

# Technical Data Sheet

## Amietol™ M12

### Chemical Synonym

2,2'-(methylimino)diethanol; Methyl-diethanolamine; N-methyl-2,2'-iminodiethanol; N-methyliminodiethanol

### Applications

- Home & industrial care intermediates

### Product Description

Amietol M12 (MDEA) is a clear hygroscopic liquid with an amine-like odor. The freshly distilled product is colorless, but prolonged storage may cause a yellowish discoloration.

The principal applications for Amietol M12 include:

#### Detergents

The amino-alcohol functionality of MDEA makes it a very useful precursor for fatty ester quaternaries (also called esterquats).

These compounds are commonly used as active substances in fabric softeners and are a good alternative to the TEA-esterquats (based on triethanolamine), in terms of both biodegradability and cost/performance.

Typically the MDEA is first esterified with 2 molecules of fatty acid (mostly C12-acid or stearic acid). The amino fatty acid diester is then quaternized with methyl chloride to give the esterquat.

#### Coatings\_

MDEA can be used in the cationic modification of acrylic polymer dispersions.

#### Textiles\_

In the production of silicone-based textile finishing agents, MDEA is used in combination with perfluoroalkyl polymers.

#### Paper chemicals

By reaction with epichlorohydrin and formic acid hydroxy functionalized quaternary ammonium compounds based on MDEA can be transformed into cationic polyurethanes, useful as paper sizing agents.

#### Pharmaceuticals\_

MDEA can be used as a precursor for the following pharmaceutical active substances:

Chlormethine (bis-(2-chloroethyl)-methylamine)

Mepiridine (1-methyl-4-phenyl-4-piperidinecarboxylic acid ethyl ester)

### Typical Properties

Property	Typical Value, Units
<b>General</b>	
Molecular Formula	C <sub>5</sub> H <sub>13</sub> NO <sub>2</sub>
Molecular Weight	119.16 g/mol
Appearance	Colorless liquid
Autoignition Temperature	280 °C
Boiling Point	243.3 °C
Critical Pressure	37 000 hPa
Critical Temperature	404 °C
Density	

@ 20°C	1.04 g/cm <sup>3</sup>
Dissociation constant, pKa	
@ 25°C	8.68
Flash Point	
Closed Cup	138 °C
Freezing Point	-21.3 °C
Heat Capacity	
@ 20°C	1.72 kJ/kg·K
Heat of Formation	-91 649 kJ/kmol
Heat of Vaporization	418.7 kJ/kg
Octanol-water partition coefficient, log Pow (pH 10.5; at 23°C)	-1.16
Refractive Index	
@ 20°C	1.4642
Solubility in Water	Miscible
Vapor Density (air = 1)	4
Vapor Pressure	
@ 20°C	0.0031 hPa
Viscosity	
@ 20°C	99.05 mm <sup>2</sup> /s

## Physical & chemical behavior

Amietol® M12 (MDEA) is miscible in all proportions with water. It is also soluble in most organic solvents.

Chemically it acts as both a tertiary amine and an alcohol. Neutralisation of the amino function by acids results in salt formation.

The product is stable at elevated temperatures but must be kept away from oxidants and acids.

## Packaging

- Bulk
- Steel drums (215 kg net)
- Plastic drums (219 kg net)
- IBC containers (1 045 kg net)

## Storage

Carbon steel is adequate for storage of MDEA.

Stainless AISI 316 L is preferable if color stability is to be maintained over long periods.

Copper and copper alloys should be avoided.

For bulk storage a nitrogen atmosphere is necessary to prevent the absorption of moisture and discoloration.

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