

**Cobalt metal with tungsten carbide**  
**Co [CAS No.7440-48-4]**  
**WC [CAS No.12070-12-1]**  
**Occupational carcinogen: Group 2A**

Summary of classification

The Japan Society for Occupational Health (JSOH) classified cobalt and cobalt compounds into Group 2B carcinogens (1995). Two cohort studies<sup>1-4)</sup> of hard metal workers in Sweden and France showed that exposure to cobalt metal with tungsten carbide increased mortality from lung cancer. In a rodent study, inhalation exposure to cobalt metal increased the incidences of alveolar/bronchiolar carcinoma in both sexes<sup>5)</sup>. The International Agency for Research on Cancer (IARC) changed the classification of cobalt metal with tungsten carbide to Group 2A (2006)<sup>2)</sup>. The mechanical study indicated that tungsten carbide has an important role in carcinogenesis. On that account, JSOH proposed to classify cobalt metal with tungsten carbide into Group 2A carcinogens, as a dependent substance from cobalt and cobalt compounds (without tungsten carbide).

Year of Proposal: 2016 (Group 2A)

**References**

- 1) Hogstedt C, Alexandersson R. Mortality among hard metal workers. *Arbete Hälsa* 1990; 21: 1–26.
- 2) Lasfargues G, Wild P, Moulin JJ, et al. Lung cancer mortality in a French cohort of hard-metal workers. *American Journal of Industrial Medicine* 1994; 26 (5): 585–595.
- 3) Moulin JJ, Wild P, Romazini S, et al. Lung cancer risk in hard metal workers. *American Journal of Epidemiology* 1998; 148 (3): 241–248.
- 4) Wild P, Perdrix A, Romazini S, et al. Lung cancer mortality in a site producing hard metals. *Occupational and Environmental Medicine* 2000; 57 (8): 568–573.
- 5) National Toxicology Program (NTP). NTP technical report on the toxicology studies of cobalt metal in F344/N rats and B6C3F1/N mice (Inhalation studies), NTP TR 581 NIH Publication No. 14-5923, 2013.
- 6) IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. Cobalt in hard metals and cobalt sulfate, gallium arsenide, indium phosphide and vanadium pentoxide. *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*. 2006; 86: 1.