

Chemical	Morpholine
CAS Number	110-91-8
Category	Category III
Cancer Classification	EPA: Not Evaluated IARC: Group 3; unclassifiable as to carcinogenicity to humans NTP: No Report
Proposed HAAS	159.07 ug/m <sup>3</sup>
Basis of Proposed HAAS	Information cited in study referred to in ACGIH TLV documentation (TLV-CL 0.01 ppm)
Basis of Value used to derive Proposed HAAS	Critical Effect: Nasal irritation Study Animal: Rat Exposure Route: Inhalation, 6 hours per day, 5 days per week for 90 days
Dose Extrapolation Method	NOAEL,LOAEL
Notes	Conaway, 1984 study referenced by ACGIH notes that no exposure related effects were noted in rats exposed as above to 25 ppm (89079.75 ug/m <sup>3</sup> ). This value was used as starting point for derivation of standard. Nasal irritation and nasal lesions were noted at higher levels of exposure.
Additional Tox and/or Occupational Values	VOSHA 1910.1 PEL 70,000 ug/m <sup>3</sup> (20 ppm) TWA 105,000 ug/m <sup>3</sup> (30 ppm) STEL NIOSH REL 70,000 ug/m <sup>3</sup> (20 ppm) TWA 105,000 ug/m <sup>3</sup> (30 ppm) STEL [skin] IDLH 4,988,466 ug/m <sup>3</sup> (1400 ppm) (10% LEL) ACGIH TLV-TWA 71,000 ug/m <sup>3</sup> (20 ppm) [skin]
Comparison Values	
Derivation of HAAS: $89079.75 \text{ ug/m}^3 \times (6\text{hr}/24\text{hr}) \times (5\text{d}/7\text{d}) \cong 15907.1 \text{ ug/m}^3$ $\text{HAAS (ug/m}^3\text{)} = \frac{\text{NOAEL}}{\text{UF}}$ UF = 10 for inter-species variability UF = 3 for intra-species variability UF = 3 for less than chronic study/data $= \frac{15907.1}{10 \times 3 \times 3}$ (For purposes of this evaluation, application of two factors of 3 is rounded to 10) $\cong 159.07 \text{ ug/m}^3$	