

LightingEurope Position on the Review of Annexes A and B of the Minamata Convention

LightingEurope welcomes the opportunity to share our views on how lamps should be addressed under the Minamata Convention.

LightingEurope supports the global harmonization of mercury limits for lighting and offer our technical expertise to the parties as observers of the Minamata Convention.

Mercury is still needed for General Lighting and for Special Purpose lamps

Mercury-containing lamps are still in use and are still needed.

- Many of these lamps are affordable energy-efficient quality lighting products for general lighting purposes.
- LED retrofit lamps do not function in several installed luminaires and applications.
- Some of these lamps are used in special purpose applications, for example lamps used to disinfect air or purify water, to treat illnesses such as dermatitis or those found in machines for printing, photocopying, projecting or manufacturing semiconductors.

LED retrofit lamps do not function in all installed luminaires

The lighting industry has been developing several LED products, pursuing a transition to LED technology by introducing LED luminaires and LED retrofit lamps for several lighting fixtures and applications.

These LED retrofit lamps do not function in all installed luminaires. Installed conventional luminaires are released and certified for the use of conventional lamps and are not designed nor approved for the use of LED tubes, as these luminaires contain a wide variety of electronic drivers and function in a wide variety of applications and temperatures.

Therefore, LED tube manufacturers publish guidance information on the (non)functionality of an LED lamp for a range of driver types found in current installations. This information includes compatibility tables, disclaimers and warranty & safety warnings, stating that the compatibility information of a LED tube for a certain conventional driver is tested under a lab-controlled environment and should be treated as a recommendation and cannot be guaranteed¹.

Potential compatibility issues for installed luminaires include flicker or light distribution problems, non-functioning or early failures when used in dimming installations or in high temperature applications like closed cap luminaires or even not allowed for emergency

¹ Compatibility information is meant for information purposes only and must be treated as a recommendation. Manufacturers attempt to provide best results, results that are generated in a lab-controlled environment and may differ from actual application conditions.

lighting due to IEC standards, to list a few examples. See the detailed overview of compatibility issues in Annex 2.

Our recommended regulatory approach

During COP 3 preparations on Minamata and as a party observing the Convention, LightingEurope notes that the Convention has not been implemented nor enforced across all parties.

Maximum Mercury Levels – ‘basic’ & ‘advanced’ ambition

LightingEurope repeats the recommendations we voiced in 2013 ([see LE position paper](#)) for the Convention to set out 2 levels of ambition – one ‘basic’ level that is the current status of the Convention, to allow all parties to implement this minimum level, and a second ‘advanced’ level setting higher maximum limits for those parties interested in going further. See [Annex I](#) for detailed tables.

For a number of lighting products, the lighting industry is transitioning to alternative products and technologies, in particular LED. LightingEurope estimates that over the next 10 years, LED products will represent the majority of the EU lighting market for new installations and we expect this transition to continue to gather pace across the world.

Special purpose lamps, i.e. lamps used in specific applications, should not be restricted as no feasible LED substitute lamps exist or might still be in a premature stage of innovation. Such lamps operate in specific applications and are often subject to strict requirements, for example the lamps used to disinfect air or purify water, to treat illnesses such as dermatitis or those found in machines for printing, photocopying, projecting or manufacturing semiconductors.

Consider affordability and social-economic impact

Where retrofit lamps are available, the Convention needs to address the affordability of such products for different parts of the world. A retrofit lamp is designed for a one-for-one compatible substitute, i.e. a non-mercury containing lamp that can be fitted in the same lighting luminaire, is compatible with the electronic driver used inside the luminaire and delivers a comparable lighting distribution. The affordability of LED retrofit lamp types differs across regions. See table below listing estimated typical price index differences:

Price indications based on commercially available price information & web sites:

Consumer lamp types <small>(examples of integrated lamps for consumer applications)</small>	Incandescent	Inc. Halogen	CFL-i	LED-i
Shelf price indication (2015)	1	2	4	8

Professional Lamp types <small>(examples of non - integrated lamps for professional applications)</small>	LFL- Halophosphate phosphor	LFL- Tri-band phosphor	LED-ni Retrofit
Shelf-price indication (2015)	5	10	30-40

Source: Global Lighting Association, 2016

For several professional applications alternative LED products are available, but they are not a one-for-one substitute for many installed luminaires and applications, because the LED lamp type of a certain supplier does not function with the installed electronic driver (see Annex 2). The complete luminaire may need to be replaced, thus creating unnecessary and avoidable waste. Alternatively the luminaire will require adaptations inside it to ensure electrical compatibility with the installed electronic drive, and these changes need to be handled by a professional installer due to safety and warranty aspects.

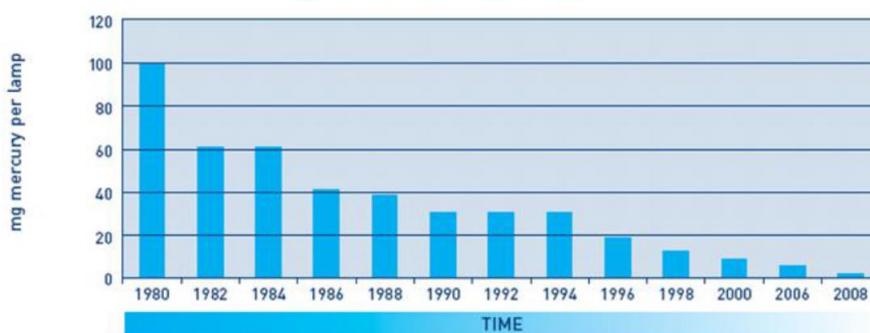
The cost of this transition goes substantially beyond the actual cost of the lamp, and also includes the cost of adapting the luminaire, in many cases by a professional installer (see Annex 2). These additional costs have already been concluded by several socio-economic impact assessments performed for the EU market and depend heavily on the expected compatibility problems with installed lighting equipment for a specific country.

Mercury reductions during the last decades

Based on the UNEP 2018 Mercury Emissions Report and the EU MELISA model, LightingEurope estimates that the sales of new lamps represent less than 1% of total mercury emissions both in Europe and in the world and will further reduce in the next years due to the natural market transition to LED technology for several mainstream applications.

LightingEurope members are committed to the reduction of mercury in lighting products – over the past 40 years the lighting industry has decreased mercury content by 98%, thanks to continued lamp processing innovation and state-of-the-art dosing technologies (see graph below).

Reduction of the mercury content in fluorescent lamps over the last 28 years
(best available technology)



(source: ELC 2009)

LightingEurope is prepared to provide expertise to the parties to the Minamata Convention to discuss where mercury contents can be reduced.

Contacts

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About LightingEurope

LightingEurope is the voice of the lighting industry, based in Brussels and representing 33 companies and national associations. Together these members account for over 1,000 European companies, a majority of which are small or medium-sized. They represent a total European workforce of over 100,000 people and an annual turnover exceeding 20 billion euro. LightingEurope is committed to promoting efficient lighting that benefits human comfort, safety and well-being, and the environment. LightingEurope advocates a positive business and regulatory environment to foster fair competition and growth for the European lighting industry. More information is available at www.lightingeurope.org.

Annex I - LightingEurope proposals²

1. Basic Level Option

The scope of the Minamata Convention covers the most popular lamps used in households, offices, electronic displays and for street lighting, setting maximum mercury content limits for several fluorescent lamp types. Specialty or niche market lamps are not further regulated. The limits on mercury reflect the feasible levels available globally for more than a decade.

Mercury-added Light Sources[*]	
Lamps to be phased out which exceed the indicated mercury limits:	
1.	Compact fluorescent lamps (CFLs) for general lighting purposes that are ≤ 30 watts with a mercury content exceeding 5 mg per lamp burner
2.	Linear fluorescent lamps (LFLs) for general lighting purposes: (a) Triband phosphor < 60 watts with a mercury content exceeding 5 mg per lamp; (b) Halophosphate phosphor ≤ 40 watts with a mercury content exceeding 10 mg per lamp
3.	High pressure mercury vapour lamps (HPMV) for general lighting purposes
4.	Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for electronic displays: (a) short length (≤ 500 mm) with mercury content exceeding 3.5mg per lamp (b) medium length (> 500 mm and $\leq 1\ 500$ mm) with mercury content exceeding 5 mg per lamp (c) long length ($> 1\ 500$ mm) with mercury content exceeding 13 mg per lamp
*The following products are excluded from the scope:	
(a) Products essential for civil protection and military uses;	
(b) Products for research, calibration of instrumentation, for use as reference standard;	
(c) Where no feasible mercury-free alternative for replacement is available, cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for electronic displays, and measuring devices	

2. Advanced Level Option

The “Advanced level” option covers the majority of mercury used in lighting.

This option includes more compact fluorescent lamps and some special purpose lamps, and is setting lower mercury limits, compared to the “Basic level”. The limits listed below reflect current globally available precise mercury dosing technology.

We propose to use the below limits and scope because different limits and scope in different markets hamper enforcement of any restricting legislation. Governments can set specific exemptions or limits for regional products as justified by the local market requirements.

² Please refer also to the LightingEurope position from 2013, link here: https://www.lightingeurope.org/images/publications/position-papers/LE_PP_Global_Mercury_limit_20131002_final.pdf

Mercury-added Light Sources*

Lamps to be phased out which exceed the indicated mercury limits:

1. Single capped compact fluorescent lamps (integrated and non-integrated control gear) for general lighting purposes
 - (a) that are ≤ 30 watts with a mercury content exceeding **2.5 mg** per lamp
 - (b) that are ≤ 30 watts with long lifetime (> 15 khrs) with a mercury content exceeding **3.5 mg** per lamp
 - (c) that are ≥ 30 Watt and < 150 Watt with a mercury content exceeding **5 mg** per lamp
 - (d) that are with circular or square structural shape or other non-linear with tube diameter ≤ 17 mm with a mercury content exceeding **7 mg** per lamp
2. Double-capped linear fluorescent lamps ≤ 1800 mm for general lighting purposes
 - (a) tri band phosphor with normal lifetime and a tube diameter < 9 mm (e.g. T2) with a mercury content exceeding **4 mg** per lamp
 - (b) tri band phosphor with normal lifetime and tube diameter ≥ 9 mm and ≤ 17 mm (e.g. T5) with a mercury content exceeding **3 mg** per lamp
 - (c) tri band phosphor with normal lifetime with a tube diameter > 17 mm and < 38 mm (e.g. T8 , T10) with a mercury content exceeding **3.5 mg** per lamp
 - (d) tri band phosphor with long lifetime > 25 khrs or tri band phosphor with a tube diameter ≥ 38 mm (e.g. T12) with a mercury content exceeding **5 mg** per lamp
 - (e) halophosphate with a mercury content exceeding **10 mg** per lamp
3. Other low pressure discharge lamps ≤ 1800 mm for general lighting not mentioned above and all low-pressure discharge lamps ≤ 1800 mm for special purpose with a mercury content exceeding **15 mg** per lamp.
4. High pressure mercury vapour lamps (HPMV) for general lighting purpose
5. Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for electronic displays:
 - (a) short length (≤ 500 mm) with mercury content exceeding **3.5mg** per lamp
 - (b) medium length (> 500 mm and $\leq 1\ 500$ mm) with mercury content exceeding **5 mg** per lamp
 - (c) long length ($> 1\ 500$ mm) with mercury content exceeding **13 mg** per lamp

*The following products are excluded from the scope:

- (a) Products essential for civil protection and military uses;
- (b) Products for research, calibration of instrumentation, for use as reference standard;
- (c) Where no feasible mercury-free alternative for replacement is available, cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for electronic displays, and measuring devices
- (d) Products for medical devices, monitoring and control instruments

- 5) **Serial lamp connections** - Rectangular luminaires are used in many office and shop applications where 4 lamps are operated by 2 magnetic drivers. Therefore, 2 lamps operate in a serial circuit connection which is not allowed for many LED tube lamps.
- 6) **Water protected or closed cap luminaires** - used in car parking's, home garages, industry halls, food industry, streetlighting, train- and metro stations etc., where most LED retrofit lamps cannot be used as one-to-one replacements.
- 7) **EMC** - Electro Magnetic Compatibility problems can happen due to driver/wiring combinations which can disturb electronic (IT) equipment when the originally designed conventional lamp is substituted by different electronic LED lamp designs.
- 8) **Light distribution problems** due to the narrow beam of LED lamps compared to wide beams of conventional lamp, inducing inhomogeneous light levels and zebra effects.
- 9) **DC operation applications** for conventional lamps e.g. battery-operated applications like boats, trucks, trains. LED lamps are not suited for these applications.
- 10) **B and C brand driver compatibility** - is unclear as these drivers were not tested. Only A-brand compatibility table data are tested and listed.

Please note that the above references of LightingEurope are based on the experience of many manufacturers and for all lamp types.

The compatibility of LED tubes with installed electronic drivers of other manufacturers, not members of LightingEurope is not known to us, nor have we found technical guidance documents online. We encourage regulators to base themselves on such compatibility files when evaluating whether universal mercury-free substitutes are available for all installed lighting.