



# The **Wise** Choice



Low Cost  
Of Ownership



Low Water  
Loss



Easy Recovery  
After Idle Period



Lowest Electricity  
Consumption In  
Recharging



Less Fumes  
Generation



5% Extra Capacity &  
Backup WRT Rated  
Capacity

## TALL TUBULAR CONVENTIONAL BATTERY (220Ah & 230Ah @ C20)

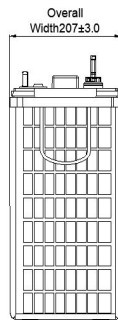
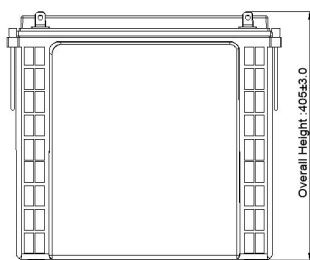
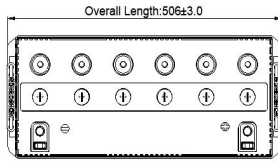


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## TECHNICAL SPECIFICATION - Tall Tubular Conventional Battery



### Product Features :-

1. Robust Tubular with High Pressure diecasted spine- resulting low rate of spine corrosion.
2. Spill Proof Vent plug – resulting in no spillage on top and low controlled acid fumes.
3. Optimized Negative paste receipt for fast charge acceptance
4. Consistent backup throughout life
5. Excellent behavior in PSOC condition as compare
6. Low Self Discharge
7. Excellent performance on deep cyclic application as compare to AGM VRLA
8. Very High Design & Service Life
9. Low water loss

### Technical Specifications

Model	Nominal Voltage	Rated Capacity 20 Hr @ 27°C (Ah)	Dimensions in mm			Net Battery Weight [Kg] [±3%]	Terminal Type
			Length [± 3 mm]	Width [± 3 mm]	Height [± 3 mm]		
EM220 [12 V 220 AH @ C20]	12	220	506	207	405	67.6	L
EM230 [12 V 230 AH @ C20]	12	230	506	207	405	68.5	L

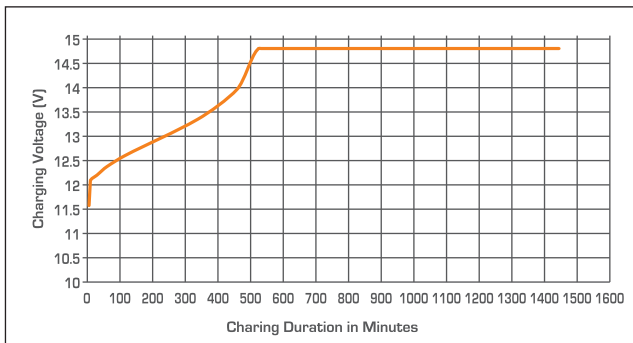
### Electrical Parameters & Charging Profile

Battery Specified Capacity Test @ 27 °C							
Model	C20 @10.5V	C10 @10.5V	C7 @10.5V	C5 @10.5V	C3 @10.5V	C1 @10.5V	Energy Kwh
EM220 [12 V 220 AH @ C20]	220	198	182	165	142	99	2.6
EM230 [12 V 230 AH @ C20]	230	207	190	172	148	104	2.8
Ah & Wh Efficiency							
Ah Efficiency	>90%		Wh Efficiency			>75%	

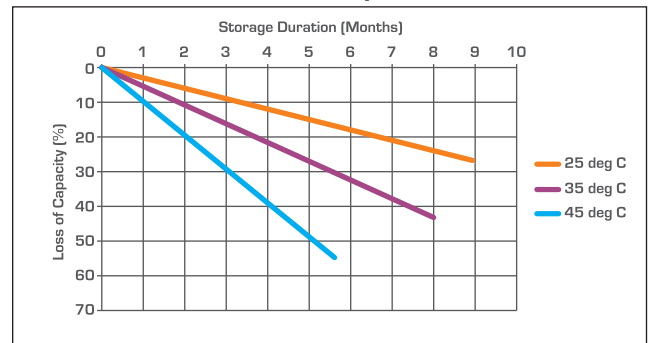
IMS Integrated Management System Certified with TUV & APAVE India for Design & Manufacturing of Lead Acid Battery

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

### Charging Profile



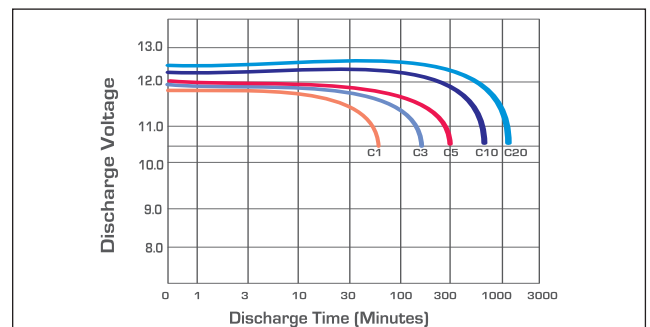
### Self Discharge Characteristics @ Different Temperature



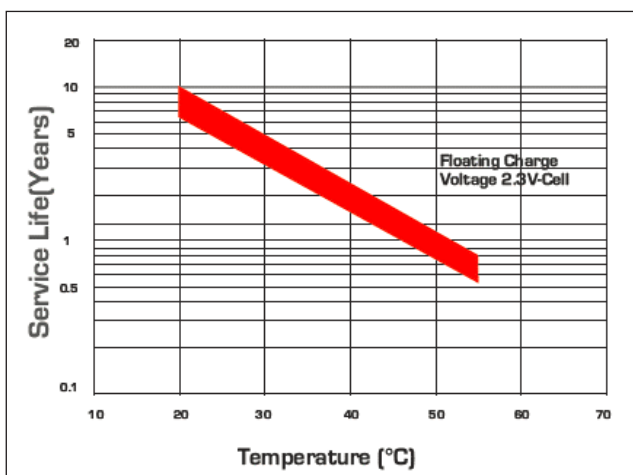
### State of Charge Measure of Open-circuit Voltage @ 27°C

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

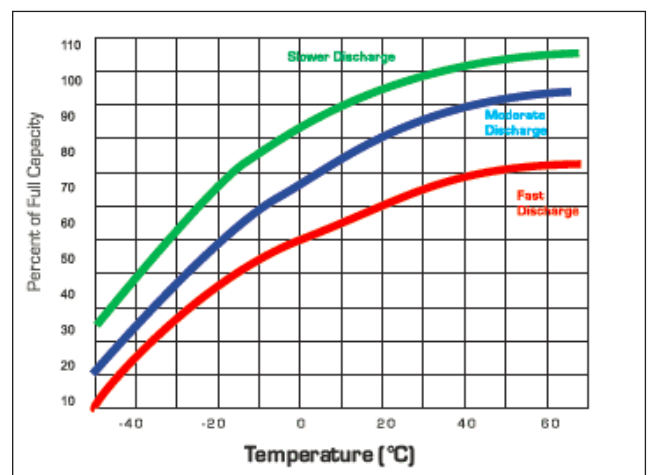
### Discharging Characteristics at various rates @ 27°C



### Service (Float) Life and Temperature



### Expected Capacity vs Temperature

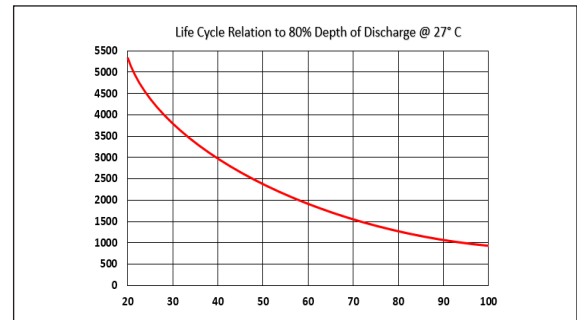


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### Specific Gravity & Self Discharge w.r.t. Temperature

	Add	Subtract
CHARGING TEMPERATURE COMPENSATION	0.005 volt per cell for every 1°C below 25°C	0.005 volt per cell for every 1°C above 25°C or
	0.0028 volt per cell for every 1°F below 77°F	0.0028 volt per cell for every 1°F above 77°F
OPERATIONAL DATA	Operating Temperature	Self Discharge
	-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 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

