Lead-acid batteries
Staple, emerging applications boost industry

Traditional and new applications are sustaining growth in China's lead-acid battery industry. With mature technology and relatively low prices, the product continues to be adopted in transportation, communication, electric, security and aviation equipment. Many electric vehicles still run on this chemistry even with the emergence of NiMH and lithium variants. Suppliers believe the first will not be totally displaced at least in the next 10 years. It is currently used in forklifts, golf carts and electric sightseeing vehicles.

The line has also started penetrating the fast-growing energy storage segment, particularly the solar and wind categories. Adoption in this sector is projected to increase in coming years together with the rising popularity and utilization of renewable power sources.

As the worldwide economy recovers, these applications are forecast to improve China's production and exports, which declined dramatically in 2009. Statistics from the China Electrical Equipment Industrial Association or CEEIA revealed the line registered a precrisis CAGR of 30 percent. In 2008, about 91 million KVAh were sold, amounting to $16.6 billion, with foreign trade contributing $2.6 billion. Last year, the growth rate dipped to 16 percent due to the global financial crisis. In 1Q10, output started to pick up, reaching approximately 30 million KVAh. This is 16 percent higher than the same period last year. CEEIA forecasts yield will continue rising and post 25 percent YoY uptick by end-2010.

Exports will likewise be buoyed up by renewed interest from buyers abroad. Releasing mainly sealed lead-acid models, Topin Battery (China) Ltd projects revenue from international trade this year will return to 2008 level after dropping 30 percent in 2009. Even more optimistic is MCA Battery Manufacture Co. Ltd, which anticipates a more than 60 percent increase in overseas sales.

Riding on the positive outlook, makers in China fortify R&D capability to offer products with better performance and secure a larger customer base. Efforts are centered on improving the energy density, extending the life span and broadening the operating temperature.

Enterprises such as Longway Battery Mfg Co. Ltd and Narada are developing a new kind of grid plate processing called the continuous casting and rolling technology. In this method, the grid plates are made 30 percent lighter than those manufactured in conventional ways, thereby improving the energy density. The technique can also reduce the emission of lead aerosol and enhance the element's utilization ratio. Models using the technology are mostly adopted in vehicles and communication equipment.

Suppliers are likewise enhancing conductivity and corrosion resistance. One way is by raising the ratio of tin in PbCa grid plates to improve the deep-cycle performance of products.

Aside from upgrading traditional categories, manufacturers are actively developing new types. One of these is the pure-lead spiral valve-regulated variant or SPB. For this category, Topin uses 99.9 percent pure lead material and high-temperature die-casting technologies. SPBs have a life span exceeding 10 years, instantaneous discharge capability of up to 50C and wider working temperature range of -55 to 75 C. They are mainly utilized in high-starting-power off-road vehicles, field solar/wind-energy storage, and compact and multifunction jump starters.

Battling cost, other challenges
Despite the rosy outlook, companies face various challenges, including fierce competition, rising costs, stricter environmental protection directives and appreciating yuan. All these factors have contributed to the thinning of the maker pool from 3,000 in 2003 to about half at present. CEEIA anticipates the number will drop to 400 by 2015 if the situation persists.

The higher manufacturing outlay continues to be one of the main concerns among suppliers as it limits their capability to leverage price advantage further. Currently, China-made lead-acid batteries are about 50 percent more expensive than those from Vietnam and India.

To lower overhead, makers are introducing automatic equipment and controlling material consumption better. Zhejiang Hengji Power Supply Co. Ltd has established a specialized department that conducts research.

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Price guide: Lead-acid batteries

<table>
<thead>
<tr>
<th>Price range (per unit)</th>
<th>Basic features</th>
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<tbody>
<tr>
<td>$93 to $108</td>
<td>AGM valve-regulated type; 100Ah nominal capacity; 12V nominal voltage; -30 to 40 C operating temperature; 8yr life span</td>
</tr>
<tr>
<td>$98 to $115</td>
<td>Gel valve-regulated type; 100Ah nominal capacity; 12V nominal voltage; -30 to 40 C operating temperature; 12 to 15yr life span</td>
</tr>
<tr>
<td>$110 to $120</td>
<td>SPB type; 50Ah nominal capacity; 12V nominal voltage; up to 50C discharge rate; -45 to 60 C operating temperature; 1.4 times longer life span than conventional sealed lead-acid batteries; anti-vibration characteristic, low self-discharge</td>
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on improving lead utilization ratio. The new team is likewise developing electrode-plate formation with activator added into the electrolyte for less power consumption.

To steer clear of the price war, some players are focusing on new variants that offer better margins. Others are using their expertise in battery manufacture to turn out models with value-added features. Topin, for instance, takes advantage of its spiral-wound lead-acid battery technology to develop compact vehicle jump starters. These are 33 percent smaller and lighter but deliver three to five times greater starting current than conventional versions.

Losing support from the government is yet another major challenge for enterprises. Since the line was listed among high-pollution, energy-consuming and resource-dependent products, the central government has withdrawn export tax rebates and other incentives for companies. The Lead Acid Batteries Association has been trying to persuade the authorities to bring back assistance since early 2009.

For their part, suppliers are taking steps to comply with environmental directives. Many are reducing material wastage, and about 90 percent of the maker pool now conforms to waste disposal requirements. Several have also built their own recycling systems for waste batteries.

**Products & prices**

Products from China can be categorized according to structure, type of maintenance and the processing method used for the electrode plates. For the first, there are open-cell, vented, acid- and explosion-resistant, and valve-regulated configurations. The second category comprises models that need regular and less-frequent checks, and maintenance-free versions. The last segment has the Planté, pasted and tubular variants.

Valve-regulated units are staple among companies. With sealed design, they do not require upkeep and have low self-discharge at about 2 percent of capacity a month. The operating temperature range is -40 to 50 C. According to CEEIA, the global production value of this type will keep growing at an annual rate of 7 to 8 percent within the next five years, reaching $9.5 billion by 2015.

AGM and gel are the two subcategories under valve-regulated models. For the second, the crack within the gel is used to circulate oxygen, while it is the tiny opening on absorbed glass mats in AGM.

About 90 percent of China’s output consists of the last but gel continues to attract more manufacturers because of its brighter prospects. The latter can reach 800 cycles and a life span of 12 to 15 years, higher than AGM’s 200 to 500 cycles and three to eight years. It also has better reliability and performance. The main drawbacks, however, are the high current and overdischarging. In addition, gel versions are about 10 percent more expensive than AGM. There are 100 suppliers in China able to provide the former, with some offering models designed mainly for solar systems.

Regardless of product type, prices depend mostly on material costs. The major inputs are lead, vitriol, plastic and separators, with the first, with some offering models designed mainly for solar systems.

Quotes are initially projected to increase due to the rise in lead outlay in past months. The element jumped from $1,000 per ton in early 2009 to $2,500 by year-end. Beginning this year, however, rates started declining, reaching $1,700 in May. If the trend continues, makers will likely cut down prices of lead-acid batteries.

AGM and gel models go for $0.90 and $1.20 per ampere-hour. For the first, with units of 12V/100Ah and 12V/7Ah are respectively quoted at $93 to $108 and $6.50 to $9.50. Gel versions having 12V/100Ah and 12V/33Ah are $98 to $115 and $37 to $39. High-end SPB types are more expensive, with 12V/50Ah variants listing at $110 to $120. Releases meet CE and UL requirements.

**Product gallery**

**Dahua Battery Co. Ltd**

- Model: DHB406
- MOQ: 500 units
- Delivery: 30 days
- Description: 4V voltage; 35.3x22.2x55.2mm; 82g; black; CE, JIS, UL

**Dahua Battery Co. Ltd**

- Model: DHB1270
- MOQ: 500 units
- Delivery: 30 days
- Description: 7Ah capacity; 12V voltage; 92, 83, 65 percent capacity after 3, 6, 12-month storage; <2.1A initial charging current; 151x66x95mm; 2.35kg; black; CE, JIS, UL

**Dahua Battery Co. Ltd**

- Model: DHB12-100DC
- MOQ: 500 units
- Delivery: 30 days
- Description: 100Ah capacity; 12V voltage; 92, 83, 65 percent capacity after 3, 6, 12-month storage; <2.1A initial charging current; 328x172x214mm; 32kg; black; CE, JIS, UL
INDUSTRY UPDATE

Batteries

Product gallery

Longway Battery Mfg Co. Ltd
Model: 12V18Ah
MOQ: 100 units
Delivery: 25 days
Price: $20.50
Description: Valve-regulated type; 18Ah capacity; 12V voltage; for electric golf carts, wheelchairs, mowers, dust collectors; CE, UL

Guangzhou NPP Power Co. Ltd
Model: NP6-4.5
MOQ: 5,000 units
Delivery: 15 days
Description: Valve-regulated type; 4.5Ah capacity; 6V voltage; 70x47x101mm; 680g; black

Guangzhou NPP Power Co. Ltd
Model: NP12-7
MOQ: 2,000 units
Delivery: 15 days
Description: Valve-regulated type; 7Ah capacity; 12V voltage; 151x65x94mm; 2.15kg; black

Guangzhou NPP Power Co. Ltd
Model: NP12-100
MOQ: 200 units
Delivery: 15 days
Description: Valve-regulated gel type; 100Ah capacity; 12V voltage; 407x174x209mm; 30.5kg

Guangzhou NPP Power Co. Ltd
Model: NP12-7
MOQ: 50 units
Delivery: 20 days
Price: $38.45
Description: Valve-regulated gel type; 33Ah capacity; 12V voltage; for lighting, security and telecom systems, electric toys, medical equipment, UPS

MCA Battery Manufacture Co. Ltd
Model: FCD12-100
MOQ: 100 units
Delivery: 30 days
Description: Valve-regulated AGM type; 100Ah capacity; 12V voltage; -30 to 40°C operating temperature; 10yr life span on standby; low self-discharge rate; maintenance-free operation; for electric golf carts, wheelchairs, power tools, lawn mowers, vacuum cleaners, toys, recreation and lighting equipment
**INDUSTRY UPDATE**

**Batteries**

**Product gallery**

**MCA Battery Manufacture Co. Ltd**
- **Model:** FCT12-100
- **MOQ:** 100 units
- **Delivery:** 30 days
- **Description:** Valve-regulated AGM type; 100Ah capacity; 12V voltage; -30 to 40°C operating temperature; 8yr life span on standby; low self-discharge rate; maintenance-free operation; for switches, data centers, power supply/emergency lighting/EPS/UPS systems, mobile base/radio/broadcasting stations

**MCA Battery Manufacture Co. Ltd**
- **Model:** GFMG-300
- **MOQ:** 100 units
- **Delivery:** 30 days
- **Description:** Valve-regulated gel type; 300Ah capacity; 2V voltage; -40 to 50°C operating temperature; 12yr life span on standby; low self-discharge rate; maintenance-free operation; for switches, data centers, power plants, emergency lighting/EPS/UPS systems, mobile base/radio/broadcasting stations

**Topin Battery (China) Ltd**
- **Model:** 6C500-12V50AH
- **MOQ:** 50 units
- **Delivery:** 25 days
- **Price:** $119
- **Description:** Spiral-wound type; up to 50°C discharge rate; -45 to 60°C operating temperature; 1.4 times longer life span than conventional batteries; anti-vibration characteristic; low self-discharge; cylindrical design; available in single cells connected in series or parallel

**Zhejiang Hengji Power Supply Co. Ltd**
- **Model:** IEB12V500AH
- **MOQ:** 100 units
- **Delivery:** 7 days
- **Description:** AGM type; 500Ah capacity; 2V voltage; maintenance-free operation; 243x171x330mm; 22kg; black; CE, UL

**Zhejiang Hengji Power Supply Co. Ltd**
- **Model:** IEB12V120AH
- **MOQ:** 100 units
- **Delivery:** 7 days
- **Description:** AGM type; 120Ah capacity; 12V voltage; maintenance-free operation; 406x174x211mm; 35kg; black; CE, UL

**Zhejiang Hengji Power Supply Co. Ltd**
- **Model:** IEB12V200AH
- **MOQ:** 100 units
- **Delivery:** 7 days
- **Description:** AGM type; 200Ah capacity; 12V voltage; maintenance-free operation; 522x240x219mm; 60kg; black; CE, UL
## CONTACT DETAILS

### Lead-acid batteries

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<thead>
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