Dstory Now & new

DN AUTOMOTIVE

www.bts.dnautomotive.com

Factory
Cheoyongsaneop 2 Gil, Onsan-Eup,
Ulju-gun, Ulsan-si,
South Korea (44993)

Sales office
103, Sanmakgondanbuk 11-gil,
Yangsan-si, Gyeongsangnam-do,
South Korea (50567)

TEL
+82-55-380-5670/5730/5720

FAX
+82-55-380-5299

E-Mail
dnainfo@dncompany.com

Catalogue No. DNA1025581R1

DN AUTOMOTIVE

WORLDWIDE CALCIUM SEALED MAINTENANCE FREE BATTERY

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About BTS

BATTERY TOTAL SOLUTION

DN Automotive delivers world class
lead-acid battery technology for global transportation

01

Dstory
Now & new

Energy move the world & Professional energy solution provider

DN Automotive is a Korean manufacturing company with global competitiveness, producing automotive parts as batteries and rubber parts.

From its BTS(Battery Total Solution) Division is a global automotive battery company with a reliable technology intelligence, advanced engineering and a qualified validation system.

Beyond its strong capabilities, BTS is continuously enhancing performance and quality enabling to supply our trusted products to over 300 customers across 120 countries worldwide.

Now DN Automotive is working towards technology-driven innovation to be a market leader while creating synergy by securing new growth domains which can create to new values.

We will go a step ahead in the industry as a global manufacturing innovator through continued growth and R&D efforts based on exclusive technologies in all of our business areas.

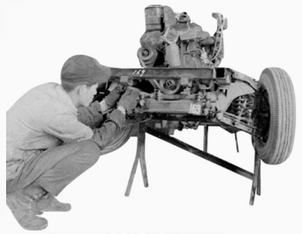
The ultimate goal of DN Automotive is to open a new era as a globally recognized company by satisfying our customers and being fully committed to corporate social responsibility.

History

DN Automotive is positioning itself as a comprehensive automotive parts maker since its foundation on 1971 as a retread tires and tire flap plant. DN Automotive expanded its automotive industry area from VMS (Vibration Management System) in 1992 and BTS (Battery Total Solution) in 1999. In 2011, using the latest technologies and processes, the world-class MF battery plant was built with top-notch machines and automated lines, which secured a foothold to leap in the global market. By changing its name to DN Automotive in 2022, we are preparing to make a gradual growth to upgrade our production capability by 2026.

1971

Established
DONGAH TIRE & RUBBER CO.,LTD



1992

Launched VMS Business
(Vibration Management System)

1999

M&A DSB battery (Dry-Charged)

2007

Built VMS Plant in China(Qingdao)

2009

M&A Avon Automotive VMS in UK

2011

Established
NEW DTR MF BATTERY PLANT

2014

Built DTR Yangsan Plant &
R&D Center
M&A CF GOMMA in Italy

2017

Launched EFB Battery
Renamed to DTR Automotive Corp.
FCA Supplier of the Year
GM Supplier of the Year ('15, '17~'21)

2019

Built VMS Plant in Mexico
Renovated Battery R&D Center

2020

Winner of Korea Consumer
Satisfaction Awards(Battery)
Started Supplying RIVIAN in US

2021

GM Supplier Quality
Excellence Awards (For 8 years)

2022

Launched AGM Battery
M&A Doosan Machine Tools
Renamed to DN Automotive Corp.

2023

Production and supply of
AGM batteries
Winner of Korea Consumer
Satisfaction Brand (4 years in row)

2024

Started 2nd Expansion in Ulsan
Awarded for Stellantis Japan
OES program

2025

Started supplying GM APC
(Aftermarket Product Center)

BTS Technology

DN Automotive delivers high-quality batteries engineered by the industry's leading experts

02

SMF AUTOMOTIVE

DN AUTOMOTIVE BATTERIES have the technology suitable for all types of passenger and high-end cars. Adapting powerful new punched grid guarantees superb starting power optimizing electricity flow. Calcium-Tin alloy prevents life shortening by minimizing decrease in electrolyte during charging and discharging. The lifespan is enhanced through the incorporation of specialized additives and the application of advanced tissue on the plates.

Smooth, powerful start-up performance

Starting power with unique grid design optimizing electricity flow.

A consistently long life span

Strengthened life span through the addition of special additives and consolidation of crystal material.

Special Structure of Closed Cover

Enhanced users safety by adaptation of a special structure to the sealed cover.

MF Technology

1 Punched Grid for Positive plate

- Full framed round edge grid offers high starting power and durability

2 Calcium High Tin Alloy

- Optimized Calcium alloy provides maintenance free and corrosion resistance

3 Special Tissue on plates

- Non-woven tissue improve adhesion of active material

4 Safety & Convenience

- Flame arrester prevent explosion by spark
- Built-in handle provides easy handling

AGM ADVANCED START & STOP

❶ AGM (Absorbent Glass Mat) Separator

- Minimized electric resistance provides outstanding cranking power
- Minimized self-discharge
- No plate movement, leak proof-installation at any angle

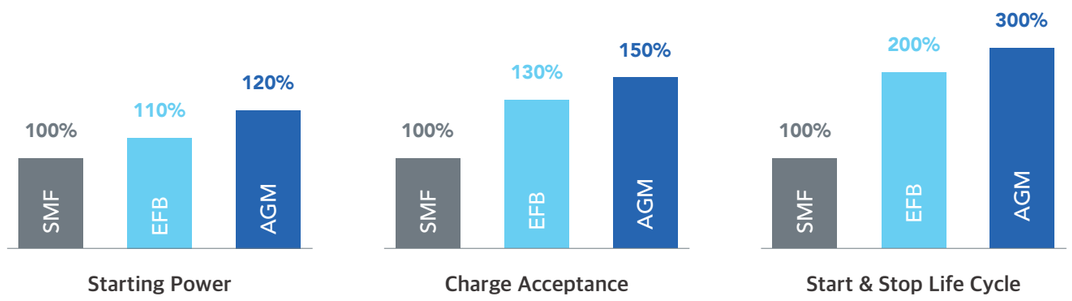
❷ Punched & Thicker Grid for both Positive and Negative

- Longer life, Stable Starting Power and Superior Durability
- High Dimension grid structure increases energy density

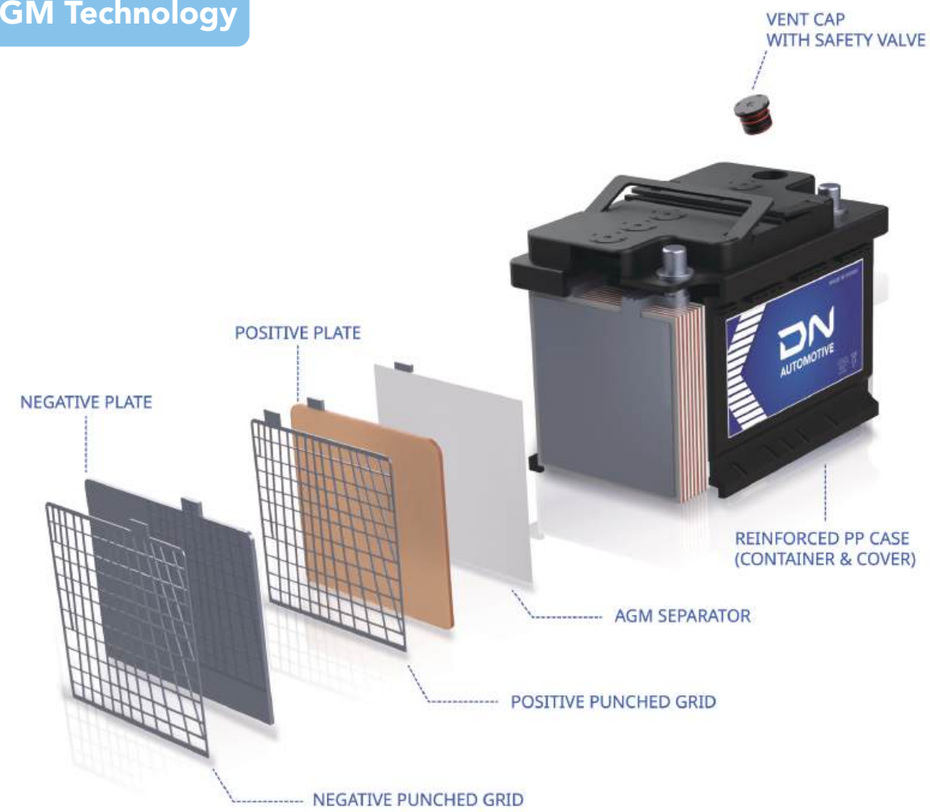
❸ Stability and Convenience

- VRLA structure allows stable cranking power
- Leak-proof and safe handing
- Reinforced plastic case with inner flame arrester

3x Higher Start & Stop cycling performance

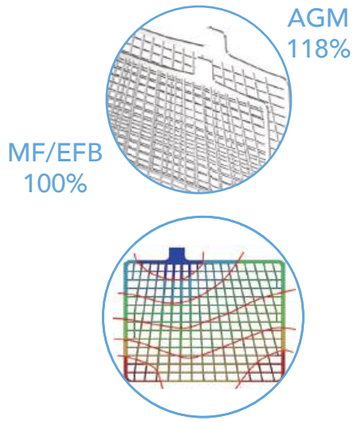


AGM Technology



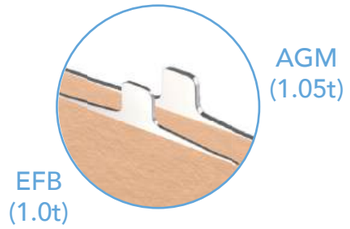
Smooth, powerful start-up performance

Starting power with unique grid design optimizing electricity flow.



Special Grid Surface Treatment

The application of thick substrates improves life, reduces resistance, improves low temperature starting power and minimizes corrosion/growth of substrates.



EFB
START & STOP

1 Punched & Thicker Grid for both Positive and Negative

- Enhanced Charge Acceptance and Durability
- Prevent distortion of grid structure from corrosion

2 Carbon+ Technology : Special Carbon Additives in Negative

- Optimized Components for quick charge
- Special Carbon applied to achieve an improvement in charging recovery performance from frequent discharge

3 Low resistance envelope separator

- Enhanced starting power

4 2x Higher Start & Stop cycling performance

EFB Technology

I Idle **S** Start **S** Stop

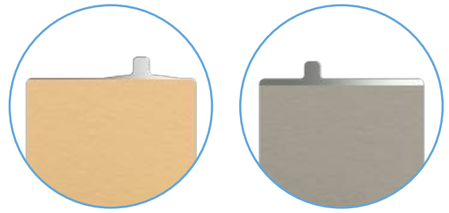
The **ISS** is a system designed to improve fuel economy by automatically turning the engine off and on when the vehicle stops or starts.
The ISS systems require higher charging efficiency and durability since they are more frequently discharged than normal systems.
DN Automotive EFB Batteries are perfectly suited for such systems. Durability is improved by applying corrosion-resistant alloys and improved materials.
Enhanced startup capability and charging efficiency is achieved by low resistance envelope separators and special carbon technology.

The Special Carbon Additive

The special carbon additive, improve the charge acceptance and minimized the electrolite depletion.

Enhanced Performance And Durability

Application of specialized additives and materials improve the performance and durbility of the active material.



MANUFACTURING PROCESS

DN Automotive's proven-quality batteries are engineered through systematic and precise processes.

1. Lead Oxide

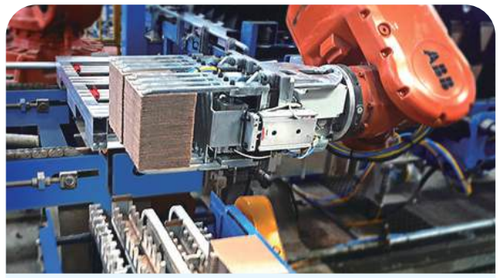
- Barton pot process is the core of lead oxide spherically shaped particles
- Fine Oxide with ca.50% by weight less than 4.5 microns

2. Strip Rolling

- Over 90% slab reduction rate
- Excellent mechanical properties, fine and uniform strip
- Anti-corrosion alloy

3. Strip Punching

- Full Framed Grid constrains the active material and provides mechanical strength
- Reduction of Internal Resistance

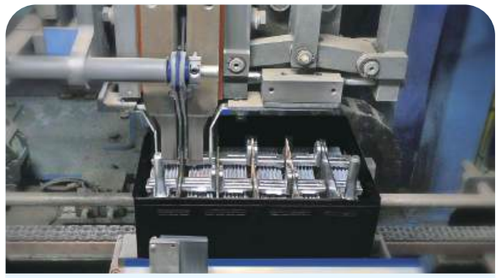


4. Pasting

- Double-sided pasting for minimizing corrosion of grid
- Strong adhesion between grid and paste

5. Curing

- Even plate quality by vertical loading
- Optimal particle size for battery performance & lifespan
- Advanced adhesion and cohesion of plate

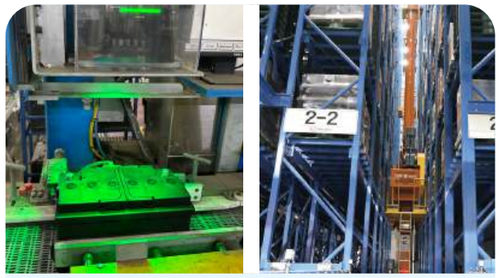


6. Assembling

- Plate quantity & weight measuring system
- Total inspection for all batteries
- Spot welding quality measuring system

7. Formation

- Dynamic charging acceptability & less self-dis charge rate by multi-step charging
- Optimized charging temperature management system



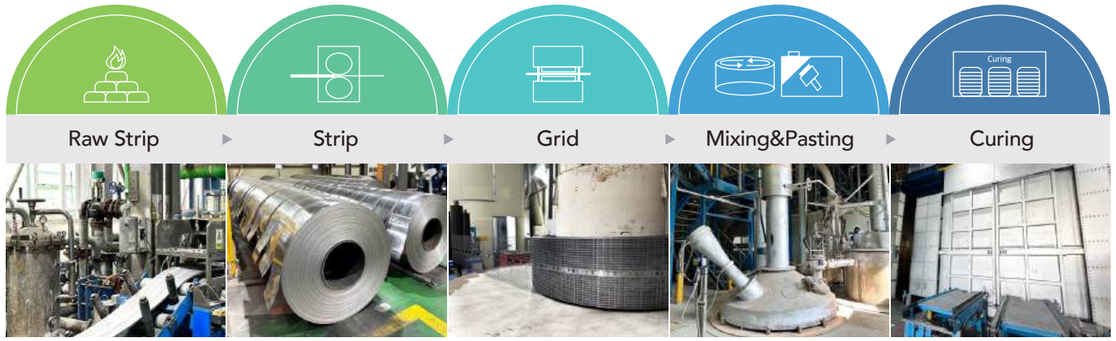
8. Finishing Process

- Electrolyte cooling system & Inspection by High Rate Discharge(HRD)
- Laser marking System & Robot Packaging System
- Storage in Automatic Warehouse for Shipping

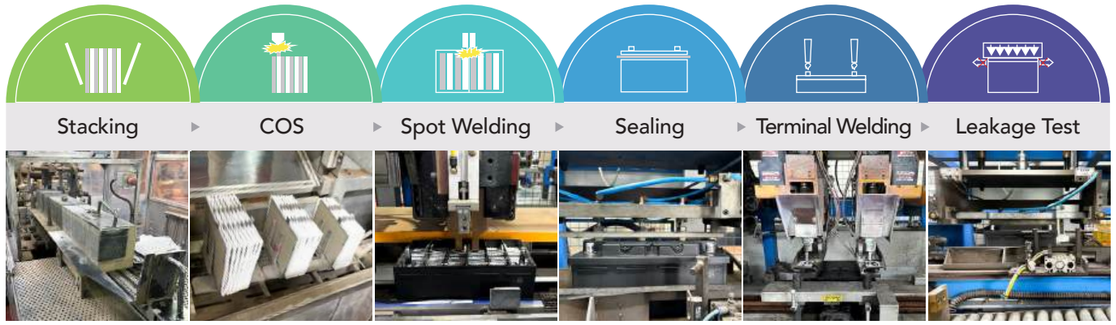
DETAILED MANFACTURING PROCESS

DN Automotive operates two plants in Ulsan, South Korea.
Our PLANT 2 specializes in plate manufacturing, which marks the beginning of our production process.
The plates are then transferred to the PLANT 1, where assembly, formation,
and finishing operations are carried out.
Finally through our well-structured and transparent manufacturing system,
we consistently deliver high-quality products and reliable service to our valued customers.

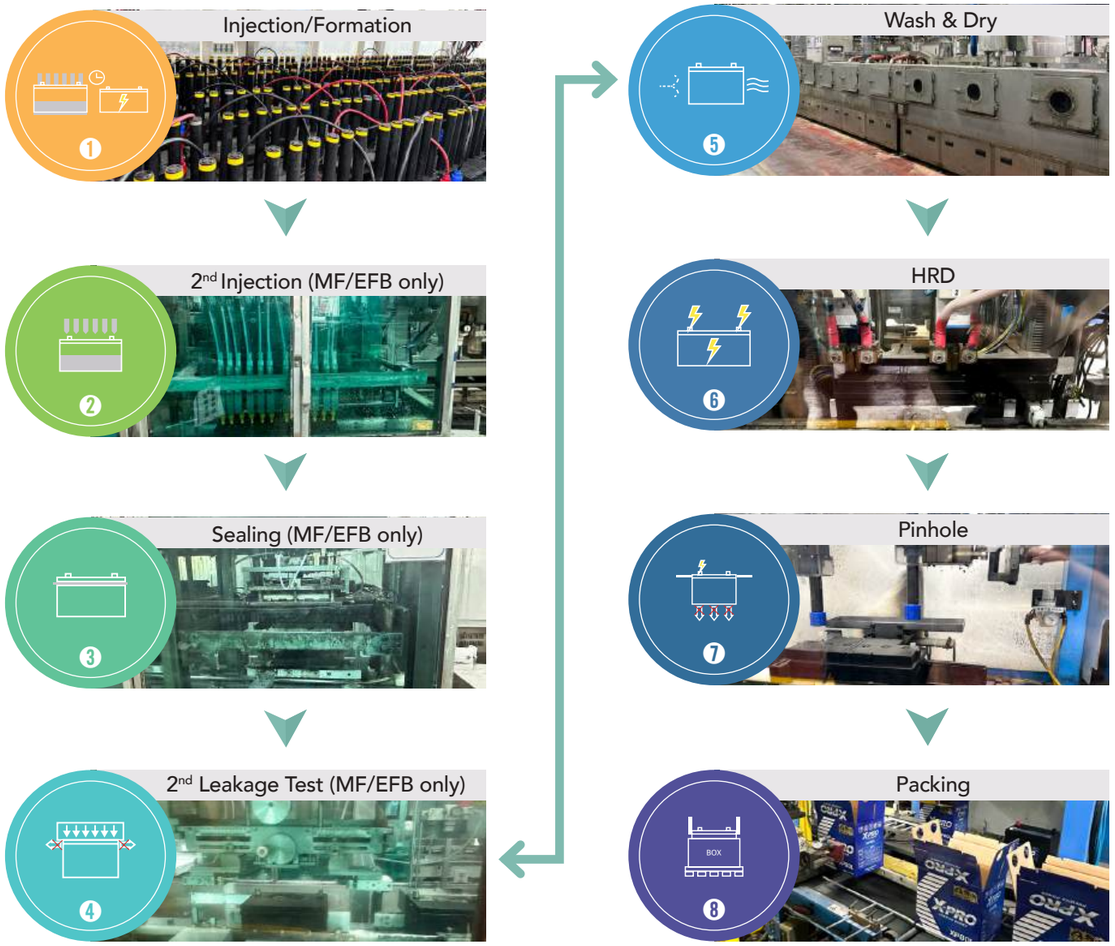
PLATE MANUFACTURING PROCESS (KOREA, ULSAN PLANT 2)



ASSEMBLY PROCESS (KOREA, ULSAN PLANT 1)



FORMATION/FINISHING PROCESS (KOREA, ULSAN PLANT 1)



OUR PRODUCTS

Leading Future Mobility with BTS Technology
A Global Manufacturing Leader Built on Innovation

03

SPECIFICATION

SMF Automotive

- JIS MF SERIES / For Japanese Vehicles
- DIN MF SERIES / For European Vehicles
- BCI MF SERIES / For American Vehicles

JIS MF SERIES (For Japanese Vehicles)

Group	TYPE No.		Capacity 20HR	CCA (SAE)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
	New	Old				L	W	H	TH			
B19	32B19L	NS40L	32	270	48	187	127	200	222	0	B	B0/B1
	32B19R	NS40	32	270	48	187	127	200	222	1	B	B0/B1
	32B19LS	-	32	270	48	187	127	200	222	0	A	B0/B1
	32B19RS	-	32	270	48	187	127	200	222	1	A	B0/B1
	40B19L	NS40ZL	35	300	52	187	127	200	222	0	B	B0/B1
	40B19R	NS40Z	35	300	52	187	127	200	222	1	B	B0/B1
	40B19LS	NS40ZLS	35	300	52	187	127	200	222	0	A	B0/B1
	40B19RS	NS40ZS	35	300	52	187	127	200	222	1	A	B0/B1
	42B19L	-	38	340	55	187	127	200	222	0	B	B0/B1
	42B19R	-	38	340	55	187	127	200	222	1	B	B0/B1
	42B19LS	-	38	340	55	187	127	200	222	0	A	B0/B1
	42B19RS	-	38	340	55	187	127	200	222	1	A	B0/B1
	44B19L	-	40	370	60	187	127	200	222	0	B	B0/B1
	44B19R	-	40	370	60	187	127	200	222	1	B	B0/B1
	44B19LS	-	40	370	60	187	127	200	222	0	A	B0/B1
	44B19RS	-	40	370	60	187	127	200	222	1	A	B0/B1
B24	46B24L	-	35	300	52	235	127	200	222	0	B	B0/B1
	46B24R	-	35	300	52	235	127	200	222	1	B	B0/B1
	46B24LS	-	35	300	52	235	127	200	222	0	A	B0/B1
	46B24RS	-	35	300	52	235	127	200	222	1	A	B0/B1
	50B24L	N40LB	40	370	60	235	127	200	222	0	B	B0/B1
	50B24R	N40B	40	370	60	235	127	200	222	1	B	B0/B1
	50B24LS	N40L	40	370	60	235	127	200	222	0	A	B0/B1
	50B24RS	N40	40	370	60	235	127	200	222	1	A	B0/B1
	55B24L	NS60L	45	430	71	235	127	200	222	0	B	B0/B1
	55B24R	NS60	45	430	71	235	127	200	222	1	B	B0/B1
	55B24LS	NS60LS	45	430	71	235	127	200	222	0	A	B0/B1
	55B24RS	NS60S	45	430	71	235	127	200	222	1	A	B0/B1
	60B24L	-	48	470	75	235	127	200	222	0	B	B0/B1
	60B24R	-	48	470	75	235	127	200	222	1	B	B0/B1
	60B24LS	-	48	470	75	235	127	200	222	0	A	B0/B1
	60B24RS	-	48	470	75	235	127	200	222	1	A	B0/B1
D20	50D20L	-	50	450	80	200	172	200	220	0	A	B0/B1
	50D20R	-	50	450	80	200	172	200	220	1	A	B0/B1

JIS MF SERIES (For Japanese Vehicles)

Group	TYPE No.		Capacity 20HR	CCA (SAE)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
	New	Old				L	W	H	TH			
D23	55D23L	-	60	550	100	231	172	200	220	0	A	B0/B1
	55D23R	-	60	550	100	231	172	200	220	1	A	B0/B1
	75D23L	-	65	580	110	231	172	200	220	0	A	B0/B1
	75D23R	-	65	580	110	231	172	200	220	1	A	B0/B1
	80D23L	-	70	630	120	231	172	200	220	0	A	B0/B1
	80D23R	-	70	630	120	231	172	200	220	1	A	B0/B1
D26	48D26L	N50L	50	430	80	258	172	200	220	0	A	B0/B1
	48D26R	N50	50	430	80	258	172	200	220	1	A	B0/B1
	55D26L	N50ZL	60	550	100	258	172	200	220	0	A	B0/B1
	55D26R	N50Z	60	550	100	258	172	200	220	1	A	B0/B1
	75D26L	NS70L	65	580	110	258	172	200	220	0	A	B0/B1
	75D26R	NS70	65	580	110	258	172	200	220	1	A	B0/B1
	80D26L	NX110-5L	70	600	120	258	172	200	220	0	A	B0/B1
	80D26R	NX110-5	70	600	120	258	172	200	220	1	A	B0/B1
	90D26L	-	75	630	130	258	172	200	220	0	A	B0/B1
	90D26R	-	75	630	130	258	172	200	220	1	A	B0/B1
D31	55D31L	-	60	510	100	303	172	200	220	0	A	B0/B1
	55D31R	-	60	510	100	303	172	200	220	1	A	B0/B1
	60D31L	-	65	560	120	303	172	200	220	0	A	B0/B1
	60D31R	-	65	560	120	303	172	200	220	1	A	B0/B1
	65D31L	N70L	70	600	120	303	172	200	220	0	A	B0/B1
	65D31R	N70	70	600	120	303	172	200	220	1	A	B0/B1
	75D31L	N70ZL	75	630	130	303	172	200	220	0	A	B0/B1
	75D31R	N70Z	75	630	130	303	172	200	220	1	A	B0/B1
	95D31L	NX120-7L	80	670	140	303	172	200	220	0	A	B0/B1
	95D31R	NX120-7	80	670	140	303	172	200	220	1	A	B0/B1
	105D31L	-	90	750	160	303	172	200	220	0	A	B0/B1
	105D31R	-	90	750	160	303	172	200	220	1	A	B0/B1
	115D31L	-	95	830	170	303	172	200	220	0	A	B0/B1
	115D31R	-	95	830	170	303	172	200	220	1	A	B0/B1
	125D31L	-	100	830	180	303	172	200	220	0	A	B0/B1
	125D31R	-	100	830	180	303	172	200	220	1	A	B0/B1
D33	MF100L	-	100	830	180	326	172	203	223	0	A	B0
	MF100R	-	100	830	180	326	172	203	223	1	A	B0
E41	95E41L	N100L	100	830	180	408	172	210	230	0	A	B0
	95E41R	N100	100	830	180	408	172	210	230	1	A	B0
	115E41L	NS120L	110	900	200	408	172	210	230	0	A	B0
	115E41R	NS120	110	900	200	408	172	210	230	1	A	B0

JIS MF SERIES (For Japanese Vehicles)

Group	TYPE No.		Capacity 20HR	CCA (SAE)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
	New	Old				L	W	H	TH			
F51	135F51L	N120L	120	870	230	506	182	212	233	3	A	B0
	135F51R	N120	120	870	230	506	182	212	233	4	A	B0
	150F51L	-	130	900	250	506	182	212	233	3	A	B0
	150F51R	-	130	900	250	506	182	212	233	4	A	B0
G51	155G51L	-	135	920	290	506	215	212	233	3	A	B0
	155G51R	-	135	920	290	506	215	212	233	4	A	B0
	160G51L	N150L	150	1000	300	506	215	212	233	3	A	B0
	160G51R	N150	150	1000	300	506	215	212	233	4	A	B0
	165G51L	NS200L	170	1050	325	506	215	212	233	3	A	B0
	165G51R	NS200	170	1050	325	506	215	212	233	4	A	B0
	180G51L	-	180	1150	350	506	215	212	233	3	A	B0
	180G51R	-	180	1150	350	506	215	212	233	4	A	B0
H52	180H52L	-	180	1000	350	509	274	219	240	3	A	B0
	180H52R	-	180	1000	350	509	274	219	240	4	A	B0
	210H52L	N200L	200	1200	430	509	274	219	240	3	A	B0
	210H52R	N200	200	1200	430	509	274	219	240	4	A	B0
	225H52L	-	210	1300	440	509	274	219	240	3	A	B0
	225H52R	-	210	1300	440	509	274	219	240	4	A	B0
	245H52L	-	220	1400	460	509	274	219	240	3	A	B0
	245H52R	-	220	1400	460	509	274	219	240	4	A	B0

DIN MF SERIES (For European Vehicles)

Group	TYPE No.	Capacity 20HR	CCA (EN)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
					L	W	H	TH			
LBN1	53518	35	330	60	207	174	175	175	0	A	B13
	53519	35	330	60	207	174	175	175	1	A	B13
	54316	43	400	70	207	174	175	175	0	A	B13
	54318	43	400	70	207	174	175	175	1	A	B13
	54321	43	450	71	207	174	175	175	0	A	B13
	54322	43	450	71	207	174	175	175	1	A	B13
LN1	54459	44	390	71	207	174	190	190	0	A	B13
	54464	44	390	71	207	174	190	190	1	A	B13
	55054	50	420	80	207	174	190	190	0	A	B13
	55055	50	420	80	207	174	190	190	1	A	B13
LBN2	54519	45	390	71	242	174	175	175	0	A	B14
	54518	45	390	71	242	174	175	175	1	A	B14
	55040	50	450	80	242	174	175	175	0	A	B13
	55044	50	450	80	242	174	175	175	0	A	B4
	55045	50	450	80	242	174	175	175	1	A	B4
	55457	54	480	90	242	174	175	175	0	A	B13
	55458	54	480	90	242	174	175	175	1	A	B13
	56009	60	510	100	242	174	175	175	0	A	B13
	56077	60	540	100	242	174	175	175	0	A	B13
LN2	55071	50	420	80	242	174	190	190	0	A	B13
	55076	50	420	80	242	174	190	190	1	A	B13
	55559	55	480	90	242	174	190	190	0	A	B13
	55565	55	480	90	242	174	190	190	1	A	B13
	56219	62	540	100	242	174	190	190	0	A	B13
	56220	62	540	100	242	174	190	190	1	A	B13
LBN3	55415	54	480	90	277	174	175	175	0	A	B13
	56318	63	540	105	277	174	175	175	0	A	B14
	56330	63	540	105	277	174	175	175	0	A	B13
	56331	63	540	105	277	174	175	175	1	A	B13
	56828	68	570	113	277	174	175	175	0	A	B13
	56821	68	570	113	277	174	175	175	1	A	B13
	57113	71	640	120	277	174	175	175	0	A	B13
	57112	71	640	120	277	174	175	175	1	A	B13
LN3	56638	66	540	110	277	174	190	190	0	A	B13
	56640	66	540	110	277	174	190	190	1	A	B13
	57219	72	610	120	277	174	190	190	1	A	B13
	57220	72	610	120	277	174	190	190	0	A	B13
	57412	74	680	130	277	174	190	190	0	A	B13
	57413	74	680	130	277	174	190	190	1	A	B13

DIN MF SERIES (For European Vehicles)

Group	TYPE No.	Capacity 20HR	CCA (EN)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
					L	W	H	TH			
LBN4	57539	75	640	130	313	174	175	175	0	A	B13
	57538	75	640	130	313	174	175	175	1	A	B13
	58014	80	680	140	313	174	175	175	0	A	B13
LN4	58043	80	640	140	313	174	190	190	0	A	B13
	58044	80	640	140	313	174	190	190	1	A	B13
	59042	90	720	160	313	174	190	190	0	A	B13
	59043	90	720	160	313	174	190	190	1	A	B13
LBN5	58515	85	720	145	351	174	175	175	0	A	B13
	59015	90	740	160	351	174	175	175	0	A	B13
LN5	58821	88	680	150	351	174	190	190	1	A	B13
	58827	88	680	150	351	174	190	190	0	A	B13
	59218	92	720	165	351	174	190	190	0	A	B13
	59219	92	720	165	351	174	190	190	1	A	B13
	60044	100	850	180	351	174	190	190	0	A	B13
	60043	100	850	180	351	174	190	190	1	A	B13
B19	54026	40	330	60	187	127	200	222	0	B	B0
	54027	40	330	60	187	127	200	222	1	B	B0
B24	54523	45	360	71	235	127	200	222	0	A	B0
	54524	45	360	71	235	127	200	222	1	A	B0
	54551	45	360	71	235	127	200	222	1	B	B0
	54584	45	360	71	235	127	200	222	0	B	B0
D20	55041	50	390	80	200	172	200	220	0	A	B1
	55042	50	390	80	200	172	200	220	1	A	B1
D23	56068	60	480	100	231	172	200	220	0	A	B1
	56069	60	480	100	231	172	200	220	1	A	B1
D26	56048	60	480	100	266	172	200	220	0	A	B9
	56049	60	480	100	266	172	200	220	1	A	B9
	57024	70	540	120	266	172	200	220	1	A	B9
	57029	70	540	120	266	172	200	220	0	A	B9
D31	57512	75	600	130	303	172	200	220	0	A	B1
	57513	75	600	130	303	172	200	220	1	A	B1
	58513	85	680	145	303	172	200	220	0	A	B1
	58514	85	680	145	303	172	200	220	1	A	B1
	59518	95	720	170	303	172	200	220	0	A	B1
	59519	95	720	170	303	172	200	220	1	A	B1
	60045	100	760	180	303	172	200	220	0	A	B1
	60046	100	760	180	303	172	200	220	1	A	B1
D33	59615	96	760	170	326	172	203	223	0	A	B1
	59616	96	760	170	326	172	203	223	1	A	B1
E41	60016	100	760	180	408	172	210	230	0	A	B0

DIN MF SERIES (For European Vehicles)

Group	TYPE No.	Capacity 20HR	CCA (EN)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
					L	W	H	TH			
A	62034	120	680	230	514	189	196	217	3	A	B0
	62035	120	680	230	514	189	196	217	3	A	B13
	62036	120	680	230	514	189	196	217	4	A	B13
	62038	120	680	230	514	189	196	217	4	A	B0
	63530	135	720	250	514	189	196	217	3	A	B0
	63532	135	720	250	514	189	196	217	4	A	B0
	64589	145	800	260	514	189	196	217	3	A	B0
	64590	145	800	260	514	189	196	217	4	A	B0
	65038	150	900	300	514	189	196	217	3	A	B0
B	64317	143	900	270	514	223	196	217	3	A	B0
	64318	143	900	270	514	223	196	217	4	A	B0
	66016	160	900	320	514	223	196	217	3	A	B0
	66017	160	900	320	514	223	196	217	4	A	B0
	67018	170	950	320	514	223	196	217	3	A	B0
	67019	170	950	320	514	223	196	217	4	A	B0
	67025	170	950	320	514	223	196	217	4	A	B13
	68032	180	1000	370	514	223	196	217	3	A	B0
	68033	180	1000	370	514	223	196	217	4	A	B0
	68035	180	1000	370	514	223	196	217	3	A	B13
	68036	180	1000	370	514	223	196	217	4	A	B13
C	70027	200	1050	430	518	273	216	237	3	A	B0
	70029	200	1050	430	518	273	216	237	4	A	B0
	71014	210	1150	430	518	273	216	237	3	A	B0
	71015	210	1150	430	518	273	216	237	4	A	B0
	72512	225	1150	460	518	273	216	237	3	A	B0
	72513	225	1150	460	518	273	216	237	4	A	B0
	73011	230	1200	460	518	273	216	237	3	A	B0
	73012	230	1200	460	518	273	216	237	4	A	B0

BCI MF SERIES (For American Vehicles)

Group	TYPE No.	CCA (SAE)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
				L	W	H	TH			
151R	151R-270	270	48	187	127	200	222	28	A	B0
	151R-340	340	55	187	127	200	222	28	A	B0
	151R-370	370	60	187	127	200	222	28	A	B0
26	26-525	525	80	208	172	181	201	10	A	B1
26R	26R-525	525	80	208	172	181	201	11	A	B1
85	85-450	450	75	231	172	180	200	11	A	B1
	85-500	500	85	231	172	180	200	11	A	B1
	85-550	550	95	231	172	180	200	11	A	B1
	85-620	620	110	231	172	180	200	11	A	B1
86	86-450	450	75	231	172	180	200	10	A	B1
	86-500	500	85	231	172	180	200	10	A	B1
	86-550	550	95	231	172	180	200	10	A	B1
	86-620	620	110	231	172	180	200	10	A	B1
24	24-430	430	80	258	172	200	220	10	A	B1
	24-500	500	90	258	172	200	220	10	A	B1
	24-550	550	100	258	172	200	220	10	A	B1
	24-580	580	110	258	172	200	220	10	A	B1
	24-600	600	120	258	172	200	220	10	A	B1
	24-630	630	130	258	172	200	220	10	A	B1
	24-670	670	140	258	172	200	220	10	A	B1
	24-700	700	140	258	172	200	220	10	A	B1
	24-750	750	140	258	172	200	220	10	A	B1
24R	24R-430	430	80	258	172	200	220	11	A	B1
	24R-500	500	90	258	172	200	220	11	A	B1
	24R-550	550	100	258	172	200	220	11	A	B1
	24R-580	580	110	258	172	200	220	11	A	B1
	24R-600	600	120	258	172	200	220	11	A	B1
	24R-630	630	130	258	172	200	220	11	A	B1
	24R-670	670	140	258	172	200	220	11	A	B1
	24R-700	700	140	258	172	200	220	11	A	B1
	24R-750	750	140	258	172	200	220	11	A	B1
24F	24F-430	430	80	266	172	200	220	11F	A	B9
	24F-500	500	90	266	172	200	220	11F	A	B9
	24F-550	550	100	266	172	200	220	11F	A	B9
	24F-580	580	110	266	172	200	220	11F	A	B9
	24F-600	600	120	266	172	200	220	11F	A	B9
	24F-630	630	130	266	172	200	220	11F	A	B9
	24F-670	670	140	266	172	200	220	11F	A	B9
	24F-700	700	140	266	172	200	220	11F	A	B9
	24F-750	750	140	266	172	200	220	11F	A	B9
25	25-450	450	80	231	172	200	220	10	A	B1
	25-500	500	100	231	172	200	220	10	A	B1
	25-550	550	100	231	172	200	220	10	A	B1
	25-580	580	110	231	172	200	220	10	A	B1
	25-630	630	120	231	172	200	220	10	A	B1

BCI MF SERIES (For American Vehicles)

Group	TYPE No.	CCA (SAE)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
				L	W	H	TH			
35	35-450	450	80	231	172	200	220	11	A	B1
	35-500	500	100	231	172	200	220	11	A	B1
	35-550	550	100	231	172	200	220	11	A	B1
	35-580	580	110	231	172	200	220	11	A	B1
	35-630	630	120	231	172	200	220	11	A	B1
21	21-450	450	80	200	172	200	220	10	A	B1
21R	21R-450	450	80	200	172	200	220	11	A	B1
34	34-550	550	100	260	172	181	201	10	A	B1
	34-600	600	113	260	172	181	201	10	A	B1
	34-670	670	120	260	172	181	201	10	A	B1
	34-750	750	130	260	172	181	201	10	A	B1
34R	34R-550	550	100	260	172	181	201	11	A	B1
	34R-600	600	113	260	172	181	201	11	A	B1
	34R-670	670	120	260	172	181	201	11	A	B1
	34R-750	750	130	260	172	181	201	11	A	B1
27	27-600	600	120	303	172	200	220	10	A	B1
	27-630	630	130	303	172	200	220	10	A	B1
	27-650	650	120	303	172	200	220	10	A	B1
	27-670	670	140	303	172	200	220	10	A	B1
	27-750	750	160	303	172	200	220	10	A	B1
	27-800	800	170	303	172	200	220	10	A	B1
	27-830	830	180	303	172	200	220	10	A	B1
	27-900	900	180	303	172	200	220	10	A	B1
27R	27R-600	600	120	303	172	200	220	11	A	B1
	27R-630	630	130	303	172	200	220	11	A	B1
	27R-650	650	120	303	172	200	220	11	A	B1
	27R-670	670	140	303	172	200	220	11	A	B1
	27R-750	750	160	303	172	200	220	11	A	B1
	27R-800	800	170	303	172	200	220	11	A	B1
	27R-830	830	180	303	172	200	220	11	A	B1
	27R-900	900	180	303	172	200	220	11	A	B1
27F	27F-600	600	120	311	172	200	220	11F	A	B9
	27F-630	630	130	311	172	200	220	11F	A	B9
	27F-650	650	120	311	172	200	220	11F	A	B9
	27F-670	670	140	311	172	200	220	11F	A	B9
	27F-750	750	160	311	172	200	220	11F	A	B9
	27F-800	800	170	311	172	200	220	11F	A	B9
	27F-830	830	180	311	172	200	220	11F	A	B9
51	51-300	300	52	235	135	200	222	10	A	B1
	51-370	370	60	235	135	200	222	10	A	B1
	51-430	430	71	235	135	200	222	10	A	B1
	51-470	470	75	235	135	200	222	10	A	B1
51R	51R-300	300	52	235	135	200	222	11	A	B1
	51R-370	370	60	235	135	200	222	11	A	B1
	51R-430	430	71	235	135	200	222	11	A	B1
	51R-470	470	75	235	135	200	222	11	A	B1

BCI MF SERIES (For American Vehicles)

Group	BCI No.	CCA (SAE)	RC (MIN)	Dimension(mm)				Layout	Terminal	B/Down
				L	W	H	TH			
47	47-430	430	80	242	174	190	190	24	A	B13
	47-500	500	90	242	174	190	190	24	A	B13
	47-550	550	90	242	174	190	190	24	A	B13
	47-580	580	100	242	174	190	190	24	A	B13
	47-650	650	120	242	174	190	190	24	A	B13
48	48-550	550	90	277	174	190	190	24	A	B13
	48-580	580	110	277	174	190	190	24	A	B13
	48-700	700	130	277	174	190	190	24	A	B13
	48-750	750	130	277	174	190	190	24	A	B13
94R	94R-750	750	160	313	174	190	190	24	A	B13
	94R-800	800	170	313	174	190	190	24	A	B13
	94R-870	870	160	313	174	190	190	24	A	B13
49	49-710	710	150	351	174	190	190	24	A	B13
	49-750	750	165	351	174	190	190	24	A	B13
	49-800	800	170	351	174	190	190	24	A	B13
	49-850	850	170	351	174	190	190	24	A	B13
	49-870	870	180	351	174	190	190	24	A	B13
	49-950	950	185	351	174	190	190	24	A	B13
65	65-650	650	120	287	187	172	192	21	A	B8
	65-700	700	120	287	187	172	192	21	A	B8
	65-750	750	140	287	187	172	192	21	A	B8
	65-800	800	135	287	187	172	192	21	A	B8
	65-850	850	160	287	187	172	192	21	A	B8
65R	65R-650	650	120	287	187	172	192	11	A	B8
	65R-700	700	120	287	187	172	192	11	A	B8
	65R-750	750	140	287	187	172	192	11	A	B8
	65R-800	800	135	287	187	172	192	11	A	B8
	65R-850	850	160	287	187	172	192	11	A	B8
75	75-500	500	90	230	179	181	181	17	SIDE	B1
	75-550	550	100	230	179	181	181	17	SIDE	B1
	75-600	600	113	230	179	181	181	17	SIDE	B1
	75-650	650	120	230	179	181	181	17	SIDE	B1
75DT	75DT-500	500	90	230	179	181	201	17	DT	B1
	75DT-550	550	100	230	179	181	201	17	DT	B1
	75DT-600	600	113	230	179	181	201	17	DT	B1
	75DT-650	650	120	230	179	181	201	17	DT	B1
78	78-550	550	100	260	179	181	181	17	SIDE	B1
	78-600	600	113	260	179	181	181	17	SIDE	B1
	78-670	670	120	260	179	181	181	17	SIDE	B1
	78-750	750	130	260	179	181	181	17	SIDE	B1

JIS DIN BCI AGM EFB SPECIALTY

BCI MF SERIES (For American Vehicles)

Group	TYPE No.	CCA (SAE)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
				L	W	H	TH			
78DT	78DT-550	550	100	260	179	181	201	17	DT	B1
	78DT-600	600	113	260	179	181	201	17	DT	B1
	78DT-670	670	120	260	179	181	201	17	DT	B1
	78DT-750	750	130	260	179	181	201	17	DT	B1
90	90-330	330	52	242	174	175	175	24	A	B13
	90-370	370	60	242	174	175	175	24	A	B13
	90-430	430	71	242	174	175	175	24	A	B13
	90-480	480	80	242	174	175	175	24	A	B13
	90-500	500	90	242	174	175	175	24	A	B13
	90-540	540	100	242	174	175	175	24	A	B13
	90-570	570	100	242	174	175	175	24	A	B13
96R	96R-430	430	71	242	174	175	175	15	A	B1
	96R-480	480	80	242	174	175	175	15	A	B1
	96R-500	500	90	242	174	175	175	15	A	B1
	96R-540	540	100	242	174	175	175	15	A	B1
	96R-570	570	100	242	174	175	175	15	A	B1
42	42-430	430	71	242	174	175	175	15	A	B4
	42-570	570	100	242	174	175	175	15	A	B4
91	91-500	500	90	277	174	175	175	24	A	B13
	91-580	580	105	277	174	175	175	24	A	B13
	91-630	630	113	277	174	175	175	24	A	B13
	91-670	670	120	277	174	175	175	24	A	B13
	91-750	750	125	277	174	175	175	24	A	B13
40R	40R-500	500	90	277	174	175	175	15	A	B1
	40R-630	630	113	277	174	175	175	15	A	B1
	40R-670	670	120	277	174	175	175	15	A	B1
41	41-500	500	90	277	174	175	175	15	A	B4
	41-580	580	105	277	174	175	175	15	A	B4
	41-670	670	120	277	174	175	175	15	A	B4
92	92-670	670	120	313	174	175	175	24	A	B13
	92-710	710	130	313	174	175	175	24	A	B13
	92-750	750	140	313	174	175	175	24	A	B13
	92-830	830	145	313	174	175	175	24	A	B13
93	93-750	750	140	351	174	175	175	24	A	B13
	93-780	780	160	351	174	175	175	24	A	B13
30H	30H-750L	750	160	326	172	203	223	11	A	B1
	30H-750	750	160	326	172	203	223	10	A	B1
	30H-830L	830	180	326	172	203	223	11	A	B1
	30H-830	830	180	326	172	203	223	10	A	B1
	30H-900L	900	180	326	172	203	223	11	A	B1
	30H-900	900	180	326	172	203	223	10	A	B1

JIS DIN BCI AGM EFB SPECIALTY

BCI MF SERIES (For American Vehicles)

Group	TYPE No.	CCA (SAE)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
				L	W	H	TH			
4D	4D-820	820	230	506	215	212	233	8	A	B0
	4D-920	920	290	506	215	212	233	8	A	B0
	4D-1000	1000	300	506	215	212	233	8	A	B0
	4D-1050	1050	325	506	215	212	233	8	A	B0
	4D-1150	1150	350	506	215	212	233	8	A	B0
8D	8D-1000	1000	350	509	274	219	240	8	A	B0
	8D-1200	1200	430	509	274	219	240	8	A	B0
	8D-1250	1250	430	509	274	219	240	8	A	B0
	8D-1300	1300	440	509	274	219	240	8	A	B0
	8D-1400	1400	460	509	274	219	240	8	A	B0
22F	22F-450	450	75	240	172	180	203	11F	DUAL FIT	B9
	22F-450R	450	75	240	172	180	203	10F	DUAL FIT	B9
	22F-500	500	85	240	172	180	203	11F	DUAL FIT	B9
	22F-500R	500	85	240	172	180	203	10F	DUAL FIT	B9
	22F-550	550	95	240	172	180	203	11F	DUAL FIT	B9
	22F-550R	550	95	240	172	180	203	10F	DUAL FIT	B9
C31	C31-670	670	150	330	172	217	239	18	TOP	B0
	C31-750	750	160	330	172	217	239	18	TOP	B0
	C31-800	800	170	330	172	217	239	18	TOP	B0
	C31-850	850	180	330	172	217	239	18	TOP	B0
	C31-900	900	185	330	172	217	239	18	TOP	B0
	C31-950	950	185	330	172	217	239	18	TOP	B0
	C31-1000	1000	190	330	172	217	239	18	TOP	B0
C31S	C31S-670	670	150	330	172	217	238	18	STUD	B0
	C31S-750	750	160	330	172	217	238	18	STUD	B0
	C31S-800	800	170	330	172	217	238	18	STUD	B0
	C31S-850	850	180	330	172	217	238	18	STUD	B0
	C31S-900	900	185	330	172	217	238	18	STUD	B0
	C31S-950	950	185	330	172	217	238	18	STUD	B0
	C31S-1000	1000	190	330	172	217	238	18	STUD	B0

AGM (Absorbant Glass Mat)

AGM PLATINUM / ADVANCED START & STOP

Group	Type No.	Capacity 20HR	CCA (SAE)	CCA (EN)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
						L	W	H	TH			
LN2	AGM60-C	60	680	710	100	242	174	190	190	0	A	B13
LN3	AGM70-C	70	760	790	120	277	174	190	190	0	A	B13
LN4	AGM80-C	80	850	880	140	314	174	190	190	0	A	B13
LN5	AGM95-C	95	900	930	160	352	174	190	190	0	A	B13
LN6	AGM105-C	105	950	980	190	394	174	190	190	0	A	B13

AGM / ADVANCED START & STOP

Group	Type No.	Capacity 20HR	CCA (SAE)	CCA (EN)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
						L	W	H	TH			
LN2	AGM60	60	650	680	100	242	174	190	190	0	A	B13
LN3	AGM70	70	730	760	120	277	174	190	190	0	A	B13
LN4	AGM80	80	770	800	140	314	174	190	190	0	A	B13
LN5	AGM95	95	820	850	160	352	174	190	190	0	A	B13
LN6	AGM105	105	920	950	190	394	174	190	190	0	A	B13

BCI AGM SERIES / ADVANCED START & STOP

Group	Type No.	Capacity 20HR	CCA (SAE)	RC (MIN)	Dimension(mm)				Layout	Terminal	B/Down
					L	W	H	TH			
C31	AGM C31	100	925	200	330	172	217	239	18	TOP	B0
C31S	AGM C31S	100	925	200	330	172	217	238	18	STUD	B0
24	AGM 24	80	750	140	258	172	200	220	10	A	B7
24F	AGM 24F	80	750	140	271	172	200	220	11F	A	B9
27	AGM 27	90	800	175	304	172	200	220	10	A	B7
27F	AGM 27F	90	800	175	317	172	200	220	11F	A	B9

JIS AGM SERIES / ADVANCED START & STOP

Group	Type No.	Capacity 20HR	CCA (SAE)	RC (MIN)	Dimension(mm)				Layout	Terminal	B/Down
					L	W	H	TH			
D26	AGM D26	80	750	140	258	172	200	220	0	A	B0/B1
	AGM D26R	80	750	140	258	172	200	220	1	A	B0/B1
D31	AGM D31	90	800	175	304	172	200	220	0	A	B0/B1
	AGM D31R	90	800	175	304	172	200	220	1	A	B0/B1

AGM /MARINE SERIES

Group	Type No.	Capacity 20HR	CCA (0°F/-18°C)	MCA (32°F/0°C)	RC (MIN)	Dimension(mm)				Layout	Terminal	B/ Down
						L	W	H	TH			
M24	AGM M24	80	750	900	140	258	172	200	221	1	TWIN	B7
M27	AGM M27	90	800	960	175	303	172	200	221	1	TWIN	B7
M31	AGM M31	100	925	1,000	200	330	172	217	238	1	TWIN	B0

EFB (Enhanced flooded Battery)

EFB / START & STOP

Group	Type No.	Capacity 20HR	CCA (SAE)	RC (MIN)	Dimension(mm)				Layout	Terminal	B/Down
					L	W	H	TH			
B19	ECK42	35	360	52	187	127	200	222	0	B	B0/B1
	ECK42R	35	360	52	187	127	200	222	1	B	B0/B1
	ECK44	40	420	60	187	127	200	222	0	B	B0/B1
	ECK44R	40	420	60	187	127	200	222	1	B	B0/B1
B20	ECM42	40	420	60	197	129	200	222	0	B	B0/B1
	ECM42R	40	420	60	197	129	200	222	1	B	B0/B1
B24	ECN55	45	460	71	235	127	200	222	0	B	B0/B1
	ECN55R	45	460	71	235	127	200	222	1	B	B0/B1
D23	ECQ85	65	670	110	231	172	200	220	0	A	B0/B1
	ECQ85R	65	670	110	231	172	200	220	1	A	B0/B1
D26	ECS95	68	730	113	258	172	200	220	0	A	B0/B1
	ECS95R	68	730	113	258	172	200	220	1	A	B0/B1
D31	ECT110	80	800	140	303	172	200	220	0	A	B0/B1
	ECT110R	80	800	140	303	172	200	220	1	A	B0/B1

Group	Type No.	Capacity 20HR	CCA (EN)	RC (MIN)	Dimension(mm)				Layout	Terminal	B/Down
					L	W	H	TH			
LN1	EC50	50	450	80	207	174	190	190	0	A	B13
LN2	EC60	60	560	100	242	174	190	190	0	A	B13
LBN3	EC65D	65	650	130	277	174	175	175	0	A	B13
LN3	EC70	70	650	120	277	174	190	190	0	A	B13
LBN4	EC75D	75	730	135	313	174	175	175	0	A	B13
LN4	EC80	80	730	140	313	174	190	190	0	A	B13
LN5	EC95	95	900	170	351	174	190	190	0	A	B13

SPECIALTY BATTERIES

1 Punched & Thicker Grid for positive plates

- Full framed round edge gird offers high starting power and durability

2 High Density Active material

- Endurable Active material provides stable perfomances during cycling

3 Twin Terminal for Marine & L Terminal for Lawn batteries

- Terminal according to application provides easy electric connection

3 Anchor Bonding

- Hot melt glue on the plates provide vibration resistance.

Battery Rating Criteria	Marine Starting	Starting & Cycling
Starting Service Capability	★★★	★★★
Dual Purpose Service Capability	-	★★★
Deep Cycle Service Capability	-	★
Floating Service Capability	★	★★
Maintenance Free	★★★	★★★
Storage Ability	★★★	★★★

Rating Scale : ★Good ★★Very Good ★★★Excellent

MARINE FOR STARTING

Group	TYPE No.	Capacity 20HR	CCA (0°F/-18°C)	MCA (32°F/0°C)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
						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
	M24-650	75	650	810	130	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	M27-600	70	600	750	130	303	172	200	221	1	TWIN	B1
	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
	M27-800	95	800	1,000	170	303	172	200	221	1	TWIN	B1
	M27-830	100	830	1,030	180	303	172	200	221	1	TWIN	B1
M31	M31-800	100	800	1,000	180	330	172	217	238	1	TWIN	B0
	M31-850	100	850	1,060	180	330	172	217	238	1	TWIN	B0
	M31-900	105	900	1,120	185	330	172	217	238	1	TWIN	B0
	M31-950	105	950	1,180	185	330	172	217	238	1	TWIN	B0

STARTING & CYCLING

Group	TYPE No.	Capacity 20HR	CCA (0°F/-18°C)	MCA (32°F/0°C)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
						L	W	H	TH			
M24	M24DC-550	75	550	715	130	258	172	200	221	1	TWIN	B1
	M24DC-650	80	650	810	145	258	172	200	221	1	TWIN	B1
M27	M27DC-700	90	700	860	170	303	172	200	221	1	TWIN	B1
	M27DC-750	90	750	920	170	303	172	200	221	1	TWIN	B1
M31	M31DC-750	100	750	920	190	330	172	217	238	1	TWIN	B0
	M31DC-800	105	800	1,000	195	330	172	217	238	1	TWIN	B0

LAWN & GARDEN

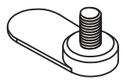
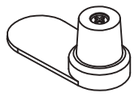
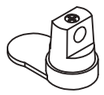
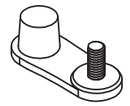
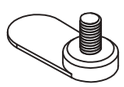
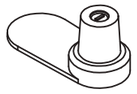
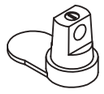
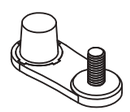
Group	Type No.	Capacity 20HR	CCA (SAE)	RC (MIN)	Dimension(mm)				Layout	Terminal	BHD
					L	W	H	TH			
U1	U1-190	14	190	20	195	130	160	183	10	LUG	B0
	U1-230	17	230	25	195	130	160	183	10	LUG	B0
	U1-250	19	250	30	195	130	160	183	10	LUG	B0
	U1-300	23	300	35	195	130	160	183	10	LUG	B0
	U1-330	25	330	40	195	130	160	183	10	LUG	B0
	U1-350	27	350	45	195	130	160	183	10	LUG	B0
U1R	U1R-190	14	190	20	195	130	160	183	11	LUG	B0
	U1R-230	17	230	25	195	130	160	183	11	LUG	B0
	U1R-250	19	250	30	195	130	160	183	11	LUG	B0
	U1R-300	23	300	35	195	130	160	183	11	LUG	B0
	U1R-330	25	330	40	195	130	160	183	11	LUG	B0
	U1R-350	27	350	45	195	130	160	183	11	LUG	B0

BATTERY GUIDE

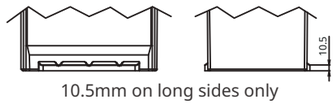
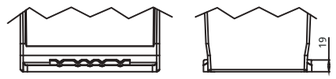
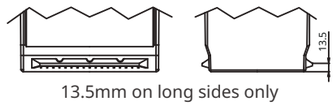
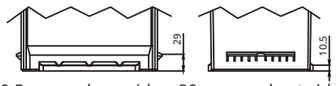
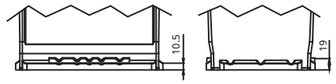
Driving Mobility Forward with Smart Lead-Acid Battery Solutions

04

TERMINAL

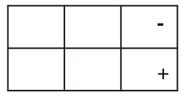
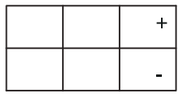
	A(Standard)	B(Small)	STUD	TOP	DUAL	MARINE TWIN	SIDE	LUG
Positive Terminal			 3/8"-16 THREADS			 5/16"-18 THREADS		
Negative Terminal			 3/8"-16 THREADS			 5/16"-18 THREADS		

BASE HOLD DOWN

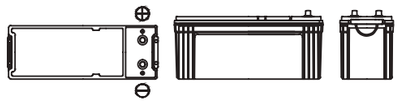
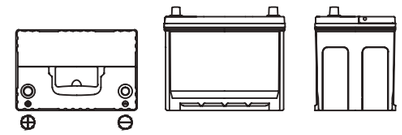
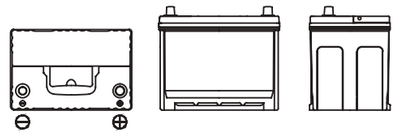
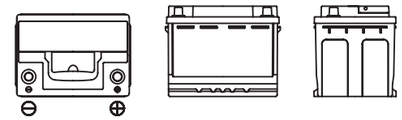
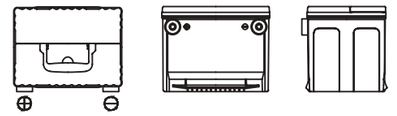
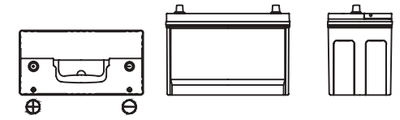
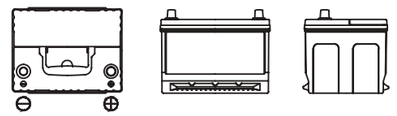
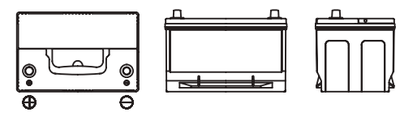
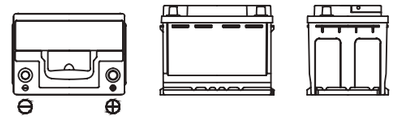
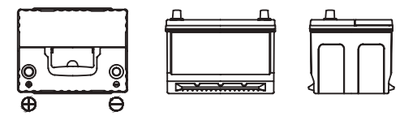
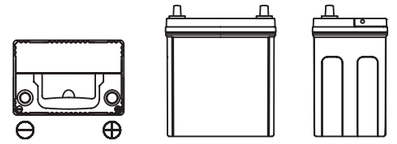
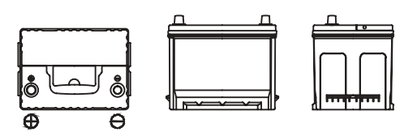
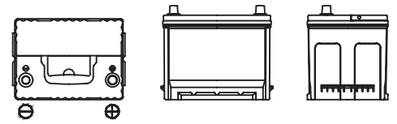
B0		B1	 10.5mm on long sides only
B4	5 notches  19mm on long sides only	B8	 13.5mm on long sides only
B9	 10.5mm on long sides, 29mm on short sides	B13	5 notches  10.5mm on all four sides
B14	 19mm on long sides, 10.5mm on short sides		

※These are common holdown types but other may be used.

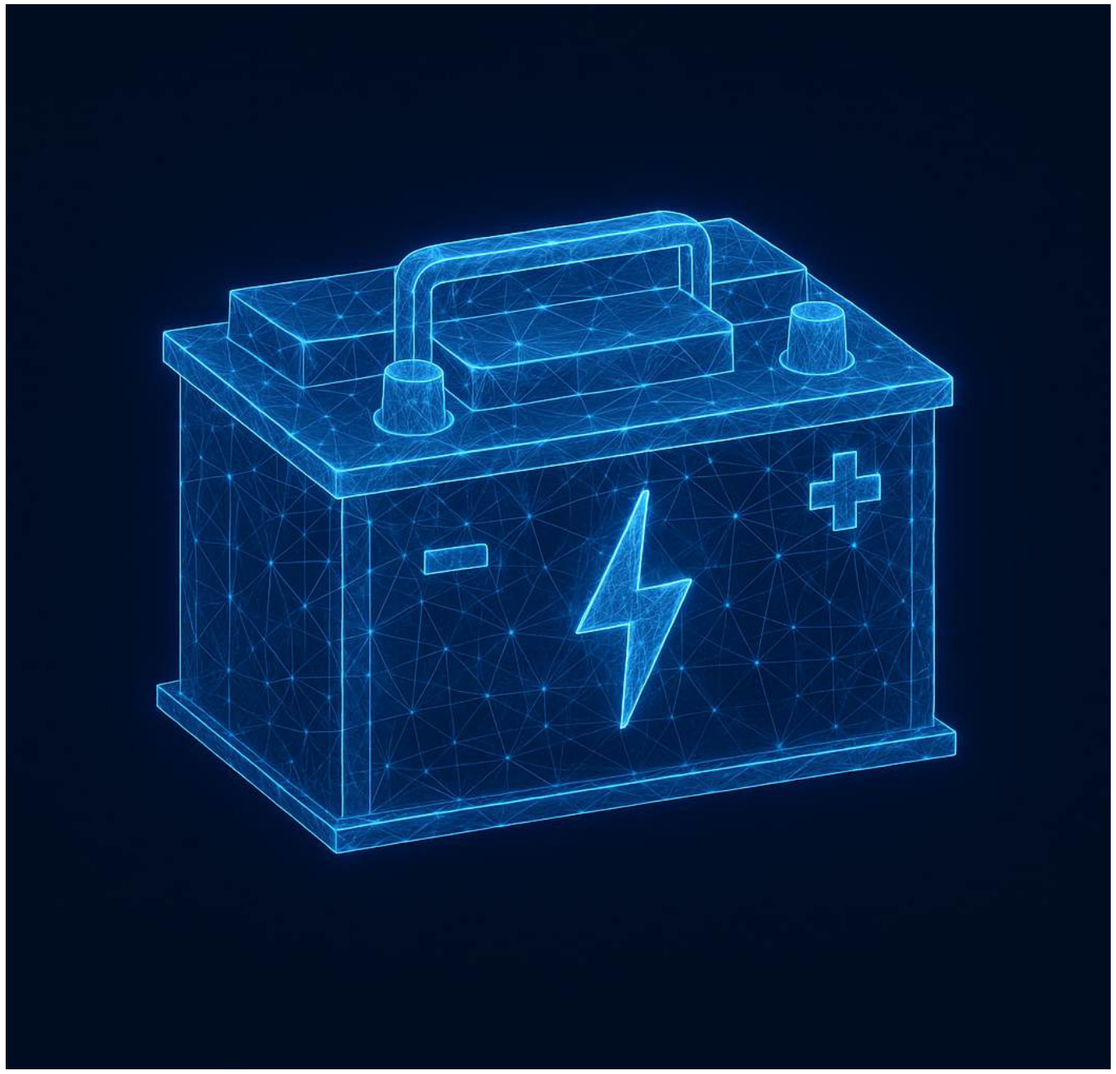
JIS, DIN Cell Layout

0	1	3	4
			

BCI Cell Layout

FIG.8		FIG.10	
FIG.11		FIG.15	
FIG.17		FIG.18	
FIG.19		FIG.21	
FIG.24		FIG.26	
FIG.28		FIG.10F	
FIG.11F			

BATTERY DIMENSION



B19								B24							
															
JIS	DIN	BCI	Dimension(mm)				HOLD DOWN	JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH					L	W	H	TH	
B19	54026	151R	187	127	200	222	B0	B24	-	51	235	127	200	222	B0

D20								D23							
															
JIS	DIN	BCI	Dimension(mm)				HOLD DOWN	JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH					L	W	H	TH	
D20	55041	21	200	172	200	220	B1	D23	-	35	231	172	200	220	B1

D26								D31							
															
JIS	DIN	BCI	Dimension(mm)				HOLD DOWN	JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH					L	W	H	TH	
D26	-	24	258	172	200	220	B1	D31	60045	27	303	172	200	220	B1

D33

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
D33	-	-	326	172	203	223	B0

E41

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
E41	-	-	408	172	210	230	B0

F51

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
F51	-	4D	506	182	213	233	B0

G51

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
G51	-	-	506	215	213	233	B0

H52

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
H52	-	8D	509	274	220	240	B0

L1

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	L1	-	207	173	190	190	B13

LN2

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	L2	47	242	173	190	190	B13

LN3

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	L3	48	276	173	190	190	B13

LN4

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	L4	94R	315	173	190	190	B13

LN5

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	L5	49	351	173	190	190	B13

LBN1

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	LB1	99R	207	173	175	175	B13

LBN2

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	LB2	42&90	242	173	175	175	B13

LBN3

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	LB3	91	276	173	175	175	B13

LBN4

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	LB4	92	315	173	175	175	B13

LBN5

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	LB5	93	351	173	175	175	B13

A

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	A	-	514	189	196	215	B0

B

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	B	-	514	223	196	215	B0

C

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	C	-	518	273	216	235	B0

26

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	-	26	208	172	181	201	B1

85

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	-	85	231	172	180	200	B1

C31

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	-	C31	330	172	217	240	B0

65

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	-	65	287	187	172	192	B8

75

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	-	75	230	179	181	181	B1

75DT

JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH	
-	-	75DT	230	179	181	201	B1

34								78								78DT							
																							
JIS	DIN	BCI	Dimension(mm)				HOLD DOWN	JIS	DIN	BCI	Dimension(mm)				HOLD DOWN	JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH					L	W	H	TH					L	W	H	TH	
-	-	34	260	172	181	201	B1	-	-	78	260	279	181	181	B1	-	-	78DT	260	179	181	201	B1

58								U1							
															
JIS	DIN	BCI	Dimension(mm)				HOLD DOWN	JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH					L	W	H	TH	
-	-	58	234	182	157	177	B8	-	-	U1	195	130	160	183	B0

M24								M27								M31							
																							
JIS	DIN	BCI	Dimension(mm)				HOLD DOWN	JIS	DIN	BCI	Dimension(mm)				HOLD DOWN	JIS	DIN	BCI	Dimension(mm)				HOLD DOWN
			L	W	H	TH					L	W	H	TH					L	W	H	TH	
-	-	M24	258	172	200	221	B1	-	-	M27	303	172	200	221	B1	-	-	M31	330	172	217	238	B0

※ Specifications are subject to change prior or without prior notice.

BATTERY SERVICE MANUAL

Safety Precautions

- Battery is dangerous to handle or work on. They are filled with dilute sulfuric acid. If any acid gets on your skin or cloth, flush with plenty of clean water and seek immediate medical care.
- When charging, hydrogen and oxygen are produced. Never bring cigarettes, flames or sparks anywhere near battery.
- Keep battery cover clean so that vent holes are free from clogging. Clogged up battery will have high internal pressure which may crack container or leak electrolyte.
- Battery should not be stored in a confined location under any conditions. Especially, when charging, place it in well-ventilated area.
- If there is energy left in used battery, please be careful with spark, short circuit and overflow of electrolyte.
- Please refrain from dismantlement of battery.
- This battery is designed and manufactured in accordance with conditions of vehicle operations. Please note that prescribed performance of battery cannot be sustained when battery is used for other purpose.

Caution Marks

- Each battery is marked with six warnings.

Handling Battery in Stock

- A wet-charged battery will be self-discharged even under not-in use condition.
- Keep battery in dark, cool place and measure open circuit voltage once a month.
- When open circuit voltage is below 12.4V/25˚C, carry out a boosting charge.
- If battery has been left at a low open circuit voltage for a long period, it will have sulfation and battery cannot be fully recharged, or at worst, cannot be recharged at all.

Before Selling to Consumer

- Usually stored battery will not have full capacity because of self-discharge.
- When OCV drops below 12.40V for MF battery(12.50V for AGM), battery should be recharged immediately to keep longer service life.

Charge

Constant Voltage Charge for Flooded & AGM Battery

- Charge to 14.4V~14.8V with max. current limit of 10% of C20 Capacity.
- Finish charging when current drop down to 1% of C20 Capacity.

Constant Current Charge for Flooded Battery

- Charge battery at constant current, 1/10 of its 20 hours rate capacity until three or more consecutive reading figures of terminal voltage are same.
- This method is very effective when discharged ampere-hour of battery is known since charging rate can be determined. Typically, 120~130% of discharged ampere-hour will be charged. Do not forget to disconnect charging power source when battery is completely charged. If not, it will continue to feed same amount of current to battery resulting in overcharge of battery.

Battery Charging Considerations

- Perform charging at place which is free from direct sunlight, rain, dew and moisture, but well ventilated, acid proof, washable and drained.
- Connect charging clamps to battery terminals firmly and precisely. Incorrect connection will deteriorate functions, and may cause damage to not only battery but also charger.
- Do not overcharge. Excessive charge may cause overcharging, resulting in damaged plates and separators and distortion of container due to high temperature.
- Never bring battery close to fire. Hydrogen and oxygen from battery will catch fire.
- Keep battery temperature below 45˚C. When it's near such temperature, reduce charging current by half or stop charging until battery goes down to 35˚C.

Charging Indicator

- Indicator on lid of battery can help to check charging status of battery.

STATE OF CHARGE

Approximate State of Charge	OCV
100%	12.75
75%	12.40
50%	12.20
25%	12.00
Discharged	11.90