Rijksinstituut voor Volksgezondheid en Milieu
Ministerie van Volksgezondheid, Welzijn en Sport

Stofdocument deel A

CAS-nr: 67-66-3 **VN-nr: 1888**

Chloroform $CHCl_3$

GEVI: 60

Synoniemen: trichloormethaan, methaantrichloride, R20 (Engels.: chloroform)

Interventiewaarden		10 min.	30 min.	1 uur	2 uur	4 uur	8 uur
Voorlichtingsrichtwaarden	**VRW (mg/m^3)**	NA	NA	NA	NA	NA	NA
Alarmeringsgrenswaarden	**AGW (mg/m^3)**	580	400	320	250	200	150
Levensbedreigende waarden	**LBW (mg/m^3)**	29.000	20.000	16.000	12.000	9.900	7.900
Datum vaststelling: 24-09-2009				1 mg/m^3 = 0,201 ppm; 1 ppm = 4,98 mg/m^3			

Explosiegrens: Geen data

Geur: typerende aangename geur

LOA: niet afgeleid

Fysisch-chemische eigenschappen

Uiterlijk: kleurloze vloeistof
Brand: niet brandbaar

Relatieve dichtheid van verzadigd damp-lucht mengsel: 1,7

Molecuulmassa: 119,4 g/mol
Zuurgraad: Geen data
LogKow: 2,0
Wateroplosbaarheid: 0,8 g/100mL (slecht oplosbaar)
Verzadigde dampdruk: 212 mbar

Overige informatie

Publieke grenswaarde: 5 mg/m^3 (8 uur)
MAK: 2,5 mg/m^3
TLV-TWA: 50 mg/m^3

Toxicologische eigenschappen

Effecten bij inhalatoire blootstelling:

*Onder **AGW***: irritatie

AGW → LBW: effect op de ongeboren vrucht, irritatie, hoofdpijn, duizeligheid, misselijkheid, hartritmestoornissen, hypotensie, levernecrose, bewustzijnsdaling

Boven LBW: sterfte

LET OP: De afwezigheid van een VRW betekent niet dat blootstelling onder de AGW zonder effecten is.

Toxiciteit bij eenmalige, inhalatoire blootstelling

- De stof werkt irriterend op de ogen en bovenste luchtwegen.
- De stof werkt in op het centrale zenuwstelsel.
- Leververvetting en levernecrose kunnen optreden bij eenmalige blootstelling.
- De stof kan reprotoxische effecten veroorzaken.
- Sterfte is veelal het gevolg van acute effecten op het hart of vertraagde effecten op de lever.

Effecten bij blootstelling aan vloeistof

Huidcontact: roodheid, droge huid

Oogcontact: roodheid en pijn, slecht zien

Carcinogeniteit

IARC classificatie: 2B
CRP: 876 mg/m^3 (blootstelling 1 uur)

Beknopte medische informatie

Ontsmetting damp

algemeen: frisse lucht, rust, halfzittende houding en direct spoedeisende medische hulp inzetten.

Ontsmetting vloeistof

huid: verontreinigde kleding uittrekken en minimaal 20 min. spoelen met veel water of douchen.

ogen: minimaal 15 min. spoelen met water (evt. contactlenzen verwijderen), dan naar oogarts brengen.

inslikken: mond laten spoelen (uitspugen!), GEEN braken opwekken en direct spoedeisende medische hulp inzetten.

***Specifieke behandeling en materialen**: geen.*

Neem contact op met het NVIC (tel: +31 (0)30 –274 8888) voor informatie met betrekking tot medisch handelen.

National Institute for Public Health and the Environment
Ministry of Health, Welfare and Sport

Stofdocument deel B

CAS-nr: 67-66-3 **Chloroform** **$CHCl_3$** **UN-nr: 1888**

Basis for the Dutch Intervention Values

VRW: Not recommended

AGW: AEGL value adopted, 2hr value added

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

Date: 24-09-2009 | AEGL document: Final, 2012

Dutch Intervention Values (mg/m^3)

	10 min	30 min	1 h	2 h	4 h	8 h	End point
VRW	NR	NR	NR	NR	NR	NR	Not recommended
AGW	580	400	320	250	200	150	Fetotoxic effects in animals
LBW	29,000	20,000	16,000	12,000	9,900	7,900	Threshold for animal mortality

Derivation of the Dutch Intervention Values

VRW: Available data on VRW like effects are insufficient to derive VRW values. Specifically, it would be difficult to identify exposures that would produce notable discomfort or mild sensory irritation without approaching levels that may be near a threshold for narcosis.

AGW: The increased fetotoxicity and embryolethality of rats exposed to 100 ppm (497 mg/m^3) for 7 hrs/day on gestation days 6-15 was considered a sensitive critical effect and point-of-departure for developing AGW values. The assumption was made that the reported effects (increased fetotoxicity and embryolethality) occurring after the 10-day gestational exposure could result from a single 7-hour exposure. This contention is not without precedent as has been shown by analyses of developmental toxicity data for other chemicals. An intraspecies uncertainty factor of 3 was applied to account for individual variability in metabolism and disposition of chloroform. No adjustment was made for interspecies variability because available metabolism/kinetics data and PBPK models indicate that humans are less sensitive than laboratory species to the toxic effects of chloroform. Time scaling was performed using the equation $C^n * t = k$ with the defaults n=1 and n=3 for extrapolation to longer and shorter exposure durations, respectively.

LBW: Assuming the mouse to be the most sensitive species, the 560-minute LC_{50} of 4500 ppm (22,350 mg/m^3) appears to be a valid basis for development of the LBW values. A 3-fold reduction in this value results in a point-of departure of 1500 ppm (7450 mg/m^3) as an estimate of the lethality threshold for mice. No interspecies uncertainty factor was applied (see AGW derivation). Based on PBPK modeling, the internal exposure in humans is much lower. Therefore, no intraspecies factor is used. Time scaling was performed using the equation $C^n * t = k$ with the default n=3 for extrapolation to shorter exposure durations. In contrast to the 10 minute AEGL-3 value, time scaling was also applied for the 10 minute LBW value.

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

Chloroform is a well-known potent CNS depressor. Exposure will result in acute effects such as head ache, dizziness, vertigo, fatty liver and mild irritation of the respiratory tract, eyes and the skin. The substance also affects the heart which may result in cardiac arrhythmia, tachycardia and ultimately lead to death. Can induce narcosis. Substance is considered reprotoxic and this is the critical endpoint for AGW derivation.

Alternatively, for AGW derivation protection against severe hepato- or renal toxicity, or narcosis can be considered the critical effects. Human data suggest that exposures to 8500 ppm (42,220 mg/m^3) will induce anesthesia; although the duration of this exposure is unknown, it is assumed that the exposure duration would be in the order of minutes. The human data reported by Lehmann and Hasegawa (1910) suggest that exposure to 7500 ppm (37,250 mg/m^3) for 15 minutes or 4300-5100 ppm (21,360-25,330 mg/m^3) for 20 minutes were approaching narcosis-inducing effects as determined by signs and symptoms of dizziness, and “intoxication”. These data and the anesthesia data reported by Whitaker and Jones (1965) are, however, compromised by the uncertainties regarding determination of exposure concentrations and specific concentration duration relationships.

H302: Harmful if swallowed; H315: Causes skin irritation; H319: Causes severe eye irritation; H331: Toxic if inhaled; H352: Suspected of causing cancer; H361d: Suspected of damaging the unborn child; H372: Causes damage to organs.

Carcinogenicity and derivation of the CRP value	***Odour and derivation of the LOA value***
IARC classification: 2B (possibly carcinogenic to humans). Derivation of the carcinogenic risk potency (CRP): 10^{-4} risk level after inhalation: 0.004 mg/m^3 [US EPA 1992, 2005] CRP = (10^{-4} risk level * average life span in hours)/DRCF = (0.004 * 613.200) /2.8 = 876 mg/m^3 Based on a gavage study in mice, where a unit risk of 0.004 mg/m^3 was calculated for hepatocellular carcinomas.	Non-irritating and pleasant odour. No LOA was derived due to lack of reliable data.

Other standards and guidelines ***(1h values in mg/m^3, unless otherwise indicated)***

VRW level **NR**	*AEGL-1* NR	*ERPG-1* NA		*IDLH: 2,480 (30 min)*
AGW level **320**	*AEGL-2* 320	*ERPG-2* 250		
LBW level **16,000**	*AEGL-3* 16,000	*ERPG-3* 25,000		