

Specific questions exemption 9

“Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators”

The following specific questions should be answered in your stakeholder contribution if you support exemption 9 to be continued / amended / discontinued:

1. Please state the **amount of CrVI** used per fridge, the CrVI content in the homogeneous material, the annual production volume of adsorption fridges in the EU as well as number of such fridges put on the EU market annually in applications falling under the scope of RoHS.
2. Are there **standard specifications** for absorption refrigerators used in RoHS-relevant applications?
3. Please provide evidence that manufacturers have put effort in **research on CrVI alternatives** for corrosion protection in the cooling liquid (e.g. test results or executive summaries of research activities). What are the alternatives to CrVI and which ones are likely to be used as substitutes? Please especially elaborate on expected life length of an alternative corrosion inhibitor, product safety, product performance and energy efficiency when using alternatives.
4. Are manufacturers still **investigating alternatives**? If yes, please provide a roadmap or similar evidence showing until when they intend to replace CrVI in the mentioned application (the evidence requested can be a simplified schematic overview as e.g. a Power Point slide on the timeline foreseen for substitution). If no, please explain and justify why no further research has been undertaken against the background that the RoHS Annex is subject to regular revisions.
5. Please explain the detailed (technical) **functionality of CrVI** as corrosion protection agent in the cooling liquid and why currently no other substance can fulfil the corresponding requirements. What technical characteristics do substitutes need to fulfil as a minimum requirement?
6. Assuming the current exemption will be given an **expiry date**, what date do you think is technologically feasible for industry?
7. On the other hand, assuming that the current exemption will be given a **limitation** in the content of CrVI in the cooling liquid, what would be an acceptable maximum amount (e.g. 4 g / fridge or x% of the cooling liquid or any other adequate reference parameter)?
8. What would be an acceptable reduction of a **refrigerator's lifetime** if using CrVI-free corrosion inhibitors from a technical and scientific point of view?

9. What possible **increase in energy** consumption would be acceptable from an environmental point of view if a certain loss in temperature performance would be accepted when using CrVI-free corrosion inhibitors?