

Marine Engineering Exam Resource – Review of Lubrication

1. What kind of friction requires the least effort to overcome?
A film friction of oil that causes no metal to metal
 - a) Fluid friction
 - b) Rolling friction.
 - c) Sliding friction
2. Heat is caused within the lubricant itself by what?
Fluid Friction
3. Low viscosity oil means what?
Oil measurement of thickness or ability to flow. Low viscosity is lighter oil.
4. High viscosity oil means what?
Flows very slowly.
5. What is the viscosity of oil?
The measure of the oils thickness or ability to flow.
6. What is meant by the oil wedge theory?
This is where the oil is drawn in under the shaft as it revolves, caused by the adhesion to the metal surface by the oil.
7. How many oil wedges does an anti-friction bearing have?
Two. Between two races so double wedge.
8. The lowest temperature at which oil will flow is called?
Pour point. - Under the influence of gravity.
9. What additive is used to remove varnish and sludge?
Oxidation inhibitors or anti corrosion. to counter the affects of air.
10. Water separation in oil is caused by?
Demulsibility - the ability of oil to separate from water.
11. What is viscosity index?
The number to indicate the stability (consistency) of the oil viscosity with temperature. The lighter the number the more stable the oil is. Lower more stable.
12. What does S.U.S. stand for?
Saybolt Universal Second. How to measure oils viscosity. The time required for a fixed volume of oil to flow through a tube of a definite diameter at constant temperature.
13. The lubricant for a wide range of temperature and speed variations should be?
Multipurpose or multigrade oils and grease. Viscosity changes as temperature changes.
14. The polar effect of grease causes what to happen?

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Oil or grease has an electrical charge. Metal surfaces have an opposite electrical charge; this polar effect causes oil or grease to be attracted to the metal surface.

15. The hardest grease would have what number?
Number 6
16. The softest grease would have what number?
Number 000 Grease is made by the thickening of oil and soap.
17. The soap based with controlled water content is?
Calcium soap- for damp conditions, both for high temperature. Water is used to stabilize the soap structure.
18. Temperature range for calcium base grease is?
175 degrees F or 80 degrees C at this temp the oil and soap separate.
19. Housing used with oil lubrication should be filled how high?
½ way up the lowest rolling element. Not to overflow at center of lowest rolling element?
20. Oil drums exposed to weather should be stored how?
On there side so dirt and water will not collect on top of oil do to possible contamination.
21. What is lubricant supposed to do?
Reduce friction. Reduce wear. Help dampen chuck. (Gears meshing). Cool moving elements.
Prevent corrosion. Seal out dirt.
22. An oil resistance to flow is called?
Flowed friction or lube drag.
23. The property of molecules of oil to stick together is called?
Cohesion
24. The pour point of oil refers to what?
The lowest temperature, which oil will flow under the influence of gravity.
25. What are the advantages of oil lubrication?
Used for high to very high speeds. Less fluid friction. Flushing action. Good heat exchange medium. Easily removed from housing.
26. What are the advantages of grease lubrication?
Good for heavy loads, medium to low speeds. Simple seals. Better start up protection. Will not flow out. Better shut down protection.
27. What are some dry lubricants?
Graphite. Teflon. Moly? Disurphate? Silicone.
28. Oil that flows slowly has?

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A high viscosity.

29. What type of oil is used with water?
Water soluble oil. ? Exp? Cutting fluid. Machine cooling fluid.
30. Heavy-duty oil means that the oil has?
EP additives. E = extreme P = pressure It is used for heavy loads
31. In oil lubricated high-speed ball bearings, the recommended oil level when the bearing is not running is?
Half way up but not covering center of lowest rolling member.
32. What causes oil to get foamy in lubricating systems?
Over filled casing. Plugged vent hole in filling plug. No antifoaming additives. Water. foaming reduces life of oil. Foaming causes lip sealed oil failed? No oil wedge.
33. A gearbox using hypoid gears should use what type of oil?
EP Rating. Extreme pressure. Used where there is lots of squeezing pressure. Worm gear boxes.
34. What are some disadvantages of grease?
Holds contaminants more than oil, such as dirt. Harder to change. More for lower speeds.
35. What is oil boundary lubrication?
This condition can exist in bearings where the lubrication filter is broken. Down either by lack of lubrication or deterioration of poor lubrication. Where critical metal to metal contact can be made or stop and go.
36. A bearing has been greased with two soft of grease, what will happen?
Property of the grease will break down. Rapidly causing loss of lubrication. Bearing failure. It will get hot and grease will drip.
37. What is it called when oil is drawn into a high-pressure area in a bearing?
Hydrodynamic lubrication: or wedge.
38. What type of soap is recommended for damp conditions?
Calcium based soap or load calcium based.
39. How would you check oil for contamination?
Sample to lab. Smell. Feel. Magnet. Pour sample onto white paper.
40. What happens when oil oxidizes with air?
Produces varnish or sludge. Soluble acids (mixes in to oil solids.) Causes slippage. Caused by chemical reaction. (Deoxidization)?
41. What causes oxidation to speed up?
Excessive heat. Catalysts i.e. copper, water.

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42. Explain hydrostatic lubrication?
This is where the oil is pumped into the bottom of the bearing. ? For rotation using an external pump. EX. Steam turbine?
43. Explain hydrodynamic lubrication?
Wedging section. Drawn under a shaft to lift shaft while rotating.
44. “Sealed for life” bearings are lubricated with what type of grease?
Silicon. Lithium. Barium.