

Sinclair Lubricant Handling Guidelines

Purpose of Guidelines These Guidelines are provided to identify **minimum** procedures and processes that should be in place for a Sinclair Lubricant Distributor to supply quality lubricant products to their customers. Adoption of such guidelines may reduce risk of liability claims, equipment damage, and misapplication of products.

Equipment Calibration A well-defined calibration program is recommended to validate the accuracy of meters, gauges and laboratory equipment. The written program should include a complete list of all equipment to be calibrated, the frequency of calibration and a log documenting calibration records.

Product Blending The procedure used for the manufacture (blending) of lubricating oil products should be well documented. The procedure should address the following aspects: (1) blend vessel inspection, (2) instructions for cleaning vessel, pumps and lines between products, (3) process for weighing or metering ingredients into the vessel, (4) documented formulation information that includes ingredient quantities and lot traceability for all base oils and additives used in the batch, (5) order of ingredient addition, (6) mixing time and temperature, and (7) product disposition (where to be stored or packaged).

Product Testing Each product should have a set of specifications that (1) identifies quantities of each ingredient and (2) provides a slate of tests required to validate the product has been blended properly and meets intended performance level. Procedures should be maintained to identify testing requirements for (1) receipts of base oils and additives and (2) each batch of blended product. Testing is also recommended after product transfer, loading and /or packaging to ensure absence of adulteration during handling. Records must be maintained to relate test results with product name/grade, batch number and date of manufacture.

Lot Traceability Each batch of product manufactured should be assigned an identifying batch number that can be associated with (1) the identity and quantity of the components used in the batch, (2) the test results obtained on the batch, and (3) the batch retain sample. A new batch number (and new retain sample) should be assigned to the product blend after multiple batches of the same product are commingled in a storage tank.

Sample Retains It is recommended that (1) at least one pint from each batch of finished product be retained for a minimum of six months and (2) retain samples be collected early in the loading or packaging process to confirm absence of contamination. A sample (8 oz) of bulk product should also be obtained at the time of custody transfer (ie, when product is pumped into the customer tank). Both the supplier and the customer should secure and retain a sample of the product being delivered. Retain samples should be identified with the product name/grade, product code number, batch number and date/time of manufacture (or filling and delivery). Samples should be stored in an environment that prevents deterioration and contamination of the retain sample.

Storage Tanks All bulk storage tanks should be clearly labeled to identify products stored therein. This practice applies to base oil tanks, additive tanks and intermediate/finished product tanks. Tanks should be equipped with temperature measuring devices to ensure proper storage conditions are maintained and with taps for securing samples. Written storage conditions (minimum/maximum bulk temperature/maximum skin temperature etc) should be maintained for all blended products and ingredients. Ingredient storage conditions should conform to supplier recommendations. It is recommended that all tanks be monitored on a routine basis—daily is desirable. Storage records should be maintained to document temperature and product movement in and out of the tank.

Lines, Pumps, Meters and Hoses All lines and hoses should be clearly identified with product (family) name near the valve closest to the tank discharge or receiving point. While it is desirable to have dedicated lines, pumps and meters, it is often not practical. In situations where a totally dedicated system is not possible, it is acceptable to use common lines, pumps and meters within each product group. Common lines should not be used for products in different groups.

Oil Product Group Recommended Flush Volume (% of common line, meter and pump volume)

(Note: 100% Flush is 0.16gal/ft for 2 inch pipe, 0.37 gal/ft for 3 inch pipe and 0.65gal/ft for 4 inch pipe.)

Motor Oils	100% when changing grades within product family / 200% of when changing from PCMO to HD and vice versa.
Hydraulic Oils	100% when changing grades within product group
Gear Oils	100% when changing grades within product group
ATF	300% when following any dyed product or until no dye color can be seen in flush
Turbine Oils	100% when changing grades

Bulk Vessel Inspection Tank trucks and rail cars should be visually inspected prior to loading to ensure that the unit is clean and dry. It is imperative that manifolds and bottom valves be opened to verify the absence of foreign materials- especially water. Any indication of contamination should be corrected prior to proceeding with the loading operation. Special care should be exercised with tank trucks that could have been previously loaded with gasoline or other low flash hydrocarbon. Likewise after loading, the tank truck or rail car should be inspected to verify that all valves and dome lids have been properly closed, there are no leaks, proper placards have been installed and chocks have been removed. The use of a checklist before and after loading and unloading would help ensure consistent compliance.

Bulk Product Loading It is important to confirm the correct product is being loaded and that lines, pumps and meters are flushed per above before beginning the loading process. When required to meet customer product cleanliness requirements, the product should be filtered during loading. The use of a written loading schedule and loading log is recommended to document the loading process. Information that should be documented includes product name and grade, storage tank, tank truck name and number, date/time of loading, product temperature and meter readings and/or stick measurements. Such records should be signed and dated by the operator and retained.

Package Material Inspection All types of packaging containers (IBCs-totes, drums, pails, and other smaller containers) need to be at least randomly inspected to verify the absence of corrosion and contaminants. If contamination or corrosion is observed, the incident should be documented, investigated to identify the source and corrective action taken to prevent recurrence.

Package Product Fill It is important to confirm the correct product is being filled into appropriate packages and that lines, pumps and meters are flushed per above before beginning the filling process. Written filling orders should include source (tank number) of product, product name/grade and batch number to be filled, and quantity of containers to be filled. Operating instructions should include fill quantities per container and container labeling guidelines for traceability purposes. A log should be maintained to document the filling process and should include storage tank ID, product/name grade filled, batch number, number and size/type of containers filled, temperature of product at time of packaging and date/time of filling operation. Such records should be signed and retained for future reference.

Note: It is important to accurately measure and document fill quantities to comply with weights and measure regulations. Random weighing of filled containers is recommended to verify compliance.

Shipping Documents Certificates of Analysis and other documents (provided to the customer at time of delivery) should contain product code number, product name and grade, and batch number. This practice helps ensure delivery of the correct product to the customer and provides a mechanism for tracing the delivery back to the manufacturing process and test results.