Department for Environment Food & Rural Affairs

Mercury in other discharge lamps for special purposes

March 2025

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We work closely with our 33 agencies and arm's length bodies on our ambition to make our air purer, our water cleaner, our land greener and our food more sustainable. Our mission is to restore and enhance the environment for the next generation, and to leave the environment in a better state than we found it.

This publication is available at www.gov.uk/defra

Any enquiries regarding this publication should be sent to

rohs@defra.gov.uk

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Introduction

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (RoHS regulations) restricts the use of 10 hazardous substances in electrical and electronic equipment (EEE), with a view to contributing to the protection of human health and the environment, including the sound recovery and disposal of waste.

Industry can apply for exemptions to allow the supply of products using one or more of the restricted substances above the threshold limits set down in the RoHS regulations where specified criteria are met. Applications for exemptions are made to the Secretary of State under regulation 6 of the Hazardous Substances and Packaging (Legislative Functions and Amendment) (EU Exit) Regulations 2020 (2020 regulations). Any exemption that is granted can be used across industry, not just by the business that applied for the exemption. Exemptions are granted where it is determined that the necessary criteria have been met following a detailed evaluation conducted in accordance with regulation 5 of the 2020 regulations.

Following the UK's withdrawal from the EU, the function of granting, renewing and revoking exemptions were, in relation to Great Britain (England, Scotland and Wales), transferred to the Secretary of State by the 2020 regulations, using powers in section 8 of the European Union (Withdrawal) Act 2018 (Withdrawal Act).

Part of the evaluation process is an 8-week consultation to collect contributions from stakeholders.

A request for renewal for an exemption was submitted for use of mercury in discharge lamps for special purposes that are not covered by other exemptions listed in the exemptions table. Mercury is a required substance in these lamps due to the unique properties of low boiling point and ability to emit the required visible wavelengths of light. The uses for these lamps include entertainment lighting for stage performances and flight simulators. Alternative technologies highlighted by the applicant are LED lighting and laser lighting, neither of which provide all the properties required in the applications (more detail is provided below).

The requested duration of the exemption renewal is 5 years and according to the application it would be expected to lead to the introduction of less than 1kg of mercury to the Great Britain (GB) market annually.

Exemption wording and scope:

Mercury in other discharge lamps for special purposes not specifically mentioned in another entry in this Table. Category 9ind and 11.

Purpose of this consultation

The purpose of this consultation is to seek views on the request for the renewal of an exemption to the substance restrictions in the RoHS regulations, to collect additional data and information, and to inform stakeholders about the application.

Geographical extent

We are consulting on proposals applicable to England, Wales and Scotland only. The Secretary of State's transferred function only applies in relation to England, Scotland and Wales.

Northern Ireland is out of scope of this consultation. This is because the EU RoHS Directive is covered under the Windsor Framework agreement with the EU. As such, the EU RoHS Directive continues to apply in Northern Ireland and Northern Ireland continues to be bound by exemption decisions made by the EU.

Audience

This is a public consultation, and we welcome all views, particularly views from the electrical and electronic equipment manufacturing and supply industry, and relevant trade bodies, organisations who use the equipment in question, research institutions and universities, non-governmental organisations (NGOs) and public administrations.

Responding to this consultation

You can respond to this consultation online using Defra's Citizen Space consultation hub.

For ease of analysis, responses via the Citizen Space platform would be preferred, but an alternative option is provided below if required.

Email rohs@defra.gov.uk

Responses must arrive by the closing date of the consultation (4 May 2025) to be counted. Any responses received after this date will not be analysed. To ensure your response is included in the analysis, consider responding online at Citizen Space.

Further exchange with stakeholders will be held after the consultation has ended for those issues where further need for information or (technical) discussion has been identified.

Duration

This consultation will be open for 8 weeks from 10 March 2025 until 4 May 2025.

Confidentiality and data protection information

A summary of responses to this consultation will be published on the government website at www.gov.uk/defra. An annex to the consultation summary will list all organisations that responded, but will not include personal names, addresses or other contact details. Defra may publish the content of your response to this consultation to make it available to the public without your personal name and private contact details (for example, y1our home address or email address).

If you would like anything in your response to be treated as confidential, please say so clearly in writing when you submit your response to the consultation and explain why you require these details to be kept confidential. The reason for this is that information in response to this consultation may be subject to release to the public or other parties in accordance with access to information laws. These are primarily the Environmental Information Regulations 2004 (EIRs), the Freedom of Information Act 2000 (FOIA) and the Data Protection Act 2018 (DPA).

We have obligations, mainly under the EIRs, FOIA and DPA, to disclose information to particular recipients or to the public in certain circumstances. In view of this, your explanation of your reasons for requesting confidentiality for all or part of your response would help us balance these obligations for disclosure against any obligation of confidentiality. If we receive a request for the information that you have provided in your response to this consultation, we will take full account of your reasons for requesting confidentiality of your response, but we cannot guarantee that confidentiality can be maintained in all circumstances.

If you select ‘No’ in response to the question asking if you would like anything in your response to be kept confidential, we will be able to release the content of your response to the public, but we won’t make your personal name and private contact details publicly available.

There may be occasions when Defra will share the information you provide in response to the consultation, including any personal data with external analysts. This is for the purposes of consultation response analysis and provision of a report of the summary of responses only. This consultation is being conducted in line with the Cabinet Office Consultation Principles.

Find our latest privacy notice uploaded as a related document alongside our consultation document.

If you have any comments or complaints about the consultation process, email consultation.coordinator@defra.gov.uk. Use the subject line: Consultation on amendments to the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations – mercury in other discharge lamps.

After the consultation

A summary of the non-confidential responses to this consultation and the government response will be published and placed on the government website at www.gov.uk/defra

The summary will include a list of respondents and organisations that responded, but not personal names, addresses or other contact details. However, information provided in response to this consultation document, including personal information, will be shared with the Devolved Administrations and may be subject to publication or release to other parties or to disclosure in accordance with the access to information regimes, for example Freedom of Information Act 2000 (FOIA) and the Data Protection Act 2018.

About you

A wide range of businesses, organisations and individuals are involved with or take an interest in the supply of electrical equipment. The questions below are intended to put your responses in perspective with those of other respondents.

Q1. Would you like your response to be confidential?

Yes or No.

- If you answered ‘Yes’, please provide your reason.

Q2. What is your name?

Q3. What is your email address?

This is optional, but if you enter your email address you will be able to return to edit your consultation response in Citizen Space at any time until you submit it. You will also receive an acknowledgement email when you submit a completed response.

Q4. Which best describes you?

Provide the name of the organisation or business you represent and the approximate size or number of staff (where applicable). (Select one option. If multiple categories apply,

choose the one which best describes the organisation you are representing in your response.)

- Business representative organisation or trade body
- Producer of electrical and electronic equipment
- Business end user of electrical or electronic equipment
- Public end user of electrical or electronic equipment (for example, NHS, educational institution)
- Distributor (including online marketplaces)
- Local government
- Community group
- Non-governmental organisation
- Charity or social enterprise
- Consultancy
- Academic or research
- Individual
- Other
- If you answered ‘Other’, please provide details:

Background

The EU RoHS Directive limits the use of specified hazardous substances in the manufacture of certain electrical and electronic products. The UK played a key role in developing the original European legislation, and the RoHS Regulations transposed the EU RoHS Directive into UK law. The RoHS Regulations limits the use of 10 substances and maximum concentration values tolerated by weight in homogeneous materials as follows:

- lead (0.1%)
- mercury (0.1%)
- cadmium (0.01%)
- hexavalent chromium (0.1%)
- polybrominated biphenyls (0.1%)
- polybrominated diphenyl ethers (0.1%)
- bis(2-ethylhexyl) phthalate (0.1 %)
- butyl benzyl phthalate (0.1%)
- dibutyl phthalate (0.1%)
- diisobutyl phthalate (0.1 %)

The scope of the RoHS Regulations is wide ranging, covering most types of electrical and electronic equipment intended for household or commercial use. A limited list of products is exempt, such as large-scale fixed installations, large-scale industrial tools, military equipment, items designed specifically for research and development, most forms of transport and active implant devices.

Businesses can apply for exemptions that allow the manufacture and supply of products that exceed these threshold limits where it can be proven that alternative less hazardous substances are not available or not reliable or the total environmental, health and safety impacts of the substitution would outweigh the benefits thereof. Following the UK withdrawal from the EU, the Secretary of State now has the power to determine applications for exemptions for products supplied to or in Great Britain. Businesses can apply to the Secretary of State for new exemptions and for the renewal of existing exemptions. A list of existing exemptions can be found in Table 1, Schedule A2, of the Hazardous Substances and Packaging (Legislative Functions and Amendment) (EU Exit) Regulations 2020.

Under Regulation 5, an exemption may only be granted where the following conditions are satisfied:

1. The exemption does not weaken the environmental or health protection afforded by UK REACH
2. The elimination or substitution of the material or component, via design changes or use of materials or components which do not include any restricted substances, is scientifically or technically impracticable.
3. The reliability of substitute materials or components is not ensured
4. The total negative environmental, health and consumer safety impacts caused by substitution of another material or component is likely to outweigh the total environmental, health and consumer safety benefits of that substitution.

The exemption request

Entry 9 in Table 1, Schedule A2 of the 2020 regulations is for the use of mercury in discharge lamps for special purposes not covered by other entries in the legislation.

The existing exemption for category 9ind, monitoring and control instruments in industry and category 11, which covers all other electronic and electrical equipment not covered under other categories, was set to expire on 21 July 2024; although the exemption remains valid until the renewal application has been determined. The applicant, The Lighting Industry Association (LIA), has requested a renewal for the maximum duration of 5 years.

The applicant estimates that granting the renewal of this exemption would lead to the continued introduction of <1kg mercury to the GB market annually. The applicant states that there are no suitable substitutes for the use of mercury in special purpose lamps.

Details on the exemption application

Mercury is used in high pressure gas discharge lamps for the generation of high-power light (up to 33 000 lumens) in the visual and non-visual range. Due to its relatively low boiling point, mercury can produce the high-pressure vapour required within the lamp. Electrons

are generated by a heated electrode; these then collide with the mercury atoms in the vapour and the mercury atoms then emit light photons in the UV and visible range. Use of other substances would change the wavelength of the light emitted, as well as needing higher temperatures to vaporise a substance with a higher boiling point.

Applications for these lamps include projection (projectors with an output < 2000 ANSI lumen), studio and stage lighting and flight simulations. Whilst there is a small and growing number of mercury-free technologies, the applicant expects that the use of mercury will still be required in two instances:

- For new equipment in applications where equivalent functionality is not offered by the alternative technologies
- As spare parts for equipment already in use

Alternatives and substitutes testing

According to the applicant, there are no alternatives for the use of mercury in these lighting applications. The alternative technologies available are unable to provide the required brightness and directionality in a safe manner.

The applicant identified LED and laser lighting as alternative technologies and provided information on trials conducted by lamp manufacturers to use zinc and xenon as alternative substances. Both zinc and xenon have been found to give very low energy efficiency light generation which leads to unsustainable cooling requirements as they overheat. Both have therefore been deemed impractical for use, due to the increased energy consumption and concerns about overheating. Other substances would not produce the required wavelengths so substituting by substance alone is unlikely to provide a viable product.

On the technology front, LEDs are increasingly being used in the entertainment industry as they have advantages on both energy usage and lifespan. However, they cannot provide the brightness required for spotlights in stage performances which can be attained by the mercury counterparts. Laser lighting is being introduced in stage and entertainment lighting, but for this application there are significant safety concerns and United States Food and Drug Administration and EU safety regulations limit the ways in which laser lighting can be used in performances. Lasers cannot be aimed at people as they can cause damage to the eye, therefore they cannot be used for spotlights or similar applications.

This consultation will collect opinions on the current state of play regarding alternatives and substitutes, at a substance and a device level, and to further understand the alternatives and any limitations that the alternatives currently available might have for end users.

Socio-economic impacts

This consultation is also looking to further understand how the granting or otherwise of this exemption request may have an impact on business, from manufacturing through to end user applications, as well as wider society and social impacts (for example, human health

impacts). The consultation also aims to understand the effects on the environment of granting or not granting this exemption (for example, additional waste generation caused by enforced equipment changes). We welcome opinions and supporting evidence for any viewpoints associated with the socio-economic impacts of this exemption.

Consultation specific questions

Q5. Do you agree or disagree that the exemption under RoHS for mercury in lighting applications should be renewed?

Agree

Disagree

Don’t know

Provide evidence to support your answer, explaining why you either support the applicant’s request or object to it. To support your views, provide detailed technical argumentation or evidence where possible.

Q6. Do you agree or disagree with the proposed length (5 years) of the exemption renewal?

Agree

Disagree

Don’t know

Provide evidence to support your answer, explaining why you either support the applicant’s request or object to it. To support your views, provide detailed technical argumentation or evidence where possible.

Q7. Do you know of alternative substances for use in high power lighting applications, which do not rely on RoHS-restricted substances?

Yes, I do know of alternative materials which do not rely on RoHS-restricted substances.

No, I do not know of alternative materials which do not rely on RoHS-restricted substances.

Provide evidence to support your answer and, if possible, links to supporting information on alternative materials and their limitations where applicable.

Q8. The applicant has identified LED lighting as an alternative technology which does not rely on use of restricted substances. In your view does LED lighting have the technical capability to replace mercury lamps in all scenarios?

Yes, I do agree that LED lighting can replace mercury lamps in all scenarios.

Yes, I do agree that LED lighting can replace mercury lamps in some or most scenarios.

No, I do not agree that LED lighting can replace mercury lamps in any scenarios.

Provide an explanation to support your answer and, if possible, links to supporting information. Provide any thoughts on why LED lighting is, or is not, suitable for use by your organisation.

Q9. The applicant has identified laser lighting as an alternative technology which does not rely on use of restricted substances. In your view does laser lighting have the technical capability to replace mercury lamps in all scenarios?

Yes, I do agree that laser lighting can replace mercury lamps in all scenarios.

Yes, I do agree that laser lighting can replace mercury lamps in some or most scenarios.

No, I do not agree that laser lighting can replace mercury lamps in any scenarios.

Provide an explanation to support your answer and, if possible, links to supporting information. Provide any thoughts on why laser lighting is, or is not, suitable for use by your organisation.

Q10. Rejecting the exemption could lead to premature obsolescence of the existing lighting equipment already on the market. Provide any information you have on the expected timescales and costs of changing to technologies that do not contain restricted substances.

Q11. Are you aware of any research initiatives (past, present or planned) which are looking into possible alternative substances or technologies to mercury in lighting?

Yes, I do know of research initiatives which will help in the eventual production of RoHS compliant devices.

No, I do not know of research initiatives which will help in the eventual production of RoHS compliant devices.

Provide evidence to support your answer and, if possible, links to supporting information. If you answered yes, provide an estimate of the time required until the technology will be available for use in the market.

Q12. Can you estimate how many mercury-containing lamps your organisation places on the GB market or purchases per year, or it is planning to place on the GB market or purchase over the next 5 years?

Provide quantitative data to support your view.

Q13. As part of the evaluation, environmental impacts will be assessed. Please estimate possible amounts of waste to be generated through a forced substitution should the exemption not be granted.

Provide quantitative data to support your view.

Q14. As part of the evaluation, environmental impacts will be assessed. Can you provide any Life Cycle Assessment (LCA) or environmental footprint estimation on the products in scope of the exemption?

Provide any quantitative data available to support your view.

Q15. As part of the evaluation, socio-economic impacts will also be assessed. Estimate possible impacts on employment in total, in and outside Great Britain, should the exemption be granted or not. Select the main sectors in which possible impacts are expected:

- manufacturers
- supply chain (for example, distribution)
- distributors or retailers (selling devices)
- end users
- other (provide more information)

Provide any quantitative data available to support your view.

Q16. Estimate additional costs associated with a forced substitution should the exemption not be granted, and how this is divided between various sectors:

- manufacturers
- supply chain (for example, distribution)
- distributors or retailers (selling devices)
- end users
- other (provide more information)

Provide any quantitative data available to support your view.

Q17. Summarise your view on the potential impacts on human health, if this exemption was or was not granted.

Provide quantitative data to support your view.

Q18. Provide any further information and/or data that you think is important to substantiate your views.