DNV·GL

Certificate No:
TAE00000HG

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Battery (Accumulator)

with type designation(s)
SUN +

Issued to
SAFT AB
OSKARSHAMN, Sweden

is found to comply with
Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards
IEC 60092-305 (1980)
IEC 62259 (2003-10)
IEC 60623 (2001-09)

Application :

Industrial Nickel-Cadmium batteries for mobile and stationary application

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

This Certificate is valid until **2018-12-31**.

Issued at **Høvik** on **2015-10-06**

for **DNV GL**

DNV GL local station: **Stockholm**

Approval Engineer: **Nicolay Horn**

Marit Laumann
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

© DNV GL 2014. DNV GL and the Horizon Graphic are trademarks of DNV GL AS.

Product description

Product description

Nickel-Cadmium accumulators / batteries type SUN⊕ designed and tested in accordance with in IEC 62259 (2003-10).

Capacities according to manufacturer's data.

Type designation	Rated Capacity C_5 Ah	Type designation	Rated Capacity C_5 Ah
SUN+ 50	45	SUN+ 960	890
SUN+ 100	95	SUN+ 1015	940
SUN+ 150	140	SUN+ 1065	980
SUN+ 200	185	SUN+ 1115	1030
SUN+ 250	235	SUN+ 1170	1080
SUN+ 305	280	SUN+ 1215	1120
SUN+ 355	325	SUN+ 1270	1170
SUN+ 405	375	SUN+ 1320	1220
SUN+ 455	420	SUN+ 1370	1260
SUN+ 505	470	SUN+ 1420	1300
SUN+ 555	515	SUN+ 1470	1350
SUN+ 610	560	SUN+ 1520	1400
SUN+ 660	610	SUN+ 1570	1450
SUN+ 710	650	SUN+ 1620	1500
SUN+ 760	700	SUN+ 1670	1550
SUN+ 810	750	SUN+ 1720	1600
SUN+ 860	800	SUN+ 1775	1650
SUN+ 910	840	SUN+ 1830	1700

Application/Limitation

Installation and maintenance to be done in accordance with the Installation and Operating Instructions and/or the Technical Manual.

Type approval documentation

Test carried out

Type tests in accordance with IEC 62259 (2003 - 10)*:

item 7.2.1 - Discharge performance at +20°C
item 7.2.2 - Discharge performance at +5°C
item 7.2.3 - Discharge performance at -18°C
item 7.2.4 - High rate current test
item 7.3 - Charge retention
item 7.4.1 - Endurance in cycles
item 7.4.2 - Permanent Charge endurance
item 7.5 - Charge acceptance at constant voltage

item 7.7 - Vent operation
item 7.8 - Electrolyte retention
item 7.9 - Determination of gas recombination efficiency
item 7.10 - Storage

* The type tests performed are also in accordance with IEC 60623 4th edition (2001-09) item 4.2 to 4.9.

Vibration test.

Marking of product

The product to be marked in accordance with IEC 62259: Manufacturers name, IEC 62259, type and manufacturing date.

Periodical Assessment

The scope of the Periodical Assessment is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the survey are:
- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routines (RT) checked (if not available tests according to PST and RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Assessment to be performed at least every second year.

END OF CERTIFICATE