



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **M-12277**

This is to certify that the
Diesel Engine

with type designation(s)
MAN L/V 32/40

Manufactured by
STX Engine Co., Ltd.
Changwon-Si Gyeongsangnam-Do, Republic of Korea

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

Application
The approval is valid for propulsion and auxiliary duty.

Rating 500 kW/cyl @ 720/750 rpm

This Certificate is valid until **2017-12-31**.

Issued at **Høvik** on **2013-06-10**

DNV local station: **DNV Pusan Station**

Approval Engineer: **Øyvind Eriksen**

for **Det Norske Veritas AS**

.....
Torbjørn Lie
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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

Product description

Four Stroke Diesel Engine

Cylinder bore: 320 mm
 Piston stroke: 400 mm
 No. of cyl: 6, 7, 8 and 9 in-line
 12, 14, 16 and 18 in-V

Application/Limitation

The approval is valid for propulsion and auxiliary duty and based on the following main data:

	MAN L/V 32/40	
Mean indicated pressure (bar):	28,9	27,8
Max. cylinder pressure (bar):	190	190
Rated cont.output (kW/cyl):	500	500
Corresponding to (RPM):	720	750

Type Approval documentation

Crankshaft drawings:	Drawing no	Revision	Approval Date
6L 32/40 Crankshaft, 2 sheets	11020011965	1.Sheet:B1 / 2. Sheet:B1	2013-04-09
7L 32/40 Crankshaft, 2 sheets	11020011966	1.Sheet:D1 / 2. Sheet:A1	2013-04-09
8L 32/40 Crankshaft, 2 sheets	11020011967	1.Sheet:B1 / 2. Sheet:A1	2013-04-09
9L 32/40 Crankshaft, 2 sheets	11020011968	1.Sheet:B1 / 2. Sheet:B1	2013-04-09
12V 32/40 Crankshaft, 2 sheets	11020011959	1.Sheet:A1 / 2. Sheet:A1	2013-04-09
14V 32/40 Crankshaft, 2 sheets	11020011960	1.Sheet:A1 / 2. Sheet:D1	2013-04-09
16V 32/40 Crankshaft, 2 sheets	11020011961	1.Sheet:A1 / 2. Sheet:A1	2013-04-09
18V 32/40 Crankshaft, 2 sheets	11020011962	1.Sheet:A1 / 2. Sheet:A1	2013-04-09
NDT-specification	Q10.09431-2120E	14	2004-06-30

The crankshafts are approved with the following limitations with respect to maximum dynamic torsional stress, in way of crankpin, and material properties, UTS and yield:

	Ck45N or Ck45V 640/375 N/mm ²	34CrNiMo6V or 50CrMo4 mod 950/750 N/mm ²
MAN 6/7/8/9L 32/40	30 N/mm ²	Not applicable
MAN 12/14/16/18V 32/40	Not applicable	45 N/mm ²

List of alarms:	Drawing no	Revision	Approval Date
Operation Data & Set Points	600.30(E.49H)	-	2013-04-09
List of measuring and control devices	1690345-2	-	2013-04-09
	609.01	-	2013-04-09
	1686126-4	-	2013-04-09

, and other drawings listed in lists and letters:

"Plans for Type Approval" stamped on 2013-06-10. DNV ref. TNANO373/ERIO/262.1-004390-J-22

MTPNO373/WILLIK/262.1-004390-8 dated 2008-11-18, (appr. of test reports)

MTPNO373/WILLIK/262.1-004390-5 dated 2007-11-19, (appr. of drawings)

MTPNO373/WILLIK/262-J-38480 dated 2004-06-30.

Turbocharger specification:

Engine model	Turbocharger specification
MAN 6/7L 32/40	1 x MAN B&W NR29/S*
MAN 8/L 32/40	1 x MAN B&W NR29/S* or NR34/S*
MAN 9/L 32/40	1 x MAN B&W NR34/S*
MAN 12/14V 32/40	2 x MAN B&W NR29/S*
MAN 16/18V 32/40	2 x MAN B&W NR34/S

Certification no.: *M-12266

Torsional vibration damper specification:

Engine model	Vibration Damper
MAN L 32/40	Geislinger D100*
MAN V 32/40	Geislinger D120*

Certification no.: *M-12013

Crankcase explosion relief valve specification:

Engine model	Valve Type
MAN L/V 32/40	Hörbiger 162 EVN*/crank or Mt. H M20**/crank

Certification no.: M-11443, **M11882

Crankcase protection specification:

Engine model	Protection system
MAN L/V 32/40	MAN B&W Diesel AG Splash Oil system*

Certification no.: *A-11920

The splash oil system shall be used together with monitoring of main bearing temperatures.

Note: The certification numbers are valid at the date of issue of this engine TA. When the certification numbers are renewed during the period of validity of this TA, the new certificate numbers applies.

Tests carried out

1. Prototype test according to Type Approval Test Report dated 94-03-22
2. Type Approval Test 12V32/40 dated 96-02-16.
3. Type Approval Test, engine no 1 063 302, dated Augsburg, 14.12.2004
4. Type Approval Retention Survey report dated 2008-10-14, which confirms that the STX MAN L/V 32/40 engine series complies with DNV Rules for Ships January 2008 edition.

Marking of product

The product to be marked with manufacturer's name or trademark and type number identification

Periodical Assessment

For retention of the Type Approval, a DNV surveyor shall perform a survey every second year and 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

Foundation arrangement to be submitted for each installation according to the Rules, Pt. Ch.3 Sec.1 A500 – Documentation of arrangement.

Torsional vibration calculations to be submitted for each installation according to the Rules Pt.4, Ch.3, Sec.1, G - Vibration.

Signboards according to the Rules Pt.4, Ch.3, Sec.1, C 406.

Flexible hoses to be Type Approved by DNV.

Engine safety, control and monitoring systems, including sensors and actuators are not covered by this type approval certificate. Documentation for engine safety, control (including speed governing) and monitoring systems shall be submitted for approval according to Pt.4 Ch.9 Sec.1 Table C2 and/or as listed in relevant type approval certificates.

Electric cables and installation of this is not covered by this approval and must be verified to comply with the requirement of DNV Rules for Ships/ High, Speed Light Craft and Naval Surface Craft Pt.4 Ch.8 - Electrical Installation.

The approval does not include driven member.

END OF CERTIFICATE