TEXAS SPECIFICATION NO. 180-92-14A
SURFACTANT, ANIONIC -- SODIUM ALPHA OLEFIN SULFONATE (40 %)
Effective Date: May 2011

1. **SCOPE:** This specification establishes the minimum requirements for an anionic surfactant consisting of alpha-olefin sulfonates. It is to be furnished in nominally 40 percent active aqueous solution, for use as a component of liquid cleaning compositions.

   A product conforming to this specification contributes excellent cleaning and foaming properties to detergent compositions. It is relatively harmless if handled with reasonable care; however, dryness and roughening of the skin could possibly result from prolonged contact with the full strength product.

2. **DEFINITIONS**:
   Terminology used in this specification is intended to be generic in nature and consistent with meanings that have been defined through general use and/or accepted trade practices. Where variant meanings may exist, the applicable interpretation shall be determined by the Texas Procurement and Support Services, a division of the Texas Comptroller of Public Accounts (CPA).

3. **SPECIFICATION REQUIREMENTS:** Products furnished under this specification shall meet or exceed the following requirements:

   3.1 **GENERAL REQUIREMENTS:** The product shall be a clear, homogeneous liquid, free from sediment or suspended matter, of a color no deeper than light amber.
   3.2 **CHEMICAL AND PHYSICAL REQUIREMENTS:** The active ingredient shall be a sodium salt of a sulfonic acid derived from mixed linear alpha-olefins having 14 to 16 carbon atoms in the molecule
   3.3 **CHEMICAL AND PHYSICAL REQUIREMENTS:** The product shall conform to the requirements below, when tested by the procedure of Section 4.

Requirement	Minimum	Maximum	Testing Method
Anionic surfactant, *pbw active	37.0	41.0	4.1
pH, as received	7.0	9.0	4.2
Unsolfonated oil (as received basis)	--	1.3	4.3

***pbw: percent by weight**

4. **TESTING:** Testing shall be performed by **American Society for Testing and Materials (ASTM)** procedures: www.astm.org

   ASTM E 70 - Standard Test Method for pH of Aqueous Solutions with the Glass Electrode

   Testing shall be done by an independent laboratory (preferred ASTM recommended, http://www.astm.org/LABS/search.html). Tests shall be performed on products will be provided to ordering agencies.

   The product furnished under this specification shall be tested by the following methods and testing methods listed in the table of Section 3.2:

   4.1 **Anionic Surfactant:** Determine by the following procedure:
      a. Prepare a solution of 100 g anhydrous sodium sulfate and 0.06 g methylene blue in 1 L distilled water. Add 13 ml 96% sulfuric acid in small increments. Dilute to 2 L with distilled water in a

volumetric flask. The pH of the resulting solution should be 1.2 - 1.5.

b. Weigh out accurately 1.5680 g Hyamine 1622 which has been dried to constant weight at 105° C. Transfer to a 1 L volumetric flask, add water to dissolve, the 0.4 ml 50% NaOH. Mix, and fill to the mark with water.

c. Estimate the sample size for titration from the expression:

$$\frac{\textbf{0.5}}{\textbf{molecular weight}} \times \textbf{estimated \% activity}$$

Weigh this amount into a beaker and record the weight to the nearest milligram. Add 100 ml distilled water, and dissolve the sample, with warming if necessary. Dilute to exactly 1 L in a volumetric flask

d. Pipette a 10 ml aliquot into a 250 ml Erlenmeyer. Add 15 ml chloroform and 25 ml methylene blue indicator solution

e. Titrate with standard cationic surfactant solution, starting with a 10 ml portion, followed by 1 ml increments. The titration mixture should be stirred or shaken for 30 seconds between additions, then allowed to stand until it separates into a dark blue lower phase and a colorless upper phase. When signs of approach to the end point appear, reduce the increments to 0.5 ml. These signs are: (1) more rapid separation of the phases and, (2) increased cloudiness of the upper (aqueous) phase

f. When the aqueous phase beings to turn blue, start adding the titrant dropwise, and compare the color intensities of the two phases while obstructing the view of the interface with a stirring rod. The end point is reached when the phases appear equally blue

g. Calculate the result from the formula: $\mathbf{A = V \times N \times F \times 1\text{-} / S}$

A = activity (percent purity) of the sample V = volume of titrant used, in milliliters
N = normality of the cationic titrant (0.0035 in Step 2)
F = molecular weight of the anionic surfactant (about 320) S = sample weight in grams

Note: It is advisable for the analyst to check his operating technique by titrating a sample of a standard anionic surfactant, such as sodium lauryl sulfate of the highest purity obtainable.

4.2 **pH:** Determine by the procedure of ASTM E 70.

4.3 **Unsolfonated Oil:** Determine by the following procedure:

a. Weight a 20 g sample to the nearest 0.1 g into a 150 ml beaker, and dilute to 100 ml with a 50% ethanol-water mixture. Transfer to a 500 ml separatory funnel, using a small portion of solvent to rise out the beaker.

b. Extract with four portions of carbon tetrachloride, and collect the extracts in a tarred evaporating dish by pouring through Whatman 1PS filter paper.

c. Evaporate on a steam bath to near dryness, then in an oven at 80 to 85°C for 10 minutes.

d. Cool in a desiccator, weigh, and determine unsolfonated material as the percent extractable material recovered from the sample.

5. **INSPECTION:** Products furnished under this specification shall be inspected by, or at the direction of the customer at the time of delivery.

6. **PACKAGING:** The product shall be packaged in polyethylene drums of 55 U.S. gallons capacity.

The material of the drum shall neither affect nor be affected by the contents for a period of six months from date of shipment.

Packing for shipment shall be in accordance with the manufacturer's standard practice and in a manner readily accepted by common carriers engaged in interstate commerce. Within the shipping carton, units shall be packed in a manner designed to minimize damage during the shipment because of rough or improper handling.

6.1. **PACKAGE MARKINGS:** Each shipping container shall be clearly marked with the following:

6.1.1. Name of contents, including brand name, if any.
6.1.2. Quantity contained in pounds and/or kilograms.
6.1.3. Name and address of the manufacturer.
6.1.4. Warning statements as required by governmental regulations. A label on a container of a hazardous chemical must meet the requirements of the most current OSHA standards.
6.1.5. The following additional information shall either be marked on the container or appear on the shipping documents:

- Purchase order number or contract number.
- Name and address of customer.
- Customer's requisition number.

6.2. **LABELING:** Each container shall bear a durable label containing the name of the product and instructions for use, including required precautionary statements.

7. **COMPLIANCE:** The vendor must comply with the following documents upon delivery:

7.1. Certificate of Analysis (CA): A certificate of analysis from the manufacturer shall be submitted with each shipment.

7.2. **Material Safety Data Sheets (MSDS):** All Items must conform to the Texas Hazard Communications Act by being certified as nontoxic or providing an official MSDS sheet conforming to the requirements of the most current OSHA standards. A copy of the official MSDS sheet for each applicable chemical product must be submitted with each sample; each initial shipment; and updated MSDS must be provided with the first shipment after update.

8. **APPROVED PRODUCTS LIST (APL**):

The CPA maintains an APL of products that meet or exceed the requirements of this specification. The products being approved are listed as follows:

Manufacturer	Brand Name / Product Number
Henkel Corporation	Sulfotex AOS
Pilot Industries of Texas, Inc.	Calsoft AOS-40
Stepan Company	BIO-TERGE AS-40
Crompton	Witconate AOS

To have a new product listed on the APL, the following procedures are required:

8.1. Submit a written request to CPA, Texas Procurement and Support Services Division and include the following documentations:

- **Official Certificate of Analysis from an independent laboratory**
  The official Certificate of Analysis must list the following:
  - ✓ Chemical Name (CTFI/INCI name) and CAS No.
  - ✓ Manufacturer Name
  - ✓ Brand Name or Trade Name
  - ✓ Batch or Lot Identification Number
  - ✓ Each analytical result given as outlined in the RFP specifications
  - ✓ Laboratory Name, Address, and Contact Information
- **Detailed technical specifications**
- **Product literature**
- **Material Safety Data Sheet (MSDS)**

8.2. The Certificate of Analysis will be reviewed and if approved, samples will be requested, in writing by CPA, for compatibility testing. The shipping instructions will be provided to the vendor at the time of the request.

8.3. A minimum of sixty (60) days will be required for compatibility testing to be conducted.

8.4. Sample sizes should be no less than 250 grams for powders and 500 ml for liquids. **Each sample must be accompanied with a current MSDS from the manufacturer.** More samples may be requested in writing by CPA. Samples will not be accepted unless accompanied with the current MSDS document for that material.

8.5. CONTINUED COMPLIANCE: Listing an approved product shall not relieve the vendor of providing products meeting each requirement of this specification. The vendor shall notify the CPA, in writing, of any changes in the product, address, brand name, etc.

8.6. REMOVAL FROM APL: Products on the APL may be removed for non-compliance, as determined by the CPA, or for failure to provide notification of any change to APL product(s).