LOCAL SPORT GLOBAL BENEFITS

The modern indoor multi-purpose sports venue plays a major role in our society and national identity, as well as the growth of our children. Local sport is the heartbeat of a healthy nation, and the incubator for world-class athletes.

Typically the largest public facilities in our communities, they have become a primary yardstick by which a municipality or institute is judged in terms of success and attractiveness.

PROMOTE HEALTH

The long term benefits of a healthy society have never been so deeply recognised. Improvements to all aspects of health effectively reduces the strain on our healthcare systems.

The physical, mental and emotional well-being of people gains enormous positive impact when achievements are made and the challenges and bonds of competition have a formal setting.

Teamwork and solo efforts are key factors in how individuals see themselves and calculate their self-worth, reducing negative mental issues in our communities.

PROMOTE UNDERSTANDING

Creating and maintaining a harmonious society faces numerous challenges to established ‘norms’. Multiculturalism delivers incalculable benefits and strengths to our communities, and is best nurtured by inclusive and participation oriented social activities.

Competing alongside and against each other allows deeper understanding and appreciation of similarities and diversity.

Sporting facilities therefore deliver a wealth of opportunities for breaking down stereotypes, promoting racial harmony, and fully appreciating our capabilities and strengths as humans.

PROMOTE PARTICIPATION

Major physical and mental disabilities cause ripples of negative effects in our communities, and it is imperative to promote inclusion and understanding. Sports provides a unique platform to both draw out the withdrawn, as well as the opportunity to push past pre-conceived barriers.

The facilities we create in our society speak of how we treat our own, and the worth we place on all members of our community.
..HAVE BECOME A PRIMARY YARDSTICK BY WHICH A MUNICIPALITY OR INSTITUTE IS JUDGED IN TERMS OF SUCCESS AND ATTRACTIVENESS

CAN LIGHTING SAVE MONEY AND IMPROVE VISIBILITY FOR PLAYERS?

In the last decade, LEDs as a light source have surged past all traditional lamps as a means of providing illumination in virtually all applications. That technological boom has been accompanied by a rapid growth in new lighting and/or ‘energy-efficiency’ companies looking to ride the wave. Yet these new companies are typically strong on marketing and sales but weak on lighting knowledge and the human factors involved. Worse still, the products are often cheaply produced by overseas electronics companies, and sold locally with the promise of warranties that in practise become difficult for users to claim against.

The result has been that many projects have been poorly illuminated, and the end users have been burdened with capital outlays for lighting systems that fail to deliver the expected results.

However there is a better way; a well designed lighting fixture can enhance all sporting visual tasks whilst providing savings for the facility owners. Player performance can be improved, competition can be more balanced and the number of injuries can be reduced. Power savings through LEDs are inevitable, but with a properly designed luminaire the facility will be on the road to success and community satisfaction.

A WELL DESIGNED LIGHTING FIXTURE CAN ENHANCE ALL SPORTING VISUAL TASKS WHILST PROVIDING SAVINGS FOR THE FACILITY OWNERS
For most Multipurpose Indoor Sports facilities, the focus of players, coaches, referees and spectators exist in 3 dimensions.

The trajectory of a shuttlecock, the path of a teammate or opponent, the extent of a playing surface, the location of a net or a goal, these all present themselves differently for each person in the space, and they change constantly during competition and training.

**THE DISTRIBUTION OF LIGHT ACROSS THE SPACE ABOVE THE PLAYING AREA SHOULD BE REASONABLY UNIFORM, OTHERWISE THE BALL WILL APPEAR TO ACCELERATE AS IT PASSES FROM A LIGHT TO A DARK ZONE.**

**LIGHTING BEST PRACTISES**

AS 2560 is the series of Australian Standards devoted to effective illumination of sports venues and fields. It includes target light levels for a large variety of activities, but those figures are generally nominated for a horizontal plane at either floor/ground level or 1000mm above it. In more recent versions of the AS 2560 series, it refers to this plane as the ‘PPA’ (PRINCIPAL PLAYING AREA).

Looking in-depth at the AS 2560 series it is quickly apparent that the lighting design needs to address far more than these horizontal targets in order to be successful, however a large number of parties involved in the process of designing, recommending, supplying and installing lighting systems are very willing to ignore the human aspect of lighting for a variety of benign or self-serving reasons.

It is preferable to remember that the majority of indoor sports actually involve a ‘PRINCIPAL PLAYING SPACE’, in lieu of the PPA. If a lighting design ignores the bulk of the content of AS 2560, and merely boasts compliance based upon meeting the horizontal illumination targets on the PPA, the possibility exists that the installed lighting system would fail to provide adequate lighting for many sports, and likely increase the risk of player injuries.

Lighting products that provide good vertical illumination via wide beam, low glare prismatic refractors give direct illumination to a much greater volume of space above the PPA. The optimal visual result is achieved by an optic that combines this with approximately 3% upward illumination, ensuring that the ceiling (which is recommended in AS 2560.2.2 to be between 60-80% reflective) reduces its contrast against the fixture, ensuring a better visual comfort factor.

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**DID YOU KNOW?**

"Where ball games and other aerial games are played the distribution of light across the space above the playing area should be reasonably uniform, otherwise the ball will appear to accelerate as it passes from a light to a dark zone. Participants may then find it difficult to judge flight and speed accurately."

- from Clause 2.6, AS 2560.1-2002, Australian Standard, Sports Lighting, General Principles
## EVOLUTION OF LIGHTING SYSTEMS FOR INDOOR SPORTS

### LINEAR FLUORESCENT SYSTEMS

- Near instant light
- Poor vertical illumination, impacting players and spectators
- Many wiring points and fittings, creating high installation & maintenance costs
- Limited, costly dimming options
- Bare/open lamp fixtures accumulate high dirt levels, requiring extra fixtures/power
- Broken lamp hazards and exposure to glass fragments and highly toxic mercury (Hg)
- Disposal issues for replaced lamps

### BASIC MERCURY VAPOUR & METAL HALIDE OPEN REFLECTOR SYSTEMS

- Fewer wiring points and fittings, reducing installation & maintenance costs
- Poor vertical illumination, impacting players and spectators
- High glare levels from open reflectors, impacting players and spectators
- 4-7 minute warm up to full illumination when switched on
- Lamps have long re-strike times after power interruption
- Broken lamp hazards and exposure to glass fragments and highly toxic mercury (Hg)
- Disposal issues for replaced lamps
- Prone to visible flickering due to standard 50Hz power cycle
- Prone to damage from intentional and unintentional ball strike
- Cannot be dimmed
- Lamp life becomes reduced substantially if switched frequently
- Maintenance at high levels requires lifting / platform equipment on polished floors
- Poor vertical illumination from metal reflector industrial-style optics
- Bare/open lamp fixtures accumulate high dirt levels, requiring extra fixtures/power

### METAL HALIDE REFRACTOR SYSTEMS

- Fewer wiring points, reducing installation & maintenance costs
- High vertical illuminance, benefiting players and spectators
- Sealed optics contained glass fragments in case of lamp breakage
- Sealed optics decrease dirt depreciation, reducing fixture/power requirements
- Less prone to damage from intentional and unintentional ball strike
- Partial dimming available on high frequency electronic version
- Broken lamp hazards contained but present from highly toxic mercury (Hg)
- Disposal issues for replaced lamps
- 4-7 minute warm up to full illumination when switched on
- Lamps have long re-strike times after power interruption
- Prone to visible flickering on standard gear version

### CAPRI MAXI LED REFRACTOR SYSTEM

- High output, high quality, long life LED system
- Minimum wiring points for optimised installation cost & minimised maintenance
- High vertical & upward illuminance, benefiting players and spectators
- IP65 sealed optic excludes dirt depreciation, reducing fixture/power requirements
- IP65 sealed optic reduces moisture ingress, reducing fixture/power requirements
- High frequency driver, no flicker, no stroboscopic affect
- No audible signature
- Instant light at switch on & at re-start
- Unaffected by frequent switching
- Easily dimmed
- Daylight harvesting and occupancy sensor options for optimal energy savings
- Constant Light Output* ensures minimal fixture quantity required over project life
- Excellent color rendering and color stability for improved visuals over project life
- Highest sealed luminaire efficiency currently available
- Fully recyclable

*CAPRI MAXI 320 only
DIRECT LIGHT STUDY

The room images on these pages are computer generated 3d renderings of two LED lighting installations for an indoor basketball court - the Versalux CAPRI MAXI vs a generic alternative. Only the direct light (i.e. no reflected light) falling on the surfaces in the model is shown, and the brightness/darkness of the images shows where the direct illumination is strongest, weakest, and most uniform. Both designs are based upon the same optimised luminaire layout.

CEILING

CAPRI MAXI's optic has a Ø750mm x 70mm deep dished prismatic refractor that spreads the light of its source LEDs over its large, three dimensional surface area. The deep nature of the illuminated optic allows approximately 3% of the light to travel into the upper hemisphere, thus delivering sufficient light into the relatively shallow ceiling space to provide a brightened background for the fixture.

As a result, subconsciously the players and spectators feel more secure and comfortable since they can perceive the boundaries of the space, and there are no darkened areas to trigger primal fear responses. In terms of illumination, the combination of a broad, diffused light source against a brightened background results in a high level of visual comfort.

WALLS & THE PRINCIPLE PLAYING SPACE

CAPRI MAXI’s wide beam option is excellent at illuminating vertical surfaces and objects in the space above the courts, ensuring that the background is not a distracting element to the gameplay. More importantly, fast moving objects such as balls and other players are visible to each participant and spectator. In many cases this can be the deciding factor between safety and injury.

FLOOR & THE PRINCIPLE PLAYING AREA

CAPRI MAXI's wide beam option has a “batwing distribution”, a spread of light where the peak illumination is not at 0° (directly under the fixture), but instead typically between 20-40° outward. This facilitates a much higher uniformity of light across the floorspace and the PPA.
CEILING

GENERIC LED fixtures with direct, open optics typically have a 'cutoff' beam, meaning that no light is directed above the LEDs themselves. Disability glare and discomfort glare are almost certain issues for the space.

WALLS & THE PRINCIPLE PLAYING SPACE

Similar to the ceiling, the walls tend to suffer limited direct illumination from GENERIC LED fixtures, as their beam spreads are often very narrow and aimed at only meeting the horizontal illumination target levels of AS 2560. The poor level of illumination on the walls is an obvious result, but the more problematic effect of this type of luminaire only becomes evident once sports are played, as there are large volumes of the PPS that receive little direct light. Shuttlecocks and balls at high distances from the floor appear to speed up and slow down as they pass through the varied levels of illumination. When visual judgement is impaired, especially with fast moving objects, there is a far greater risk of player injury and resulting legal actions.

FLOOR & THE PRINCIPLE PLAYING AREA

Typical narrow distributions of GENERIC LED fixtures cannot match the uniformity of the CAPRI MAXI across the floor and PPA, meaning that they will typically require more installation points. Wiring point costs, fixture costs, maintenance costs and energy costs are all increased as a result. A higher quantity of fixtures also increases the odds of ball damage.

CAVE EFFECT

When a light fixture only projects its beam in one direction, it is referred to as a ‘direct’ optic fixture. This can be beneficial in applications where the fixture will be recessed, especially in a high ceiling, as there is no need for upward light and the distance between the fixture and the task plane allows the beam to broaden out enough so the quantity of fixtures is not considered overly excessive.

However, suspending a ‘direct’ optic fixture leads to a phenomenon known to lighting professionals as the ‘cave effect’, where surfaces above the line of the optic are perceived as dark and gloomy.

In spaces where the ‘cave effect’ exists and the fixture itself has a high light output, the contrast between the optic and the background leads to both discomfort glare (glare that causes physical effects such as pain and fatigue) and disability glare (glare that causes people to be unable to perform visually orientated tasks).
CAPRI MAXI

A high performance LED luminaire with a specialised optical system for improved performance and visual comfort. Cost-effective, low-maintenance and low-glare design minimises shadowing delivering multiple benefits to the client and occupants. Suspended as standard, with optional recessing trims to suit various ceilings. IP65 sealed, dust tight and protected against water jets.

PRODUCT FEATURES
- Low glare acrylic refractor
- Anodised faceted aluminium reflector
- IP65 construction
- High ambient temperature rated
- Multiple photometric distributions
- 3% upward light
- Four outputs between 20,000lm to 60,000lm
- COB LED technology with integral driver
- Constant Light Output version available (CLO)
- Programmable version available
- Emergency version available
- Wide range of usable mounting heights (4-20m)
- Supreme diversity of use and application
- Best in class components and construction quality
- Closed loop heavy-duty eye bolt for suspended applications
- IP rated 3 core flex (5 core on dimming versions)
- Safety lanyard supplied as standard
- Zero UV / Infra red
- 5 year warranty

MOUNTING HEIGHTS
The range of products is suitable for mounting heights from 4 to 20 metres. Can be suspended or recessed to suit the structure and environment of the application.

ACCESSORIES
- Plaster recess trim
- Bondor ceiling trim kit (for freezer panel installations)

NARROW BEAM
Especially suitable for very high mounting heights of specialised sports facilities

WIDE BEAM
Suitable for a wide range of facilities with low, medium and high mounting heights

Refer Versalux website for full technical & warranty details.
A COMPLETE PACKAGE

Custom designed by Versalux to specific performance and quality requirements, CAPRI MAXI manages the balance between the critical thermal dynamics required to meet the stringent temperature limits essential to achieving long and reliable product expectancy, while satisfying all the important visual comfort factors such as low glare, high colour rendering and stable flicker free illumination.

- Heavy duty closed loop eye bolt for easy suspension.
- Pre-fitted IP65 rated 3/5 core circular cable with glanded entry to gear housing.
- Pressure die cast aluminium gear housing for maximum heat dissipation. IP65 rated and high impact resistant.
- Extruded and anodised aluminium heat sink for ‘super cool’ thermal management.
- Faceted spun high purity aluminium reflector for optimal photometric performance. 2 beam distributions available.
- Spring loaded clamping band for refractor retention to reflector.
- Impact resistant acrylic refractor, minimising direct glare while maintaining maximum light output.

www.versalux.com.au © versalux - archilux
TIME TO SHINE

Energy consumption and product lifespans are greatly affected by operating periods and output. Versalux’s CAPRI MAXI is designed to provide a wide choice of cost-effective control options that ensure users can minimise their energy and maintenance costs. Dimming/switching when daylight abounds or when spaces are not occupied, setting ‘scenes’ for different sports and competition/training levels, automation or manual operation, all this and more...

DYNAMIC RESPONSE

1. DYNAMIC DIMMING WITH DAYLIGHT “HARVESTING”
   - Only use the energy you need
   - Harvest daylight and “top up” with artificial lighting to achieve desired illumination levels
   - Available for CM320 and CM600 versions

2. DYNAMIC DIMMING WITH DAYLIGHT ‘HARVESTING’ AND MOTION SENSING
   - Only use the energy you need
   - Harvest daylight and “top up” with artificial lighting to achieve desired illumination levels
   - Activated lighting system if space is occupied
   - Available for CM320 and CM600 versions

3. MOTION SENSING ONLY
   - Only activate the lighting system if the space is occupied
   - Available for all versions
MANUAL & PRE-SET CONFIGURATIONS

1. MANUAL SWITCH AND DIMMING
   - Push ON/OFF button and rotary DIM pot totally flexible for “multi purpose” use
   - Available for CM320 and CM600 versions

2. MANUAL SWITCH
   - Simple ON / OFF button
   - Available for all versions

3. PRESET DALI CONTROL BOX
   - Pre-programmed control unit with preset push button scenes
   - Can be tailored to suit customer requirements
   - Can be tailored for number of scenes
   - Available for CM320 and CM600 versions

1. BUILDING MANAGEMENT SYSTEM
   - Lighting system can be integrated with all BMS systems operating a DALI protocol
   - Available for CM320 and CM600 versions

JARGON

BMS (Building Management System)
A computer-based system for controlling and monitoring a wide variety of systems for operation, maintenance and safety functions.

DALI (Digital Addressable Lighting Interface)
A protocol for control of lighting. Fixtures with DALI interfaces can be individually identified on a system, with options to switch and/or dim them, as well as communicate other data (e.g. failure).

Daylight Harvesting
Sensor system that dims or switches lights off when sufficient daylight is penetrating the space.

Motion Sensing / Presence Detection
Sensor system that switches lights on or off in response to whether movement or human presence (e.g. sounds, heat, etc.) is detected.
ENTIRE SOLUTIONS

Versalux has 4 decades experience in providing solutions across entire projects. For sporting venues we have superior products backed by expert knowledge of lighting and the applicable Codes and Standards. Our capabilities extend from pool to court, kiosk to creche, reception to amenities, first-aid to admin, lobby to car park, corridors to security. Each decade we have continued to enrich our vast list of successful results in both major and minor projects.

COMMON FIXTURE TYPES FOR MULTI-PURPOSE SPORTS CENTRES

**CAPRI MAXI**
- High performance LED fixture for illumination of large spaces

**USAGE**
- Suits all multi-purpose sports areas

**ASTI**
- Recessed or surface low-profile LED panel

**USAGE**
- Gymnasiums
- Office & administration areas
- General spaces (corridors, creche, etc.)
- Kiosks & merchandise zones

**COMO / THE PAD**
- Complementary recessed LED downlight families for a wide range of applications & cost effective solutions

**USAGE**
- Office & administration areas
- Amenities
- Lobby & transition zones
NEMO LED
- Utility LED fixture for reliable operation in wet and/or dirty locations

USAGE
- Change rooms
- Plant rooms
- Outdoor security lighting
- Undercover car parks

VRL
- Adjustable LED fixture for a wide variety of broad illumination purposes

USAGE
- Multi-purpose sports areas
- Impact-prone locations
- Plant rooms
- External security lighting
- Undercover car parks

PERSEO
- Low profile exterior area LED fixture for pole and wall mounting

USAGE
- Car parks
- Bike & fitness tracks
- Landscaped zones

Refer Versalux website for full technical & warranty details
Versalux has been bringing state-of-the-art products to the Australasian lighting market for 37 years and has been integral to the evolution and revolution that is part of the lighting journey. A heritage than spans almost 4 decades has forged a solid profile in many facets of commercial and industrial lighting and established strong relationships with key international suppliers. We are proud of our great depth of lighting experience and repertoire of major projects within Australia and New Zealand across a diverse range of markets and products.

That rich history extends to our relationships with market leading luminaire manufacturers such as Glamox / Luxo group. They too have a proud history of product development and innovation across the lighting landscape. In particular, Luxo has 75 years of history in arm-based product development and are still market leaders in this area. With over fifty million units sold across the globe, the iconic L-1 is ground zero for task lamps and is an integral part of the LUXO story.

Lighting designers and producers alike are faced with increased compliance with over 40 standards relating to lighting design and in excess of 10 standards applicable to luminaire construction, not to mention ERAC, TGA and the Building Code of Australia. Versalux’ commitment to quality in lighting design and luminaire assembly embraces the compliance regime and ensures best in class lighting solutions for our clients. Our innovative sales and design teams are the cream of the lighting industry with a formidable combination of expertise and passion for lighting, making us the logical partner for your next project or application.
Highly flexible and responsive production facilities & staff

3000m² purpose-built warehouse facility

Fully qualified lighting designers with decades of combined experience