



The **WISE** Choice

EASTMAN WORLD

Welcome to Eastman World - Your Global Partner in Energy Solutions!



TUBULAR BATTERIES

TALL TUBULAR | TUBULAR GEL
SHORT TUBULAR MAINTENANCE FREE

Eastman Introduction

Founded in 2006

Established in 2006, Eastman Auto & Power Limited is a well-known name in the field of solar energy, energy storage, and power electronics, boasting a USD 300 million revenue and a dedicated workforce of over 3,000 professionals. Building on the group's decades-long success and maintaining the trust of our partners, Mr. Jagdish Rai Singal ventured into the future of energy with Eastman Auto & Power Limited. Today, the business spans over 25 countries across Asia and Africa, providing the world with cutting-edge products that have set new benchmarks in their respective segments. Driven by innovation, we continually set industry standards, ensuring uninterrupted power supply for residential, commercial, and industrial applications.

Our global solar distribution business provides reliable and high-quality solar solutions, including solar inverters, solar panels, solar batteries (tubular, carbon, gel and lithium) solar pump inverters, solar charge controllers, and more. Our products offer a range of solutions to help you make the switch to clean energy. With us as your unwavering partners, we forge a sustainable future, amplifying global excellence through transformative products and services.



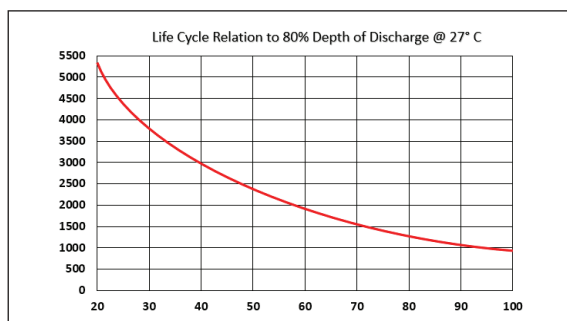


TALL TUBULAR BATTERY

100, 150, 200, 220, 230, 240Ah

Series: Regular

Expected Life



Technical Specifications

- Poly Components Material: Polypropylene Co polymer, Color: Blue
- Watering System: Individual in every cell in monobloc
- Testing Parameters - IS 13369:1992 , IEC 60896-11 & IEC 61407-1

Introduction

Our Tall Tubular Battery is a specialized energy storage solution crafted to meet your diverse power needs efficiently. Engineered with a focus on longevity and reliability, it stands out as a dependable source of power, ensuring a consistent and uninterrupted energy supply over an extended period.

Product Features

- Robust Tubular with High Pressure diecasted spine- resulting low rate of spine corrosion.
- Spill Proof Vent plug - resulting in no spillage on top and low controlled acid fumes.
- Optimized Negative paste receipt for fast charge acceptance
- Consistent backup throughout life
- Excellent behavior in PSOC condition as compare
- Low Self Discharge
- Excellent performance on deep cyclic application as compare to AGM VRLA
- Very High Design & Service Life
- Low water loss
- Low Cost Of Ownership
- Easy Recovery After Idle Period
- Lowest Electricity Consumption In Recharging
- Less Fumes Generation
- 5% Extra Capacity & Backup WRT Rated Capacity

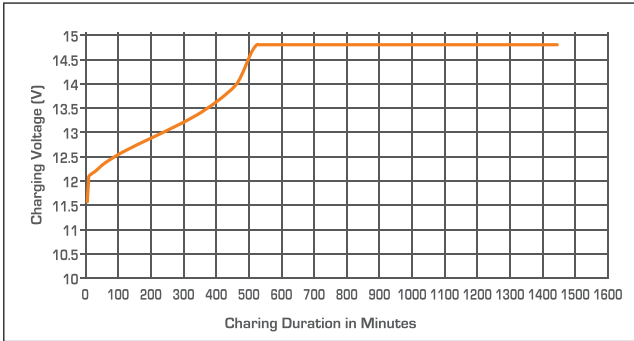
Model	EM220			EM230		
Nominal Voltage (V)	12V			12V		
Rated Capacity 20 Hr @ 27° C	220Ah			230Ah		
Approx. Weight	67.6			68.5		
Dimensions(L*W*H)mm	506*207*405			506*207*405		
Terminal	L			L		
Battery Capacity Test @27° C	C20@10.5V- 220Ah	C10@10.5V- 198Ah	C7@10.5V- 182Ah	C20@10.5V- 230Ah	C10@10.5V- 207Ah	C7@10.5V- 190Ah
	C5@10.5V- 165Ah	C3@10.5V- 142Ah	C1@10.5V- 99Ah	C5@10.5V- 172Ah	C3@10.5V- 148Ah	C1@10.5V- 104Ah
	Energy Kwh-2.6Ah			Energy Kwh-2.8Ah		
Ah Efficiency	>90%			>90%		
Wh Efficiency	>75%			>75%		

TALL TUBULAR BATTERY

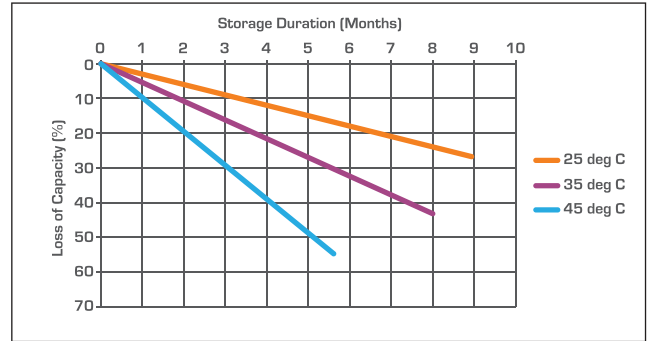


Charging & Discharging | Characteristics Regular Series

Charging Profile



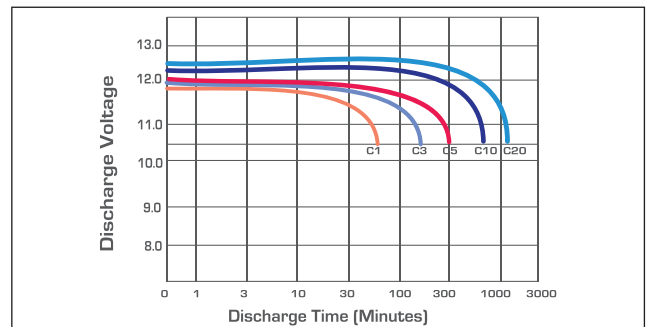
Discharge Characteristics @ Different Temperature



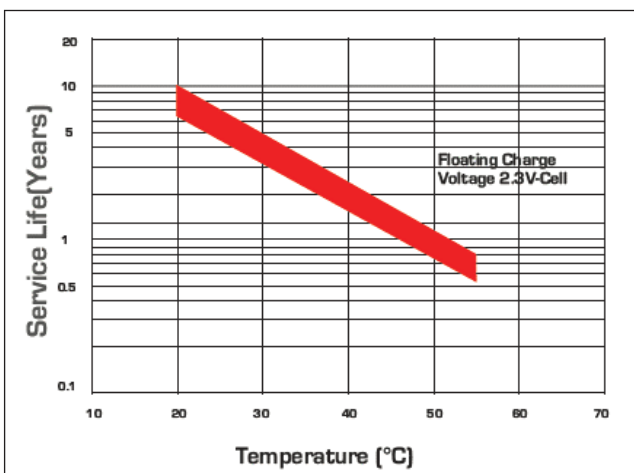
State of Charge Measure of Open-Circuit Voltage 27°C

State of Charge	Specific Gravity	Voltage
100%	1.245-1.275	12.55V-12.70V
75%	≤ 1.225	≤ 12.4V
50%	≤ 1.190	≤ 12.1V
25%	≤ 1.155	≤ 12.0V
0%	1.120	11.8V

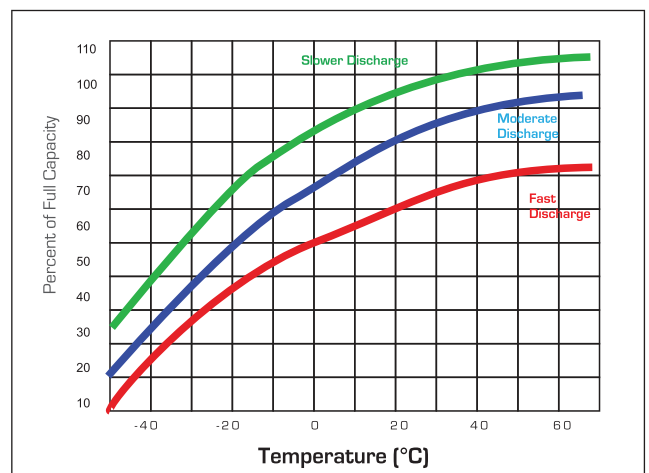
Discharging Characteristics at Various rates @ 27°C



Service (Float) Life & Temperature



Expected Capacity vs Temperature



IMS Integrated Management System Certified with TUV & APAVE India for Design & Manufacturing of Lead Acid Battery



TALL TUBULAR BATTERY

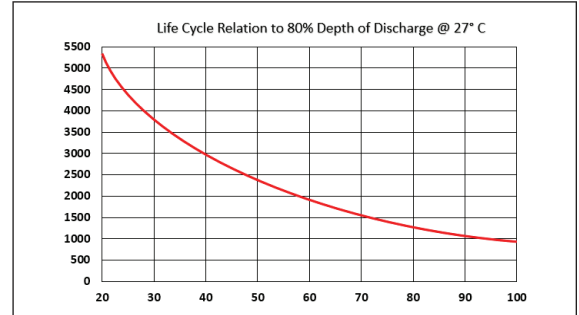


Regular Series

Specific Gravity & Self Discharge w.r.t. Temperature

	Add	Subtract
CHARGING TEMPERATURE COMPENSATION	0.005 volt per cell for every 1°C below 25°C 0.0028 volt per cell for every 1°F below 77°F	0.005 volt per cell for every 1°C above 25°C or 0.0028 volt per cell for every 1°F above 77°F
OPERATIONAL DATA	Operating Temperature -4°F to 131°F (-20°C to +55°C) At temperatures below 32°F (0°C) maintain a state of charge greater than 60%.	Self Discharge As per discharge Graph

Expected Life



Charging Instructions

Charger Voltage Settings (at 77°F/25°C)			
System Voltage	12V	24V	48V
Maximum Charge Current	0.2C10		
Minimum Charge Current	20Amp.		
Maximum Absorption Phase Time (hours)	4		
Absorption Voltage	14.6	29.2	58.4
Float Voltage	13.8	27.6	55.2
Equalization Voltage	16	32	64
NOTE:			
1) Do not install or charge batteries in sealer or non-ventilated compartment. Constant under or overcharge will damage the battery and shorten its life as any battery.			
2) Maximum two strings are allowed in parallel connections.			
Periodic Charge	Provide a periodic fresh charge to maintain a SOC greater than the threshold of 80%		

Comparison in Between Eastman TTC & AGM VRLA

S.No	Parameter	Eastman Tall Tubular Conventional	AGM VRLA
1.	Plate technology	Tall Tubular Plate	Flat Pasted Plate
2.	Life W.R.T. Application	Excellent performance on cyclic application	Not good for deep cycle application
3.	Application	"Power Backup solution-solar/Inverter/UPS suitable for float application above 1 Hours discharge rate"	"Power Backup Inverter/UPS suitable for float application and Stand by application"
4.	Electrolyte	Free Flow Electrolyte	Electrolyte in Between AGM
5.	Water Loss	Low	Negligible
6.	Water Top up	Low Water Top	No water Top up required
7.	Life Extension	Long life with regular water top up	Not Applicable
8.	Self Discharge	Low <3.0%	Very Low <2.0%
9.	"Life Cycle w.r.t. 80% DOD@27°C "	1300 cycles	450 Cycles
10.	Recovery in PSOC	Excellent	Low
11.	Charger Setting	Generic set point for charger	Required special set point for chargers
12.	Operating Temperature Range	- 20 Degrees to + 55 Degree	-15 Degrees to + 40 Degree
13.	Terminal type	L-Type Terminal	Stud Type Terminal

Terminal Configuration :- Terminal Type:- L
Terminal Height :- 24 mm Torque Value:- 8-10 N.m
Bolt Type:- M8

Vent Plug Type :- M22 Coin Type

Vent Plug Type :- M30 Dummy Plug



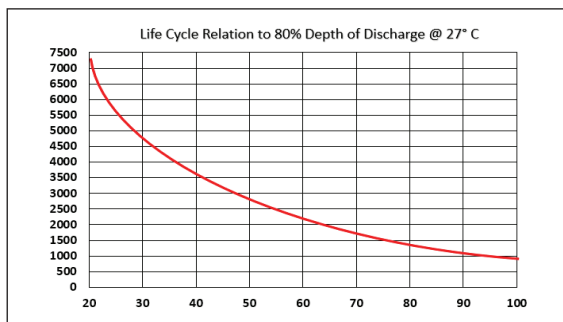


TALL TUBULAR BATTERY

150, 160, 200, 240, 300, 270, 330Ah

Series: Diamond

Expected Life



Technical Specifications

- Poly Components Material: Polypropylene Co polymer, Color: Blue
- Watering System: Individual in every cell in monobloc
- Testing Parameters - IS 13369:1992 & IEC 60896-11

Introduction

Our Tall Tubular Battery is a specialized energy storage solution crafted to meet your diverse power needs efficiently. Engineered with a focus on longevity and reliability, it stands out as a dependable source of power, ensuring a consistent and uninterrupted energy supply over an extended period.

Product Features

- Robust Tubular with High Pressure diecasted spine- resulting low rate of spine corrosion.
- Spill Proof Vent plug - resulting in no spillage on top and low controlled acid fumes.
- Optimized Negative paste receipt for fast charge acceptance
- Consistent backup throughout life
- Excellent behavior in PSOC condition as compare
- Low Self Discharge
- Excellent performance on deep cyclic application as compare to AGM VRLA
- Very High Design & Service Life
- Low water loss
- Low Cost Of Ownership
- Easy Recovery After Idle Period
- Lowest Electricity Consumption In Recharging
- Less Fumes Generation
- 5% Extra Capacity & Backup WRT Rated Capacity

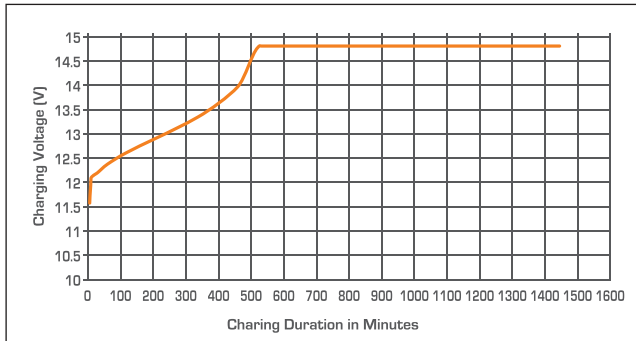
Model	EM240D			EM300D		
Nominal Voltage (V)	12V			12V		
Rated Capacity 20 Hr @ 27° C	240Ah			300Ah		
Approx. Weight	75.20			83.2		
Dimensions(L*W*H)mm	506*207*405			506*207*405		
Terminal	L			L		
Battery Capacity Test @27° C	C20@10.5V- 240Ah	C10@10.5V- 200Ah	C7@10.5V- 182Ah	C20@10.5V- 300Ah	C10@10.5V- 270Ah	C7@10.5V- 248Ah
	C5@10.5V- 165Ah	C3@10.5V- 142Ah	C1@10.5V- 99Ah	C5@10.5V- 225Ah	C3@10.5V- 194Ah	C1@10.5V- 135Ah
	Energy Kwh-2.9			Energy Kwh-3.6Ah		
Ah Efficiency	>90%			>90%		
Wh Efficiency	>75%			>75%		

TALL TUBULAR BATTERY

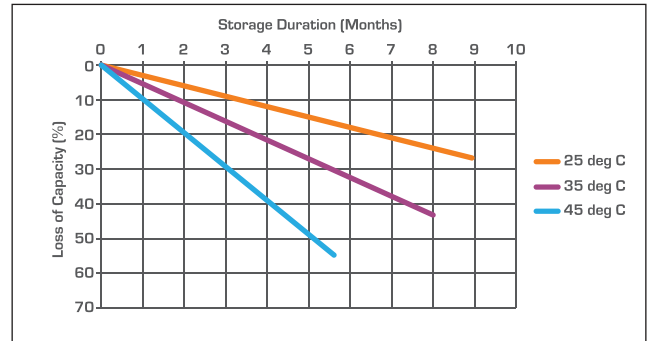


Charging & Discharging | Characteristics Diamond Series

Charging Profile



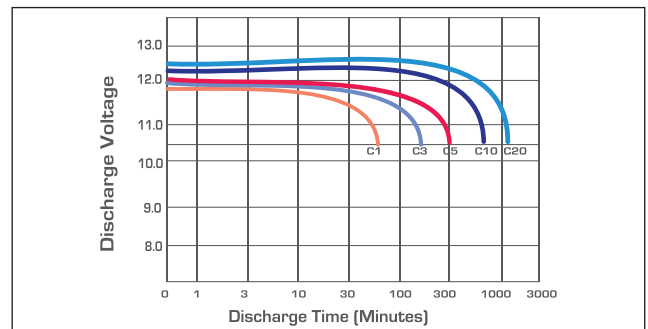
Discharge Characteristics @ Different Temperature



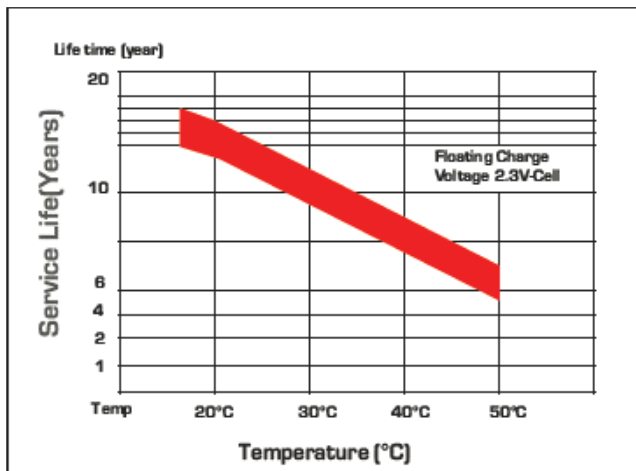
State of Charge Measure of Open-Circuit Voltage 27°C

State of Charge	Specific Gravity	Voltage
100%	1.245-1.275	12.55V-12.70V
75%	≤ 1.225	≤ 12.4V
50%	≤ 1.190	≤ 12.1V
25%	≤ 1.155	≤ 12.0V
0%	1.120	11.8V

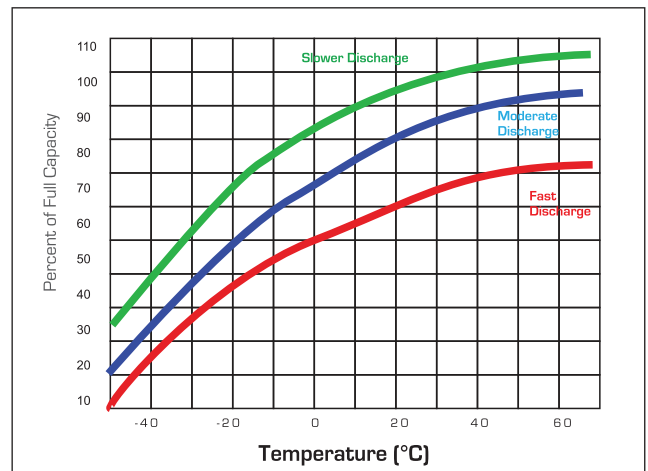
Discharging Characteristics at Various rates @ 27°C



Service (Float) Life & Temperature



Expected Capacity vs Temperature



IMS Integrated Management System Certified with TUV & APAVE India for Design & Manufacturing of Lead Acid Battery



TALL TUBULAR BATTERY

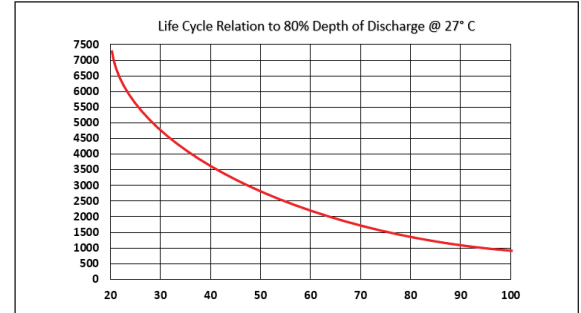


Diamond Series

Specific Gravity & Self Discharge w.r.t. Temperature

	Add	Subtract
CHARGING TEMPERATURE COMPENSATION	0.005 volt per cell for every 1°C below 25°C 0.0028 volt per cell for every 1°F below 77°F	0.005 volt per cell for every 1°C above 25°C or 0.0028 volt per cell for every 1°F above 77°F
OPERATIONAL DATA	Operating Temperature -4°F to 131°F (-20°C to +55°C) At temperatures below 32°F (0°C) maintain a state of charge greater than 60%.	Self Discharge As per discharge Graph

Expected Life



Charging Instructions

Charger Voltage Settings (at 77°F/25°C)			
System Voltage	12V	24V	48V
Maximum Charge Current	0.2C10		
Minimum Charge Current	20Amp.		
Maximum Absorption Phase Time (hours)	4		
Absorption Voltage	14.6	29.2	58.4
Float Voltage	13.8	27.6	55.2
Equalization Voltage	16	32	64
NOTE:			
1) Do not install or charge batteries in sealer or non-ventilated compartment. Constant under or overcharge will damage the battery and shorten its life as any battery.			
2) Maximum two strings are allowed in parallel connections.			
Periodic Charge	Provide a periodic fresh charge to maintain a SOC greater than the threshold of 80%		

Comparison in Between Eastman TTC & AGM VRLA

S.No	Parameter	Eastman Tall Tubular Conventional	AGM VRLA
1.	Plate technology	Tall Tubular Plate	Flat Pasted Plate
2.	Life W.R.T. Application	Excellent performance on cyclic application	Not good for deep cycle application
3.	Application	"Power Backup solution-solar/Inverter/UPS suitable for float application above 1 Hours discharge rate"	"Power Backup Inverter/UPS suitable for float application and Stand by application"
4.	Electrolyte	Free Flow Electrolyte	Electrolyte in Between AGM
5.	Water Loss	Low	Negligible
6.	Water Top up	Low Water Top	No water Top up required
7.	Life Extension	Long life with regular water top up	Not Applicable
8.	Self Discharge	Low <3.0%	Very Low <2.0%
9.	"Life Cycle w.r.t. 80% DOD@27°C "	1800 cycles	450 Cycles
10.	Recovery in PSOC	Excellent	Low
11.	Charger Setting	Generic set point for charger	Required special set point for chargers
12.	Operating Temperature Range	- 20 Degrees to + 55 Degree	-15 Degrees to + 40 Degree
13.	Terminal type	L-Type Terminal	Stud Type Terminal

Terminal Configuration :- Terminal Type:- L
Terminal Height :- 24 mm
Torque Value:- 8-10 N.m
Bolt Type:- M8

Vent Plug Type :- M22 Coin Type

Vent Plug Type :- M30 Dummy Plug



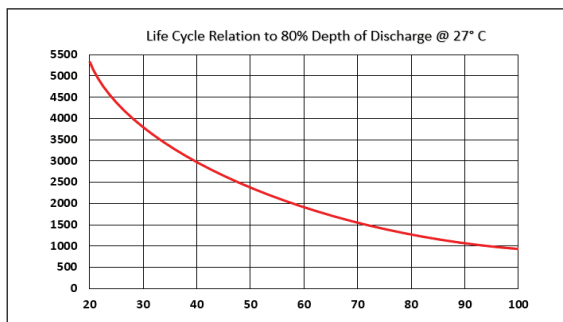


TALL TUBULAR BATTERY

220Ah

Series: Smart Series

Expected Life



Technical Specifications

- Poly Components Material: Polypropylene Co polymer, Color: Blue
- Watering System: Individual in every cell in monobloc
- Testing Parameters - IS 13369:1992 , IEC 60896-11 & IEC 61407-1

Introduction

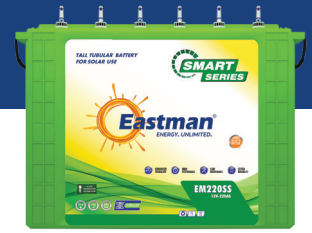
Our Tall Tubular Battery is a specialized energy storage solution crafted to meet your diverse power needs efficiently. Engineered with a focus on longevity and reliability, it stands out as a dependable source of power, ensuring a consistent and uninterrupted energy supply over an extended period.

Product Features

- Robust Tubular with High Pressure diecasted spine- resulting low rate of spine corrosion.
- Spill Proof Vent plug - resulting in no spillage on top and low controlled acid fumes.
- Optimized Negative paste receipt for fast charge acceptance
- Consistent backup throughout life
- Excellent behavior in PSOC condition as compare
- Low Self Discharge
- Excellent performance on deep cyclic application as compare to AGM VRLA
- Very High Design & Service Life
- Low water loss
- Low Cost Of Ownership
- Easy Recovery After Idle Period
- Lowest Electricity Consumption In Recharging
- Less Fumes Generation
- 5% Extra Capacity & Backup WRT Rated Capacity

Model	EM220SS					
Nominal Voltage (V)	12V					
Rated Capacity 20 Hr @ 27° C	220Ah					
Approx. Weight	62.9					
Dimensions(L*W*H)mm	506*192*405					
Terminal	L					
Battery Capacity Test @27° C	C20@10.5V- 220Ah	C10@10.5V- 198Ah	C7@10.5V- 182Ah	C5@10.5V- 165Ah	C3@10.5V- 142Ah	C1@10.5V- 99Ah
	Energy Kwh-2.6Ah					
Ah Efficiency	>90%					
Wh Efficiency	>75%					

TALL TUBULAR BATTERY

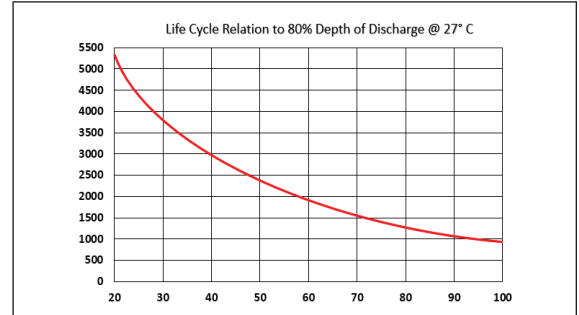


Smart Series

Specific Gravity & Self Discharge w.r.t. Temperature

	Add	Subtract
CHARGING TEMPERATURE COMPENSATION	0.005 volt per cell for every 1°C below 25°C 0.0028 volt per cell for every 1°F below 77°F	0.005 volt per cell for every 1°C above 25°C or 0.0028 volt per cell for every 1°F above 77°F
OPERATIONAL DATA	Operating Temperature -4°F to 131°F (-20°C to +55°C) At temperatures below 32°F (0°C) maintain a state of charge greater than 60%.	Self Discharge As per discharge Graph

Expected Life



Charging Instructions

Charger Voltage Settings (at 77°F/25°C)			
System Voltage	12V	24V	48V
Maximum Charge Current	0.2C10		
Minimum Charge Current	20Amp.		
Maximum Absorption Phase Time (hours)	4		
Absorption Voltage	14.6	29.2	58.4
Float Voltage	13.8	27.6	55.2
Equalization Voltage	16	32	64
NOTE:			
1) Do not install or charge batteries in sealer or non-ventilated compartment. Constant under or overcharge will damage the battery and shorten its life as any battery.			
2) Maximum two strings are allowed in parallel connections.			
Periodic Charge	Provide a periodic fresh charge to maintain a SOC greater than the threshold of 80%		

Comparison in Between Eastman TTC & AGM VRLA

S.No	Parameter	Eastman Tall Tubular Conventional	AGM VRLA
1.	Plate technology	Tall Tubular Plate	Flat Pasted Plate
2.	Life W.R.T. Application	Excellent performance on cyclic application	Not good for deep cycle application
3.	Application	"Power Backup solution-solar/Inverter/UPS suitable for float application above 1 Hours discharge rate"	"Power Backup Inverter/UPS suitable for float application and Stand by application"
4.	Electrolyte	Free Flow Electrolyte	Electrolyte in Between AGM
5.	Water Loss	Low	Negligible
6.	Water Top up	Low Water Top	No water Top up required
7.	Life Extension	Long life with regular water top up	Not Applicable
8.	Self Discharge	Low <3.0%	Very Low <2.0%
9.	"Life Cycle w.r.t. 80% DOD@27°C "	1300 cycles	450 Cycles
10.	Recovery in PSOC	Excellent	Low
11.	Charger Setting	Generic set point for charger	Required special set point for chargers
12.	Operating Temperature Range	- 20 Degrees to + 55 Degree	-15 Degrees to + 40 Degree
13.	Terminal type	L-Type Terminal	Stud Type Terminal

Terminal Configuration :- Terminal Type:- L
Terminal Height :- 24 mm Torque Value:- 8-10 N.m
Bolt Type:- M8

Vent Plug Type :- M22 Coin Type

Vent Plug Type :- M30 Dummy Plug



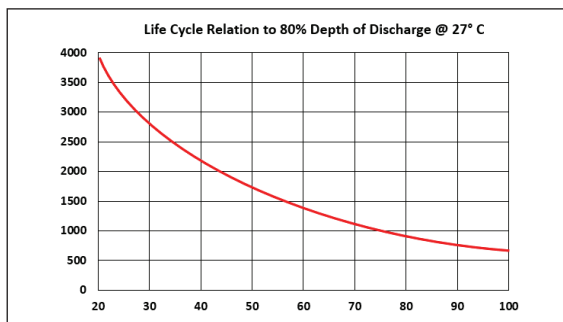


TALL TUBULAR BATTERY

220Ah

Series: Dawn Series

Expected Life



Technical Specifications

- Poly Components Material: Polypropylene Co polymer, Color: Blue
- Watering System: Individual in every cell in monobloc
- Testing Parameters - IS 13369:1992 , IEC 60896-11 & IEC 61407-1

Introduction

Our Tall Tubular Battery is a specialized energy storage solution crafted to meet your diverse power needs efficiently. Engineered with a focus on longevity and reliability, it stands out as a dependable source of power, ensuring a consistent and uninterrupted energy supply over an extended period.

Product Features

- 5% Extra Capacity & Backup WRT Rated Capacity.
- Stunning Performance, Stunning Technology.
- New Inbulit terminal PDC for higher current carry & Low Sulfation.
- Low Water Loss.
- Longer battery service life with High back-up time.
- Ability to withstand long and frequent power outages.
- Big size container design ensuring high acid level, ensure minimum maintenance cost.
- Ability to recover from deep discharge.
- Have better thermal management.
- Factory charged - ready to use.
- Low Cost Of Ownership.
- Easy Recovery After Idle Period.
- Lowest Electricity Consumption In Recharging.
- Less Fumes Generation.

Model	EMDS220					
Nominal Voltage (V)	12V					
Rated Capacity 20 Hr @ 27° C	220Ah					
Approx. Weight	62.9					
Dimensions(L*W*H)mm	506*192*405					
Terminal	L					
Battery Capacity Test @27° C	C20@10.5V- 220Ah	C10@10.5V- 198Ah	C7@10.5V- 182Ah	C5@10.5V- 165Ah	C3@10.5V- 142Ah	C1@10.5V- 99Ah
Ah Efficiency	Energy Kwh-2.6Ah					
Wh Efficiency	>90%					
	>75%					

TALL TUBULAR BATTERY

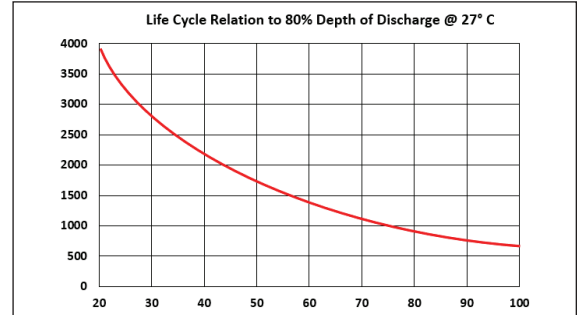


Dawn Series

Specific Gravity & Self Discharge w.r.t. Temperature

	Add	Subtract
CHARGING TEMPERATURE COMPENSATION	0.005 volt per cell for every 1°C below 25°C 0.0028 volt per cell for every 1°F below 77°F	0.005 volt per cell for every 1°C above 25°C or 0.0028 volt per cell for every 1°F above 77°F
OPERATIONAL DATA	Operating Temperature -4°F to 131°F (-20°C to +55°C) At temperatures below 32°F (0°C) maintain a state of charge greater than 60%.	Self Discharge As per discharge Graph

Expected Life



Charging Instructions

Charger Voltage Settings (at 77°F/25°C)			
System Voltage	12V	24V	48V
Maximum Charge Current	0.2C10		
Minimum Charge Current	20Amp.		
Maximum Absorption Phase Time (hours)	4		
Absorption Voltage	14.6	29.2	58.4
Float Voltage	13.8	27.6	55.2
Equalization Voltage	16	32	64
NOTE:			
1) Do not install or charge batteries in sealer or non-ventilated compartment. Constant under or overcharge will damage the battery and shorten its life as any battery.			
2) Maximum two strings are allowed in parallel connections.			
Periodic Charge	Provide a periodic fresh charge to maintain a SOC greater than the threshold of 80%		

Comparison in Between Eastman TTC & AGM VRLA

S.No	Parameter	Eastman Tall Tubular Conventional	AGM VRLA
1.	Plate technology	Tall Tubular Plate	Flat Pasted Plate
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5.	Water Loss	Low	Negligible
6.	Water Top up	Low Water Top	No water Top up required
7.	Life Extension	Long life with regular water top up	Not Applicable
8.	Self Discharge	Low <3.0%	Very Low <2.0%
9.	"Life Cycle w.r.t. 80% DOD@27°C "	950 cycles	450 Cycles
10.	Recovery in PSOC	Excellent	Low
11.	Charger Setting	Generic set point for charger	Required special set point for chargers
12.	Operating Temperature Range	- 20 Degrees to + 55 Degree	-15 Degrees to + 40 Degree
13.	Terminal type	L-Type Terminal	Stud Type Terminal

Terminal Configuration :- Terminal Type:- L
Terminal Height :- 24 mm Torque Value:- 8-10 N.m
Bolt Type:- M8

Vent Plug Type :- M22 Coin Type

Vent Plug Type :- M30 Dummy Plug

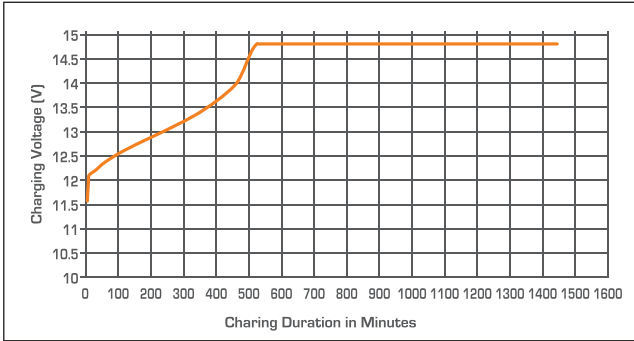


TALL TUBULAR BATTERY

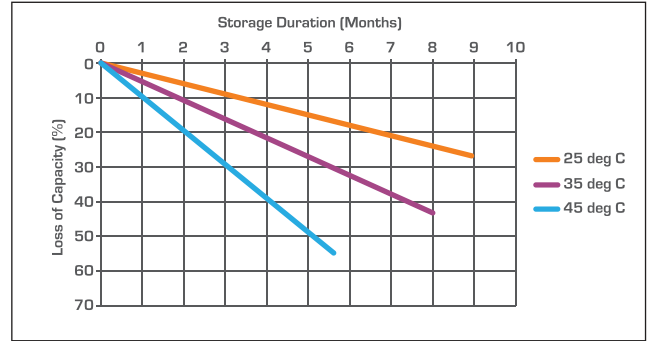


Charging & Discharging | Characteristics Smart Series | Dawn Series

Charging Profile



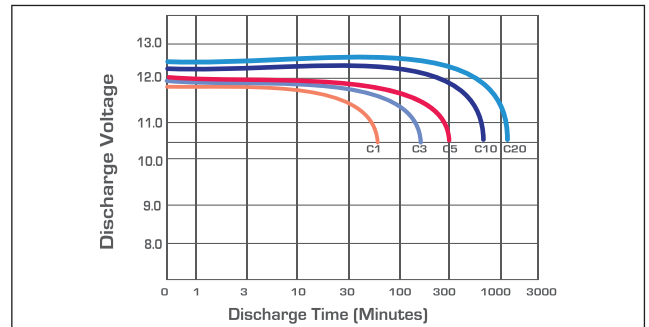
Discharge Characteristics @ Different Temperature



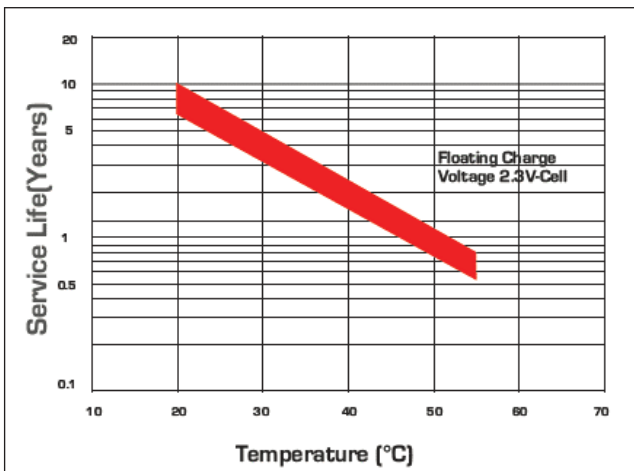
State of Charge Measure of Open-Circuit Voltage 27°C

State of Charge	Specific Gravity	Voltage
100%	1.245-1.275	12.55V-12.70V
75%	≤ 1.225	≤ 12.4V
50%	≤ 1.190	≤ 12.1V
25%	≤ 1.155	≤ 12.0V
0%	1.120	11.8V

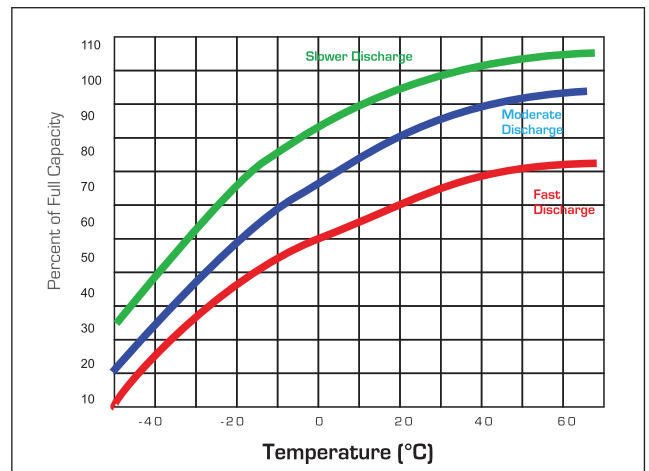
Discharging Characteristics at Various rates @ 27°C



Service (Float) Life & Temperature



Expected Capacity vs Temperature



IMS Integrated Management System Certified with TUV & APAVE India for Design & Manufacturing of Lead Acid Battery





TUBULAR GEL BATTERY

200Ah

Available Series: Platinum | Blue | Pinnacle

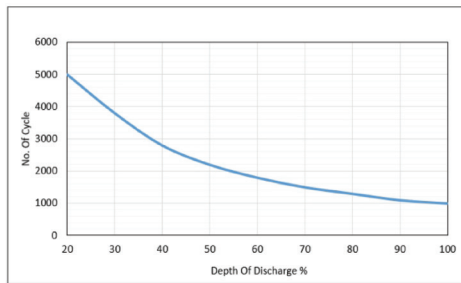
Introduction

Our Tubular Gel Battery is a testament to reliability and efficiency, catering to a wide array of energy storage requirements. Specifically designed to excel in both cyclic and float applications, it serves as a versatile solution suitable for various settings.

Product Features

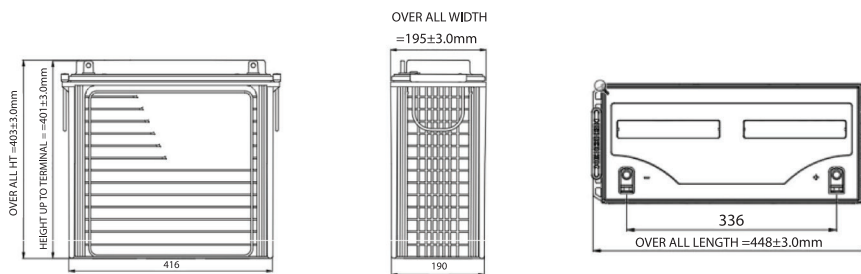
- Robust Tubular With High Pressure Diecasted Spine.
- Gelled Electrolyte - No Stratification And No Failure Due To PSOC.
- Valve Regulated - No Water Top Up During Service Life.
- Antimony Free Alloy - Low Self Discharge.
- Very High Design & Service Life As Compare To AGM VRLA.
- Good For Cyclic & Float Applications.
- Wide Operating Temperature Range.
- Completely Maintenance Free.
- Negligible Fumes, No Health Hazards.
- Full Rated Backup Till 85% Of Life.
- Low Cost Of Ownership.
- Safe Operation and Hassle Free Transportation.

DOD vs Number of cycles



Technical Specifications

- Poly Components Material: Polypropylene Co polymer
- Color :- Blue
- Testing Parameters - IS 13369:1992, IEC 60896-21 & IEC 61427-1



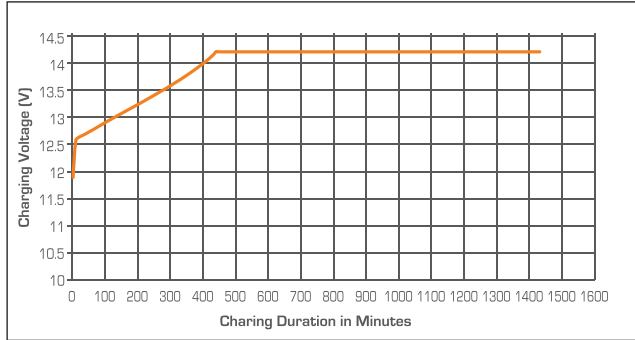
Model	EM200PT					
Nominal Voltage (V)	12V					
Rated Capacity	200Ah					
Approx. Weight	63.30					
Dimensions(L*W*H)mm	448*195*403					
Terminal	L					
Battery Capacity Test @27°C	C20@10.5V- 200Ah	C10@10.5V- 180Ah	C7@10.5V- 166Ah	C5@10.5V- 150Ah	C3@10.5V- 129Ah	C1@10.5V- 90Ah
Ah Efficiency	>96%					
Wh Efficiency	>84%					

TUBULAR GEL BATTERY

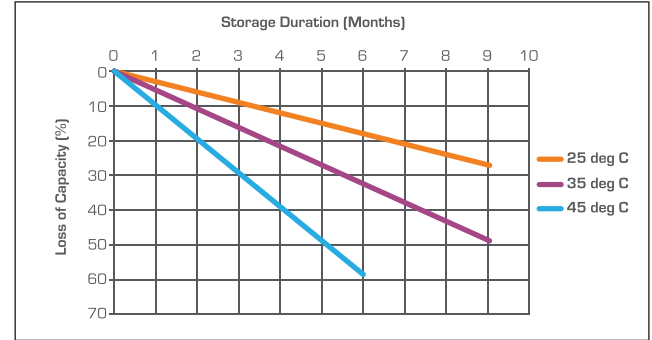


Charging & Discharging | Characteristics EM200PT

Charging Profile



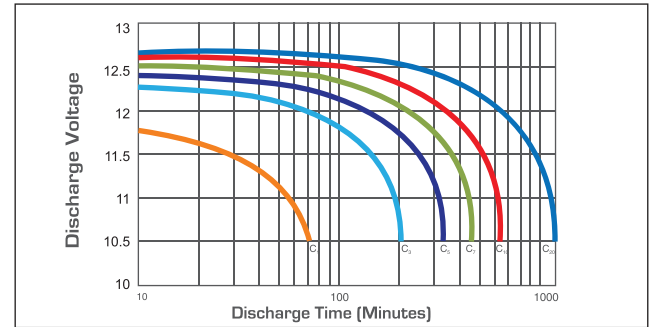
Discharge Characteristics @ Different Temperature



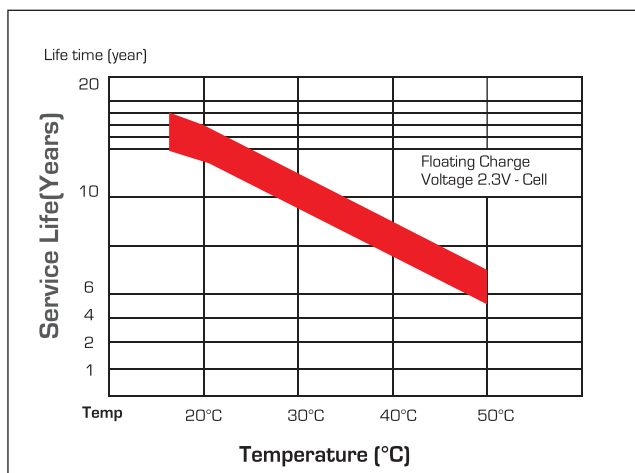
State of Charge Measure of Open-Circuit Voltage 27°C

State of Charge	Specific Gravity	Voltage
100%	NA	12.90-13.10V
75%	NA	≤ 12.75V
50%	NA	≤ 12.45V
25%	NA	≤ 12.1V
0%	NA	11.9V

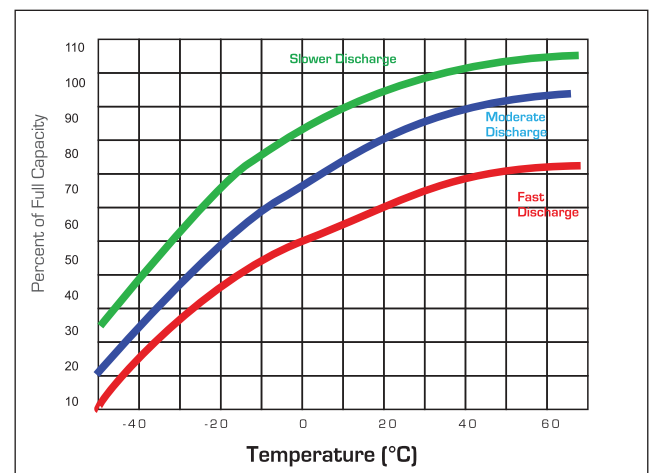
Discharging Characteristics at Various rates @ 27°C



Service (Float) Life & Temperature



Expected Capacity vs Temperature



Eastman Battery Manufacturing Certified by TUV India



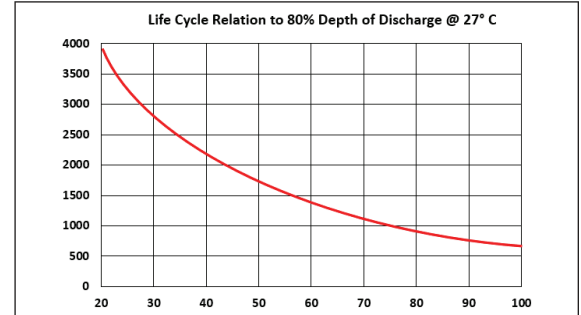
TUBULAR GEL BATTERY



Specific Gravity & Self Discharge w.r.t. Temperature

	Add	Subtract
CHARGING TEMPERATURE COMPENSATION	0.005 volt per cell for every 1°C below 25°C 0.0028 volt per cell for every 1°F below 77°F	0.005 volt per cell for every 1°C above 25°C or 0.0028 volt per cell for every 1°F above 77°F
OPERATIONAL DATA	Operating Temperature -4°F to 131°F (-20°C to +55°C) At temperatures below 32°F (0°C) maintain a state of charge greater than 60%.	Self Discharge As per discharge Graph

Expected Life



Instruction during installation of Tubular Gel

- Please check the inverters settings before installation. It should be as mentioned in Table -1
- Max. 48 V series string allowed.
- No parallel string allowed.
- Always keep the ideal settings on inverters.
- Use always sine wave inverter with flexible charging settings not fixed setting modes.
- Wire gauge should be as per current standard gauge requirements.
- No loose connections allowed.
- The distance between inverter & battery should be 1 meter maximum, long wire length may drop the backup & charging efficiency.
- Don't open the vent plugs (during maintenance and equalization process).

Table-1

RECOMMENDED BATTERY IDEAL SETTINGS BY EASTMAN (48 V System)

Battery Type Gel	Absorption Stage 14.4V (57.6 V)	Float Stage 13.8V (55.2V)	Torqur Values (Every 30 days 3 Hrs) 15 V (60V)
*Absorption Voltage:- 14.4V individual battery x N [No. of battery]			
*Float Voltage :- 13.8V individual battery x N [No. of battery]			
Torque (Equalization Voltage) :- 15V individual battery x N (No. of battery)			

RECOMMENDED BATTERY HIGHEST SETTINGS BY EASTMAN (48 V System)

Battery Type Gel	Absorption Stage 14.6V (58.4 V)	Float Stage 14.0V (56.0V)	Torqur Values (Every 30 days 3 Hrs) 15.2 V (60.8V)
*Absorption Voltage:- 14.60V individual battery x N [No. of battery]			
*Float Voltage :- 14.0V individual battery x N [No. of battery]			
Torque (Equalization Voltage) :- 15.20V individual battery x N (No. of battery)			

Eastma Gel battery testing procedure ahere IEC & UL 94 test standards

Comparison in Between Eastman Tuubular Gel & AGM VRLA

S.No	Parameter	Eastman Tubular GEL	AGM VRLA
1.	Plate technology	Tall Tubular Plate	Flat Pasted Plate
2.	Life W.R.T. Application	Excellent performance on cyclic application	Not good for deep cycle application.
3.	Application	"Power Backup Solution-Solar/Inverter/UPS Suitable for Float Application above 1 Hour discharge rate"	"Power Back up - Inverter/UPS Good for float & stand by application"
4.	Electrolyte	Electrolyte in- Between Gel	Electrolyte in-between AGM
5.	Water Loss	Negligible	Negligible
6.	Water Top up	No water top up throughout Warranty Life	No water top up throughout Warranty Life
7.	Life Extension	Not Applicable	Not Applicable
8.	Self Discharge	Very Low <2.0%	Very Low <2.0%
9.	"Life Cycle w.r.t DOD @27°C @ 80% DoD "	1300 Cycle	450 Cycle
10.	Spillage	Spill-proof	Spill-proof
11.	Fumes	No	No
12.	Recovery in PSOC	Excellent	Low
13.	Charger Settings	Generic set point for chargers	Required special set point for chargers
14.	Operating Temperature Range	-20 Degrees to +55 Degrees	-15 Degrees to +40 Degrees
15.	Terminal type	L-Type Terminal	Stud Type Terminal

Terminal Configuration :-
Terminal Type:- L
Terminal Height :- 25 mm
Torque Value:- 8-10 N.m
Bolt Type:- M8



Vent Plug Type :-
M18 with vent value & flame arrestor assembly



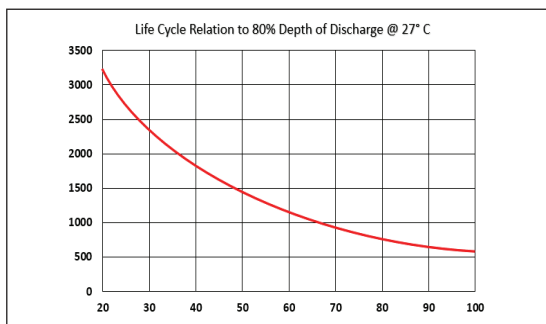


SEALED MAINTENANCE FREE BATTERY

200Ah



DOD vs Number of cycles



Technical Specifications

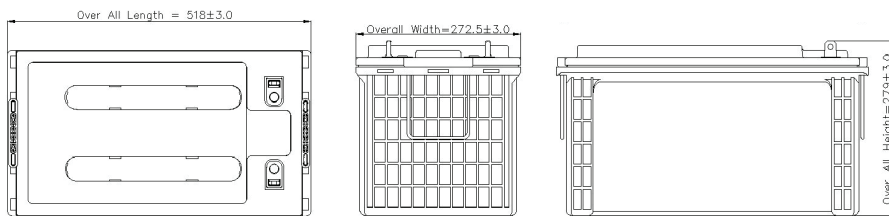
- Poly Components Material :- Polypropylene Co polymer
- Color - Blue
- Testing Parameters :- IS 13369:1992 & IEC 60896-11 & IEC 61407-1

Introduction

Experience worry-free power with our Sealed Maintenance-Free Battery. Enjoy hassle-free operation without the need for maintenance, ensuring continuous performance for your convenience.

Product Features

- Special alloy with High pressure die-casted spine - resulting in low rate of spine corrosion.
- Special ceramic vent plugs for controlled acid fumes and resistance to thermal runaway.
- Enhanced plate length for high power density and deep cycle application.
- Extended cycle life.
- Low self Discharge and Excellent charge retention.
- Sealed Maintenance free.
- Easy Recovery After Idle Period
- Lowest Electricity Consumption In Recharging
- Less Fumes Generation
- 5% Extra Capacity
- & Backup Wrt Rated Capacity
- Maintenance Free Battery
- Consistent Backup Throughout Life
- Low Self Discharge



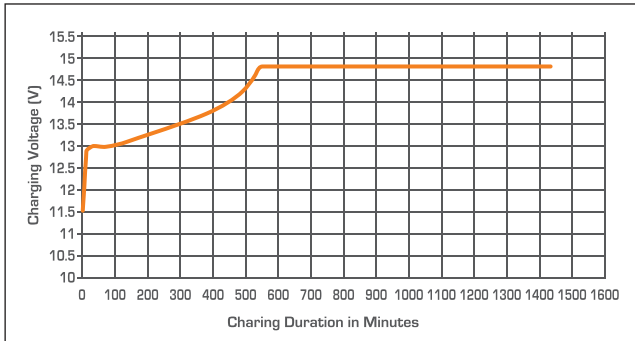
Model	EM200SMF						
Nominal Voltage (V)	12V						
Rated Capacity 20 Hr @ 27° C	200Ah						
Approx. Weight	63.3						
Dimensions(L*W*H)mm	518*273*279						
Terminal	L						
Battery Capacity Test @27° C	C20@10.5V- 200Ah	C10@10.5V- 180Ah	C7@10.5V- 165Ah	C5@10.5V- 150Ah	C3@10.5V- 129Ah	C1@10.5V- 90Ah	Energy Kwh(10Hr)-2.4Ah
Ah Efficiency	>90%						
Wh Efficiency	>75%						

SEALED MAINTENANCE FREE BATTERY

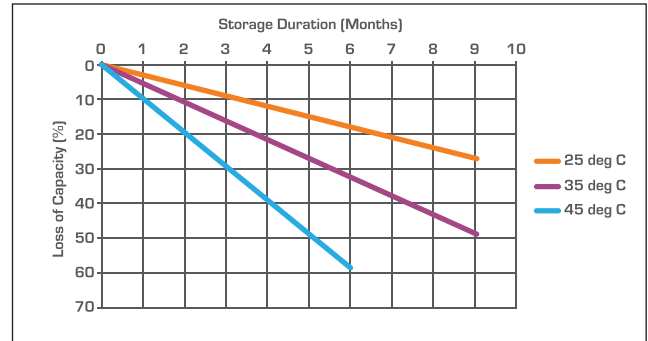


Charging & Discharging | Characteristics EM200SMF

Charging Profile



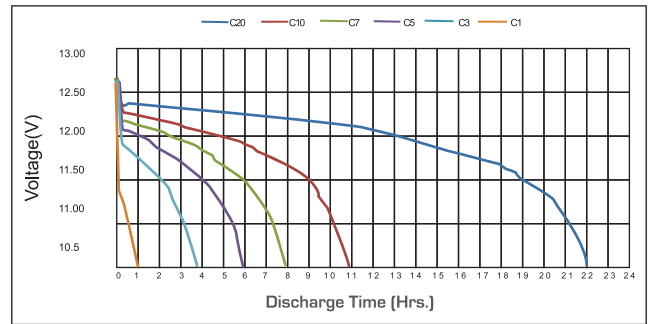
Discharge Characteristics @ Different Temperature



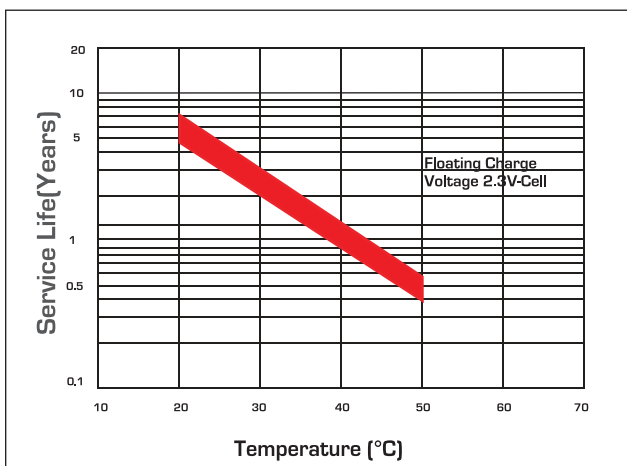
State of Charge Measure of Open-Circuit Voltage 27°C

State of Charge	Specific Gravity	Voltage
100%	1.245-1.270	12.55V-12.75V
75%	≤ 1.225	≤ 12.4V
50%	≤ 1.190	≤ 12.1V
25%	≤ 1.155	≤ 12.0V
0%	1.120	11.8V

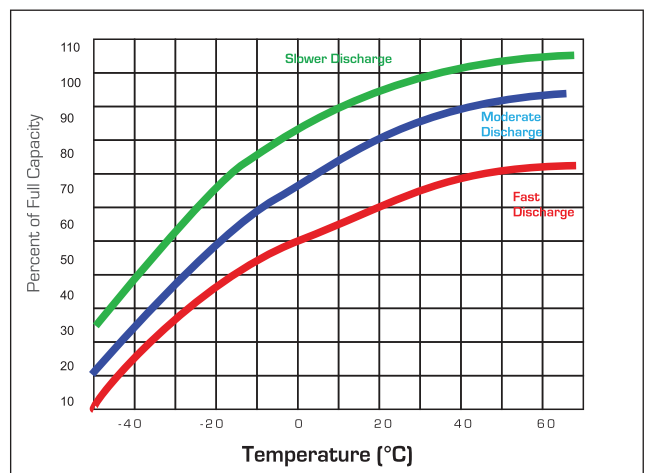
Discharging Characteristics at Various rates @ 27°C



Service (Float) Life & Temperature



Expected Capacity vs Temperature



IMS Integrated Management System Certified with TUV & APAVE India for Design & Manufacturing of Lead Acid Battery
Eastman Battery Manufacturing Certified by TUV India



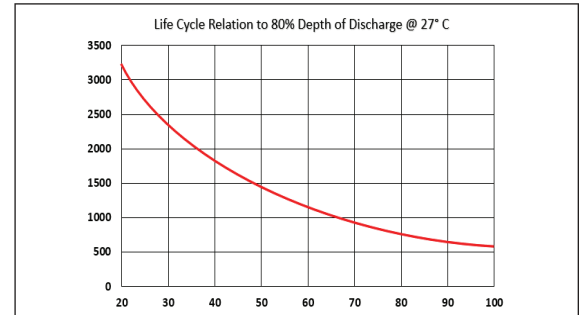
SEALED MAINTENANCE FREE BATTERY



Specific Gravity & Self Discharge w.r.t. Temperature

	Add	Subtract
CHARGING TEMPERATURE COMPENSATION	0.005 volt per cell for every 1°C below 25°C 0.0028 volt per cell for every 1°F below 77°F	0.005 volt per cell for every 1°C above 25°C or 0.0028 volt per cell for every 1°F above 77°F
	Operating Temperature	Self Discharge
OPERATIONAL DATA	-4°F to 131°F (-20°C to +55°C) At temperatures below 32°F (0°C) maintain a state of charge greater than 60%.	As per discharge Graph

Expected Life



Charging Instructions

Charger Voltage Settings (at 77°F/25°C)			
System Voltage	12V	24V	48V
Maximum Charge Current	0.2C10		
Minimum Charge Current	20Amp.		
Maximum Absorption Phase Time (hours)	4		
Absorption Voltage	14.6	29.2	58.4
Float Voltage	13.8	27.6	55.2
Equalization Voltage	16	32	64
NOTE:			
1) Do not install or charge batteries in sealer or non-ventilated compartment. Constant under or overcharge will damage the battery and shorten its life as any battery.			
2) Maximum two strings are allowed in parallel connections.			
Periodic Charge	Provide a periodic fresh charge to maintain a SOC grater than the threshold of 80%		

Comparison in Between Eastman TTC & AGM VRLA

S.No	Parameter	Eastman Tall Tubular Conventional	AGM VRLA
1.	Plate technology	Tall Tubular Plate	Flat Pasted Plate
2.	Life W.R.T. Application	Excellent performance on cyclic application	Not good for deep cycle application
3.	Application	"Power Backup solution-solar/Inverter/UPS suitable for float application above 1 Hours discharge rate"	"Power Backup Inverter/UPS suitable for float application and Stand by application"
4.	Electrolyte	Free Flow Electrolyte	Electrolyte in Between AGM
5.	Water Loss	Low	Negligible
6.	Water Top up	Low Water Top	No water Top up required
7.	Life Extension	Long life with regular water top up	Not Applicable
8.	Self Discharge	Low <3.0%	Very Low <2.0%
9.	"Life Cycle w.r.t. 80% DOD@27°C "	650 cycles	450 Cycles
10.	Recovery in PSOC	Excellent	Low
11.	Charger Setting	Generic set point for cahrger	Required special set point for chargers
12.	Operating Temperature Range	- 20 Degrees to + 55 Degree	-15 Degrees to + 40 Degree
13.	Terminal type	L-Type Terminal	Stud Type Terminal



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