



Brussels, **XXX**  
[...](2015) **XXX** draft

**COMMISSION DELEGATED DIRECTIVE ../.../EU**

**of **XXX****

**amending, for the purposes of adapting to technical progress, Annex IV to Directive 2011/65/EU of the European Parliament and of the Council as regards an exemption for cadmium anodes in Hersch cells for certain oxygen sensors used in industrial monitoring and control instruments**

(Text with EEA relevance)

## EXPLANATORY MEMORANDUM

### 1. CONTEXT OF THE DELEGATED ACT

Subject: Commission Delegated Directive amending, for the purposes of adapting to technical progress, Annex IV of the Directive 2011/65/EU of the European Parliament and of the Council as regards an exemption for applications containing cadmium.

Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 (RoHS 2)<sup>1</sup> restricts the use of certain hazardous substances in electrical and electronic equipment. RoHS 2 (recast) entered into force on 21 July 2011.

The restricted substances are listed in Annex II of RoHS 2; while to date the restriction of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, and polybrominated diphenyl ethers restriction is being enforced, the restriction of bis(2-ethylhexyl) phthalate (DEHP), butyl benzyl phthalate (BBP), dibutyl phthalate (DBP), diisobutyl phthalate (DIBP) shall be enforced from 22 July 2019. Annexes III and IV of RoHS 2 list the materials and components of Electrical and Electronic Equipment (EEE) for specific applications exempted from the substance restriction in Article 4(1) of RoHS 2.

Article 5 contains the provisions for the adaptation to scientific and technical progress (inclusion and deletion of exemptions) of Annexes III and IV. Pursuant to Article 5(1)a, exemptions shall be included in Annexes III and IV, provided that such inclusion does not weaken the environmental and health protection afforded by Regulation (EC) No 1907/2006 and where any of the following conditions is fulfilled: their elimination or substitution via design changes or materials and components which do not require any of the materials or substances listed in Annex II is scientifically or technically impracticable; the reliability of substitutes is not ensured; or the total negative environmental, health and consumer safety impacts caused by substitution are likely to outweigh the total environmental, health and consumer safety benefits thereof.

Article 5 establishes the procedure for the adaptation of the Annexes to scientific and technical progress. Article 5(1) provides that the European Commission (the Commission) shall include materials and components of EEE for specific applications in the lists in Annexes III and IV by means of individual delegated acts in accordance with Article 20.

### 2. CONSULTATIONS PRIOR TO THE ADOPTION OF THE ACT

As a consequence of the provisions in Article 5(3) and Annex V for granting, renewing or revoking an exemption, which allows stakeholders to apply for an exemption from the substance restriction, the Commission has received about 50 requests for new exemptions since the publication of RoHS 2 and about 100 requests to renew existing exemptions.

The Commission received an application on the 28 April 2014 in relation to the use of cadmium in equipment requiring high-sensitivity in oxygen measurement. In Annex IV to RoHS 2, the exemption 1b "Lead anodes in electrochemical oxygen sensors" allows for the use of lead (Pb) in anodes of oxygen sensors; however, these lead anodes are unable to provide the levels of sensitivity (measurements of tens or hundreds of parts per trillion) and stability required by certain industries.

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<sup>1</sup> OJ L 174, 1.7.2011, p. 88.

With a view to evaluate the application for exemption, the Commission commissioned a study and carried out the requisite technical and scientific assessment including an official 8-week online open-ended stakeholder consultation<sup>2</sup> for the application<sup>3</sup>. No contributions were received during the stakeholder consultation for the application concerned.

The final report for the application assessment was written by consultants Oeko Institute, approved by DG Environment and published<sup>4</sup>; stakeholders and Member States were notified. The project page is accessible via the DG Environment webpage<sup>5</sup>.

Subsequently, the Commission consulted the official expert group for delegated acts under RoHS 2. A proposed modification of the RoHS 2 Annex IV with all necessary background information was sent out on 9 September 2015 and experts were invited to comment on the proposal by 8 October 2015. The expert group unanimously supported the proposal to exempt cadmium anodes in Hersch cells for oxygen sensors used in industrial monitoring and control instruments, where sensitivity below 10 parts per million is required, for a duration of seven years. All necessary steps pursuant to Article 5(3) to (7) have been performed. Council and Parliament were notified of all activities.

According to the final report, the following technical information was collected (for further information see footnote 4):

- Cadmium (Cd) is present in the anodes of Hersch Cells, which are used in specialized, high sensitivity oxygen sensors. While alternative oxygen sensors exist, it has been proven that all these available alternative technologies do not provide the same sensitivity, reliability and accuracy related to the Hersch cell sensors when measuring oxygen concentration at very low levels.
- Though some of the other technologies could be applied at such very low levels in theory, their need for calibration at such levels would make their use in practice not sufficiently reliable. Indeed, though alternatives could be used for high sensitivity measurements, the calibration limitations would not provide for a sensor with comparable sensitivity and reliability specifically when measuring levels below 10 part per million of oxygen.
- The reliability of alternatives to Hersch Cells using cadmium for oxygen sensors in industrial monitoring and control instruments is therefore not ensured where sensitivity below 10 parts per million is required. Below this level, an exemption would thus be in line with Art. 5(1)(a), as at least one of the three main criteria would be fulfilled.
- The duration of a new sensor development project, including the redesign, recertification and launch onto the market in the form of an oxygen sensor, is typically close to 7 years for industrial monitoring and control instruments. A suitable substitute is unlikely to appear onto the market within the next 7 years.

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<sup>2</sup> [http://ec.europa.eu/environment/consultations/rohs12\\_en.htm](http://ec.europa.eu/environment/consultations/rohs12_en.htm); consultation period from 31.10.2014 to 09.01.2015

<sup>3</sup> The list of consulted stakeholders is regularly updated and maintained by the consultants in cooperation with the Commission, and includes electronics related industry organisations, manufacturers and suppliers, recyclers, consumer associations, NGOs, academia, Member States' representatives, etc.

<sup>4</sup> Direct link to evaluation and recommendation: [https://circabc.europa.eu/sd/a/dc3ec089-8ce1-4592-93d7-12e7fbbefc44/20150624\\_RoHS\\_Ex\\_Pack6\\_Final\\_Report.pdf](https://circabc.europa.eu/sd/a/dc3ec089-8ce1-4592-93d7-12e7fbbefc44/20150624_RoHS_Ex_Pack6_Final_Report.pdf), [http://rohs.exemptions.oeko.info/fileadmin/user\\_upload/reports/20150624\\_RoHS\\_Ex\\_Pack6\\_Final\\_Report.pdf](http://rohs.exemptions.oeko.info/fileadmin/user_upload/reports/20150624_RoHS_Ex_Pack6_Final_Report.pdf).

<sup>5</sup> [http://ec.europa.eu/environment/waste/rohs\\_eee/studies\\_rohs1\\_en.htm](http://ec.europa.eu/environment/waste/rohs_eee/studies_rohs1_en.htm).

With respect to the insertion of the following exemption in Annex IV "*Cadmium anodes in Hersch cells for oxygen sensors used in industrial monitoring and control instruments, where a sensitivity below 10 ppm is required*", the evaluation results show that at least one of the relevant criteria specified in Article 5(1)(a) is fulfilled and the inclusion of the specific application in the exemptions listed in Annex IV is thus justified, as currently no cadmium-free alternatives are sufficiently reliable for the specific use. No current exemption exists in Annex IV to which this new exemption could be associated for similarity in the technical assessment and validity period. Thus, considering that for monitoring and control instruments 7 years is a relatively short transition period which is unlikely to have adverse impacts on innovation, pursuant to Article 5(2) of Directive 2011/65/EU, the validity period of the exemption should be 7 years. This period is unlikely to have adverse impacts on innovation as no alternative are available today or are likely to come to market in the same period. The specific exemption does not weaken the environmental and health protection afforded by Regulation (EC) No 1907/2006 (REACH) in accordance with Article 5 of Directive 2011/65/EU.

### **3. LEGAL ELEMENTS OF THE DELEGATED ACT**

The proposed act grants an exemption from the substance restrictions of Directive 2011/65/EU (RoHS 2), to be listed in Annex IV, for the use of cadmium in specific applications.

The proposed instrument is a delegated directive, which implements Directive 2011/65/EU, and in particular Article 5(1)(a) thereof.

The objective of the proposed act is to ensure legal certainty and sustainable market conditions for electronic manufacturers, by allowing specific applications of otherwise banned substances in line with the provisions of RoHS 2 and the therein established procedure for the adaptation of the Annexes III and IV to scientific and technical progress.

In accordance with the principle of proportionality, the measure does not go beyond what is necessary to achieve its objective.

The proposal has no implications for the EU budget.

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**amending, for the purposes of adapting to technical progress, Annex IV to Directive 2011/65/EU of the European Parliament and of the Council as regards an exemption for cadmium anodes in Hersch cells for certain oxygen sensors used in industrial monitoring and control instruments**

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment<sup>6</sup>, and in particular Article 5(1)(a) thereof,

Whereas:

- (1) Directive 2011/65/EU prohibits the use of cadmium in electrical and electronic equipment placed on the market. Cadmium is present in the anodes of Hersch Cells, which are used in specialized, high-sensitivity oxygen sensors. In comparison to the Hersch cell sensors, all available alternative technologies do not provide the same sensitivity, reliability and accuracy when measuring oxygen concentration at very low levels.
- (2) The reliability of alternatives to Hersch Cells using cadmium for oxygen sensors in industrial monitoring and control instruments is not ensured where sensitivity below 10 parts per million is required. The use of cadmium anodes in Hersch cells for oxygen sensors used in industrial monitoring and control instruments, where sensitivity below 10 parts per million is required, should therefore be exempted from the prohibition.
- (3) As currently no cadmium-free alternatives are sufficiently reliable for the specific use and considering that for monitoring and control instruments seven years is a relatively short transition period which is unlikely to have adverse impacts on innovation, pursuant to Article 5(2) of Directive 2011/65/EU, a corresponding validity period of exemption should be granted.
- (4) Directive 2011/65/EU should therefore be amended accordingly,

HAS ADOPTED THIS DIRECTIVE:

## *Article 1*

Annex IV to Directive 2011/65/EU is amended as set out in the Annex to this Directive.

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<sup>6</sup> OJ L 174, 1.7.2011, p. 88.

## *Article 2*

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by [*OP, please insert, as concrete date, the last day of the 9<sup>th</sup> month after entry into force of this directive*] at the latest. They shall forthwith communicate to the Commission the text of those provisions.

When Member States adopt those provisions, they shall contain a reference to this Directive or be accompanied by such a reference on the occasion of their official publication. Member States shall determine how such reference is to be made.

2. Member States shall communicate to the Commission the text of the main provisions of national law which they adopt in the field covered by this Directive.

## *Article 3*

This Directive shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

## *Article 4*

This Directive is addressed to the Member States.

Done at Brussels,

*For the Commission*  
*The President*  
[\[...\]](#)



EUROPEAN  
COMMISSION

Brussels, **XXX**  
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ANNEX 1

**ANNEX**

**EN**

CIRS|C&K Testing  
www.cirs-ck.com  
hotline: 4006-721-723  
Email: test@cirs-group.com

**EN**

## ANNEX

In Annex IV to Directive 2011/65/EU, the following point 43 is added:

"43. Cadmium anodes in Hersch cells for oxygen sensors used in industrial monitoring and control instruments, where sensitivity below 10 ppm is required.

Expires on [*OP, please insert, as concrete date, 7 years after the date of entry into force of this directive*]."