

# Celectric CSM batteries

SUNLIGHT based on the vast know-how and experience in designing and producing advanced technology batteries (i.e. submarine and torpedo batteries) has developed the **XtremeForce Product range** based on **CSM (Copper Stretch Metal) technology** that is able to operate **under extreme temperatures** and can offer **longer operating time** through its **higher energy content** as well as **faster charging** through its **reduced internal resistance**.



**Higher Energy**



**Faster Charging**



**Extreme Conditions**



**1 Negative Grid**

- ⚙️ Copper grid ensuring more uniform current density distribution over the plate surface.
- ✓ Reducing internal resistance

**2 Positive Grid**

- ⚙️ Die Casted Grid using Optimized Lead - Antimony Alloy
- ✓ High tensile strength, corrosion resistance, excellent interface with the active mass

**3 Positive Active Mass**

- ⚙️ 100% Red Lead
- ✓ Efficient formation ensures that full cell capacity is achieved after 3-5 cycles
- ⚙️ Dry filling Process
- ✓ Uniformly filled positive plates, 100% weight controlled
- ⚙️ In house Red Lead production
- ✓ Constant quality, homogeneous tamped density
- ⚙️ Produced by 99,99% Primary Lead
- ✓ Long service life, high conductivity, increased performance

**4 Gauntlet**

- ⚙️ Non woven, high quality polyester
- ✓ Prevents mass shedding, high mechanical stability

**5 Bottom Bar**

- ⚙️ Ultrasonically Welded
- ✓ Provides space for the unavoidable growth of the spine

**6 Negative Active Mass**

- ⚙️ In house production of Lead Oxide
- ✓ Consistent Quality
- ✓ Fully automatic Vacuum Negative Paste Mixing process

**7 Separator**

- ⚙️ Highly porous Polyethylene, enveloped using mechanically crimped sleeve
- ✓ Increased performance preventing short-circuits

**8 Formation & Activation**

- ⚙️ Fully automatic Jar Formation process
- ✓ Constant quality in each and every cell

**9 Electrolyte**

- ⚙️ High Purity
- ✓ Long life performance

**10 Pole Terminal**

- ⚙️ Innovative conical design of the pole sealing system
- ✓ Uses the unavoidable growth of the plates to press against the grommet and improve the sealing
- ⚙️ Tin plated 16 mm diameter inserts

**11 Pole Bridge**

- ⚙️ Cast On Strap manufactured pole bridge
- ✓ Consistent & uniform composition ensures superior connections

**12 Lid**

- ⚙️ Polypropylene reinforced lid thermo-welded to the container

**13 Cell Container**

- ⚙️ Polypropylene container with sufficient sediment space

**14 Operational Vent Plug**

- ⚙️ Electrolyte level marking, anti-surge baffle, free cell gassing
- ✓ Increased operational safety

⚙️ Key Features  
⚙️ Design Features  
✓ Benefits

# Applications



Cold storage / Outdoor applications



Forklifts operating in high rack facilities requiring more lifting



Heavy duty applications with demanding acceleration periods during operation from the forklift



Multi-shift applications with one battery through fast and opportunity charging



Seasonal business with high activity peaks

**Designed & Manufactured for Ultimate Performance & Longevity**





# Design Features

## ✓ Benefits

### 1 Inter-cell Connector

- Fully insulated flexible bolt-on cable connectors
- Allows fast and easy cell replacement
- Reduces time & cost

### 2 Bolt

- Plastic-head connector bolt
- Touch proof insulated with voltage measurement point

### 3 Battery Connectors (Plugs & Sockets)

- Available in the following types:
  - DIN Type connectors according to DIN 43589
  - Flat pole connectors with color coding

### 4 Exit Cables

- Insulated color marked cables
- Prevent short circuit and allow correct and fast installation

### 5 Tray

- Made of steel
- Protected with plastic powder coating (standard configuration)
- Durability
- Corrosion protection
- Available in various sizes

### 6 Automatic Filling System

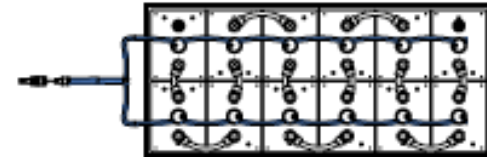
- Top up of the battery's cells from one central point through an integrated piping system
- The automatic filling plugs ensure the optimum filling level of the cells
- Minimization of the required maintenance time and cost

### 7 Airlift System

- A pump is used to circulate low-level compressed air into the cells and create a homogeneous electrolyte concentration throughout them
- Optimum design and installation of tubes in cells for perfect sealing and efficient operation
- The stratification of the electrolyte is prevented
- Homogeneous density and temperature is achieved

## Automatic Filling System

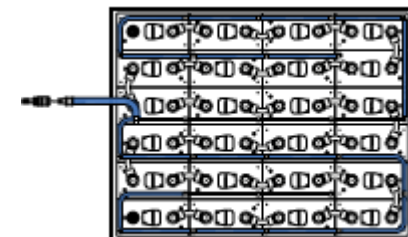
A centralized piping system permanently fixed on the battery which quickly distributes the necessary water quantity to all the battery cells ensuring optimum electrolyte level and density.



## Airlift system

A centralized piping system permanently fixed on the battery cells, delivers to them low pressure air (requires an airlift configured charger). This air is mixing the electrolyte solution with many and significant benefits for the battery life and its related costs:

- Lower recharge times
- Lower water consumption because of the significantly less energy required for the recharge (recharge factor as low as 1,07) causing up to a 60% water consumption saving.
- Lower battery temperatures during recharge
- An overall decrease in energy costs because of the less energy used.



# Celectric CSM batteries

## 2 Shift Operation

- Batteries equipped with Airlift are able to take full advantage of the fast and opportunity charging capabilities of CSM technology allowing the battery to operate **on 2 shifts with opportunity charging.**

## Higher Energy Efficiency

- Negative plates with CSM grid (Copper Stretch Metal) reduces internal resistance resulting in **higher energy efficiency** and **higher energy content.**

## Standard DIN size - Higher Energy Content

- Within the same dimensions with standard cells (fully compatible to IEC 60254-2) offer **higher capacity** and higher energy content especially useful in **high rack facilities and heavy-duty operations.**

