DNV·GL

Certificate No:
TAE000010N

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Battery (Accumulator)

with type designation(s)
LC..P, MC..P and HC..P

Issued to
Alcad Ltd.
OSKARSHAMN, Sweden

is found to comply with
IEC 60092-305 (1980)
IEC 60623 (2001-09)
DNV GL rules for classification – Ships and offshore units

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 **2016-05-22**

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.

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Product description

Industrial Ni-Cd pocket plate batteries with the following type designation are covered by this certificate

Cell type	Capacity at the 5hr rate (Ah)	Drawing No
LC 10P	10	31-04471
LC 15P	15	31-04472
LC 21P	21	31-04473
LC 30P	30	31-04474
LC 38P	38	31-04475
LC 45P	45	31-04476
LC 59P	59	31-04477
LC 70P	70	31-04478
LC 85P	85	31-04479

Cell type	Capacity at the 5hr rate (Ah)	Drawing No
LC 105P	105	31-04480
LC 135P	135	31-04481
LC 170P	170	31-04482
LC 205P	205	31-04483
LC 220P	220	31-04484
LC 260P	260	31-04485
LC 310P	310	31-04486
LC 355P	355	31-04487

Cell type	Capacity at the 5hr rate (Ah)	Drawing No
MC9P	9	31-04488
MC14P	14	31-04489
MC22P	22	31-04490
MC31P	31	31-04491
MC39P	39	31-04492
MC47P	47	31-04493
MC50P	50	31-10377
MC55P	55	31-04494
MC60P	60	31-10378
MC70P	70	31-04495
MC80P	80	31-10379
MC90P	90	31-04496
MC100P	100	31-10380
MC110P	110	31-04497
MC115P	115	31-10381
MC130P	130	31-04498

Cell type	Capacity at the 5hr rate (Ah)	Drawing No
MC140P	140	31-10382
MC145P	145	31-04499
MC150P	150	31-10383
MC165P	165	31-04500
MC185P	185	31-04501
MC190P	190	31-10384
MC200P	200	31-10385
MC215P	215	31-04502
MC220P	220	31-10386
MC240P	240	31-04503
MC250P	250	31-10387
MC260P	260	31-10388
MC285P	285	31-04504
MC310P	310	31-04505
MC335P	335	31-04506

Cell type	Capacity at the 5hr rate (Ah)	Drawing No
HC9P	9	31-04507
HC12P	12	31-04508
HC17P	17	31-04509
HC21P	21	31-04510
HC25P	25	31-04511
HC29P	29	31-04512
HC34P	34	31-04513
HC40P	40	31-04514
HC50P	50	31-04515
HC60P	60	31-04516
HC70P	70	31-04517

Cell type	Capacity at the 5hr rate (Ah)	Drawing No
HC80P	80	31-04518
HC90P	90	31-04519
HC100P	100	31-04520
HC110P	110	31-04521
HC120P	120	31-04522
HC130P	130	31-04523
HC145P	145	31-04524
HC155P	155	31-04525
HC170P	170	31-10267
HC185P	185	31-04526
HC210P	210	31-04527

Application/Limitation

Industrial Nickel-Cadmium batteries for mobile and stationary applications and for use in ship and Offshore Units.

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

Type Approval documentation

Tests carried out

Type tests in accordance with IEC 60623 (Fourth edition 2001 – 09).

item 4.2 - Discharge performance
- sub-clauses
- 4.2.1 - Discharge performance at 20°C
- 4.2.3 - Discharge performance at - 18°C
- 4.2.4 - High rate current test

item 4.3 - Charge retention

item 4.4 - Endurance
- sub-clauses
- 4.4.1 - Endurance in cycles
- 4.4.2 - Permanent charge endurance

item 4.5 - Charge acceptance at constant voltage

item 4.8 - Electrolyte retention
- sub-clauses
- 4.8.1 - Test procedure

item 4.9 - Storage

Vibration test

Marking of product

The product to be marked in accordance with section 2 in IEC 60623: Manufacturers name, IEC 60623, 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 Assessment 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