

Stofdocument deel A

CAS-nr: 7790-91-2

Chloortrifluoride

ClF₃

VN-nr: 1749

GEVI: 265

Synoniemen: (Eng: Chlorine trifluoride)

Interventiewaarden		10 min.	30 min.	1 uur	2 uur	4 uur	8 uur
Voorlichtingsrichtwaarden	VRW (mg/m³)	0,46	0,46	0,46	0,46	0,46	0,46
Alarmeringsgrenswaarden	AGW (mg/m³)	31	13	7,9	4,6	2,7	1,6
Levensbedreigende waarden	LBW (mg/m³)	320	140	80	48	28	28
Datum vaststelling: 28-11-2008		1 mg/m ³ = 0,26 ppm; 1 ppm = 3,85 mg/m ³					
Explosiegrens: geen data			Geur: stekende geur LOA: niet afgeleid				

Fysisch-chemische eigenschappen

Uiterlijk: kleurloos gas
Brand: niet brandbaar, maar bevordert de verbranding van andere stoffen. Geeft giftige stoffen vrij in een brand en veel reacties kunnen brand of ontploffing veroorzaken.
Relatieve dichtheid van verzadigd damp-lucht mengsel: 3,18

Molecuulmassa: 92,5 g/mol
Zuurgraad: Geen data
LogKow: Geen data
Wateroplosbaarheid: reactie
Verzadigde dampdruk: 1000 mbar

Overige informatie

Publieke grenswaarde: niet afgeleid
MAK: niet afgeleid
TLV-TWA: niet afgeleid
TLV-Ceiling: 0,39 mg/m³

Toxicologische eigenschappen

Effecten bij inhalatoire blootstelling:

Onder VRW mogelijk lichte irritatie
VRW → AGW: oog- bovenste luchtwegirritatie, tranenvloed, hoesten, lichte benauwdheid
AGW → LBW: ernstige oog- en luchtwegirritatie, pijn op de borst, benauwdheid, longontsteking, longoedeem, hartkloppingen, spierkrampen
Boven LBW: convulsies, hartstilstand, ademnood, sterfte

Toxiciteit bij eenmalige, inhalatoire blootstelling

- Chloortrifluoride is instabiel in lucht en hydrolyseert onder vorming van waterstoffluoride (HF) en chloorhoudende verbindingen zoals chloordioxide (ClO₂). De toxiciteit van chloortrifluoride wordt bepaald door HF en ClO₂.
- Chloortrifluoride is corrosief voor alle weefsels. Bij acute inhalatoire blootstelling kunnen luchtwegen (longontsteking en/of longoedeem), slijmvliezen en huid aangetast worden; bij hoge concentraties kan blijvende longschade ontstaan.
- HF kan aanleiding geven tot een daling van Ca en Mg in het bloedserum

Effecten bij blootstelling aan vloeistof

Huidcontact: bijtend, roodheid, pijn, blaren, ernstige brandwonden op de huid.
Oogcontact: roodheid, pijn, ernstige diepe brandwonden, blijvend verlies van gezichtsvermogen.

Carcinogeniteit

IARC classificatie: niet geclassificeerd
CRP: niet afgeleid

Beknopte medische informatie

Inademing/inslikken van chloortrifluoride kan leiden tot larynx- en glottisoedeem, met risico op verstikking (asfyxie) door zwellingen in de keel. Intubatie eventueel gevolgd door beademing moeten in ernstige gevallen z.s.m. worden uitgevoerd (door specialisten).

Ontsmetting gas

algemeen: frisse lucht, rust, halfzittende houding calciumgluconaatoplossing 4% als vernevelde oplossing laten inhaleren en direct spoedeisende medische hulp inzetten.

Ontsmetting vloeistof

huid: verontreinigde kleding uittrekken (vastgevroren kleren niet lostrekken), afspoelen met water, daarna zo snel mogelijk calciumgluconaatgel 10% op de besmette huid aanbrengen¹⁾ en blijven inwrijven en direct spoedeisende medische hulp inzetten.
ogen: uitspoelen met water (evt. contactlenzen verwijderen), daarna zo snel mogelijk calciumgluconaatoplossing 4% in de ogen druppelen²⁾, dan naar oogarts brengen. Blijven druppelen tijdens vervoer.
inslikken: mond laten spoelen (uitspugen!), 200 ml calciumgluconaat 4% laten drinken³⁾, GEEN braken opwekken en direct spoedeisende medische hulp inzetten.

Specifieke behandeling en materialen:

calciumgluconaatoplossing 4% (inademen, ogen¹⁾ en inslikken²⁾); calciumgluconaatgel 10% (huid³⁾)

Neem contact op met het NVIC (Tel: 030 - 274 8888) voor informatie met betrekking tot medisch handelen

¹ bij het ontbreken van de 4% calciumgluconaatoplossing ogen minimaal 15 min. spoelen met water.

² bij het ontbreken van de 4% calciumgluconaatoplossing maximaal 200 ml water of melk laten drinken.

³ bij het ontbreken van de 10% calciumgluconaatgel de huid met veel water spoelen of douchen.

Stofdocument deel B

CAS-nr: 7790-91-2

Chlorine trifluoride ClF₃

UN-nr: 1749

Basis for the Dutch Intervention Values

VRW: AEGL values are adopted, 2 h value added

AGW: AEGL values are adopted, 2 h value added

LBW: AEGL values are adopted, 2 h value added

Date: 28-11-2008

Final AEGL document 2007

Dutch Intervention Values (mg/m³)

	10 min	30 min	1 h	2 h	4 h	8 h	End point
VRW	0.46	0.46	0.46	0.46	0.46	0.46	Mild irritation (nasal discharge)
AGW	31	13	7.9	4.6	2.7	1.6	Irritation, salivation, lacrimation, rhinorrhea, coughing and sneezing
LBW	320	140	80	48	28	28	Lethality in animals

Derivation of the Dutch Intervention Values

VRW: There are no suitable human data for the derivation of the VRW. The 1.17 ppm (4.5 mg/m³) exposure level, derived from a dog study (6 hr/d, 5 d/wk, 6 wks) was used as a starting point for the calculation of the VRWs. At this dose level, nasal discharge as observed, indicating nasal irritation within 45 minutes of exposure and obvious lacrimation was not observed until 3 hours of exposure. A total uncertainty factor of 10 (3 x 3) was applied; 3 for interspecies differences (the dog was more sensitive than the rat) and 3 for intraspecies differences (slight irritation should occur at similar level among the general population). Time-scaling was not applied, because adaptation to slight irritation occurs. Therefore, the calculated value of 0.12 ppm (0.46 mg/m³) was used for all time points. The resulting VRW values are in accordance with the VRW levels for ClO₂ of 0.15 ppm (0.41 mg/m³, slight sensory irritation) and HF of 0.8 mg/m³ (1.0 ppm), which are expected to be rapidly formed by hydrolysis (one mole of ClF₃ potentially forms three moles of HF and one mole of ClO₂).

AGW: For the derivation of the AGWs, the 5.15 ppm (20 mg/m³) level (6 hr/d, 5 d/wk, 6 wks) showing irritation, salivation, lacrimation, rhinorrhea, coughing, and sneezing in dogs, was used. Twenty rats exposed to this concentration for 6 hours appeared unaffected. However, repeated daily exposure of rats and dogs to this concentration resulted in increasingly severe signs of irritation. A combined uncertainty factor of 10 was applied; 3 for interspecies differences (the value is based on the dog, which was considerably more sensitive than the rat) and a factor 3 for intraspecies differences (irritation should occur at a similar concentration level among the general population). Scaling across time was done using the Cⁿ x t = k relationship, with n= 1.3. Although the endpoint for time scaling was lethality in several species, the same time relationship can be used for the AGW and the LBW, because the difference between severe irritation (AGW) and lethality (LBW) is one of degree. The 10-minute value was time-scaled from the 6-hr point of departure, because time-scaling data were available for 13.5 to 222 minutes. The AGW values are considerably lower than the calculated AGW values for HF and similar to the longer term AGW values for ClO₂. The 10- and 30 minute values for ClF₃ are lower than the 10- and 30-min values for ClO₂, because in contrast to ClO₂, time-scaling data were available for ClF₃.

LBW: Of three species tested, the mouse is the most sensitive species as determined by the 1-hour LC₅₀ of 178 ppm (685 mg/m³). However, based on the similar respiratory rates, gross respiratory tract anatomy, amount and distribution of types of respiratory epithelium, and nasal flow patterns, the monkey is the more appropriate model for chemical disposition in the human respiratory tract. The LBW values are based on the highest 1-hour concentration that resulted in no deaths in monkeys, 127 ppm (489 mg/m³). A total uncertainty factor of 6 was applied, 2 for interspecies differences (the monkey is an appropriate model for extrapolation to humans) and 3 for intraspecies differences (appropriate for differences among individuals in sensitivity to contact irritants should not differ greatly). Time scaling was performed using the equation C^{1.3} x t = k. The value for n was calculated using lethality data of different species. The 8-hour LBW value was set equal to the 4-hour value because the time-scaled 8-hour value of 4.3 ppm (16.5 mg/m³) is inconsistent with the experimental data: dogs exposed to 21 ppm (81 mg/m³) for 2 days did not die during the following months of

observation and dogs and rats tolerated repeated 6-hour exposures to 5.15 ppm (20 mg/m³) for several weeks before the first death was recorded.

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

Chlorine trifluoride is corrosive to all tissues, especially the respiratory tract. In the moist respiratory tract, ClF₃ is predicted to hydrolyze to ClOF, which further degrades to ClO₂F and ClF. ClO₂F rapidly hydrolyzes to ClO₂, HF and ClO_x anions; the first two products predominate and are thought to be responsible for ClF₃ toxicity as the ClO_x anions are relatively nontoxic.

No information on reproductive toxicity was found in the available literature.

No harmonized H-sentences for human health.

Carcinogenicity and derivation of the CRP value

IARC classification: not classified.

Derivation of the carcinogenic risk potency (CRP): No carcinogenic risk potency was derived.

No information on the chronic toxicity or carcinogenic potential of chlorine trifluoride either in humans or animals was located.

Odour and derivation of the LOA value

Pungent odour.

No LOA was derived due to lack of data. No ranges can be identified either.

Other standards and guidelines (1h values in mg/m³, unless otherwise indicated)

VRW level 0.46	AEGL-1 0.46	ERPG-1 0.39	IDLH: 77 mg/m³ (30 min)
AGW level 7.9	AEGL-2 7.7	ERPG-2 3.9	
LBW level 80	AEGL-3 81	ERPG-3 39	