Eternity TECHNOLOGIES

+971 724 33 535
info@eternitytechnologies.com
www.eternitytechnologies.com

Care & Maintenance

Layout for Motive Power battery charging rooms

General information

The charging room should be maintained between 5°C and 35°C

Chargers should be robustly mounted to a permanent fixing

Chargers should be connected with a suitable lockable isolator/ breaker that is compatible with the charger

The charger should be installed to the manufacturers recommendations

Full service access should be allowed for the trucks, batteries and chargers – taking note of all necessary access points

Health and Safety

A notice prohibiting naked flames and smoking must be displayed in the charging area

When servicing batteries suitable clothing must be worn e.g. goggles and apron

Health and safety equipment must be supplied e.g. fire extinguisher suitable for electrical fires

Eye wash facilities

Acid spill shower installation

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Control of hazardous gases

During the recharge process hydrogen and oxygen evolve from the lead acid battery when the voltage exceeds 2.35 Volts per cell.

If the hydrogen level exceeds 4% of the available volume in the area then the general atmosphere can become explosive – because of this it is recommended that the concentration of hydrogen never exceeds 1% of available volume.

Adequate ventilation needs to be provided to keep the hydrogen level below 1% – remembering that hydrogen gases rise it is recommended that extraction be at a high level with air input at a low level. All extractor fans should have external motors.

Health and Safety

At the average cell voltage during recharge – which is 2.5 Volts per cell – 0.0004194 cubic meters of hydrogenis evolved per hour

Typically the charging current of a motive power cell at 2.5 Volts (average voltage during recharge) is 0.083

To calculate the evolution of a battery

Calculation: Formula

No. of cells	x	(Charging current of a cell at 2.5 Volts x Ampere hour capacity of the cell)	x	Rate of evolution of hydrogen gas in a cell

Worked example of battery type 24 5PZS-ET 775

24	x	(0.083 x 775)	x	0.0004194

= 0.65 cubic meters per hour

Worked example of battery room 14 batteries 24 5PZS-ET 775

Charging room dimensions	30 meters long x 10 meters wide x 3 meters high
Hydrogen evolved	0.65 x 14 = 9.1 cubic meters per hour
Charging room volume	30 x 10 x 3 = 900 cubic meters

Therefore the hydrogen evolved per hour as a percentage of total available volume is

$$\frac{9.1}{900} \times 100 = 1.01$$

Therefore the air in the charging area would need to be circulated once every hour while the batteries were on charge.

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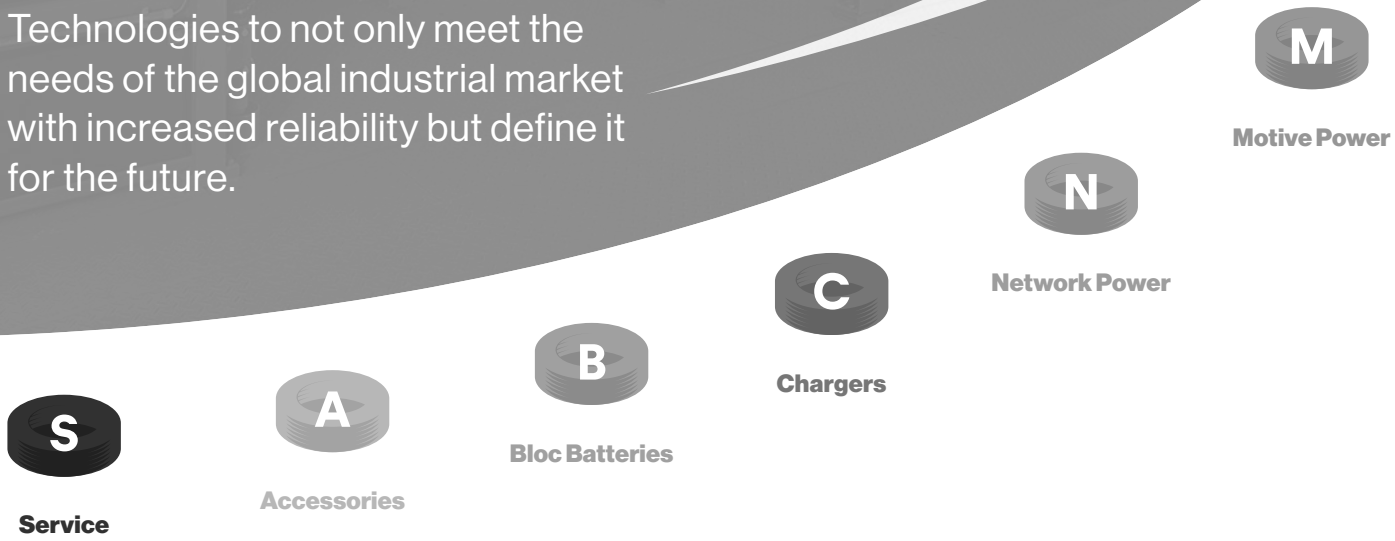
It is this innovation, modern design criteria and industry-leading machinery that allows Eternity Technologies to not only meet the needs of the global industrial market with increased reliability but define it for the future.



Eternity Technologies FZ-LLC
Al Jazeera / Al Hamra, PO Box 35102,
Ras Al Khaimah, UAE

Sales & service
info@eternitytechnologies.com

www.eternitytechnologies.com

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