Certificate No:
TAM000019C

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Waterjet

with type designation(s)
HJx27

Issued to
C W F Hamilton & Co. Ltd.
Christchurch, CAN, **New Zealand**

is found to comply with
DNV rules for classification – High speed and light craft
DNV rules for classification – Ships

Application :

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

Issued at **Hamburg** on **2022-02-07**
This Certificate is valid until **2027-02-06**.
DNV local station: **Auckland**

Approval Engineer: **Stanislav Avanesov**

for **DNV**

Olaf Drews
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.

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

Waterjet propulsion unit with steering and reversing system.

Application/Limitation

The waterjet is approved for the following rating:

Max engine power: 353 kW
Impeller shaft speed: 2990-3300 rpm
Max torque: 1,127 kNm

The application factor, K_A, shall be less to or equal to 1,1

Type Approval documentation

		INSTALLATION DRAWING 5 DEGREE - HJX27
		INSTALLATION DRAWING 0 DEGREE - HJX27
		REVERSE ASSY - HJX27
TECH-70-0059	A	HTX27 DESIGN CALCULATIONS FOR CLASSIFICATION
89942	F	HAMJET STAINLESS STEEL SPECIFICATION
89938	F	HAMJET ALUMINIUM SPECIFICATION SCHEDULE
85080	D	ALUMINIUM WELD PROCEDURE - SHIPYARD
65024	G	SEASTAR - HC5303-3 (BA125-3ATM) - OPTIONS
61527	A	(JET) ROTARY SEALS 1.5" (BR1-G2482CAN-X24)
340967	A	IMPELLERS - HJX27
340878	A	HEAD - Ø31.75 - 1/4" PORT - AB2
340445	K	CYLINDER ASSY - REVERSE CYLINDER 38 MM - HSRX HJX27
340329	A	CYLINDER SUBASSY - SHAFTS AND PISTION - Ø31.75 X Ø19.05 X 181.5
339786	C	REVERSE DUCT - HJX27
339527	E	CYLINDER SHAFT - Ø25.4 X 502 - HSRX
336835	A	REVERSE DUCT ASSY - HJX27
336573	A	MARINE BEARING SHELL - DRY RUN - HJX27
335951	A	HEAD - Ø31.8 - 1/4" PORT
335921	B	CYLINDER SHAFT - MAIN - Ø19.05 - HJX27
335912	B	CYLINDER ASSY - Ø31.75 X Ø19.05 X 181.5 - BALANCED
335385	D	INTAKE - HJX27
335326	B	COUPLINGS - HJX27
335309	B	CAP - BEARING - HJX27
335305	C	BEARING HOUSING - HJX27
335248	A	BEARING HOUSING ASSY - HJX27
335243	C	TRANSOM PLATE - HJX27
335198	C	TAILPIPE - HJX27
335180	C	INTAKE BLOCK - 5 DEG - HJX27
335139	C	INTAKE BLOCK - 0 DEG - HJX27
335000	A	STEERING ASSY - AFT - HJX27
334816	D	NOZZLE HOUSING - HJX27
334815	D	NOZZLE - HJX27
334814	C	NOZZLE INSERT - HJX27
334755	A	JET MAINSHAFT - HJX27
331578	A	PISTON - Ø31.75 X 21 - M12
331576	A	CYLINDER TUBE - ID 31.8 x OD 40 x 226.5

331575	D	END CAP - Ø31.75
328873	C	STUD CHART M10 A470 2.5D THREAD BOTH ENDS
328017	A	INSPECTION HATCH - 115 DIAMETER HATCH
327934	A	INSPECTION HATCH - 115 DIAMETER HATCH - CAST
326974	D	SHAFT - Steering
310596	F	TIE ROD M8
308462	C	STUD CHART M20 A470 3D THREAD BOTH ENDS
308440	C	STUD CHART M16 A470 3D THREAD BOTH ENDS
308424	D	STUD CHART M12 A470 3D THREAD BOTH ENDS
30647	R	STUD CHART M8 316
30639	AK	STUD CHART M12 316
30637	Z	STUD CHART M10 316
30635	P	STUD CHART M6 316
112757	D	FRONTHEAD EXTENSION HSRX 38mm CYLINDER
112742	C	CYLINDER TUBE - 38mm (222mm LONG) - HSRX HJ274
112741	F	FRONTHEAD HSRX 38mm CYLINDER
112740	F	CYLINDER SUBASSY - SHAFT/PISTON ASSEMBLY (HSRX 38mm) - HJ274
112738	E	PISTON - HSRX CYL OD40 - HJ274
112729	E	BACKHEAD - HSRX - HJ274
112290	B	IMPELLER-COUPLING NUT AB2
111481	C	STEERING PIVOT PIN - JT - HJ273 HJ274 HJ291 HJ292
111480	A	BUSH ID 24.8, OD 30.14, L28 COMPOSITE (STEERING) - HJ274 HJ292
111277	L	TILLER
109703	D	STEERING CRANK (JT STEERING)
106626-2	C	MARINE BEARING - INNER 50X61X75 - DGLIDE - HJ273 HJ274
106264	T	MARINE WATER BEARINGS
105283-2	J	KEY- 63X12X8mm - HJX29 HJ274
104610	D	BUSH SHLD ID 43.25, OD 63.5, L23 ACETAL (Pivot)
104609	G	REVERSE PIVOT PIN
65024	G	SEASTAR Cylinder Assembly
DRW000760	F	Assy, ATM Cylinder 1.000 & 1.250 Bores
DRW000657	C	Cylinder Barrel M/C
DRW000600	A	AL Extrusion, Cylinder Barrels
DRW000632	B	Cylinder Shaft
A-1215	D	Cylinder Shafting Round Bar
DRW000676	A	Rod Gland
DRW000669	B	Ball Mount Gland
B-2745	B	Rod End
DRW000647	B	Piston
DRW000716	C	Machined Celcon Piston
D-0300	G	Spherical mount
D-0301	E	Spherical Bearing Cap
B-0621	B	Bush Half

Tests carried out

Full scale waterjet testing has to be carried out on the vessel. Factory tests consist of a water pressure test and hydraulic pressure and function tests. These are witnessed by the surveyor. A folder of Material Test Certificates, chemical analysis, mechanical properties, NDT tests etc. is compiled for each waterjet built.

Marking of product

The product shall be marked with the manufacturer’s name or trademark and type number identification.

Periodical assessment

For retention of the Type Approval, a DNV surveyor shall perform a survey after 2 and 3,5years before the expiry date of this certificate to verify that the conditions of the type approval are complied with.

The objective of the Periodical Assessment is to verify that the conditions for the Type Approval are not altered since the Type Approval Certificate was issued. The main scope of the Periodical Assessment will normally include:

- Verification of the Type Approval applicant's production and quality system w.r.t. ensuring continued consistent production of the Type Approved products at the Type Approval applicant's own premises and at other companies that are given the responsibility for manufacturing of the products.
- Review of the Type Approval documentation and that this is still used as basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking.

In cases where the Type Approved product is manufactured at other companies, the Periodical Assessment shall verify that the Type Approval applicant has a quality control system for consistent production at their licensees/subcontractors. Furthermore Periodical Assessment shall be carried out randomly at these companies.

Other Conditions

The following items are not covered by this type approval and shall be submitted for approval on a case-by-case basis:

- Connection to hull (shipbuilder's responsibility)
- Hydraulic system diagram, including set points and alarms

Flexible hoses shall be type approved.

The design of key connections are not full in compliance with our rules but the functionality has been proven by the similar designs previously.

END OF CERTIFICATE