

Recommendation from Scientific Expert Group
on Occupational Exposure Limits
for Ethylamine

8 hour TWA	:	5.0 ppm (9.4 mg/m ³)
STEL (15 mins)	:	-
Additional classification	:	-

Substance:

Ethylamine		CH ₃ CH ₂ NH ₂
Synonyms	:	1-Aminoethane; ethanamine; monoethylamine
EINECS N°	:	200-834-7
EEC N°	:	612-002-00-4- Classification : F; R13 Xi; R36/37
CAS N°	:	75-04-7
MWt	:	45.08
Conversion factor (20°C, 101kPa)	:	1.88 mg/m ³ = 1 ppm

Occurrence/use:

Ethylamine is a colourless, volatile flammable liquid with a strong ammoniacal odour. It has a MPt of -81°C, a BPt of 16.6°C and a vapour pressure of 53.2 kPa at 20°C. It has a vapour density of 1.56 times that of air and is explosive in the range 3.5 - 14 % in air. The odour threshold is about 0.3 ppm (0.6 mg/m³).

Ethylamine is used as an intermediate in the chemical and pharmaceutical industries. It is used as a stabiliser for rubber latex, an intermediate for dyestuffs and in resin chemistry. The production rate in the EEC is in excess of 1,000 tonnes per annum.

Health Significance:

Ethylamine is a severe eye irritant. Dermal irritation may occur, probably due to the high pH. The acute inhalatory toxicity is presumed to be low.

From the limited data available the lungs are regarded as the critical target organ. A subchronic study in rabbits exposed to 48 ppm (90 mg/m³) and 95 ppm (180 mg/m³) ethylamine (7h/d, 5d/w, for 6 weeks) showed effects on lungs (small haemorrhages, peribronchitis and vascular wall thickening), kidneys (parenchymatous degeneration) and eyes (oedema of the cornea and nictitating membrane) at the high dose. At the lower dose the lungs showed similar symptoms without the haemorrhage (Brieger and Hodes, 1951). An RD50 value of 151 ppm (284 mg/m³) has been determined in mice (Gagnaire *et al.*, 1989).

No long term or reproductive studies are available.

A limited number of mutagenicity tests indicated that ethylamine is not mutagenic to bacteria, except in combination with nitrite.

Recommendation:

The study of Brieger and Hodes (1951), indicating a LOAEL of 48 ppm (90 mg/m³) for lung damage in rabbits, was considered to be the best available basis for proposing an 8-hour TWA. An uncertainty factor of 10 was considered appropriate to allow for the absence of a NOAEL, of long term animal data and of human data. Taking into account the preferred value approach, the recommended 8-hour TWA is 5.0 ppm (9.4 mg/m³). There was no sufficient basis for proposing a STEL.

No "skin" notation was considered to be necessary.

At the levels recommended, no measurement difficulties are foreseen.

Key Bibliography:

Dutch Expert Committee for Occupational Standards (1990) Health-based recommended occupational exposure limits for ethylamine (met Nederlandstalige samenvatting), Ra 7/90. Voorburg, Directorate-General of Labour of the Ministry of Social Affairs and Employment, the Netherlands. 21pp. ISSN 0921-9641. ISBN 90-5307-082-6.

Brieger, H. and Hodes, W.A. (1951). Toxic effects of exposure to vapors of aliphatic amines. Arch. Ind. Hyg. Occup. Med. 3, 287-291.

Gagnaire, F., Azim., S., Bonnet, P., Simon, P., Gueniere, J.P. and De Ceaurriz, J. (1989). Nasal irritation and pulmonary toxicology of aliphatic amines in mice. J. Appl. Toxicol. 2, 301-304.