Texte zu EU-Regelungen zur umweltgerechten Produktgestaltung und zur Energieverbrauchskennzeichnung in der Beleuchtung – Zusammenstellung [1] des Umweltbundesamtes (UBA), Deutschland

Diskussion über eine künftige Änderungsverordnung (Produktgestaltung)

Anhang III Nummer 3:
Zusätzliche Ausnahmen für Infrarot-Strahlungsquellen:
Stellungnahme des Herstellers Heraeus Noblelight [2] vom 11. März 2020

Hinweis: Bitte beachten Sie, daß der angehängte Text nur in Englisch verfaßt ist.

EN: Information on EU Lighting Regulations – Ecodesign and Energy Labelling – Compilation [1] of the Federal Environment Agency (UBA), Germany

Discussion of a future amending regulation (Product Design)

Annex III.3: Additional exemptions for infrared radiation sources: Comments by the manufacturer Heraeus Noblelight [2] as of 11 March 2020

FR: Informations sur réglementations de l'UE concernant l'éclairage – l'écoconception et l'étiquetage énergétique – Compilation [1] de l'Agence Fédérale de l'Environnement (UBA), Allemagne

Discussion d'un futur règlement modificatif (Conception des produits)

Annexe III, point 3 : Exemptions supplémentaires pour sources de rayonnement infrarouge : Commentaires du fabricant Heraeus Noblelight [2] de 11 mars 2020

Indication : Veuillez noter que le présent texte n'est disponible qu'en anglais.

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[1] https://www.eup-network.de/de/eup-netzwerk-deutschland/offenes-forum-eu-regelungen-beleuchtung/dokumente/texte/

[2] https://www.heraeus.com/de/hng/home_hng/home_noblelight.aspx

DE: ↓ **EN**: → page III **FR** : → page IV

Texte im Offenen Forum (**abc** = vorliegender Text)

- **Bestehende EG- und EU-Regelungen**
- **Studien der EU-Kommission**
- **Regelungsentwürfe**
  - Frühere Entwürfe
  - **Diskussion über eine künftige Änderungsverordnung**
    - **Vorab-Stellungnahmen**
      - Produktgestaltung und -information: verschiedene Themen
      - Produktgestaltung Anhang II Nummer 2: SVM-Höchstwert
      - Produktgestaltung Anhang III Nummer 3 Buchstabe w): Ausnahmen für bestimmte Weißlichtquellen
      - **Produktgestaltung Anhang III Nummer 3: Zusätzliche Ausnahme für Infrarot-Strahler**
        - Herstellerverband Lighting Europe (27. Mai 2019) [EN]
        - **Hersteller Heraeus Noblelight (11. März 2020) [EN]**
      - Produktgestaltung Anhang III und Produktinformation Anhang IV: Zusätzliche Ausnahme für Lichtquellen in und für Haushaltsgeräte
      - Produktinformation Anhang III Nummer 1: Größe und Farbe des Etikettes
    - Informelles Interessensgruppentreffen am 19. Februar 2020
- **Öffentliche Konsultationen auf EU-Ebene**
- **Diskussion im Offenen Forum**
- **Weitere Dokumente**

Abkürzungen: ● EG = Europäische Gemeinschaft ● EU = Europäische Union ● SVM : Maß für die Sichtbarkeit des Stroboskopeffektes

EN

Documents in the Open Forum (**abc** = text at hand)

- **Existing EC and EU Regulations**
- **Studies of the European Commission**
- **Draft regulations**
  - Earlier drafts
  - **Discussion of a future amending regulation**
    - **Comments in advance**
      - Product design and product information: various issues
      - Product design Annex II.2: SVM limit value
      - Product design Annex III.3 (w): Exemptions for certain white light sources
      - **Product design Annex III.3: Additional exemption for infrared radiation sources**
        - Manufacturer association Lighting Europe (27 May 2019) [EN]
        - **Manufacturer Heraeus Noblelight (11 March 2020) [EN]**
      - Product Design Annex III and Product Information Annex IV: Additional exemption for light sources in and for household appliances
      - Product information Annex III 1: Label size and colour
    - Informal stakeholder meeting on 19 February 2020
- **Public Consultations at EU level**
- **Discussion in the Open Forum**
- **Further documents**

Abbreviations: ● EC = European Communities ● EU = European Union ● SVM = Stroboscopic Visibility Measure

FR

Documents dans le forum ouvert (**abc** = présent document)

- **Règlements existants de la CE et de l'EU**
- **Études de la Commission européenne**
- **Projets de règlements**
  - Projets antérieurs
  - **Discussion d'un futur règlement modificatif**
    - **Commentaires en avance**
      - Conception des produits et informations sur les produits : sujets variés
      - Conception des produits, Annexe II, point 2 : Valeur maximale du SVM
      - Conception des produits, Annexe III, point 3 w : Exceptions pour certaines sources de lumière blanche
      - **Conception des produits, Annexe III, point 3 : Exemption supplémentaire pour sources de rayonnement infrarouge**
        - Association de producteurs Lighting Europe (27 mai 2019) [EN]
        - **Fabricant Heraeus Noblelight (20 mars 2020) [EN]**
      - Conception des produits, annexe III et informations sur les produits, annexe IV : exemption supplémentaire pour les sources lumineuses dans et pour les appareils ménagers
      - Informations sur les produits, annexe III, point 1 : Taille et couleur de l'étiquette
    - Réunion informelle des parties prenantes le 19 février 2020
- **Consultations publiques au niveau de l'UE**
- **Discussion dans le Forum Ouvert**
- **Autres documents**

Abréviations : ● CE = Communauté européenne ● SVM : mesure de la visibilité stroboscopique ● UE = Union européenne

Es folgt ein unveränderter Originaltext.

EN: The following is an unmodified original text.

FR: Ce qui suit est un texte original.

COMMISSION REGULATION (EU) 2019/2020 laying down ecodesign requirements for light sources and separate control gears pursuant to Directive 2009/125/EC of the European Parliament and of the Council and repealing Commission Regulations (EC) No 244/2009, (EC) No 245/2009 and (EU) No 1194/2012

Exemption request for infrared emitters for industrial electro-heating installations[1]

Incandescent light-sources emit optical radiation in the visible as well as the infrared spectrum. Incandescent light-sources have a low energy efficiency when used for general lighting, but they are highly energy efficient when it comes to the generation of infrared emission. Therefore, they are by far the best technical solution for industrial electro-heating applications or for heating in animal husbandry.
Infrared electro-heating emitters are optimized to maximize process efficiency of the electro-heating process (which is a goal of the EU directive 2009/125/EC). Strengthening electrical processes throughout all sectors of industry is implied by the EU Green Deal and EU climate action[2].

Applications of infrared electro-heating emitters in industry:
Infrared electro-heating emitters (with or without halogen filling) are designed and intended for industrial electro-heating equipment. Applications of such emitters are for example

- advanced coating processes for photovoltaics, solar-thermal or electronics manufacturing
- 3D printing
- hardening and drying of inks, paints and coating
- all kinds of forming especially but not limited to plastics and modern high-performance materials like fiber-reinforced plastics
- soldering and welding

in sectors like automotive, aircraft, electronics, food, pharmacy, photovoltaics, plastics, printing, semiconductor etc. Electro-heating is the only available technical alternative to heating with fossil fuels in many industrial processes. They are a relevant mainstay of core technologies for digitalization and renewable energy generation.

Application of infrared electro-heating emitters in animal husbandry:
Typical applications are the provision of local heat for piglets in pig-raising, warming of fledglings in poultry farming or similar. Zoos as well as private pet or livestock-owners depend on such emitters for providing appropriate living conditions for exotic animals as well.
Emitters for these applications are incandescent bulbs, usually with an E27 socket[3] and often with an anti-glare coating. Typical anti-glare coatings create a warm red light and reduce the emission in the visible light range. They are often based on infrared reflector lamps as defined in the European standard EN 60240-1.

[1] Electro-heating and infrared electro-heating are defined and covered by the European standard EN 60519-1 Ed. 6.0 – Safety installations for electroheating and electromagnetic processing – Part 1: General requirements
[2] https://ec.europa.eu/clima/policies/eu-climate-action_en
[3] As defined in the EN IEC 60061 standard series

Characteristics of industrial infrared electro-heating emitters:
Electro-heating emitters are not intended for general lighting applications like luminaires.

- Technology: industrial electro-heating emitters use the same technology as incandescent lamps but differ in their design and cost structure to hinder any diffusion into general lighting applications.
- Operating voltage: Infrared emitters are operated depending on customer requirements with voltages up to 1000V AC. Most of them cannot be operated under household electrical conditions.
- Starting current: due to high starting current up to 17 times of the rated current infrared emitters can only be operated in industrial environments as fuses or line safety switches used in households would break or be triggered at such high currents.
- Electrical power: whereas commercially available light bulbs used for general lighting have an electrical power of 40 to 100W, shortwave infrared emitters can have an electrical power of up to 40.000 W depending on the application
- Dimensions: infrared emitters designed for industrial processes have customized length and shape that differ from dimensions suited for general lighting applications; most applications demand dimensions of 1 m up to 6 m length.
- Connection/Socket: They usually have blade contact, cable, wire- or non-standard customized electrical interfaces which makes it impossible to install them in commercially available luminaires. Electrically trained persons are required to install and operate these emitters.
- Cost and sales: expensive materials (e.g. rugged quartz-glass tubes, large diameter tungsten coils, tantalum discs like) are used for electro-heating infrared emitters to enable high lifetime in excess of 10.000 hours of continuous operation. Channel of distribution (b2b) and sales price exclude sales to the general public; emitters are typically sold at prices exceeding LED lamps for general lighting by a factor of 50 to 500

Infrared electro-heating emitters are in the scope the regulation as is as they meet the definition of a “light source” in Article 2, No. 1. As they cannot meet the energy efficiency requirements set in Annex II, regulation 2019/2020 will prohibit the use of infrared electro-heating in many core industrial applications and it will hinder the future use of electrical energy in many industrial processes, i.e. making a transition from fossil fuels to electricity impossible for industry inside the European Union.

The following recitals of Directive 2009/125/EC and regulation (EU) 2019/2020 serve to justify that industrial electro-heating emitters need to be exempted from the ecodesign requirements:

Recitals (14) energy efficiency and (17) best available technologies of 2009/125/EC:
Infrared electro-heating emitters are the only relevant technology with an energy efficiency (conversion of electric current into usable heat (not conversion into visible light!)) of almost 100% in the field of infrared electro-heating, as illustrated in Figure 1. Specially designed emitters (large, high power) enable these processes at high energy efficiency, with long lifetime and at low cost. Quite often there is no alternative on the market, i.e. the loss of this technology will directly lead to a deindustrialization of the processes from the European Union, thus endangering growth in relevant future technologies.
The technical alternatives for high power applications (e.g. LED or vortex cooled flash-lamps) come at prohibitive cost and lower energy efficiency: Liquid cooling becomes necessary due

to high conversion losses to remove about 50 % or more of the applied electricity as waste heat.
Halogen light sources (Annex III, No. 3(s)) are limited by environmental conditions (the halogen cycle operates only in specific temperature settings), the electric connection is limiting their application. Only non-halogen incandescent emitters can overcome design constraints typical for many industrial applications (long unheated ends, cooled pinching, vacuum lead through). Non-halogen incandescent lamps can be designed for a much broader range of color temperature, thus enabling higher efficiency in industrial processes through better matching of spectra. Low temperature non-halogen emitter show lifetime, well exceeding that of halogen lamps, enabling uninterrupted operation over years. Currently only halogen light sources for electro-heating applications are exempted by the requirements by exemption No 3(s) in Annex III.
Refer to the Best Available Technology (BREFs) documents of the EU Commission (e.g. Reference Document on Best Available Techniques for Energy Efficiency, code ENE; http://eippcb.jrc.ec.europa.eu/reference/).

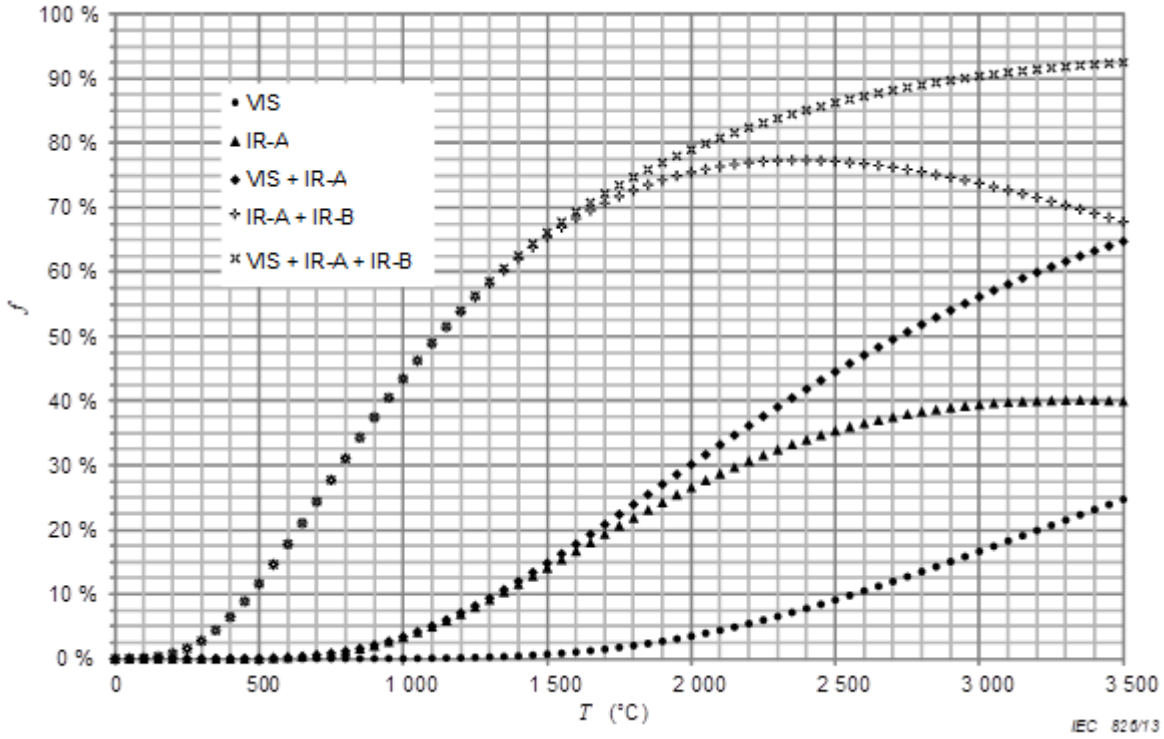


Figure 1: Fraction of energy provided in defined bands: VIS = 380 to 780 nm, IR A = 780 to 1400 nm, IR B = 1400 to 3000 nm. The balance is not lost, but emitted as IR C = 3000 nm to 1 mm. This figure illustrates the high energy conversion achieved through the use of incandescent lamps into the industrially relevant IR-A and IR-B bands.[4]

Recital (15) light sources for special applications of (EU) 2019/2020:
Exemptions from the requirements set out in this regulation should be made for light sources with special technical features for use in specific applications in industrial environments. This applies to the above described infrared electro-heating emitters. They should therefore be exempted from the ecodesign requirements set up in this regulation independent of if they contain halogen or not.

[4] The figure is from the European standard EN IEC 60519-12 ed. 2, *Safety in installations for electroheating and electromagnetic processing - Part 12: Particular requirements for infrared electroheating*

Exemption proposal

Taking the arguments above into consideration, we propose to include infrared emitters without halogen filling to exemption No. 3(s) in Annex III:

Wording of exemption 3(s), Annex III of 2019/2020:

> *Halogen light sources with blade contact-, metal lug-, cable-, litz wire- or non-standard customised electrical interface, specifically designed and marketed for industrial or professional electro-heating equipment (e.g. stretch blow-moulding process in PET-industry, 3D-printing, gluing, inks, paints and coating hardening)*

Suggested Wording for an exemption for industrial infrared electro-heating emitters:

> ***Industrial electro-heating light sources with blade contact, - metal lug, cable-, litz wire- or non-standard customized electrical interface, encasing made from quartz-glass tube, specifically designed and marketed for industrial or professional electro-heating equipment (e.g. photovoltaic and electronic manufacturing, vacuum processes, printing, coating, hardening, gluing).***

Background information why certain infrared electro-heating emitters are affected

A definition of “light source” with certain characteristics like chromaticity coordinates is given in article 2, No. 1 of the above-mentioned regulation defining the range of visible light. Infrared electro-heating emitters generate an output radiation which is usually at or near the Planck Locus in the CIE diagram (s. Figure 2). Any infrared emitter will thus become a light source in the sense of the regulation 2019/2020, once the surface temperature of the incandescent material exceeds about 2000 K (1700°C). This feature is independent of the gas filling (a noble gas with or without the addition of a halogen). Incandescent lamps are usually filled with a noble gas (Argon) and achieve rated lifetimes of 7500 h (which is about one year of continuous operation, often the minimum requirement for industrial use) below 2500 K (2200°C). They can be designed to operate at the complete range between 1700 K to 3300 K (1400°C to 3000°C), but lifetime is dramatically limited above 2600 K (2300°C), making their use uneconomic.

Halogen filled incandescent lamps are in addition filled with a halogen (Bromine, Iodine, Chlorine or Fluorine), to extend the lifetime of the lamp at very high color temperature: Halogen lamps have a longer lifetime at identical performance than incandescent lamps in the temperature range above 2600 K (2300°C), but halogen limits the lifetime through internal corrosion below that temperature.

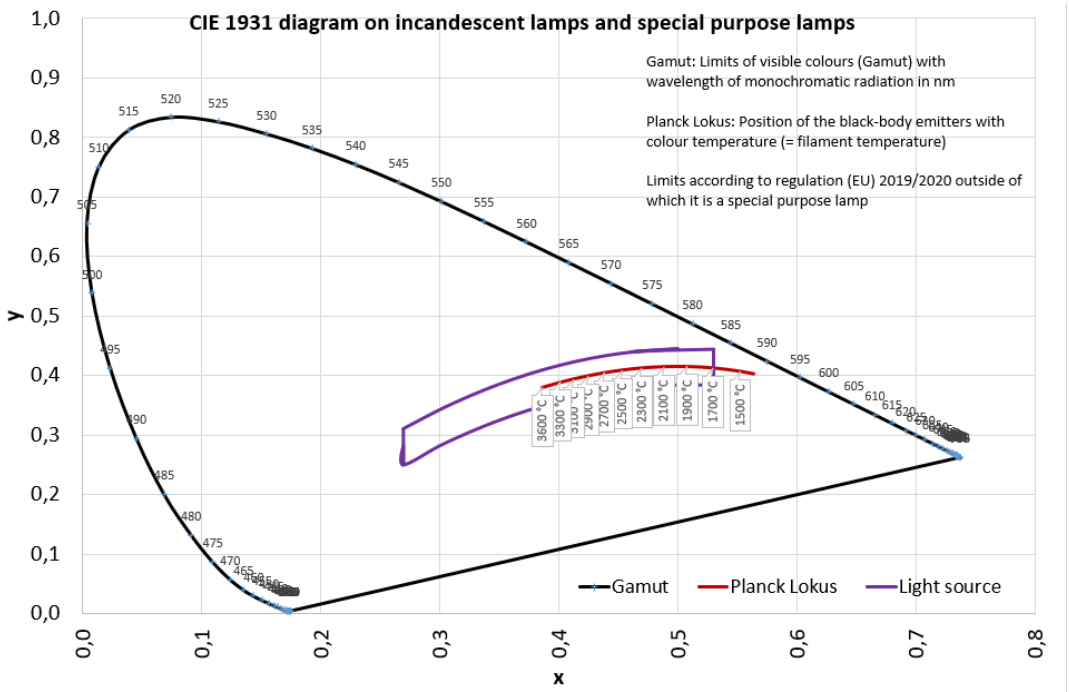
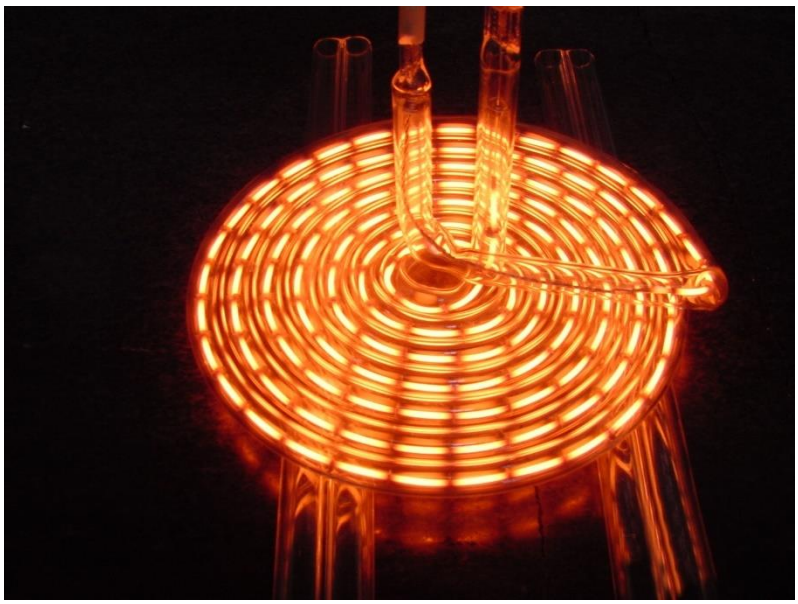


Figure 2: CIE diagram with chromaticity coordinate range of light source according to definition (1) in article 2 of regulation (EU) 2019/2020 (© Heraeus Noblelight)

Images of shortwave infrared emitters:

Customized, non-standard shapes



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Non-standard connection:

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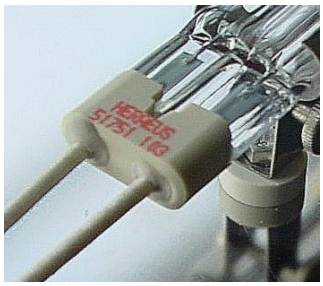

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