

INTERIOR TECHNICAL





Technical – Energy Saving Initiatives

THE BUILDING CODE OF AUSTRALIA –BCA

The Building Code of Australia is a mandatory document setting the technical provisions for the design and constructions of buildings across Australia.

Section J6 of the BCA, first introduced in 2006, addresses energy efficiency in buildings and specifically, Artificial Lighting and Power. The approach adopted has been to minimise power consumption of lighting installations. This is independent of the extent of the usage.

Table J6.2a provides maximum Illumination Power Density (IPD) expressed as watts/m² for specific applications. Maximum IPD figures have been derived based on the lighting design complying with AS/NZS1680 and can be achieved through the use of high-efficacy light sources, electronic control gear and high efficiency luminaries.

Concessions to the specified values of IPD (watts/m²) in Table J6.2a can be obtained by using intelligent lighting control. An adjustment factor for enclosed spaces where the Room Aspect Ratio is less than 1.5 can also be applied. The IPD is to be applied as an average over a space. This enables the energy usage to be traded from space to space.

The introduction of section J6 of the BCA has resulted in design solutions that embrace more efficient luminaries with a higher Light Output Ratio (LOR) through improved fitting design using high quality reflective material. This combined with the availability of more efficient light sources and smarter lighting controls provides energy efficient solutions which are reducing greenhouse gas emissions.

Pierlite has met the challenges of Section J6 of the BCA by providing optimum lighting solutions using state of the art products that ensure compliance with BCA.

This will provide certainty to the designer, contractor and end user secure in the knowledge that compliance with BCA can be achieved.

Further information is available on the Pierlite website www.pierlite.com

MEPS - MINIMUM ENERGY PERFORMANCE STANDARDS

In February 2007 it was announced that the Government would be phasing out inefficient GLS lamps. Legislation was subsequently introduced and the humble light globe was no longer available from October 2009.

Australian standards (AS4934) were introduced to clearly define minimum energy performance requirements and a time line established for phasing out inefficient lamps.

The enforcement dates were taken out to 2015 with all incandescent lamps removed from sale by that year. The development of more efficient alternatives became a priority and we now have alternative light sources such as LED under development.

A guide to MEPS for incandescent (including halogen) lamps has been published by Lighting Council Australia and is available on the Pierlite website www.pierlite.com

GREEN STAR

The Green Star environmental rating system for buildings was developed by the Green Building Council of Australia (GBCA). Green Star is Australia's first comprehensive rating system for evaluating the environmental design and performance of Australian buildings based on a number of criteria including energy and water efficiency, indoor environment quality and resource conservation.

Green Star has built on existing systems and tools in overseas markets, including the British BREEAM (Building Research Establishment Environmental Assessment Method) system the North American LEED (Leadership in Energy and Environmental Design) system, by establishing individual environmental measurement criteria relevant to the Australian marketplace and environmental context.

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The Green Star Certified Ratings

In environmentally sustainable design and/ or construction

4 Star signifies “Best Practice”

5 Star signifies “Australian Excellence”

6 Star signifies “World Leadership”

Credits are available for good lighting practices based on the use of energy efficient

measures. The practices include use of electronic control gear, maintaining illuminance levels within the recommendations of AS/NZS1680, achieving minimum power density and office lighting zoning. Although the Green Star certification requires a formal process, design assistance is available through the local Pierlite office.

COMMERCIAL BUILDING DISCLOSURE

Commercial Building Disclosure (CBD) is a national program designed to improve the energy efficiency of Australia’s large office buildings.

Under the Building Energy Efficiency Disclosure Act 2010, there are mandatory obligations applicable to many commercial buildings. Most sellers or lessors of office space of 2,000 square metres or more are required to obtain and disclose a current Building Energy Efficiency Certificate (BEEC). A BEEC is comprised of:

- * NABERS Energy star rating for the building
- Assessment of tenancy lighting in the area of the building that is being sold or leased and
- General energy efficiency guidance

BEECs are valid for 12 months and must be publicly accessible on the online register. From 1 November 2011 a full Building Energy Efficiency Certificate (BEEC) will need to be disclosed.

*NABERS (the National Australian Built Environment Rating System) is a performance-based rating system for existing buildings. NABERS rates a commercial office, hotel or residential building on the basis of its measured operational impacts on the environment.

RCD's in commercial fluorescent circuits – TECHNICAL GUIDE:

Introduction:

Following the new requirement of additional protection by the use of RCD's in AS/NZS 3000:2007; understandably a number of questions have been raised in regards to their use with commercial fluorescent circuits. The following information serves as a basic guideline for the use of such equipment.

General guide:

To avoid unwanted tripping of RCD's, care should be taken to ensure that the sum of leakage on the load side of the RCD is significantly less than the rating of the RCD used. Residual current devices may operate ie: trip in excess of 50% of their rated current, hence it is recommended that the loading of the circuit be such that the leakage current not exceed one-third of the tripping current, which is specified in AS/NZS3000 Clause 2.6.2.1. As a guide, ensure that no more than 3 circuits are to be protected by 1 RCD, and for installations that require more than one lighting circuit; distribution between the RCD's is recommended.

Types of RCD's:

The RCD used must comply with AS/NZS3190, AS/NZS61008.1 or AS/NZS 61009.1 for fixed installations.

Type AC: designed for residual sinusoidal alternating currents

Type A: designed for sinusoidal and pulsing direct currents

Type B: designed as per Type A and residual alternating currents up to 1000Hz, residual direct currents, which may result from rectifying circuits.

Type S: designed with a predetermined time delay.

It is important that the correct RCD be determined at the time of the electrical installation design.

General design expectations:

As a general example, a single 28w electronic (linear fluorescent ballast) has an earth leakage of <0.5mA with a total harmonic distortion of <10%; therefore a maximum of twenty (20) ballasts could be used on a 30mA RCD, with no other equipment connected on the same circuit.

For more information:

Please consult your local, licensed electrical advisor.

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Guide to Highbay & Lowbay Lighting

This guide is intended to assist with choosing the most suitable Highbay or Lowbay in order to achieve the best lighting results.

In making a choice there are a number of key issues that should be considered, these are based on the type of area to be lit, the tasks within that area to be performed (refer product pages for guidance) and any constraints affecting the selection process such as:

Budget - costs combined.

Maintenance - on-going energy & lamp replacement cycle or other maintenance costs.

Type of site - general light industry, extremely dirty or adverse industry or commercial requiring emphasis on aesthetics as well as function.

Ceiling type - extremely high or low, or limiting mounting due to structural design, or type of ceiling, such as insulating "sandwich" false ceilings.

Quality of light - visual appearance/ distribution of light, glare control and lamp colour appearance/rendering.

Quantity of light - light fitting efficiency, light distribution and lamp wattage

MOUNTING HEIGHT (Hm)

All Highbays and Lowbays have nominal recommended mounting heights. This is to ensure glare control, reasonable uniformity of light and good economics as light reaching the working surface is reduced by the distance travelled and the angle it strikes the surface. The distribution of light from the Highbay or Lowbay and its mounting height are therefore important in achieving a balance between these 3 aspects. The mounting height is derived from the working surface to the light emitting part .

TYPICAL LIGHT DISTRIBUTIONS

There are 4 basic light distribution types each providing lighting solutions for different applications.

Spun metal reflector highbays.

These produce almost all downward directional light. They are best suited for lighting horizontal work surfaces and provide a good solution for high to very high mounting heights. The often small amount of upward light gives no relief in reducing a dark ceiling contrast.

Enclosed metal reflector/prismatic refractor lowbays.

These provide good uniform horizontal and high vertical lighting but with generally no uplight to reduce dark ceiling contrast. Wide spacing at low to medium mounting heights possible.

Enclosed controlled full prismatic refractor lowbays.

Precisely engineered prismatic optics that give good horizontal and high vertical lighting without producing glare and eliminating dark ceiling contrast for a visually well lit area.