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Adaption to scientific and technical progress under Directive 2002/95/EC

Results previous evaluation
Exemption No. 28

"Hexavalent chromium in corrosion preventive coatings of unpainted metal sheetings and fasteners used for corrosion protection and Electromagnetic Interference Shielding in equipment falling under category three of Directive 2002/96/EC (IT and telecommunications equipment). Exemption granted until 1 July 2007"

(Excerpt from Öko-Institut Report 2007; Annex 1 Monthly Report 7)

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exemption was handed in to the Commission by 26 July 2006, the component would be phased-out by end 2007 thus making an exemption obsolete by then[4].

5.2.2.1 Final recommendation

Since the applicant could not bring forward sufficient argumentation and evidence - in line with Art. 5 (1) (b) –concerning his exemption request and since it is assumed that the necessity of an exemption will not be maintained beyond end of 2007, it is recommended not to grant the exemption.

Nevertheless, the attention is drawn to the fact that this exemption request belongs to the lot of the so-called LTB requests and that an evaluation sticking closely to Article 5 (1) (b) does not seem to be adequate (for the general discussion of this issue please refer to section 5 of monthly report 9 of the last evaluation contract[5]).

5.3 Hexavalent Chrome Cr-VI when used as a passivate – Amphenol Limited (set 6 request no. 18)

5.3.1 Description of requested exemption

Amphenol Limited requests an exemption for the use of CrVI as surface treatment used to protect metal parts like connectors, fasteners and associated fittings. The aim is to get a surface which provides high corrosion resistance, electrical conductivity, self healing and colourant properties.

The estimated amount of CrVI affected by this exemption request in one year is 25 t.

This request is very similar to request 5 of the second stakeholder consultation. The previous evaluation can be found in monthly reports 3 and 9 of the former contract[6].

The applicant requests an exemption as a minimum until 1 July 2007 to be consistent with the ELV Directive. He suggests that it should then be reviewed in the light of advances in science and available replacement technology prior to that date.

Upon request to narrow down its request to certain categories of the WEEE Directive instead of requesting a general exemption for the use of CrVI as passivate in electrical and electronic equipment, the applicant proposed the following wording:

"*CrVI used in corrosion preventive coatings of metal and of plated connectors, fasteners, and associated fittings used for corrosion protection and electrical conductivity (in view of electrical radio frequency and electromagnetic interference shielding, or where electrical*

[4] The applicant has upon his submission for exemption been informed by the Commission about the length of the process by e-mail on the same day.

[5] See Annexes to the Final Report published on http://ec.europa.eu/environment/waste/weee/studies_en.htm

[6] See Annexes to the Final Report published on http://ec.europa.eu/environment/waste/weee/studies_en.htm

earth or electrical grounding requirements exist) in equipment falling under categories three, five and six of Directive 2002/96/EC."

This wording is similar to the wording of the existing exemption no. 8 in the RoHS Annex. The differences are shown in the table below.

Table 2: Comparison current wording exemption no. 8 and new proposal

	Wording exemption no. 8	**New wording proposed**
Coating of	unpainted metal sheetings and fasteners	metal and of plated connectors, fasteners, and associated fittings
Electrical characteristics	electromagnetic Interference shielding	electrical conductivity (in view of electrical radio frequency and electromagnetic interference shielding, or where electrical earth or electrical grounding requirements exist)
WEEE categories	3 "IT and telecommunications equipment"	3 "IT and telecommunications equipment"; 5 "Lighting equipment" and 6 "Electrical and electronic tools"

5.3.2 Summary of justification for exemption

The applicant justifies his exemption request according to the following technical and environmental arguments. The argumentation on the positive effects of CrVI as surface treatment as well as the non-availability of suitable alternatives is similar to the argumentation used in the previous stakeholder consultation on the same topic:

- CrVI allows for self-healing properties (continues to protect surfaces when scratched), provide an electrically conductive surface and provide a finished coloured surface.
- Alternatives like coated steel, paint finishes and / or polymer coatings, stainless steel, aluminium and aluminium alloy substrates as well as metallic nickel, zinc, CrIII or other combination plating finishes are not able to deliver the same above-mentioned properties all in one as CrVI can.
- Using an alternative would lead to severe corrosion, leading to poor electrical connection, causing failure of the product, preventing repair, and in some cases causing a safety hazard.
- The automotive industry has been allowed an exemption until 1 July 2007 for the same application. The RoHS Directive should at least be in line with the ELV Directive.
- According to the applicant, the reasons why alternatives to CrVI investigated by industry are not suitable for the use of surface protection of connectors, fasteners and associated fittings in electrical and electronic products are the following:
  - Coated steel: new coatings for steel are primarily developed for automotive industry (e.g. CrIII); applicant claims these to be less effective with respect to "self healing" and provision of electrically conductive surface. Applicant states that it is not possible to obtain corresponding data or samples for purposes of qualification testing and life expectancy trial.

  - Paint finishes and / or polymer coatings: applicant claims than when used electrical grounding and protection from Electrical Radio Frequency Interference (RFI) and EMI (Electro Magnetic Interference) is lost. Also electrical conductivity might be lost which can be useful for electrical safety purposes (e.g. positive earth connection).
  - Stainless steel alternatives: the applicant states that stainless steel can be used as an alternative for selected applications but that due to its very high price it cannot be used as an alternative in commercial quantities. Furthermore, the applicant argues that stainless steel requires more energy to process and would thus lead to waste of natural resources.
  - Aluminium and aluminium alloy substrates: applicant states that aluminium metal components tested to date with CrIII or equivalent passivate finishes are unable to meet the same level of protection as CrVI.
  - Metallic nickel, zinc, chromium or other combination plating finishes: applicant admits that these alternatives are technically suitable for some applications like fasteners However, the applicant argues that costs would be higher and that resources would be wasted since plating finishes of this type would need to be significantly thicker.
- Research into substitutes is currently mostly carried out with a view to harmonise with the ending of the current exemption in the ELV Directive. The applicant states that however, many applications in the automotive industry do not have the same strong requirements about electrical conductivity as electronics.
- Furthermore, the applicant argues that technically feasible substitutes (i.e. coated steels) are not available in sufficient quantity to support production of electronic goods for the European market.
- According to the applicant, the use of CrVI has to be seen together with the use of other surface plating such as e.g. Cadmium. Since some use of Cadmium (i.e. in electrical contacts) has been exempted from the requirements of the RoHS Directive (entry of the Annex no. 8), the applicant requests the same condition for the use of CrVI. He argues that otherwise cadmium applications mentioned in the exemption would become “at risk”.
- The applicant has been supported in his argumentation by several stakeholders (e2v, Emerson, Serious Science, BCF, Glenair and Tyco).
- One stakeholder – Electrolux – has reiterated their previous statement that for household appliances there are technical and economical viable substitutes to CrVI surface coatings available (e.g. CrIII, galvanised metal layers, Zinc flake techniques, and zirconium based passivation solutions. According to this stakeholder these new solutions show no reduced performance with regard to corrosion protection, friction, thread tolerance or thermal resistance and are also available insufficient quantities.

- Responding to this argument the applicant states that household appliances do not generally have RFI and EMI shielding requirements. He argues that in general equipment belonging to WEEE categories 1, 2, 4, 7 and 10 does not have this type of requirement and is furthermore generally used in a benign environment and therefore does not require extended corrosion protection.

A critical review of the documents made available by the applicant and of further data and information given by other parties lead to the following observations and conclusions:

- The applicant has stated that the exemption in force no. 28 does not cover his exemption request since the wording restricts the exemption to “metal sheetings and fasteners” while the applicant requests an exemption for “connectors, fasteners and associated fittings”. A re-wording of the existing exemption no. 28 would thus have to take place if it is recommended to grant the exemption request.
- Upon request by Öko-Institut, the applicant admitted that due to an absence of exemption, “Amphenol Limited in common with other manufacturers of high reliability connectors and associated components have been prevented by the RoHS Legislation from supplying connectors with high corrosion resistance finishes and enhanced electrical conductivity. Customers have had to purchase product with either inferior protection (which will require early replacement due to corrosion) or have purchased stainless steel product which, due to the overall energy costs associated with producing and machining Stainless Steel, it rates as a very poor second to aluminium which has been plated with a CrVI passivate protection.”
- This leads to the conclusion that alternatives are technically feasible. However, the applicant also mentions the higher amount of energy necessary for the production of the stainless steel alternatives leading to the question whether the environmental impact of substitution might outweigh the benefits thereof. This question cannot be answered within the framework of this evaluation since no sufficient data is available and the applicant has not supported this statement by any evidence.
- The applicant argues that even though “research has been ongoing for a number of years by the metal finishing industry globally, to date no replacement has been found which will provide the electrically conductive, self healing, coloured finishes with high corrosion resistance […] performance that is obtainable from the present CrVI.” This argumentation is not in line with Art. 5 (1) (b) since technical practicability cannot be understood in a way that a substitute needs to be a 1:1 replacement fulfilling all characteristics of the restricted substance. As stated above, substitutes appear to exist for some of the applications mentioned by the applicant even if the use of these substitutes leads to certain restrictions.
- The argumentation that a technical practicability of substitutes in household appliances cannot be taken over for all electrical and electronic equipment is comprehensible and has been used in the context of the previous evaluation of request 5 in the second

stakeholder consultation. WEEE category 3 (IT and telecommunications equipment) has in that context already be identified as having stricter requirements to surface treatment than household appliances thus leading to the existing exemption no. 28. Whether this is also the case for categories 5 (lighting equipment) and 6 (electrical and electronic tools) is less comprehensible.

- However, as stated in monthly report 9 of Öko-Institut's previous contract[7], "other industry sectors than ICT may have problems in complying with RoHS by 1 July 2006. The new proposed wording has not been subject to a stakeholder consultation thus not giving stakeholders the chance to comment on the now narrowed exemption request." Thus, even though the applicant has not well justified the necessity to include categories 5 and 6 into an exemption, the general argumentation on substitution issues described in the monthly report are still valid, i.e. it is possible than alternatives to CrVI are not yet fully practicable for certain applications.
- Furthermore, the applicant asks for an alignment with the ELV Directive. In the mentioned monthly report 9 Öko-Institut recommended that "phase-out of Cr-VI in passivation coatings should be harmonised with Annex II of Directive 2000/53/EC (on end-of-life-vehicles). Item 13 a) of this Annex includes the exemption for the use of hexavalent chromium in corrosive preventive coatings, which expires on 1 July 2007. Thus, in the field of electric and electronic products covered by RoHS Directive, the same time-line should be applied." This has also to be seen in the context that "supply chains of the automotive industry and the ones of the electronics industry are often the same and that in practice it can not be guaranteed that supply and delivery channels can be properly separated in order to ensure RoHS conformity. This is especially the case for stocks that supply both industry sectors (e.g. a screw used in a car might just as well be used in a refrigerator)."
- Following from the above, it is recommended to grant the exemption until 1 July 2007. However, the wording proposed by the applicant would needed to be cross-checked with the applicant of request 5 from the second stakeholder consultation as well as other concerned stakeholders concerning inclusion of WEEE categories 5 and 6 as well as the changes in the wording regarding the metal parts exempted and the purpose of the surface treatment (see explanation of proposed wording in section 5.3.1).
- Since the timeline between transmission of the current monthly report to the Commission, the ensuing formal procedure until a possible proposal of the Commission to adopt a new wording and the entry into force of the exemption would exceed by far 1 July 2007, it does not appear sensible for the Commission to take over the proposed exemption into the formal procedure of RoHS Annex adaptation.

[7] See Annexes to the Final Report published on http://ec.europa.eu/environment/waste/weee/studies_en.htm

5.3.2.1 Final recommendation

Concluding from the above-mentioned review, it is not recommended to grant the requested exemption. This takes into account that due to the length of the formal procedure of adaptation of the RoHS Annex, the exemption will not be able to be passed though on time before the date of expiry of the existing exemption no. 28 it should replace.

However, should an extension of exemption no. 28 be envisaged, it is strongly recommended to review the new proposed wording with all relevant stakeholders- especially with those involved in the exemption request no. 5 of the second stakeholder consultation.

A proposal for a new wording would then be the following:

"CrVI used in corrosion preventive coatings of metal, unpainted metal sheetings and of plated connectors, fasteners, and associated fittings used for corrosion protection and electrical conductivity (in view of electrical radio frequency and electromagnetic interference shielding, or where electrical earth or electrical grounding requirements exist) in equipment falling under categories three, five and six of Directive 2002/96/EC."

This wording should then replace the existing exemption no. 28.

6 Further proceeding

The next step will be to finally clarify open issues concerning withdrawals, scope issues and necessary technical clarifications with applicants. Furthermore, recommendations for remaining requests will be finalised.

The next monthly report is scheduled for 24 June 2007.