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मानक

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IS 9837 (1981): Code for testing of marine centrifugal oil purifiers [TED 19: Marine Engineering and Safety Aids]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard
CODE FOR
TESTING OF MARINE CENTRIFUGAL OIL PURIFIERS

1. Scope — Deals with the testing of centrifugal oil purifiers for marine use.

2. Terminology

2.1 Capacity — Total quantity of fluid in litres per hour that can be fed into the purifier.

2.2 Revolution Speed — Number of revolutions of bowl per minute. The revolution speed shall be measured at the bowl spindle. When this measuring becomes unpracticable on account of the purifier or its installation, the number of revolutions may be converted from the revolution speed of the driving spindle or the driving motor.

3. Testing Oil — The oil to be used, for testing of purifier shall be as follows.

3.1 Lubrication Oil Purifier — Non-additive turbine oil specified in IS : 1012-1978. 'Specification for steam turbine lubricating oils (first revision)' shall be used mixed with fresh water by 5 percent on volume and heated so that the viscosity shall be 24 mm²/s (24 centistokes).

When required, non-abrasive solid particles screened through 150 mesh shall be mixed to the oil by 0.1 to 0.2 percent by weight.

3.2 Fuel Oil Purifier — Test, if specified by the purchaser, shall be carried out with fuel oil of grade LV specified in IS : 1593-1971 'Specification for fuel oils (first revision)' and heated so that the viscosity shall be 24 mm²/s (24 centistokes) after heating.

4. Testing Arrangement

4.1 Testing Equipment — Testing equipment shall be arranged as shown in Fig. 1 and shall be well prepared for all the tests specified in 5.

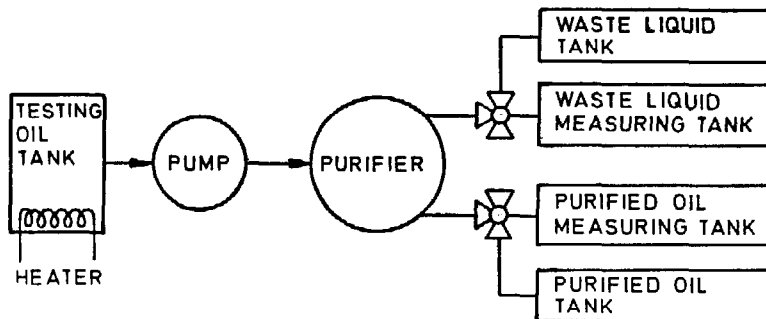


FIG. 1 TESTING ARRANGEMENT FOR OIL PURIFIER

4.2 Driving Motor — The motor shall be the one which is to be equipped on the purifier, where practicable.

4.3 Purifier Oil Pump — The pump for the purifier shall be tested together with the purifier.

5. Testing and Inspection

5.1 Starting Test — Keeping the terminal voltage and frequency (in case of ac source) of the motor at the rated value or a value close to this, the purifier shall be started under no load. Then, the accelerating state of the revolution speed during start up shall be inspected. In addition, the time required from start up to the rated revolution speed, frequency (in case of ac source), voltage and maximum current shall be measured.

5.2 Stopping Test

- a) Under water sealed condition, operating at the rated revolution speed, the time required from cutting off the power source until stop shall be measured. In addition, the operating condition shall also be inspected.
- b) In case the motor is equipped with brake, operating at the rated revolution speed and water sealed condition, the time required from actuating the brake immediately after cutting off the power source until stop shall be measured. In addition, the operating condition shall also be inspected.

5.3 Performance Test — The test shall be carried out at room temperature. Keeping the terminal voltage and frequency (in case of ac source) of the motor at the rated value or a value close to this, and purifying the testing oil at the rated oil flow quantity, the following items shall be inspected for at least three times or more:

- a) *The quantity of purified oil and waste liquid* — Using measuring tank, the quantity discharged shall be measured during more than one minute. However, well calibrated flow motor may be used instead of measuring tank.
- b) *Water droplets and foreign matters remaining in the purified oil* — The purified oil shall not contain solid particles greater than five microns. When operating on a continuous bypass system the moisture content in the purified oil shall be less than 0.1 percent. The solid particles and water droplets shall be ascertained by chemical method.
- c) *Oil droplets in the waste liquid* — To be observed by visual inspection.

5.4 Over Speed Test — Operating for five minutes at 110 percent or over of the rated revolution speed under the water sealed condition (a different driving motor may be used), the condition of purifier shall be inspected.

5.5 Oscillation Test — Keeping the terminal voltage and frequency (in case of ac source) at the rated value or a value close to this under the water sealed condition, and oscillating approximate five cycles per minute with inclination of 22.5 degrees to the left and right against the vertical axis (see Fig. 2), the operating condition of the purifier shall be inspected for five minutes.

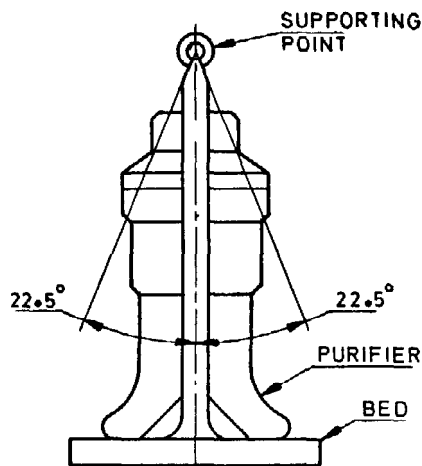


FIG. 2 ARRANGEMENT FOR OSCILLATION TEST

5.6 Endurance Test — Operating for four hours under the designed condition, the temperature rise of each portion, motor input and the number of revolutions shall be measured, and also the vibration and noise shall be inspected. In this test, the purifier may be operated without circulating the testing oil continuously under water sealed condition. However, when the purifier with oil pump is tested under the water sealed condition, the oil shall be circulated through the pump using the bypass pipe.

5.7 Operating Test For Accessory Devices — In case of the purifier equipped with automatic or remote control devices, the operation of these devices shall be inspected.

5.8 Overhaul Inspection — After the tests of 5.1 to 5.6, the main parts shall be overhauled and inspected. Adhering condition of separated sludge inside the bowl shall be usually inspected. Separated solid shall be scraped and weighed.

6. Test Record — The test results shall be recorded as shown in Table 1 and reported.

TABLE I RECORD FOR SHOP TEST OF CENTRIFUGAL OIL PURIFIER

Purchaser

Order No.

Principal Item

Place Tested

Date Tested

Purifier	
Model	
Capacity	I / h
Rev/speed, rev/min	
Mfg No.	

Motor			
Model			
Voltage	V	Current	A
Cycle	Hz	Pole	Rating
Rev/speed, rev/min			
Manufacturer and Mfg No.			
Stopping Test			
Time required for stop after cutting off power source			
Without brake		With brake	
min	s	min	s

Starting and Stopping Test

Starting test			
Time required from Start Up to Rated rev / speed	Voltage	Cycle	Maximum Current
min s	V	Hz	A

Testing Oil

Kind	Viscosity (at 50°C)	Specific gravity 15/4°C

Performance Test

Oil Flow l / h	Testing Oil			Purified oil l / h	Waste liquid l / h	Voltage V	Current A	Power kW	Rev/Speed, rev/min		Pump Pressure kgf / cm ²	
	Temp °C	Vis- cosity	Specific gravity						Bowl	Motor	Suc.	Del.

Endurance Test

Item	Temp °C	Temp °C						Voltage V	Current A	Power kW	Rev / speed, rev / min	
		Purifier			Motor						Motor	Bowl
		Body	Upper bearing	Low bearing	Casing	Bearing	Bearing					
(Commence)												
(Finish)												

Over Speed Test

Volt	Current	Rev/speed of motor	Rev/speed of bowl	Over speed ratio
V	A	rev/min	rev/min	percent

Oscillation Test

Inclination	Speed	Time for Test	Operating Condition
degrees	Cycle/min		

EXPLANATORY NOTE

In the preparation of this standard, assistance has been derived from JISF 6601-1975 'Shop test code for marine centrifugal oil purifiers' issued by Japanese Industrial Standards Committee (JISC).