



DOW Tetraethylenepentamine (TEPA)

TEPA & TEPA-UHP

Product Description

DOW Tetraethylenepentamine (TEPA) and DOW TEPA-UHP are commonly used in the manufacture of lube oil and fuel additives, corrosion inhibitors, asphalt additives and epoxy curing agents. Additional applications include hydrocarbon purification, mineral processing aids, polyamide resins, surfactants, and textile additives.

DOW TEPA is principally a mixture of three ethyleneamines:

- TEPA [L-TEPA (CAS #000112-57-2), AE-TAEA, (CAS #031295-46-2), AE-DAEP (CAS #031295-54-2), AE-PEEDA (CAS #031295-49-5)]
- Triethylenetetramine Mixture (CAS #000112-24-3)
- Pentaethylenehexamine Mixture (CAS #004067-16-7; 3,6,9,12-Tetraazatetradecane-1,14-diamine)

DOW Tetraethylenepentamine-UHP is a mixture of four different pentamines and additional higher and lower molecular weight ethyleneamines, all with close boiling points including linear, branched and two cyclic pentamines. These compounds include:

- L-TEPA (CAS #000112-57-2, N-(2-aminoethyl)-N'-{2-[(2-aminoethyl)amino]ethyl} 1,2-ethanediamine)
- AE-TAEA (CAS #031295-46-2, 4-(2-aminoethyl)-N-(2-aminoethyl)-N'-{2-[(2-aminoethyl)amino]ethyl}-1,2-ethanediamine)
- AE-DAEP (CAS #031295-54-2, 1-(2-aminoethyl)-4-[(2-aminoethyl)-amino]ethyl]-piperazine)
- AE-PEEDA (CAS #031295-49-5, 1-[2-[[2-[(2-aminoethyl)amino]ethyl]-amino]ethyl]-piperazine)
- Polyethylenepolyamines (CAS #029320-38-5 or CAS #068131-73-7)
- Triethylenetetramine Mixture (CAS #000112-24-3)

Typical Physical Properties⁽¹⁾

Properties	TEPA	TEPA-UHP
Molecular Weight (Linear component) (Typical product)		189.3 200
Boiling Point at 760 mm Hg, °C	323	288
Freezing Point, °C (°F)	-46	-46
Density, g/ml @ 20°C		0.996
Specific Gravity at 20/20°C	0.993	0.994
Viscosity, cp at 20°C		83.1
Kinematic viscosity, cst @ 25°C		54.1
Kinematic viscosity, cst @ 40°C		24.6
Vapor Pressure at 20°C, mm Hg	<0.01	<0.01
Specific Heat, cal/g °C @ 20°C		0.61
Thermal Conductivity, cal/cm-sec-°C @ 20°C		0.000435
Surface tension, dynes/cm @ 20°C		39.3
Coefficient of expansion, 1/°C @ 20°C		0.000681
Refractive index @ 20°C		1.505
Dielectric constant @ 23°C and 1 kHz		9.32
Electrical conductivity, μ mhos/cm @ 25°C		0.091
Heat of formation, 25°C BTU/lb		-139
Heat of vaporization, @ 760 mm Hg, °C, BTU/lb		162
Heat of combustion, BTU/lb 25°C		-14487
Ionization constants, K1 @ 25°C		0.72x10 ⁻⁴
pH of 1 wt% solution		11.5
Nitrogen content, wt. %		35.3
Amine value, mg KOH/g		1335

(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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