



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 reacts with acids to form salts or soaps. As an alcohol, TEA is hygroscopic and can be esterified.

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 99% for easier handling in colder ambient temperatures (freezing point: -5°C/23°F). It is a blend of an 85% solution of TEA with 15% water.
- TEA Commercial Grade is a solution of TEA containing $\geq 85\%$ TEA and $\leq 15\%$ Diethanolamine (DEA).
- TEA Commercial LFG is a low freeze grade variation of TEA Commercial Grade for easier handling in colder ambient temperatures (freezing point: -42°C/-44°F). It is a blended solution of $\sim 74\%$ TEA, $\sim 15\%$ water and $\sim 11\%$ 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.

Typical Physical Properties⁽¹⁾

Properties	Triethanolamine
Formula	(HOCH ₂ CH ₂) ₃ N
Molecular Weight	149.19
Apparent Sp. Gr. at 20/20°C (supercooled liquid)	1.126
ΔSp. Gr./ Δt 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 _D 20 (supercooled liquid)	1.4852
ΔN _D /Δt 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 has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

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