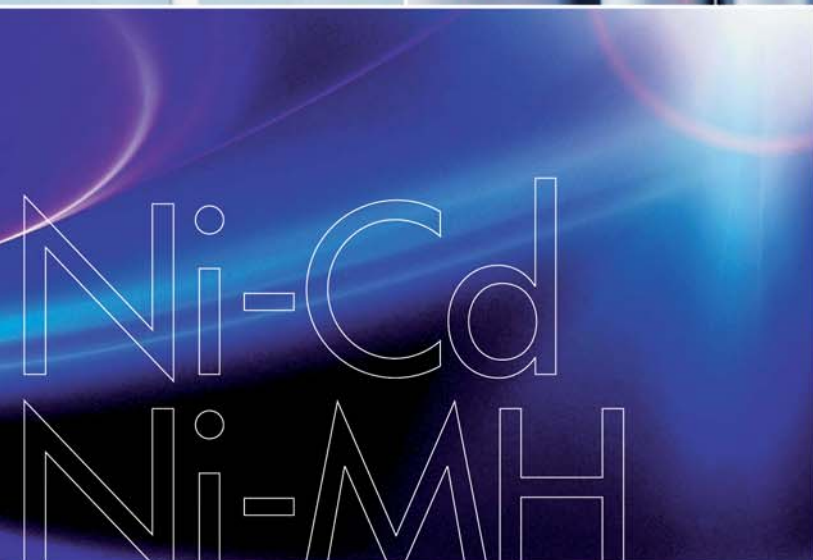


Soft small nickel batteries

Selector guide



VOTRE DISTRIBUTEUR :



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Saft, your trusted partner for reliable, intelligent and eco-friendly rechargeable battery systems



Why are Saft rechargeable battery systems the optimal solution?

Saft: a global leader in high quality rechargeable batteries

With its long-term experience in producing batteries, we have unequalled expertise in designing, developing and manufacturing robust and reliable cells and battery systems.

Saft focuses on business applications

We are totally focused on delivering products and solutions designed for business applications and adapted to the specific needs of a wide range of users.

Saft: more than a mere supplier, we are your partner

If you cannot find the answer to your needs from our standard offer, we can conceive, design and produce a customised solution that will do the job. We will combine your team's strengths with ours to create and manufacture a purpose-built battery system for your unique requirements, designed to cost.

Saft is global

In the battery industry, most manufacturing and assembly is done manually in the Far East. Saft is the only industrial company still located in Europe, with state-of-the-art, fully automated factories in Nersac, Poitiers

and Bordeaux, France. Saft also has battery assembly facilities in the United States, China and many other countries. Saft's global network means you can rely on faster delivery times and a highly competitive cost/quality ratio.

Saft controls the process from design to delivery

Saft designs, produces and delivers its products. Because we control and supervise the entire end-to-end value chain, we have a seamless view on quality. In addition, we meet your ever-increasing requirements for higher-power and higher-energy battery solutions through continuous and heavy investment in research and development. We are constantly looking for more innovative and efficient solutions.

Saft makes intelligent batteries

When you choose Saft, you get more than just a battery. You also get our highly advanced and innovative battery system. The technological expertise we pack inside each battery delivers an intelligent turnkey solution. Your battery communicates with other applications, controls its own charge and discharge and is pre-programmed to do what has to be done... A timesaver enabling you to focus on your core business.

Saft works hard to protect the environment

As an industry pioneer in eco-designed products, Saft is dedicated to building batteries that meet the goals of sustainable development. When your rechargeable batteries have to be replaced, Saft works through several national collection and recycling organisations to provide you with an easy-to-use collection and treatment service. Most importantly, Saft factories strictly comply with all environmental regulations concerning air, water, ground and solid waste standards.



A battery to fit every application, specification and need

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Saft's comprehensive product range includes standard and purposebuilt battery systems composed of Nickel-Cadmium and Nickel Metal-Hydrate technologies, all using Saft's intelligent engineering design and state-of-the-art battery management solutions. You will find Saft batteries in...

Buildings and industrial plants

Alarms, UPS, back-up systems and more.

Emergency and security systems

Exit signs, emergency fixtures, conversion kits, alarms and more.

Personal mobility

E-bikes, e-scooters, underwater scooters, electrical wheelchairs, lift systems for disabled persons and other personal electric vehicles.

Professional tools

Construction, agriculture, gardening and many other professional tools.

Professional electronics

Vacuum cleaners, personal care equipment, handheld terminals, audio and video equipment, flashlights, diving and mine lamps and more.

Medical

Drug dispensers, cardiac defibrillators, respirators, homecare ventilators, medical carts, monitoring and diagnosis equipment and more.

Military and defence

Robots, portable radio communication equipment and more.

Marine

Signalling, UPS, back-up systems and more.

Small off-grid PV applications

Street lighting, signage, water supply and irrigation, weather stations, sensors, navigation aids, rural electrification PV, professional applications.

Telecommunications

Cellular and cordless phones, personal communication systems, private mobile radios, back-up systems for telecom networks and more.

	Buildings & industrial plants	Emergency & security systems	Professional mobility	Professional tools	Professional electronics	Medical	Military & defence	Marine	Small off-grid PV applications	Telecommunications
Ni-Cd	VRE									
	VSE									
	VT									
	VNT									
	VNT U									
	VST									
Ni-MH	Saft ecolife									
	VH									
	VHT									
	VHT U									

Ni-Cd batteries

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Ni-Cd battery Standard & High Energy VRE / VSE series

Saft VRE standard Ni-Cd series were originally designed for cycling applications requiring a rapid charge. However, they are also suited for a wide range of applications where they offer an excellent cost / performance ratio.

The high level of reliability provided by Saft's standard series is time-tested and well-proven, with hundreds of millions of units delivered over years. Saft's VSE high energy Ni-Cd series benefit from significant technological upgrades compared with standard series.

The VSE design features advanced nickel foam electrode technology to meet the fast charge and increased capacity needs of light and compact equipment.

Saft type			IEC capacity at 0.2C rate		Standard charge (16h)	Quick or fast charge		Typical internal impedance	Max. dimensions for bare cells		Typical weight
Nominal voltage 1.2 volts/cell	Top		Typical [mAh]	Minimum [mAh]	Current [mA]	Current [mA]	Time [h]	[mOhm]	Diameter [mm]	Height [mm]	[g]
VRE	VRE AA 700	L	780	700	70	700	1	14	14.0	49.3	21
	VRE Cs 1600	L	1600	1500	150	1500	1	5	22.2	42.2	48
	VRE Cs 1800	L	1800	1700	170	1700	1	5	22.2	42.2	49
	VRE C	L	2550	2300	230	2300	1	5	25.3	49.5	75
	VRE 1/2 D	L	2550	2400	240	800	2-3	10	32.2	36.6	80
	VRE D	L&H	5100	4500	450	4500	1	4	32.2	58.6	140
	VRE D 5500	L	5500	5000	500	5000	1	4	32.2	58.6	150
	VRE F	L	8800	8000	800	8000	1	4	32.2	89.2	220
VSE	VSE AA	L	980	940	94	940	1	16	14.0	49.3	22





High Temperature VT / VST / VNT / VNT U / Saft ecolife series

Saft's high temperature Ni-Cd series are perfectly suited to emergency and security equipment applications in compliance with International (IEC 61951), US (UL 924) and Japanese (JISC 8705) standards. They are designed to accept a permanent charge (C/20 to C/15) for a minimum of four years in high temperature environments (up to + 40° C / 104° F). Higher-end versions of

the cells, such as the "U" and "70" models, can even withstand a constant temperature of up to + 55° C / 131° F with a similar life expectancy when permanently charged. The VNT / VNT U series benefit from Saft's innovative PNE (Plastic bonded Nickel Electrode) technology which provides improved energy density and an excellent resistance to cold weather conditions.

Saft ecolife series serve your emergency lighting project with their greatly reduced environment impact and their greatly extended service life of 8 years.

A product Life Cycle Assessment is carried out on all the following phases: raw material extraction, manufacturing, distribution and use.

A Product Environmental Profile (PEP) is available upon request.

	Saft type		IEC capacity at 0.2C rate		Standard charge (16h)	Permanent charge		Typical internal impedance	Max. dimensions for bare cells		Typical weight
	Nominal voltage 1.2 volts/cell	Top	Typical [mAh]	Minimum [mAh]	Current [mA]	Current [mA]	Time [h]	[mOhm]	Diameter [mm]	Height [mm]	[g]
VT	VT 1/2 D ⁽¹⁾	L	2500	2200	220	110	-	10	32.2	36.8	80
	VT F ⁽¹⁾	H	7500	7000	700	350	-	5	32.2	91.1	196
	VT F 70 ⁽²⁾	L	7700	7000	700	350	-	5	32.2	89.2	196
VST	VST AA ⁽¹⁾	L	860	800	80	40	-	30	14.0	49.3	26
VNT	VNT Cs ⁽¹⁾	L	1650	1600	160	80	-	8	22.2	42.2	45
	VNT D ⁽¹⁾	H	4250	4000	400	200	-	6	32.2	60.3	115
VNT U	VNT Cs U ⁽²⁾	L	1650	1600	160	80	-	8	22.2	42.2	45
	VNT C U ⁽²⁾	L	2650	2500	250	125	-	8	25.3	49.5	75
	VNT D U ⁽²⁾	H	4250	4000	400	200	-	6	32.2	60.3	115
	VNT D U HC ⁽²⁾	L&H	4500	4200	420	200	-	6	32.2	60.3	124
Saft ecolife	Saft ecolife AA ⁽¹⁾	L	650	600	60	30	-	30	14.0	49.3	26
	Saft ecolife Cs ⁽¹⁾	L	1570	1500	150	75	-	8	22.2	42.2	45
	Saft ecolife D ⁽¹⁾	H	4250	4000	400	200	-	6	32.2	60.3	115

(1) Up to + 40°C temperature environment

(2) Up to + 55°C temperature environment



Ni-MH batteries

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Super High Energy and High Energy Back-up VH / VHT / VHT U series

Saft's VH super high energy and VHT long life back-up Ni-MH series are designed for professional applications that demand fast charge and discharge capability over a prolonged lifetime. VH Cs, VH D and VH F are designed specifically for high energy density

applications requiring fast charge and high discharge rate (50 A) and target cordless power tools, personal mobility and many other professional applications.

The VHT series has been engineered for very long life (1000 - 2000 cycles)

in extreme range of temperature and target back-up, medical, small off-grid photovoltaic and other applications requiring cycles.

The VHT U series are designed for + 55°C ELU applications.

	Saft type		IEC capacity at 0.2C rate		Standard charge (16h)	Quick or fast charge		Typical internal impedance	Max. dimensions for bare cells		Typical weight
	Nominal voltage 1.2 volts/cell	Top	Typical [mAh]	Minimum [mAh]	Current [mA]	Current [mA]	Time [h]	[mOhm]	Diameter [mm]	Height [mm]	[g]
VH	VH AAA	L	680	650	65	650	1	50	10.5	43.7	13
	VH AA 1500	L	1500	1400	140	1400	1	20	14.0	49.3	26
	VH AA 1700	L	1700	1600	160	1600	1	20	14.0	49.3	26
	VH 4/3 A	L	3750	3700	370	2000	1-2	20	17.0	67.0	53
	VH Cs 3200 XL	L	3200	3000	300	3000	1-2	4	22.0	42.7	58
	VH D 9500 XP	L	9500	9000	900	5000	2-3	3	32.2	58.6	168
	VH F XP	L	15000	14000	1500	5000	3-4	3	32.2	89.2	252
VHT	VHT AA	L	1150	1100	110	-	-	18	14.0	49.3	24
	VHT Cs	L	2200	2000	200	-	-	5	22.0	42.7	48
	VHT 7/5 Cs	L	4200	4000	400	-	-	20	22.2	60.0	74
	VHT F	L	11000	10000	1000	-	-	5	32.3	89.2	215
VHT U	VHT AA U	L	1150	1100	110	-	-	18	14.0	49.3	24
	VHT Cs U	L	2200	2000	200	-	-	5	22.0	42.7	48
	VHT 7/5 Cs U	L	4200	4000	400	-	-	20	22.2	60.0	74





Battery systems



Ni-Cd & Ni-MH standard battery systems

Saft offers Ni-Cd & Ni-MH standard battery systems addressing all professional and industrial portable applications.

As well as the electrical and mechanical interfaces, these systems usually include management, control and communication capabilities, plus the charger. Parallel assemblies and intelligent battery design are used to achieve high-capacity systems. Special management algorithms implemented in proprietary electronics

bring optimised performance, long shelf and service life, guaranteed user safety and extended warranty conditions. Battery and system design benefit from Saft's extensive experience in rapid prototyping, design-to-cost and volume production. As well as making standard battery systems addressing most needs, Saft also develops custom systems to client specifications. Wherever possible, custom batteries are designed and made using standard components and subassemblies.

Saft's standard offer consists of modules in ABS plastics (Smart modules), whose assembly has been adapted to robust and easily-connecting designs in aluminium casings.

Smart VH modules are specially designed for personal mobility applications. Smart VHT modules address small off-grid PV applications, back-up power systems and professional electronics requiring unsurpassed long life energy storage.

	Smart VH module						Mobility module			
	VH D			VH F			VH D		VH F	
	10S	20S	30S	20S1P	30S1P	10S2P	20S2P	10S2P	20S1P	20S2P
Electrical characteristics										
Nominal voltage [V]	12	24	36	12	24	36	24	36	24	36
Typical capacity at C/3 drain rate after full charge at 3A at +20°C [Ah]	9			15			9		15	
Minimum capacity at end of life [Ah]	6			10			6		10	
Specific energy [Wh/kg]	51	57	58	56	62	64	57	58	62	64
Energy density [Wh/dm ³]	83	103	112	106	124	135	103	112	124	135
Mechanical characteristics										
Height (mm)	99	159	219	129	219	309	170	228	231	320
Length (mm)	178						185			
Width (mm)	73.5						81			
Weight (kg)	2.1	3.8	5.6	3.2	5.8	8.4	4.9	6.5	6.5	9.6
Volume (l)	1.3	2.1	2.9	1.7	2.9	4.0	2.5	3.4	3.5	4.8

	Smart VHT module			PV module				Tubular PV module			
	10S	20S	30S	20S1P	30S1P	10S2P	20S2P	10S2P	20S1P	20S2P	30S2P
Electrical characteristics											
Nominal voltage (V)	12	24	36	24	36	12	24	12	24	24	36
Typical capacity at C/3 drain rate after full charge at 3A at + 20°C (Ah)	10			10		20		20	10	20	20
Minimum capacity at end of life (Ah)	7			6		12		12	6	12	12
Specific energy (Wh/kg)	44	50	52	44	44	44	44	40	40	44	46
Energy density (Wh/dm3)	71	83	90	69	75	69	78	52	52	66	72
Mechanical characteristics											
Height (mm)	129	219	309	231	320	231	410	300	300	475	650
Length (mm)	178			185				Diameter: 140			
Width (mm)	73.5			81							
Weight (kg)	2.7	4.8	6.9	5.5	8.1	5.5	10.8	6.0	6.0	11.0	15.0
Volume (l)	1.7	2.9	4.0	3.5	4.8	3.5	6.1	4.6	4.6	7.3	10.0

As part of its ongoing commitment to advanced technology systems, Saft has developed a strong expertise in developing, qualifying and manufacturing customised integrated Li-ion battery systems. The specific characteristics of Li-ion cells require well adapted battery management and control systems. Charge and discharge control, application interfacing, communication and safety are to be considered as a whole and need to be optimised for a given application and operating conditions. For more details on the offer, please contact Saft.

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 CO₂ emissions, and ensures that its customers have recycling solutions for their spent batteries.

Regarding industrial 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 trans-boundary waste shipments.

Saft has selected a recycling process for industrial lithium-ion cells with very high recycling efficiency. A list of our current 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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