

ADDO
PLATINUM

**Powering
ahead...**



MADE IN INDIA

automotive batteries

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add **ADDO** to your life

ADDO is a decade old brand created with a focus on innovation and customer satisfaction. With a global footprint, ADDO has proved its mettle in the market and has created a mark in the maintenance free battery segment.

With a huge range starting from 35 ah to 215 ah across JIS and DIN series, application ranges from all light to heavy motor vehicles.

ADDO is known for its superior quality which makes it known for long life performance.

Addo is a power packed product from the Eastman Auto Group. Eastman is known world over for its commitment, reliability and quality. With a global reach, Eastman supplies Motorcycles, Tyres & Tubes, Spare parts & Batteries.

The group has been exporting quality products since 1974 and has been recognized and rewarded many a times on international levels including getting awarded for "NIRYAT SHREE" for Excellence in exports and "EEPC INDIA" Excellence award.

Experience ADDO, the proud product of Eastman Auto Group.



Quick Facts

Global lead acid battery market size is estimated about \$50B.

A yellow wheel loader is parked on a sandy beach at sunset. The sun is low on the horizon, creating a warm orange glow. The loader is facing right, with its bucket slightly raised. The background shows the ocean and a clear sky.

why choose **ADDO...**

Our customers inspire us

Our customers are the main focus of our operations in terms of product development and marketing. We strive hard to ensure that our customers benefit from our product offerings and services.

Extensive range of automotive batteries

Be it the fleet owner who demands a cost-effective and reliable battery solution or the private car owner who demands a high quality battery for his or her cherished transport, we have the right battery for them.

Nothing but the best

We source the best components from the best suppliers and ensure that these high-quality components perform at their best every time an engine starts.

Stringent quality checks

Quality control management is carried out at every interval. An exhaustive, 11-step quality control process, including work monitoring, charge/discharge testing, material testing and product testing, is used to eliminate the production of defective batteries. We have one of the lowest claim ratios in the industry.

Not just growing...,evolving

We constantly strive towards improvement in the product features and technology with a focus on making our products friendlier to the environment. We take our duties as an environment friendly company very seriously.

take a technical look [structure & characteristics]



Polypropylene case

- Strong material for resistance to vibration
- Light weight and east to handle

1



High quality grid

- Resistant to grid corrosion
- Over – charge resistant
- Less self – discharge
- Resists thermal runaway

2



Low resistance envelope separators

- Improve vibration durability
- Prevents “treeing” and internal shorting between positive and negative plates

3



Centered cast-on plate strap

- Reduces the lever action movement resulting from road shock
- Thicker strap than normal battery
 - Maximized output of power through minimized electricity resistance

4



Heat sealed covers

- Prevent leakage and contamination
- Built-in hydrometer for faster check

5



Hydrometer

At full charge, the electrolyte specific gravity is 1.280, while at 50% of charge, considered the minimum serviceable condition, the specific gravity is typically 1.220. Under normal conditions, when the specific gravity drops to 1.100, the battery is considered fully discharged.

6



Exclusive liquid gas separator

- Prevents electrolyte loss by collecting and returning liquid to the reservoir
- Vents allow the battery to breathe during temperature changes and charging

7



Flame Arrestor

- Prevents outside sparks from causing explosions
- Minimize acid leakage
- Prevents the inflow of dust

8



8

7

3

6

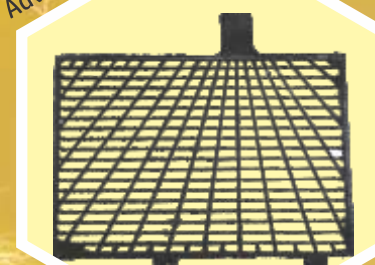
Quick Facts

Lead acid batteries account for half the demand of rechargeable batteries worldwide.

strengths of ADDO

- The positive plate is made using **grid cast technology**
- The negative plate is made using **expanded grid technology**
- Thicker grid which leads to a longer life of the battery as compared to competition, which also results to **low corrosion**
- Delivers higher corrosion resistance and has a **longer life span** at high temperature due to the high content of Sn (tin) in the grid alloy
- Made with **C21 alloy technology**
- **Double clad separation** – high reliability and life expectancy
- Special side vented cover design – **Excellent spill – resistant** characteristics

Advanced Grid Design



Positive Plate Hybrid Grid Casting



Glass Mat Assembly

Quick Facts

Global Lead-Acid Battery Market anticipated to be valued at over US\$ 94.8 Mn by 2022

ADDO PLATINUM - sealed for life

High performance maintenance free battery. Country of origin - India

LIGHT MOTOR VEHICLE BATTERY

| Battery Standard: JIS (Japan Industrial Standard) | | | | | | | | | |
|--|------------------|----------------|-------------------------|--------------|----------------------------|-----------------------|--------|----------|-----------|
| S.No | JIS Model Number | Amp@C20 Rating | Dimensions L x W xH(mm) | CCA SAE /EN1 | Reserve Capacity (Minutes) | Weight with Acid (KG) | Layout | Terminal | Indicator |
| 1 | 44B20L | 35 | 197x127x227 | 332 | 54 | 10.5 | 0 | T1 | Yes |
| 2 | 44B20R | 35 | 197x127x227 | 332 | 54 | 10.5 | 1 | T1 | Yes |
| 3 | 40B24L | 40 | 238x129x227 | 250 | 57 | 12.3 | 0 | T1 | Yes |
| 4 | 40B24R | 40 | 238x129x227 | 250 | 57 | 12.3 | 1 | T1 | Yes |
| 5 | 40B24LS | 40 | 238x129x227 | 250 | 57 | 12.3 | 0 | T2 | Yes |
| 6 | 40B24RS | 40 | 238x129x227 | 250 | 57 | 12.3 | 1 | T2 | Yes |
| 7 | 60B24L | 45 | 238x129x227 | 410 | 71 | 12.6 | 0 | T1 | Yes |
| 8 | 60B24R | 45 | 238x129x227 | 410 | 71 | 12.6 | 1 | T1 | Yes |
| 9 | 60B24LS | 45 | 238x129x227 | 410 | 71 | 12.6 | 0 | T2 | Yes |
| 10 | 60B24RS | 45 | 238x129x227 | 410 | 71 | 12.6 | 1 | T2 | Yes |
| 11 | 55D23L | 60 | 232x172x225 | 500 | 100 | 16 | 0 | T2 | Yes |
| 12 | 55D23R | 60 | 232x172x225 | 500 | 100 | 16 | 1 | T2 | Yes |
| 13 | 75D23L | 62 | 232x172x225 | 420 | 105 | 16.4 | 0 | T2 | Yes |
| 14 | 75D23R | 62 | 232x172x225 | 420 | 105 | 16.4 | 1 | T2 | Yes |
| 15 | 48D26L | 50 | 260x173x225 | 340 | 76 | 16.1 | 0 | T2 | Yes |
| 16 | 48D26R | 50 | 260x173x225 | 340 | 76 | 16.1 | 1 | T2 | Yes |
| 17 | 55D26L | 60 | 260x173x225 | 500 | 100 | 17.1 | 0 | T2 | Yes |
| 18 | 55D26R | 60 | 260x173x225 | 500 | 100 | 17.1 | 1 | T2 | Yes |
| 19 | 65D26L | 65 | 260x173x225 | 510 | 104 | 17.6 | 0 | T2 | Yes |
| 20 | 65D26R | 65 | 260x173x225 | 510 | 104 | 17.6 | 1 | T2 | Yes |
| 21 | 80D26L | 70 | 260x173x225 | 600 | 120 | 18.3 | 0 | T2 | Yes |
| 22 | 80D26R | 70 | 260x173x225 | 600 | 120 | 18.3 | 1 | T2 | Yes |
| 23 | 65D31L | 70 | 305x173x225 | 510 | 126 | 19.6 | 0 | T2 | Yes |
| 24 | 65D31R | 70 | 305x173x225 | 510 | 126 | 19.6 | 1 | T2 | Yes |
| 25 | 75D31L | 75 | 305x173x225 | 580 | 137 | 21.2 | 0 | T2 | Yes |
| 26 | 75D31R | 75 | 305x173x225 | 580 | 137 | 21.2 | 1 | T2 | Yes |
| 27 | 95D31L | 80 | 305x173x225 | 650 | 140 | 21.8 | 0 | T2 | Yes |
| 28 | 95D31R | 80 | 305x173x225 | 650 | 140 | 21.8 | 1 | T2 | Yes |
| 29 | 105D31L | 90 | 305x173x225 | 750 | 155 | 23.4 | 0 | T2 | Yes |
| 30 | 105D31R | 90 | 305x173x225 | 750 | 155 | 23.4 | 1 | T2 | Yes |
| 31 | 115D31L | 95 | 305x173x225 | 750 | 155 | 23.9 | 0 | T2 | Yes |
| 32 | 115D31R | 95 | 305x173x225 | 750 | 155 | 23.9 | 1 | T2 | Yes |
| 33 | 95E41R | 100 | 410x176x233 | 640 | 182 | 28.1 | 1 | T2 | Yes |
| Battery standard: DIN (Deutsche Industrie Normung) | | | | | | | | | |
| 1 | DIN36R | 36 | 210x175x175 | 270 | 52 | 11.5 | 1 | T1 | Yes |
| 2 | DIN36L | 36 | 210x175x175 | 270 | 52 | 11.5 | 0 | T2 | Yes |
| 3 | DIN44L | 44 | 210x175x190 | 360 | 65 | 12.6 | 0 | T2 | Yes |
| 4 | DIN44R | 44 | 210x175x190 | 360 | 65 | 12.6 | 1 | T2 | Yes |
| 5 | DIN55L | 55 | 243x175x190 | 420 | 82 | 15 | 1 | T2 | Yes |
| 6 | DIN55R | 55 | 243x175x190 | 420 | 82 | 15 | 0 | T2 | Yes |
| 7 | DIN66L | 66 | 278x175x190 | 510 | 105 | 18.5 | 0 | T2 | Yes |
| 8 | DIN74L | 74 | 278x175x190 | 570 | 115 | 19.5 | 0 | T2 | Yes |
| 9 | DIN80L | 80 | 313x175x190 | 750 | 157 | 22.5 | 0 | T2 | No |
| 10 | DIN90L | 90 | 353x175x190 | 800 | 160 | 25 | 0 | T2 | No |
| 11 | DIN90R | 90 | 353x175x190 | 800 | 160 | 25 | 1 | T2 | No |
| 12 | DIN100L | 100 | 353x175x190 | 750 | 176 | 25.2 | 0 | T2 | Yes |

HEAVY MOTOR VEHICLE BATTERY

| Battery Standard: JIS (Japan Industrial Standard) | | | | | | | | | |
|--|------------------|----------------|-------------------------|--------------|----------------------------|-----------------------|--------|----------|-----------|
| S.No | JIS Model Number | Amp@C20 Rating | Dimensions L x W xH(mm) | CCA SAE /EN1 | Reserve Capacity (Minutes) | Weight with Acid (KG) | Layout | Terminal | Indicator |
| 1 | MF120 | 120 | 505x182x240 | 680 | 228 | 34 | 4 | T2 | No |
| 2 | HMF150 | 150 | 508x222x257 | 785 | 285 | 41.9 | 4 | T2 | Yes |
| 3 | 145G51R | 150 | 508x222x257 | 785 | 294 | 39.5 | 4 | T2 | Yes |
| 4 | N170 | 170 | 512x212x240 | 810 | 290 | 44.6 | 4 | T2 | No |
| 5 | MF 190 | 190 | 508x222x240 | 845 | 300 | 48 | 4 | T2 | No |
| 6 | HMF200 | 200 | 521x278x270 | 950 | 421 | 56.7 | 4 | T2 | Yes |
| 7 | MF 200 Z | 215 | 521x278x242 | 1010 | 380 | 62 | 4 | T2 | No |
| Battery standard: DIN (Deutsche Industrie Normung) | | | | | | | | | |
| 1 | DIN 170 | 170 | 513x223x223 | 940 | 356 | 44.6 | 3 | T2 | No |

ADDO PLATINUM - sealed for life

Key to Battery Layout

0

1

3

4

The CCA Values are at service gravity 1.280±0.001@27° c

Terminals

| Types of Terminals | Tip Diameter (F.D) | |
|--------------------|--------------------|----------------|
| | Positive (mm) | Negative (mm) |
| T1 | 14.7 0 -0.3 | 13.0 0 -0.3 |
| T2 | 19.5 0 -0.3 | 17.9 0 -0.3 |



useful terms of BATTERY

- 

International standard mainly named as JAPANESE INDUSTRIAL STANDARD. The test is carried out at -15°c for setting this standard.
- 

Deutsches Institute fur Normung (German Institute of Standardization). This is carried out at -18°c for setting this standard.
- 

BCI Battery council international (Publishes automotive battery standards).
- 

BS3031:1996 Specification of distilled water used in lead acid batteries.
- 

RC (Reserve Capacity in minutes) Reserve capacity is the amount of time in minutes that a battery @25°c can deliver current at 25ah, until the voltage of the battery drops to 10.5 volts.
- 

CCA (Cold cranking ah)
Cold cranking performance measures the starting performance (to extract load) of the battery @ -18°c

BATTERY TESTING procedures

| *Resting voltage (Table 1) | | |
|----------------------------|----------------------------------|--|
| Temperature | Standard battery (Resting volts) | Remarks on resting volts |
| 100% | 12.60 – 12.75 | – |
| 95% | 12.60 – 12.70 | – |
| 90% | 12.60 – 12.65 | Resting voltage for standard auto battery |
| 85% | 12.6 | Resting voltage for standard auto battery |
| 80% | 12.50 – 12.55 | Do not allow the battery to get discharged at this point |
| 75% | 12.5 | Minimum resting voltage for a charged battery |
| 70% | 12.45 | Anything below this is poorly charged |
| 65% | 12.4 | Give freshening charge at this point |
| 60% | 12.35 | – |
| 55% | 12.3 | – |
| 50% | 12.25 | Never discharge the battery at this point |
| 45% | 12.2 | – |
| 40% | 12.15 – 12.20 | – |
| 25% | 12.10 – 12.15 | Low voltage, do not conduct load test |
| 20% | 11.80 – 12.00 | Cell get affected at this point. |

*conditions apply as per storage condition.

Visual Check

- Check the container, cover and terminals. If there are physical damages, reject the battery
- Check the indicator (If the battery has the indicator). Always have a top view look when viewing the indicator, also tap the indicator lightly to dislodge any air bubbles.

Voltage check

- If OCV is below 12.4V, recharge the battery immediately.

Discharge test (Load test)

- Connect the battery tester to battery terminals
- Measure the temperature of the battery. Set the battery tester ampere values for ½ of the CCA rating
- Apply the load for 15 seconds and read the voltage
- Compare measures values with the values in table 2
- If the values are outside of the table values, recharge the battery and test again. If the battery fails the load test twice, replace it.
- Sometimes, electronic testers such as MIDTRONICS, SNAP-ON etc. are used instead of load tester. Electronic testers are only suitable for batteries that have been in use for a certain time. They cannot rate the performance of new or unused batteries. For this reason, we recommend the test defined in global standards to confirm rated specifications.

| *Load chart (Table 2) | | |
|------------------------------------|---------------------------------|----------------------------|
| Electrolyte temperature Fahrenheit | Electrolyte temperature Celsius | Minimum voltage under load |
| 100 | 37.8 | 9.9 |
| 90 | 32.2 | 9.8 |
| 80 | 26.7 | 9.7 |
| 70 | 21.1 | 9.6 |
| 60 | 15.6 | 9.5 |
| 50 | 10.0 | 9.4 |
| 40 | 4.4 | 9.3 |
| 30 | -1.1 | 9.1 |
| 20 | -6.7 | 8.9 |
| 10 | -12.2 | 8.7 |
| 0 | -17.8 | 8.5 |

Quick Facts

Lead-acid batteries are capable of being recycled completely.

BATTERY CHARGING procedures

***Constant current charge condition (Table 3)**

| OCV | 31-40AH | 41-50AH | 51-60AH | 61-70AH | 71-80AH | 81-90AH | 91-100AH | 101-110AH |
|---------------|---------|---------|---------|---------|---------|---------|----------|-----------|
| 12.4-12.49V | 4X3 | 5X3 | 6X3 | 7X3 | 8X3 | 9X3 | 10X3 | 11X3 |
| 12.3-12.39V | 4X5 | 5X5 | 6X5 | 7X5 | 8X5 | 9X5 | 10X5 | 11X5 |
| 12.2 – 12.19V | 4X7 | 5X7 | 6X7 | 7X7 | 8X7 | 9X7 | 10X7 | 11X7 |
| 12.1-12.19V | 4X8 | 5X8 | 6X8 | 7X8 | 8X8 | 9X8 | 10X8 | 11X8 |
| 12.0-12.09V | 4X10 | 5X10 | 6X10 | 7X10 | 8X10 | 9X10 | 10X10 | 11X10 |
| Below 11.99V | 4X13 | 5X13 | 6X13 | 7X13 | 8X13 | 9X13 | 10X13 | 11X13 |

*4X3 means 4 ampere and 4 hours

Battery charge

If the battery is below 12.4V or fails to pass the load test, battery must be recharged as soon as possible to prevent lead sulfation. During charge, if the battery sprays electrolytes through the vent holes or gets hot (over 52°C), the charge must be stopped for a time to allow the battery to cool down.

Constant current charge

Another method is to charge a battery at a specified voltage (14.3 – 16V). When charging starts, a high rate current flows into the battery. As the battery is being charged, the current is reduced. Generally, this method needs more time than the constant current charge, but overcharge risk is lower.

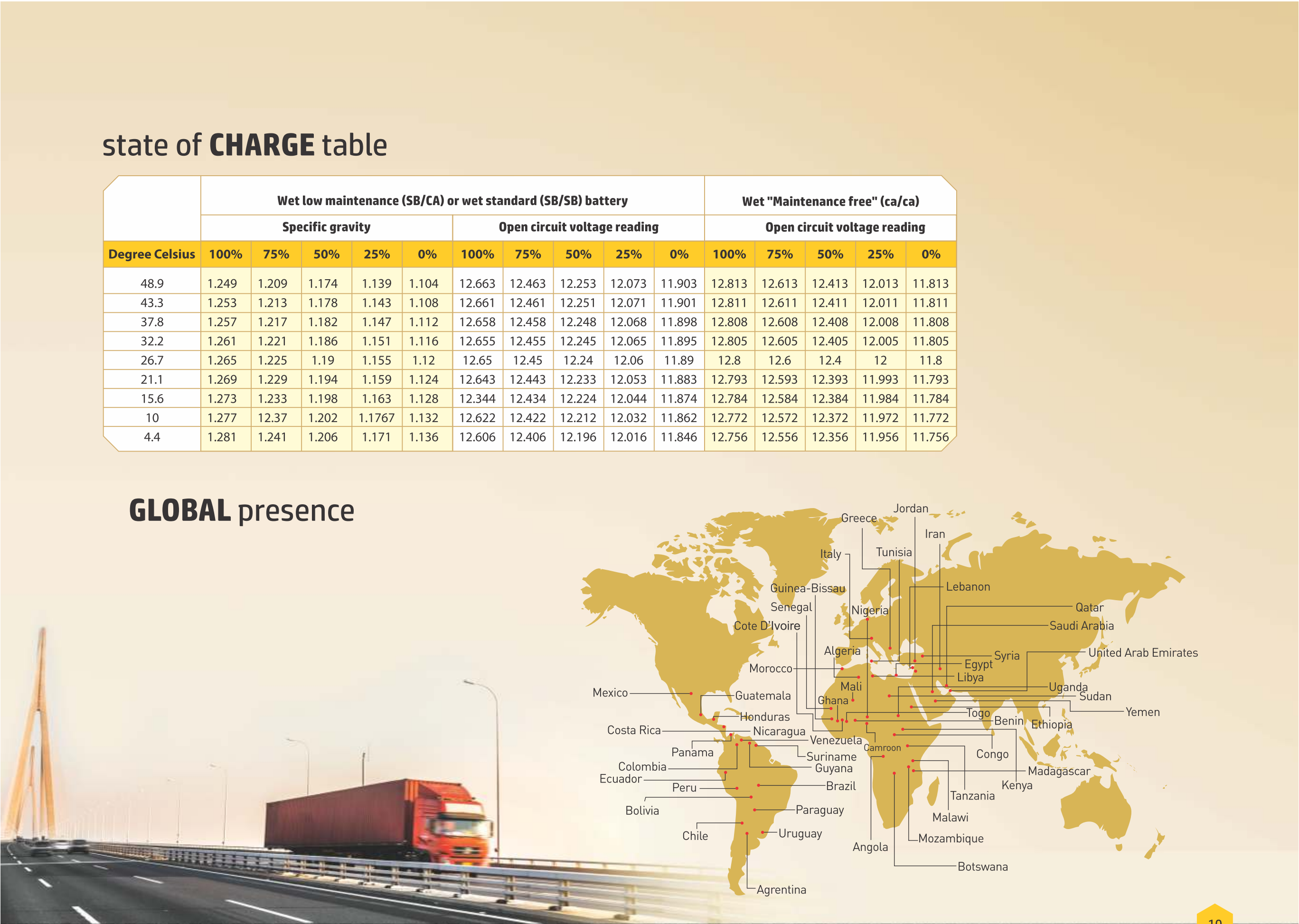
End of charge

If the battery has been properly charged, voltage output across battery terminals on charge will be maintained for 2 hours.



Quick Facts

Automotive remains the highest consuming market for Lead acid batteries followed by telecom.



state of **CHARGE** table

| | Wet low maintenance (SB/CA) or wet standard (SB/SB) battery | | | | | | | | | | Wet "Maintenance free" (ca/ca) | | | | |
|----------------|---|-------|-------|--------|-------|------------------------------|--------|--------|--------|--------|--------------------------------|--------|--------|--------|--------|
| | Specific gravity | | | | | Open circuit voltage reading | | | | | Open circuit voltage reading | | | | |
| Degree Celsius | 100% | 75% | 50% | 25% | 0% | 100% | 75% | 50% | 25% | 0% | 100% | 75% | 50% | 25% | 0% |
| 48.9 | 1.249 | 1.209 | 1.174 | 1.139 | 1.104 | 12.663 | 12.463 | 12.253 | 12.073 | 11.903 | 12.813 | 12.613 | 12.413 | 12.013 | 11.813 |
| 43.3 | 1.253 | 1.213 | 1.178 | 1.143 | 1.108 | 12.661 | 12.461 | 12.251 | 12.071 | 11.901 | 12.811 | 12.611 | 12.411 | 12.011 | 11.811 |
| 37.8 | 1.257 | 1.217 | 1.182 | 1.147 | 1.112 | 12.658 | 12.458 | 12.248 | 12.068 | 11.898 | 12.808 | 12.608 | 12.408 | 12.008 | 11.808 |
| 32.2 | 1.261 | 1.221 | 1.186 | 1.151 | 1.116 | 12.655 | 12.455 | 12.245 | 12.065 | 11.895 | 12.805 | 12.605 | 12.405 | 12.005 | 11.805 |
| 26.7 | 1.265 | 1.225 | 1.19 | 1.155 | 1.12 | 12.65 | 12.45 | 12.24 | 12.06 | 11.89 | 12.8 | 12.6 | 12.4 | 12 | 11.8 |
| 21.1 | 1.269 | 1.229 | 1.194 | 1.159 | 1.124 | 12.643 | 12.443 | 12.233 | 12.053 | 11.883 | 12.793 | 12.593 | 12.393 | 11.993 | 11.793 |
| 15.6 | 1.273 | 1.233 | 1.198 | 1.163 | 1.128 | 12.344 | 12.434 | 12.224 | 12.044 | 11.874 | 12.784 | 12.584 | 12.384 | 11.984 | 11.784 |
| 10 | 1.277 | 12.37 | 1.202 | 1.1767 | 1.132 | 12.622 | 12.422 | 12.212 | 12.032 | 11.862 | 12.772 | 12.572 | 12.372 | 11.972 | 11.772 |
| 4.4 | 1.281 | 1.241 | 1.206 | 1.171 | 1.136 | 12.606 | 12.406 | 12.196 | 12.016 | 11.846 | 12.756 | 12.556 | 12.356 | 11.956 | 11.756 |

GLOBAL presence





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