



ENTEK

RAISING EXPECTATIONS.
KEEPING THEM THERE.



ENTEK AGM

ENTEK AGM products offer industry-leading quality and performance for every demanding environment. Vertically integrated glass fiber production gives us the highest control with unparalleled operation in stressful applications. With a wide range of uses including UPS, Hybrid Vehicles, E-Bike, Forklift, Golf Cart, and Base Stations for Telecom, ENTEK AGM has you covered for all of your VRLA needs.

An Absorbent Glass Mat (AGM) separator is a paper or mat that is composed of specially selected acid-resistant glass fiber. In some AGM types, additives can be incorporated into the glass fiber mixture to impart unique properties for battery manufacturing and/or to improve certain battery performance. It is used in Valve-Regulated-Lead-Acid (VRLA) batteries to separate the positive and negative plates of the battery cell and prevent a short-circuit. Its porous structure absorbs battery acid much like a sponge and allows the transfer

of electrons between the plates during charge and discharge conditions.

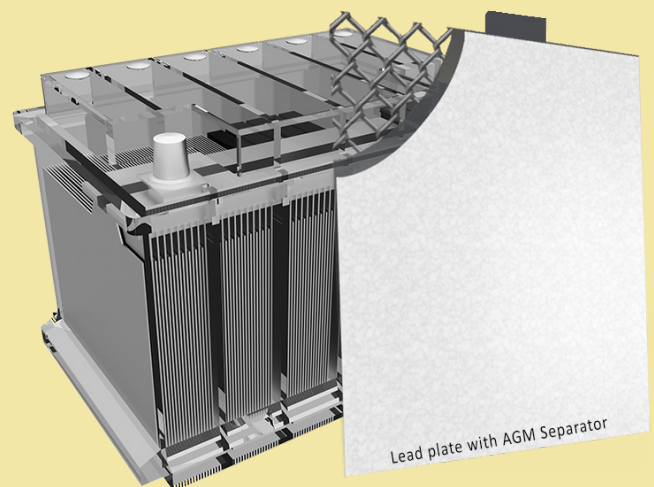
AGM Advantages:

- Low Internal Resistance (IR)
- Excellent Cycle-Life
- Improved Dynamic Charge Acceptance (DCA) and Depth of Discharge (DOD)
- Resistant to sulfation and vibration

AGM Separator Types:

VRLA batteries are used in a variety of applications that require certain features of the AGM separator. Depending on the customer need, ENTEK AGM is available in three types and can be generally described as follows:

- 1. All-glass fiber AGM:** is typically used in applications where maximum capacity and battery life are concerned.
- 2. Hybrid-AGM:** used where mechanical strength is important for, e.g., high-speed battery assembly, where there is a narrow distance between the poles, and/or where the battery is subject to vibration during use.
- 3. Hybrid-PLUS-AGM:** used in similar applications as Hybrid-AGM, especially where there is a requirement for long-life cycle batteries or where batteries are concerned with dendrite short-circuit.



ENTEK AGM PORTFOLIO

(most popular grades shown)

All-glass fiber AGM: a multi-purpose separator composed of 100% specially selected acid-resistant glass fiber. It exhibits low electrical resistance and superior absorption characteristics for maximum capacity, resistance to dendrite growth, and acid stratification. It is available in a wide range of density, thickness and depending on the specific surface area selected, is suitable for float or high-rate discharge applications.

Typical Characteristics

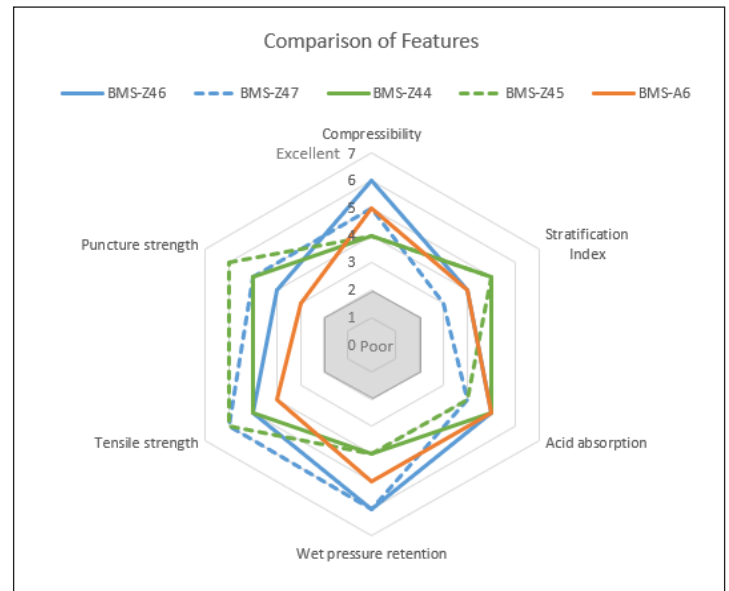
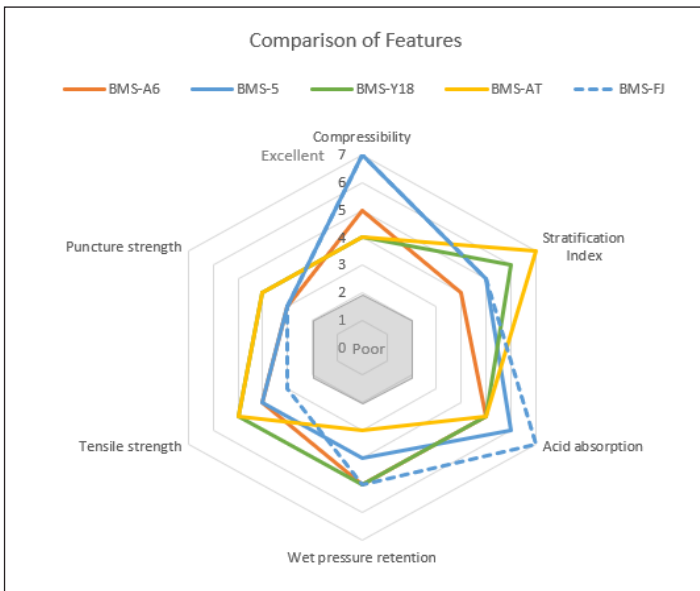
Grade	BET Specific Surface Area (m ² /g)	Density [@10kPa] (g/cm ³)	Loss on Ignition (%)	Tensile Strength [MD] N/10mm ²
BMS-A6	1.4	0.150	0.4	5.3
BMS-5	1.5	0.130	0.4	4.5
BMS-Y18	1.6	0.153	0.4	8.0
BMS-AT	2.0	0.150	0.4	8.5
BMS-FJ	1.5	0.130	0.4	3.2

Hybrid-AGM: a robust separator composed of a blend of acid-resistant glass and polymer fibers to increase mechanical properties such as tensile and puncture strength to minimize puncture short-circuits during battery assembly, and to increase vibration resistance to prevent short-circuits when in use.

Typical Characteristics

Grade	BET Specific Surface Area (m ² /g)	Density [@10kPa] (g/cm ³)	Loss on Ignition (%)	Tensile Strength [MD] (N/10mm ²)	Puncture Strength (N/mm)
BMS-Z46	1.3	0.150	8	8.0	4.5
BMS-Z47	1.2	0.147	16	9.0	6.5
BMS-Z44	1.9	0.150	8	8.5	5.5
BMS-Z45	1.8	0.147	16	11.0	7.5
BMS-A6 ¹	1.4	0.150	0.4	5.3	2.6

¹ Comparison with all-glass fiber AGM



ENTEK AGM PORTFOLIO

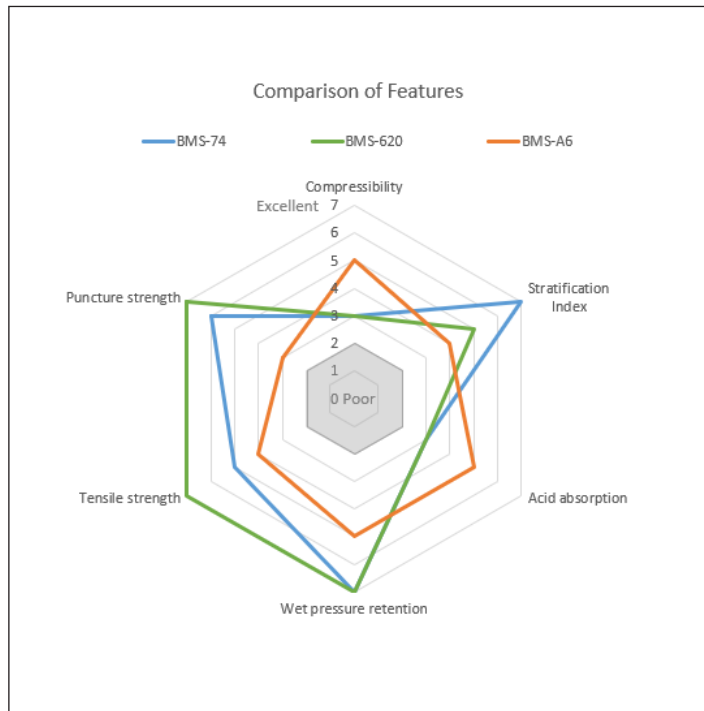
(most popular grades shown)

Hybrid-PLUS-AGM: a Hybrid AGM with silica filler to minimize the occurrence of dendrite short-circuits and maximize cycle-life performance. It is ideally suited for solar and EV applications where cycle-life and endurance are required.

Typical Characteristics

Grade	BET Specific Surface Area (m ² /g)	Density [@10kPa] (g/cm ³)	Loss on Ignition (%)	Tensile Strength [MD] (N/10mm ²)	Puncture Strength (N/mm)
BMS-74	35	0.195	10	6.5	6.4
BMS-620	20	0.195	30	21.7	16.1
BMS-A6¹	1.4	0.150	0.4	5.3	2.6

¹ Comparison with all-glass fiber AGM

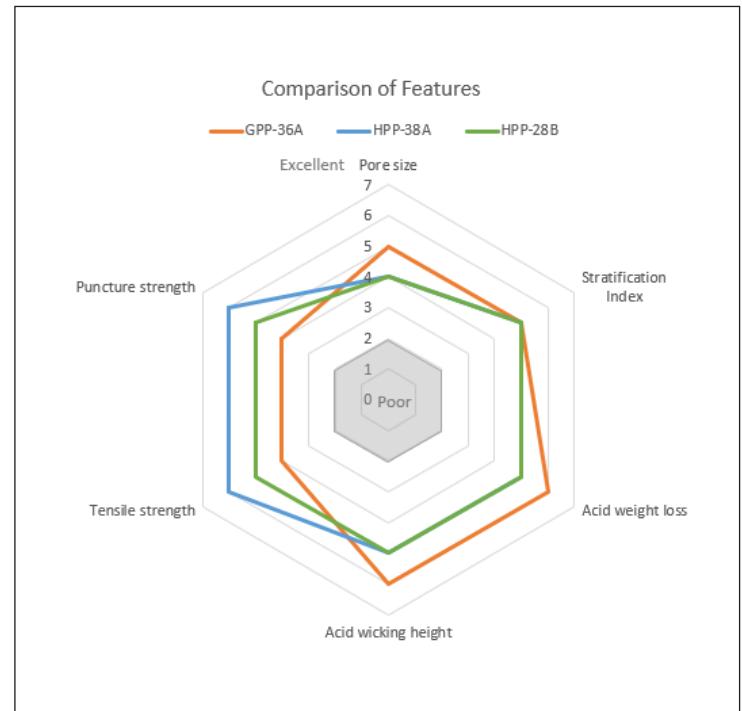


AGM Pasting Paper: a dual-functioning product engineered to enhance AGM separator performance and serve as a process aid to retain active materials using continuous grid pasting technology. Depending on customer requirements, this is composed of 100% acid-resistant glass fiber or with a blend of acid-resistant glass and polymer fibers.

Typical Characteristics

Grade	BET Specific Surface Area (m ² /g)	Thickness [@10kPa] (mm)	Basis weight (g/m ²)	Loss on Ignition (%)	Tensile Strength [MD] (N/25mm)
GPP-36A¹	2.2	0.2	36	0.4	5
HPP-38A¹	1.6	0.2	38	15	9
HPP-28B¹	1.6	0.2	28	11	7

¹ Numbers indicate basis weight



Typical VRLA Applications

MARKET SEGMENT	APPLICATION
Automotive	48V (Mild Hybrid) 12V Stop-Start (Micro Hybrid)
Powersport	Recreational Vehicle (RV)
	All-Terrain Vehicle (ATV)
	Motorcycle
	Marine
	Jet Ski
Aircraft	Snowmobile
	E-Bike
	General Aviation
	Commercial
Motive Power	Military
	Mining
	Railroad
	Industrial Truck
Stationary	Automated Guided Vehicle (AGV)
	Misc. Stationary
	UPS
Energy Storage (ESS)	Control & Switchgear
	Communications (Telecom)
	Regulation
	Arbitrage
	Black-start
	Back-up
	Investment Deferral
	Grid Independent Power Supply (GIPS)



ACCELERATING THE FUTURE

ENTEK is a technical leader in the development of battery separator solutions and the first separator supplier in the world to offer products across the three primary separator technologies (Lead Acid, Lithium and AGM). Our robust R&D Team is leading innovations to answer market demands from a technical, quality and commercial standpoint. ENTEK is devoted to serving the lead-acid industry with reliable products to ensure the success of its customers. Our customer-centricity is based on our philosophy: "Be the best supplier to our customers, and the best customer to our suppliers" to answer the market expectation with a reliable and sustainable partnership. For over 35 years, we've helped customers exceed their business objectives. How can we help you?



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