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COMMISSION DELEGATED DIRECTIVE (EU) 2024/1416

of 13 March 2024

amending Directive 2011/65/EU of the European Parliament and of the Council as regards an exemption for cadmium in downshifting quantum dots directly deposited on LED semiconductor chips

(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 ([1]), and in particular Article 5(1), point (a), thereof,

Whereas:

(1) Article 4(1) of Directive 2011/65/EU requires Member States to ensure that electrical and electronic equipment placed on the market does not contain the hazardous substances listed in Annex II to that Directive. That restriction does not apply to certain exempted applications listed in Annex III to that Directive.

(2) Cadmium is a restricted substance listed in Annex II to Directive 2011/65/EU. The maximum tolerated concentration value is 0,01 % by weight of cadmium in homogenous materials.

(3) By Delegated Directive (EU) 2017/1975 ([2]), the Commission granted an exemption for the use of cadmium selenide in downshifting semiconductor nanocrystal quantum dots for use in display lighting applications ('the current exemption'), which is listed in entry 39(a) of Annex III to Directive 2011/65/EU. The exemption was to expire on 31 October 2019.

(4) On 29 September 2017, 29 April 2018 and 30 April 2018, the Commission received applications for amending the current exemption ('the applications'), that is within the time limit laid down in Article 5(5) of Directive 2011/65/EU. In accordance with Article 5(5), second subparagraph, of Directive 2011/65/EU, an exemption remains valid until a decision on the renewal application has been taken.

(5) The evaluation of the applications, which took into account the availability of substitutes and the socioeconomic impact of substitution, included a technical and scientific assessment study ([3]) and a follow-up study ([4]). The evaluation also included stakeholder consultations in accordance with Article 5(7) of Directive 2011/65/EU. The comments received during those consultations were made publicly available on a dedicated website.

(6) The current exemption does not distinguish between different configurations regarding the way the cadmium-based material is embedded in the quantum dot. The evaluation found that applications with the so-called on-edge and on-surface configurations no longer meet the conditions set out in Article 5(1), point (a), of Directive 2011/65/EU. The so-called on-chip configuration requires the lowest amount of cadmium and shows better performance levels.

([1]) OJ L 174, 1.7.2011, p. 88.

([2]) Commission Delegated Directive (EU) 2017/1975 of 7 August 2017 amending, for the purposes of adapting to scientific and technical progress, Annex III to Directive 2011/65/EU of the European Parliament and of the Council as regards an exemption for cadmium in colour converting light-emitting diodes (LEDs) for use in display systems (OJ L 281, 31.10.2017, p. 29).

([3]) Assessing three exemption requests for the use of cadmium in quantum dot applications in displays and lighting – Study to support the review of the list of restricted substances and to assess a new exemption request under RoHS (RoHS Pack 15 – Task 5, final), November 2020 (https://op.europa.eu/en/publication-detail/-/publication/afa12b2f-5a0a-11eb-b59f-01aa75ed71a1/language-en/format-PDF/source-187695217).

([4]) Study to update the information on the use of cadmium in quantum dot applications for displays and lighting under Directive 2011/65/EU, Final Report, November 2022 (https://op.europa.eu/en/publication-detail/-/publication/ac232efe-76ad-11ed-9887-01aa75ed71a1/language-en/format-PDF/source-277797051).

(7) The evaluation further concluded that alternatives to 'on-chip' technology applicable in lighting applications are currently available that are reliable and that achieve similar performance levels. For those applications, the evaluation concluded that the benefits of an exemption would not outweigh the negative environmental, health and consumer safety impacts thereof. The conditions set out in Article 5(1), point (a), of Directive 2011/65/EU are therefore not met for the 'on-chip' technology applicable in lighting applications.

(8) The evaluation further concluded that many alternatives to 'on-chip' technology applicable in display applications are currently available, however, for some specific technologies, such as micro displays, no reliable alternative currently exists. For those specific display applications, even though substitutes are under development, the condition set out in Article 5(1), point (a), second indent, of Directive 2011/65/EU is met, namely that the reliability of substitutes is not ensured.

(9) 'On-chip' configuration can also result in less cadmium per device, in particular for liquid crystal displays, compared to 'on-surface' configurations, which uses less than 0,01 % by weight of cadmium in homogenous material. Due to greater energy efficiency and lower use of total cadmium, the environmental benefits outweigh the total negative environmental, health and consumer safety impacts caused by a substitution of cadmium. The limited scope of the exemption sought in the applications, in the form of a maximum concentration of cadmium per device, would ensure that less cadmium is placed on the market than under the current exemption. The condition set out in Article 5(1), point (a), third indent, of Directive 2011/65/EU is therefore fulfilled.

(10) The exemption is consistent with Regulation (EC) No 1907/2006 of the European Parliament and of the Council ([5]) and does not weaken the environmental and health protection afforded by it.

(11) It is therefore appropriate to grant the exemption for cadmium in downshifting semiconductor nanocrystal quantum dots directly deposited on LED semiconductor chips for use in display and projection applications. It is expected that alternatives for those cadmium quantum dot applications might be available by the end of 2027. Both positive effects on innovations (e.g. miniaturisation) as well as negative effects on innovation (e.g. fewer incentives for the development of cadmium free alternatives) are taken into account here. It is therefore appropriate to limit the duration of the exemption until that date in accordance with Article 5(2) of Directive 2011/65/EU.

(12) An expiry date for the current exemption should be set in accordance with Article 5(6) of Directive 2011/65/EU. In order to allow sufficient time for industry and in view of global supply chains for such products, it is appropriate to set the maximum possible expiry date of 18 months following the decision for the current exemption.

(13) Directive 2011/65/EU should therefore be amended accordingly,

HAS ADOPTED THIS DIRECTIVE:

Article 1

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

Article 2

1. Member States shall adopt and publish by 31 December 2024 at the latest, the laws, regulations and administrative provisions necessary to comply with this Directive. They shall forthwith communicate to the Commission the text of those provisions.

([5]) Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (OJ L 396, 30.12.2006, p. 1).

They shall apply those provisions from 1 January 2025.

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, 13 March 2024.

For the Commission
The President
Ursula VON DER LEYEN

ANNEX

Annex III to Directive 2011/65/EU is amended as follows:

(1) entry 39(a) is replaced by the following:

'39(a)	Cadmium selenide in downshifting cadmium-based semiconductor nanocrystal quantum dots for use in display lighting applications (< 0,2 µg Cd per mm^2 of display screen area)	Expires for all categories on 21 November 2025'

(2) the following entry is inserted:

'39(b)	Cadmium in downshifting semiconductor nanocrystal quantum dots directly deposited on LED semiconductor chips for use in display and projection applications (< 5 µg Cd per mm^2 of LED chip surface) with a maximum amount per device of 1 mg	Expires for all categories on 31 December 2027'