



## Sixth *lites.asia* workshop

### Australian Requirements for Lighting Energy Efficiency Product Registration

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# Regulation of Lighting Energy Efficiency in Australia

- Minimum Energy Performance Standards (MEPS) programs are mandatory requirements for certain lighting products sold in Australia.
- Enforced by legislation with reference to the relevant Australian or Australia/New Zealand Standards.
- Regulations specify the requirements for MEPS for lighting, including offences and penalties if a party does not comply with the requirements.
- Technical requirements for MEPS are set out in Determinations which usually reference the relevant appliance standard.

# Lighting Products Subject to MEPS

Lighting MEPS specify efficacy levels for lamps in lumens/watt, + performance requirements

- ❑ Incandescent lamps (tungsten filament and halogen)
- ❑ Compact Fluorescent Lamps (integrated)
- ❑ Linear Fluorescent Lamps
- ❑ Ballasts for Linear Fluorescent Lamps
- ❑ Transformers and Converters for Halogen Lamps
  
- ❑ Requirements set out on the Energy Rating Website:  
[www.energyrating.gov.au/](http://www.energyrating.gov.au/)

# Australian Lighting Efficiency Standards - Incandescent

- AS/NZS 4934.1(Int):2008/Amdt 1:2011  
Incandescent lamps for general lighting service Part 1: Test methods – Energy performance
- AS 4934.2 Incandescent lamps for general lighting Services Part 2: Minimum Energy Performance Standards (MEPS) requirements
- Refer to AS 4934.2 for full definitions of lamps subject to regulation

# Incandescent lamp timetable

□ *MEPS currently in force for :*



□ General Lighting Service (GLS) tungsten filament lamps <150 W



□ Extra low voltage (ELV) halogen lamps (reflector and non-reflector)



□ Mains voltage halogen non-reflector



□ >25W candle, fancy round, globe and decorative tungsten filament lamps



# Incandescent lamp timetable



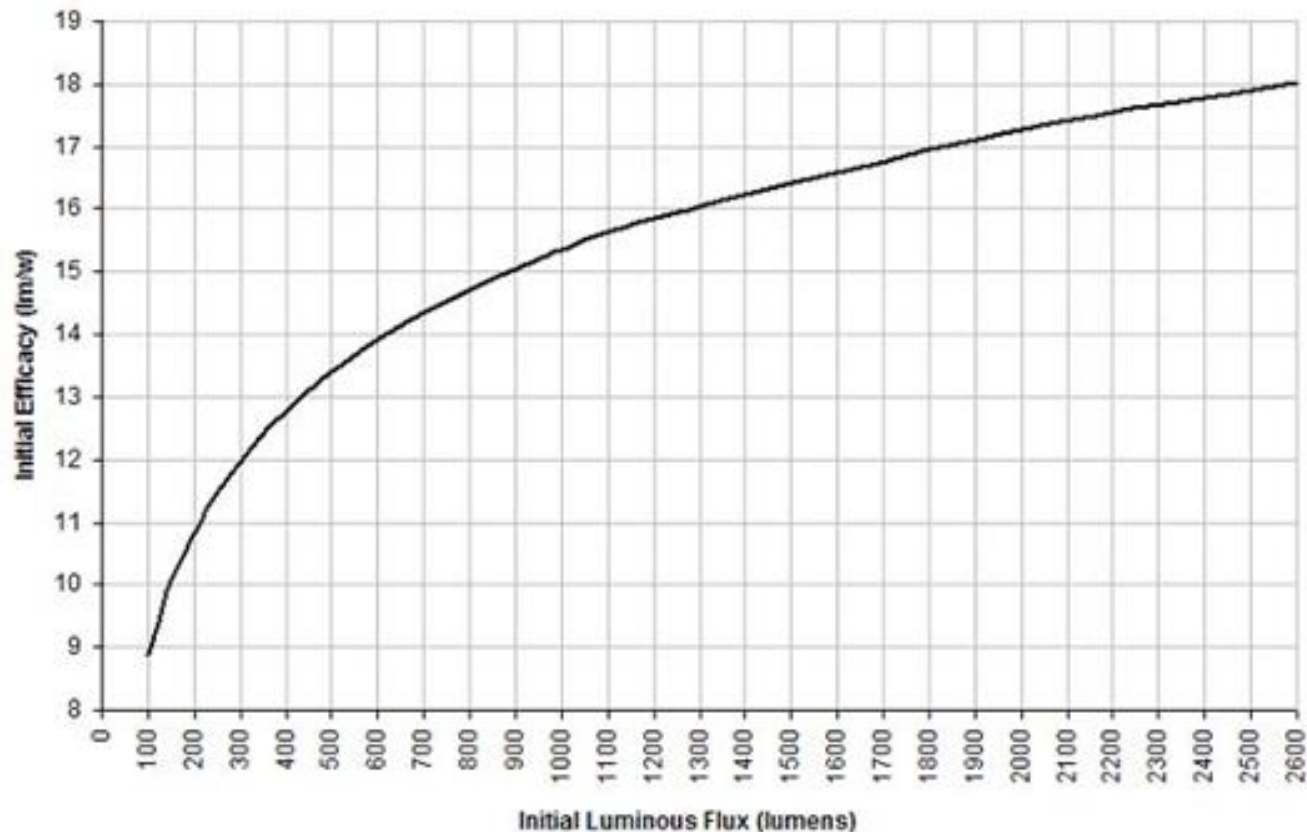
- ❑ October 2013 - Mains voltage reflector lamps including halogen (shapes PAR, ER, R, etc)
- ❑ Does not include: coloured lamps, crown-reflector lamps and special purpose and automotive lamps:
  - ❑ Lamps intended for traffic signals - AS 4113
  - ❑ Very long life lamps intended for sea or air navigation purposes
  - ❑ Lamps with a temperature rating greater than 300°C intended for use in ovens
  - ❑ Infra-red lamps
  - ❑ Reinforced construction (rough use or vibration) lamps
  - ❑ Packaging must state not intended for general purpose illumination

# Incandescent Lamps MEPS

- Minimum Efficacy (in lumens per Watt). When tested in accordance with AS/NZS 4934.1 the required minimum initial lamp efficacy (in lm/W) is given by the formula:
  - Initial efficacy: Average value shall be  $\geq (2.8 \ln (L) - 4.0)$
  - Where  $\ln (L)$  is the natural logarithm of the measured initial luminous flux (in lumens)
- Until 30 September 2013, mains voltage halogen non-reflector lamps may comply with an alternative initial efficacy requirement, as follows:
  - Initial efficacy: Average test value shall be  $\geq 0.95 \times (2.8 \ln (L) - 4.0)$

# Incandescent Lamps MEPS

## □ Incandescent lamp efficacy curve





# Incandescent Lamps MEPS

- There are also requirements for:
  - Lumen Maintenance (minimum of 80% measured at 75% of rated lamp life); and,
  - Minimum Lamp Life (median lamp life of at least 2000 hours)
- ELV Halogen Reflector lamps max wattage 37 watts
- GLS tungsten filament lamps <150 W are also subject to Import Prohibition
- (Australian Customs Notice No. 2009/04)  
<http://www.customs.gov.au/site/page4369.asp#e2147>

# Incandescent Lamps MEPS

## Package Marking Requirements:

- Light output (lumens)
- Wattage (watts)
- Lamp Lifetime



# Compact Fluorescent Lamps

- AS/NZS 4847.1 Self ballasted lamps for general lighting services Part 1: Test methods – Energy performance
- AS/NZS 4847.2:2010/Amdt 1:2011 Self ballasted lamps for general lighting services Part 2: Minimum Energy Performance Standards (MEPS) requirements
- AS/NZS 4782.3(Int):2006 Double-capped fluorescent lamps – Performance specifications Part 3: Procedure for quantitative analysis of mercury present in fluorescent lamps
- Refer to AS/NZS 4847.2:2010/Amdt1:2011 for full definitions of lamps subject to regulation



# Compact Fluorescent Lamps

- ❑ Self-ballasted compact fluorescent lamps (CFLs) of all voltages and wattages irrespective of the type of lamp cap are required to comply with Minimum Energy Performance Standards (MEPS)
- ❑ The intention of MEPS for CFLs is to ensure the performance of CFLs to ensure that they remain a viable alternative for inefficient incandescent lamps.
- ❑ CFL MEPS covers efficacy and a range of other performance parameters.

# Compact Fluorescent Lamps

- CFL MEPS includes performance specifications for the following attributes:
  - Starting time
  - Run-up time
  - Luminous flux, efficacy and lumen maintenance
  - Power, power factor and harmonics
  - Premature lamp failure rate
  - Low temperature starting
  - Switching withstand
  - Lamp life
  - Colour attributes
  - Mercury content



# Compact Fluorescent Lamps

- ❑ AS/NZS 4847.1 used as the test method
- ❑ Lamps shall comply with Table 1, Compliance Requirements of AS/NZS 4847.2, or,
- ❑ Alternatively, in Australia, lamps certified by one of the following programs are also acceptable:
  - ❑ (a) Efficient Lighting Initiative (ELI) Technical Specification for Self Ballasted Compact Fluorescent Lamps, Version 1 dated 01 March 2006 and Version 2 dated 01 March 2011.  
NOTE: Available for download from <http://www.efficientlighting.net/>
  - ❑ (b) UK Energy Saving Trust (EST) Lamp Specification, Version 5, Version 6.1 or Version 7.  
NOTE: Available for download from <http://www.energysavingtrust.org.uk/>
- ❑ NOTE: The performance criteria for the above programs are outlined in Appendix A of AS/NZS 4847.2.

The test report from the chosen programs shall be examined and **if** some of the attributes from Table 1 (of AS/NZS 4847.2) are not specified then the lamps shall comply with the requirements of Table 1 for the attributes not specified by ELI or EST.

# Compact Fluorescent Lamps

## Package Marking Requirements:

- Light output (lumens)
- Wattage (watts)
- Lamp Lifetime
- Mercury
- *See 4.4.1 of AS/NZS 4847.2 for full requirements*



# Linear Fluorescent Lamps

- AS/NZS 4782.1 *Double Capped Fluorescent lamps – performance specifications – Part 1: General (test requirements)*
- AS/NZS 4782.2 *Double Capped Fluorescent lamps – performance specifications – Part 2 MEPS*
- AS/NZS 4782.3(Int): 2006 *Double-capped fluorescent lamps – Performance specifications Part 3: Procedure for quantitative analysis of mercury present in fluorescent lamps*





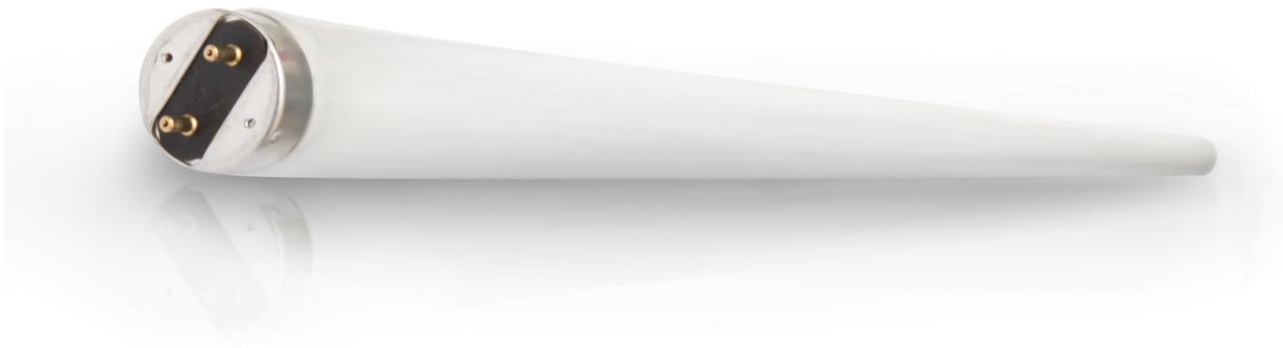
# Linear Fluorescent Lamps

- When measured in accordance with AS/NZS 4782.1 the initial efficacy (at 100 hours) and the maintained efficacy (at 5000 hours) shall exceed the values specified in the table below.
- Lamps shall also have a Colour Rendering Index (CRI) which exceeds the value in the table below.

Lamp nominal length L (mm) mandatory	$550 \leq L < 700$	$700 \leq L < 1150$	$1150 \leq L < 1350$	$1350 \leq L < 1500$
Lamp typical power (watts)(informative)	16 – 24	17 – 40	28 – 50	35 – 80
Initial Efficacy	$F_{100} \geq 66.0$ and	$F_{100} \geq 74.0$ and	$F_{100} \geq 80.0$ and	$F_{100} \geq 85.0$ and
Maintained Efficacy	$F_M \geq 57.5$	$F_M \geq 61.0$	$F_M \geq 70.0$	$F_M \geq 70.0$
Minimum CRI	79	79	79	79

# Linear Fluorescent Lamps

- ❑ Maximum quantity of mercury present in fluorescent lamps shall not exceed 15 mg.
- ❑ The quantity of mercury present is determined in accordance with the relevant Clauses of AS/NZS 4782.3.



# Ballasts for Linear Fluorescent Lamps

- ❑ AS/NZS 4783.1:2001: Performance of electrical lighting equipment – Ballasts for fluorescent lamps Part 1: Method of measurement to determine energy consumption and performance of ballast-lamp circuits.
- ❑ AS/NZS 4783.2:2002: Performance of electrical lighting equipment – Ballasts for fluorescent lamps Part 2: Energy labelling and minimum energy performance standards requirements.

# Ballasts for Linear Fluorescent Lamps

What type of Ballasts?

- ferromagnetic and electronic ballasts used with fluorescent lamps with a rated power from 10W to 70W;
- for use on 50 Hz supplies of 230/240/250V (or a range that includes these);
- ballasts supplied as separate components or as part of a luminaire.

# Ballasts for Linear Fluorescent Lamps

- The Minimum Energy Performance Standards (MEPS) requirements are set out as maximum allowable total circuit power when tested in accordance with AS/NZS 4783.1.
- Ballasts within the scope of MEPS must also be marked with their energy efficiency by way of their Energy Efficiency Index (EEI), the details of which are also specified in AS/NZS 4783.2.
- Ballasts within the scope of MEPS be designed to comply with the relevant performance requirements of IEC 60921 for ferromagnetic ballasts and IEC 60929 for electronic ballasts (performance requirements).

# Transformers and Converters for Halogen Lamps

- AS/NZS 4879.1 Performance of Transformers and Electronic Step-down Converters for ELV Lamps – Part 1: Test Method
- AS/NZS 4879.2 Performance of Transformers and Electronic Step-down Converters for ELV Lamps Part 2: Minimum Energy Performance Requirements (MEPS)

# Transformers and Converters for Halogen Lamps

- Units intended for use with extra-low voltage (ELV) lighting, having a rated load up to 500 VA mains supply input, and single AC or DC ELV output (up to 50V).
- MEPS requires a minimum full load efficiency as specified in the table below.

Rated ELC Power (VA)	MEPS efficiency at full load (%)	High Efficiency level at full load (%)
$\leq 200$	$\geq 86$ ( $\geq$ Level III)	$\geq 92.5$ ( $\geq$ Level V)
$200 < \text{power} \leq 500$	$\geq 91$ ( $\geq$ Level IV)	$\geq 92.5$ ( $\geq$ Level V)

# Transformers and Converters for Halogen Lamps

## Declaration of High Efficiency:


- Only those ELCs with efficiency greater than or equal to the efficiency listed in Table 1 shall be capable of being termed 'high efficiency', 'efficient', or 'energy efficient'.



# Product Registration

- ❑ Products subject to MEPS regulation must be registered on the Energy Rating website:  
[www.energyrating.gov.au/](http://www.energyrating.gov.au/)
- ❑ Before you register a product you need to apply for a username and password for the Online Registration System.

# Product Registration

**E3**  
Equipment Energy  
Efficiency

[Log in](#)

[Login](#) [Register](#) [Reset Password](#) [Help](#)

## Register a New Account

Fill out the form below to register a new user account

Please fill-in the form below to register a new account on the Energy Rating Product Registration system. An email will be sent to you containing instructions on how to activate your account and login for the first time.

First Name:\*

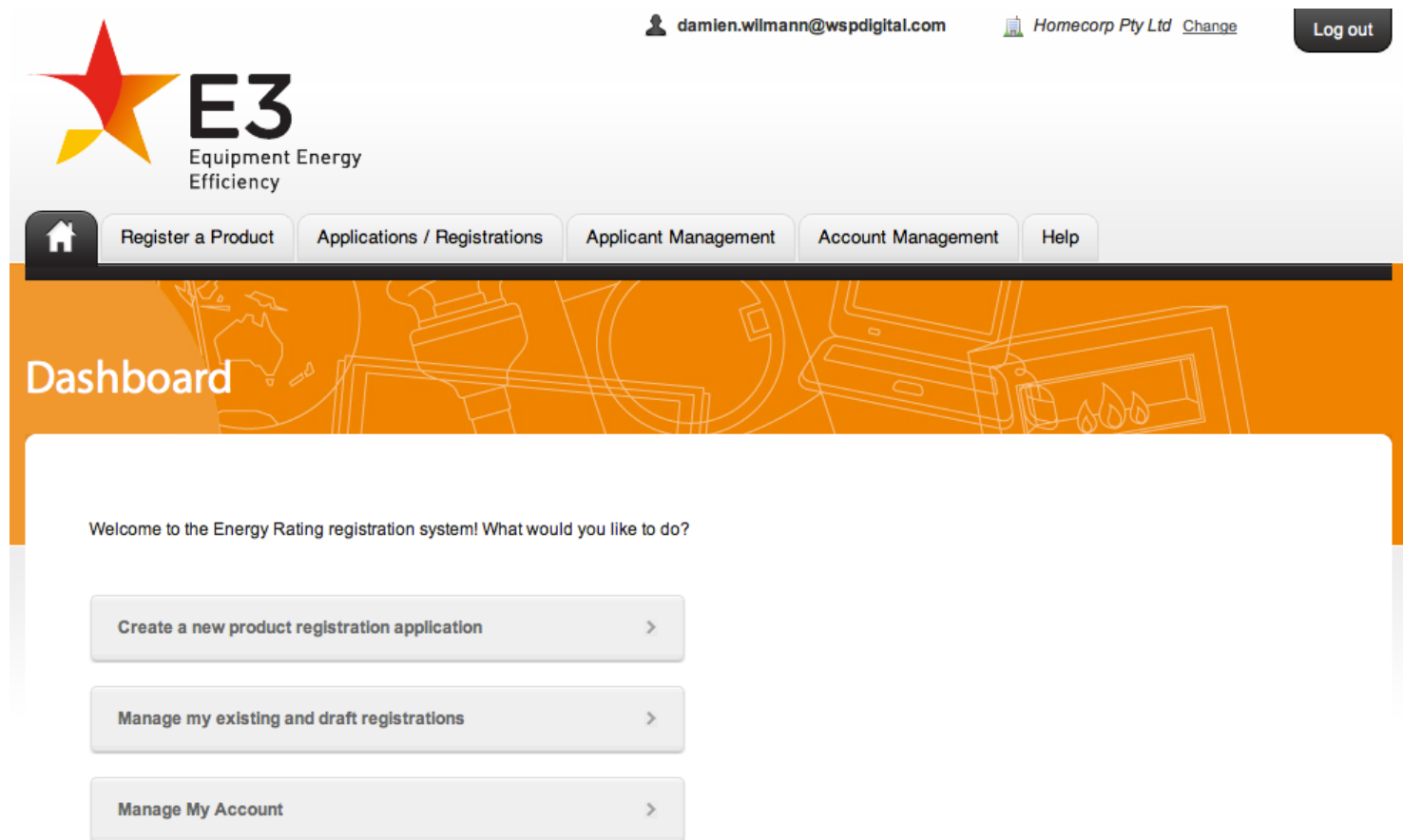
Last Name:\*

Email Address:\*

# Product Registration

- ❑ You must also either join an existing applicant or create a new applicant.
- ❑ An Applicant is the company or organisation that submits product registration applications to the regulatory authority.
- ❑ The Applicant is accountable for the registrations they submit and may be held legally liable.

# User Dashboard



The screenshot displays the user dashboard for the E3 Equipment Energy Efficiency system. At the top, the user is logged in as **damien.wilmann@wspdigital.com** from **Homecorp Pty Ltd**, with a **Log out** button. The E3 logo, featuring a stylized star, is prominently displayed. A navigation bar includes a home icon and links to **Register a Product**, **Applications / Registrations**, **Applicant Management**, **Account Management**, and **Help**. The main content area, titled **Dashboard**, features a background image of various household appliances. A welcome message reads: "Welcome to the Energy Rating registration system! What would you like to do?". Below this, three actionable buttons are provided: **Create a new product registration application**, **Manage my existing and draft registrations**, and **Manage My Account**, each with a right-pointing arrow.

**E3**  
Equipment Energy  
Efficiency

damien.wilmann@wspdigital.com Homecorp Pty Ltd [Change](#) **Log out**

Register a Product Applications / Registrations Applicant Management Account Management Help

## Dashboard

Welcome to the Energy Rating registration system! What would you like to do?

- Create a new product registration application >
- Manage my existing and draft registrations >
- Manage My Account >

# Product Registration

- ❑ A Supplier User Guide is available to take you through the product registration steps:
- ❑ <http://www.energyrating.gov.au/resources/program-publications/?viewPublicationID=2139>
- ❑ When registering a lighting product you will need to supply test reports.
- ❑ There are no laboratory accreditation requirements however note that the regulator does carry out independent product testing for compliance purposes.

# Other Australian Regulations

- There are other Australian regulations relating to safety of electrical products and electromagnetic Radiation (EMR). Further information can be found on the following sites:
- Electrical Regulation Authorities Council (ERAC)
  - [www.erac.gov.au/](http://www.erac.gov.au/)
- Australian Communications and Media Authority
  - [www.acma.gov.au/](http://www.acma.gov.au/)



# Thank You