# DOW Triethanolamine

TEA 99%, TEA 99% Low Freezing Grade (LFG), TEA Commercial Grade, & TEA Commercial LFG

## Product Description

DOW Triethanolamine (TEA) offers a broad spectrum of application opportunities, primarily in detergents, personal care products and textile finishing. Other applications include use as intermediates in concrete additives and adhesive, rubber, agricultural and photographic chemicals; use as a component of cement grinding aids; use as "down hole" in oil well chemicals and in metalworking to prevent corrosion; and use as catalysts that promote stability during the reaction process in the manufacture of flexible and rigid urethane foams.

Because TEA combines the properties of amines and alcohols, TEA exhibits the unique capability of undergoing reactions common to both groups. As an amine, TEA is mildly alkaline and reactswith acids to form salts or soaps. As an alcohol, TEA is hygroscopic and can be esterfied.

DOW Triethanolamine is available as TEA 99%, TEA 99% Low Freezing Grade (LFG), TEA Commercial Grade, and TEA Commercial Grade LFG.

- TEA 99% is a tertiary amine used to react with acidic compounds to form salts.
- TEA 99% LFG is a low freeze grade variation of TEA Commercial Grade for easier handling in colder ambient temperatures (freezing point: -5ºC/23ºF). It is a blend of an 85% solution of TEA with 15% water.
- TEA Commercial Grade is a solution of TEA containing >=85% TEA and <= 15% Diethanolamine (DEA).
- TEA Commercial LFG is a low freeze grade variation of TEA Commercial Grade for easier handling in colder ambient temperatures (freezing point: -42ºC/-44ºF). It is a blended solution of ~74% TEA, ~15% water and ~11% Diethanolamine (DEA).

## Features and Benefits

**Detergents**

- TEA imparts a reserve alkalinity to the laundry bath, which is essential to efficient cleaning.
- TEA is an effective oil and anti-redeposition agent.

**Personal Care**

- TEA may be reacted with lauryl sulfate to form the foaming base surfactant used in hair shampoos.
- Fatty acids neutralized with TEA are excellent emulsifiers for oil-in water emulsions such as gel-type industrial hand cleaners, aerosol shave creams, and hand and body lotions.
- TEA is also used as the base component in the production of certain mild bar soaps.

**Textile Finishing**

- TEA is used as reaction intermediates for the preparation of durable press fabric finishes and softeners.
- When reacted to form amine soaps, useful as scouring agents for wool and silk because of its low alkalinity.
- Because it is hygroscopic, TEA is used in the preparation of vat printing pastes.
- TEA is also useful in making acetate rayon dyes.



Form No. 111-01412-1204 AMS
Dow Ethanolamines

## Typical Physical Properties(1)

| Properties | Triethanolamine |
|---|---|
| Formula | $(HOC_2H_4)_3N$ |
| Molecular Weight | 149.19 |
| Apparent Sp. Gr. at 20/20°C (supercooled liquid) | 1.126 |
| $\Delta$Sp. Gr./ $\Delta$t at 10 to 80°C | 0.00059 |
| Boiling Point at 760 mm Hg, °C (°F) | 335 |
| At 59mm Hg, °C, Extrapolated (decomposes) | 245 |
| At 10mm Hg, °C | 205 |
| Vapor Pressure at 20°C, mm Hg | <0.001 |
| Freezing Point, °C (°F) (supercools easily) | 21 (69.8) |
| Absolute Viscosity at 20°C, cP (supercooled liquid) | 921 |
| At 30°C, cP | 404 |
| Solubility at 20°C, % by wt | |
| In Water (supercooled liquid) | Complete |
| Water In (supercooled liquid) | Complete |
| Solubility in Organic Liquids at 25°C, % by wt | |
| Acetone | Complete |
| Benzene | 2 |
| Carbon Tetrachloride | Complete |
| Ethyl Ether | 2 |
| Heptane | <0.03 |
| Methanol | Complete |
| Surface Tension at 25°C, dynes/cm | 48.9 |
| Refractive Index, $n_D20$ (supercooled liquid) | 1.4852 |
| $\Delta N_D/\Delta t$ at 20 to 40°C per °C | 0.00020 |
| Flash Point, Pensky-Martens Closed Cup (ASTM D 93), °C (°F) | 208 (407) |

(1) Data represent typical physical properties only and should not be construed as product specifications.

## Product Stewardship

Dow encourages its customers and potential users to review their applications from the standpoint of human health and environmental aspects. To help ensure that Dow products are not used in ways for which they are not intended or tested, Dow personnel will assist customers in dealing with environmental and product safety considerations. Dow literature, including Material Safety Data Sheets, should be consulted by customers and potential users prior to use.

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