



DOW Diethanolamine (DEA)

DEA & DEA Low Freezing Grade (LFG)

Product Description

DOW Diethanolamine (DEA) offers a broad spectrum of application opportunities, primarily in detergents, personal care products and textile finishing. Other applications include use as intermediates in agricultural and photographic chemicals, and as catalysts that promote stability during the reaction process in the manufacture of flexible and rigid urethane foams.

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

DOW Diethanolamine is available as DEA & DEA LFG.

- DEA is a commercial grade of diethanolamine (CAS number: 111-42-2).
- DEA Low Freezing Grade (LFG) is a variation of DEA commercial grade for easier handling in colder ambient temperatures (freezing point: -2°C/28.4°F). It is an 85% solution of DEA with 15% water.

Features and Benefits

Detergents

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

Personal Care

- DEA is reacted with fats, oils or derived fatty acids to form fatty acid amides to form foam stabilizers, emulsifiers and viscosity builders in products such as shampoos and cosmetics.

Textile Finishing

- DEA 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, DEA is used in the preparation of vat printing pastes.
- DEA is also useful in making acetate rayon dyes.

Typical Physical Properties⁽¹⁾

Properties	Diethanolamine
Formula	(HOC ₂ H ₄) ₂ NH
Molecular Weight	105.14
Apparent Sp. Gr. at 30/4°C	1.08818
ΔSp. Gr./ Δt at 35 to 65°C	0.00065
Boiling Point at 760 mm Hg, °C (°F)	268 or 259 (514)
At 59mm Hg, °C	182
At 10mm Hg, °C	150
Vapor Pressure at 20°C, mm Hg	<0.01
Freezing Point, °C (°F)	28.0 (82.4)
Absolute Viscosity at 20°C, cP	—
At 30°C, cP	380
Solubility at 20°C, % by wt	
In Water (supercooled liquid)	Complete
Water In	—
Solubility in Organic Liquids at 25°C, % by wt	
Acetone (supercooled liquid)	Complete
Benzene	0.03
Carbon Tetrachloride	0.01
Ethyl Ether	0.5
Heptane	0.03
Methanol (supercooled liquid)	Complete
Surface Tension at 30°C, dynes/cm	48.5
Refractive Index at 30°C, n _D 20	1.4747
Δn _D /Δt at 35°C to 65°C	0.00027
Flash Point, Pensky-Martens Closed Cup (ASTM D93), °C (°F)	191 (375)

(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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