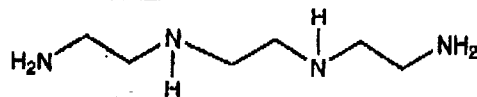


# Technical Bulletin

## HUNTSMAN

### TRIETHYLENETETRAMINE (TETA)

#### STRUCTURE



#### DESCRIPTION

Triethylenetetramine is a mixture of four TETA ethyleneamines with close boiling points including linear, branched and two cyclic molecules. These compounds are:

- TETA (CAS #000112-24-3, N,N'-bis (2-aminoethyl)-1,2-ethanediamine)
- Bis AEP (CAS #006531-38-0, N,N'-bis-(2-aminoethyl)piperazine)
- PEEDA (CAS #024028-46-4, N-[(2-aminoethyl)2-aminoethyl]piperazine)
- Branched TETA (CAS #004097-89-6, tris-(2-aminoethyl)amine)

#### APPLICATIONS

- Asphalt additives
- Corrosion inhibitors
- Epoxy curing agents
- Hydrocarbon purification
- Lube oil & fuel additives
- Mineral processing aids
- Polyamide resins
- Surfactants
- Textile additives

#### SALES SPECIFICATIONS

|                  |                   |
|------------------|-------------------|
| Appearance       | Liquid, colorless |
| Assay, wt. %     | 97.0 min.         |
| Color, Pt-Co     | 50 max.           |
| Amines, mol. wt. |                   |
| <TETA, wt. %     | 2.0 max.          |
| Water, wt. %     | 0.5 max.          |
| Drum shelf life  | 24 months         |

#### TYPICAL PROPERTIES

| Property                                             | SI Units |
|------------------------------------------------------|----------|
| Molecular weight                                     |          |
| (Linear component)                                   | 146.24   |
| (Typical product)                                    | 151      |
| Boiling point, 760 mm Hg, °C                         | 276.5    |
| Freezing point, °C <sup>a</sup>                      | -35.1    |
| Density, g/ml, 20°C <sup>b</sup>                     | 0.981    |
| Specific gravity 20°/20° <sup>b</sup>                | 0.983    |
| Viscosity, cp, 20°C                                  | 13.9     |
| Kinematic viscosity, cSt, 25°C <sup>b</sup>          | 21.4     |
| Kinematic viscosity, cSt, 40°C <sup>b</sup>          | 10.3     |
| Vapor pressure, 20°C, mm Hg                          | <0.01    |
| Specific heat, cal/g °C, 20°C                        | 0.482    |
| Thermal conductivity, cal/cm-sec-°C, 20°C            | 0.000450 |
| Surface tension, dynes/cm, 20°C                      | 22.2     |
| Coefficient of expansion, 1/°C, 20°C                 | 0.00075  |
| Refractive index, 25°C <sup>b</sup>                  | 1.496    |
| Dielectric constant, 25°C and 1 kHz <sup>b</sup>     | 11.4     |
| Electrical conductivity, μmhos/cm, 24°C <sup>b</sup> | 0.038    |
| Heat of formation, kcal/mol                          | -17.6    |
| Heat of vaporization, BTU/lb                         | 160.2    |
| Heat of combustion, BTU/lb                           | 14297    |
| Ionization constants, K <sub>b</sub> 1               | 6.7E-5   |
| 25°C, K <sub>b</sub> 2                               | 7.0E-6   |
| pH of 1 wt% solution <sup>b</sup>                    | 11.5     |
| Nitrogen content, % <sup>b</sup>                     | 37.0     |
| Amine value, mg KOH/g <sup>b</sup>                   | 1443     |

<sup>a</sup>Pour point

<sup>b</sup>Property of typical sales product

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