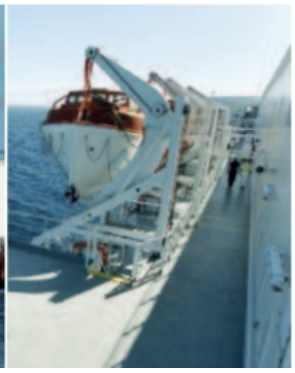
Saft batteries for marine

saft

a company of TOTAL





SAFT BATTERIES FOR CLEAN PROPULSION

Saft is working proactively with navies, shipyards and OEMs in industrial programs worldwide to implement advanced technology for the design and manufacture of battery systems. Saft's range of rugged battery solutions are deployed in full-electric and hybrid electric transportation applications worldwide, as well as in other industrial applications.

FULL ELECTRIC SOLUTIONS

Designed specifically for marine propulsion, Saft recommends its lithium-ion (Li-ion) Seanergy battery system that delivers high-power and energy storage in a lightweight and compact, modular package that can be scaled to meet the required duty while offering high efficiency and long life, even under extreme Stockholm temperatures.

Seanergy – a fully integrated marine solution – provides maintenance-free energy storage in a reduced volume, combining high operational reliability over thousands of cycles with outstanding energy efficiency.

WHAT ARE THE KEY ADVANTAGES OF SAFT LI-ION SUPER-IRON PHOSPHATE® (SLFP) TECHNOLOGY?

- Increased safety
- Compact & weight saving package
- High efficiency
- Long calendar and cycling life: Performances and lifetime verified through Saft Simulation tool
- Fast charging
- Maintenance-free
- Full electric propulsion within a compact footprint
- High power (continuous and pulses) and high voltages (up to 1000 V)

SURPASSING EXPECTATIONS TO MEET STRINGENT OPERATIONAL TARGETS

Social	Economic	Environment
• Safety	• Fuel efficiency	↓ CO_2
• Increased comfort	• Reduced operating costs	↓ NO_x
• Reduced noise	• Vessel productivity	↓ SO_x

SEANERGY® BATTERY SYSTEM : HIGH ENERGY AND HIGH POWER LI-ION BATTERY SYSTEM

Applications	Benefits	Battery configuration
• Cruise liners & ferries • Offshore vessels • Yachts • Cargos • Tankers	• Very long lifetime • Easy installation and upscaling • High operational reliability • Remote control/diagnostic	• For floating or cycling applications • From high energy to very high power demands

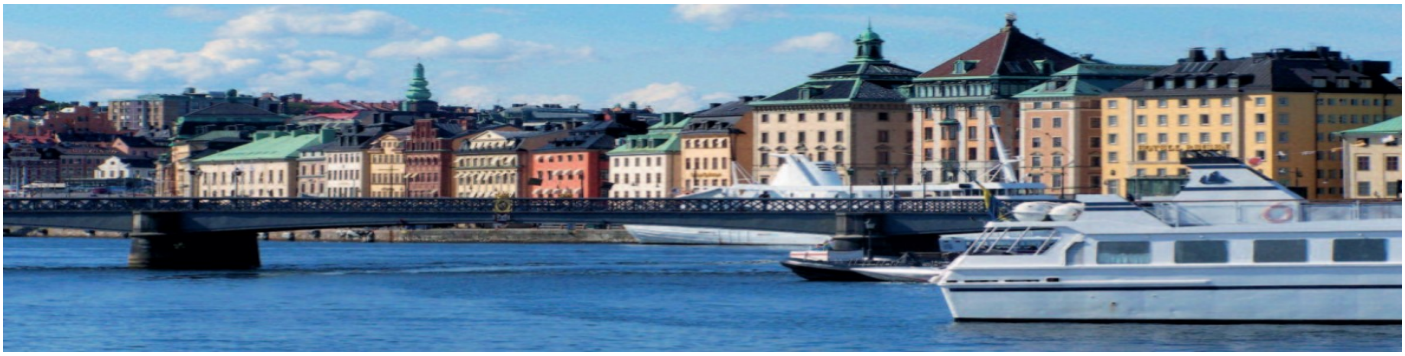
Configurations Examples	Power Systems 500 kWh	Energy Systems 1.4MWh
Nominal characteristics of example		
Nominal Voltage (19 modules maximum)	880 V	880 V
Capacity (C/5) (Ah)	600 Ah	1640 Ah
Nominal Energy (kWh)	520 kWh	1 440 kWh
Mechanical characteristics (standard cabinets variable height)	From 1200mm up to 2300 mm	
Maximum length (mm)	9 000 mm	12 000
Maximum Height (mm)	2 100	2 100
Depth (mm)	800	800
Weight of configurations	10 tons	20 tons
Voltage window	718V - 1010 V	
Max continuous discharge capability	4 C	3 C
Max continuous charge capability	4 C	1 C
Standard charge time	30mn	2 hours

SAFETY : ALL SEANERGY SYSTEMS COMPLIANT WITH NMA TEST1

At cell level: No reaction in an abuse event with Saft-Iron Phosphate®(SLFP) positive material, shutdown-effect separator, mechanical vent and electrical CID.

At module level: electronic board, individual cell voltage monitoring, module temperature monitoring, balancing, fuse.

At system level: BMS, thermal management.



SAFT RECENT SUCCESS STORIES

SAFT SOLUTION FOR STOCKHOLM'S FULLY ELECTRIC FERRY

Ferry operator Ballerina has ordered Seanergy® battery systems to save fuel and improve its environmental credentials.

The new ferry boat work year-round, completing eight round trips of its 50-minute route per day over a very long lifetime of 10 years or more.

The results are zero-emissions and improved confort for passengers.

SAFT SOLUTION FOR ROLLS ROYCE'S RESEARCH POLAR VESSEL

Saft provided Li-ion Seanergy high power batteries for Rolls Royce Sir David Attenborough, research polar vessel operated by the British Antarctic Survey.

The objectives are low emissions, peak shaving, load smoothing and spinning reserve.

SAFT SOLUTION FOR TOTAL'S TANKER HYBRIDATION

Saft has been part of the Joint Investment Project for Total's tanker hybridation.

The objective is 10% emission reduction on auxiliary engines.

This project is the result of the partnership between:

SAFT
Rue Georges Leclanché
86060 Poitiers—France
Tel. : +33 (0)5 49 55 48 48
Fax : +33 (0)5 49 55 48 50
www.saftbatteries.com

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