

TEXAS SPECIFICATION NO. 180-12-07A
DIETHANOLAMINE (DEA) 99%, COMMERCIAL GRADE

Effective Date: May 2011

1. **SCOPE:** This specification establishes the minimum requirements for a commercial grade of diethanolamine suitable for use in formulations for liquid laundry detergent and other janitorial products.

Diethanolamine is a clear, colorless, water-soluble liquid with a relatively low vapor pressure at room temperature. It is only very slightly toxic but it is capable of causing irritation to the eyes and mild irritation to the skin. Avoid contact with eyes and prolonged contact with skin. In case of ingestion of copious quantities, dilute with water and immediately induce vomiting; obtain medical assistance at once.

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:** The diethanolamine furnished under this specification shall meet or exceed the following:

3.1. **GENERAL REQUIREMENTS:** The product shall be a clear, essentially sediment free liquid with no more than a mild ammoniac odor at room temperature.

3.2. **CHEMICAL AND PHYSICAL REQUIREMENTS:** The product shall conform to the requirements below, when tested by the methods cited in Section 4.

Requirement	Minimum	Maximum	Testing Method
Diethanolamine, pbw	99	--	4.1
Equivalent weight	104.0	106.0	4.2
Specific gravity,	1.090	1.094	4.3
Water, %	--	0.15	4.4
Color, Pt-Co (ALPHA)	--	15	4.5
pH, as received	11.0		4.6

***pbw: percent by weight**

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

ASTM D 1209 -- Standard Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)

ASTM D 2111 -- Specific Gravity of Halogenated Organic Solvents and their Admixtures

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

ASTM E 203 -- Test Method for Water Using Volumetric Karl Fischer Titration

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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:

- 4.1. **Composition:** Measure the percent by weight of diethanolamine in a sample using the Dow Chemical Company Method (DOWM 100095-ME92B), Union Carbide Method (1B-17A-0.1), or approved equally applicable test method.
- 4.2. **Equivalent Weight:** Weigh a two gram sample to the nearest mg into 25 ml deionized water in a 125 ml Erlenmeyer flask. Titrate with 1 N HCl to the first color change, using 1 ml 0.4% bromcresol green as indicator. Calculate equivalent weight from the expression:

$$\text{Equivalent Weight} = \frac{W \times 1000}{V \times N}$$

W = sample weight in grams

V = volume HCl used in milliliters

N = normality of HCl

- 4.3. **Specific Gravity:** Determine by the procedure of ASTM D 2111.
- 4.4. **Water:** Determine by the procedure of ASTM E 203.
- 4.5. **Color:** Determine by the procedure of ASTM D 1209.
- 4.6. **pH:** Measure by the procedure of ASTM E 70.
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 tight-head steel drums of 55 gallons (208 L) capacity, net weight approximately 470 pounds (213 kg). The material of the container shall neither affect nor be affected by the contents for a period of one year from date of delivery.

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.

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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
Dow Chemical U.S.A.	Diethanolamine - Commercial Grade
Occidental Chemical Corporation	Diethanolamine
Huntsman Chemical Company	Diethanolamine, DEA
Union Carbide Corporation	Diethanolamine

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

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- **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).