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EMIRATES AUTHORITY FOR STANDARDIZATION AND METROLOGY
(ESMA)



اللائحة الفنية
متطلبات الترخيص و التسجيل منتجات الاضاءة
TECHNICAL REGULATION No. ###:2012
REQUIREMENTS FOR APPROVAL AND REGISTRATION OF LIGHTING PRODUCTS

دولة الامارات العربية المتحدة
UNITED ARAB EMIRATES

REQUIREMENTS FOR APPROVAL AND REGISTRATION OF LIGHTING PRODUCTS

28-11-2012	
Technical Regulation	

FOREWORD

The Emirates Authority for Standardization and Metrology (ESMA), as mandated by Federal Law No. 28 of 2001 hereby issue this Technical Regulation.

ESMA through the Technical Committee for Lighting Products has developed the Technical Regulation No. ###:2012 – Requirements for Approval and Registration of Lighting Products.

This Technical Regulation has been approved by Decree of UAE Cabinet No. ###:2012, held on ##/##/1434H, ##/##/2012

INTRODUCTION

With the UAE's commitment to consumer safety, energy conservation and environment protection, this regulation is developed to ensure that lighting products are registered and monitored for their continuous compliance to the set specifications on:

- Electrical Safety;
- Performance: Energy Efficiency;
- Functionality;
- Hazardous Chemicals;
- Safe Disposal of Lighting Products.

This regulation along with its precedents and accompanying requirements detailed in this document is set to take effect fully six (6) months following its publication in the Official Gazette of the United Arab Emirates.

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1 Scope

This regulation covers lighting products listed in [Annex A](#) of this regulation.

Similar lighting products for special purposes and not intended for lighting purposes are not covered by this regulation. Control gears used for emergency lighting and those not meant for general lighting are outside the scope of this regulation.

This regulation establishes requirements for electrical safety, performance, functionality, hazardous chemicals and safe disposal of products.

This regulation also gives reference to the Emirates Conformity Assessment Scheme (ECAS) for Low Voltage Equipment where the requirements for electrical safety are defined.

General exemptions for lamps, luminaires and control gears are listed in [Annex B](#) (Note 1).

Note 1: Products exempted from this Technical Regulation does not exempt it from ECAS for Low Voltage Equipment or any other existing regulation unless specified.

2 Terms and Definitions

For the purpose of this document, the following terms and definitions apply:

2.1 General

- 2.1.1. **Authorized representative** – means any natural or legal person established in the UAE, having a valid trade license, who has received a written mandate from the manufacturer or from the Own Brand Labeler to perform on his behalf all or part of the obligations and formalities connected with this Technical Regulation.
- 2.1.2. **Competent Third Party Laboratory** – means a competent laboratory capable of performing tests and issues a valid test report depending on the applicable product standard.
- 2.1.3. **Disposal**
- 2.1.4. **Direct impact** – means the impact of products that actually consume energy during use.
- 2.1.5. **End-user** – means a natural person buying or expected to buy a product for purposes which are outside his trade, business, craft or profession.
- 2.1.6. **ESMA** – Emirates Authority for Standardization & Metrology, the national authority mandated to implement this regulation.
- 2.1.7. **Final owner** – means the person or entity owning a product during the use phase of its life cycle, or any person or entity.

- 2.1.8. **General Lighting** – the full or partial illumination of an area, by replacing or complementing natural light with artificial light in order to enhance visibility in that area.
- 2.1.9. **IEC CB Test Report and Certificate** – is a type of test report and certificate issued by an IEC Recognized Laboratory under the CB Scheme of International Electrotechnical Commission (IEC).
- 2.1.10. **IEC Recognized Laboratory** – a competent third party laboratory capable of performing tests and issues an IEC CB Test Report and Certificate based on applicable IEC standards.
- 2.1.11. **Importer** – means any natural or legal person established in the UAE who places a product from another country on the UAE market in the course of his business.
- 2.1.12. **Indirect impact** – means the impact of products that do not consume energy, but contribute to energy conservation during use.
- 2.1.13. **Manufacturer** – means the natural or legal person who manufactures products covered by this Regulation and is responsible for their conformity with this Regulation in view of their being placed on the market and/or put into service under the manufacturer’s own name or trademark or for the manufacturer’s own use. In the absence of a manufacturer as defined in the first sentence of this point or of an importer, any natural or legal person who places on the market and/or puts into service products covered by this Regulation shall be considered a manufacturer.
- 2.1.14. **Own Brand Labeler (Private Labeler)** – an own brand labeler (OBL) purchases a finished (or component parts of a) product from the Original Equipment Manufacturer (OEM) which he then places on the market under his own name or trade mark (brand label). This Own Brand Labeler may not be the person who actually designs, manufactures, packages or labels the device.
- 2.1.15. **‘Placing on the Market’** – means making a product available for the first time on the UAE market with a view to its distribution or use within the UAE, whether for reward or free of charge and irrespective of the selling technique.
- 2.1.16. **Point of Sale or Vendor** – means a physical location where the product is displayed or offered for sale, hire or hire-purchase to the end-user. Showrooms are also included under this definition.
- 2.1.17. **Product** – an equipment, system or part which is included in the list of regulated products under this regulation.
- 2.1.18. **‘Putting into Service’** – means the first use of a product for its intended purpose in the UAE.
- 2.1.19. **Recovery**
- 2.1.20. **Recycling**
- 2.1.21. **Retailer** – means an entity or a person who sells, hires, offers for hire-purchase or displays products to end-users.
- 2.1.22. **Reuse**
- 2.1.23. **Supplier** – a manufacturer and/or trader responsible for the product covered by this Specific Requirement.

2.1.24. **Technical Regulation** – refers directly to this Technical Regulation No. ###:2012 – Requirements for Approval and Registration of Lighting Products.

2.1.25. **Treatment**

2.2 Technical

2.3.1. **Tungsten halogen lamp** – means a filament lamp in which the filament is made of tungsten and is surrounded by gas containing halogens or halogen compounds. They may be supplied with an integrated power supply.

2.3.2. **Ballast** – means lamp control gear inserted between the supply and one or more discharge lamps which by means of inductance, capacitance or a combination of inductance and capacitance, serves mainly to limit the current of the lamp(s) to the required value.

2.3.3. **Beam angle** – means the angle between two imaginary lines in a plane through the optical beam axis, such that these lines pass through the center of the front face of the lamp and through points at which the luminous intensity is 50 % of the center beam intensity, where the center beam intensity is the value of luminous intensity measured on the optical beam axis.

2.3.4. **Chromaticity** – means the property of a color stimulus defined by its chromaticity coordinates, or by its dominant or complementary wavelength and purity taken together.

2.3.5. **Color consistency** – means the maximum deviation of chromaticity coordinates (x and y) of a single lamp from a chromaticity center point (cx and cy), expressed as the size (in steps) of the Macadam ellipse formed around the chromaticity center point (cx and cy).

2.3.6. **Color rendering (R_a)** – means the effect of an illuminant on the color appearance of objects by conscious or subconscious comparison with their color appearance under a reference illuminant.

2.3.7. **Compact fluorescent lamp (CFL)** – means a fluorescent lamp that includes all components necessary for starting and stable operation of the lamp.

2.3.8. **Components and sub-assemblies** – means parts intended to be incorporated into products which are not placed on the market and/or put into service as individual parts for end- users or the environmental performance of which cannot be assessed independently.

2.3.9. **Control device** – means an electronic or mechanical device controlling or monitoring the luminous flux of the lamp by other means than power conversion for the lamp, such as timer switches, occupancy sensors and daylight regulation devices. In addition, phase cut dimmers shall also be considered as control devices.

2.3.10. **Control signal** – means an analogue or digital signal transmitted to the control gear wirelessly or wired either via voltage modulation in separate control cables or via modulated signal in the supply voltage.

- 2.3.11. **Correlated color temperature (T_c [K])** – means the temperature of a Planckian (black body) radiator whose perceived color most closely resembles that of a given stimulus at the same brightness and under specified viewing conditions.
- 2.3.12. **Directional Lamp** – a lamp having at least 80% light output within a solid angle of πsr (corresponding to a cone with an angle of 120°).
- 2.3.13. **Discharge lamp** – means a lamp in which the light is produced, directly or indirectly, by an electric discharge through a gas, a metal vapour or a mixture of several gases and vapors.
- 2.3.14. **Energy-related product** – means any good having an impact on energy consumption during use, which is placed on the market and/or put into service in the UAE, including parts intended to be incorporated into energy-related products covered by this regulation which are placed on the market and/or put into service as individual parts for end-users and which are placed on the market and/or put into service as individual parts for end-users and of which the environmental performance can be assessed independently.
- 2.3.15. **External lamp control-gear** – means non-integrated lamp control gear designed to be installed outside the enclosure of a lamp or luminaire, or to be removed from the enclosure without permanently damaging the lamp or the luminaire.
- 2.3.16. **Filament lamp** – means a lamp in which light is produced by means of a threadlike conductor which is heated to incandescence by the passage of an electric current. The lamp may contain gases influencing the process of incandescence.
- 2.3.17. **Fluorescent lamp** – means a discharge lamp of the low pressure mercury type in which most of the light is emitted by one or more layers of phosphors excited by the ultraviolet radiation from the discharge. Fluorescent lamps may be supplied with integrated ballast.
- 2.3.18. **Fluorescent lamp without integrated ballast** – means a single or double-capped fluorescent lamp without integrated ballast.
- 2.3.19. **Halogen lamp control gear** – means lamp control gear that transforms mains voltage to extra low voltage for halogen lamps.
- 2.3.20. **High-intensity discharge lamp** – means an electric discharge lamp in which the light producing arc is established by wall temperature and the arc has a bulb wall loading in excess of 3 watts per square centimeter.
- 2.3.21. **Household luminaire** – means a luminaire intended to provide general lighting in a household environment.
- 2.3.22. **Incandescent lamp** – means a filament lamp in which the filament operates in an evacuated bulb or is surrounded by inert gas.
- 2.3.23. **Initial luminous flux** – means the luminous flux of a lamp after a short operating period.
- 2.3.24. **Ingress protection grading (IP)** – means a coding system to indicate the degree of protection provided by an enclosure against ingress of dust, solid objects and moisture and to give additional information in connection with such protection.

- 2.3.25. **Lamp** – means a unit whose performance can be assessed independently and which consists of one or more light sources. It may include additional components necessary for starting, power supply or stable operation of the unit or for distributing, filtering or transforming the optical radiation, in cases where those components cannot be removed without permanently damaging the unit.
- 2.3.26. **Lamp cap** – means that part of a lamp which provides connection to the electrical supply by means of a lamp holder or lamp connector and may also serve to retain the lamp in the lamp holder.
- 2.3.27. **Lamp control gear** – means a device located between the electrical supply and one or more lamps, which provides a functionality related to the operation of the lamp(s), such as transforming the supply voltage, limiting the current of the lamp(s) to the required value, providing a starting voltage and preheating current, preventing cold starting, correcting the power factor or reducing radio interference. The device may be designed to connect to other lamp control gear to perform these functions.
- 2.3.28. **Lamp holder or ‘socket’** – means a device which holds the lamp in position, usually by having the cap inserted in it, in which case it also provides the means of connecting the lamp to the electric supply.
- 2.3.29. **Lamp lifetime** – means the period of operating time after which the fraction of the total number of lamps which continue to operate corresponds to the lamp survival factor of the lamp under defined conditions and switching frequency. For LED lamps, lamp lifetime means the operating time between the start of their use and the moment when only 50% of the total number of lamps survive or when the average lumen maintenance of the batch falls below 70%, whichever occurs first.
- 2.3.30. **Lamp lumen maintenance factor (LLMF)** – means the ratio of the luminous flux emitted by the lamp at a given time in its life to the initial luminous flux.
- 2.3.31. **Lamp mercury content** – means the mercury contained in the lamp.
- 2.3.32. **Lamp start time** – means the time needed, after the supply voltage is switched on, for the lamp to start fully and remain alight.
- 2.3.33. **Lamp survival factor (LSF)** – means the defined fraction of the total number of lamps that continue to operate at a given time under defined conditions and switching frequency.
- 2.3.34. **Lamp warm-up time** – means the time needed after start-up, for the lamp to emit a defined proportion of its stabilized luminous flux.
- 2.3.35. **LED lamp** – means a lamp incorporating one or more LED modules. The lamp may be equipped with a cap.
- 2.3.36. **LED module** – means an assembly having no cap and incorporating one or more LED packages on a printed circuit board. The assembly may have electrical, optical, mechanical and thermal components, interfaces and control gear.
- 2.3.37. **LED package** – means a surface or object designed to emit mainly visible optical radiation produced by a transformation of energy. The term visible refers to a wavelength of 380-780 nm.

- 2.3.38. **Light-emitting diode (LED)** – means a light source which consists of a solid state device embodying a p-n junction. The junction emits optical radiation when excited by an electric current.
- 2.3.39. **Lighting** – means the application of light to a scene, objects or their surroundings so that they may be seen by humans.
- 2.3.40. **Light source** - means a surface or object designed to emit mainly visible optical radiation produced by a transformation of energy. The term ‘visible’ refers to a wavelength of 380-780 nm.
- 2.3.41. **Luminaire** – means an apparatus which distributes, filters or transforms the light transmitted from one or more lamps and which includes all the parts necessary for supporting, fixing and protecting the lamps and, where necessary, circuit auxiliaries together with the means for connecting them to the electric supply.
- 2.3.42. **Luminaire Maintenance Factor (LMF)** – means the ratio of the light output ratio of a luminaire at a given time to the initial light output ratio.
- 2.3.43. **Luminous flux (Φ)** – means the quantity derived from radiant flux (radiant power) by evaluating the radiation in accordance with the spectral sensitivity of the human eye. Without further specification it refers to the initial luminous flux.
- 2.3.44. **Luminous intensity (candela or cd)** – means the quotient of the luminous flux leaving the source and propagated in the element of solid angle containing the given direction, by the element of solid angle.
- 2.3.45. **Materials** – means all materials used during the life cycle of a product.
- 2.3.46. **Nominal value** – means the value of a quantity used to designate and identify a product.
- 2.3.47. **No-load mode** – means the condition of a lamp control gear where it is connected to the supply voltage and where its output is disconnected in normal operation from all the primary loads by the switch intended for this purpose (a faulty or missing lamp, or a disconnection of the load by a safety switch is not normal operation).
- 2.3.48. **No-load power** – means the power consumed by the lamp control gear in no-load mode.
- 2.3.49. **Non-directional lamp** – means a lamp that is not a directional lamp. A lamp emitting light in a uni-directional manner or close to 360° evenly.
- 2.3.50. **Power factor** – means the ratio of the absolute value of the active power to the apparent power under periodic conditions.
- 2.3.51. **Premature failure** – means when a lamp reaches the end of its life after a period in operation which is less than the rated life time stated in the technical documentation.
- 2.3.52. **Rated value** – means the value of a quantity used for specification purposes, established for a specified set of operating conditions of a product. Unless stated otherwise, all requirements are set in rated values.
- 2.3.53. **Self-ballasted lamp** – a unit which cannot be dismantled without being permanently damaged, provided with a lamp cap and incorporating a light source and any additional elements necessary for starting and stable operation of the light source. This is also considered as a Compact Fluorescent Lamp (CFL).

- 2.3.54. **Special purpose lamps** – are lamps designed essentially for other types of applications (such as traffic signals, terrarium lighting, or household appliances) and clearly indicated as such on accompanying product information should not be subject to the requirements set out in this Technical Regulation.
- 2.3.55. **Standby mode** – means a mode of lamp control gear where the lamps are switched off with the help of a control signal under normal operating conditions. It applies to lamp control gear with a built-in switching function and permanently connected to the supply voltage when in normal use.
- 2.3.56. **Standby power** – means the power consumed by the lamp control gear in standby mode.
- 2.3.57. **Supplementary information** – means other information concerning the performance and features of a product which relate to, or are helpful in evaluating, its use of energy or other essential resource based on measurable data.
- 2.3.58. **Switching cycle** – means the sequence of switching the lamp on and off at set intervals.
- 2.3.59. **Useful luminous flux (Φ_{use})** – means the part of the luminous flux of a lamp falling within the beam angle used for calculating the lamp's energy efficiency applications where the primary purpose of the light is not lighting.
- 2.3.60. **Utilization Factor (UF)** of an installation for a reference surface – means the ratio of the luminous flux received by the reference surface to the sum of the individual total fluxes of the lamps of the installation.
- 2.3.61. **White light source** – means a light source having chromaticity coordinates that satisfy the following requirement:
- $0,270 < x < 0,530$
 - $2,3172 x^2 + 2,3653 x - 0,2199 < y < -2,3172 x^2 + 2,3653 x - 0,1595$

For other terms and definitions, details mentioned in specific UAE standards per product scope listed in [Annex C](#) shall apply.

3 Product Requirements

Products covered by this Technical Regulation shall comply with the requirements stipulated under this section.

3.1 Electrical Safety

This section of this Technical Regulation gives reference to the requirements set by the Emirates Conformity Assessment Scheme (ECAS) for Low Voltage Equipment (LVE). Products covered by this Technical Regulation shall comply with the requirements set by the referenced Scheme for Low Voltage Equipment (LVE).

3.2 Performance: Energy Efficiency

Lamps covered by this regulation shall comply with the Energy Efficiency Requirements specified in [Annex D](#). Lamps shall meet, at the least, the lowest Energy Efficiency Index (*EEI*) – 1 Star value as listed in [Table 1](#).

Energy Efficiency classes and the methods of calculating the energy efficiency index and energy consumption for lamps are stipulated in [Annex D](#).

Control gears for fluorescent lamps without integrated control gear covered by this regulation shall comply with the Energy Efficiency Requirements specified in [Annex E](#).

3.3 Efficacy and Functionality

Lamps covered by this regulation shall comply with the Efficacy and Functionality Requirements specified in [Annex F](#) and [Annex G](#) respectively.

3.4 Hazardous Chemicals

Products specified in [Annex H](#), [Table 12](#) shall comply with the maximum mercury content. All products covered by this Technical Regulation shall comply with the hazardous chemicals limits in [Table 13](#).

3.5 Marking Requirements

Instruction manuals and energy efficiency labels supplied with products should include the Arabic language. Cautionary and/or any safety warnings for the direct user or consumer should be in Arabic language. Products shall not contain any material or descriptive images or definitions which may be regarded offensive to the Islamic Religion.

3.5.1 For special purpose lamps, the following information shall be clearly and prominently indicated on their packaging and in all forms of product information accompanying the lamp, luminaire and control gear when it is placed on the market:

3.5.1.1 Their intended purpose; and

3.5.1.2 That they are not suitable for household room illumination.

3.5.2 Product information requirements on lamps are the following in addition to the requirements specified clause 4.9.

3.5.2.1 Information to be visibly displayed prior to purchase to end-users on the packaging and on free access websites

The information does not need to be specified using the exact wording of the list below. It may be displayed using graphs, figures or symbols rather than text.

- a. Nominal lamp power;
- b. Nominal luminous flux;
- c. Nominal life time (in hours);
- d. Number of switching cycles before premature lamp failure;
- e. Color temperature;
- f. Lamp mercury content as X,X mg (applicable only to lamps that contains mercury);
- g. Indication which website to consult in case of accidental lamp breakage to find instructions on how to clean up the lamp debris.

3.5.2.2 Information to be made publicly available on free-access websites

As a minimum, the following information shall be expressed at least as values:

- a. The information specified in 3.5.2.1;
- b. Rated wattage (0.1W precision);
- c. Rated luminous flux;
- d. Rated lamp life time;
- e. Lamp power factor;
- f. Lumen maintenance factor at the end of the nominal life;
- g. Starting time (as X, X seconds);
- h. Color rendering
- i. Instructions on how to clean up the lamp debris in case of accidental lamp breakage (applicable only to lamp that contains mercury);
- j. Recommendations on how to dispose of the lamp at its end of life (applicable only to lamp that contains mercury).

3.5.3 Product information requirements for control gears

Manufacturers of control gears shall provide at least the following information on free-access websites and in other forms they deem appropriate for each of their control gear models. That information shall also be affixed in a distinct and durable form to the control gear.

It shall also be contained in the technical documentation file drawn up for the purposes of conformity assessment in line with the procedure prescribed in the Emirates Conformity Assessment Scheme (ECAS) for Low Voltage Equipment.

For control gears for fluorescents lamps, an energy efficiency index (EEI) class shall be provided as defined in [Annex E](#).

4 Safe Disposal

- 4.1. Safe disposal of light bulbs containing mercury requires coordinated action amongst waste management authorities, producers of light bulbs and relevant local and federal government bodies, retailers, private sector waste management companies.
- 4.2. All activities shall be in compliance with Federal Law 24 of 1999 for the Protection and Development of the Environment, Cabinet Order No. 37 of 2001 for Executive Order of Law 24 on Handling Hazardous Substances, Hazardous Wastes and Medical Wastes and the UAE's commitments under the Basel Convention.
- 4.3. Other guidance to be taken into account include the guidance document on safe disposal of light bulbs in the UAE (see [Annex I](#)) which includes relevant recommendations from the UNEP document *Achieving the Global Transition to Energy Efficient Lighting Toolkit* and *Technical Guidelines for the Environmentally Sound Management of Wastes Consisting of Elemental Mercury and Wastes Containing or Contaminated with Mercury* from the Basel Convention.
- 4.4. All activities shall also be supported by and in compliance with relevant waste management strategies at federal and local emirate levels. Detailed technical guidance on the safe disposal of light bulbs containing mercury is included in [Annex I](#).
- 4.5. Legal status of waste from lighting products will indicate how spent light bulbs shall be handled, collected, stored, transported, treated, recycled or disposed.
 - 4.5.1. Light bulbs to be classified as general waste include incandescent light bulbs and halogens.
 - 4.5.2. Light bulbs to be classified as hazardous waste include mercury containing light bulbs (CFLs and LFs), electronic waste light bulbs (LEDs) and any new lighting technology containing mercury or other hazardous compounds.
- 4.6. Waste from mercury containing light bulbs shall follow the details mentioned in clause 4.2 and take into account clause 4.3 for labeling of waste, in country and trans-boundary transport, temporary storage, treatment, recovery/recycling and permanent disposal.
- 4.7. Collection of Mercury Containing Light Bulbs
 - 4.7.1. Mercury containing light bulbs shall be collected intact to avoid breakage and discarded in a specially designed container at a waste collection station or drop off depot to avoid mixing waste containing mercury with other waste.
 - 4.7.2. Refer to [Annex I](#) for details on collection stations and broken lamps procedure.

- 4.8. Financing of safe disposal of mercury containing light bulbs shall consider labeling, collection, transport, storage, treatment, recycling/recovery, permanent disposal and information and awareness activities.
- 4.9. Information for users regarding the safe disposal of mercury containing light bulbs shall take into account clause 4.3, and as a minimum, the following information shall be given to users of mercury-containing lamps in private households:
 - 4.9.1. Details on the potential effects on the environment and human health from the presence of hazardous substances, particularly mercury, in light bulbs.
 - 4.9.2. Instructions on how to safely install and remove mercury-containing light bulbs.
 - 4.9.3. Instructions on how to avoid breakage and clean up procedures from mercury containing light bulbs.
 - 4.9.4. Instructions to collect such mercury-containing light bulbs separately and not to dispose them unsorted in municipal waste.
 - 4.9.5. Details of return and collection systems available in the UAE and their role in contributing to reuse, recycling and other forms of recovery of mercury-containing light bulbs
- 4.10. Roles and responsibilities for safe disposal of light bulbs containing mercury shall support implementation of clauses 4.6, 4.7, 4.8 and 4.9, and shall follow the details mentioned in clause 4.5, and should take into account clause 4.3. Specifically:
 - 4.10.1. The concerned authority in each Emirate is responsible for the handling and dealing of hazardous waste, and the Municipalities in the different Emirates can issue the license for the handling and dealing of hazardous waste to a third party in accordance with clause 4.2.
 - 4.10.2. Consumers are responsible for transporting spent light bulbs to initial collection points.
 - 4.10.3. Lamp collection systems shall be designed and operated by qualified and government appointed third parties in accordance with clause 4.2.
 - 4.10.4. According to Cabinet Order No. 37, transport shall be authorized by the corresponding municipal authorities in each Emirate, both sending and receiving the waste.
 - 4.10.5. A federal regulation for transport of wastes from mercury containing light bulbs shall be developed by the MOEW to facilitate waste transport between the Emirates.

4.10.6. Any producer, concerned authority or entity promoting uptake of mercury containing light bulbs, shall follow clause 4.9.

5 Product Certification

The Emirates Conformity Assessment Scheme is a certification program enforced by ESMA for regulated products. Under this scheme, products are evaluated based on requirements and standards set by the program. As a result of the evaluation, a Certificate of Conformity is generated to act as evidence of compliance.

- Manufacturers/Traders/Suppliers having a valid trade license in the UAE shall be responsible for securing approval from ESMA through the product certification process.
- To secure such approval, the responsible party for registering the products should submit the following documents:
 - ECAS Application form (fully filled-out, signed and stamped) [Annex J](#).
 - Declaration of Conformity (printed with applicant's letterhead, signed and stamped) [Annex J](#).
 - Valid UAE industry/trade license
 - IEC CB Certificate and referenced test report
 - Competent Third Party Performance test report
 - Competent Third Party Hazardous Chemical Composition Test Report
- ESMA shall process the application and evaluate the documents based on standards and specifications detailed in clause 3.
- ESMA shall evaluate and assign the appropriate star rating for the product and the applicant notified.
- Processing time of fully documented applications takes an average of 1 week (5 working days) from the receipt of the application.

5.1 Registration Procedure

Registration process shall be conducted by ESMA as per [Annex K](#).

5.2 Certificate of Conformity

- The ECAS Certificate of Conformity shall be granted after a full confirmation that the product is complying with the requirements of clause 3. Such certificate shall contain all necessary details and shall be formatted as depicted in [Annex L](#) of this regulation.
- The ECAS Certificate of Conformity will include details such as the date of issuance and expiry, owner of the certificate, product type, model details and country of origin as well as the details of the standard that the product was found complying with.
- The ECAS Certificate of Conformity shall have the following use and responsibilities given to the awardee:
 - To be used for clearing the products from the Ports and Customs Authorities.
 - To be used in trading products as a proof that the products has been approved by the Federal Government through ESMA.
 - Validity is one year. Renewal of registration shall be initiated by the applicant one (1) month before the expiration of the certificate.

5.3 Energy Efficiency Label

- Products having required compliance to Energy Efficiency requirements shall bear the Energy Efficiency Label depicted in [Annex M](#). This label should also include a symbol that indicates that the product has special disposal and collection requirements.

6 Surveillance and Market Monitoring

ESMA in coordination with different local government authorities are responsible for market monitoring of products to ensure compliance to this regulation. This regulation also applies to lighting products traded in the Free Zones for use in the UAE.

- 6.1. Consignment without the ECAS Registration Certificate shall be held. Appropriate action shall then be taken by both ESMA and the Ports and Customs Authorities.
- 6.2. Vendors shall maintain records or copies of valid ECAS Certificates of Conformity of products displayed and/or sold in their establishment. Failure to generate these certificates upon request by consumers or inspectors alike shall warrant a violation to this regulation.
- 6.3. ESMA reserves the right to inspect and conduct inspections of products being distributed in the local market. The result of the tests and evaluation shall be the basis whether to continue or revoke the registration of the product.
- 6.4. All fees related to market sampling and testing shall be paid by the manufacturer/supplier

6.5. For Lamps/Bulbs

Sample batch of minimum twenty (20) lamps of the same model from the same manufacturer shall be randomly selected and tested.

The batch shall be considered to comply with the provisions set out in clause 3 if the average result does not vary from the limit, threshold or declared value by more than 10%.

Otherwise, the product shall be considered non-compliant.

6.6. For Ballasts and Luminaires

Testing shall be done on one single unit. The model shall be considered complying with the provisions set out in clause 3 if the result does not exceed set limits.

Otherwise, three (3) units shall be tested. The model shall be considered to comply with this regulation if the average of the latter three (3) sets does not exceed the limit values.

Otherwise, the product shall be considered non-compliant.

7 Vendor Responsibilities

Vendors are responsible to ensure that all products sold, displayed and/or marketed comply with this regulation. They are held responsible for proper communication and coordination with ESMA, identifying products that are regulated or not and at the same time ensuring that regulated products sold, displayed and/or marketed in their establishments complies with this regulation by requiring copies of valid ESMA certificates from their respective traders/suppliers.

Vendors shall maintain records of these valid certificates in their establishments and make these valid certificates available upon request not only by authorized inspectors but also consumers.

Failure to generate these certificates will result to legal actions accordingly.

8 Revision

ESMA shall review this regulation in light of technological progress no later than five (5) years after the entry into force.

Annex A – Regulated Products

This regulation covers non-directional lamps, luminaires and control gears that include the following:

- Incandescent lamps $\geq 16W$ (watts);
- Linear fluorescent lamps;
- Compact fluorescent lamps (CFLs);
- Halogen lamps;
- Light emitting diode (LED) lamps;
- Luminaires and Control gears for general lighting purposes.

Annex B – General Exemptions for Lamps, Luminaires and Control Gears

B.1 The following special purpose lamps are exempted from this regulation:

- Rough service lamps
- Lamps and LED modules with a luminous flux of less than 30 lumens
- Lamps and LED modules marketed for operation with batteries
- Lamps and LED modules marketed as part of a luminaire and not intended to be removed by the end-user, except when they are offered for sale, hire or hire purchase or displayed separately to the end user, for example as spare parts.
- Lamps and LED modules marketed as part of a product whose primary purpose is not lighting. However, if they are offered for sale, hire or hire purchase or displayed separately, for example as spare parts, they shall be included within the scope of this Technical Regulation.
- Lamps and LED modules marketed for applications where their primary purpose is not lighting, such as:
 - Emission of light as an agent in chemical or biological processes (such as polymerisation, photodynamic therapy, horticulture, pet care, anti-insect products);
 - Image capture and image projection (such as camera flashlights, photocopiers, video projectors);
 - Heating (such as infrared lamps);
 - Signaling (such as airfield lamps).

These lamps and LED modules are not excluded when they are marketed for lighting purposes.

- Pet care (aquarium, terrarium, etc.)
- Anti-insect lamps
- Disinfection
- Tanning
- Display optic lamps (< 12,000 lumens), such as:
 - Stage and studio lamps;
 - Theatre lamps;
 - Television (TV) lamps;
 - Studio lamps;
 - Photo lamps – Flashlights or lamps for the development of pictures;
 - Projection lamps.
- Heating lamps (infrared), such as:
 - Infrared heat lamps – comfort heating (outdoor and indoor);
 - Infrared heat lamps – industrial
 - Infrared heat lamps – animal rearing;
 - Infrared heat lamps – health care.
- Traffic/signal lamps, such as:
 - Signal lamps;
 - Aircraft lighting – for runways and planes, all exterior applications;
 - Train lighting, including signal lighting;

- Water craft lighting, including signal lighting;
- Automotive lighting/lamps.
- Household appliances, such as:
 - Oven lamps;
 - Refrigerator lamps;
 - Sewing machine lamps.
- Others, such as:
 - Temperature and shock-proof lamps;
 - Mirror lamps.

B.2 The following luminaires are exempted from this regulation:

- Emergency lighting luminaires and emergency sign luminaires
- Luminaires to be used in explosive atmospheres
- Luminaires that are designed to operate exclusively with the lamps and LED modules listed in B.1
- Luminaires in a medical surrounding, where light is needed to perform medical tasks
- Luminaires used as a part of machinery
- Luminaires used as a part of a toy
- Professional luminaires

B.3 The following control gears are exempted from this regulation:

- Control gear for emergency lighting
- Control gear not meant for general lighting, when the intended use of the control gear is marked on the control gear.

Annex C – Applicable Standards

C. 1 IEC Safety and Performance Standards for Light Sources

- IEC 60064 Tungsten Performance Standard
- IEC 60081 Double-capped fluorescent lamps Performance Standard
- IEC 60155 Glow starters Safety and Performance
- IEC 60188 High pressure mercury vapour lamps
- IEC 60192 Low pressure sodium vapour lamps
- IEC 60357 T-H Performance Standard
- IEC 60360 Method of measurement of lamp cap temperature rise
- IEC 60432-1 Tungsten Safety Standard
- IEC 60432-2 T-H Safety Standard.
- IEC 60432-3 T-H Safety Standard
- IEC 60630 Maximum lamp outlines
- IEC 60634 Heat test source (HTS) lamps for carrying out heating tests on luminaires
- IEC 60662 High pressure sodium vapour lamps
- IEC 60682 Method of measuring pinch temperatures
- IEC TR 60882 Pre-heat requirements for starter less tubular fluorescent lamps
- IEC TR 60887 Glass bulb designation system for lamps
- IEC 60901 Single-capped fluorescent lamps - Performance Standard
- IEC 60968 CFLi Safety Standard
- IEC 60969 CFLi Performance requirements
- IEC 60983 Miniature lamps
- IEC TR 60972 Classification and interpretation of new lighting products
- IEC 61126 Procedure for constructing maximum outlines
- IEC TR 61127 High pressure xenon short arc lamps
- IEC 61167 Metal halide lamps
- IEC 61195 Double-capped fluorescent lamps - Safety Standard Safety Standard
- IEC 61199 Single-capped fluorescent lamps Safety Standard
- IEC 61228 Method of measuring sun tanning lamps
- IEC 61231 International Lamp coding system (ILCOS)
- IEC TR 61341 Method of measurement of center beam intensity and beam angle
- IEC 61549 Miscellaneous lamp standard
- IEC 62031 LED Modules – Safety standard
- IEC 62035 HID Safety Standard
- IEC TR 62732 3 digit code
- IEC 62471 Photo biological Safety of Lamps and Lamp Systems
- IEC 62471-2 Guidance on manufacturing requirements
- IEC/TS 62504 General lighting – LEDs and LED modules – Terms and definitions
- IEC 62532 Fluorescent Induction lamps – Safety standard
- IEC 62554 Sample preparation for measurement of mercury level in fluorescent lamps
- IEC 62560 Self ballasted LED lamps > 50V Safety Standard
- IEC/PAS 62612 Self ballasted LED lamps > 50V Performance Requirements
- IEC 62639 Fluorescent Induction lamps Performance Requirements
- IEC 62663-1 Non-ballasted LED lamps - Safety requirements
- IEC 62663-2 Non-ballasted LED lamps – Performance Requirements

- IEC/PAS 62707-1 LED Binning
- IEC 62717 LED Modules Performance specifications
- IEC TR 62750 Unified Fluorescent Lamp Dimming Standard Calculations
- IEC 62776 Double-capped LED lamps - Safety specifications
- IEC TR 62778 Application of 62471 to light sources and luminaires (blue light)

C.2 IEC Safety and Performance Standards for Control Gears

- IEC 61347-1 Lamp control gear - Part 1: General and safety requirements
- IEC 61347-2-1 Lamp control gear - Part 2-1: Particular requirements for starting devices (other than glow starters)
- IEC 61347-2-2 Lamp control gear - Part 2-2: Particular requirements for d.c. or a.c. supplied electronic step-down convertors for filament lamps
- IEC 61347-2-3 Lamp control gear - Part 2-3: Particular requirements for a.c. and/or d.c. supplied electronic control gear for fluorescent lamps
- IEC 61347-2-7 Lamp control gear - Part 2-7: Particular requirements for battery supplied electronic control gear for emergency lighting (self-contained)
- IEC 61347-2-8 Lamp control gear - Part 2-8: Particular requirements for ballasts for fluorescent lamps
- IEC 61347-2-9 Lamp control gear - Part 2-9: Particular requirements for ballasts for discharge lamps (excluding fluorescent lamps)
- IEC 61347-2-10 Lamp control gear - Part 2-10: Particular requirements for electronic invertors and convertors for high-frequency operation of cold start tubular discharge lamps (neon tubes)
- IEC 61347-2-11 Lamp control gear - Part 2-11: Particular requirements for miscellaneous electronic circuits used with luminaires
- IEC 61347-2-12 Lamp control gear - Part 2-12: Particular requirements for d.c. or a.c. supplied electronic ballasts for discharge lamps (excluding fluorescent lamps)
- IEC 61347-2-13 Lamp control gear - Part 2-13: Particular requirements for d.c. or a.c. supplied electronic control gear for LED modules
- IEC 60921 Ballasts for tubular fluorescent lamps - Performance requirements
- IEC 60923 Auxiliaries for lamps - Ballasts for discharge lamps (excluding tubular fluorescent lamps) - Performance requirements
- IEC 60927 Auxiliaries for lamps - Starting devices (other than glow starters) - Performance requirements
- IEC 60929 AC and/or DC-supplied electronic control gear for tubular fluorescent lamps - Performance requirements
- IEC 61047 DC or AC supplied electronic step-down convertors for filament lamps - Performance requirements
- IEC 61048 Auxiliaries for lamps - Capacitors for use in tubular fluorescent and other discharge lamp circuits - General and safety requirements
- IEC 61049 Capacitors for use in tubular fluorescent and other discharge lamp circuits. Performance requirements
- IEC 61050 Transformers for tubular discharge lamps having a no-load output voltage exceeding 1000 V (generally called neon-transformers). General and safety requirements
- IEC 62384 DC or AC supplied electronic control gear for LED modules - Performance requirements

- IEC 62442-1 Energy performance of lamp control gear - Part 1: Control gear for fluorescent lamps - Method of measurement to determine the total input power of control gear circuits and the efficiency of the control gear
- IEC 62442-2 ed.1: Energy performance of lamp control gear - Part 2: Control gear for high intensity discharge lamps (excluding fluorescent lamps) - Method of measurement to determine the efficiency of control gear
- IEC 62442-3 Ed.1: Energy performance of lamp control gear - Part 3: Control gear for halogen lamps and LED modules - Method of measurement to determine the efficiency of the control gear
- IEC 61547 EMC requirements in development Safety software EMF interface standards DALI and in development is DTL
- IEC 60838 -2-2 LED Connectors safety standard
- IEC 61347-1 LED Control gear (Drivers) safety standard
- IEC 61347-2-13 LED Control gear (Drivers) safety standard
- IEC 62384 LED Control gear (Drivers) performance standard
- IEC 60061-1 Edition 3.2 2002-07 Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 1: Lamp caps
- IEC 60061-2 Edition 3.2 2002-07 Lamp caps and holders together with gauges for the control of interchangeability and safety - Part 2: Lampholders
- IEC 60061-3 Edition 3.2 2002-07 Lamp caps and holders together with gauges for the control of interchangeability and safety - Part 3: Gauges
- IEC 62471, Photo-biological safety of lamp and lamp systems
- IEC 60927, Auxiliaries for lamps – Starting devices (other than glow starters) – Performance requirements
- IEC 61347-2-1: 2006-01 Particular requirements for starting devices (other than glow starters)
- IEC 60061 series: Lamp caps and holders together with gauges for the control of interchangeability and safety
- IEC 62386-101: Digital addressable lighting interface – Part 101: General requirements - System
- IEC 62386-102: Digital addressable lighting interface – Part 102: General requirements - Control Gear
- IEC 62386-207: Digital addressable lighting interface – Part 207: Particular requirements for control gear – LED modules (device type 6)
- IEC 61547 Equipment for general lighting purposes - EMC immunity requirements
- IEC 61000-3-2 Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
- IEC 62493 Assessment of lighting equipment related to human exposure to electromagnetic fields

C.3 IEC Safety and Performance Standards for Luminaires

- IEC 60598-1 Luminaires safety standard
- IEC 60598-2-xx recessed, floodlight, street light, portable, lighting chains....
- IEC/PAS 62722-1 Luminaires performance standard
- IEC/PAS 62722-2-1 LED Luminaires performance standard

Annex D – Energy Efficiency Requirements for Lamps

D.1 Energy Efficiency Classes

The energy efficiency rating of lamps shall be determined on the basis of their Energy Efficiency Index (*EEI*) as set out in [Table 1](#).

Table 1 - Energy Efficiency Classes for Lamps

Energy Efficiency Class	Energy Efficiency Index (<i>EEI</i>)
5-Star (<i>most efficient</i>)	$EEI \leq 0.11$
4-Star	$0.11 < EEI \leq 0.17$
3-Star	$0.17 < EEI \leq 0.24$
2-Star	$0.24 < EEI \leq 0.60$
1-Star (<i>least efficient</i>)	$0.60 < EEI \leq 0.80$

D.2 Calculation of Energy Efficiency Index (*EEI*)

For the calculation of the energy efficiency index (*EEI*) of a model, its corrected power for any control gear losses is compared with its reference power. The reference power is obtained from the useful luminous flux, which is the total flux for non-directional lamps, and the flux in a 90° or 120° cone for directional lamps.

The *EEI* is calculated as follows and rounded to two decimal places:

$$EEI = \frac{P_{cor}}{P_{ref}}$$

Where:

P_{cor} is the rated power (P_{rated}) for models without external control gear and the rated power (P_{rated}) corrected in accordance with [Table 2](#) for models with external control gear. The rated power of the lamps is measured at their nominal input voltage.

Table 2- Power Correction if the model requires external Control Gear

Correction Scope	Corrected Power for control gear losses (P_{cor})
Lamps operating on external halogen lamp control gear	$P_{rated} \times 1.06$
Lamps operating on external LED lamp control gear	$P_{rated} \times 1.10$
Fluorescent lamps of 16mm diameter (T5 lamps) and 4-pin single capped fluorescent lamps operating on external fluorescent lamp control gear	$P_{rated} \times 1.10$

Other lamps operating on external fluorescent lamp control gear	$P_{rated} \times \frac{0.24 \sqrt{\Phi_{use}} + 0.0103\Phi_{use}}{0.15 \sqrt{\Phi_{use}} + 0.0097\Phi_{use}}$
Lamps operating on external high-intensity discharge lamp control gear	$P_{rated} \times 1.10$
Lamps operating on external low pressure sodium lamp control gear	$P_{rated} \times 1.15$

P_{ref} is the reference power obtained from the useful luminous flux of the model (Φ_{use}) by the following formulae:

For models with $\Phi_{use} < 1300$ lumen: $P_{ref} = 0.88\sqrt{\Phi_{use}} + 0.049\Phi_{use}$

For models with $\Phi_{use} \geq 1300$ lumen: $P_{ref} = 0.07341\Phi_{use}$

The useful luminous flux (Φ_{use}) is defined in accordance with [Table 3](#).

Table 3 - Definition of Useful Luminous Flux

Type	Useful Luminous Flux (Φ_{use})
Non-directional Lamps	Total Rated Luminous Flux (Φ)

D.3 Calculation of Energy Consumption

The weighted energy consumption (E_c) is calculated in kWh/1000h as follows and is rounded to two decimal places:

$$E_c = \frac{P_{cor} \times 1000h}{1000}$$

Where P_{cor} is the power corrected for any control gear losses in accordance with D.2 above.

Annex E – Energy Efficiency Requirements for Control Gears

The minimum energy efficiency index class for non-dimmable control gears for fluorescent lamps shall be B2 as detailed in [Table 4](#).

Table 4 - Energy Efficiency Index Requirements for Non-Dimmable Control Gears for Fluorescent Lamps

LAMP DATA					CONTROLGEAR EFFICIENCY (P_{lamp}/P_{input}) Non-Dimmable				
Lamp Type	Nominal Wattage	ILCOS CODE	Rated / Typical Wattage		A2 BAT	A2	A3	B1	B2
	W		50 Hz	HF					
			W	W					
T8	18	FD-18-E-G13-26/600	18	16	87.70%	84.20%	76.20%	71.30%	65.80%
T8	30	FD-30-E-G13-26/900	30	24	82.10%	77.40%	72.70%	79.20%	75.00%
T8	36	FD-36-E-G13-26/1200	36	32	91.40%	88.90%	84.20%	83.40%	79.50%
T8	38	FD-38-E-G13-26/1050	39	32	87.70%	84.20%	80.00%	84.10%	80.40%
T8	58	FD-58-E-G13-26/1500	58	50	93.00%	90.90%	84.70%	86.10%	82.20%
T8	70	FD-70-E-G13-26/1800	70	60	90.90%	88.20%	83.30%	86.30%	83.10%
TC-L	18	FSD-18-E-2G11	18	16	87.70%	84.20%	76.20%	71.30%	65.80%
TC-L	24	FSD-24-E-2G11	24	22	90.70%	88.00%	81.50%	76.00%	71.30%
TC-L	36	FSD-36-E-2G11	36	32	91.40%	88.90%	84.20%	83.40%	79.50%
TCF	18	FSS-18-E-2G10	18	16	87.70%	84.20%	76.20%	71.30%	65.80%
TCF	24	FSS-24-E-2G10	24	22	90.70%	88.00%	81.50%	76.00%	71.30%
TCF	36	FSS-36-E-2G10	36	32	91.40%	88.90%	84.20%	83.40%	79.50%
TC-D / DE	10	FSQ-10-E-G24q=1 FSQ-10-I-G24d=1	10	10	89.40%	86.40%	73.10%	67.90%	59.40%
TC-D / DE	13	FSQ-13-E-G24q=1 FSQ-13-I-G24d=1	13	13	91.70%	89.30%	78.10%	72.60%	65.00%
TC-D / DE	18	FSQ-18-E-G24q=2 FSQ-18-I-G24d=2	18	17	89.80%	86.80%	78.60%	71.30%	65.80%
TC-D / DE	26	FSQ-26-E-G24q=3 FSQ-26-I-G24d=3	26	24	91.40%	88.90%	82.80%	77.20%	72.60%
TC-T / TE	13	FSM-13-E-GX24q=1 FSM-13-I-GX24d=1	13	13	91.70%	89.30%	78.10%	72.60%	65.00%
TC-T / TE	18	FSM-18-E-GX24q=2 FSM-18-I-GX24d=2	18	17	89.80%	86.80%	78.60%	71.30%	65.80%
TC-T / TC-TE	26	FSM-26-E-GX24q=3 FSM-26-I-GX24d=3	27	24	91.40%	88.90%	82.80%	77.50%	73.00%
TC-DD / DDE	10	FSS-10-E-GR10q FSS-10-L/P/H-GR10q	11	10	86.40%	82.60%	70.40%	68.80%	60.50%
TC-DD / DDE	16	FSS-16-E-GR10q FSS-16-I-GR8	16	15	87.00%	83.30%	75.00%	72.40%	66.10%

		FSS-16-L/P/H-GR10q							
TC-DD / DDE	21	FSS-21-E-GR10q FSS-21-L/P/H-GR10q	21	20	89.70%	86.70%	78.00%	73.90%	68.80%
TC-DD / DDE	28	FSS-28-E-GR10q FSS-28-I-GR8 FSS-28-L/P/H-GR10q	28	25	89.10%	86.00%	80.30%	78.20%	73.90%
TC-DD / DDE	38	FSS-38-E-GR10q FSS-38-L/P/H-GR10q	39	35	92.00%	89.60%	85.20%	84.10%	80.40%
TC	5	FSD-5-I-G23 FSD-5-E-2G7	5	5	72.70%	66.70%	58.80%	49.30%	41.40%
TC	7	FSD-7-I-G23 FSD-7-E-2G7	7	7	77.60%	72.20%	65.00%	55.70%	47.80%
TC	9	FSD-9-I-G23 FSD-9-E-2G7	9	8	78.00%	72.70%	66.70%	60.30%	52.60%
TC	11	FSD-11-I-G23 FSD-11-E-2G7	12	11	83.00%	78.60%	73.30%	66.70%	59.60%
T5	4	FD-4-E-G5-16/150	5	4	64.90%	58.10%	50.00%	45.00%	37.20%
T5	6	FD-6-E-G5-16/225	6	5	71.30%	65.10%	58.10%	51.80%	43.80%
T5	8	FD-8-E-G5-16/300	7	8	69.90%	63.60%	58.60%	48.90%	42.70%
T5	13	FD-13-E-G5-16/525	13	13	84.20%	80.00%	75.30%	72.60%	65.00%
T9-C	22	FSC-22-E-G10q-29/200	22	19	89.40%	86.40%	79.20%	74.60%	69.70%
T9-C	32	FSC-32-E-G10q-29/300	32	30	88.90%	85.70%	81.10%	80.00%	76.00%
T9-C	40	FSC-40-E-G10q-29/400	40	32	89.50%	86.50%	82.10%	82.60%	79.20%
T2	6	FDH-6-L/P-W4,3x8,5d-7/220		5	72.70%	66.70%	58.80%		
T2	8	FDH-8-L/P-W4,3x8,5d-7/320		8	76.50%	70.90%	65.00%		
T2	11	FDH-11-L/P-W4,3x8,5d-7/420		11	81.80%	77.10%	72.00%		
T2	13	FDH-13-L/P-W4,3x8,5d-7/520		13	84.70%	80.60%	76.00%		
T2	21	FDH-21-L/P-W4,3x8,5d-7/		21	88.90%	85.70%	79.20%		
T2	23	FDH-23-L/P-W4,3x8,5d-7/		23	89.80%	86.80%	80.70%		
T5-E	14	FDH-14-G5-L/P-16/550		14	84.70%	80.60%	72.10%		
T5-E	21	FDH-21-G5-L/P-16/850		21	89.30%	86.30%	79.60%		
T5-E	24	FDH-24-G5-L/P-16/550		23	89.60%	86.50%	80.40%		
T5-E	28	FDH-28-G5-L/P-16/1150		28	89.80%	86.90%	81.80%		
T5-E	35	FDH-35-G5-L/P-16/1450		35	91.50%	89.00%	82.60%		
T5-E	39	FDH-39-G5-L/P-16/850		38	91.00%	88.40%	82.60%		
T5-E	49	FDH-49-G5-L/P-16/1450		49	91.60%	89.20%	84.60%		
T5-E	54	FDH-54-G5-L/P-16/1150		54	92.00%	89.70%	85.40%		
T5-E	80	FDH-80-G5-L/P-16/1150		80	93.00%	90.90%	87.00%		
T5-E	95	FDH-95-G5-L/P-16/1150		95	92.70%	90.50%	84.10%		
T5-E	120	FDH-120-G5-L/P-16/1450		120	92.50%	90.20%	84.50%		
T5-C	22	FSCH-22-L/P-2GX13-16/225		22	88.10%	84.80%	78.80%		
T5-C	40	FSCH-40-L/P-2GX13-16/300		40	91.40%	88.90%	83.30%		
T5-C	55	FSCH-55-L/P-2GX13-16/300		55	92.40%	90.20%	84.60%		
T5-C	60	FSCH-60-L/P-2GX13-16/375		60	93.00%	90.90%	85.70%		
TC-LE	40	FSDH-40-L/P-2G11		40	91.40%	88.90%	83.30%		

TC-LE	55	FSDH-55-L/P-2G11		55	92.40%	90.20%	84.60%		
TC-LE	80	FSDH-80-L/P-2G11		80	93.00%	90.90%	87.00%		
TC-TE	32	FSMH-32-L/P-2GX24q=3		32	91.40%	88.90%	82.10%		
TC-TE	42	FSMH-42-L/P-2GX24q=4		43	93.50%	91.50%	86.00%		
TC-TE	57	FSM6H-57-L/P-2GX24q=5 FSM8H-57-L/P-2GX24q=5		56	91.40%	88.90%	83.60%		
TC-TE	70	FSM6H-70-L/P-2GX24q=6 FSM8H-70-L/P-2GX24q=6		70	93.00%	90.90%	85.40%		
TC-TE	60	FSM6H-60-L/P-2G8=1		63	92.30%	90.00%	84.00%		
TC-TE	62	FSM8H-62-L/P-2G8=2		62	92.20%	89.90%	83.80%		
TC-TE	82	FSM8H-82-L/P-2G8=2		82	92.40%	90.10%	83.70%		
TC-TE	85	FSM6H-85-L/P-2G8=1		87	92.80%	90.60%	84.50%		
TC-TE	120	FSM6H-120-L/P-2G8=1 FSM8H-120-L/P-2G8=1		122	92.60%	90.40%	84.70%		
TC-DD	55	FSSH-55-L/P-GRY10q3		55	92.40%	90.20%	84.60%		

In addition, non-dimmable control gears not included in [Table 4](#) shall be assigned an *EEI* depending on their efficiency as described in [Table 5](#).

The minimum energy efficiency index class for non-dimmable control gears for fluorescent lamps not included in [Table 4](#) shall be A3 as detailed in [Table 5](#).

Table 5 - Energy Efficiency Index Requirements for Non-Dimmable Control Gears for Fluorescent Lamps not included in Table 4

$\eta_{controlgear}$	Energy Efficiency Index
$\geq 0.94 * Ebb_{FL}$	A3
$\geq Ebb_{FL}$	A2
$\geq 1 - 0.75 * (1 - Ebb_{FL})$	A2 BAT

For control gears for single and double capped fluorescent lamps, the Ebb_{FL} is calculated as follows:

$$\text{When } P_{lamp} \leq 5W: \quad Ebb_{FL} = 0.71$$

$$\text{When } 5W < P_{lamp} < 100W: \quad Ebb_{FL} = \frac{P_{lamp}}{2 * \sqrt{\frac{P_{lamp}}{36} + \frac{38}{36 * P_{lamp}}} + 1}$$

$$\text{When } P_{lamp} \geq 100W: \quad Ebb_{FL} = 0.91$$

Furthermore, dimmable fluorescent lamp control gears receive *EEI* classes according to the class into which the control gear would fall when it is operated at the 100% lumen output, as described in [Table 6](#).

Table 6 - Energy Efficiency Index Requirements for Dimmable Control Gears for Fluorescent Lamps

Complied Class at 100% Lumen Output	Energy Efficiency Index for Dimmable Control Gear
A3	A1
A2	A1 BAT

At the dimming position corresponding to 25% of the lumen output of the operated lamp, the input power (P_{in}) of the lamp-controlgear circuit shall not exceed:

$$P_{in} < 50\% * PL_{rated} / \eta_{controlgear}$$

Where PL_{rated} is the rated lamp power and $\eta_{controlgear}$ is the minimum energy efficiency limit of the respective *EEI* class. Multi-wattage control gears shall either be classified according to their efficiency under the lowest (least) efficiency, or a relevant class shall be indicated for each operated lamp.

Annex F – Efficacy Requirements for Lamps

The following requirement applies to the following non-directional lamp types:

- Incandescent lamps;
- Halogen lamps;
- Compact fluorescent lamps;
- Light-emitting diode (LED) lamps;
- Linear fluorescent lamps (LF).

Maximum Rated Power (P_{max})

The maximum rated power (P_{max}) for a given rated luminous flux (Φ) is provided in [Table 7](#).

Table 7 - Maximum Rated Power (P_{max})

Maximum rated power (P_{max}) for a given rated luminous flux (Φ), (W)		
GLS & HAL	CFLi & LED	LF
$0.8*(0.88\sqrt{\Phi}+0.049\Phi)$	$0.24*(0.88\sqrt{\Phi}+0.049\Phi)$	

The correction factors applicable to the calculated maximum rated power are given in [Table 8](#).

Table 8 - Correction Factors

Correction Scope	Maximum rated power (W)
Filament lamp requiring external power supply	$P_{max} / 1.06$
Discharge lamp with cap GX53	$P_{max} / 0.75$
Non-clear lamp with color rendering index ≥ 90 and $P \leq 0.5*(0.88\sqrt{\Phi}+0.049\Phi)$	$P_{max} / 0.85$
Discharge lamp with color rendering index ≥ 90 and $T_c \geq 5000K$	$P_{max} / 0.76$
non-clear lamp with second envelope and $P \leq 0.5*(0.88\sqrt{\Phi}+0.049\Phi)$	$P_{max} / 0.95$
LED lamp requiring external power supply	$P_{max} / 1.1$

Annex G – Functionality Requirements for Lamps

The lamp functionality requirements are set out in [Table 9](#) for compact fluorescent lamps and in [Table 10](#) for lamps excluding compact fluorescent lamps and LED lamps.

Where the rated lamp lifetime is higher than 2000h, the requirements for the parameters ‘Rated lamp lifetime’, ‘Lamp Survival Factor’ and ‘Lumen maintenance’ in [Tables 9](#) and [Table 10](#) are also applicable.

For the purposes of testing the number of times the lamp can be switched on and off before failure, the switching cycle shall consist of periods comprising 1 minute on and 3 minutes off. For the purposes of testing lamp lifetime, lamp survival factor, lumen maintenance and premature failure, the standard switching cycle shall be used.

Table 9 - Functionality Requirements for Compact Fluorescent Lamps

Functionality Parameter	Requirement
Lamp survival factor at 6000h	≥ 0.70
Lumen maintenance	At 2000h: ≥ 88 % (≥ 83% for lamps with second lamp envelope) At 6000 h: ≥ 70%
Number of switching cycles before failure	≥ lamp lifetime expressed in hours ≥ 30000 if lamp starting time > 0.3s
Starting time	< 1.5s if P < 10W < 1.0s if P ≥ 10W
Lamp warm-up time to 60% Φ	< 40s or < 100s for lamps containing mercury in amalgam form
Premature failure rate	≤ 2.0% at 400h
UVA + UVB radiation	≤ 2.0 mW/klm
UVC radiation	≤ 0.01 mW/klm
Lamp power factor	≥ 0.55 if P < 25W ≥ 0.90 if P ≥ 25W
Colour rendering (R_a)	≥ 80

Table 10 - Functionality Requirements for Lamps Excluding Compact Fluorescent Lamps and LED Lamps

Functionality Parameter	Requirement
Rated lamp lifetime	≥ 2000h
Lumen maintenance	≥ 85% at 75% of rated average lifetime
Number of switching cycles	≥ four times the rated lamp life expressed in hours

Starting time	< 0.2s
Lamp warm-up time to 60% Φ	\leq 1.0s
Premature failure rate	\leq 5.0% at 200h
Lamp power factor	\geq 0.95

Table 11 - Functionality Requirements for Non-directional LED Lamps

Functionality Parameter	Requirement
Lamp survival factor at 6000h	\geq 0.90
Lumen Maintenance at 6000h	\geq 0.80
Number of switching cycles before failure	\geq 15000 if rated lamp life \geq 30000h otherwise: \geq half the rated lamp life expressed in hours
Starting time	< 0.5s
Lamp warm-up time to 95% Φ	< 2s
Premature failure rate	\leq 5.0% at 1000h
Colour rendering (Ra)	\geq 80 \geq 65 if the lamp is intended for outdoor or industrial applications in accordance with point 3.1.3(l) of this Annex
Colour consistency	Variation of chromaticity coordinates within a six-step MacAdam ellipse or less.
Lamp power factor (PF) for lamps with integrated control gear	P \leq 2W : no requirement 2W < P \leq 5W : PF > 0.4 5W < P \leq 25W : PF > 0.5 P > 25W : PF > 0.9

Annex H – Hazardous Substances Limits

Table 12 - Maximum Mercury Content Limits for Lamps

Lamp Type	Limit
Single capped compact fluorescent lamps (integrated and non-integrated control gear) for general lighting purpose, not exceeding a mercury content per burner:	
≥30 W and <150 W	5 mg
<30 W	2.5 mg
<30 W with long lifetime (> 15 khrs)	3.5 mg
with circular or square structural shape or other non-linear with tube diameter ≤ 17 mm	7 mg
Double-capped linear fluorescent lamps ≤ 1800 mm for general lighting purposes not exceeding a mercury content per lamp:	
tri band phosphor with normal lifetime and a tube diameter < 9 mm (e.g. T2):	4 mg
tri band phosphor with normal lifetime and tube diameter ≥ 9 mm and ≤ 17 mm (e.g. T5):	3 mg
tri band phosphor with normal lifetime with a tube diameter > 17 mm (e.g. T8, T10 and T12):	3,5 mg
tri band phosphor with long lifetime >25 khrs:	5 mg
Halo phosphate	10 mg
Other low pressure discharge lamps for general lighting not mentioned above	15 mg
High Pressure Mercury (vapour) lamps (HPMV) for general lighting purpose	to be phased out
All lamps with lower Mercury content as mentioned above are allowed. Other lamp types, which are not mentioned specifically in this table, do not have mercury limits.	

Table 13 - Maximum Content Limits of Other Substances for Lamps

Descriptions	Tolerated mcv of substance by weight in homogeneous materials
Lead (Pb)	0.1%
Cadmium (Cd)	0.01%
Hexavalent chromium (Cr6+)	0.1%

Polybrominated biphenyls (PBB)	0.1%
Polybrominated diphenyl ether (PBDE)	0.1%

Annex I – Guidance Document on the Safe Disposal of Lighting Products Containing Mercury in the UAE

Introduction

The purpose of the document is to be used as a guidance on how wastes from lighting products, should be managed within the UAE. In particular, some energy efficient lighting (EEL) products such as Compact Fluorescent Lighting (CFL's) contain mercury (Hg) which is globally recognized as a hazardous pollutant (Basel Convention, 2010). Given that the Emirates Standardization and Metrology Authority (ESMA) is approving a standard lighting regulation that will increase the use of EEL in the UAE, it is particularly important to indicate how spent lamps containing mercury should be safely disposed of.

This document builds upon the “Road Map for Safe Disposal Article in Lighting Regulations” that was discussed by the Sustainability Working Group Committee (SWG) set up by ESMA. The SWG includes key expert stakeholders across the UAE including, ESMA, the Emirates Wildlife Society in association with WWF (EWSWWF), the Ministry of Environment and Water (MOEW), BEE'AH, Abu Dhabi Municipality, and the Middle East Lighting Association (MELA) who have been meeting regularly to discuss how lighting products in the UAE can be managed and disposed of safely. The document is a reflection of the discussions and recommendations from the SWG, and also highlights relevant documentation highlighting safe disposal of hazardous waste. These include the *Federal Law No.24 of 1999 on Protection and Development of the Environment*, the *Cabinet order No.37 for year 2001 regarding Executive order of the Federal Law No.24 of 1999 on the Handling Hazardous Substances, Hazardous Wastes, and Medical Wastes*, the *Basel Convention, Technical Guidelines for the Environmentally Sound Management of Wastes Consisting of Elemental Mercury and Wastes Containing or Contaminated with Mercury* (Basel Convention, 2010) , as well as recommendations from the UNEP document *Achieving the Global Transition to Energy Efficient Lighting Toolkit* (UNEP, 2012).

General considerations on safe disposal of lighting products:

- Certain types of Energy Efficient Lighting (EEL) contain mercury and their waste should be considered hazardous waste and require safe management and disposal
- Federal Law 24 of 1999 *Protection and Development of the Environment* , and the Cabinet order No. 37 on Federal Law no. 24 of 1999 on the *Regulation for Handling Hazardous Substances, Hazardous Wastes, and Medical Wastes* provide the legal framework for the UAE lighting regulation with respect to safe disposal. The Cabinet order No. 37 is attached in [Appendix A](#) of this Guidance document for easier reference.
- Likewise the waste management plans currently been developed and implemented by the Ministry of Environment and Water including the waste management regulatory guideline, and other Emirates should contribute to the implementation of the Cabinet order No. 37 on Hazardous wastes and the safe disposal articles of the lighting regulation.

- According to Article 58 in the Federal Law No.24 of 1999, handling ¹or dealing with hazardous substances, hazardous wastes and medical wastes is prohibited without license from the Municipalities in each Emirate. The Cabinet order No. 37 specifies the conditions and regulations for license issuance.
- According to Article 61 in the Federal Law No.24 of 1999 persons in charge of the production or handling of hazardous substances, whether in gas, liquid or solid states, shall take all the necessary precautions to ensure that no damage to the environment occurs. The Cabinet order No. 37 shall stipulate such precautions.
- To fully benefit from the transition to energy efficient lamps, to avoid future environmental and health risks, countries should establish collection and recycling systems for CFLs and other mercury-added lamps (UNEP, 2012).
- In order to reduce the negative impacts of mercury containing EEL, a dual strategy should be implemented:
 - Reduce Hg levels per light bulb through the lighting regulation following international best practices, and specifically the RoHS Directive. These limits on mercury content have been included in the UAE lighting regulation.
 - Maximize the safe disposal (including proper handling, collection, storage, transportation, treatment, recycling or disposal) of waste from spent mercury-containing light bulbs so the least amount goes into general waste.
- Extended producer responsibility (EPR) could be used as an instrument to encourage the production of mercury-free or less mercury containing products and collection of end-of-life products (BASEL Convention, 2011).
- In the UAE, the Ministry of the Environment and Water (MoEW) is currently setting up Policy, guidelines and the regulatory frameworks within the federal waste management regulatory guideline in coordination with the appropriate Emirate level authorities, for the safe disposal of electronic waste and other wastes that are classified as hazardous wastes.
- Cabinet Order No.37 (Article 3) establishes that in coordination with the federal level the Municipalities shall promulgate the administrative and technical procedures for handling or dealing with hazardous waste, and specifies the content of such procedures. Please refer to [Appendix A](#).
- According to the Cabinet order No. 37 (Article 2), the Municipalities in each Emirate are the responsible authority for issuing a license to a third party to handle or deal with hazardous wastes Article 4 specifies the procedures and conditions for licensing. . This guidance document can support the development of such regulatory frameworks and respective implementation plans relative to the safe disposal of waste from mercury containing light bulbs.

¹ According to Law 24 “Waste handling” is defined as “All operations from the time of generation of wastes to their safe disposal, including collection, storage, and treatment and recycling or disposal”.

- Alternatively, if an EPR program were to be established in the UAE, the responsibility should be placed on all producers of the products considered, and free riders (producers who do not share their responsibilities) should not be allowed, otherwise other producers are forced to bear costs that are disproportionate to their product market share (BASEL Convention, 2011). Whenever appropriate for the UAE, the regulation could include off-the-shelf best practice international regulations. Under an EPR program, waste for mercury containing light bulbs should also comply with the UAE regulatory framework.

Outline of safe disposal of lighting products in the UAE:

1. Legal Status of waste from lighting products

- Legal status of waste from lighting products will indicate how spent light bulbs should be handled, collected, stored, transported, treated, recycled or disposed.

1.2. Waste categories of spent light bulbs

- The following categories of spent lighting technologies should be treated as general waste following Federal Law No. 24 of 1999:
 - Incandescent light bulbs;
 - Halogens.
- The following categories of spent lighting technologies should be treated as Hazardous wastes, following the Cabinet order No. 37 Regulation on Handling of hazardous substances, Hazardous wastes², and Medical wastes in the UAE, and the Basel Convention and the guidance provided in this document:
 - Mercury containing light bulbs (CFL's and LF's)
 - Electronic waste light bulbs (LED's)
- As new lighting technologies emerge, these categories should be reviewed by the environmental authorities.

1.3. Labeling of waste

- A labeling system should be implemented by the producer in the packaging to help consumers and collection/recycling programs learn which products that contain mercury and need special handling (BASEL Convention, 2011).
- A labeling system in the packaging should specify that it is a “mercury-added product” and could achieve the following objectives as described in Section F in the BASEL Convention technical guidelines for the environmentally sound management of wastes (Basel Convention, 2011):
- Informing consumers at the point of purchase that the product contains mercury and may require special handling at the end-of-life;
- Identifying the products at the end of disposal so that they can be kept out of the waste stream destined for landfill or incineration and thus be recycled;
- Informing consumers that a product contains mercury, so they have information on safer alternatives (such as LEDs in the case of CFL's);
- Providing right to know disclosure for a toxic substance.

²² Hazardous waste is defined as “The residual or ash of the residual or ash of the various activities and operation having hazardous substances”.

- International standards have been developed for the proper labeling and identification of wastes (UNEP, 2012). The following reference materials are useful for labeling waste in the UAE:
 - UNECE (2003): *Globally Harmonized System of Classification and Labeling of Chemicals*.
 - OECD (2001b): *Harmonized Integrated Classification System for Human Health and Environmental Hazards of Chemical Substances and Mixtures*.

2. Collection of mercury containing light Bulbs

2.1. General considerations

- Mercury containing light bulbs should be collected intact to avoid breakage (UNEP, 2012).
- Mercury containing lamps are to be discarded in a specially designed container at a waste collection station or drop off depot to avoid mixing waste containing mercury with other waste (UNEP, 2012). Additional details will be provided in section 2.3 Consumers should be able to take spent light bulbs to collection stations free of charge.

2.2. Collection stations³

- Collection at the communal and neighborhood level:
 - The challenges that need to be anticipated of collection at the communal/neighborhood level are the health risk of repeat exposure to individuals in case of breakage, misunderstanding from consumers on separation requirements, collection schedules and logistics (UNEP, 2012).
 - To ensure efficient collection of waste containing mercury by local collectors, an initiative or legal mechanism will be required. For example, governments, producers of mercury-added products or other agencies will need to provide arrangements for the collection of waste containing mercury by local collectors on a regular basis (UNEP, 2012). The committee discussed that a dedicated pick up service from collection points could provide an effective solution.
- Collection at the communal and or Retail level:
 - Advantages of collection at the communal and or retail level are that they are accessible.. Retailers are also interested in collection at this level, and affected parties and perceived to have responsibility with regard to mercury containing light bulbs. This collection scheme could be integrated with selected items from other mercury containing wastes (UNEP, 2012).

2.3. Collection site design

- Containers for waste collection should consider the following guidelines:
- CFLS and other mercury containing light bulbs should be collected intact to avoid breakage (UNEP, 2012).
- Spent light bulbs containing mercury should be discarded in a specially designed container at a waste collection station to avoid mixing mercury containing waste with other waste (UNEP, 2012).
- Boxes or containers for mercury containing lamps should be made available at waste collection stations (BASEL Convention, 2011).

³ The Sustainability working group discussed the possibility of establishing collection at the household level. The committee concluded that this alternative was not practical and was costly, mainly because the waste generated from spent light bulbs would not justify setting such a collection program.

- Only containers specifically designed and shown to be capable of containing mercury vapour from broken lamps should be used in public collection locations (UNEP, 2012).
- Breakage of CFLs should be avoided through appropriate box design and by providing written information on collection procedures. Collection containers should minimize the “free fall” of the lamp by installing soft, cascading baffles or flaps. Another more desirable option to minimize breakage is that the consumer hands the CFLs to competent and trained staff of a collection station who place the lamps in a box (UNEP, 2012).
- Designated containers should all be the same color and/or bear the same logo to facilitate public education and increased participation (UNEP, 2012).
- Monitoring of waste collection site:
- The boxes or containers should be labeled and placed where they can be monitored in a well-ventilated area, for example, outside the building in a covered and secure space (UNEP, 2012). The temperature of waste collection site should be maintained as low as feasibly possible, preferably at a constant temperature of 21°C.
- Authorized collectors, such as municipal collectors or private sector collectors (i.e. collectors authorized by the appropriate authorities), should gather the waste in the waste collection containers. They should pay particular attention to the prevention of evaporation and spillage of elemental mercury into the environment. Such waste should be placed in a gas- and liquid-tight container that bears a distinctive mark indicating that it contains “toxic” elemental mercury (BASEL Convention, 2011).

2.4. Broken lamps procedure

- Analyses of various CFLs health risks conclude that with adequate ventilation and proper cleanup, a broken CFL is very unlikely to lead to mercury exposure that creates any significant threat. The most effective strategy to prevent health risks is to provide accurate factual information describing the potential risks, and also to provide clear, useful advice about how to prevent and address breakages (UNEP, 2012).
- Critical variables that influence the risk from a broken CFL or mercury containing light bulb include: the amount of mercury the bulb contains; the chemical and physical form(s) of that mercury; the fraction of mercury that escapes on breakage; the absorbency of the surface onto which mercury is released; how long mercury remains in or around the breakage site; environmental factors such as temperature, room volume, rate and timing of ventilation; and, most importantly, clean-up actions taken by the consumer. A broken CFL can release mercury vapour, which is of most concern within enclosed spaces without ventilation (UNEP, 2012).
- Education and information to consumers regarding safe disposal is described in section 10 of this document.
- Broken lamps procedure should be provided at the collection point.

2.5. Roles and responsibilities

- Consumers would be responsible for transporting spent light bulbs to initial collection point. They should receive adequate information, such as specified in section 9, to avoid lamp breakage.
- Lamp collection systems should be designed and operated by qualified and government appointed third parties.
 - The concerned authority in each Emirate is responsible for the handling and dealing of hazardous waste, and the Municipalities in the different Emirates can issue the license for the handling and dealing of hazardous waste to a third party (MOEW, 2001).
 - Alternatively, this could also be the EPR who would assume the financial and operational burden of collection of the products they are putting on the market. For an EPR system to be effective it is indispensable that there is a level playing field for all producers putting products in the UAE market. In order for an EPR scheme to work on a federal level, the

producers would need to obtain licenses for handling and dealing of hazardous waste from the Municipalities in each Emirate.

- Retailers could be responsible for promoting the collection of light bulbs by putting in place a combined visible disposal fee and take back collection program, where consumers would receive a refund on part of the visible disposal fee for returning their spent light bulb (details on article 9).
- Guidelines for special containers would need to be developed by the concerned authority in each Emirate responsible for handling and dealing with hazardous waste (MOEW, 2011).

3. In-Country Transportation of wastes of mercury containing light bulbs

- Cabinet order No.37 indicates in Article 12 that transport of locally produced hazardous wastes shall be controlled in accordance to the rules, procedures and controls mentioned and specified in the Basel Agreement and in coordination with the federal authority.
- Transportation of waste from mercury containing light bulbs should adhere to UAE legislation and the Basel Convention, and its corresponding guidelines.
- For transporting wastes containing or contaminated with mercury such as waste from spent mercury containing light bulbs from public collection points to waste treatment facilities should be properly packaged and labeled (Basel, 2011; UNEP, 2012).

3.2. Packaging and labeling

- According to the Cabinet order No. 37, Article 6 contains general rules and procedures for packing of hazardous wastes.
- In addition to the provisions of the Cabinet order No. 37 referenced above, the following reference materials are helpful to develop emirates level regulations and waste management strategies (Basel, 2011):
 - UNECE (2003): Globally Harmonized System of Classification and labeling of chemicals;
 - OECD (2001): Harmonized Integrated Classification System for Human Health and Environmental Hazards of Chemical Substances and Mixtures;
 - As well as document from IATA, IMO and UNCE.

3.3. Transport

- Details on transportation of Hazardous chemical materials in the UAE can be found in Article 7, and Article 10, numeral 3 of Cabinet order No. 37 ([Appendix A](#)).
- For transport and trans-boundary movement of hazardous wastes, the following documents should be consulted to determine specific requirements (BASEL Convention, 2011) and should be taken into account when developing the UAE legislation regarding hazardous wastes or dangerous goods transportation legislation:
 - Basel Convention: Manual for the Implementation of the Basel Convention (SBC 1995a);
 - International Maritime Organization (IMO): International Maritime Dangerous Goods Code (IMO 2002);
 - International Civil Aviation Organization (ICAO): Technical Instructions for the Transport of Dangerous Goods by Air (ICAO 2001);
 - International Air Transport Association (IATA): Dangerous Goods Regulations Manual (IATA 2007);
 - UNECE: United Nations Recommendations on the Transport of Dangerous Goods, Model Regulations (UNECE 2007).

- During transportation, hazardous waste should be identified, packaged and transported in accordance with the United Nations Recommendations on the Transport of Dangerous Goods: Model Regulations (Orange Book) (Basel, 2011).
- Persons transporting such waste should be qualified and certified as carriers of hazardous materials and wastes (Basel, 2011; UNEP, 2012).
- Guidance on the safe transportation of hazardous materials can be obtained from the International Air Transport Association, International Maritime Organization, and United Nations Economic Commission for Europe and the International Civil Aviation Organization (Basel, 2011).

3.4. Roles and responsibilities

- Under the current legal framework the transport has to be authorized by the corresponding municipal authorities in each Emirate, both sending and receiving the waste.
- In order to facilitate transport of waste of mercury containing light bulbs it would be desirable that a federal regulation for transport be developed by the MOEW to facilitate waste transport between the Emirates. This would be particularly important if a centralized waste management system is promoted either through a licensed third party or to facilitate the implementation of EPR.
- Companies transporting wastes within the country should be certified as carriers of hazardous materials and wastes by the relevant local authorities in each Emirate, and their personnel should be qualified (BASEL Convention, 2011).
 - Employees of transporting hazardous waste have to be appropriately trained.

4. Temporary Storage

4.1. Storage guidelines

- Details on storage of hazardous chemicals materials in the UAE can be found in Article 8, and Article 10, point 2 in the Cabinet order No. 37.
- Additional storage guidelines can be found in the BASEL Convention technical guidelines and the Enlighten toolkit as indicated below:
 - Waste containing mercury should be stored safely and kept apart from other waste until it is brought to waste collection facility or picked up by collection programs or contractors.
 - Waste should be stored by generators for a limited time, as allowed by federal standards, and sent off-site for appropriate disposal as soon as is practical.
 - Household waste containing CFLs or mercury containing light bulbs should be stored temporarily after appropriately packaging the light bulbs.
 - Any mercury containing light bulbs that are broken in the course of handling should be cleaned-up and all clean-up materials stored outdoors until collection for further management.
 - It is important to properly store wastes consisting of elemental mercury and waste containing or contaminated with mercury after collection but before disposal. The technical requirements for storage of hazardous waste should be complied with, including national standards and national and international regulations. The risk of contamination to other materials should be avoided.

4.2. Storage site design

- Cabinet order # 37 in article 3, numeral 2 indicates among other things, that Municipalities shall promulgate the administrative and technical procedures for handling hazardous wastes including the establishment of a national database for hazardous wastes. This database should include wastes generated from spent mercury containing light bulbs.
- Additional storage site design guidelines can be found in the BASEL Convention technical guidelines (Basel, 2011) below:
 - Storage facilities should not be built in sensitive locations such as floodplains, wetlands, groundwater, earthquake zones, Karst terrain, unstable terrain or areas with unfavorable weather conditions and incompatible land use, in order to avoid any significant risks of mercury release and possible exposure to humans and the environment.
 - The mercury waste storage area should be designed to ensure that there is no unnecessary chemical or physical reaction to mercury. The floors of storage facilities should be covered with mercury-resistant materials. Additionally, these facilities should not be used to store other liquid waste and materials.
 - Storage facilities should have fire alarm systems and fire suppression systems and have negative pressure environments to avoid mercury emissions to the outside of the building.
 - The temperature in storage areas should be maintained as low as feasibly possible, preferably at a constant temperature of 21°C.
 - The storage area for wastes consisting of elemental mercury and wastes containing or contaminated with mercury should be clearly marked with warning signs.
 - A full inventory of the waste kept in the storage site should be created and updated as waste is added or disposed of.
 - Regular inspection of storage areas should be undertaken, focusing particularly on damage, spills and deterioration.
 - Clean-up and decontamination should be carried out speedily, but not without alerting the authorities concerned.
 - Access to waste containing mercury, such as waste form mercury containing lamps, should be restricted to those with adequate training for the purpose including in recognition, mercury specific hazards and handling.
 - The temperature of waste collection site should be maintained as low as feasibly possible, preferably at a constant temperature of 21°C.
 - In terms of safety for facilities, site-specific procedures should be developed to implement the safety requirements identified for storage of waste consisting of elemental mercury and wastes containing or contaminated with mercury. A workable emergency plan, preferably with multiple procedures, should be in place and implemented immediately in case of accidental spillage and other emergencies.

4.3. Roles and responsibilities

- The MOEW is developing appropriate regulations for the storage of hazardous waste, including waste from mercury containing light bulbs; as well as setting up the appropriate coordinating mechanisms between Emirates within the hazardous waste section in the federal waste management regulatory guidelines. These regulations should take into consideration international best practice guidelines as specified above.
- The concerned authority in each Emirate is responsible for the handling and dealing of hazardous waste, and the Municipalities in the different Emirates are responsible for issuing

the licenses for handling or dealing of hazardous wastes in the UAE to a third party, according to the Cabinet order No.37 (MOEW, 2001).

5. Treatment and recovery/recycling of mercury containing light bulbs

- Cabinet order No.37 indicates in Article 12 that disposal of locally produced hazardous wastes shall be controlled in accordance to the rules, procedures and controls mentioned and specified in the Basel Agreement and in coordination with the federal authority.

5.1. Treatment guidelines

- Details on treatment and disposal of hazardous waste in the UAE can be found in Article 10, numeral 4 of Cabinet order No. 37 ([Appendix A](#)).
 - The licensed party shall, in coordination with the concerned authorities, select the sites of hazardous waste treatment and disposal plant in an area of not less than five kilometers away from residential and urban gatherings.
- Cabinet order No. 37, Article 11 also indicates that no installations shall be constructed for treating hazardous wastes without obtaining a license from the competent authorities in coordination with the federal authority, and should ensure that such installation have met all environment and personnel safety conditions.
- Treatment should also follow the Basel guidelines, which specify environmentally appropriate pre-treatment and treatment requirements for recycling and reclamation of Hg compounds
- Recycling facilities should not be restricted to one specific technology or solution but allow for a number of different appropriate technologies. The Basel guidelines contain detailed description of the technologies for *Recycling/reclamation of mercury and mercury compounds* in section G related to *Environmentally Sound Disposal*(Basel, 2011).
- Through utilization of lamp processing equipment, the main objective of these systems is to prevent loss of mercury vapour and mercury-containing phosphor powder to the environment while recovering materials for primary recycling (UNEP, 2012).
- Mercury-added lamp waste management systems generally involve the following steps: crushing or shredding the lamps into small pieces; separating the crushed or shredded materials into different components for subsequent processing; mercury-recovery; and waste treatment and disposal processes for materials that remain, either before or after mercury recovery (UNEP, 2012).
- Pre-treatment- Before undergoing thermal treatment, wastes containing mercury or contaminated with mercury are treated to increase the efficiency of the thermal treatment; the pre-treatment processes include removal of materials other than those containing mercury by crushing and air separation, dewatering of sludge and removal of impurities (UNEP,2012).
- Lamp glass from crushed mercury-added lamps can retain mercury, and for some end uses, should be treated thermally, or in other ways to remove mercury, before sending it for reuse or disposal. If the glass is re-melted, the melting unit should have air pollution controls specifically designed to capture released mercury (such as activated carbon injection) (UNEP, 2012).

5.2. Treatment and recovery/recycling site design

- Treatment site design should follow the BASEL Convention technical guidelines below (Basel, 2011):
 - To minimize mercury emissions from the mercury recovery process, a facility should employ a closed system.
 - The entire process should take place under reduced pressure to prevent leakage of mercury vapour into the processing area.

- Various methods for recycling of gas-discharge lamps are described in detail in the Basel Guidelines. They include the following: the shredder method, used for all types of discharge lamps, including energy-efficient lamps; the end cut method, for linear fluorescent lamps; the crush and sieve method, used for all types of fluorescent lamps; the centrifugal separation method, used for CFLs; and the high intensity discharge lamp processor, used for high-mercury content lamps to help improve recovery and reduce cross-contamination of equipment. Product-specific stripping methods yield maximum recycling rates.
- The *Technical Guidelines on the Environmentally Sound Recycling/Reclamation of Metals and metal Compounds (R4)* of the Basel Convention address the environmentally sound recycling and reclamation of metals and metal compounds including mercury (UNEP, 2012). It is possible to recycle waste consisting of elemental mercury and waste containing or contaminated with mercury, in special facilities which have advanced mercury-specific recycling technology. It should be noted that appropriate procedures should be employed in such recycling to prevent any releases of mercury into the environment (UNEP, 2012).

5.3. Materials that are to be recycled apart from mercury

- The elements found in mercury containing light bulbs are glass, ferrous and non-ferrous materials, phosphor powder (rare earths), flame retardant chemicals, and plastics (UNEP, 2012).
- The Phosphors help produce high lamp efficiency and color rendering (UNEP, 2012). Phosphor powder is becoming a more valuable commodity as the value for rare earth phosphors increases. Limited available resources, trade issues and increasing costs are entering into greater demand for recycled rare earth phosphors.
- LED lamps also contain electronic waste and other components that need to be separated from general waste and could be recycled.
- Most of the materials have little or no value and therefore the recycler must recover processing costs from the generators (UNEP, 2012).

5.4. Sale of recyclable materials

- In the case that recyclable materials are sellable, these need to comply with BASEL guidelines Section G titled *Environmentally sound disposal* (Basel, 2011)

5.5. Roles and responsibilities

- The concerned authority in each Emirate is responsible for the handling and dealing of hazardous waste, and the Municipalities in the different Emirates are responsible for issuing the licenses for handling or dealing of hazardous wastes in the UAE to a third party, according to the Cabinet order No.37 (MOEW, 2001).
- Alternatively, this could be included in the EPR who would assume the responsibility of the treatment, recycling and disposal of the waste from mercury containing light bulbs, and would have to follow the licensing requirements specified in the Cabinet order No. 37.

6. Permanent Disposal for non-recyclable materials or waste from mercury containing light bulbs

6.1. Disposal of hazardous waste

- According to Article 59 in the Federal Law No.24 of 1999, disposal of hazardous wastes and medical wastes shall be undertaken in accordance with the conditions and criteria specified by the Cabinet order No. 37. It is prohibited to establish any facilities for the treatment of hazardous wastes without a license issued by the Municipalities in the different Emirates.

- Details on disposal of hazardous waste in the UAE can be found in Article 10, point 4 in the Cabinet order No. 37(Appendix A).
- Further information on the disposal of mercury waste, including mercury containing light bulbs, can be found in Section G titled *Environmentally sound disposal* (Basel, 2011).

6.2. Materials for export

- Any hazardous materials for export should follow BASEL Convention technical guidelines section F *Handling, separation, collection, packaging, labelling, transportation and storage* (Basel, 2011).

6.3. Roles and responsibilities

- The concerned authority in each Emirate is responsible for the handling and dealing of hazardous waste, and the Municipalities in the different Emirates are responsible for issuing the licenses for handling or dealing of hazardous wastes in the UAE to a third party, according to the Cabinet order No.37 (MOEW, 2001). In order for a third party to work on a federal level or to facilitate an EPR scheme, producers would need to obtain licenses for handling and dealing of hazardous waste from the Municipalities in each Emirate.

7. Landfill requirements

7.1. Mandatory sanitary requirements for landfills in the UAE

- Even though recycling of mercury containing light bulbs should be maximized, a rate of 100% recycling is hardly achieved. Therefore in order to minimize the negative impact of mercury containing light bulbs that might end as general waste, as well as other hazardous wastes, the landfill requirements in the UAE should be upgraded.
- Refer to section G and H in the BASEL Convention technical guidelines on environmentally sound disposal for specific guidance on this topic (Basel, 2011).

7.2. Roles and responsibilities

- It is recommended that the MOEW, in coordination with the relevant Emirate level authorities, should take into consideration the appropriate landfill requirements in the development of the regulations and waste management systems currently been developed.

8. Financing of disposal of mercury containing light bulbs

8.1. Financing of collection program

- Financing through a visible advance disposal fee system combined with a deposit-refund take back collection program
 - A number of regulatory initiatives that stipulate the collection and recycling of all mercury-added lamps in line with extended producer responsibility norms, require producers to set up the system that will facilitate the collection and recycling for the lighting products. Major lamp manufacturers and national regulators have successfully established take-back infrastructures for mercury-added lamps in some countries (UNEP, 2012).

8.2. Financing of storage facility

- The concerned authority in each Emirate is responsible for the handling and dealing of hazardous waste, or alternatively the Municipalities in the different Emirates are responsible for issuing the licenses for handling or dealing of hazardous wastes in the UAE according to the Cabinet order No.37 (MOEW, 2001).

8.3. Financing of treatment and recovery/recycling center

- Similar to above article 8.1

8.4. Financing of information and awareness tools and activities

- Producers may take on responsibility of awareness in the UAE along with the government, however specific measurable targets would need to be defined along with a monitoring plan.

9. Information for users regarding the safe disposal of mercury containing light bulbs

- Programs for public awareness and public participation should generally be developed around a waste management situation at national/local/community level. Refer to table 7 in the Basel Technical Guidelines section L on *Awareness and Participation* for details for programs on public awareness and education (Basel, 2011).
- In order to raise the awareness of citizens, the authorities concerned, e.g. local governments, need to initiate various awareness-raising and sensitization campaigns to enable citizens to take an interest in protection against the adverse effects to human health and the environment (Basel, 2011).
- Communication campaigns should always accentuate the positive and focus on the range of benefits and outcomes that end users will enjoy as a result of seeking out and selecting efficient lighting products. If end users can feel good about the outcome, they are more motivated to take an interest in seeking out information and to understand why it is meaningful to their purchasing decision. Dry, factual messages will have less impact than positive, beneficial statements (UNEP, 2012).
- When initiating activities such as the collection and recycling of waste containing mercury, it is essential to ensure cooperation from the consumers who generate mercury-containing waste. Continuous awareness-raising is a key to the successful collection and recycling of waste containing mercury. Encouraging public involvement in designing a collection and recycling system for waste containing mercury, which provides participating residents with information about the potential problems caused by the environmentally unsound management of such waste, would help to increase consumer awareness according to the Basel Technical Guidelines section L on *Awareness and Participation* (Basel, 2011).
- Crisis communication strategies should be developed and put in place from the start of a phase-out program and may be used to address situations such as; the opening of a new production or recycling facility or incidents that attract public attention or raise health concerns (UNEP, 2012).
- For more detailed information on public awareness campaigns, refer to section 6: Communications and Engagement in the Enlighten toolkit (UNEP, 2012).

9.2. Necessary information for users

- Users of mercury-containing lamps in private households should be given the necessary information about:
 - potential effects on the environment and human health as a result of the presence of hazardous substances, particularly mercury in mercury-containing lamps
 - Installation of mercury-containing lamps, e.g. CFLs should be handled carefully when installing or removing them and allowed to cool before touching the glass, and force should be applied to the ceramic or plastic base, not to the glass tube (UNEP, 2012).
 - The requirement of not to dispose of mercury-containing lamps as unsorted municipal waste and to collect such mercury-containing lamps separately;
 - The return and collection systems available to them detailed
 - Their role in contributing to reuse, recycling and other forms of recovery of mercury-containing lamps

- According to the UNEP Enlighten toolkit many successful campaigns focus on monetary savings, national pride, energy efficiency and energy savings, convenience (long-life), a simple switch, environmental responsibility, political and economic advantages. For more information, refer to section 6: Communications and Engagement in the Enlighten toolkit (UNEP, 2012).
- Some common FAQs and recommended responses can be found in section 6: Communications and Engagement in the Enlighten toolkit (UNEP, 2012).
- Publications should be translated into the locally relevant languages and dialects to ensure the information is communicated efficiently to the target population (Basel, 2011).

9.3. Clean up procedures information

- Refer to ANNEX A: clean up procedures in UNEP En-lighten toolkit, 2012.
- When a CFL is broken, the debris and mercury needs to be cleaned up, otherwise it remains in a room for an extended period of time (UNEP, 2012).
- The EU Eco-design regulation requires manufacturers to provide information on their websites about how consumers should clean up debris in case of CFL breakage (UNEP, 2012). They must include a link to the online information on the packaging of each lamp.
- Tools for public awareness and participation
 - Refer to section L in the BASEL Convention technical guidelines section L on *Awareness and Participation* (Basel, 2011).

9.4. Roles and responsibilities

- Breakage education could be the responsibility of manufacturers and retailers alongside government campaigns however specific measurable targets would need to be defined along with a monitoring plan

References

1. BASEL Convention, 2011. BASEL Convention Technical Guidelines. Cartagena, Colombia, October 2011
2. UNEP, 2012. Achieving the Global Transition To Energy Efficient Lighting Toolkit. ISBN:978-92-807-3238-2
3. Ministry of Environment and Water, 1999. Federal Law No. 24 of 1999 Protection and Development of the Environment. Issue No.340, Year 28.
4. Ministry of Environment and Water, Cabinet order No. 37 of 2001 regarding Executive order of Federal Law No.24 for 1999 on Handling of Hazardous Substances, Hazardous Wastes and Medical Wastes.

Appendix A

Cabinet order No. 37 of 2001 regarding Executive order of Federal Law No.24 for 1999 on Handling of Hazardous Substances, Hazardous Wastes and Medical Wastes.

REGULATION ON

- 1) Cabinet order No. 37 of 2001 regarding Executive order of Federal Law No.24 for 1999 on Handling of Hazardous Substances, Hazardous Wastes and Medical Wastes.

Article (1)

Definitions

For the purposes of this law the following words and phrases shall have the meanings given opposite each unless the text specifies otherwise:

State	:	United Arab Emirates
Agency	:	Federal Environmental Agency
Competent Authorities	:	The concerned local authority in each Emirate of the State
Competent Regularity Unit	:	The Department, Agency or any other regularity unit established by the competent authority for issuing licenses.
Environment	:	The biosphere where life exists in various kinds and consists of two elements:
		<u>Natural element:</u> comprises all living species, mankind, animal, plant and other kinds of species, forms of life natural resources including air, water, soil, organic substance, non-organic and natural ecosystems, and
		<u>Unnatural element:</u> anything introduced by mankind to the natural environment such as fixed and moveable installations, roads, bridges, airports, transportation means and whatever industries, innovations and technologies developed by mankind.
Environment Degradation	:	Adverse effects against the environment which lead to degradation or deformation of its environmental nature or depletion of its resources or damage the existing species or archeology.
Environment Pollution	:	Pollution resulting from natural or unnatural sources due to mankind, direct or indirect, voluntary or non-voluntary introduction of any polluting materials or elements affecting the natural environmental elements which may

		lead to any hazardous effects against the health of mankind, plants or animals or damages to the environmental resources and Ecosystems.
Pollutant Materials and Factors	:	Any solid, liquid, gas, smoke, fume, vapor, odor, noise, radiation, heat, fluorescence or vibration materials which are naturally produced or by acts of mankind and leads directly or indirectly to environmental pollution, degradation, or damage to mankind or living species
Air Pollution	:	Every change in the criteria and description of external and confined or semi confined public places air endangering the health of mankind and the environment, whether produced from natural causes or mankind activities.
Water Pollution	:	The introduction of any material or power in the water environment, whether voluntary or non voluntary, direct or indirect, which adversely affects the living or non-living resources, threatens the human health or impedes water activities including fishing and tourist activities or impairs its serviceability or decreases its benefits or changes its criteria.
Environmental Protection	:	Conservation of its components, criteria, natural balance, prevent pollution or decrease or fight pollution, conserve natural resources and rationalize its consumption and protect living species with particular attention to those threatened by extinction and devote efforts towards its growth and development.
Hazardous Materials	:	Solid, liquid or gas materials hazardous to mankind health severely affects the environment such as toxic explosive, flammable or ionized radiation materials.
Harmful Materials	:	All materials that may lead directly or indirectly to damages of mankind health or the environment, whether such material was chemical, biological or radioactive.
Wastes	:	All hazardous or non-hazardous offal or wastes including nuclear wastes to be disposed or required to be disposed of according to the terms of law, including:
		<u>Solid Wastes:</u> Like domestic, industrial, agricultural, medical, construction and demolition wastes.
		<u>Liquid Wastes:</u> Effluents from residential, commercial and industrial premises and others.
		<u>Gas, Fume, Vapor and Dust Wastes:</u>

		produced by crushers houses, bakeries, incinerators, factories, , quarries, power stations, oil works, and transportation and commuting various means.
		<u>Hazardous Wastes:</u> the residual or ash of the various activities and operation having hazardous contents.
		<u>Medical Wastes:</u> Any wastes made in whole or part of human tissue, animal tissue, blood or other body liquids, secretions, drugs or other pharmaceutical products, bandages, syringes, needles or other medical sharp objects, or any other wastes whether contagious chemical or radioactive produced by medical activities, nursing, treatment, medical care, dental, veterinary or pharmaceutical or processed activities or others, tests, research works or study materials or sampling or storage of the same.
Handling & Dealing	:	Import / transport / storage / production / utilization / trade / any other activities.
Waste Management	:	Collection, storage, transportation, recycling and disposal of wastes including further care and protection of disposal points.
Waste Handling	:	All operations beginning from the time of producing waste until safe disposal off, including collection, storage, transportation, treatment, recycling or disposal off wastes.
Disposal of Wastes	:	Any Process that does not lead to scavenging or recycling of materials, such as burial, deep injection, biological process, physical / chemical treatment, permanent storage, destruction or any other process approved by the competent Authorities.
Re-cycling of Wastes	:	The process of extraction or reuse of materials of wastes for using them as fuel or extraction of metals or biological materials, soil treatment or refinement of oil.
Firm	:	Industrial and tourist firms as well as electricity production and generation plants and corporations working in the field of oil exploration, production, transportation and use in addition to all infrastructure projects and any other firm.
Oil	:	All kinds of crude oil and its products including any kind of liquid Hydrocarbons, greasing oil, fuel oil, refined oils, oven oil, bitumen and other materials produced from oil or its derivatives or wastes.
Drainage	:	Every leak, spill, emission or discharge of any contaminating

		materials, or drainage of the same in water, soil or air environment.
Dumping	:	A) Any intentional discharge into marine environment of contaminated or surplus from vessels, aircrafts, docks or others.
		B) Any intentional dumping in marine environment of vessels or industrial installations or others.
Transportation Vehicles	:	Aircrafts, automobiles, trains, tractors or motorcycles or any other machinery intended for operation on roads.

Article (2)
Competent Authorities

Handling or dealing in hazardous material, hazardous waste and medical wastes without license issued by the competent authorities as determined in the following schedule, within their respective prerogatives, shall be prohibited:

Kind of Material or Waste	Competent Authority
Chemical materials	<ul style="list-style-type: none">• Ministry of Health• Ministry of Interior• Ministry of Finance and Industry• Ministry of Agriculture and Fisheries• Municipality
Hazardous medical wastes	<ul style="list-style-type: none">• Ministry of Health• Municipality
Other hazardous materials	Municipality
Chlorofluorocarbons and Halon compounds.	Federal Environmental Agency

Article (3)
General Requirements

Within their respective prerogations and in coordination with Federal Environmental Agency, Ministers or Municipality Chairmen shall promulgate the administrative and technical procedures necessary for handling or dealing in hazardous material, hazardous wastes and medical wastes provided such procedures shall, in particular, include the following:

1. The establishment of a competent regularity unit for the issue of licenses for materials specified in of Article (2) herein.
2. Establishment of national databases for hazardous materials, hazardous wastes and medical wastes.
3. Cooperation with the competent authorities and international organizations in following up hazardous materials, hazardous wastes or those wastes internationally listed and taking necessary actions on national level.
4. Evaluation of license applications for carrying out works and business mentioned in Article (2) herein and issuing the relevant licenses.
5. Examination of hazardous material and determination of their dangers through laboratories and specialized equipment, if necessary.
6. Coordination with the concerned authorities within the state in respect of pollutants analytical studies.
7. Dissemination of awareness of probable environmental and health risks and dangers arising from irrational use of hazardous materials.
8. Any other controls or commissions the Ministry of the Municipality deems necessary to add.

Article (4)
Licenses

Without prejudice of the special conditions and procedures related to each handling and dealing operation in hazardous material, hazardous wastes and medical wastes under this regulation. The license applicant shall submit his application to the competent authorities specified in Article (2) hereof under the following procedures and conditions:

1. License Issue Procedures

Handling and dealing in hazardous wastes, hazardous materials and medical wastes shall be issued for five years by the competent regularity unit (competent authority) as follows:

a) Any party purporting to undertake any business or works mentioned in Article (2) hereof shall submit its application to the regularity authority for obtaining business or work license.

b) Each party applying to the competent regularity unit shall enclose all relevant data and information necessary for supporting its application particularly:

1) Information related to the person undertaking hazardous materials, hazardous wastes and medical wastes handling operations:

- Firm's name and nationality;
- Address and telephone number.
- Firm's location and area (plus stores).
- Safety equipment available with the firm.
- Surrounding environment monitoring system applied by the firm.

2) Party producing hazardous materials or wastes and medical wastes:

- Firm's name and nationality.
- Address and telephone number.

3) Kind of handling or dealing the license is purported in respect thereof.

4) Full description of hazardous materials, hazardous wastes and medical wastes intended to be handled and the nature and concentration of hazardous elements therein as per international classifications applicable in schedule 1.1 of Annex No. 1 to this regulation.

5) Determination of the quantity of hazardous materials, hazardous wastes and medical wastes intended to be handled every year and the description of packing methods (barrels, tanks, bulk).

6) Description of intended storage methods for hazardous materials, hazardous wastes and medical wastes and their respective storage periods with an undertaking for making a clear statement on the packages disclosing the contents thereof and the extent of their dangers and actions to be taken in emergency cases.

7) Indication of transport means.

8) Full statement of the method intended to be adopted for treating and disposing of hazardous materials, hazardous wastes and medical wastes application is made for obtaining handling license therefore.

9) Undertaking for maintaining records reflecting ample description of the quantities of hazardous materials, hazardous wastes and medical wastes and their sources, rates and collection periods as well as their transport and treatment methods and to maintain such records for five years from the date of their compilation.

10) Previous experience certificate in the field of handling hazardous materials, hazardous wastes and medical wastes.

11) The licensed party shall prepare an accident emergency plan to be submitted to the competent regularity unit for approval.

c) The competent regularity unit may suspend the license, refrain from issuing the license or finally cancel the license if violations, breaches or non-compliance of the requirements mentioned in federal Law No. 24 of 1999 in respect of Environment Protection and Development or in this regulation were proven.

2. License Issue Conditions

- Submission of all required information.
- Availability of licensed personnel responsible for handling hazardous materials, hazardous wastes and medical wastes.
- Federal Environmental Agency's approval of the competency of such personnel for handling hazardous materials or obtaining a certificate indicating the completion of a specialized hazardous material handling course from the Civil Defense Institute.
- The availability of necessary requirements for meeting hazards arising from accidents during handling.
- Business applied for shall not produce any adverse damaging effects to the environment or public health.
- Display of emergency management plan in the site.

Article (5)

Import of Hazardous Chemical Materials

1. Unless approval was obtained from the competent regularity unit, applicant shall not import any hazardous material mentioned in schedule 1.1 of Annex No. 1 for trade or multi usage purposes.

2. The licensee shall fill in all information mentioned in the import form prepared by the competent regularity unit and shall submit such form to the competent regularity unit before fifteen days from carrying out the import operation enclosed with MSDS including the following.

- a) The scientific and commercial names of the hazardous material and its chemical composition.
- b) U.N. serial number and the material serial number in accordance with CAS.
- c) The physical and chemical characters of the hazardous material
- d) The extent of the material dangers and its health and environmental impacts.
- e) The quantity of hazardous material intended to be imported.
- f) Expected date and time of transport.
- g) Purpose of import.
- h) Best methods for storage and disposal of such material.
- i) Actions to be taken upon the occurrence of any leakage of the hazardous material.

- j) Actions to be taken for fighting fires arising from the hazardous material.
- k) Certificate of origin and test certificate from the country of export.
- l) Chemical material date of production and its period of validity.
- m) First aid actions for injuries resulting from exposure to the material through eyes skin, inhaling or swallowing.
- n) Protection equipment and personal protective clothes upon dealing with the material.

Article (6)

Packing of Hazardous Chemical Materials

1. Hazardous materials shall be packed in tightly sealed special packs of a quality which can stand all transport and handling circumstances, vibration impact and changes in temperatures.
2. Packs shall be verified to be conforming, in all respects, with the materials to be placed therein so as not to be affected by the materials packed therein or affect such materials.
3. Internal packs shall be sealed, fixed or placed on a lining material for preventing breakage thereof or leakage therefrom and for controlling their movements within the external packages.
4. The pack shall be of a size providing sufficient space for adhesion all marks and information tags required under MSDS.
5. Tags shall be placed on each pack with strong adhesive so as to stand normal transport circumstances and to ensure the tag and the information thereon not to be exposed to damage or defacing.

Article (7)

Transport of Hazardous Chemical Materials

The following conditions shall apply to the transport of hazardous chemical materials:

1. Materials shall be transported in a safe manner within the determined speed limits.
2. Metal boards shall be fixed on the external surface on all sides of the transport units for warning against the tank contents and the extent of their danger. Such metal warning boards shall be coated with a weather proof reflective paint of the required color.
3. The tank containers used in transporting hazardous materials shall be constructed in accordance with the internationally approved technical rules and regulations.
4. All vehicle drivers handling hazardous materials must be trained and licensed. Ready emergency and accident plans must be available.
5. All vehicles transporting bulk hazardous chemical materials shall be provided with a yellow flash light fixed on the drivers cabin and shall be operated throughout the transport voyage.

6. Drivers shall be provided with documents including necessary main information of the transported hazardous materials (the scientific chemical name and U.N. number). The traffic police at all times may stop any vehicle and carry out necessary examinations and inspection procedures for determining the vehicle safety and integrity. All transit drivers crossing the State must abide by the conditions stipulated in this Article.

7. The Agency and the concerned authorities will coordinate with the concerned department at Ministry of Interior in implementation of the rules of this article.

Article (8) **Storage of Hazardous Chemical Materials**

The licensed owner of the store shall observe the following:

1. Design the store in a manner restricting fire, spillage and injury hazards.
2. Provision of emergency exits easy to open in the dark or in case of heavy smoke.
3. Provision of sufficient ventilation.
4. Floorings must be liquid impermeable, soft, non-slippery and free from cracks to enable easy cleaning, and shall be designed so as to contain leakage and firefighting water.
5. Upon the storage of low flash point solvents or smoldering chemicals, heavy duty equipment or systems shall be used.
6. Upon storage of hazardous materials in the open air, storage arrangements, ceilings or protective covers against sun and rain shall be provided.
7. Provision of suitable firefighting equipment in accessible places with a fire alarm system. This fire alarm system shall be periodically inspected and tested to verify its suitability.
8. Stow materials in a manner not impeding forklift and handling equipment or emergency systems movement.
9. Hazardous materials shall be separated in accordance with the U.N. classification system and in accordance with the requirements mentioned in schedule No. 1.3 of Annex No. (1) enclosed herewith.
10. Storage of hazardous chemical materials must be provided for within the industrial installations with a separating distance of not less than three meters from any inflammable material production facility and not less than ten meters between flammable materials and any source of flame.
11. Maintenance of complete records of hazardous materials existing in the stores and keeping of a copy thereof in the head office.
12. Spillage and leakage shall be dealt with after referring to suitable MSDS.
13. Setting up an emergency management plan on site.
14. All damaged packages shall be disposed of in a suitable manner with the maintenance of the surrounding area cleanliness at all times.

Article (9)
Handling of Hazardous Chemical Materials

Handling instructions determined by the manufacturer in accordance with the nature of each material including any special precautions to be made for the protection of personnel and environment, shall be observed.

Article (10)
General Rules and Procedures for Hazardous Waste Management

1. Generation of Hazardous Wastes

Parties generating hazardous wastes shall observe the following:

a) Endeavour to reduce generation rates of such wastes in both quality and quantity by developing the utilized technologies and adopting clean production principle and the selection of product or raw material alternatives of lesser damage to the environment.

b) Describe and record the quality and quantity of generated wastes.

c) Construction and operation of waste treatment units in the source subject to the competent authority's approval of treatment method, technical specifications and operation programs of such units. If the treatment or disposal of hazardous wastes in their source was impossible, the generating party shall collect and transport them to the places allocated to such purpose as determined by the competent authority.

2. Collection and Storage of Hazardous Waste

Parties generating hazardous wastes shall observe the following:

a) Determine certain places for storing hazardous materials meeting safety conditions preventing any damages to the public.

b) Storage of hazardous wastes in special containers made of block material free from holes resisting leakage provided with tight caps and seals and of enough capacity to hold the hazardous wastes.

c) Clear marks shall be placed on hazardous waste storage containers stating the containers contents and indicating the hazards which might arise upon improper handling of such materials.

d) Set up a time program for the collection of hazardous waste so as not to be left for a long period in storage containers.

e) In case of mobile containers, the hazardous wastes generating party shall not put such containers in public areas and shall not damage the environment.

3. Transport of Hazardous Wastes

Hazardous wastes shall not be transported by any means other than those belonging to parties licensed to manage hazardous wastes and such means must meet the following conditions:

a) Transport vehicles shall be equipped with all safety equipment.

b) Hazardous waste transport vehicles must be capable of containing hazardous wastes without any leakage.

- c) Transport vehicles shall be of capacity suitable to the quantity of hazardous wastes.
- d) These vehicles shall be driven by trained licensed drivers capable of taking necessary actions especially in emergency cases.
- e) Vehicles shall display clear marks indicating the extent of danger of their loads and the best course of action in emergency cases.
- f) Determination of the routes of hazardous wastes transport vehicles and immediately advising the Civil Defense Authorities of any change in such routes enabling Civil Defense Authorities to take immediate sound actions in emergency cases.

4. Treatment and Disposal of Hazardous Wastes

a) The licensed party shall, in coordination with the concerned authorities, select the sites of hazardous waste treatment and disposal plant in an area of not less than five kilometers away from residential and urban gatherings. The following conditions, equipment and installations must be available:

- 1) The site area shall commensurate with the quantity of hazardous wastes expected to be collected.
- 2) Site shall be surrounded by a brick wall not less than 2.5 meters high.
- 3) Site shall be provided with more than one door of suitable opening permitting easy entrance of hazardous waste transport vehicles.
- 4) Site shall be provided with water source, toilets and a telephone line.
- 5) Site shall be provided with all mechanical equipment facilitating work movement therein.
- 6) Site shall be provided with equipped stores for keeping hazardous wastes until treatment and disposal thereof.
- 7) Site shall be provided with an incinerator for burning all kinds of hazardous wastes.
- 8) Site shall be provided with the necessary equipment and installations for sorting and classifying some hazardous wastes for recycling purposes.
- 9) Site shall be provided with sanitary burial hole of a suitable capacity for burying incineration leftovers.

b) Hazardous wastes treatment operations for recycling shall be carried out within the following frame:

- 1) Using some hazardous wastes as fuel for power generation.
- 2) Retrieval of organic solvents and reusing them in extraction operations.
- 3) Recycling and reusing of some organic materials from hazardous wastes.
- 4) Reusing of ferrous and non-ferrous metals and their compounds.
- 5) Recycling and reusing some in-organic materials found in the hazardous wastes.

- 6) Retrieval and recycling of acids or alkalis.
 - 7) Retrieval of used oils and reusing them after refining.
- c) Treatment operations of hazardous wastes not suitable for recycling or reusing shall be carried out within the following frame:
- 1) Burial of hazardous wastes in special equipped burial holes isolated from other environment elements.
 - 2) Physical and chemical treatment of hazardous wastes.
 - 3) Incineration in special equipped incinerators not permitting gas or vapour emissions in a manner causing damage to the surrounding environment.
 - 4) Permanent storage (like placing hazardous waste containers under the ground).
- d) All procedures ensuring the restriction or minimization of hazardous waste generation shall be taken through:
- 1) Development and dissemination of clean technology.
 - 2) Development of hazardous waste management systems.
 - 3) Expanding reusing and incineration of hazardous wastes after treatment whenever possible.
- e) Set up a periodical program for monitoring the environmental system wastes on site and in hazardous waste treatment and disposal plants and their surroundings.
- f) Parties licensed to handle and manage hazardous wastes and hazardous materials shall be responsible for the damages inflicted on third parties due to the non-observance of the provisions hereof.

Article (11)

No installations shall be constructed for treating hazardous wastes without obtaining license to this effect from the competent authorities in coordination with the Federal Environmental Agency under the provisions of Article (2) hereof ensuring such installation to have met all environment and personnel safety conditions.

Disposal of hazardous wastes shall be carried out in accordance with the conditions and criteria stipulated in Article (10) hereof.

In coordination with the Federal Environmental Agency, the competent authority shall determine the places and conditions issuing hazardous wastes disposal licenses.

Article (12)

Transport and disposal of locally produced hazardous wastes through land borders, marine environment limits and air space shall be controlled in accordance with the rules, procedures and controls mentioned and specified in Basel Agreement and in coordination with Federal Environmental Agency.

Article (13)

Parties producing or handling hazardous wastes, whether in liquid, gaseous or solid state shall take all precautions necessary for evading causing any environmental damages and shall in particular observe the following:

1. Selection of the site on which such materials shall be produced or stored under necessary conditions in accordance with the quality and quantity of such materials.
2. Buildings inside which such materials are produced or stored shall be designed in accordance with the engineering standards and criteria which must be observed for each kind of such materials. Such buildings shall be subject to periodical inspection by the competent unit.
3. Technology used for the production of such materials as well as all suitable equipment and systems shall not be causing any damage to the installations, environment or personnel.
4. Buildings shall include security, safety, alarm, firefighting and first aid systems and equipment in proper quantities and numbers in coordination with Ministry of Health, Civil Defense Directorate and the competent regularity unit.
5. Emergency plan shall be set for facing any expected accidents during production, storage, transport or handling operations of such materials provided such plan shall be approved by the competent regularity unit.
6. Staff of hazardous wastes handling parties shall be subject to periodical medical checkup provided the results of such medical checkup shall be kept in the file of each person and provided they shall be treated from all occupational diseases under the U.A.E. applied laws, rules and regulations.

Article (14)

The owners of installations generating hazardous wastes under the provisions of this Law shall maintain a record for such a wastes including:

- Full description of wastes showing their dangers and their physical and chemical characteristics.
- Quantities.
- Sources.
- Collection rates and periods.
- Transport means.
- Treatment method.
- The name of the contractor to which these wastes are delivered.

Article (15)

General Rules and Procedures for medical wastes management

1. All health installations of whatever kind shall be strictly prohibited to dispose of any medical wastes mentioned in Schedule No. 2.1 of Annex No. (1) hereof outside the containers prepared to this purpose under the directions of the Ministry of Health.
2. Health installations shall segregate their medical wastes from any other wastes and municipalities.
3. Health installations shall sort their medical wastes under the provisions of the classification schedule mentioned in Schedule No. 2.1 of Annex No. (2) hereof.
4. The group of wastes provided for in the preceding Clause should be packed in packages or containers in the manner stipulated in Schedule No. 2.2 of Annex No. (2) hereof.

5. Medical wastes shall be disposed of as follows:
- a) Within the health installations by using proper means and equipment safe to the environment (incineration, etc.).
 - b) On the site prepared to this purpose in coordination with the concerned authorities provided with the specialized treatment equipment (incineration, etc.).
6. Health installation or that in-charge of medical waste transport shall pack, transport and store such wastes in the manner described in Schedule No. 2.3 of Annex No. (2) hereof. Persons packing, transporting and storing wastes shall be qualified and licensed operators.

Article (16)

Final Provisions

The provisions of this regulation do not apply to storage, transport and handling of hazardous materials and radioactive wastes.

Article (17)

Parties adopting comprehensive systems and programs for the protection and development of environment sufficient for the implementation of this regulation shall provide the authority with such systems and programs for approval by the Authority's Board of Directors. Parties for which a Board of Directors Resolution shall pass approving their systems and programs shall be exempted from the implementation of the provisions of this regulation.

Article (18)

Rules mentioned in the regulation for lesions insecticides; fertilizers and agricultural additives apply to dangerous agricultural materials and wastes.

Article (19)

This regulation is considered as part of the executive act of Federal Law No. 24 of 1999 in respect of environment protection and development and the agency official and the concerned authorities who are approved as juridical control officials have the right to seize any violation to its rules and to refer the violations in accordance with applicable rules in the country to the concerned judicial authorities for enforcement of legally prescribed penalties.

Annex (1)
Schedule 1.1
Classification of Hazardous Materials

Hazardous materials shall be classified as follows subject to reference to the U.N. current directions:

- | | |
|---------------------|--------------------------------------------------------------------------------------------------------------|
| Category (1) | Explosives |
| Category (2) | Pressurized on, liquefied and inflammable and poisonous gases. |
| Category (3) | Inflammable fluids. |
| Category (4) | Inflammable solid materials, self-igniting solid materials, solid materials inflammable upon touching water. |
| Category (5) | Oxidized materials and organic peroxides. |
| Category (6) | Poisonous materials and contagious materials. |
| Category (8) | Corrosives. |
| Category (9) | Other hazardous materials. |

Schedule 1.2
Classification of Hazardous Wastes

A. Continuously Flowing Wastes:

- * Wastes resulting from manufacturing chemical materials for wood, their preparation and usage.
- * Wastes resulting from production of organic solvents, their preparation and usage.
- * Wastes resulting from thermal treatment and processing containing cyanide.
- * Wastes of mineral oil unsuitable for its original aim.
- * Wastes of oils / waters and hydrocarbon sludge / waters and emulsions.
- * Wastes of materials and compounds containing PCBs bi-vinyl or/and PBBs bi-vinyl.
- * Wastes of tar sediments resulting of refining, filtration and any other treatment by thermal analysis.
- * Residual wastes resulting from production of ink, paint, color materials, paints, varnish and their preparation and use.
- * Residual wastes resulting from production of resins, gum emulsions, plastics, glue/adhesive materials and their preparation and use.
- * Wastes of chemicals resulting from researches and developing or unclassified and/or new activities, whose effects are known on human beings and environment.
- * Wastes of exclusive nature which is not subject to legislation.
- * Residual wastes resulting from production of chemicals, photographic treatment materials and their preparation and use.
- * Wastes resulting from surface treatment of minerals and plastics.
- * Sediments resulting from disposal operations of industrial wastes.

B. Wastes in which the following materials are used:

- * Mineral carbonates.
- * Beryllium - Beryllium compounds.
- * Hex-valence chromium compounds.
- * Copper compounds.
- * Zinc Compounds
- * Arsenic - Arsenic Compounds.
- * Selenium – Selenium Compounds.

- * Cadmium – Cadmium Compounds.
- * Antimony – Antimony Compounds.
- * Tellurium – Tellurium Compounds.
- * Thallium – Thallium Compounds.
- * Lead – Lead Compounds.
- * Inorganic Fluorine Compounds except calcium fluoride.
- * Inorganic Cyanide Compounds.
- * Acidic Solutions or Acids in the solid state.
- * Alkaline Solutions or Alkaline in the solid state.
- * Asbestos (dust and fibers).
- * Organic phosphorus compounds.
- * Organic Cyanide Compounds.
- * Phenol – Phenol Compounds including Chloro-phenol.
- * Ether Compound.
- * Homogenated Organic Solvents.
- * Any other materials similar to PCBs Furan bi-benzene.
- * Any other materials similar to PCBs Dioxin bi-benzene.
- * Organic Halogen Compounds except the materials referred to herein above.

Schedule (1.3)
Hazardous Materials Segregation Requirements

Category	1-1	2-1	2-2	2-3	3-1	4-1	4-2	4-3	5-1	5-2	6-1	8
1-1		C	C	C	C	C	C	C	C	C	C	C
2-1	C			C	B	B	C	B	C	C	B	B
2-2	C			C	A	A	B	A	A	B	A	A
2-3	C	C	C		C	C	C	C	C	C	C	C
3-1	C	B	A	C		B	B	B	C	C	B	A
4-1	C	B	A	C	B		B	B	C	C	B	A
4-2	C	C	B	C	B	B		B	C	C	B	A
4-3	C	B	A	C	B	B	B		C	C	B	B
5-1	C	C	A	C	C	C	C	C		B	B	B
5-2	C	C	B	C	C	C	C	C	B		C	B
6-1	C	B	A	C	B	B	B	B	B	C		A
8	C	B	A	C	A	A	A	B	B	B	A	

Note:

Segregation between two different categories of hazardous materials shall be made by using the Code at the intersection between the vertical line representing First Category and the horizontal line representing the other Category.

- a) Minimum separating distance shall be 3 meters.
- b) Minimum separating distance shall be 5 meters.
- c) Storage in the same room or area shall be prohibited. The minimum separating distance between storage areas shall be ten meters.

Schedule (1.4)
Minimum Segregation Requirements Between Hazardous Materials and Public

Category	Minimum Separating Distance (Meters)
1	50
2-1	5
2-2	5
2-3	15
3-1 to 3-3	10
4-1 to 4-3	5
5-1 to 5-2	5
6-1 to 6-3	5
8	5

Annex (2)
Schedule (2.1)
Medical Waste Classification

1. Group (A) Wastes

Dirty bandages, bed sheets, etc... polluted wastes such as cloth other than clothes and bed sheets arising from the treatment of contagious diseases and all human tissues (contaminated or un-contaminated), animal remains and all materials on which animals lay or cloth or any other materials used for animals whether contaminated or not or which might be probably be contaminated and all related matters of cloth and bandages, etc...

2. Group (B) Wastes

Used syringes and needles, surgical tools, different medicine and medical equipment vessels, broken glass and all other sharp equipment, tools and materials.

3. Group (C) Wastes

Blood, tissue and microbiology laboratories wastes mortuary wastes not specified under Group (A) or Group (B).

4. Group (D) Wastes

Pharmaceutical wastes and chemical wastes to which medical specifications apply.

5. Group (E) Wastes

Disposable linings used in the patients beds for covering the vessels receiving secretions, caps of bottles and vessels for receiving and storing urine, blood and urine diapers, bags or vessels used for receiving stomach wastes and similar materials.

6. Group (F) Wastes

Wastes resulting from treatment with radio active materials and wastes resulting from all operations related to radio active materials will be classified in accordance with international principles.

Schedule (2.2)
Packages and Containers Determination

1. Group (A) Wastes

Heavy duty polyethylene (gauge 400) red color bags clearly marked with the phrase "Contiguous Wastes - for Incineration Only" shall be used for packing all wastes mentioned in group A of the Schedule No. 2-1 in Annex No. 2.

2. Group (B) Wastes

Heavy-duty thick polyethylene plastic boxes of yellow color internationally known as "Sharp Object Boxes" clearly marked with the phrase (Sharp Objects - for Incineration Only) for wastes mentioned in group (B) of Schedule No. 2.1 in Annex No.2. The said boxes used for preserving such wastes shall be tightly sealed with a cap or lock or any other means so as not to be opened and must not be stowed for more than 75% of their capacity.

3. Group (C) Wastes

3/1 Wastes to be sterilized before disposal

All laboratory wastes such as contaminated clothes, covers or sheets, gloves, bacterial plates (bacteriology laboratories culture plates and other plastic plates) and vessels used for handling organic tissues, blood, bacteria, etc... These wastes shall be placed in blue transparent bags made of special material clearly marked up "Medical Wastes - to be Sterilized Before Disposal". These bags shall be tied from the neck by temporary locks and shall not be packed for more than 65% of their capacity.

3/2 Wastes to be treated

These wastes include the remaining wastes under Group (C) not listed under those mentioned in the preceding Para and which must be placed in medium duty (gauge 200) polyethylene bags of yellow color clearly marked up (Medical Wastes - for Incineration Only). These bags shall not be stowed for more than 65% of their capacity and shall be tied from the neck and stored awaiting collection and disposal by incineration under the provisions hereof.

4. Group (D) Wastes

4/1 Pharmaceutical Wastes

All packed pharmaceutical material partially used or expired shall be returned to the pharmacy to be returned to their original containers, then stored in bags of polyethylene of medium duty (gauge 300) of yellow color marked up (Medical Wastes - for Incineration Only). These bags shall be tied from the neck and shall not be filled for more than their capacity and shall be stored awaiting collection and disposal.

4/2 Poisonous Wastes

All cellular or poisonous materials shall be returned to a predetermined point inside the pharmacy in which such materials are prepared or issued. All poisonous cellular medicines and other materials contaminated with cellular poisonous drugs and medicines (except for under skin needles and other sharp objects classified under Group

(B) wastes) shall be placed in heavy duty (gauge 400) polyethylene bags of yellow color clearly marked up "Poisonous Cellular Wastes - for Incineration Only" and such bags shall not be filled for more than 65% of their capacity and shall be tied from the neck and stored waiting collection and disposal thereof by incineration.

4/3 Chemical Wastes

All chemical wastes to which medical wastes characteristics apply such as industrial solvents and other liquid materials used in diagnostic tests in addition to all remaining chemical materials shall be returned to a predetermined point within the pharmacy or the central laboratory store where they shall be tagged according to their respective kinds and types either by using adhesive tags or by cards attached thereto. Tags and marks placed on each pack shall indicate its components and hazards. Bags after that shall be stored awaiting collection and disposal.

5. Group (E) Wastes

All used bed materials of linings used for covering vessels receiving patient secretions and stomach wastes and other wastes (except for those used by patients suffering contagious diseases listed under Group (A) wastes) shall be placed in medium duty (gauge 300) yellow polyethylene bags. These bags shall not be filled in for more than 65% of their capacity and shall be tied from the neck after placing wastes therein and at the neck of each bag a tag clearly indicating the contents thereof to be "Medical Wastes of Group (E)" shall be hanged. These bags must be isolated in a separate place from other medical wastes if not incinerated on site.

6. Group (F) Wastes

Must be kept in special security places allocated for storing this kind of wastes until the expiry of half of their expected lives then incinerated or buried.

Schedule (2.3)
Methods Determination - Medical Wastes Packing, Transport and Storage

1. Containers

Bags used for keeping medical wastes shall be of a minimum density of one cubic meter. Bags used for sterilization shall be made of special material and shall be carefully selected to this purpose and shall be clearly marked to this effect and to whether the contents thereof were treated or not (Sterilization Strip for example). After sealing each medical wastes bag for the disposal thereof, it shall be marked indicating the place in which such wastes were generated and the place in which such wastes shall be disposed of.

2. Transport on Site

Upon transporting any waste bag or container to its storage place within the site or to its disposal place within the site, such transport shall be made through secured trolleys marked "Medical Wastes" and any unauthorized or unlicensed person shall be denied access thereto. such trolleys shall be equipped so as to prevent any waste bags, packages or containers to fall therefrom. Trolleys used for transporting wastes from one point to another within the site shall be secured against leakage or spillage or shall be wrapped with clothes to absorb any liquid materials which might leak or spill from the bag or containers. Such cloth shall be either of a disposable kind or shall be made of materials which can be sterilized and shall be actually sterilized after each use before using them again.

3. Storage on Site

Upon storage of waste on site, such storage shall be in the nearest possible point to that from which transport has taken place and shall be placed inside packages or containers suitable to the kind of wastes in accordance with the classification determined for the medical wastes group. Such points shall also be allocated to this purpose only. The place in which such containers or packages shall be kept must be of a suitable temperature degree so as to prevent germs reproduction and shall be far away from the patients, public or loose animals reach unless such place was always and in all times subject to the control of qualified and efficient personnel in the medical care profession field. Packages or containers shall be tightly sealed and tied or secured so as not to be easily opened.


4. Transport of Wastes Outside the Site

All vehicles, transport means or containers used for transporting medical wastes on public roads must be made, equipped or prepared and amended so as to be suitable for transporting medical wastes in a safe and secure manner. Such vehicles must also be capable of preventing leakage or spillage of any materials loaded therein and must be capable of carrying heavy loads and standing strong impacts without being liable to explode or crush so as to ensure that their load of wastes shall not spill or leak. Such vehicles shall also be provided with strong and secure locking devices and all vehicles or other means of transportation or containers used for transporting medical wastes shall always be kept tightly secured and closed so as to prevent any leakage or spillage.


5. Disposal of Wastes on Site

Wastes shall be disposed of on sites determined by the Municipality Department and prepared and equipped with the necessary plant for the disposal thereof whether by incineration or by any other means under the instructions of Ministry of Health.

Annex J – ECAS Application Form



هيئة الإمارات للمواصفات والمقاييس
 Emirates Authority For Standardization & Metrology
 إدارة شؤون المطابقة | Conformity Affairs Department



EMIRATES CONFORMITY ASSESSMENT SCHEME Application for Registration

For ESMA use only:

Type of Application	New	Renewal	Extension	Reduction
Application No.				
Date Received				
Received By				

1. Requirements For Registration

Documents Required for ECAS application	Additional Requirements for Emirates Quality Mark Application
<input type="checkbox"/> Valid Industry/Trade License (For Companies within UAE)	<input type="checkbox"/> Controlled Copy of relevant MS Manual (Soft Copy/in CD/DVD)
<input type="checkbox"/> Test Report from recognized Testing Laboratory (soft copy)	<input type="checkbox"/> Brief Description of Manufacturing Process
<input type="checkbox"/> Declaration of Conformity by the Applicant on the Product(s) for Registration using the Applicant's Official Letterhead	<input type="checkbox"/> Plant Equipment Lay-out (scaled 1:50)
<input type="checkbox"/> Certification Fees	<input type="checkbox"/> Vicinity Map of the Factory
	<input type="checkbox"/> Quality Plan showing how to comply with Specific Standard
	<input type="checkbox"/> Evidence of Approval from other Conformity Assessment Bodies (if approved)
	<input type="checkbox"/> Copies of labels, markings, logos as required by Specific Standard

Note: Other requirements may be required by ESMA if deemed necessary to ascertain compliance to the applicable standards prior to product registration.

2. Applicant Information

2.1 Applicant Details

Name of Establishment:		
Type of Business:		
<input type="checkbox"/> Manufacturer <input type="checkbox"/> Trader <input type="checkbox"/> Others _____		
Mailing / Site Address:		
Contact Person:		
Designation:		
Tel:	Fax:	E-mail:

Form No.: CAF-01-01 Issue Date: 10/06/2010 Revision No.:3
Page 1 of 3

Appendix D

Declaration of Conformity

1) Applicant Details

Applicant's name: _____

The applicant is: Local manufacturer Importer

Address: _____

Contact Person: _____

E-mail Address: _____

Telephone: _____ Fax _____

2) Product Details

Product Brand/ Model	Product Description	Reference Standards / Specification

We hereby declare that product listed in this declaration is in compliances with the National Standards of the UAE or the International Standards and the essential requirements stated in the technical guidelines

Authorized Person:	_____
Company name:	_____
Signature:	_____
Date:	_____

This form is to be filled on the applicant's letterhead

Annex K – Registration Process

The registration procedure involves a very direct process of document submission, verification, certification and payment of fees. Details of each step are stipulated as follows:

Step 1: All documents as listed in clause 1.1 of this document are submitted to ESMA as a formal application to the ECAS certification program.

Step 2: Upon receipt of the application documents, the application fee is paid by the applicant and a confirmation number and receipt is issued to the applicant.

Step 3: This stage involves document review and verification of the documents submitted particularly the test reports. These reports are cross-verified against applicable standards for compliance.

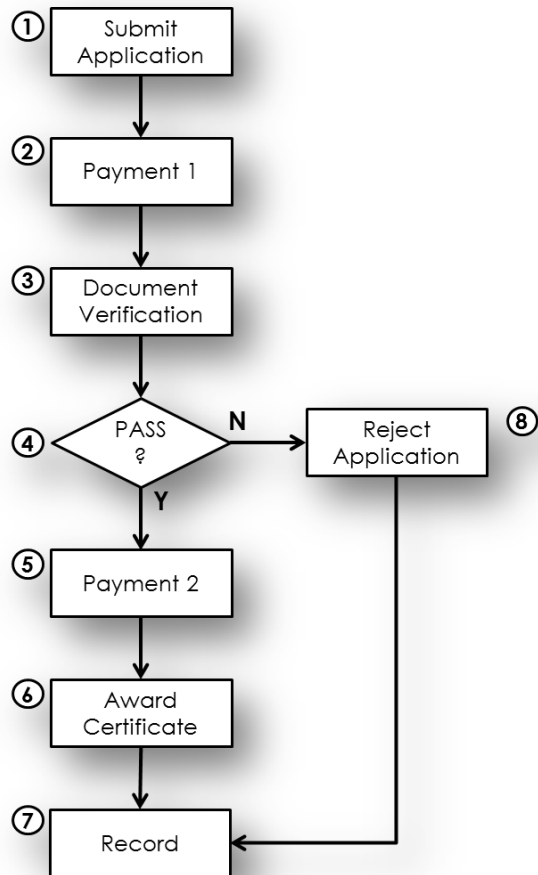
Step 4: Upon review of the submitted documents, decision is made if the application is approved or rejected in case of some non-compliance with the requirements. The applicant is then notified of the status of their application.

Step 5: Once the application is approved, the applicant is requested to claim the Certificate of Conformity and finish the payment for the document verification fee and certification fee.

Step 6: Certificates are then awarded to the applicant.

Step 7: These details are recorded to the ESMA database for market inspection and monitoring purposes.

Step 8: In this stage, the application is rejected due to non-compliance and reasons and details of the product are recorded.



Annex L – ECAS Certificate of Conformity



هيئة الإمارات للمواصفات والمقاييس
Emirates Authority For Standardization & Metrology



نظام تقويم المطابقة الإماراتي (إيكاس)
شهادة مطابقة
CERTIFICATE OF CONFORMITY
EMIRATES CONFORMITY ASSESSMENT SCHEME

Certificate No: _____

Report No: _____

Issue Date: 23-FEBRUARY-2011

Valid Until: 22-FEBRUARY-2012

Issued To: _____

Product: _____

رقم الشهادة: _____

رقم التقرير: _____

التاريخ: _____

صلاحية لغاية: _____

أصدرت الى: _____

إسم المنتج: _____

الإسم التجاري Brand Name	الطراز Model	تفاصيل المنتج Product Details	بلد المنشأ Country of Origin
_____	_____	_____	_____

Product is registered under the Emirates Conformity Assessment System (ECAS) based on compliance to the following requirements:

المنتج مسجل في نظام تقويم المطابقة الإماراتي (إيكاس) بناءً على مطابقته للمتطلبات التالية:

ECAS Specific Requirements for Registration of Low Voltage Equipment




Eng. Mohamed Saleh Badri
Acting Director General



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www.ISMA.ae



هيئة الإمارات للمواصفات والمقاييس
Emirates Authority For Standardization & Metrology
Conformity Affairs Department إدارة شؤون المطابقة



بيان التسجيل
SCHEDULE OF CERTIFICATION

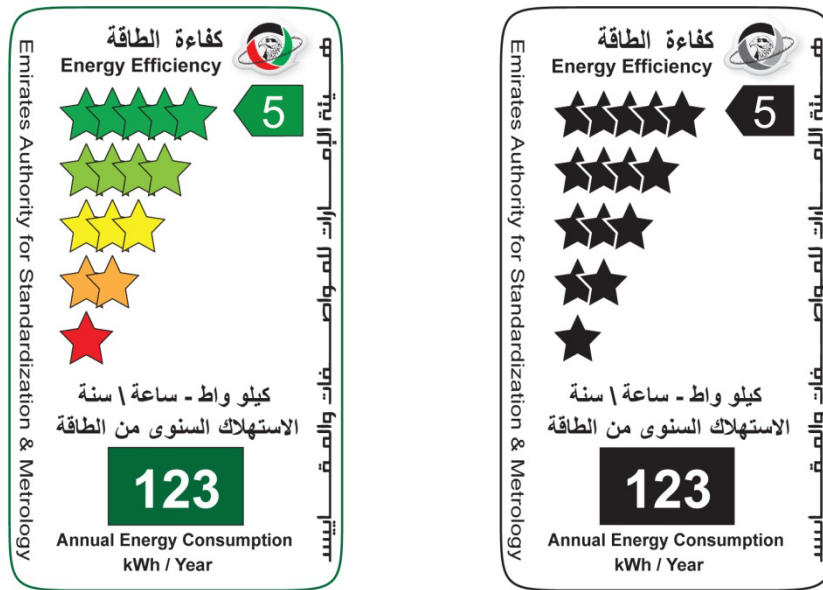
Company Name:							اسم الشركة:
Product Category:							فئة المنتج:
Certificate No.:							رقم التسجيل:
تسلسل رقم	الإسم التجاري	رقم الطراز	تفاصيل المنتج	المواصفة المطبقة	بلد المنشأ	تاريخ التسجيل	صالح لغاية
Count	Brand Name	Model No.	Product Details	Applicable Standards	Country of Origin	Registration Date	Valid Until
1	Brand	Model	Voltage Rating; Power Rating; Type; Star Rating; Lumens;	Standard	CHINA	15-August-2012	15-August-2015

- NOTHING FOLLOWS -

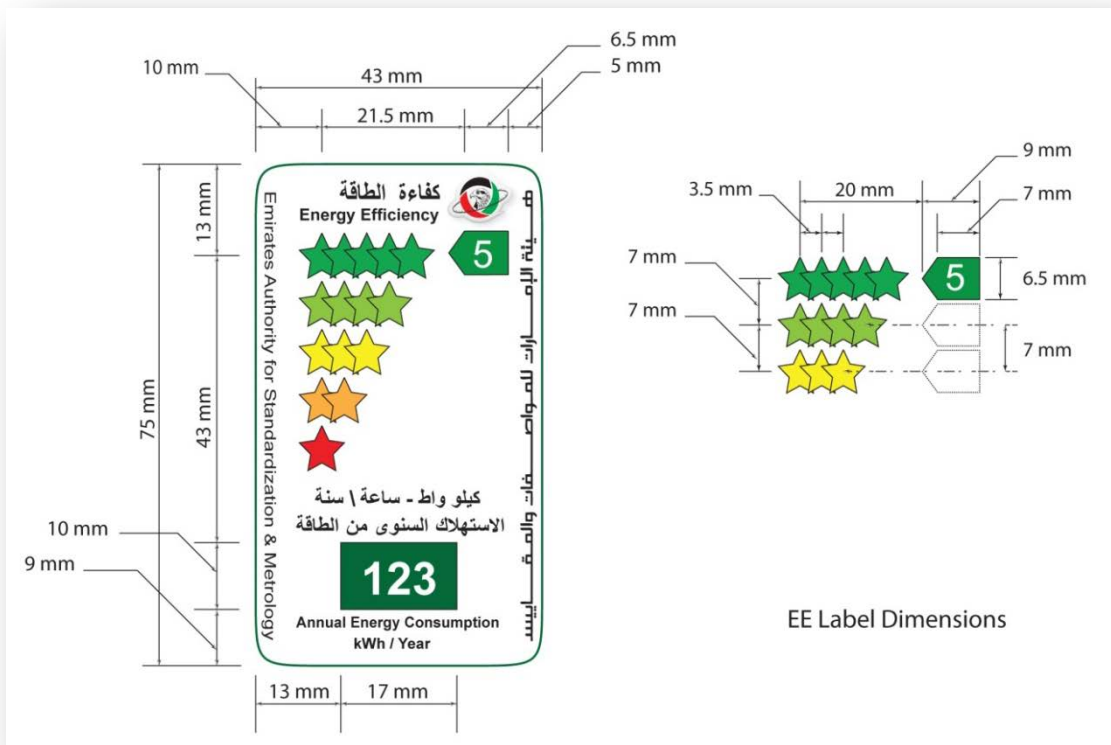
Abdulla Abdelqadir Al Muaini
Director of Conformity Affairs Department

علامة الجودة الإماراتية
Emirates Quality Mark

Annex M – Energy Efficiency Label



Comparative Energy Efficiency Label for Lamps



EE Label Dimensions