



**TUBULAR MONOBLOC RANGE**  
Flooded Batteries for Extreme Deep Cycling

**CYCLOFORZ**  
**TUBULAR MONOBLOCS**





# ABOUT CEIL

The competitive world today is borderless. Major industries of the world require speed and agility to ensure business sustainability; downtime is simply no excuse. These same driving forces have led to the inception of CEIL – Trusted Battery Systems.

CEIL is designed to drive principal economic sectors globally. This is achieved by developing products in tandem with innovative technology and creating contemporary methods of utilising energy in mobility.

CEIL is no commonplace battery. It is designed to be Tougher & Hassle-Free. These brand values are born out of the same values of CBSEA and EXIDE Industries Ltd (EIL); CEIL's proud parents, trusted for their advancement in battery technology. CEIL's parentage reflects strength and technological advancement which ensure that CEIL provides a reliable flow of constant energy.

CEIL thrives on being the unrivalled choice as a battery systems brand. CEIL will enable your business to be more reliable. This hassle-free reliability will enhance your operational efficiency. By hassle-free, we mean focusing on making your processes free of downtime. You will experience this in our products, process and people.

Your needs remain at the center of everything we do at CEIL, and the dynamics of our customers' trends will lead us to focus on innovative delivery. Within each CEIL Traction battery system, Uninterrupted Standby Power System and Automotive Battery, CEIL is designed to deliver a complete system allowing you to stay reliable and efficient. This is the Trusted value of CEIL.



# TÖRRENT OF POWER

CEIL Tubular Monoblocs deliver optimum performance in deep cycle applications even in harsh outdoor weather conditions.







# CYCLOFORZ | TUBULAR MONOBLOCS

## THE INSIDE STORY

High temperatures prevalent in tropical countries pose a major threat to the life of storage batteries in rural and outdoor applications. Applications such as Solar PV and Telecom towers are mostly cyclic in nature and, coupled with abusive environmental conditions, this demands customized technologies.

CEIL, being a quality leader in power storage solutions, has widened its horizon by developing the CYCLOFORZ Tubular Monoblocs featuring our TÖRR technology.

The use of low antimony lead alloy formula and high technology casting process for the positive spine combined with the special non-woven gauntlets and specially formulated active material produce batteries that withstand heavy duty cyclic operations with long service life of 8-10 years.

In certain storage power applications where more sophisticated lead acid batteries (e.g. VRLA) meet premature failure due to abusive environmental conditions, the CYCLOFORZ range continues delivering optimum product life and performance, at the same time, offers compactness, ruggedness, optimum space utilization, commercial affordability, and minimum maintenance to support these applications.



### Ceramic Vent Plugs

The ceramic vent plugs keep the water topping up requirement to a minimum by trapping evaporated water and sending them back to the batteries as water droplets.

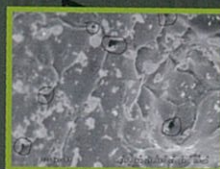


# ADVANCED. BY DESIGN.

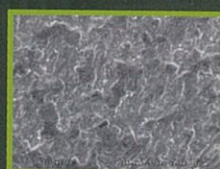
### Positive Spine

The backbone of the plate. The positive spines are cast at incredibly high 100 bar pressure with a special low antimony lead alloy formula.

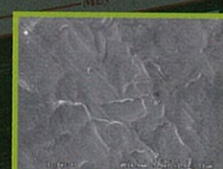
### Spine Casting Comparison



GRAVITY CAST (1 Bar)



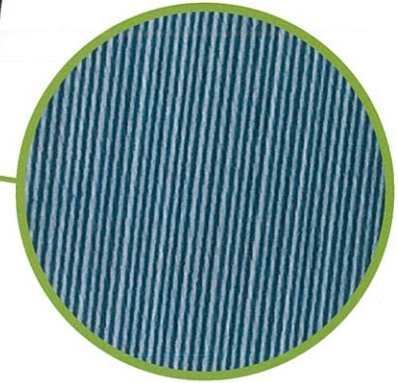
CAST IN LOW PRESSURE (10 Bar)



CAST IN HADI (100 Bar)

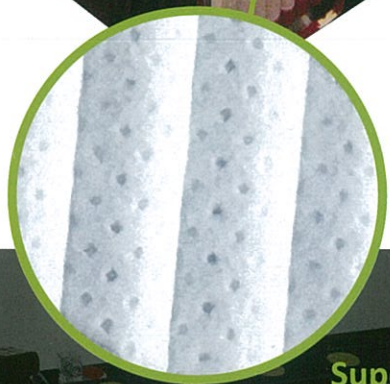
This uses the high technology Hadi (Austria) equipment. This gives an excellent combination of a very reliable frame work and low electrical plate resistance.





**Separator**

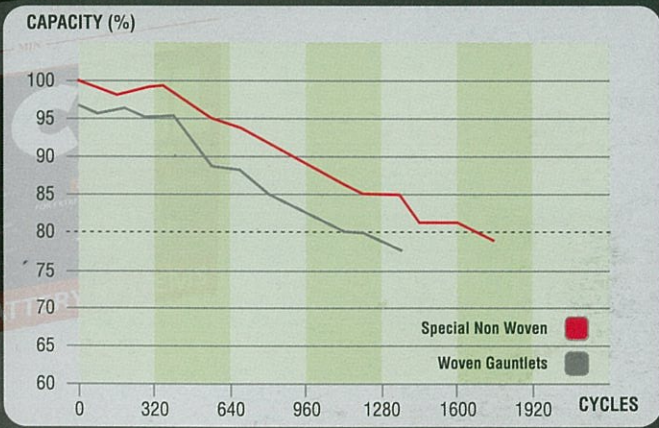
Microporous polyethylene separators from the global sources, which has excellent oxidation and puncture resistance. Its low ionic resistance ensures higher battery power throughout its life.



**Gauntlets & Active Material**

The special non woven gauntlets have a unique structure that enable the electrolyte to penetrate more freely while FURTHER reducing the shedding of the active material. This combination of the gauntlets and the specially formulated active material enhances the cycle life of the battery.

**Superior Life Cycle of Non Woven Gauntlets**







# CYCLOFORZ | TUBULAR MONOBLOCS

## ADVANTAGE TUBULAR

- Designed for deep cycle applications
- Extremely suitable for tropical climate
- Protected against "Partial-State-Of-Charge" deterioration
- Ultra Low Maintenance
- 20 year design life on float
- Operational life 8-10 years
- 5 years warranty
- Ceramic Vent Plugs

Depth of discharge	No. of cycles
80%	1500
50%	3000
20%	5000

Operating temperature at 35°C

## TUBULAR & VRLA COMPARISON

Basis of comparison	Tubular	VRLA
Cyclic Capability	Excellent	Much inferior compared to Tubular
High Ambient Temperature Operation	Satisfactory operation even at 40/45°C ambient temperature	Preferred ambient temperature is 25°C. Prolonged operation at high ambient temperature curtails battery life
Partial State of Charge (PSOC) Operation	Excellent	Limited
Air Conditioning required	No	Preferred
Recovery from deep discharge	Very good	Average







## TUBULAR MONOBLOC TECHNICAL SPECIFICATIONS

Model	Nominal Voltage	C10 capacity @ at 30°C up to 1.75V	Dimensions			Approximate Battery Weight	
			Length	Width	Height	Without Acid (kg) +5%	With Acid (kg) +5%
6EL40	12	40	260	173	240	18.1	28.0
6EL50	12	50	410	176	281	18.3	28.2
6EL60	12	60	410	176	281	17.9	30.2
6EL75	12	75	410	176	281	23.2	32.3
6EL80	12	80	506	220	293	28.6	44.0
6EL100	12	100	506	220	257	29.8	56.9
6EL120	12	120	500	187	421	34.0	63.0
6EL130	12	130	500	187	421	40.6	66.9
6EL150	12	150	500	187	421	47.6	71.7
6EL180	12	180	500	187	421	48.8	70.8
6EL200	12	200	500	187	421	55.0	74.0

Model	Nominal Voltage	C10 capacity @ at 30°C up to 1.75V	Dimensions			Approximate Battery Weight	
			Length	Width	Height	Without Acid (kg) +5%	With Acid (kg) +5%
6TT100	12	100	500	187	418	30.0	57.0
3TT200	6	200	500	187	450	44.7	69.0
3TT300	6	300	500	187	450	54.0	72.0

Model	Nominal Voltage	C5 capacity @ at 30°C up to 1.75V	Dimensions			Approximate Battery Weight	
			Length	Width	Height	Without Acid (kg) +5%	With Acid (kg) +5%
3EV200	6	200	264	182	278	25.0	33.0

**Charging current:** 0.1 of C10 capacity under boost state at 14.4VDC

**Recommended float voltage:** 2.25 ± 0.02 Vpc (5°C - 35°C)

2.23 ± 0.02 Vpc (36°C - 45°C)

**Electrolyte topping period:** every 6-9 months





**CYCLOFORZ**

**TRUSTED BATTERY SYSTEMS**

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