

## Chlorine

### Definition of causal agent

At ambient temperature and pressure chlorine is a green-yellow gas, which is heavier than air and has a pungent, suffocating smell.

#### *Main occupational uses and sources of exposure:*

Chlorine is widely used in the chemical industry for the synthesis of derivatives such as: hydrochloric acid, hypochlorite, calcium and zinc chloride, organic chlorine compounds. It is also used as a bleaching agent in the textiles and paper industries, and is a powerful disinfectant in water purification.

### Toxic effects

#### *1. Acute effects*

##### **☐ Irritant and corrosive effects**

Chlorine may cause severe irritation of the skin, eyes and respiratory tract (pulmonary oedema). Recovery without pulmonary sequelae is usual but some complications have been reported such as bronchiolitis, pulmonary fibrosis and emphysema. Accidental and repeated exposure to high concentrations of chlorine may cause bronchial hyper responsiveness (Irritant Induced Asthma or Reactive Airways Dysfunction Syndrome) and chronic rhinitis that may persist for several years.

Direct contact with liquid chlorine produces severe ocular lesions and skin damage.

See section on *Occupationally caused irritation of the skin and mucous membranes* in Annex I entry nr. 202.

#### ***Exposure criteria:***

##### *Minimum intensity of exposure*

- Occupational exposure confirmed, if possible assessed by history and study of exposure conditions providing evidence of skin contact or inhalation.
- Workplace air monitoring:  
Guide values: atmospheric concentration well above 1.5 mg/m<sup>3</sup> Cl (0,5 ppm) (STEL, SCOEL)

*Minimum duration of exposure:* Seconds to minutes depending on the intensity of the exposure.

*Maximum latent period:* The first manifestations should appear during exposure or within a few hours.

#### *Chronic effects*

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An increased risk of asthma (Relative Risk > 2) and chronic obstructive pulmonary disease has been established in pulp-mill workers and domestic cleaners. Repeated exposure to chlorine may be one of the causal agents.

***Exposure criteria***

*Minimum intensity of exposure*

- Repeated occupational exposure confirmed, if possible assessed by history and study of exposure conditions providing evidence of inhalation.

Workplace air monitoring:

Guide values: atmospheric concentration above 1.5 mg/m<sup>3</sup> (0.5 ppm) (STEL, SCOEL)

*Minimum duration of exposure:* Seconds to minutes depending on the intensity of the exposure

*Maximum latent period:* The first manifestations should appear during the period of employment causing exposure.