

# No. 36 Recommended procedure for the determination of contents of metals and other contaminants in stern tube lubricating oil

(1992)  
(Rev.1  
1997)  
(Rev.2  
Aug  
2011)

## 1. General

As provided by IACS UR Z21.2 (d), a lubricating oil analysis should be carried out at the required intervals.

The documentation on lubricating oil analysis is to be available on board. Each analysis, to be performed by an appropriate method, should include the minimum parameters as listed:

- water contents, refer Section 4
- chloride contents, refer Section 4
- contents of bearing metal particles, refer Section 4 and 6
- oil ageing (resistance to oxidation), refer Section 5

## 2. Sampling procedure

Oil samples should be taken under service conditions, i.e. with a rotating shaft and the system at service temperature.

The samples are to be drawn from the same agreed position in the system which should be positively identified.

These samples, unless supervised by a Surveyor, are to be collected and identified by the Chief Engineer.

## 3. Contaminants determination

The contents of the following metals should be determined:

- in connection with contents of wear metals:

Chromium  
Copper  
Iron  
Lead  
Nickel  
Silicon  
Tin

- in connection with contents of sea water:

Magnesium  
Sodium

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## 4. Metal and water content values

The metal and water content values should be considered taking into account the type of seals used and the chemical composition of the bearing material.

Suggested upper limits are given below for guidance only:

Water	1%	Nickel	10 ppm
Chromium	10 ppm	Silicon	40 ppm
Copper	50 ppm	Tin	10 ppm
Iron	30 ppm	Magnesium	30 ppm
Lead	10 ppm	Sodium	80 ppm
Chloride content in water	70 ppm (ingress of salt water)		

These limits should be considered versus the elapsed time.

It is important to have results of a number of sequential analyses in order to observe any trends taking place.

## 5. Oil ageing

Oxidation characteristics such as TAN (total acid number) depend upon the type of oil used. Hence no recommended value is listed. Instead observation of any trends (such as viscosity and change in colour etc.) based on sequential analysis should be made.

## 6. Other analysis

Microscopic analysis of the particles may be recommended to identify the failure process and, where applicable, non-metallic bearing or seal material.

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