Call for Evidence:

Occupational Exposure Limit for

Cadmium and its Inorganic Compounds

Brussels, 2 June 2020

In response to the above Call for Evidence, the International Cadmium Association would like to submit recently updated and extensive information on uses and occupational exposure to cadmium and cadmium compounds collated from measured data by Industry over the last 10 years in the EU, as well as an update summary and conclusions on health effects, toxicology, epidemiology and modes of action from the scientific literature. The input is structured in 3 parts:

Part 1. Uses and occupational exposure

The information on uses of cadmium and cadmium compounds has been updated with recent numbers on the different applications in the EU. Restriction and substitution in the EU have reduced the use to critical application where no substitute is available.

Occupational exposure is more extensively described and documented with results of more than a decade of extensive data collection by ICdA on biomonitoring and workplace air monitoring in EU industrial settings where cadmium exposure can occur. The results cover annual monitoring data from approximately 5000 exposed workers in about 40 plants across Europe. The data clearly illustrate the significant and continuously ongoing progress made in workers protection.

Part 2. Health effects: Genotoxicity and modes of action

This part starts with an updated literature summary on the genotoxicity data (*in vitro*, *in vivo*, human) for cadmium and cadmium compounds is provided. This overview mainly focuses on the literature published since the last SCOEL evaluations of cadmium and its inorganic compounds.

International Cadmium Association
168, Avenue de Tervueren/Box4
B-1150 Brussels Belgium

International Cadmium Association

Tel +32 (0)2 776 00 96
Fax +32 (0)2 776 00 73
www.cadmium.org

It then reviews the mechanisms of action involved in the genotoxic activity of Cd compounds and whether there is evidence to deviate from the default regulatory approach, which assumes a non-threshold mechanism of action.

The various lines of evidence described are consistent with a mechanism of action-based threshold for the genotoxic activity of cadmium and cadmium compounds. *In vitro* data demonstrate sufficient evidence that thresholded dose-response relationships take place. Lowest concentrations inducing statistically significant effects could be identified with consistency across all genotoxicity endpoints. *In vivo* genotoxicity studies are reinforcing this evidence. The evidence from human workers data supports a thresholded genotoxic mode of action as well.

Part 3. Health effects: Repeated dose toxicity and Carcinogenicity

A literature update of data published after the SCOEL 2010 and 2017 review is provided. This covers long term health effects of cadmium and cadmium compounds in animals and humans, with focus on specific target organ toxicity/repeated exposure and carcinogenicity.

The aim of the literature update has been to address specific questions:

A. Is the kidney still the critical organ (systemic) after repeated exposure? And what is the effect level?
B. Are other systemic endpoints (bone, ED) covered by this effect level?
C. Is lung function impairment still the critical effect after inhalation exposure and what is the effect level? (Consequently can 4 µg/m³ respirable fraction still be retained as protective for this end point)?
D. Is an OEL-only based approach protective against renal effects?

This current updated literature review clearly indicates there are no new good quality studies which bring any new, clear conclusions to the SCOEL assessment linked to the above questions (A-C). However, the weaknesses or limitations of adopting an OEL-only based approach for protection against renal effects, are documented and discussed.

This review was executed by EBRC consulting, Germany in collaboration with the International Cadmium Association

Summary and conclusion

In conclusion, with the submission of these 3 parts of information in this Call for Evidence, the International Cadmium Association believes it has provided a detailed and well-balanced assessment of current Scientific knowledge on cadmium. We would be happy to discuss or provide any further information which might contribute in the process of the review of the existing occupational exposure limits for cadmium and its inorganic compounds.

Respectfully submitted by:

Mik Gilles
Director
International Cadmium Association