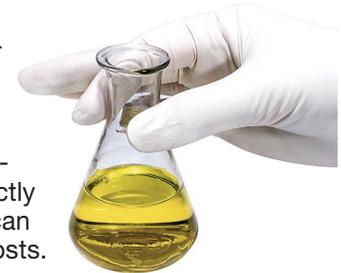


Bottle selection is a key component of lubricant analysis. Determining the appropriate bottle for your testing needs, both the size and cleanliness requirements, can ensure test results are appropriate to make informed maintenance decisions.

Selecting an appropriate sample bottle has both a direct and an indirect impact on maintenance costs. A clean, certified bottle is more expensive than a standard bottle, which directly affects material costs. A standard bottle may falsely elevate particle count results, which can result in unnecessary filter and lubricant changes that can indirectly affect maintenance costs.



Sample jar cleanliness is relevant when doing particle count testing, which is often requested in applications where a specific level of cleanliness is required. For example, GE requires a 19/16/13 ISO Cleanliness Code for some of its turbines. This level of precision should be a major consideration in selecting an appropriate sample bottle.

### Sample Bottle Material

**High Density Polyethylene (HDPE)** bottles - opaque plastic sample containers - are commonly used throughout most applications. Although HDPE bottles will tolerate samples taken at high temperatures, clarity is low and the manufacturing process can leave enough residue behind to impact cleanliness levels and particle count results in applications where a particular level of precision must be achieved.

**Polyethylene Terephthalate (PET)** bottles have a much lower heat tolerance than the HDPE but are made of a clear plastic that allows for visual inspection of the fluid, making it easier to identify contamination. The manufacturing process for PET bottles generates less contamination, which can impact particle count test results.

Bottle Material	Available Sizes	Clarity	Heat Tolerance
HDPE	3oz, 4oz, 8oz	Low	High
PET	4oz, 8oz	High	Low

### Sample Bottle Cleanliness

ISO Standard 3722 has become the accepted industry specification for classifying sample jar cleanliness. It specifies a method and establishes a means for ensuring that the accuracy of particulate contamination analyses in hydraulic systems is not degraded by a lack of sample container cleanliness. It defines three bottle cleanliness classifications based on the number of particles present of a specific size per milliliter of sample bottle.

**ISO Clean, Super Clean, and Ultra Clean** sample bottles are chemically cleaned, dried and sealed to prevent any inherent environmental contamination. They are then tested to ensure that the appropriate cleanliness classifications have been met. ISO clean bottle suppliers should provide a certificate of analysis that verifies bottle shipments as having been cleaned to one of the standard's three cleanliness classifications.

ISO Clean sample bottles have no more than 100 particles >10 microns in size per ml of sample bottle and are sufficient for most industrial applications requiring particle count testing. ISO Super Clean sample bottles have no more than 10 particles >10 microns in size per ml of sample bottle and ISO Ultra Clean bottles have no more than 1 particle >10 microns per ml of sample bottle.

Cleanliness levels are typically based on OEM requirements. Taking the time to determine optimal sample bottle cleanliness will minimize sample bottle interference with particle count results. Eliminating falsely elevated particle counts will prevent your laboratory from recommending unnecessary fluid and/or filters changes that can result in increased lubricant, parts and labor costs.