

# SRM+ Ni-Cd battery

Optimized for high energy railway backup applications



**SAFT**



# Saft: an outstanding track record in the railway industry

Saft is a world specialist in the design and manufacture of high-tech batteries for the rail and mass transit sectors. With over 50 years experience in the railway industry, Saft has developed a full spectrum service ranging from supplying individual batteries right through to operating as a global supplier of fully integrated, turnkey battery systems for both new-build and refurbishment projects.

## SRM+: Reliable backup power for high-energy applications on any train

Saft has combined years of practical experience with advanced battery technology to develop a wide range of onboard battery systems to suit virtually any backup application on all types of rolling stock.

### Onboard energy backup:

- Passenger safety and comfort (lighting, door control, ventilation, communications, etc.)
- Fail-safe train start-up

### All types of rolling stock:

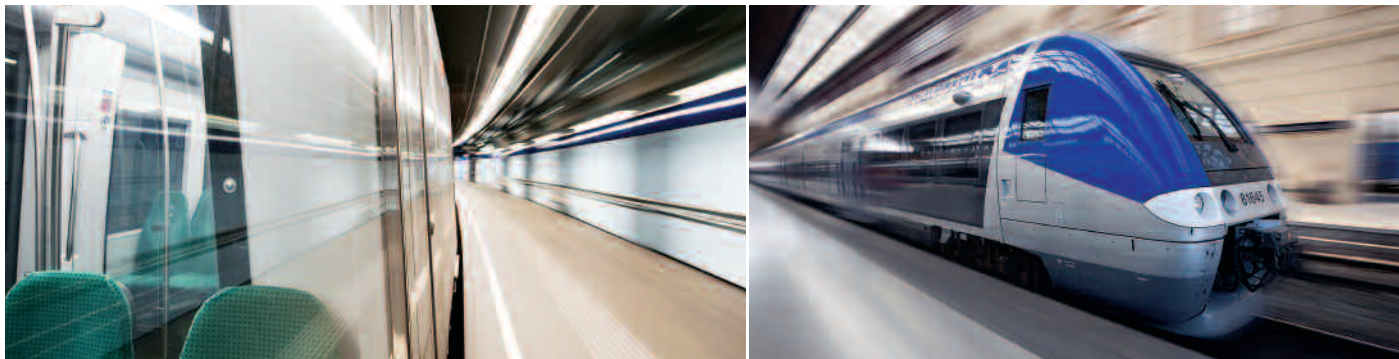
- Urban transport: metros, trams, tram-trains, light rails
- Regional transport: EMU, DMU (Electric and Diesel Multiple Units)
- Intercity transport: high-speed trains, electric locomotives, passenger coaches

## Ni-Cd for performance, reliability and long life

Saft Ni-Cd batteries are the benchmark technology for the difficult and demanding conditions encountered in the rail industry. Thanks to their robust construction, reliability and long, totally predictable service life, there is no risk of sudden death failure.

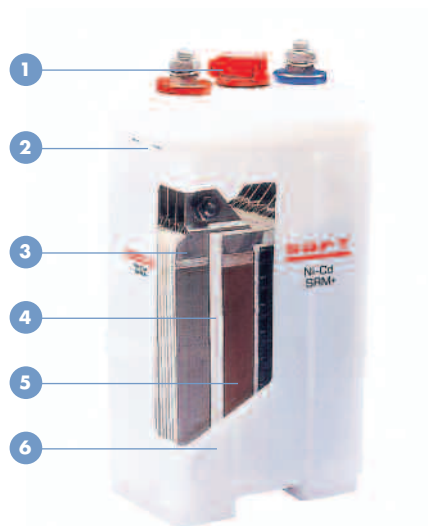
# SRM+

## Compact high energy backup



### The compact cost-effective solution for energy backup applications

SRM+ provides the ideal compact cost-effective single cell solution for high energy backup applications. It combines our SRM sintered/PBE construction, field proven over 20 years of service and millions of track kilometers, with advanced solutions deployed on the industry leading MRX design. SRM+ delivers high energy, reliability and a 15-year plus service life in a fully recyclable single cell package that has the same installation footprint as a block battery.



- 1/ Bayonet flame arrester vent cap
- 2/ Large electrolyte reserve
- 3/ Sintered positive electrode
- 4/ Separator
- 5/ Plastic bonded negative electrode
- 6/ Container

#### The cost-effective way to ensure the security and comfort of your passengers

SRM+ provides total reliability for high energy backup applications requiring 'M'-type performance, even in the toughest conditions.

- Robust sintered/PBE Ni-Cd construction for long life (15 years or more) and reliability
- Advanced electrolyte to ensure excellent charge/discharge performance
- Wide operating temperature range from - 30°C to + 50°C and resistance to extreme temperatures from - 50°C to + 70°C
- Proven resistance to shocks and vibrations

#### Make optimum use of your battery space

SRM+ is the compact single cell that offers a 25% weight and footprint reduction compared to SRM allowing you to install more equipment and carry more passengers to boost revenue/profit.

- Plates include improved and field proven active material
- Cell design is optimized to provide the smallest possible footprint for each capacity step

# SRM+

## Optimized total cost of ownership



### Technical expertise contributes directly to your bottom line performance

SRM+ is purpose-designed to save operating costs throughout its long service life.

- Capability to replace individual cells
- Outstanding chargeability over an extended temperature window
  - Fast recharge – 90% capacity achieved in 5 hours – for rapid return to service
  - No need to oversize batteries
  - Lower water consumption for optimised maintenance intervals
  - 15-years plus service life

SRM+ offers a 25% weight and footprint reduction compared to SRM



### Select the ideal cell for your specific needs

SRM+ is designed to offer complete flexibility.

#### Choose your capacity

- Single cells which offer the closest fit to each specific need
- 17 capacity steps ranging from 44 Ah to 360 Ah

#### Choose your container

- P – plastic containers in compact stainless steel crates
- FR – polyamide flame retardant plastic containers in compact stainless steel crates
- FRpp – polypropylene flame retardant plastic containers

#### Choose your maintenance system

- Optional water-filling system, for safe, easy and efficient annual topping up

### The fast-track route to your ideal battery system

Saft offers the fast-track route to your ideal battery system, using either a range of standardized designs or developing a fully customised turnkey solution.

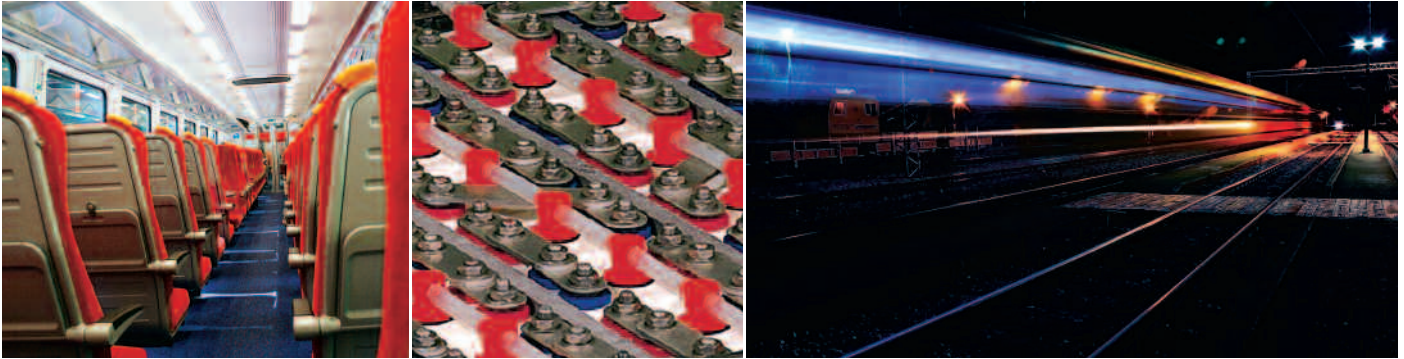
- SRM+ cells fit within Saft's range of standardized battery systems
- Batteries can be integrated into a customised tray, individually designed, engineered and tested to meet specific application requirements



# SRM+ Ni-Cd battery

# SRM+

## Proven performance and reliability



### SRM+ FRpp physical characteristics

Cell type	Ah	Electrolyte Reserve (cm <sup>3</sup> )	Cell Weight (kg)	Crate configuration	H	W	Weight including crate (kg)								Length (mm)							
							2	3	4	5	6	7	8	2	3	4	5	6	7	8		
SRM+ 40	40	200	2,2	1 row	307	90			10,2	13,0	14,8	17,6	19,4			354	439	526	611	697		
				2 rows	307	177			21,4	26,5	32,6	37,7	42,8			354	439	526	611	697		
SRM+ 70	70	195	2,6	1 row	307	90			11,8	15,0	17,2	20,4	22,6			354	439	526	611	697		
				2 rows	307	177			24,6	30,5	37,4	43,3	49,2			354	439	526	611	697		
SRM+ 80	80	295	3,3	1 row	307	90			14,6	18,5	21,4	25,3	28,2			354	439	526	611	697		
				2 rows	307	177			27,4	34,0	41,6	48,2	54,8			354	439	526	611	697		
SRM+ 90	90	290	3,5	1 row	307	90			15,4	19,5	22,6	26,7	29,8			354	439	526	611	697		
				2 rows	307	177			28,2	35,0	42,8	49,6	56,4			354	439	526	611	697		
SRM+ 100	100	285	3,6	1 row	307	90			15,8	20,0	23,2	27,4	30,6			354	439	526	611	697		
				2 rows	307	177			29,8	37,0	45,2	52,4	59,6			354	439	526	611	697		
SRM+ 120	120	355	4,2	1 row	307	91		14,4	18,2	23,0	27,8				323	426	530	634				
				2 rows	307	178			27,4	36,2	45,0	44,8				323	426	530	634			
SRM+ 135	135	350	4,4	1 row	307	91		15,0	19,0	24,0	28,1				323	426	530	634				
				2 rows	307	178			28,9	38,2	47,5	57,8				323	426	530	634			
SRM+ 160	160	495	5,6	1 row	343	170	12,8	17,7	23,6	29,5	35,4	41,3	47,2	163	241	319	397	475	553	631		
SRM+ 180	180	555	6,4	1 row	343	170	14,6	20,9	28,2	35,5	41,8	49,1	59,4	181	268	355	442	530	616	703		
SRM+ 200	200	555	6,6	1 row	343	170	15,5	21,5	29,0	36,5	43,0	50,5	57,0	181	268	355	442	530	616	703		
SRM+ 220	220	665	7,7	1 row	343	170	16,8	25,2	33,6	42,0	50,4			213	316	419	523	626				
SRM+ 240	240	665	7,9	1 row	343	170	17,2	25,8	34,4	43,0	51,6			213	316	419	523	626				
SRM+ 260	260	770	9,2	1 row	343	170	20,6	29,9	38,9	49,5	58,8			241	358	475	593	709				
SRM+ 280	280	765	9,4	1 row	343	170	21,0	30,5	39,7	50,5	60,0			241	358	475	593	709				
SRM+ 300	300	935	10,5	1 row	343	170	23,2	33,8	44,4	56,0				285	423	562	701					
SRM+ 320	320	920	10,8	1 row	343	170	23,8	34,7	45,6	57,5				285	423	562	701					
SRM+ 360	360	915	11,2	1 row	343	170	24,6	35,9	47,2	59,5				285	423	562	701					

Note: for stainless steel cells and other specific requests, please contact your local Saft representative.

### Full conformity with quality, safety and environmental standards

**Electrical:** Meets the medium "M" type requirements of IEC 60 623

**Fire & smoke:** NFF 16101-16102, DIN 5510-2, UL 94-V0, ASTM E 162, ASTM E 662

**Shocks & vibrations:** IEC 61373

**Others:** DIN 40771, BS 6260

**Quality:** ISO 9001, IRIS, Saft world class continuous improvement program

**Environment:** Fully recycled, ISO 14001, RoHS, REACH



# Saft is committed to the highest standards of environmental stewardship

As part of its environmental commitment, Saft gives priority to recycled raw materials over virgin raw materials, reduces its plants' air and water releases year after year, minimizes water usage, reduces fossil energy consumption and associated CO<sub>2</sub> emissions, and ensures that its customers have recycling solutions for their spent batteries.

Regarding industrial Ni-Cd batteries, Saft has had partnerships for many years with collection companies in most EU countries, in North America and in other countries. This collection network receives and dispatches our customers' batteries at the end of their lives to fully approved recycling facilities, in compliance with the laws governing transboundary waste shipments.

This collection network is undergoing minor adaptations to meet the requirements of the EU batteries directive. A list of our collection points is available on our web site. In other countries, Saft assists users of its batteries in finding environmentally sound recycling solutions. Please contact your sales representative for further information.



## Saft

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Document N° 21812-0716-2  
Edition: July 2016

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Rouge485 – D121 – Cap 668  
Printed on PEFC paper by GMK, an Imprim' Green member  
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RCS Bobigny B 383 703 873