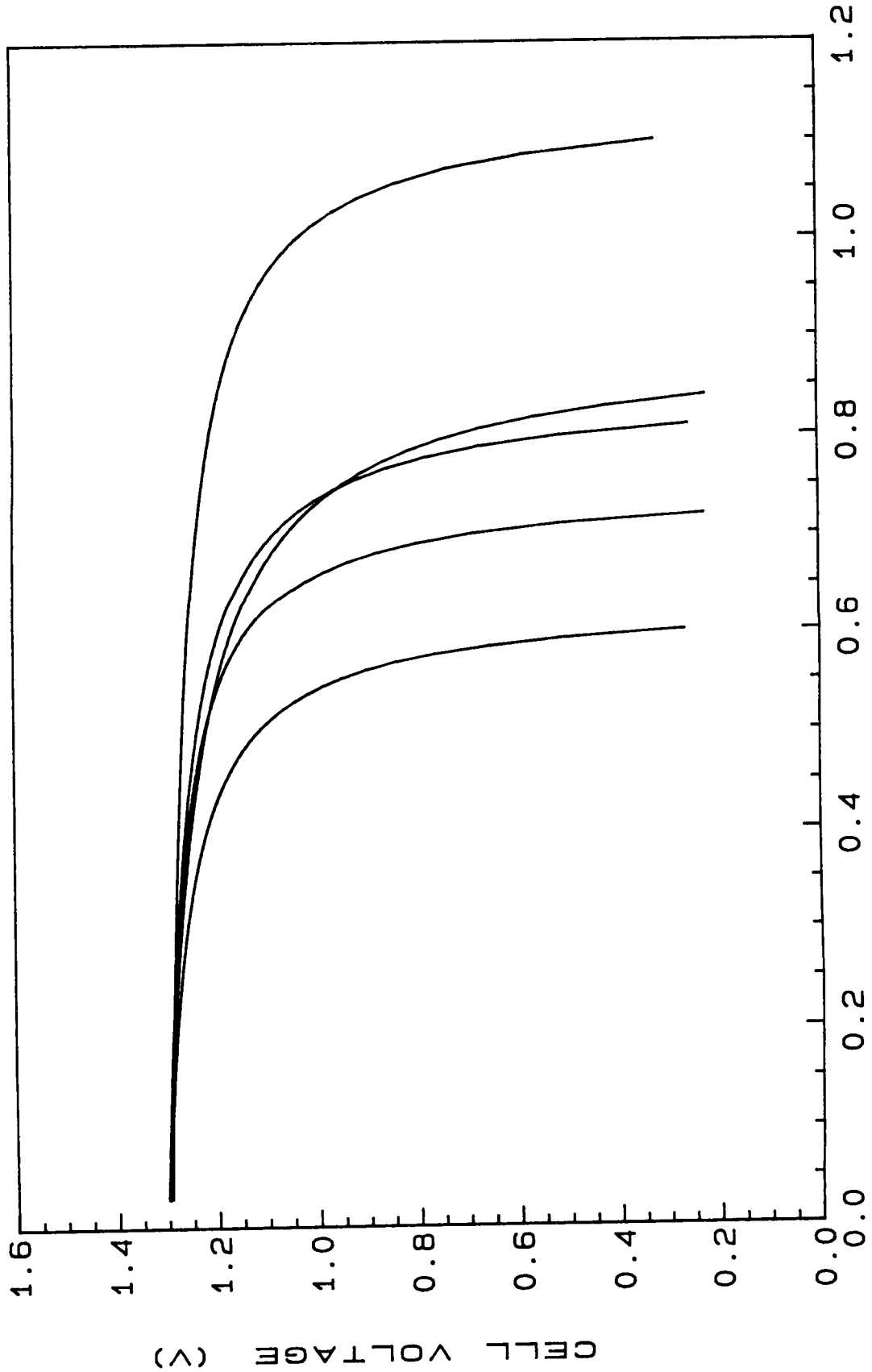



Figure 3. Performance of E-1-Size HG/ZN Cells (R = 35 OHM); Competitive Separator (Polypropylene Nonwoven).

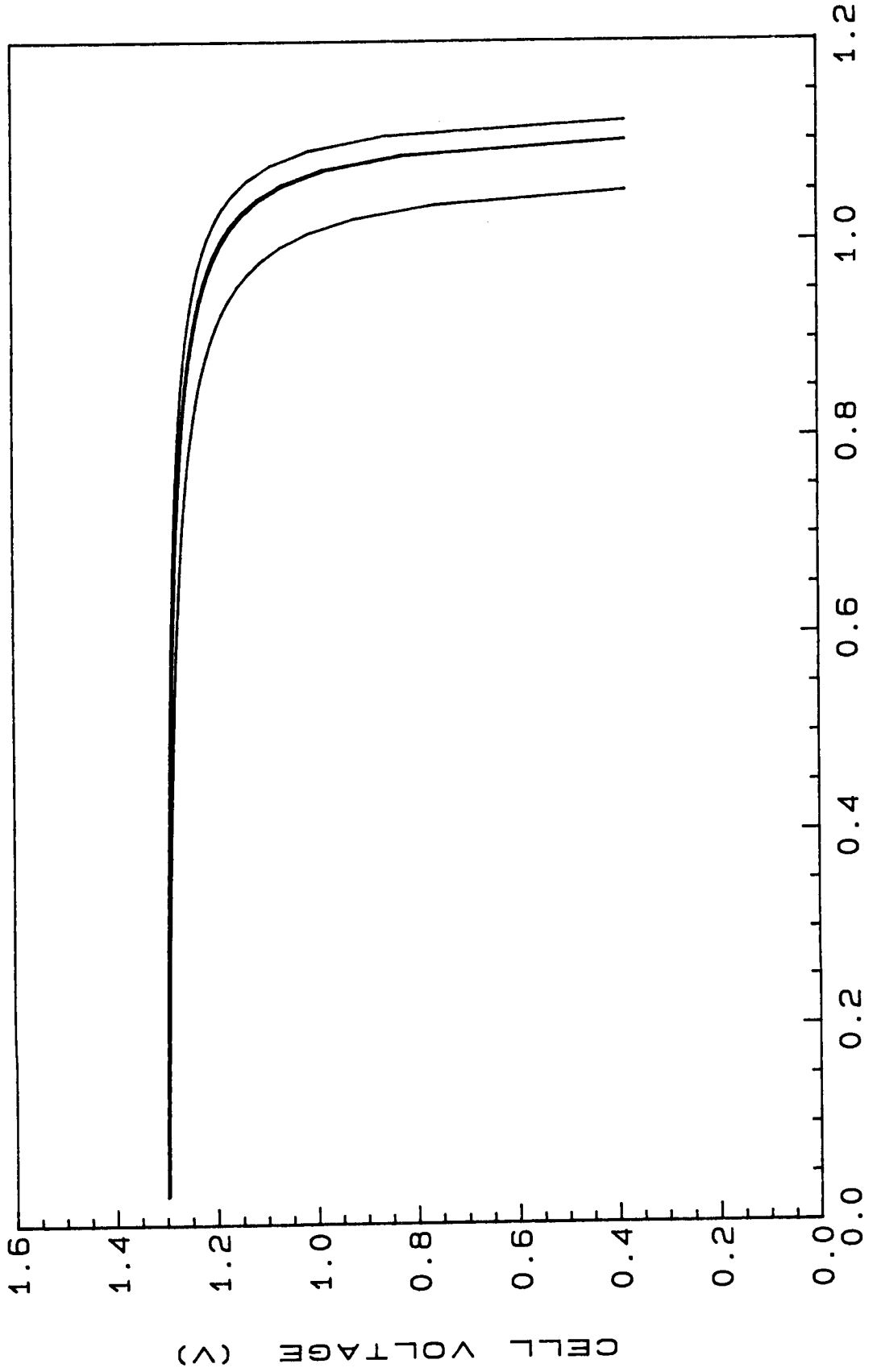



Figure 4. Performance of E-1-Size HG/ZN Cells (R = 35 OHM); Grace DAKASEP Separator.

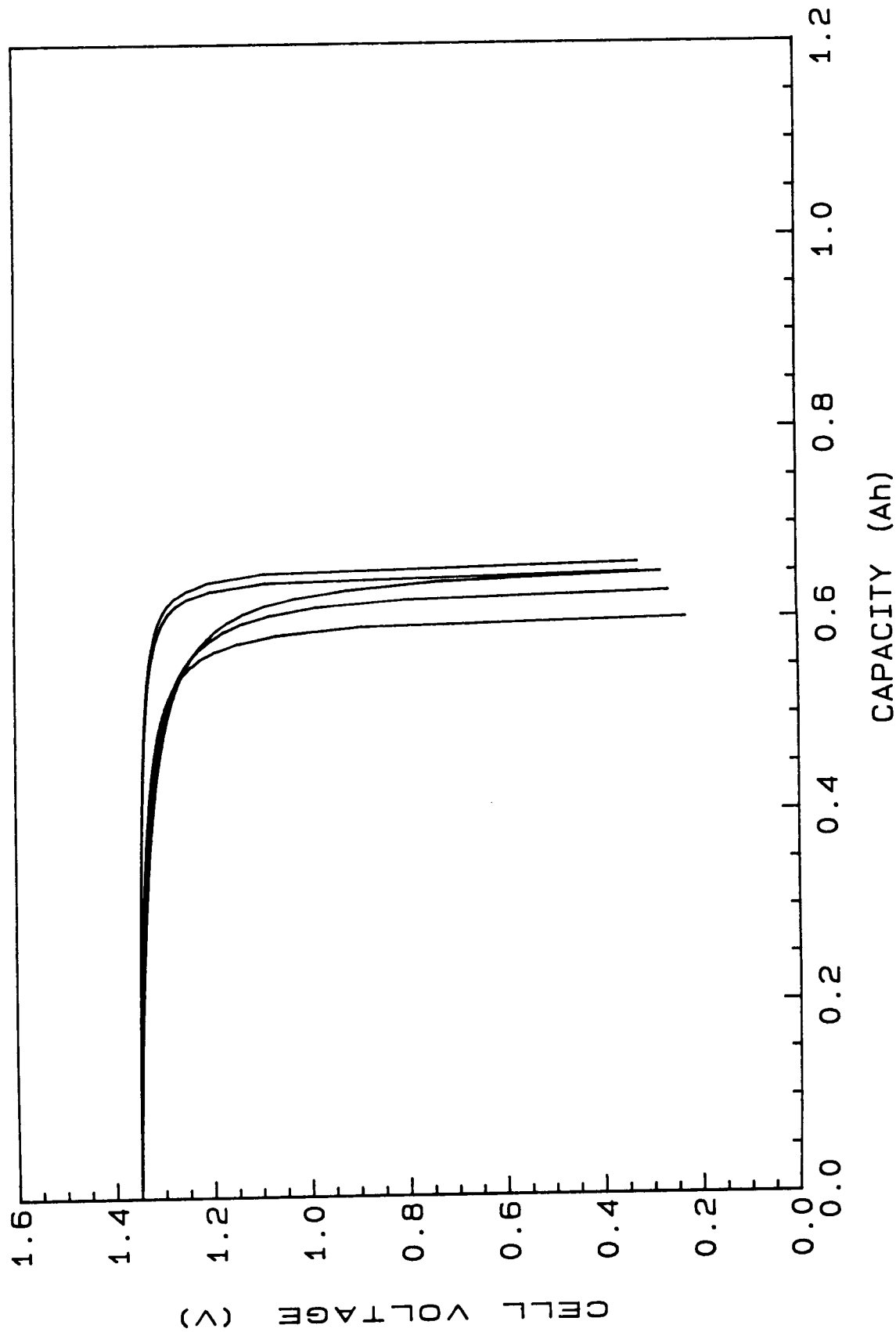



Figure 5. Performance of E-1-Size HG/ZN Cells (R = 15 OHM); Grace DAKASEP Separator.