Certified Laboratories (Criteria)

**DEFINITION**

AOCS Certified Laboratories are those laboratories recognized to be proficient in the use of AOCS methodologies for the analysis of soybean meal, as determined by criteria established by the AOCS Examination Board. Certification entitles a laboratory to recognition as a National Oilseed Processors Association (NOPA) referee for soybean meal analyses.

**SCOPE**

This procedure applies to any laboratory seeking AOCS certification. Both independent and industrial laboratories may apply for certification. There must be no conflict of interest when analyses are performed at industrial laboratories.

**PROCEDURE**

1. **Application**
   
   (a) Any laboratory wishing to be considered for Certified Laboratory status must first be able to demonstrate the ability to perform the required analyses. This includes:
   
   — Having an existing facility in which to perform the appropriate analyses at the time of application during the testing period.
   
   — Having all apparatus and reagents required by AOCS methodology at the time of application during the testing period.
   
   — Being willing to allow members of the AOCS Examination Board (or designated representatives) to inspect the laboratory facilities.
   
   — Being able to demonstrate proficiency in unground soybean meal

   (b) An AOCS Examination Board Approved Chemist, approved in oilseed cake and meal analyses, must be retained on the laboratory staff.

   (c) Completion of the application form, certified lab checklist, and submission of the application and administrative fee. Request for application must be made in writing to: AOCS Headquarters, 2710 S. Boulder Dr., Urbana, IL 61802 USA. Applications must be received at AOCS Headquarters by **July 30**, annually.

   (d) New labs will need to be inspected at their cost.

2. **Certification**

   (a) The initial laboratory certification will be based both on the acceptance of a satisfactory application, proficiency in unground soybean meal series in the Laboratory Proficiency Program, and the Approved Chemist staff position criteria. Subsequent certification will include the Approved Chemist criteria as well as successful participation in the AOCS Examination Board blind check sample program for soybean meal.

   (b) The AOCS Examination Board blind check sample program provides each laboratory with twelve (12) samples of soybean meal. The samples will be distributed in NOPA-approved sample bags with specific instructions requesting a “NOPA Referee” or “AOCS Certified” analysis.

   (c) The twelve (12) blind check samples will be comprised of duplicates of six (6) unique samples distributed at different times. The average and standard deviation of the six unique samples will be used to assess the performance of each individual laboratory. Outliers will be detected and eliminated at 3.0 standard deviation units.

   (d) For individual sample assessment, a single sample is considered deficient if any or all of the laboratory values fall outside ± 2.0 standard deviation units from the grand mean with outliers detected and eliminated. A laboratory will be decertified if six or more samples are found to be deficient at 95%.

   (e) For average laboratory bias assessment, the average bias for each laboratory and sample constituent will be calculated and bias values determined on constituents for all twelve samples. The standard error of the bias will be determined from the pooled standard deviation for all of the laboratories for the twelve samples. Any laboratory which has any average constituent bias outside the 95% confidence limit will be placed on probation. A laboratory which is on probation and has an average constituent bias outside the 99.7% confidence limit will be decertified.

   (f) Laboratory performance is evaluated using both the individual samples and the average constituent bias. The criteria for each evaluation is based on placing a laboratory on probation at the 95% confidence limit and decertifying a laboratory currently on probation at the 99.7% confidence limit.

   (g) A laboratory cannot be decertified without first being placed on probation. Any laboratory that has been decertified can return to the program after one (1) year of satisfactory participation in unground soybean meal.
series, but will be certified on probation. If a laboratory is subsequently decertified a second time, it can return to the program after two (2) years. Likewise, after a third decertification, a lab cannot reapply for three (3) years.

(h) A laboratory can remain on probation indefinitely until either both criteria are less than the 95% confidence limit or until either criteria exceeds the 99.7% confidence limit.

(i) All new laboratories that comply with the program requirements will be considered certified on probation for the first year of participation.

(j) Participant results will be made available by Aug. 1 of each year. After Aug. 1, those laboratories on probation or decertified may appeal to the AOCS Examination Board between Aug 1 and Aug 15. The finalized listing of Certified Laboratories will be made public by Oct. 1.

(k) A laboratory whose AOCS Approved Chemist leaves the employ of the Certified Laboratory will remain certified for a period of up to one year. During this time, they must have a chemist participate in the AOCS Approved Chemist program and become approved in their laboratory.

3. Transferability of laboratory certification—AOCS Laboratory Certification is not transferable. Should an independent laboratory have more than one facility, each individual facility must pursue certification on an independent basis.

4. Foreign approval—Laboratories outside the USA wanting to become certified must comply with the criteria outlined in this procedure. However, if circumstances warrant special consideration, the need for special consideration will be determined by consensus of the AOCS Examination Board. Special consideration will be given only by consensus of the AOCS Examination Board and only to the extent that the integrity of the Program is not compromised.

NOTES

1 The application and administrative fee is subject to change at the discretion of the AOCS Examination Board.

2 Approved Chemist listings are published yearly in the NOPA Year Book and Trading Rules, Inform, and the AOCS web page (www.aocs.org).
NITRIC ACID is a highly corrosive and toxic oxidizing agent. Use effective acid-resistant fume-removal device whenever heating acids or performing reactions that liberate acid fumes. When diluting acids, always add acid to water unless otherwise directed in a method. Keep acids off skin and protect eyes when working with acids. If acids come in contact with skin or eyes, wash immediately with large amounts of water. Do not store oxidizing acids (perchloric, nitric, sulfuric) near organic materials. Mixing organic materials with these acids, particularly perchloric, could result in an explosion.

PERIODIC ACID is an oxidizing agent and is dangerous in contact with organic materials. It is a strong irritant. It decomposes at 130°C. Do not use cork or rubber stoppers on storage bottles.

SULFURIC ACID is a strong acid and will cause severe burns. Protective clothing should be worn when working with this acid. It is a dehydrating agent and should not be stored in the vicinity of organic materials. Use great caution in mixing with water due to heat evolution that can cause explosive spattering. Always add the acid to water, never the reverse.

ALKALI ALKALIES ANHYDROUS SOLUTIONS

Hydroxide is a strong irritant to skin and tissue. The TLV in air is 10 ppm. Hydrogen bromide gas and hydrobromic acid are toxic by inhalation and strong irritants to eyes and skin. Use a properly operating fume hood when working with these compounds.

ACIDS USE EFFECTIVE ACID-RESISTANT FUME-REMOVAL DEVICE WHENEVER HEATING ACIDS OR PERFORMING REACTIONS WHICH LIBERATE ACID FUMES. WHEN DILUTING ACIDS, ALWAYS ADD ACID TO WATER, UNLESS OTHERWISE DIRECTED IN A METHOD. KEEP ACIDS OFF SKIN, AND PROTECT EYES WHEN WORKING WITH ACIDS. IF ACIDS COME IN CONTACT WITH SKIN OR EYES, WASH IMMEDIATELY WITH LARGE AMOUNTS OF WATER. DO NOT STORE OXIDIZING ACIDS (PERCHLORIC, NITRIC, SULFURIC) NEAR ORGANIC MATERIALS. MIXING ORGANIC MATERIALS WITH THESE ACIDS, PARTICULARLY PERCHLORIC, COULD RESULT IN AN EXPLOSION.
Chlorobenzene and trichlorobenzene are toxic by ingestion and inhalation. Use a properly operating fume hood when working with this solvent.

Chloroform is a known carcinogen. It is toxic by inhalation and has anesthetic properties. Avoid contact with the skin. Prolonged inhalation or ingestion can lead to liver and kidney damage and may be fatal. It is nonflammable, but will burn on prolonged exposure to flame or high temperature, forming phosgene gas when heated to decomposition temperatures. Can react explosively with aluminum, lithium, magnesium, sodium, potassium, disilane, N₂O₅, and sodium hydroxide + methanol. The TLV is 10 ppb in air. A fume hood should be used at all times when using chloroform.

Cylohexane is a highly flammable liquid. It may be fatal if swallowed or inhaled, and can cause skin irritation. Use effective fume-removal device. Can react vigorously with strong oxidizing agents.

Dichloromethane (methylene chloride) is toxic and a carcinogen that will emit highly toxic fumes and phosgene gas when heated. The TLV is 100 ppb in air. A fume hood should be used at all times when using methylene chloride.

Diethyl ether is an extremely flammable liquid, and a severe fire and explosion hazard when exposed to heat or flame. It is a central nervous system depressant by inhalation and skin absorption. Store protected from the light. It will form explosive peroxides upon exposure to light. Handle empty containers, particularly those from which ether has evaporated, with extreme caution. Explosive limits in air are 1.85–48%. The TLV is 400 ppm in air. Can react explosively when in contact with chlorine, ozone, lithium aluminum hydride, or strong oxidizing agents. A fume hood should be used at all times when using ethyl ether. Avoid static electricity.

Dimethylformamide is a clear flammable liquid and a strong irritant to skin and tissue. It is toxic by skin absorption. The TLV is 10 ppb in air.

Ether (ethyl alcohol) is a clear, colorless, highly flammable liquid. Use effective fume-removal device when heating or evaporating.

Ethyl ether is a highly flammable liquid and a severe fire and explosion hazard when exposed to heat or flame. It is a central nervous system depressant by inhalation and skin absorption. It will form explosive peroxides upon exposure to light. Handle empty containers, particularly those from which ether has evaporated, with extreme caution. Explosive limits in air are 1.85–48%. The TLV is 400 ppm in air. A fume hood should be used at all times when using ethyl ether.

Hexane is a highly flammable solvent and a dangerous fire risk. All work should be performed in a fume hood, with no open flames. The TLV for hexane is 50 ppm in air. OSHA recommends that exposure not exceed 350 ng/M³ for a time-weighted average. Respiratory irritation, dizziness, and disorientation have been reported. A fume hood should be used at all times when using these solvents.

Heptane is a highly flammable liquid and a dangerous fire risk. Vapors may cause lung irritation and may produce neurotoxic effects. A fume hood should be used at all times when using this solvent.

Methanol (methyl alcohol) is flammable liquid, and toxic. Avoid contact with eyes. Avoid breathing vapors. Use effective fume-removal device. Can react vigorously with sodium hydroxide + chloroform, potassium hydroxide + chloroform, and perchloric acid.

Methyl isobutyl ketone (MIBK) is a clear, colorless, highly flammable liquid and a dangerous fire risk. Explosive limits in air are 1.4–7.9%. Avoid inhalation and ingestion. It is absorbed by the skin. The TLV is 50 ppb in air.

Petroleum ether is the petroleum fraction consisting of aliphatic hydrocarbons in the boiling range 35–60 °C. The term ether is only figurative, signifying extreme lightness and volatility. It is extremely flammable. The explosive limits in air are 1–6%. Use effective fume-removal device. Avoid static electricity.

Pyridine is a clear liquid with a distinct odor, is highly flammable and a dangerous fire risk. The explosive limits in air are 0.8–12.4%. It is toxic by ingestion and inhalation. The TLV is 5 ppm in air. The danger from crude pyridine is greater than from pure pyridine, the associated homologs and impurities being even more toxic than pyridine itself.

Tetrachloroethylene (perchloroethylene) is a colorless, volatile, nonflammable liquid chlorinated hydrocarbon that will emit toxic fumes of phosgene when exposed to sunlight or flames. It is an irritant to eyes and skin. The TLV is 50 ppm in air. Tetrachloroethylene is highly flammable liquid and a dangerous fire risk. The explosive limits in air are 2–11%. It is toxic by ingestion and inhalation. The TLV is 200 ppm in air. Tetrachloroethylene tends to form peroxides upon storage in air.

Toluene is a highly flammable liquid and a dangerous fire risk. Explosive limits in air are 1.27–7.7%. It is toxic by ingestion, inhalation, and skin absorption. The TLV is 100 ppm in air. A fume hood should be used at all times when using toluene.

Trichloroethane is a synthetic, light-sensitive, volatile, colorless, liquid miscible with many nonpolar organic solvents. It is an irritant to eyes and skin. The TLV is 350 ppm in air.

Xylene is flammable and a dangerous fire risk. The TLV is 100 ppm in air.