

MARINE

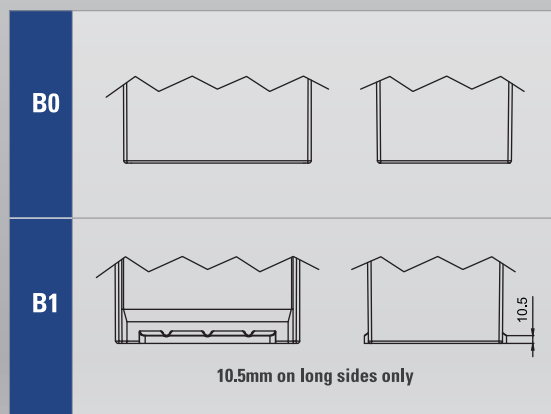
FOR STARTING & SEMI-DEEP CYCLE

Group	MARINE No.	C20(AH)	CCA (0°F/-18°C)	CA (32°F/0°C)	R.C (MIN)	Dimension(mm)				Layout	Terminal	B/Down
						L	W	H	TH			
M24	M24-500	55	500	620	90	258	172	200	221	1	TWIN	B1
	M24-560	60	560	700	105	258	172	200	221	1	TWIN	B1
	M24-600	70	600	750	120	258	172	200	221	1	TWIN	B1
	M24-700	75	700	860	140	258	172	200	221	1	TWIN	B1
	M24-750	75	750	930	130	258	172	200	221	1	TWIN	B1
M27	M27-710	85	710	880	145	303	172	200	221	1	TWIN	B1
	M27-750	90	750	920	160	303	172	200	221	1	TWIN	B1
M31	M31-800	100	800	1000	180	330	172	217	238	1	TWIN	B0
	M31-850	100	850	1060	180	330	172	217	238	1	TWIN	B0
	M31-900	105	900	1120	185	330	172	217	238	1	TWIN	B0
	M31-950	105	950	1180	185	330	172	217	238	1	TWIN	B0

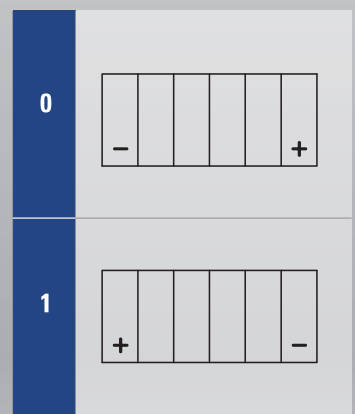
TERMINAL



HOLD-DOWN



LAYOUT

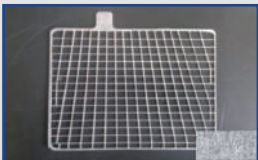
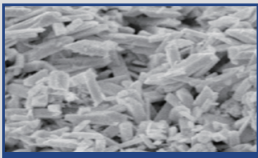



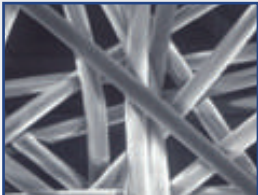
MF BATTERIES FOR MARINE

Construction Features & Benefits

Features	Benefits
<p>Dual Purpose Plate(Starting & Deep Cycling)</p> <ul style="list-style-type: none"> - Full Frame Grid (Stamped Grid)Technology - Special (Thicker) Plate with High Density Active Material - Calcium + High Tin Alloy - Micro Fiber & New Special Tissue - Twin Terminal <p>Anti-Vibration</p> <ul style="list-style-type: none"> - Low Resistance Envelope Separator with Glass Mat - Hot Melt Glue & Reinforced container 	<p>Longer Life & High Cycle Stability</p> <ul style="list-style-type: none"> - Longer life, stabler starting power, and stronger durability - Flexible design for semi-traction (deep cycling) and starting - Compatibility with TOP and STUD Terminal - Corrosion Resistance due to repeated cycling improvements <p>Strongly built to withstand the pounding and vibration of marine, 4WD and heavy vehicle application</p>

Special Material

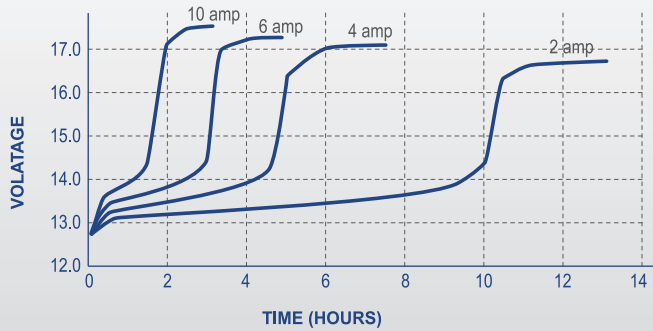
GRID ▼	
 <p>Punched Grid</p>	<p>Calcium Tin Alloy</p> <ul style="list-style-type: none"> - Preventing transformation of grid surface from corrosion - Reduce self-discharge by chemical bonding with Calcium-Tin alloy <p>Optimized Mesh Pattern</p> <ul style="list-style-type: none"> - Quick transmission of electrical power - Improvement of charging acceptability
 <p>4BS-Seed</p>	<p>Specialized Processing Methods</p> <ul style="list-style-type: none"> - The strong adhesion of active materials to unique designed punched grid - High durability from poly fleece <p>A.M</p> <ul style="list-style-type: none"> - Stable performance during deep cycle by applying special additives (4BS-Seed) and high-density A.M

Common Structure & Advantage (Marine) ▼	
 <p>Micro Fiber</p>	<p>Special Sealed Cover</p> <ul style="list-style-type: none"> - Preventing ACID leakage & block fire from outside - Minimizing electrolyte deflection between cells - Minimizing electrolyte loss by gassing recovery system - Reinforced design for Resistance of vibration & shock damage - ECO friendly materials(PP/PE Copolymer)
 <p>Special Tissue</p>	<p>Micro Fiber & Special Tissue</p> <ul style="list-style-type: none"> - Enhances adhesion of Active materials - Improves starting power and greater service life

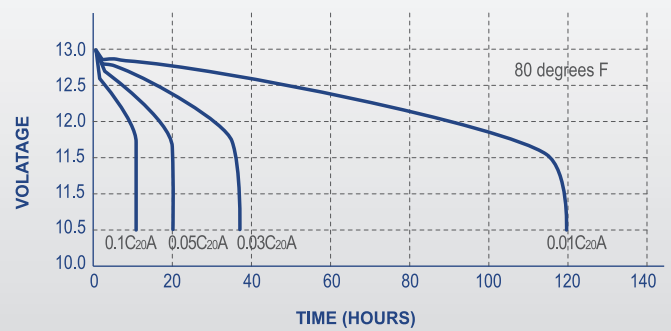
MF BATTERIES FOR MARINE

Charge and Discharge Characteristics

Charge characteristics from 20% DOD, M31-800 MF



Discharge characteristics



Charging Method

- ※ Batteries should be recharged within 24hours after each period of use.
- ※ Charging time by various charging rate can be determined by the the SOC(state of charge)

Method 1 ; Constant Voltage Charge (Recommended Method)

Type	Voltage Setting
Daily Cycle Service	14.4~14.8
Floating Service	13.2~13.7
Equalizing	15.5

* Unit Average at 77°F (25°C)

- ※ Every 30 to 90 days, conduct the equalizing charge.
Daily cycle service and deep discharging service need more frequent equalizing.

End of charge

- Current : below 1.0A during charge.
- Stabilized open circuit voltage : 12.75V or higher.

Method 2 ; Constant Current charge

Battery		M24-720	M27-750	M31-800
SOS	OCV	4.25A	4.5A	5.0A
100%	12.75V		-	
75%	12.40V		6Hr	
50%	12.20V		12Hr	
25%	12.00V		18Hr	
0%	11.90V		24Hr	

End of charge

- Maximum voltage output across the battery terminals is maintained at constant level for 2 hours during the charge.
- Stabilized open circuit voltage : 12.75V or higher.

Hours of Usable Power(H.U.P)			
Amp.Draw	5A	15A	25A
M24-700	16.0hrs.	4.4hrs.	2.5hrs.
M27-750	17.8hrs.	4.9hrs.	2.7hrs.
M31-800	20.0hrs.	5.6hrs.	3.1hrs.