Certificate No.: 2406211135073938

TÜRK LOYDU

TYPE APPROVAL CERTIFICATE

This is to certify that the

Internal Combustion Engines

TL Project No	**23-0697**
Manufacturer	**Guangxi Yuchai Marine and Genset Power Co.,Ltd.**
Address	**No:88, Tianqiao West Rd, Yulin, Guangxi, China**
Product Type	**YC6T450C, YC6T510C, YC6T540C, YC6TD600L-C20, YC6TD650L-C20, YC6TD760L-C20, YC6TD800L-C20, YC6C820L-C20, YC6C925L-C20, YC6C960L-C20, YC6CL1035L-C20, YC6CL1200L-C20**
Reference Rule	**TL Rules, Part B, Chapter 4, Machinery, 01.07.2022** **TL Rules, Part B, Chapter 5, Electric, 01.07.2022** **TL Rules, Part A, Chapter 2, Material, 01.01.2023**
Expire Date of Previous Certificate	**10.12.2022**
Place and Date	**Istanbul / 21.06.2024**

Subject to the conditions referred to in the following pages, this certificate is valid until 10.12.2027.

Emrah Söğütçü

New Building Division Manager

122984

This certificate is subject to terms and conditions described below:

- Any significant change in design or construction may render this Certificate invalid. Type Approval Certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. This certificate is not valid for products without marking above mentioned. The manufacturer should notify TÜRK LOYDU of any modifications or changes to equipment in order to obtain valid certificate. This certificate shows that tested specimens as representative of the product complies of the TÜRK LOYDU rules, and revelant international instruments that apply to it.

Product : Internal Combustion Engines

Product Description : 4 strokes, 6 cylinders, in-line along the longitudinal axis of the crankshaft, turbocharged, intercooling, liquid fuel diesel engine.

Approval No / Date : PAE-EPAS/016868/23-0697/SU dated 23.08.2023
PAE-EPAS/016886/23-0697/MYO dated 25.08.2023

Application : These internal combustion engines were intended for marine main propulsion and marine auxiliary on ship.

Method of Operation : Four Stroke

Last Inspection Date : 05.06.2024

Performed Tests :
- Quality Audit
- Visual Inspection
- Starting Performance Test
- Governing Performance Test
- Minimum No-Load Speed (Idle Speed) Test
- Minimum Steady Test
- Safety Protection Device Test
- Load Test
- Hot Surface Temperature Measurement
- Turbocharger Cut-Out Test
- Fire Protection Controls
- Leakage Test
- Integration Controls

Test Place : Guangxi Yuchai Marine and Genset Power Co.,Ltd. - No:88, Tianqiao West Rd, Yulin, Guangxi, China

Surveyor Remarks : -

	Type of Product	Rated Power	Rated RPM	Number of Cylinders	Stroke	Bore
1	YC6T450C	330 kW	1500 rpm	6 pcs.	145 mm	165 mm
2	YC6T510C	375 kW	1800 rpm	6 pcs.	145 mm	165 mm
3	YC6T540C	396 kW	1800 rpm	6 pcs.	145 mm	165 mm
4	YC6TD600L-C20	441 kW	1500 rpm	6 pcs.	152 mm	180 mm
5	YC6TD650L-C20	478 kW	1800 rpm	6 pcs.	152 mm	180 mm
6	YC6TD760L-C20	559 kW	1800 rpm	6 pcs.	152 mm	180 mm
7	YC6TD800L-C20	588 kW	1800 rpm	6 pcs.	152 mm	180 mm
8	YC6C820L-C20	603 kW	1200 rpm	6 pcs.	200 mm	210 mm
9	YC6C925L-C20	680 kW	1350 rpm	6 pcs.	200 mm	210 mm

Surveyor Name : Caner COŞKUN

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10	YC6C960L-C20	706 kW	1350 rpm	6 pcs.	200 mm	210 mm
11	YC6CL1035L-C20	760 kW	1000 rpm	6 pcs.	200 mm	290 mm
12	YC6CL1200L-C20	882 kW	1000 rpm	6 pcs.	200 mm	290 mm

Approval Conditions : Environmental conditions according to TL Machine Rules and IACS UR M28;
Seawater temperature: +32 °C
Temperature range: 0°C ÷ +45 °C
Atmospheric pressure: 1 bar
Suction air temperature: +45 °C
Relative humidity: 60 %
For electric components: 0°C ÷ +55 °C

Inclination limits (degrees)	Athwartships		Fore --and-- Aft	
	Static	Dynamic	Dynamic	Static
	± 15,0°	± 22,5°	± 5,0°	± 7,5°
Emergency and safety equipment	± 22,5°	± 22,5°	± 10,0°	±10,0°

Limitation;
In order for these machines to be used on ships with single-engine propulsion applications, the control of the machine (in case of failure of the regulator or actuator) must be done with another independent control system. In other words, two separate machine control systems should be arranged. The main machines must be fitted with stand-by cooling pumps that operate independently. If this equipments is not on the machine, the ships should be equipped with more than one main engine.

Other Conditions;

- Flexible hoses with couplings are to be type approved.
- 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 the TL-Part B- Chapter 4-1-Section 2 (January 2022). (It is only required for Türk Loydu's product certificate.)
- Electric cables and cabling are not covered by this approval and must be verified to comply to the TL Part B-Chapter 5-Section 9 (July 2022). (It is only required for Turkish Lloyd's product certificate.)
- Guangxı Yuchai Marine and Genset Power Co.,LTR is responsibility to inform the shipbuilders and/or their subcontractors about the installation, use, general maintenance of the approved equipment and the conditions of this approval.

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Service Restriction;

1- Unit Certification (Türk Loydu's product certification) is required for this product to be used on TL-classed ships.

2- Signalization and protection related to the engine shall be subjected to Turkish Lloyd approval in each particular case and will depend on service applied and the degree of the vessel's automation. These engines can be installed on ships with automation notation provided that all the conditions specified in our rules are followed. For this purpose, equipment that meets the requirements of the Automation Rules must be on the engine and our surveyors must check whether these requirements are met during FAT or ship trials.

3- Equipment must be provided for enabling "turning gear engaged" signal.

Comments;

1- Torsion vibration analysis is required for each propulsion installation unit.

2- The fitting of Rules required protective devices is to be verified at installation on board a vessel in class with the Türk Loydu as well as the Rule required quantity of pump units depending on actual installation arrangements.

3- For engines intended to be used for emergency services, supplementary tests in accordance with regulations of the Administration whose flag the vessel flies may be required.

4- Products requiring witnessed testing by a Surveyor as part of their Certification for use on a vessel,or facility classed by Türk Loydu, as defined in the applicable section of the Rules,will continue to require witnessed testing. Each engine produced in future where Türk Loydu certification is required is to be shop tested in the presence of our Surveyor.

5- Minimum tensile strenght of crankshaft material is 950 N/mm^2. After forging quenched and tempered.

6- This certificate does not cover the following plans which



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