

Soft railway batteries

Solutions for a world in motion



SAFT

Performance and reliability perfected for railway applications

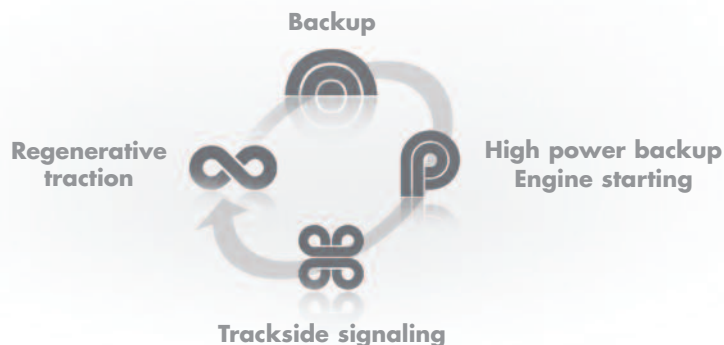


Meeting the challenges of the modern railway industry

Saft has over 60 years of experience as a world specialist in the design, manufacture and supply of high-tech railway batteries. We have developed a new generation of batteries that meet the reliability, safety and performance challenges encountered in today's complex railway landscape. Our full spectrum service ranges from supplying individual batteries to operating as a global supplier of fully integrated, turnkey battery systems for both new-build and replacement projects.

The ideal battery for every need

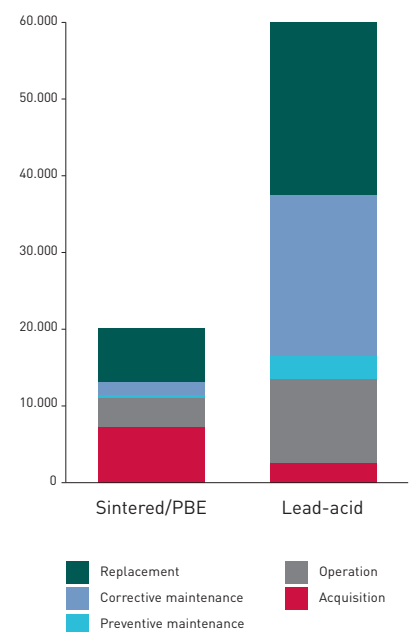
Saft onboard and trackside battery solutions are based on a broad range of dependable battery technologies: nickel-cadmium, nickel-carbon capacitor and lithium-ion (Li-ion). They cover main applications such as: auxiliary backup, engine starting, regenerative traction and trackside signaling.



It's TCO that really counts

The true value of your battery is best represented by its Total Cost of Ownership (TCO). This includes the initial purchase cost, maintenance costs (preventive and corrective), operation costs and replacement costs. Your installation will last more than five years. So should your batteries.

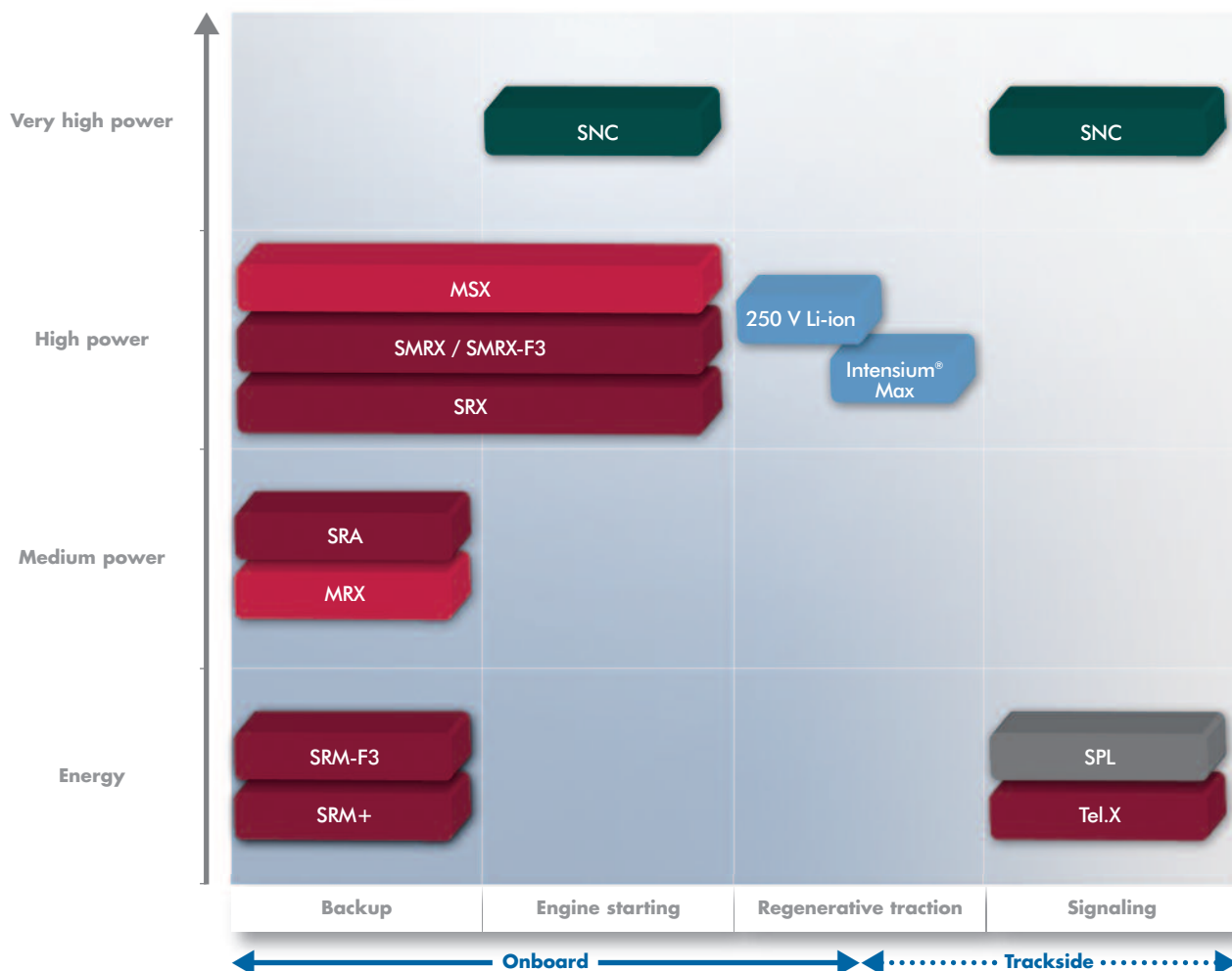
TCO cost (€) after 30 years





Saft meets the evolving railway market trends

- Ni-Cd S/PBE block battery
- Nickel capacitors
- Ni-Cd S/PBE single cells
- Li-ion
- Ni-Cd pocket plate



Soft Ni-Cd railway batteries ensure reliable performance year after year



Comprehensive backup solutions

Soft continually strives to add new products to its selection of high technology Ni-Cd rail batteries that meet the changing requirements of a world in motion. The product portfolio provides a reliable backup power source for vital onboard services such as lighting, data and communications systems, ventilation and door opening functions, as well as the safety-critical demands of electromagnetic braking applications.



Energy range (Continuous current = 1C / Peak current = 2C)

	Main characteristic	Operating temperature range	Capacity range
SRM+	The ideal compact and cost-effective solution	- 20°C to + 50°C	40-360 Ah
SRM-F3	Provides high energy in a transparent polysulfone cell container	- 30°C to + 50°C	80-250 Ah



Medium power range (Continuous current = 2C / Peak current = 5C)

	Main characteristic	Operating temperature range	Capacity range
MRX	Block format ensures fast and easy commissioning, installation and maintenance	- 20°C to + 50°C	70-520 Ah
SRA	Very compact single cells	- 20°C to + 50°C	75-375 Ah
SRA LT	Single cells for operation in extremely cold climates	- 50°C to + 40°C	75-375 Ah
SRA HT	Single cells for operation in extremely hot climates	- 20°C to + 65°C	70-350 Ah



High power for even the most demanding applications

Saft batteries provide the ideal high power solution for demanding critical backup applications. They also support the peak power requirements of braking and tilting systems on high speed trains. Saft batteries deliver exceptionally high cranking currents essential for reliable engine starting on locomotives and DMUs that enables train operators to save fuel, reduce noise and gas emissions, including CO₂ footprint.



High power range (Continuous current = 5C / Peak current = 20C)

	Main characteristic	Operating temperature range	Capacity range
MSX	Block format for fast and easy commissioning, installation and maintenance	- 30°C to + 50°C	70-260 Ah
SRX	Delivers high power performance	- 20°C to + 50°C	22-220 Ah(Plastic) 73-375 Ah (Steel)
SMRX	Very compact package for high power performance	- 30°C to + 50°C	75-375 Ah
SMRX-F3	Puts compact high power performance into transparent polysulfone containers	- 30°C to + 50°C	160-360 Ah



▲ Saft Nickel Capacitor (SNC)

Ahead with super capacitors

The innovative Saft Nickel Capacitor (SNC) module, also known as a supercapacitor, is designed to operate in conjunction with the train's onboard battery to provide the very high cranking power needed to start large diesel engines. The SNC module uses aqueous electrolyte for added safety and does not require electronics resulting in an exceptionally reliable product. It is maintenance-free, simple to operate and its life and performance are largely unaffected by extreme temperatures.



Total reliability for trackside signaling

Saft Ni-Cd batteries provide the reliable backup power that ensures total reliability for trackside signalling installations. High or low current versions are available for signaling, level crossing and point operation, positive train control, security surveillance and telecommunications equipment.



Energy range (Continuous current = 1C)

	Main characteristic	Operating temperature range	Capacity range
SPL	Combines reliable backup power with fast, flexible charging	- 30°C to + 40°C	80-420 Ah
Tel.X	Ideal for installation in tight spaces and is also compatible with VRLA charging systems	- 20°C to + 50°C	83-185 Ah

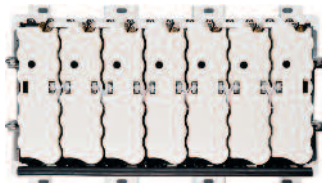
Ni-Cd durability ensures predictable long-life performance

Saft nickel-based batteries feature a robust construction that ensures a fully predictable and reliable performance over a long service life. For critical installations this predictability eliminates the risk of 'sudden death' that can affect lead-acid batteries, which deteriorate rapidly in high temperatures or in demanding operating conditions.

Lithium-ion delivering energy efficiency



Saft Li-ion regenerative traction battery



▲ *Li-ion 250V battery bank:
scalable in series to obtain
voltages of 500 V and 750 V
and in parallel*

Saft's 250 V Li-ion banks for regen traction provide both high power and energy from a single source resulting in increased energy efficiency. The batteries are composed of battery building blocks complete with a management system for a modular, easy to integrate solution provided in its own railway grade enclosure.

- Storing kinetic braking energy (regenerative braking) and reusing it for autonomous traction for extended catenary-free operation and also to assist train acceleration for increased energy efficiency
- Reducing energy consumption, infrastructure costs and maintenance requirements for a fast return on investment
- Ensuring passenger comfort and safety during power outages – the onboard battery can provide sufficient backup energy for auxiliaries and autonomous traction power for the hybrid vehicle to continue its journey to the next station
- Increasing sustainable mobility for a more livable future by reducing fossil fuel consumption, diesel engine noise and particulate emissions and by improving the aesthetic appeal of transport.

Intensium® Max Li-ion trackside energy storage systems



▲ *Intensium® Max*

Saft's Intensium® Max Li-ion megawatt level energy storage systems can be deployed as part of a trackside regenerative system to capture train braking energy and reuse it when accelerating. The fully integrated containerized system serves a dual purpose by saving energy and helping to increase network stability through frequency support. It can also generate further revenues by enabling operators to sell excess reserve energy back to the local grid.

Li-ion technology for advanced rail applications

Saft has over 18 years of experience in deploying Li-ion technology in a wide range of applications from mobility to large energy storage installations for industrial or renewable energy markets. For advanced rail applications requiring lightweight and compact battery systems, Saft Li-ion batteries offer the perfect combination of high energy density, high power and excellent cycling capabilities in a reliable, long-life and maintenance-free package.

Comprehensive service and support



Quality products

- High performance cells, batteries and accessories
- Choice of multiple battery solutions

Dedicated support

- Dedicated support teams: project management for system development, application engineering, quality assurance and customer service
- Global sales network

Service

- Training programmes
- After-sales support

Adding value at every stage

Expertise

- Expert in multiple technologies
- Over 60 years of proven expertise in the management of global rail projects
- Comprehensive knowledge of international railway standards and rolling stock requirements

Innovation

- Maintaining on-going investment in new product development to meet evolving customer needs

Environmentally friendly

- Dedicated global network of collection and recycling facilities

Saft railway batteries conform to all major quality, safety and environmental standards

Quality: IRIS, ISO 9001, Saft World Class Continuous Program

Transport: UN 2795, UN3480

Environment: ISO 14001, fully recyclable

REACH: The Saft Group has adopted internal procedures to ensure conformity with the European Reach Regulations.

RoHS: Although batteries and accumulators are not within the scope of the RoHS directive, Saft has taken voluntary measures to ensure that the substances forbidden by RoHS are not present in the battery, with the exception of the electro-chemical core.



Saft is committed to the highest standards of environmental stewardship

As part of this environmental commitment, Saft prioritises the use of recycled raw materials over virgin raw materials in all manufacturing processes. We also strive, year on year, to reduce air and water emissions from our plants, as well as minimizing water usage, reducing fossil energy consumption and associated CO₂ emissions, and ensuring that all our customers have access to recycling solutions for their spent batteries.

To facilitate the end-of-life collection and recycling of industrial batteries, including our nickel-based and lithium-ion technologies, Saft has developed well established partnerships with collection companies in most EU countries, in North America and in many other countries worldwide. This collection network receives spent batteries from our customers and dispatches them to fully approved recycling facilities, in compliance with the laws governing

trans-boundary waste shipments.

This collection network is currently undergoing minor adaptations to meet the requirements of the EU batteries directive.

A list of our battery collection points is available on our web site. In other countries, Saft will assist anyone using our batteries in finding environmentally sound recycling solutions.

Please contact your sales representative for further information.



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