

# Tel.X Ni-Cd battery

The compact maintenance-free solution for telecom networks

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# Tel.X, delivering high-energy performance in a compact maintenance-free package

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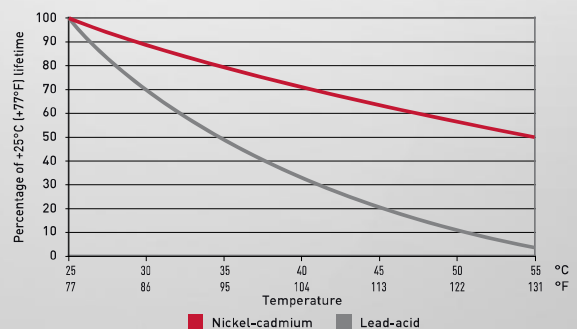
## Tel.X: guaranteed power continuity for remote or hard to access installations

The Tel.X Ni-Cd battery delivers the optimum combination of high-energy performance, reliability and long-life in a new compact, modular maintenance-free design that ensures the lowest TCO (Total Cost of Ownership). Thanks to its outstanding energy density of up to 100 Wh/l, Tel.X is the perfect direct replacement for VRLA batteries in telecom back-up applications where limited space is available. Tel.X reduces battery weight by 30% in the same foot print.

## Tel.X's robust Ni-Cd construction ensure total reliability and a long, predictable service life.

The Tel.X battery has a Ni-Cd construction designed for more than 20 years' service life at + 25°C (+ 77°F). Like any other battery, high temperature operation will reduce its life expectancy. The life of the Tel.X is less impacted by high temperature when compared to VRLA battery. At +35°C (+95°F), the lifetime reduction for a Ni-Cd battery is 20%, while it reaches 50% for a lead-acid battery.

Effect of temperature on lifetime



# Tel.X, perfectly adapted for battery installations in tight spaces



Tel.X delivers exceptional reliability against unexpected outages for telecom installations where continuity and reliability of power supplied is critical. Tel.X is ideally suited for applications including remote cabinets and central offices as well as BTS (Base Transceiver Station) and BSC (Basic Station Controller). Tel.X is especially suited for remote and/or decentralized locations where travel time and restricted access is difficult.

## Reliable backup performance guaranteed – even in extreme temperatures

Tel.X offers the ideal combination of reliability, performance and long-life over a wide range of operating temperatures.

- Utilizes robust steel nickel plated internal construction based on unique well-proven Ni-Cd electrochemistry
- Eliminates the corrosion, sudden death and thermal runaway risks associated with VRLA batteries
- Combines superior performance with high charging efficiency
- Operates in temperatures from - 20°C to + 50°C (- 4°F to + 122°F) and tolerates - 50°C to + 70°C (- 58°F to + 158°F) for short durations
- Exceptional reliability removes the need for redundant systems

## Operating and maintenance requirements are reduced – even for remote installations

Tel.X's reliable maintenance-free design is perfectly adapted for difficult to access installations.

- Maintenance free design, with a low pressure venting system, reduces water consumption to an absolute minimum
- No topping up is necessary (under operation) – water addition is possible under exceptional circumstances
- Periodic checks of charging voltage are recommended, but Tel.X requires no further attention once installed
- Extended lifetime matches or surpasses the telecom equipment life it supports

# Tel.X, for ease of installation and operation



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## Easy installation makes Tel.X a simple and direct replacement

Compact modular design makes Tel.X the ideal direct replacement for VRLA batteries in backup floating applications - it fits easily within the available space and is fully compatible with existing equipment.

- Highly compact design optimizes:
  - Volume: high energy density of up to 100 Wh/l
  - Weight: 30 % lighter than VRLA
- Modular design suits specific capacity needs:
  - From 75 to 172 Ah in modular block construction
  - Each module comprises 3 to 10 cells in flame retardant material
- Layout provides easy access to front terminals
- Lifting handles on each module ensure easy handling and installation
- Less than 20 minutes installation
- Simple modular design easy to fit in cabinets, well adapted to 19" and 23" racks

## Designed for ease of operation

Tel.X offers the ease of operation that contributes to a long and trouble-free service life.

- Tel.X is compatible with telecom charging systems thanks to its single step 1.43 V/cell floating voltage, with no need for temperature compensation
- Environmental protection for terminals and connectors is provided by a protection cover (meeting IP2 level against electrical shock according to safety standard EN 50272-2/IEC 62485-2)
- Cabling is carried out from front to back, with front accessible connection points between adjacent blocks
- Active cooling is not required, even in harsh environments
- Central gas venting system option is available for use in sealed enclosures
- Tel.X batteries may be stored for up to one year without special maintenance before installation

Tel.X  
Ni-Cd battery

# Tel.X, the sustainable battery solution



## Designed with sustainability in mind

Tel.X is purpose designed for minimum environmental impact throughout its entire life cycle, from manufacturing to operation and recycling at end-of-life.

- Tel.X manufacturing processes are designed to minimize consumption of upstream energy
- In operation, Tel.X contributes to a significant reduction in energy consumption throughout its service life
- Highly efficient charging reduces peripheral energy consumption, including cabinet air conditioning and maintenance
- Advanced design reduces the environmental impact of waste processing

## Conforms with quality, safety and environmental standards



## Meets the highest international standards including:

### Electrical and performances

- Certified IEC 60623 – Secondary cells and batteries containing alkaline or other non-acid electrolytes – vented nickel-cadmium prismatic rechargeable single cell
- Certified Telcordia GR-3020 – Nickel-cadmium batteries in the outside plant
- Certified NF C 15-100 – Low-voltage electrical installations

### Safety

- EN 50272-2/IEC 62485-2 – Safety requirements for secondary batteries and battery installations – Part 2: Stationary batteries
- UL 94 V0 : UL standard for flammability safety of plastic materials for parts in devices and appliances testing
- UL 1989 – Safety for standby batteries certified by Intertek
- Telcordia – GR 63 NEBS level 3 – NEBS requirements for physical protection
- Telcordia – GR 1089 NEBS level 3 – Electromagnetic compatibility and electrical safety – generic criteria for network telecommunications equipment.

### Quality

- ISO 9001 and ISO 14001
- Saft world class continuous program

### Environment

- Fully recyclable
- RoHS – Although batteries and accumulators are not within the scope of the RoHS directive, Saft has taken voluntary measures to ensure that the substances prohibited by RoHS are not present in the battery, with the exception of the electro-chemical core
- REACH – The Saft Group has adopted internal procedures to ensure conformity with the European REACH (Registration, Evaluation, Authorisation and Restriction of Chemical Substances) Regulation

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# Tel.X

## Technical data

### Tel.X Physical properties

Cell type	Voltage V	Nominal capacity C <sub>8</sub> Ah*	Rated capacity C <sub>5</sub> Ah**	Maximum dimensions						Weight per block	
				L		W		H		kg	lbs
				mm	in	mm	in	mm	in		
TLX 80-3	3.6	75	83	128	5.03	105	4.13	254	10	5.8	12.7
TLX 80-4	4.8	75	83	168	6.62	105	4.13	254	10	7.9	17.3
TLX 80-5	6.0	75	83	209	8.22	105	4.13	254	10	9.9	21.9
TLX 80-6	7.2	75	83	249	9.82	105	4.13	254	10	12.0	26.5
TLX 80-7	8.4	75	83	290	11.41	105	4.13	254	10	14.0	30.9
TLX 80-8	9.6	75	83	330	13.01	105	4.13	254	10	15.9	35.1
TLX 80-9	10.8	75	83	371	14.61	105	4.13	254	10	17.9	39.4
TLX 80-10	12.0	75	83	412	16.20	105	4.13	254	10	19.7	43.5
TLX 100-3	3.6	97	103	153	6.03	105	4.13	254	10	7.4	16.4
TLX 100-4	4.8	97	103	202	7.96	105	4.13	254	10	9.8	21.7
TLX 100-5	6.0	97	103	251	9.89	105	4.13	254	10	12.2	26.9
TLX 100-6	7.2	97	103	300	11.82	105	4.13	254	10	14.6	32.1
TLX 100-7	8.4	97	103	349	13.76	105	4.13	254	10	16.8	37.0
TLX 100-8	9.6	97	103	398	15.69	105	4.13	254	10	19.2	42.2
TLX 100-9	10.8	97	103	447	17.62	105	4.13	254	10	21.5	47.5
TLX 100-10	12.0	97	103	497	19.55	105	4.13	254	10	23.9	52.7
TLX 150-3	3.6	140	152	209	8.22	105	4.13	254	10	10.4	23.0
TLX 150-4	4.8	140	152	277	10.89	105	4.13	254	10	13.5	29.9
TLX 150-5	6.0	140	152	344	13.55	105	4.13	254	10	16.7	36.7
TLX 150-6	7.2	140	152	412	16.21	105	4.13	254	10	19.9	44.0
TLX 150-7	8.4	140	152	479	18.87	105	4.13	254	10	23.0	50.8
TLX 150-8	9.6	140	152	547	21.54	105	4.13	254	10	26.0	57.3
TLX 180-3	3.6	172	185	250	9.86	105	4.13	254	10	11.7	25.8
TLX 180-4	4.8	172	185	332	13.07	105	4.13	254	10	16.0	35.4
TLX 180-5	6.0	172	185	413	16.28	105	4.13	254	10	19.9	43.9
TLX 180-6	7.2	172	185	495	19.49	105	4.13	254	10	23.7	52.3
TLX 180-7	8.4	172	185	576	22.70	105	4.13	254	10	27.5	60.6

\* Obtained after prolonged float constant voltage charge of 1.45 V/cell at + 25°C (+ 77°F) and available charge current of 0.15 C<sub>8</sub>A, followed by a discharge of 8 h at + 25°C (+ 77°F) down to 1.1 V/cell

\*\* According to IEC 60623

### Battery rack assembly

Tel.X batteries can be assembled into modular and scable systems either at 24 V or 48 V. Available in standard 19" and 23" rack, the systems are custom fit for the overall Tel.X battery range. In option, these equipments can be also offered to resist to Seismic Zone 4 characteristics.

With such systems, Saft is able to provide a turnkey solution which significantly reduces the floor loading compared to VRLA.



## Tel.X discharge data - Amperes

Performance in ampere after prolonged float constant voltage charge between 1.43 to 1.45 V/cell at + 20°C to + 25°C (+ 68°F to + 77°F) available charge current 0.15 C<sub>8</sub>A

Final voltage	Cell type	C <sub>8</sub> Ah	Hours									
			1	2	3	4	5	8	10	12	18	24
1.00 V/cell	TLX 80	75	58.0	35.2	24.7	19.0	15.3	9.9	7.9	6.6	4.4	3.3
	TLX 100	97	73.9	45.6	32.0	24.5	19.7	12.8	10.3	8.6	5.7	4.3
	TLX 150	140	101.0	66.4	46.2	35.4	28.5	18.5	14.9	12.4	8.3	6.2
	TLX 180	172	122.9	81.7	56.7	43.5	35.1	22.8	18.3	15.3	10.2	7.6
1.05 V/cell	TLX 80	75	50.6	33.7	24.0	18.5	14.9	9.7	7.8	6.5	4.3	3.2
	TLX 100	97	64.7	43.7	30.9	23.9	19.3	12.6	10.1	8.4	5.6	4.2
	TLX 150	140	89.7	63.0	44.3	34.5	27.9	18.2	14.6	12.2	8.1	6.1
	TLX 180	172	109.4	77.4	54.4	42.4	34.2	22.3	17.9	15.0	10.0	7.5
1.10 V/cell	TLX 80	75	44.8	31.2	22.5	17.7	14.4	9.3	7.6	6.3	4.2	3.1
	TLX 100	97	57.5	40.0	29.0	23.0	18.6	12.1	9.8	8.2	5.4	4.1
	TLX 150	140	81.2	56.4	41.6	33.2	26.9	17.5	14.2	11.8	7.9	5.9
	TLX 180	172	99.3	69.0	51.0	40.7	33.0	21.5	17.4	14.6	9.7	7.3
1.14 V/cell	TLX 80	75	39.6	27.5	20.7	16.6	13.7	9.1	7.3	6.1	4.1	3.0
	TLX 100	97	50.1	35.2	26.8	21.8	17.7	11.8	9.5	7.9	5.3	3.9
	TLX 150	140	66.8	49.0	38.4	31.4	25.6	17.0	13.7	11.4	7.6	5.7
	TLX 180	172	80.8	59.8	47.1	38.6	31.5	20.9	16.8	14.0	9.4	7.0

## Tel.X discharge data - Watts

Performance in watts after prolonged float constant voltage charge between 1.43 to 1.45 V/cell at + 20°C to + 25°C (+ 68°F to + 77°F) available charge current 0.15 C<sub>8</sub>A

Cell type	Cell type	C <sub>8</sub> Ah	Hours									
			1	2	3	4	5	8	10	12	18	24
1.00 V/cell	TLX 80	75	59.4	40.1	29.1	23.2	18.8	12.3	9.9	8.2	5.5	4.1
	TLX 100	97	75.7	52.0	38.1	29.9	24.2	15.9	12.8	10.7	7.1	5.4
	TLX 150	140	103.3	75.8	55.1	43.1	35.0	23.1	18.6	15.5	10.5	7.7
	TLX 180	172	125.8	93.1	67.5	53.0	43.1	28.4	22.9	19.2	12.8	9.5
1.05 V/cell	TLX 80	75	54.1	39.3	28.9	22.6	18.3	12.1	9.7	8.1	5.4	4.0
	TLX 100	97	69.2	51.0	37.1	29.1	23.7	15.7	12.7	10.5	7.0	5.3
	TLX 150	140	95.8	73.5	53.3	42.2	34.3	22.7	18.2	15.3	10.3	7.7
	TLX 180	172	116.9	90.3	65.4	51.7	42.0	27.7	22.4	18.8	12.5	9.4
1.10 V/cell	TLX 80	75	50.0	36.8	27.2	21.6	17.8	11.8	9.5	7.9	5.3	3.9
	TLX 100	97	64.1	47.2	35.0	28.2	22.9	15.3	12.2	10.2	6.8	5.2
	TLX 150	140	90.5	66.4	50.2	40.7	33.2	22.1	17.8	14.7	10.0	7.4
	TLX 180	172	110.7	81.4	61.6	49.8	40.7	27.2	21.8	18.2	12.2	9.2
1.14 V/cell	TLX 80	75	44.2	32.4	25.0	20.9	17.1	11.3	9.1	7.6	5.2	3.8
	TLX 100	97	55.8	41.5	32.4	27.2	22.1	14.7	11.9	9.9	6.6	4.9
	TLX 150	140	74.3	57.7	46.4	39.2	31.9	21.2	17.2	14.3	9.6	7.2
	TLX 180	172	90.1	70.5	56.9	48.1	39.3	26.0	21.0	17.5	11.8	8.9

\* Nominal capacity is obtained after prolonged float constant voltage charge (I-U) of 1.45 V/cell (at + 25°C / + 77°F) followed by a discharge (at the discharge rate corresponding to 8 h autonomy) down to 1.1 V/cell

Power cable selection: The selection of power cables used within the installation of Saft Batteries is a function of:

- 1-Installation location; dry, damp or wet (as defined by the NEC code).
- 2-The maximum ambient operating temperature.
- 3-The maximum sustained current (amperage) applied during charge or discharge.

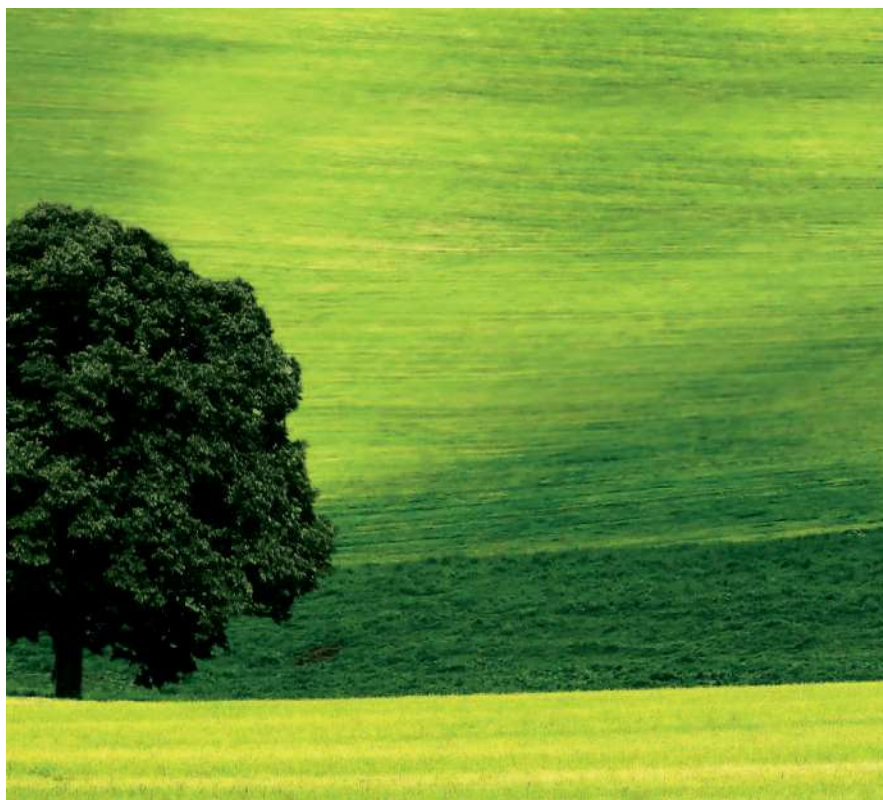
Saft's standard Tel.X product power cables are a #6 AWG rated for installations in dry or damp locations. The maximum operating ambient temperature of the Tel.X product is 50 °C. Based on a 50 °C max ambient temperature, the maximum sustained discharge current is 86 amps and a maximum available current limit of 150 amps during constant potential charging. When the application installation and operation exceeds the above parameters, then the design will require a careful review which may prescribe the need to move to higher ampacity rated power cables.

# 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 nickel-based batteries, Saft has had partnerships for many years with collection companies in most EU 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.

This collection network meets 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.



Document N°21841-2-0714  
Edition: July 2014

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Produits certifiés PEFC™ (PEFC-10-31-1143)  
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RCS Bobigny B 383 703 873