DNV·GL

Certificate No:
TAE000010M

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Battery (Accumulator)

with type designation(s)
LB...P, MB...P and HB...P

Issued to
Alcad Ltd.
OSKARSHAMN, Sweden

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

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 designations are covered by this certificate:

Type L	Capacity (Ah)	Drwg. No.
LB385P	387	31-00467
LB430P	429	31-00468
LB470P	470	31-00469
LB510P	510	31-00988
LB600P	600	31-03112
LB645P	645	31-00989
LB770P	770	31-00990

Type L	Capacity (Ah)	Drwg. No.
LB860P	860	31-00991
LB1020P	1020	31-00992
LB1070P	1070	31-00993
LB1280P	1280	31-00994
LB1450P	1450	31-03099
LB1540P	1540	31-03100

Type M	Capacity (Ah)	Drwg. No.
MB350P	350	31-00488
MB370P	370	31-00489
MB390P	390	31-00490
MB415P	415	31-00995
MB440P	440	31-00996
MB460P	460	31-00955
MB480P	480	31-10358
MB505P	505	31-03113
MB525P	525	31-10359
MB555P	555	31-00998
MB575P	575	31-10360
MB600P	600	31-10361
MB625P	625	31-00999
MB645P	645	31-10362
MB670P	670	31-10363
MB690P	690	31-01000
MB720P	720	31-10364
MB740P	740	31-01001
MB765P	765	31-10365

Type M	Capacity (Ah)	Drwg. No.
MB790P	790	31-10366
MB830P	830	31-01002
MB865P	865	31-10367
MB890P	890	31-10368
MB920P	920	31-01003
MB940P	940	31-10369
MB965P	965	31-03114
MB1000P	1000	31-10370
MB1040P	1040	31-01004
MB1080P	1080	31-10371
MB1100P	1100	31-10372
MB1150P	1150	31-01005
MB1180P	1180	31-10373
MB1220P	1220	31-03101
MB1270P	1270	31-10374
MB1320P	1320	31-10375
MB1390P	1390	31-03102
MB1440P	1440	31-10376

Type H	Capacity (Ah)	Drwg. No.
HB230P	230	31-00514
HB255P	255	31-00515
HB270P	270	31-10270
HB280P	280	31-00516
HB305P	305	31-00517
HB325P	325	31-10271
HB345P	345	31-00518
HB365P	365	31-10272
HB385P	385	31-00519
HB400P	400	31-10273
HB420P	420	31-01006

Type H	Capacity (Ah)	Drwg. No.
HB440P	440	31-10274
HB460P	460	31-01007
HB510P	510	31-01008
HB560P	560	31-01009
HB600P	600	31-10275
HB615P	615	31-01010
HB640P	640	31-01011
HB655P	655	31-10276
HB670P	670	31-10277
HB705P	705	31-01012
HB765P	765	31-01013

Type H	Capacity (Ah)	Drwg. No.
HB800P	800	31-10278
HB865P	865	31-03103

Type H	Capacity (Ah)	Drwg. No.
HB920P	920	31-03104

Application/Limitation

Industrial Nickel-Cadmium batteries for mobile and stationary applications and for use in ships 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