

Technical Bulletin

Foaming In Oil

What is Foaming?

The air bubbles that result from oil agitation should rise to the surface and burst. The accumulation of air bubbles due to excessive agitation or insufficient oil quality on the surface is known as foaming.

Why Do Oils Foam?

- ✓ Water penetration into oil
 - ✓ Oil contamination (solid particles)
 - ✓ Grease penetration into oil
 - ✓ Seal penetration into oil
 - ✓ Liquid and anti-corrosion penetration into oil
 - ✓ Mechanical reasons (excessive air intake due to collision, agitation, eakage problems, aeration *)
 - ✓ Decrease in anti-foaming additive (excessive filtration can keep the anti-foam additives in the filter)
 - ✓ Excessive anti-foaming additive
- Aeration:** Ventilation, air intake

Which Negative Effects Occur When Oil Foams?

- ✓ Cavitations in pumps
- ✓ Shaking in hydraulic systems, rough operation
- ✓ Reduced control sensitivity, vibration
- ✓ Component abrasion due to hydrodynamic film damage between the surfaces
- ✓ Stops due to low pressure
- ✓ Overheating in oil
- ✓ Oxidation and deterioration in oil

How Do We Measure Foaming?

Foaming in oils can be measured through Foaming Tendency and Foam Stability Tests (ASTM D892). Place about 190 ml of the oil sample in the test flask. After airflow of 94 ml/min is delivered for 5 minutes, measure the foam volume of the oil sample. The result is reported as foam-ing tendency. After the airflow is cut, the foam volume after 10 minutes is measured and the result is reported as foam stability.

This process is carried out in Stage I (24 °C), Stage II (93.5 °C) and Stage III (24 °C). It is reported as:

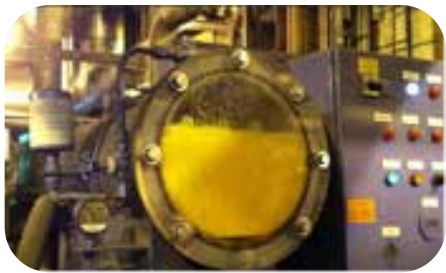
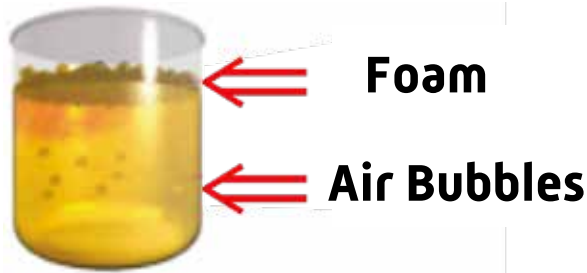
E.g.,
10/0
50/0
10/0..

How to Prevent Foaming?

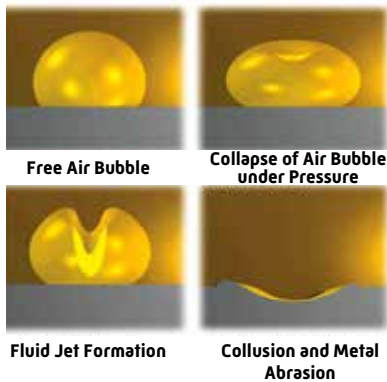
- Mechanically**
- ✓ Prevention of air inflow from areas such as system connections, gaskets, pumps
 - ✓ Reducing oil agitation in the tank and ensuring adequate resting time
 - ✓ Removal of metal chips from production from the system
 - ✓ Flushing the system before using different oils
 - ✓ Adding oil without causing splash

- Chemically**
- ✓ Using oil with proper foaming tendency
 - ✓ Use of anti-foam additives, if necessary

IMPORTANT NOTE: The creamy appearance on the oil lid occurring especially in stop-and-go rides in the city may not be related to the foaming tendency of the oil due to the inability to discharge the oil vapour from the crankcase (in old vehicles without positive ventilation systems or in case of failure of this system). In such cases, it is recommended that the oil be tested under the laboratory conditions to determine its foaming tendency.



Cavitation



Does Every Type of Oil Foam to the Same Extent?

Synthetic oils (PAO & Hydrocracked Oils) tend to foam less than mineral oils due to higher surface tension.

