

Stofdocument deel A

CAS-nr: 57-14-7 **1,1- Dimethylhydrazine** (CH₃)₂NNH₂

VN-nr: 1163

Synoniemen: N,N-dimethylhydrazine, asym-dimethylhydrazine, dimazine (Eng.: Dimethyl hydrazine)

GEVI: 663

Interventiewaarden		10 min.	30 min.	1 uur	2 uur	4 uur	8 uur
Voorlichtingsrichtwaarden	VRW (mg/m³)	NA	NA	NA	NA	NA	NA
Alarmeringsgrenswaarden	AGW (mg/m³)	140	45	23	11	5,6	2,8
Levensbedreigende waarden	LBW (mg/m³)	490	160	82	41	20	10
Datum samenstelling: 28-11-2008		1 mg/m ³ = 0,4 ppm; 1 ppm = 2,5 mg/m ³					
Explosiegrens: LEL = 2 vol% ≈ 50 000 mg/m³			Geur: ammoniak-achtige stekende geur				
			LOA: 96 mg/m ³				

Fysisch-chemische eigenschappen		Overige informatie
Uiterlijk: kleurloze hygroscopische rokende vloeistof, die geel wordt aan de lucht	Molecuulmassa: 60,1 g/mol	Publieke grenswaarde: niet afgeleid MAK: niet afgeleid TLV- TWA: 0,025 mg/m ³ (proposed)
Brand: zeer brandgevaarlijk	Zuurgraad: Geen data	
Relatieve dichtheid van verzadigd damp-lucht mengsel: 1,2	LogKow: -1,2	
	Wateroplosbaarheid: Volledig	
	Verzadigde dampdruk: 145 mbar	

Toxicologische eigenschappen	
Effecten bij inhalatoire blootstelling <u>Onder AGW:</u> geen effect tot matige of ernstige irritatie van de luchtwegen, longoedeem, misselijkheid, braken, sufheid, kortademigheid, spiertrillingen <u>AGW → LBW:</u> ademnood, pijn op de borst, CZS depressie (ademstilstand, ernstige bloeddrukdaling, bewusteloosheid), convulsies <u>Boven LBW:</u> sterfte LET OP: De afwezigheid van een VRW betekent niet dat blootstelling onder de AGW zonder effecten is.	Toxiciteit bij eenmalige, inhalatoire blootstelling <ul style="list-style-type: none"> • 1,1-Dimethylhydrazine heeft een effect op het centraal zenuwstelsel wat zich uit in spiertrillingen en convulsies • 1,1-Dimethylhydrazine veroorzaakt contact irritatie aan ademhalingsorganen, huid en ogen • Sterfte is waarschijnlijk het gevolg van respiratoire stilstand en cardiovasculaire collaps. • 1,1-Dimethylhydrazine heeft een steile dosis-respons relatie.
Effecten bij blootstelling aan vloeistof <u>Huidcontact:</u> roodheid en pijn, branderig gevoel. <u>Oogcontact:</u> bijtend, slecht zien	Carcinogeniteit IARC classificatie: 2B CRP: 22 mg/m ³ (blootstelling 1 uur)

Beknopte medische informatie
Ontsmetting damp <u>algemeen:</u> frisse lucht, rust, halfzittende houding en direct spoedeisende medische hulp inzetten. <u>ogen:</u> minimaal 15 min. spoelen met water (evt. contactlenzen verwijderen), dan naar oogarts brengen, blijven spoelen tijdens vervoer.
Ontsmetting vloeistof <u>huid:</u> 1,1-dimethylhydrazine wordt door de huid opgenomen. Vanwege brandgevaar verontreinigde kleding uittrekken, minimaal 20 min. spoelen met veel water of douchen en arts raadplegen. <u>ogen:</u> minimaal 15 min. spoelen met water (evt. contactlenzen verwijderen), dan naar oogarts brengen, blijven spoelen tijdens vervoer. <u>inslikken:</u> mond laten spoelen (uitspugen!), GEEN braken opwekken en direct spoedeisende medische hulp inzetten.
Specifieke behandeling en materialen: geen. ³ Neem contact op met het NVIC (Tel: 030 - 274 8888) voor informatie met betrekking tot medisch handelen

Stofdocument deel B

CAS-nr: 57-14-7 **1,1- Dimethyl hydrazine** (CH₃)₂NNH₂

UN-nr: 1163

Basis for the Dutch Intervention Values

VRW: AEGL values are adopted (except 10 min value for which time scaling was applied), 2 hr value added

AGW: Same point of departure as for AEGL values but using different uncertainty factors, 2h value added

LBW: Same point of departure as for AEGL values but using different uncertainty factors, 2h values added

Date: 28-11-2008

Final AEGL document 2000

Dutch Intervention Values (mg/m³)

	10 min	30 min	1 h	2 h	4 h	8 h	End point
VRW	NR	NR	NR	NR	NR	NR	Not recommended
AGW	140	45	23	11	5.6	2.8	Neurotoxicity (muscular fasciculation, behavioural changes)
LBW	490	160	82	41	20	10	Threshold for animal lethality

Derivation of the Dutch Intervention Values

VRW: There are no suitable human data to derive a VRW. The experimental data with animals indicate that there is an almost non-existent margin between exposures resulting in no response and those causing lethality. Therefore, VRW values for dimethylhydrazine are not recommended.

AGW: The exposure value of 360 ppm (900 mg/m³) for 15 minutes, derived from a study with dogs was chosen as starting point for the derivation of the AGW. This exposure level resulted in behavioral changes and mild muscle fasciculations. A total uncertainty factor of 10 was applied. For interspecies variation a factor of 3 was applied, because the response to inhaled dimethylhydrazine was comparable between different laboratory species, especially for LC₅₀ values. They did not vary more than a 3-fold. The dog was found to be the most sensitive species. In deviation to the AEGL document, a factor of 3 was used for intraspecies variation, despite the variability observed in the effects (varying from extreme toxicity to no observable effects at the same dose levels). Regression analyses of exposure response data with dogs and rats, with exposures that varied from 5 to 240 minutes indicated a near linear exposure response of 0.84 for rats and 0.80 for dogs. Therefore, for time scaling, a linear relationship was assumed, and a value of 1. Time scaling using the equation $C^n \times t = k$, with $n = 1$, was used to derive the time specific AGWs. In contrast to the 10 min AEGL-2 value, time scaling was also applied for the 10 min AGW value.

LBW: The lethality threshold for dogs exposed to 1,1-dimethylhydrazine was estimated from the 1-hr LC₅₀ of 981 ppm (2452 mg/m³). Reducing this value 3-fold to 327 ppm (818 mg/m³) results in an exposure concentration 3 times higher than the 1-hr concentration associated with the no-effect level in dogs (96 ppm = 240 mg/m³). A total uncertainty factor of 10 was applied based on the same grounds as for the AGW derivation: a factor 3 for interspecies variation, because only small differences in effects were observed between species. A factor 3 for intraspecies variation was applied in view of the small within species variability among several animal species. Scaling to the LBW time frames was done using the equation $C^1 \times t = k$, as was done for time specific AGW values, including the 10 min LBW.

Additional toxicological information (including relevant results of a general literature search, if any)

The mechanisms of toxicity after acute inhalation exposure are directed to contact irritation (irritation of respiratory tract, pulmonary edema) nausea, vomiting as well as to neurologic effects, including muscle fasciculation, behavioral changes, tremors and convulsions. There is a very steep dose-response relationship indicating a very narrow margin between exposures producing no toxic responses and those resulting in significant toxicity.

No relevant information on reproductive and developmental toxicity with regard to the derivation of AGW values. Only studies parenteral applications were available, showing developmental effects only at maternally toxic doses.

H301: Toxic if swallowed, H314: causes severe skin burns and eye damage, H331: Toxic if inhaled, H350:

May cause cancer

Carcinogenicity and derivation of the CRP value	Odour and derivation of the LOA value
<p>IARC classification: 2B (Possibly carcinogenic to humans)</p> <p>Derivation of the carcinogenic risk potency (CRP):</p> <p>10^{-4} risk level after inhalation: $1 \times 10^{-4} \text{ mg/m}^3$ [AEGL]</p> <p>$\text{CRP} = (10^{-4} \text{ risk level} * \text{average life span in hours})/\text{DRCF}$</p> <p>$= (1 \times 10^{-4} * 613.200) / 2.8 = 22 \text{ mg/m}^3$</p> <p>In deviation to the AEGL document, a multistage factor of 2.8 was used in the above calculation, instead of 6.</p> <p>Therefore, the one-hour value in this document is a factor 2 higher than the CRP calculated in the AEGL document.</p>	<p>Ammonia-like pungent odour.</p> <p>OT_{50}: 6.1 mg/m^3 [Guidance for the application of Odor in Chemical Emergency Responses, 2002]</p> <p>$\text{LOA} = 11.8 * \text{OT}_{50} * 1.33 = 96 \text{ mg/m}^3$</p> <p>(The concentration <u>L</u>evel leading to distinct <u>O</u> odour <u>A</u>wareness ($I=3$) is calculated using the formula: $I = 2.33 * \log (C/\text{OT}_{50}) + 0.5$. A correction factor of 1.33 is applied to this value)</p> <p>The lower level of the LOA lies under the AGW-10 minute value and the LBW 10 and 30 min value, but above all other AGW values and the 1-8 hour LBW values. Apart from the 10-min LBW, the upper level is higher than all the proposed intervention values.</p>

Other standards and guidelines (1h values in mg/m^3, unless otherwise indicated)			
VRW level NR	AEGL-1 NR	ERPG-1 -	IDLH: = 37.5 mg/m^3 (30 min)
AGW level 23	AEGL-2 7.4	ERPG-2 -	
LBW level 82	AEGL-3 27	ERPG-3 -	