Annex I 129.01

Aromatic amines or aromatic hydrazines or halogenated, phenolic, nitrified, nitrated or sulfonated derivatives thereof

Definition of causal agent

Aromatic amines are chemical compounds derived from aromatic hydrocarbons by the replacement of at least one hydrogen atom by an amino group ($-NH_2$).

Most common compounds: aniline, aminophenol, 4-aminodiphenyl, 2-naphthylamine, toluidine, 4,4-diaminodiphenyl-methane (MDA), benzidine, phenylendiamine.

Main occupational uses and sources of exposure:
Synthesis of dyes and pigments; used as intermediates in the manufacture of isocyanates; accelerators and anti-oxidants in the rubber industry; pharmaceutical industry; production of herbicides. The production and use of the following aromatic amines have been banned in the EU, according to Council Directive 88/364/EEC: 2-naphthylamine, 4-aminobiphenyl, benzidine, 4-nitrodiphenyl and their salts.

Toxic effects

Most of the aromatic amines are able to penetrate the intact skin.

1. Local effects

☐ Irritant effects

Aromatic amines can irritate the skin, eyes and upper respiratory tract.
See section on ***Occupationally caused irritation of the skin and mucous membranes*** in Annex I entry nr. 202.

☐ Allergic effects

Some aromatic amines induce hypersensitivity in the skin and respiratory tract, *e. g.*:
p- (m-) phenylenediamine, nitroanilines, 2-aminophenol.

2. Systemic effects

Acute

☐ Haematological disorders

Methaemoglobinaemia
At methaemoglobin levels > 10%, cyanosis occurs
At methaemoglobin levels > 20 to 25%, hypoxia occurs
At higher methaemoglobin levels: low blood pressure, headache, and nervous system dysfunction.

Haemolytic anaemia

Presence of HEINZ bodies in red blood cells.

Exposure criteria:

Minimum intensity of exposure:
Occupational exposure confirmed by:

- history and study of working conditions providing evidence of repeated acute or intense exposure to aromatic amines (taking into account the possibility of absorption via the skin)

Minimum duration of exposure: From a few minutes to a few hours depending on the intensity of exposure.

Maximum latent period: Several days.

☐ Liver effects

Most occupational over-exposures with aromatic amines lead to transient liver function abnormalities. Disorders of the liver ranging from reversible functional abnormalities to severe atrophy. Jaundice occurred in cases of ingestion of MDA.

Chronic

☐ Cancer of the bladder

Cancer of the bladder (and, to some extent, cancer of the efferent urinary passages) resulting from prolonged exposure to certain aromatic amines, especially benzidine, 2-naphthylamine, 4-aminodiphenyl, o-toluidine and others. To some extent the risk is dependent upon the individual speed of metabolic acetylation of these compounds; persons with a slower acetylation rate have a higher risk than those with faster acetylation.

Exposure criteria:

Minimum intensity of exposure: Occupational exposure confirmed by:

- history and study of working conditions providing evidence of prolonged/repeated exposure to the above mentioned aromatic amines (taking into account the possibility of absorption via the skin)

Minimum duration of exposure: One year

Minimum induction period: 10 years

Maximum latent period: Not known

See section on ***Occupational cancers*** in the **Preface.**