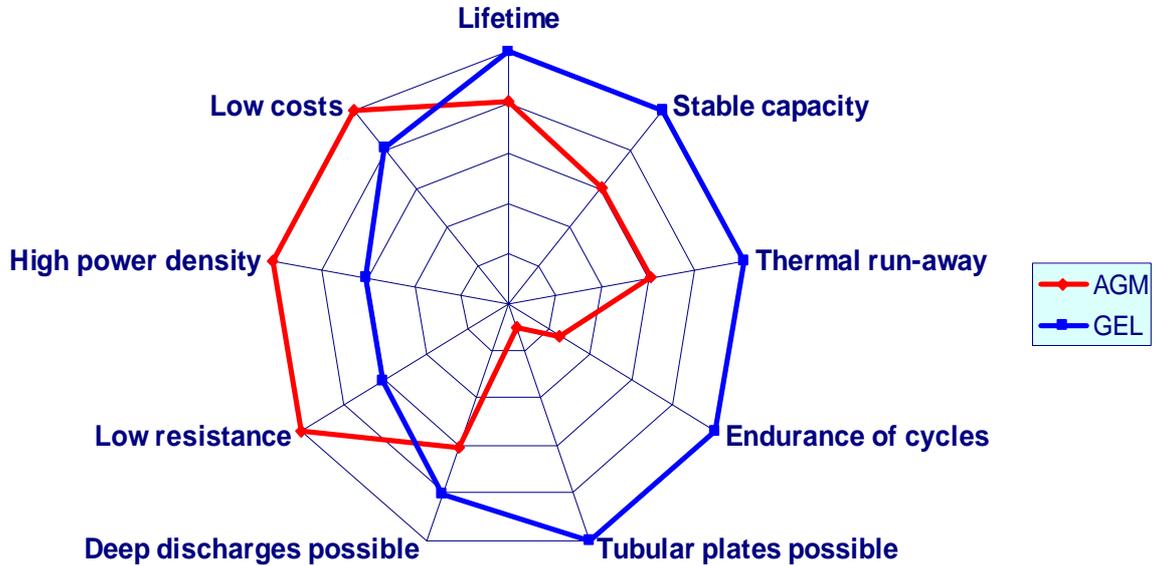


COMPARISON BETWEEN MAINTENANCE FREE LEAD ACID BATTERIES OF AGM AND GEL DESIGN

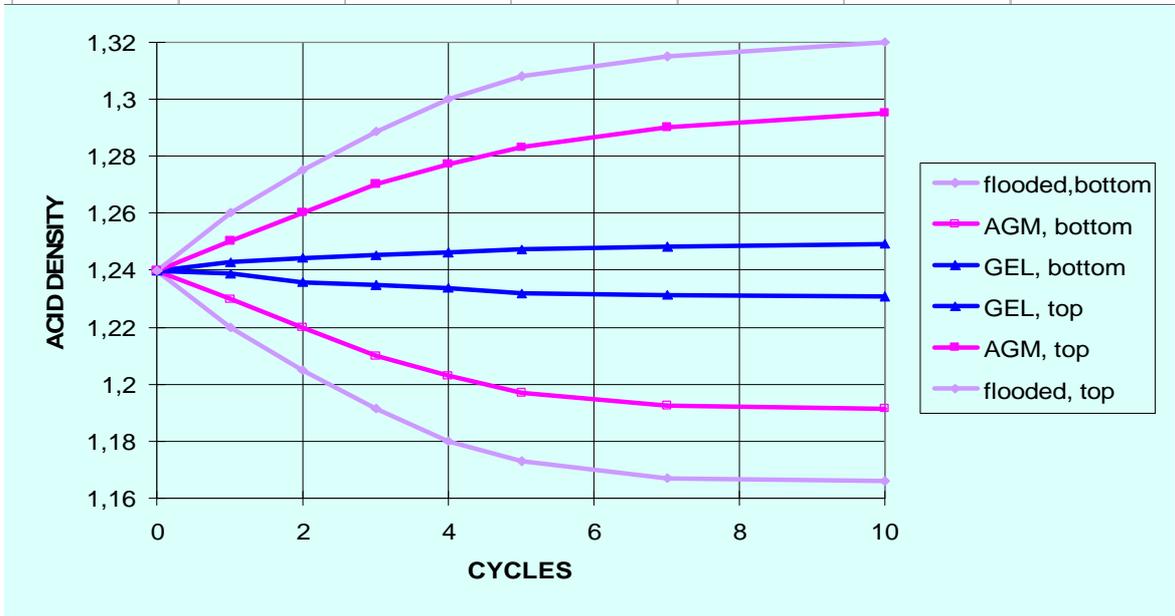
AGM BATTERIES (Liquid electrolyte contained by Glass Mat separators)

GEL BATTERIES (Gelled electrolyte with micro porous separators)



CHARACTERISTIC	AGM BATTERY	GEL BATTERY
Cycle Life	Low because of acid stratification, lack of contact between separator and plate, thinner plate, dendrites	Better. No acid stratification, smaller pores = no dendrites, thicker and tubular plates possible
Tolerance towards deep discharges	Low. Large pores allow growth of dendrites through AGM separator	Better. Microporous separator and gelled electrolyte prevent dendrite growth
Thermal runaway	Possible because of high internal recombination and low diffusion resistance	Less possible due to hindered diffusion by gel and microporous separator
Stability of capacity over life	Low. Increasing dry-out during life increases internal resistance and contracts the AGM separator reducing contact with plates	Good. Gel remains wet. Internal resistance remains relatively constant. Gel creeps to maintain contact with plates
Internal resistance	Very low. Ideal for UPS application	Higher because of the Gel and separators
Power density	High. Low electrical losses and low space requirement	Not as high. Average electrical losses. Similar space requirement to AGM.
cost	Low. AGM glass mat separators cheaper than microporous separators	Higher. Apart from the separators Gelled electrolyte batteries cost slightly more to manufacture.
Design constraints	Grid plate only. Low tolerance on plate thickness; cell height limited to around 350mm	Grid or tubular plate. No cell height restriction.

ACID STRATIFICATION IN CELLS



Based on complete discharge cycles with no gassing charge

ACID DISTRIBUTION IN THE CELL AFTER 10% WATER LOSS

