

EC-T TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate no.:
MEDB0000371
Revision No:
7

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV AS under the authority of the Government of Norway.

This is to certify:

that the **Fast rescue boats: (b) rigid**

with type designation(s)
Merlin-615 MKI Waterjet

issued to

VIKING Life-Saving Equipment Norway AS
FÆRVIK, Norway

is found to comply with the requirements in the following Regulations/Standards:

Regulation (EU) 2023/1667,

item No. MED/1.20b. SOLAS 74 as amended, Regulation III/4, III/26, III/34, LSA Code, IMO MSC/Circ.1016, IMO MSC/Circ.1094, IMO MSC.1/Circ.1631 and IMO MSC/Circ.1006

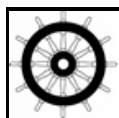
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2027-07-31**.

Issued at **Høvik** on **2024-05-29**

DNV local unit:
West Norway CMC

Approval Engineer:
Tessa Bieber



Notified Body
No.: **0575**



for **DNV AS**

Digitally Signed By: Kristensen, Steinar
Location: DNV Høvik, Norway, on behalf of

Mydlak-Röder, Christine
Head of Notified Body



The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.

This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.

Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

“Merlin-615 MKI Waterjet”

Is a rigid fast rescue boat equipped with inboard engine and with single point lifting hook.

Material specification:

ASIA			
Material	Generic name	Type	Manufacturer
Polyester resin:	Polyester resin	FL-918 OR ETERSET 2929PT	Changzhou Rixin Resin Co., Ltd. OR Eternal Materials Co.Ltd.
Gelcoat:		Enguard series: Enguard GE XXXXXS/HZ, Enguard TM XXXXXS/HZ	Ashland (Changzhou) Specialty Chemical Co., Ltd.
Gelcoat/topcoat		FL-NCxxxG	Changzhou Rixin Resin Co., Ltd.
Glass Fiber:	CSM	P-100g/m ² -- P-900g/m ² , chopped strand mat - powder bound	Jiangsu Changhai Composite Materials Holding Co., Ltd
		EMC (powder type), EMCL (emulsion type)	Taishan Fiberglass Inc.
Buoyant material:	Rigid polyurethane foam	Rigid polyurethane foam,	Jiangyin Tongqi Allied Chemical Factory OR
		Rigid polyurethane foam, LM-206A/LM-206B	Qingdao Lianmei Chemical Co. Ltd.

EUROPE			
Material	Generic name	Type	Manufacture
Polyester resin	Polyester resin	Aropol F 207 or Aropol F 207 INF	INEOS Composites Finland Oy
Gelcoat		Maxguard NP WHI S, Maxguard NP WHI H	INEOS Composites Finland Oy
		LS-30PA white, LS-31PA & LS-30PA variants	Scott Bader Co., Ltd.
Glass fiber	CSM	Emulsion Bound E-100 – 900 g/m ²	Jiangsu Changhai Composite Materials
	Multi-axial	Uni-axial; UNIE-L (250-1200 g/m ²) with or without CSM (100-600 g/m ²), Uni-axial; UNIE-T (150-1000 g/m ²) with or without CSM (100-600 g/m ²)	Selcom S.r.l. a Socio Unico
		Bi-axial; EBX (200-2000 g/m ²) with or without CSM (100-600 g/m ²), Bi-axial; EBXS (300-2000 g/m ²) with or without CSM (100-600 g/m ²)	Selcom S.r.l. a Socio Unico
		Tri-axial; ETXL (350-2200 g/m ²) with or without CSM (100-600 g/m ²), Tri-axial; ETXT (200-2000 g/m ²) with or without CSM (100-600 g/m ²)	Selcom S.r.l. a Socio Unico
		Quadri-axial; EQX (400-3500 g/m ²) with or without CSM (100-600 g/m ²)	Selcom S.r.l. a Socio Unico
	Spray Gun Roving	Spray Up Rovings; ER13-2400-180, ER13-3000-180	Jushi Group Co., Ltd.
Buoyant material	Rigid polyurethane foam	Elastopor H 1700/10, Elastopor H 1700/11 and Elastopor H 1702/4	BASF Polyurethanes Nordic AB

Length over all: 6.25 m
 Breadth over all: 2.45 m
 Depth: 0.985 m
 Height over all: 2.50 m

Weight of boat, fully equipped: 1563 kg ^{(1) (2) (4) (5) (6) (7)}
 1483 kg ⁽³⁾

Weight of boat, fully manned (82.5 kg/person): 2800 kg ^{(1) (2) (5) (6) (7)}

2473 kg ⁽³⁾
 2718 kg ⁽⁴⁾

Hook manufacturer and type: Viking Norsafe AS, K4-D / K4-D FM ^(a)
 H.Henriksen AS, HMK 3.5 ^(b)
 Viking Norsafe Life-saving Equipment Jiangyin Ltd., DIB-32 ^(c)

Hook SWL: K4-D / K4-D FM - 4000 kg ^(a)
 HMK 3.5 - 3500 kg ^(b)
 DIB-32 - 3263 kg ^(c)

Hull material: FRP

Propulsion system: Inboard engine/waterjet
 Engine manufacturer and type: Steyr Motors GmbH, Steyr 144 ⁽¹⁾
 Steyr Motors GmbH, Steyr 164 ⁽²⁾
 Yanmar Norge AS, 4JH3-DTE ⁽³⁾
 BUKH D3-150 ⁽⁴⁾
 BUKH D3-170 ⁽⁵⁾
 BUKH R210J ⁽⁶⁾
 Yanmar Norge AS, 4LV-150 ⁽⁷⁾

Waterjet: Alamarin 230 ^(A)
 SYP23 ^(B)

Bollard pull: 4.6 kN ^{(1A) (2A) (3A) (5A)}
 5.0 kN ^(4A)
 5.3 kN ^(6A)
 5.3 kN ^(7A)
 5.5 kN ^(6B)

Application/Limitation

Approved engine power, max: 106 kW ⁽¹⁾
 120 kW ⁽²⁾
 91.9 kW ⁽³⁾
 110 kW ⁽⁴⁾
 125 kW ⁽⁵⁾
 154 kW ⁽⁶⁾
 110 kW ⁽⁷⁾

Number of persons, max: 15 ^{(1) (2) (5) (6) (7)}
 12 ⁽³⁾
 14 ⁽⁴⁾

Maximum load of persons (82.5 kg/person): 1238 kg ^{(1) (2) (5) (6) (7)}
 990 kg ⁽³⁾
 1155 kg ⁽⁴⁾

Approved colours: Orange or Yellow

The fast rescue boat equipment and marking/instructions to be inspected after installation on board the ship. Equipment shall comply with LSA Code and IMO Res. MSC.81(70).

The fast rescue boat is fitted with a release hook without on-load release capabilities, in accordance with LSA Code 4.4.7.6.9. Hence, if it is to be combined with launching appliances with permanent high-speed tensioning device (LSA Code 6.1.7.3), compatibility must be assured.

The normal equipment of the fast rescue boat to include a hands-free and watertight VHF radio communication set, in addition to the ones required on the bridge.

The design assessment is based on IMO Res. MSC.48(66) as amended by IMO Res. MSC.207(81), IMO Res. MSC.218(82), IMO Res. MSC.272(85) and IMO Res. MSC.320(89).

Retro-reflective material shall satisfy IMO Res. MSC.481(102) for equipment installed on or after 10 October 2026.

Production and installation testing shall be carried out according to IMO Res. MSC.81(70) Part 2 as amended.

Type Examination documentation

Drawing	Date
G-500581 Rev.5 - Merlin-615 MKI Waterjet, K4-D, Fast Rescue Boat	2018-10-10
G-501217 Rev.1 - Merlin-615 Waterjet, Henriksen hmk3,5 hook, Fast rescue boat	2017-12-29
G-501289 Rev.10 - Merlin-615 MKI Waterjet, K4-D FM, Fast rescue boat	2024-01-20
G-504121 Rev.0 - Merlin-615 MKI Waterjet, DIB-32, Fast rescue boat	2020-10-16
A-502364 Rev.2 - Merlin-615, Lifting arrangement, K4-D	2016-06-30
A-503000 Rev.7 - Merlin-615 waterjet, Fuel tank 120L Alu. 4mm	2022-12-02
A-503097 Rev.2 - Merlin-615 OUTBOARD, K4-D FM W/REMOTE CONTROL	2022-08-13
A-503807 Rev.3 - Merlin-615 Waterjet Console with aft cover	2022-04-07
A-504670 Rev.3 - Merlin-615 MKI Engine arrangement Yanmar 4JH3-DTE	2022-02-28
A-504688 Rev.0 - Merlin-615 MKI Waterjet, Propulsion arrangement Yanmar 4JH3-DTE	2017-10-17
A-504689 Rev.2 - Merlin-615 Exhaust system Yanmar 4JH3-DTE	2022-06-16
A-506612 Rev.5 - Merlin-615 MKI Waterjet, Fuel system, 120L tank and Ø8mm line	2022-07-16
A-507335 Rev.1 - Release system, DIB32	2022-01-29
A-509708 Rev.2 - Merlin-615 Waterjet MKI, Hook Arrangement, DIB32 single	2022-08-12
D-500161 Rev.1 - Control table for laminate thickness liner Merlin 615 Dieseljet	2023-07-06
D-500162 Rev.1 - Control table for laminate thickness hull Merlin 615 Dieseljet	2023-07-06
D-500163 Rev.1 - Control table for laminate thickness in console Merlin 615	2022-10-31
E-501421 Rev.7 - Electrical circuit diagram Midget-500 MKII waterjet/Merlin-615 waterjet	2020-11-23
E-505935 Rev.0 - ELECTRICAL CIRCUIT DIAGRAM MERLIN-615 WATERJET WITH DIB-32	2022-05-10
R-501033 Rev.4 - Merlin-615 MKI Waterjet, Seating Plan 15 Persons	2020-07-29
R-501697 Rev.2 - Merlin-615 Waterjet, Buoyancy calculation	2019-10-12
R-504252 Rev.0 - DIB32 SINGLE POINT GA	2020-07-07
R-506393 Rev.0 - Merlin-615 MKI Waterjet, Propulsion system, Yanmar 4LV-150 & Alamarin 2830	2023-08-07
R-506637 Rev.0 - Merlin-615 MKI Waterjet, General Propulsion system	2023-08-07
S-501343 Rev.2 - Painter hook 4.6T, bottom part 1	2020-08-28
S-506888 Rev.2 - Merlin-615 MKI jet, Hull Lamination	2021-12-16
S-506889 Rev.5 - Merlin-615 Waterjet, liner lamination	2021-12-16
Calculations	Date
CAL-0366 Rev.7 - Merlin-615, Lifting arrangement equipment strength analysis	2022-06-06
CAL-0409 Rev.0 - 3,5T Adapter Plate	2015-10-07
R-501697 Rev.2 - Merlin-615 Waterjet, Buoyancy calculation	2019-10-12
Reports	Date
REP-0273-0 - Fuel consumption report of Merlin-615 with Steyr 164 engine	2014-06-11
REP-0900-0 - Merlin-615 Jet prototype test report signed by CCS	2015-07-30
REP-0901-0 - Merlin-615 Jet prototype test report signed by BGV	2013-03-07
REP-0902-0 - Merlin-615 Jet prototype test report signed by BGV	2010-05-04
REP-0908-0 - Merlin-615 Jet prototype test report signed by BGV	2000-12-14
REP-0909-0 - Merlin-615 Jet prototype test report signed by LR	2001-02-26
REP-0910-0 - Merlin-615 Jet prototype test report signed by LR	2009-03-18
REP-0940-0 - Merlin-615 waterjet with Steyr 144 prototype test report signed by NK	2016-11-21/22
REP-0977-0 - Fire test and moulding journal GES-18 and Mako-655 NO	2002-06-18
REP-1118-0 - Merlin-615 waterjet with Steyr 164 prototype test report signed by NK	2017-04-26
REP-1211-0 - Merlin-615 WJ, prototype Test Report BGV	2010-05-11
REP-1218-0 - Merlin-615 Hull Fire-retardant and Flame-resistant test, Report no.: 2016-065-M002 signed by BV	2016-06-21
REP-1219-0 - Merlin-615 Laminate strength test report (2016) signed by BV	2016-06-24
REP-1409-0 - Merlin-615 Waterjet, prototype test report with engine Yanmar 4JH3-DTE, signed by DNVGL	2017-12-25
REP-1702-0 - Merlin-615 Waterjet, prototype test report with BUKH D3-170, signed by DNVGL	2019-08-16
REP-1703-0 - Merlin-615 Waterjet, prototype test report with BUKH D3-150, signed by DNVGL	2019-09-23
REP-1743-0 - Merlin-615 Waterjet, prototype test report with BUKH R210, signed by DNVGL	2019-12-13
REP-1995-0 - Risk assessment of Merlin-615	2021-07-27
REP-2163-1 - Prototype test report of Merlin-615 MKI waterjet with DIB32 and holed lifting bracket - signed by DNV	2022-07-13
REP-2398-0 - Prototype test report for new engine Yanmar 4LV-150- signed by DNV	2024-01-10
REP-2423-0 - Prototype test report for new waterjet SYP23 - signed by DNV	2024-03-12
Other	Date
MAN-0252 Rev.11 - Merlin-615 Waterjet, K4-D FM, Operation and Maintenance manual	2022-02-22
MAN-0984 Rev.0 - Merlin-615 Waterjet, Henriksen hook, Operation and maintenance manual	2017-09-07
MAN-2236 Rev.0 - Merlin-615 Waterjet, DIB-32, Operation and Maintenance manual	2022-05-05
Document Index No. 12556 Rev.0 - Components data sheets and approval certificates	2017-06-09
Document Index No. 23387 Rev.A - Alternative Polyester Resin ETERTSET 2929PT	2021-03-01



Job ID: **344.1-007438-8**
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Tests carried out

Tests are documented in accordance with recommendation on testing of Lifesaving Appliances, IMO Res. MSC.81(70) part 1, as amended by IMO Res. MSC.226(82), IMO Res. MSC.274(85), IMO Res. MSC.321(89), IMO Res. MSC.323(89) and IMO MSC./Circ.1006.

Marking of product

The product is to be indelibly marked with name and address of manufacturer, boat model and serial number, month and year of manufacturer, number of persons approved for and operational restrictions, if any, according to LSA code item 4.4.1.2 and the MED Mark of Conformity (see page 1).

List of fast rescue boat equipment to be posted in the boat.