DNV·GL

Certificate No:
TAA00001CE

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Window Wipers

with type designation(s)
Bohamet Horizontal Wipers WL.10.A.01, WL.10.B.01, WAL.I.2100, WAL.E.2100

Issued to
BOHAMET S.A.
Ciele, Poland

is found to comply with
Det Norske Veritas' Rules for Classification of Ships and Det Norske Veritas' Offshore Standards

Application :

See page 2

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

Issued at **Høvik** on **2018-03-23**
This Certificate is valid until **2023-03-20**.
DNV GL local station: **Gdansk**

for **DNV GL**

Approval Engineer: **Frederik Tore Elter**

Jan Tore Grimsrud
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

Wiper Model	**Wiper Designation**
WL.10.A.01 Straight line wipers with a divided wiper drive mechanism installed inside the ship. Wiper designation as follows:	SL – I – SSSS – AAAA – BBBB – 220 – DC
	SL – I – SSSS – AAAA – BBBB – 024 – DC
WL.10.B.01 Straight line wipers with the wiper motor integrated with the wiper mechanism. Wiper designation as follows:	SL – E – SSSS – AAAA – BBBB – 220 – DC
	SL – E – SSSS – AAAA – BBBB – 024 – DC
WAL.I.2100 Straight line wipers with a divided wiper drive mechanism installed inside the ship. Wiper designation as follows:	SL – I – SSSS – AAAA – BBBB – 220 – DC
	SL – I – SSSS – AAAA – BBBB – 024 – DC
WAL.E.2100 Straight line wipers with the wiper motor integrated with the wiper mechanism. Wiper designation as follows:	SL – E – SSSS – AAAA – BBBB – 220 – DC
	SL – E – SSSS – AAAA – BBBB – 024 – DC
Controller Model	**Controller Designation**
MPCS-230-AC Control system for WL.10.A.01, WL.10.B.01, WAL.I.2100, WAL.E.2100 consisting of:	Individual control box IMS-230VAC
	Touch control panel MSH-24VDC and/or MMS-24VDC (see limitations)
MPCS-024-DC Control system for WL.10.A.01, WL.10.B.01, WAL.I.2100, WAL.E.2100 consisting of:	Individual control box IMS-24VAC
	Touch control panel MSH-24VDC and/or MMS-24VDC(see limitations)
Control Panel	Touch control panel MS_24_VDC

Application/Limitation

- For marine and offshore applications.
- Installation to be performed according to the manufacturers Installation and operating manual.
- Motor parts for WL.10.A.01 shall be installed in protected area as defined by IEC 60945.
- The MMS is a smaller version of the MS and may operate as an individual component; however it will have to operate together with the MS in order to comply with the rules and regulations.
- When installed on ships with class notations NAUT-AW, NAUT-OC or NAUT-OSV(A), the window wiper system shall comply with the minimum blade coverage requirements described in the relevant class notation in use.
- Wiper dimetion ranges:

SSSS	from 250 to 2735 mm
AAAA	from 300 to 2000 mm
BBBB	from 150 to 1500 mm

Job Id: **262.1-015000-2**
Certificate No: **TAA00001CE**

Tests carried out

- Environmental: IEC 60945 (2002)
- Presentation: IEC 62288 (2014)
- Performance: ISO 17899 (2004)

Type Approval documentation

DNV GL No	Document Title	Document Reference	Rev
66	Manual: Type: HORIZONTALY with motor outside		
65	Manual: Type: HORIZONTALY with motor inside		
58	Manual: Multi-point network Control Panel (MS)		
56	Manual: Instruction manual of control panel MS_24_VDC Basic		19.01.2016
55	Manual: Instruction manual of control panel MS_24_VDC		19.01.2016
53	Block diagram controller wiper connection		
47	Report: BOHAMET - Verification report - Wiping Quality - Horizontal Wipers SL-I-SSSS-BBBB-220-DC and SL-L-SSSS-BBBB-024-DC	2017/12/1704	
46	Report: BOHAMET -Verification report - Speed - Horizontal Wipers SL-I-SSSS-BBBB-220-DC and SL-L-SSSS-BBBB-024-DC	2017/12/1703	
45	Report: BOHAMET -Verification report - Materials - Horizontal Wipers SL-I-SSSS-BBBB-220-DC and SL-L-SSSS-BBBB-024-DC	2017/12/1705	
44	Report: BOHAMET - Verification report - Marking and Identification - Horizontal Wipers SL-I-SSSS-BBBB-220-DC and SL-L-SSSS-BBBB-024-DC	2017/12/1707	
43	Report: BOHAMET -Verification report - Low Voltage Safety - Horizontal Wipers SL-I-SSSS-BBBB-220-DC and SL-L-SSSS-BBBB-024-DC	2017/12/1708	
42	Report: BOHAMET - Verification report - Durability - Horizontal Wipers SL-I-SSSS-BBBB-220-DC and SL-L-SSSS-BBBB-024-DC	2017/12/1706	
41	Report: Resistance on mechanical exposure test Horizontal wiper Series SL-E-0260-AAAA-BBBB-220-DC and SL-I-0260-AAAA-BBBB-220-DC	DPL/005/041/17	
40	Report: Resistance on mechanical exposure test - control panel type MS-24-VDC	DPL/005/257/17	
39	Report: Environmental testing – Part 2: Tests- Test Kb: Salt mist, cycle (sodium chloride solution) IEC/EN 60068-2-52 - Window wipers SL-E-0255-0700-0350-024-DC and SL-I-0255-0700-0350-220-DC	LA-17.125-E	
38	Report: Degree of protection provided by enclosures (IP code) IEC 60529 - Widow Wiper SL-E-0255-0700-0350-220-DC and SL-I-0255-0700-0350-024-DC	LA-17.124/E	
37	Report: Environmental climate tests - Touch Control Panel MS-24-VDC	DPL/005/258/17	
36	Report: Electromagnetic Compatibility Test - Touch Control Panel MS-24-VDC	DPL/005/254/17	
35	Report: RADMOR - Degrees of protection IP - Touch Control Panel MS-24-VDC	NL/44/17	
34	Report: Compass safe distane test Control Panel MS-	DPL/005/255/17	

DNV GL No	Document Title	Document Reference	Rev
	24-VDC		
33	Report: Acoustic Noise Test Control Panel MS-24-VDC	DPL/005/256/17	
28	Report: Bohamet, Low-voltage equipment safety	2013/12/1708	
27	Report: Bohamet, Marking and Indendtification	2013/12/1707	
26	Report: Bohamet, Durability	2013/12/1706	
25	Report: Bohamet, Materials	2013/12/1705	
24	Report: Bohamet, Wiping quality	2013/12/1704	
23	Report: Bohamet, Speed	2013/12/1703	
22	Report: Bohamet, Design & Construction	2013/12/1702	
21	Report: Bohamet, Glass wiped surface	2013/12/1701	
20	Report: DNV, Type Approval Assessment	2013/12/17	
19	Report: Centrum Techniki Morskiej, Climate test wipers	BL/040/333/13/A	
18	Report: IEL Gdansk, IP67 testing	004/LBS-808/2013	
17	Report: IEL Gdansk, Salt mist test	003/LBS-808/2013	
16	Report: Centrum Techniki Morskiej, Mechanical shock and vibration test wipers	BL/040/392/12/A	
15	Report: Centrum Techniki Morskiej, EMC tests	BL/040/234/13/A	
14	Report: Centrum Techniki Morskiej, Mechanical shock and vibration test filtering modules	BL/040/109/13/A	
13	Report: Centrum Techniki Morskiej, Environmental climate tests wipers w/control system	BL/040/107/13/A	
12	Report: Centrum Techniki Morskiej, Environmental Climate testing of Individual filtering modules IMF w/Individual control modules IMS	BL/040/106/13/A	
11	Report: Centrum Techniki Morskiej, Compass safe distance test	BL/040/074/13/A	

Marking of product

The Manufacturer and Type Designation to be applied to the equipment in a clearly visible location. In addition the equipment shall be marked with serial number, safe distance to magnetic compass, power consumption and/or supply voltage.

Periodical assessment

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.
The scope of the periodical/renewal assessment is to verify that the production quality conditions stipulated for the type approval are complied with and that no alterations are made to the product design or its components and/or materials without appraisal by the Society.