Applications in Focus

Lighting for Healthcare
Good health and well-being are much valued components of all our lives.

Light, both natural and artificial, is an essential ingredient for safe and efficient healthcare facilities that really do promote patient well-being. Feelings of well-being, being at ease with our surroundings and receiving good quality light, artificial or natural, have all been shown to have a significant impact on our health and our ability to fight infection or recover from treatment. By ensuring adequate levels of light for safe movement within buildings, high quality light to aid diagnosis, treatment and recovery, and comfortable light for wards and day-rooms we can help minimise stress, reduce errors and improve conditions for both staff and patients. And by designing luminaires that are easy to maintain and clean we can help reduce energy consumption and control infection.

This brochure shows how light and lighting can support good health and well-being. Throughout, application specific comments provide understanding of suitable techniques and equipment.

**Performance, Efficiency, Comfort (PEC)**

**Three core values applied to lighting in healthcare**

This dynamic programme is based on the principle that Performance, Efficiency and Comfort determine the visual effectiveness of lighting. It has the ability to measure the impact on the people using it and the places influenced by it. Thorn and healthcare a partnership based on shared values.

**Performance:**
To provide an optimal lighting solution. In hospitals, clinics and care homes, this can lead to less fatigue, quicker reactions and task completion with fewer mistakes resulting in higher standards of care.

**Efficiency:**
Efficiency is concerned with the energy consumption, economics and practical aspects of a lighting installation. Thorn lighting products are carefully engineered and manufactured to produce practical, easy to maintain solutions that consume the least possible power and provide long-life, trouble-free solutions.

**Comfort:**
The ability to give people satisfaction and stimulation. Lighting influences concentration and mood. Comfort is concerned with atmosphere, reassurance, and in the healthcare environment, the well-being of the patient.
Sustainability
Artificial lighting represents 19% of the electrical energy consumed worldwide.

We have all witnessed cities alive with light from the air at night. We are all guilty of leaving lights burning unnecessarily at home or at work. We enjoy extravagantly lit shops and stores and mile after mile of perfectly lit, sometimes empty motorway stretching into the distance. This is unsustainable!

Thorn have made a commitment to sustainability, to optimise the use of energy with technically innovative and intelligently controlled luminaires.

The long term aim of sustainability is to conserve our eco-system and the human habitat for the next generations. However, there must be a balance between energy saving and human need, with particular regard to our health, well-being and safety.

The challenges of globalisation and its resulting social issues must be addressed in an effort to create international equal opportunities, and a more equitable share of the earth’s finite resources. Thorn has a vision to be among the world’s leading brands in demonstrating progress toward sustainability. We aim to do this by reducing our environmental footprint through innovative product design and manufacturing, minimising resource and energy use. We will continue to apply these products and ideas in well conceived intelligent lighting solutions.

Daylight and lighting controls
Daylight, an infinite resource can be used in partnership with artificial lighting controls to conserve energy and hence add to an installations sustainability.

Using daylight
The use of natural light in any building connects us to the outside, to the weather conditions, a view to the world beyond and helps create a sense of the passing of time. This is particularly relevant to patients in hospital and residents in a care home. A connection to the outside, from a relatively unchanging environment inside, helps relieve the feelings of isolation and is a boost to morale and an aid to recovery.

Our developing knowledge on the impact of light on circadian rhythms and health disorders such as seasonal affective disorder (SAD) provides important input when architects and planners are designing buildings. Daylight, whether from windows or atria, produces a variety of benefits and lighting effects, different to those provided by artificial lighting. Additionally the correct use of natural light has the added benefit of helping to reduce energy consumption and associated costs.
Lighting controls
Lighting controls can add much to the operational efficiency of an installation. Typical energy savings of 30-70% are possible with simple paybacks that make good economic sense. Controls provide one or both of the following two simple functions: Switch (on or off) or dim (raise or lower output).

The essence of lighting control systems:
Absence and presence detection, using sensors which respond to the movement of people entering and leaving a space can reduce demand by turning the lighting on or off. This can be overridden by manual switches or a handheld controller to give users a sense of control over their environment.

Daylight switching uses a dedicated photocell switching the lighting on or off in response to changes in the ambient light level. When sufficient daylight is present the lighting is automatically turned off.

Daylight dimming operates in a similar way to daylight switching, automatically increasing or decreasing the artificial lighting in response to changes in the ambient light level, including the on/off option.

Controls save energy by providing electric light only where and when needed, these deliver the best results where they have been carefully planned and effectively implemented. A good lighting control system should ensure that all occupants have exactly the lighting they want, when they want it, without compromising safety.
Indoor lighting controls in Healthcare applications
Conserving energy reduces operational costs whilst protecting global resources.

Entrance and waiting areas
Conventional solutions have been replaced with scene setting controls combined with dimmable luminaires. In its simplest form SensaModular allows sections of lighting to dim, or to enhance and highlight areas for special events.

Circulation areas
Spaces for the movement of patients, staff and visitors where lighting should never be fully switched off. SensaModular combined with SwitchLite presence detectors and dimmable luminaires reduces light output to 10% in unoccupied spaces, and automatically restores output when the space is entered. For certain circulation areas a corridor function can be used to dim the lighting but never quite turn it off. For example this can make public circulation spaces less oppressive at night. However this is on a case by case basis as many corridor spaces can be switched off with no problems. Thorn Prisma SLDMD Corridor luminaire, with integral high frequency sensors, is a practical energy saving alternative.

Operating theatres and cleanrooms
These areas will benefit from the different lighting solutions offered by SensaModular where three contrasting scenes can be set and recalled.

Wards and bedrooms
Natural daylight and artificial lighting is balanced seamlessly to support a variety of activities with the SensaModular energy saving daylight linking and scene setting capability. RotaryDim is a manual dimming alternative.

Hospital restaurants
Generally used day to day by staff and visitors, the lighting in these spaces must be flexible enough to adapt to parties, music performances and movie presentations. SensaLink offers 6 scene setting alternatives, SensaAdvanced enables 20 scene setting possibilities, both integrating multiple groups of dimmable luminaires.

Care home dining rooms
RotaryDim is a manual light level control operating a group of digitally dimmable luminaires.

Hospital day rooms
Again this would be on a case by case basis depending upon the types of ward the day room serviced. Many day rooms could use controls with no problem, treating fairly mobile admissions, and using a general day room (as opposed to a dedicated day room manned by staff) to ‘dump’ patients is not good practice.

Care home common rooms
These rooms are designed to be a focal point for the residents of a care home, a space to socialise and be entertained in comfort and safety with minimal supervision. SensaModular provides scene setting and optional presence detection with daylight linking from ‘look down’ multi sensors.

Building amenity
Outdoor luminaires will benefit from SwitchLite IP64 presence detectors to bring safety with energy efficiency to building surrounds. In some countries a mandatory Absence and daylight control is required.
**Milestones to energy conservation with modern lighting**

<table>
<thead>
<tr>
<th>Fluorescent lamp and conventional ballast</th>
<th>Fluorescent lamp and low-loss ballast</th>
<th>Fluorescent lamp and electronic ballast</th>
<th>Fluorescent lamp and dimmable electronic ballast</th>
<th>Manual dimming</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>-7%</td>
<td>-22%</td>
<td>-55%</td>
<td>Daylight-link</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-42%</td>
<td>-61%</td>
<td>Presence-link</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-71%</td>
<td>System with T26 fluorescent lamps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-82%</td>
<td>System with T16 fluorescent lamps</td>
</tr>
</tbody>
</table>

**CELMA** - highlights the potential energy savings that dimmable ballasts, daylight linking and presence detection offers the healthcare user.

SwitchLite IP64 detector
SwitchLite PIR detector, corner/wall mounted
SwitchLite microwave detector, wall mounted
RotaryDIM, simple DSI dimmer
SensaModular controller
SensaModular scene plate
SensaAdvanced touch panel
Emergency Escape Lighting

By definition hospitals and healthcare buildings are occupied by the sick, the incapacitated and those caring for them. In the event of an incident, Emergency Escape Lighting will be required to assist with the movement of patients, staff and visitors to a place of safety. Hospitals have adopted a policy of progressive horizontal evacuation, moving occupants from high risk to low risk areas, while any emergency is brought under control. Emergency Escape Lighting is an essential component bridging the period between mains failure and the point when the hospital generators can resume normal supply.

Entrance and waiting room areas

These spaces are generally large open areas but will contain dedicated escape routes as well and must comply with the emergency escape light levels for anti panic lighting, minimally 0.5 lux, or 1 lux. This is achieved by careful selection and positioning of a number of maintained emergency conversions of the mains lighting luminaires. Clearly visible emergency exit signage should be installed and operated in the maintained mode to enhance their efficiency.

Corridors and stairs

Emergency lighting levels for main escape routes in hospitals and healthcare buildings call for the minimum EU standard of 1 lux. Building regulations and fire authorities will expect a significant improvement on this level. This can be achieved with mains luminaire maintained emergency conversions supplemented with dedicated luminaires to highlight exit doors, key hazards and fire fighting equipment, to a level of 5 lux.

Operating theatres and cleanrooms

It is normal in these high risk task areas that minimal emergency lighting levels of as much as 100% are achieved within 0.5 seconds of mains failure. In the event of an incident, operating theatre lamps are powered by central battery systems to ensure continuity of light. The main emergency light levels should be provided by a secondary guaranteed supply or static inverter, often backed up by generators.

Wards, treatment areas and bedrooms

During an emergency 10% of the maintained illuminance levels should be provided in these areas, supported with clearly visible emergency exit signage. If low level night lights are required it is possible to utilise the maintained output of modern LED based emergency luminaires to provide both requirements. The maintained operation of these luminaires can be centrally controlled with the Thorn Explorer Project.

Restaurants and kitchens

Restaurants are frequented by patients, staff and visitors and require higher than normal emergency illumination levels and clearly visible emergency exit signage. Kitchens are designated as high risk task areas requiring equally high emergency illumination levels provided from IP rated installed luminaires.

Common rooms and day rooms

Rooms greater than 60m² are treated as open areas requiring emergency escape lighting. They may also be nominated and identified as refuge areas for bed ridden patients prior to evacuation, and should be illuminated to 5 lux minimum.

Car parks and pathways

Covered car parks and walkways should be treated as open areas and appropriate vandal protected emergency illumination and signage applied. For added protection the Thorn Explorer Project test and control system will automatically report faults or damage should vandalism occur.

Lift cars

Emergency lighting in lift cars should provide 50% of normal service levels for a minimum of 1 hour. Lifts with transit bed capacity should supply 100% of normal levels for 1 hour to cover the possibility of distress to the patient in transit before the generators resume supply.

Plant and control rooms

Emergency lighting in these rooms is critical to assist staff to monitor and close down processes, locate and repair faults, operate back up generators and aid evacuation if necessary.
Maintenance and testing of the Emergency Escape Lighting

Maintenance and testing emergency lighting is a legal requirement in Healthcare premises. Now it is considered to be essential to base any emergency lighting installation around an automatic central test and control system.

Thorn Explorer Project and Explorer Vision are systems that automatically control, test and report on the emergency lighting installation, maintaining test records for operational and legal requirements. See our guide on the Thorn Explorer emergency lighting test range for further details.
Reflecting the needs of the user

Luminaire requirements, Light sources

What should the healthcare specifier be looking for when choosing lighting?

A lighting supplier well versed in modern procurement practises who can work in a collaborative supply chain environment. A lighting supplier prepared to work in close cooperation with architects, specifiers and healthcare management, to help deliver best value for money proposals working to budgets and understanding whole life costs.

Fitness for purpose is becoming the ultimate arbiter of good lighting. Technical innovation and depth of product range, backed by the service characteristics of an organisation to manage the project through to completion will influence choice.

Through life costing is another key ingredient. Technology and efficient design will do much to strike a balance between capital and running costs over time.

Thorn is able to produce calculations based on comparisons between products, installation and operating costs. Calculations can include cleaning, lamp replacement and maintenance costs and the effect of the introduction of lighting controls on reducing energy use and CO₂ emissions. Download our EcoCalc software to calculate all the costs incurred by a lighting solution throughout its service life: www.Thornlighting.com/ecocalc.

**Luminaire requirements**

High standards of hygiene and safety are essential in all healthcare buildings.

Planned maintenance programmes for the cleaning of luminaires to eliminate bacteria and the replacement of lamps should be introduced. All lighting products should be free from noise and flicker, with fluorescent lamp luminaires fitted with high frequency electronic control gear.

**Light Sources**

Skin tone and eye colour are vital or crucial in diagnosis, hence a high quality source of colour rendering with a Ra of at least 90 should be provided (Ra of 80 for other spaces). It is recommended that a consistent colour temperature of 4000K be provided throughout the whole of a healthcare complex, with colour rendering properties appropriate to specific need - see General recommendations.

**LED lighting**

Care should be taken when using light emitting diode technology (LED’s) for lighting, especially within clinical areas. Clinical areas within healthcare facilities require light sources that provide high quality colour rendering and the current measure for categorising colour rendering is widely considered inadequate for correctly assessing the ability of LED sources to show colour correctly. Therefore colour rendering classifications quoted for LED sources should be viewed with caution.

However LED lighting is suitable for display and signage applications, emergency lighting and also night lighting within wards. Sensible use of LED lighting can result in energy savings and reduced maintenance costs due to the long life of LED sources. Effect lighting in public areas can also benefit from the use of LED’s, allowing a colourful, dynamic and interesting lit effect to be provided.
Standards, directives and codes of practice

**Standards**
Standards that may affect a lighting scheme design.
- EN12464-1 Light and lighting - Lighting for work places - Part 1: Indoor
- EN12464-2 Light and lighting - Lighting for work places - Part 2: Outdoor
- EN15193 Energy performance of buildings - Energy requirements for lighting
- EN1838 Lighting applications - Emergency lighting

**Directives**
Directives that may affect a lighting scheme design.
- ELPD - Energy Efficiency Labelling of Product Directive
- EuPD - Energy related Product Directive
- WEEED - Waste of Electrical and Electronic Equipment Directive
- RoHSD - Restriction of Hazardous Substances Directive
- B&AD - Battery and Accumulators Directive

**Codes of Practice**
Codes of practice are recommendations of good practice from professional societies or associations. These bodies may not be internationally recognised in the same manner standards institutions are.

Unless specifically mentioned in law, directive or standard they have no official recognition although a client may refer to them in a specification.
### General recommendations

EN12464-1 schedule of illuminance and recommendations related to hospitals and healthcare buildings

<table>
<thead>
<tr>
<th>Type of task or activity</th>
<th>Em</th>
<th>UGRL</th>
<th>Ra</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rooms for general use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waiting rooms</td>
<td>200</td>
<td>22</td>
<td>80</td>
</tr>
<tr>
<td>Corridors (during the day)</td>
<td>200</td>
<td>22</td>
<td>80</td>
</tr>
<tr>
<td>Corridors (at night)</td>
<td>50</td>
<td>22</td>
<td>80</td>
</tr>
<tr>
<td>Day rooms</td>
<td>200</td>
<td>22</td>
<td>80</td>
</tr>
<tr>
<td><strong>Staff rooms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff office</td>
<td>500</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td>Staff rooms</td>
<td>300</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td><strong>Wards, maternity wards</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General lighting</td>
<td>100</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td>Reading lighting</td>
<td>300</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td>Simple examinations</td>
<td>300</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td>Examination and treatment</td>
<td>1000</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td>Night lighting, observation lighting</td>
<td>5</td>
<td>-</td>
<td>80</td>
</tr>
<tr>
<td>Bathrooms and toilets for patients</td>
<td>200</td>
<td>22</td>
<td>80</td>
</tr>
<tr>
<td><strong>Examination rooms (general)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General lighting</td>
<td>500</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td>Examination and treatment</td>
<td>1000</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td><strong>Eye examination rooms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General lighting</td>
<td>300</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td>Examination of the outer eye</td>
<td>1000</td>
<td>-</td>
<td>90</td>
</tr>
<tr>
<td>Reading and colour vision tests with vision charts</td>
<td>500</td>
<td>16</td>
<td>90</td>
</tr>
<tr>
<td><strong>Ear examination rooms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General lighting</td>
<td>300</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td>Ear examination</td>
<td>1000</td>
<td>-</td>
<td>90</td>
</tr>
<tr>
<td><strong>Scanner rooms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General lighting</td>
<td>300</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td>Scanners with image enhancers and television systems</td>
<td>50</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td><strong>Delivery rooms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General lighting</td>
<td>300</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td>Examination and treatment</td>
<td>1000</td>
<td>19</td>
<td>80</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of task or activity</th>
<th>Em</th>
<th>UGRL</th>
<th>Ra</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment rooms (general)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dialysis</td>
<td>500</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td>Dermatology</td>
<td>500</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td>Endoscopy rooms</td>
<td>300</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td>Plaster rooms</td>
<td>500</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td>Medical baths</td>
<td>300</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td>Massage and radiotherapy</td>
<td>300</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td><strong>Operating areas</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-op and recovery rooms</td>
<td>500</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td>Operating theatre</td>
<td>1000</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td><strong>Intensive care unit</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General lighting</td>
<td>100</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td>Simple examinations</td>
<td>300</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td>Examination and treatment</td>
<td>1000</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td>Night watch</td>
<td>20</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td><strong>Dentists</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General lighting</td>
<td>500</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td>At the patient</td>
<td>1000</td>
<td>-</td>
<td>90</td>
</tr>
<tr>
<td>Operating cavity</td>
<td>5000</td>
<td>-</td>
<td>90</td>
</tr>
<tr>
<td>White teeth matching</td>
<td>5000</td>
<td>-</td>
<td>90</td>
</tr>
<tr>
<td><strong>Laboratories and pharmacies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General lighting</td>
<td>500</td>
<td>19</td>
<td>80</td>
</tr>
<tr>
<td>Colour inspection</td>
<td>1000</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td><strong>Decontamination rooms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sterilisation rooms</td>
<td>300</td>
<td>22</td>
<td>80</td>
</tr>
<tr>
<td>Disinfection rooms</td>
<td>300</td>
<td>22</td>
<td>80</td>
</tr>
<tr>
<td><strong>Autopsy rooms and mortuaries</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General lighting</td>
<td>500</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td>Autopsy table and dissecting table</td>
<td>5000</td>
<td>-</td>
<td>90</td>
</tr>
</tbody>
</table>

Em - Illuminance (Lux)
UGRL - Glare rating
Ra - Colour rendering
Objectives site map
A hospital building is a facility that aids and promotes healthcare, the lighting should support this aim.

Care home

Bedrooms (care homes)
Within care homes the objective of bedrooms is less clinical than that of hospital wards, requiring a different approach to the lighting to produce a more homely, domestic space for long term care patients.
See pages 32-33

Common room/day room
The purpose of these areas is to provide a more homely space away from clinical areas to allow patients to relax. This is especially important for long term patients.
See pages 38-41

Circulation areas
The artery of the building, enabling patients, visitors and staff to move around safely. In addition to general lighting the objective is to ensure the corridors and stairs are equipped with emergency lighting and way-guidance systems.
See pages 22-25

Entrance and waiting areas
This is a non clinical area and a transition into the medical environment.
The objective is to create a welcoming atmosphere, populated by reception staff with well lit reassuring faces.
See pages 18-21
Operating theatres and cleanrooms
The most critical of all areas within a hospital. The objective is to provide the medical staff with technically correct illumination and emergency back up systems to carry out the surgical procedures. Cleanrooms should be treated with equal care and consideration.
See pages 26-27

Restaurants and kitchens
Nobody wants to eat or prepare food in a dull and dreary environment. The objective is to create the best possible lit atmosphere in which to eat, and the technically correct atmosphere in which to prepare and cook.
See pages 34-37

Wards, bedrooms and bathrooms
The ward is both a clinical area and a residential space. The objective is to satisfy both requirements with a mix of luminaires to enable the staff to carry out their tasks and the patients to rest and recuperate.
See pages 28-31
Entrance and waiting areas
The important first impressions, an opportunity to reassure the patient and welcome the visitor.

Performance - The reception area provides patients and visitors with a first point of contact and a visual change between exterior and interior lighting levels. The reception area within an accident and emergency department is designated as a clinical area, leading to where medical staff can observe and treat patients, and therefore this area demands the correct levels of illuminance.

Efficiency - Poorly maintained lighting gives the impression of neglect, and could instil concern and lack of confidence in the medical facilities. The reception area luminaires should be easy to access and maintain. For staff a well maintained space can create a sense of pride in their work place. Energy efficiency is important but takes a subsidiary role to the well lit and welcoming appearance of this space.

Comfort - The primary consideration is to put the patient and visitors at their ease by providing an ambience of calm reassurance.

Technique - For the general reception area a combination of downlights, wallwashers and uplighters will invigorate a gloomy or oppressive atmosphere and lift the status of the space. Suspended or close mounted luminaires at the reception desk will highlight the location and aid communication. Entrances with high ceilings will benefit from uplighters or suspended lighting with an upward and downward distribution. An accident and emergency reception area, where people may spend a long time, requires lighting with a wider distribution to provide good levels of vertical illuminance.
Prisma - IP44

- A range of slim, 64mm deep, T16 fluorescent luminaires with prismatic diffusers for surface, and suspended mounting
- Low glare combined with high light output
- Emergency lighting and Sensor options available

Cruz 240/205 H

- High performance downlight available in 10 sizes with a wide range of decorative attachments
- True 'low height' versions (type 1, height 98mm) for 100mm void depth
- Excellent glare control - compliance with EN 12464 and LG3/7 addendum in most wattages, with luminance limit of 1000cd/m² at 45° (specular reflector of type H versions) or 200cd/m² when used with attachments

Cruz 160 LED

- Combines high power LEDs with active cooling technology for efficient and low glare illumination from a third smaller aperture
- Delivers 2,000 lumens, with only 6% optical losses, in either warm white (3000K, 51 lm/W) or cool white (4000K, 55 lm/W), equating to 2 x 26W CFL downlights.
- DALI dimmable and delivers 100% instant light with an Ra of 80 and rated life of 50,000 hours (70% lumen maintenance)

Graffiti

- Spotlight with two reflector options and stepless adjustable beam angles: 10°-35° (narrow) and 25°-55° (wide)
- The pure and simple shape complements all environments and integrates well with a variety of interiors
- Surface mounting or 3 circuit track (Multi adaptor)

Performance

Design

Comfort

Efficiency
Entrance and waiting areas

Olympie
- Elegant family of wall mounted luminaires for compact fluorescent lamps
- Pleasing indirect lighting effect with some direct spill light
- Available in a choice of white or aluminium finishes

Garbo Ceiling
- Stylish ceiling fitting featuring a cylindrical diffuser in satin polycarbonate
- Soft ‘mellow’ lighting effect
- Throws light onto the ceiling, reduces contrast between ceiling and luminaire

Garbo Pendant
- A stylish pendant featuring the tubular shape that defines the family
- Soft ‘mellow’ lighting effect
- Suitable for use with high ceilings
- Comes with 2.6m cable

Menlo3
Family of direct/indirect luminaires, offering greater choice, better performance and improved aesthetics through:
- 3 mounting options - recessed, semi-recessed and surface
- 3 optical choices - louvre, diffuser, Micro-Prism Technology
- 3 geometric shapes - square, rectangular, circular

Fata Morgana
- Architectural range of elegant luminaires for spacious locations
- Direct and indirect diffuse lighting effect
- Complimentary wall, ceiling and floor standing versions

Concavia S
- A versatile and compact reflector fitting offering high performance and unique aesthetics for user in many interior applications
- Option of aluminium, plastic and glass reflectors offering direct/indirect distribution, each with individual aesthetic appearance
- A range of suspension options to suit various applications

Glacier II
- An ultra-modern, decorative pendant with advanced direct/indirect optics.
- Available in two sizes, with a wide choice of reflectors and lamp types
- 1 and 3 hour emergency versions as standard

Recessed Wall Asymmetric
- Hidden light source gives glare-free light
- Asymmetric reflector casts an even wash of light onto the floor
- Comes pre-wired with cable tail for use with remote 24V DC converter
- Available in warm white (3000K) or cold white (6500K) options
- Finished anodised aluminium
- Recessed box available as an accessory
Danube - IP65
- Stylish wall/ceiling luminaire with low profile diffuser. Available in two sizes in a circular or square design
- Grille and eyelid visor versions available for aesthetic appearance
- Integral 3 hour maintained emergency versions are available

Thames - IP44
- Stylish aluminium wall/ceiling luminaire with floating halo lighting effect
- Choice of two sizes in a circular or square design
- Integral 3 hour maintained emergency versions, suitable for escape routes

Piazza II - IP65
- Robust high output exterior bulkhead (up to 11m spacings) designed to provide security, surround or accent illumination with a touch of style
- Opaque light control - E3 compliant versions available as standard
- Two sizes with a choice of lamp types, plus integral emergency lighting options, suitable for escape routes

Piazza - IP44 wall bracket/pole versions
- Semi-cylindrical luminaire for lighting footpaths, facades, porches, entrances, under canopies, arches and signs
- Large and small body sizes
- Flat glass cover minimises obtrusive light

Oyster
- Ideal wall washer with decorative edging. Can be used as uplight indoors, or to project downwards in outdoor applications.
- Choice of four finishes: Natural sandblasted, textured matt grey, white and anthracite
- Body features decorative edge effect

Qba - IP66
- Rectangular compact discharge projector with smooth edges and concealed stirrup, in cast aluminium
- Two body sizes for metal halide or high pressure sodium lamps (35W to 150W)
- Four available beam patterns, produced by precision reflector systems: circular reflector in intensive or extensive symmetrical distributions, and linear cylindrical parabolic reflector in asymmetrical or symmetrical distributions

EyeKon
- Round aluminium exterior bulkhead in two sizes, four styles and three colours
- Bezel, cross, visor and halo visor decorative features
- Emergency/daylight sensing options
Circulation areas

Corridors and stairs, the artery of a hospital, a clinic or a care home.

Performance - A network of corridors and stairs are there to enable visitors and staff to move from one place to another safely. The primary objective of the lighting is to reduce risk by providing glare free illuminance to help identify potential dangers, for example changes in levels such as steps, staircases and ramps. Circulation areas are the main exit routes in emergency situations and must be protected with emergency lighting and way-guidance systems.

Efficiency - Many circulation areas experience little traffic for long periods of the day. Using presence detection to control the lighting will greatly reduce the use of electricity. Abundant natural daylight is often found in these spaces, where automatic dimming of the artificial light would improve energy efficiency. However, care is needed in the selection of lighting controls. Generally the lighting at all critical points should be on at all times.

Comfort - The lighting in circulation areas is there to help the navigation of people throughout the building, particularly the speedy transfer of patients. Bright ceilings, walls and floors make the space seem open and appealing, providing a balanced ambience.

Technique - Luminaires with upward light distribution will help achieve bright ceilings, walls and floors. Wall mounted luminaires provide good modelling of peoples faces, while wallwashing luminaires can create interesting effects. Continuous lines of luminaires positioned to one side of the corridor are preferred to luminaires centrally mounted. A consistent level of light should be provided to eliminate visual disturbance for patients being conveyed on trolleys and transferred in wheelchairs.
Circulation areas

Cruz 240/205 H
- High performance downlight available in 10 sizes with a wide range of decorative attachments
- True ‘low height’ versions (type L, height 98mm) for 100mm void depth
- Excellent glare control - compliance with EN 12464 and LG3/7 addendum in most wattages, with luminance limit of 1000cd/m² at 65° (specular reflector of type H versions) or 200cd/m² when used with attachments

Cruz 160 LED
- Combines high power LEDs with active cooling technology for efficient and low glare illumination from a third smaller aperture
- Delivers 2,000 lumens, with only 6% optical losses, in either warm white (3000K, 51 lm/W) or cool white (4000K, 55 lm/W), equating to 2 x 26W CFL downlights.
- DALI dimmable and delivers 100% instant light with an Ra of 80 and rated life of 50,000 hours (70% lumen maintenance)

Base LED - IP44
- Cree LED technology for unprecedented lighting performance - 650 lumens for only 12W power consumption. Energy use is cut by 50% and 75% compared with 18W compact fluorescent and 50W halogen mains downlights respectively
- Excellent colour rendering (Ra 94) and choice of colour appearance (2700K or 3500K)
- Fit and forget for reduced maintenance costs as designed to last 50,000 hours - maintains at least 70% of luminous output

Cetus
- Simple and quick to install downlight (low 100mm height/ mounting void depth 120mm)
- 3 hour maintained emergency versions with remote gear
- Range of attachments, including tri-vane louvre and IP44 cover

Qvintus
- A wide selection of luminaires to cover most lighting needs
- Ceiling or pendant mounting
- With or without dimming

College - IP44
- High performance surface/suspended fluorescent luminaire with appealing curved shape and smooth, dust limiting, outer surfaces
- Choice of two lighting distributions for T16 or T26 lamps: opal diffuser for general light distribution or clear prismatic for specific light control
- Integrated emergency lighting versions available

Prisma - IP44
- A range of slim, 64mm deep, T16 fluorescent luminaires with prismatic diffusers for surface, and suspended mounting
- Low glare combined with high light output
- Emergency lighting and Sensor options available

Indiquattro
- A range of recessed modular fluorescent direct/indirect luminaires providing well balanced task lighting and ambient lighting (LOR exceeding 70%)
- Available with opal or micro perforated diffusers and satinsprite or mirrorbrite louvres (louvre versions have luminance <1500cd/m² at 65 degrees)
- Versions with emergency lighting facility are available
Menlo
Family of direct/indirect luminaires, offering greater choice, better performance and improved aesthetics through:
- 3 mounting options - recessed, semi-recessed and surface
- 3 optical choices - louvre, diffuser, Micro-Prism Technology
- 3 geometric shapes - square, rectangular, circular

Omega T5 + IP44 frame
- Recessed fluorescent luminaire designed for 15 - 24mm exposed grid ceilings or concealed grid with height 12-65mm (using wedge brackets)
- High performance with LOR >75% with good glare control
- Compatible with the IP44 frame where higher ingress protection is required

Danube - IP65
- Stylish low profile wall/ceiling with a flat front diffuser. Available in two sizes in a circular or square design
- Grille and eyelid visor versions available for aesthetic appearance
- Integral 3 hour maintained emergency versions are available

Thames - IP44
- Stylish aluminium wall/ceiling luminaire with floating halo lighting effect
- Choice of two sizes in a circular or square design
- Integral 3 hour maintained emergency versions, suitable for escape routes

Voyager LED
- LED emergency luminaire with choice of 3 optimised optic lenses, gives excellent performance and spacing.
- Low parasitic power consumption and a long life/low maintenance NiMH battery.
- Discreet, quality aluminium construction, available in surface or recess mounting formats

Voyager Sigma - IP40
- Single sided, wall mounting exit sign complying with the requirements of EN1838, with viewing distance of up to 30m
- Choice of LED or fluorescent light sources manual, self and addressable test
- Polycarbonate body, finished in white or silver with optional EU or ISO legend panels.
Operating theatres and cleanrooms

Lighting for the operating theatre and other sterile environments subject to contamination control.

Performance - Nowhere is the need for even, high quality illumination more apparent than in the operating theatre. Localised lighting is used to achieve the high levels of illuminance required for the task, with general lighting providing background illuminance for the theatre staff to carry out ancillary tasks. The emergency lighting should be of equal quality to that provided by the normal lighting, to ensure continuity of light levels in the event of an interruption to the mains power.

Efficiency - Control of disease is of critical importance, therefore the luminaires should be sealed, easy to clean and appropriate to a sterile environment. The luminaires should be designed to cause the minimum possible disturbance in maintenance conditions.

Comfort - These facilities are designed to perform critical tasks possibly over long periods of time. Therefore, the lighting should provide a calm, stress free, visually stimulating environment, helping to reduce fatigue and error.

Technique - For general lighting, sealed, fully recessed, corrosion resistant fluorescent luminaires should be installed. It is essential to reduce shadowing in operating theatres and cleanrooms. This can be achieved with more luminaires of a lower wattage as opposed to fewer with higher power.
Invincible II - IP65 (below) and IP54 (above)
- Range of sealed recessed fluorescent luminaires for maximum protection when used in clean room applications
- Smooth, easy to clean, white frame design with internal locking mechanism
- Choice of prismatic or louvre optics. Dimmable and emergency versions available on request

LSB - IP65
- Surface mounted or recessed versions available
- Robust construction to resist impact
- Easy to clean with smooth surfaces

Cruz - IP54
- High performance downlight with excellent glare control and IP54 attachment. Compliance with EN 12464 and LG3/7 addendum in most wattages, with luminance limit of 1000cd/m² at 65° (specular reflector of type H versions) or 200cd/m² when used with attachments
- True ‘low height’ versions (type L, height 98mm) for 90mm void depth
- 3 hour, maintained emergency versions, manual test or SelfTest/Addressable Test, with remote pack (battery and gears) available

Prisma - IP44
- A range of slim, 64mm deep, T16 fluorescent luminaires with prismatic diffusers for surface, and suspended mounting
- Low glare combined with high light output
- Emergency lighting and Sensor options available
**Wards and bedrooms**

Clinical areas for treatment, residential spaces for rest and recuperation.

**Performance** - Wards in hospitals have a dual purpose which from a lighting point of view need to blend successfully. First they are clinical areas where medical staff observe and treat patients. The lighting must provide good visibility to enable the staff, including cleaners, to function correctly, helping to reduce fatigue and mistakes. The ward is also a residential space where the lighting should enable the patients, who may have limited mobility, to read, write and take their meals in comfort.

**Efficiency** - Bedded areas represent the major proportion of space allocated in hospitals and other healthcare buildings. The lighting should be designed to conserve energy without compromise to the functional safety of the ward. The luminaires should be practical to install, easy to clean and maintain.

**Comfort** - Healthcare staff work in a pressurised environment where they need to respond in a quick and efficient manner. A calm, stress free atmosphere is essential. For patients, time in hospital is a time of uncertainty, the fear of the unknown. A ward should be a reassuring space, clean and comfortable, a place in which to recover.

**Technique** - Hospital wards with restricted ceiling heights and privacy curtains, which surround individual beds, present particular problems for lighting designers. Options are fully recessed ceiling luminaires or luminaires that are separately wall mounted or integral with bedhead trunking, which also supplies medical gas and other services.
Wards and bedrooms

Cruz 205
- High performance downlight with excellent glare control. Compliance with EN 12464 and LG3/7 addendum in most wattages, with luminance limit of 1000 cd/m² at 65° (specular reflector of type H versions) or 200 cd/m² when used with attachments
- True ‘low height’ versions (type L, height 98 mm) for 100 mm void depth
- 3 hour, maintained emergency versions, manual test or SelfTest/Addressable Test, with remote pack (battery and gears) available

Menlo
Family of direct/indirect luminaires, offering greater choice, better performance and improved aesthetics through:
- 3 mounting options - recessed, semi-recessed and surface
- 3 optical choices - louvre, diffuser, Micro-Prism Technology
- 3 geometric shapes - square, rectangular, circular

Danube - IP65
- Stylish low profile wall/ceiling with a flat front diffuser. Available in two sizes in a circular or square design
- Grille and eyelid visor versions available for aesthetic appearance
- Integral 3 hour maintained emergency versions are available

Mandi - IP44
- Bathroom luminaire with smooth, curved diffuser to avoid water retention on top surface
- Body in white polycarbonate with opal diffuser. Integrated socket in end cap
- Good choice of lamps and lengths to cover different applications

Tettoia
- A medical supply unit with protective, direct beam canopies
- In addition to indirect room lighting (39W, 49W or 54W T16), light is focussed on the patient (24W T16) for reading
- The direct lighting element can be upgraded to 80W TCL for examinations. Switched locally using a momentary-action switch (automatically resets after 15 mins)
- The miniature micro-vane optic gives glare free light with a feeling of privacy, whilst reducing the volume of the overall unit
- For further information please contact your local sales office

VE-W
- Decorative linear medical supply unit
- Integrates general lighting, reading lights, examination and night lights through to medical gas supply and monitoring and communication systems
- Decorative panels in different materials, wood veneer finishes, powder-coated RAL surfaces, discreetly illuminated transparent plastic, or, if required, high-quality satin-frosted safety glass are available
- For further information please contact your local sales office

VE-F
- Elegant, linear medical supply unit
- Integrates lighting, medical gases distribution, electrical, data and nurse call functions
- Indirect room lighting (1/2 x 39W / 54W T16 or 36W/58W T26) and direct reading light (24W T16 or 36W TCL) with optional step dimming
- Examination lighting via joint switching of room and reading lights
- Sleek extruded aluminium section
- For further information please contact your local sales office

VE-L
- Variation of VE-F medical supply unit offering a choice of natural finishes (textured aluminium or light beechwood) and a horizontally adjustable lower reading light (VE-LV)
- For further information please contact your local sales office.
Belia
- Wall mounted single-bedhead luminaire for room and reading lighting
- Top prismatic diffuser gives indirect light (2 x 39W T16)
- Incorporates switches and sockets with data/nurse call options
- Lower diffuser directs light onto the reading plane (24W T16).
- Separate night lighting possible
- Colour finishes on request
- For further information please contact your local sales office.

Conboard
- Wall mounted, surface or recessed, medical supply panel - non-illuminated
- Concentrates the supply outlets compactly (600mm wide) at one single location
- Mounting frame only 60mm deep
- For further information please contact your local sales office.

Curea
- Luminaire made of extruded aluminium section
- Luminaire has powder-coated titanium finish
- Surface resistant against conventional disinfectants
- Simple, reduced design
- Waveguide light technology
- High lighting quality and good direction of light
- Integral room, reading, examination and orientation lighting
- For further information please contact your local sales office.

Caduce II
- Wall mounted single-bed luminaire for room and reading lighting
- Top prismatic diffuser gives indirect light (39W, 49W or 54W T16)
- With data/nurse call options
- Directs light onto the reading plane (24W T16)
- Optional step dimming
- Switching of room and reading lights
- Components can be flush-fitted to the underside
- For further information please contact your local sales office.

Conboard NP
- Innovative and design orientated medical supply solution
- Sliding doors can be opened synchronously even when accessories are plugged
- Decorative panels with high-pressure laminated (HPL) surface
- Surface resistant to conventional cleaning agents and disinfectants
- Covers can be individually disassembled for electrical and medical gas connection on site or inspection purpose
- Flexible lighting solutions (CUREA or PURELINE single bed luminaire) with LED’s too
- For further information please contact your local sales office.

Conboard SH
- Illuminated system version of Conboard. The front-panel is integrated into decorative natural wood paneling, topped with an indirect/direct linear luminaire
- 1.6 m width neatly takes up the same space as a bed, plus bedside table.
- Indirect room lighting (2 x 49W T16)
- Direct reading light (24W T16 or 36W T1C), with optional step dimming
- Examination lighting via joint switching of room and reading lights
- LED night light (3.1W)
- For further information please contact your local sales office.

Curea
- Aluminium section
- Titanium finish
- Conventional disinfectants
- Direction of light
- Examination and orientation lighting
- For further information please contact your local sales office.

Concave
- A space-saving medical supply base for intensive care locations
- All outlets are easily accessible and ergonomically arranged, whether the system is installed vertically or horizontally
- Available with or without top and bottom mounting rail.
- Mounting rail designed for medical equipment support (50kg/m load capacity)
- Night light can be integrated in front panel
- For further information please contact your local sales office.

Curea
- Aluminium section
- Titanium finish
- Conventional disinfectants
- Direction of light
- Examination and orientation lighting
- For further information please contact your local sales office.

Pureline
- Horizontal “Bed-Head” medical trunking system integrating the lighting, medical gases distribution, electrical, data and nurse call functions, in a single pre wired and pre piped solution, requiring only final connections on site
- Indirect room lighting (1/2 x 39W/54W T16) and direct reading light (24W/39W T16)
- Examination lighting via joint switching of room and reading lights
- Position of reading light can be adjusted horizontally
- Sleek extruded aluminium section
- For further information please contact your local sales office.
Bedrooms (care homes)

Within care homes the objective of bedrooms is less clinical than that of hospital wards, requiring a different approach to the lighting to produce a more homely, domestic space for long term care patients.

**Performance** - Ideally the main room lighting should only be required for simple tasks such as dressing, etc., with supplementary lighting by the bed to allow reading in bed, etc. If bedrooms contain an area with table and chairs the lighting levels should be increased to reflect the requirements for possible activities in this area. The colour of the light should not be too cold as this may make the area appear sterile and clinical. Consideration should be given to the expected age of patients as care homes tend to contain a high proportion of older patients who require higher levels of light and careful control of glare to compensate for the deterioration of the visual function with age.

**Efficiency** - Whilst bedrooms should be used for only a small proportion of the day with most activity being in day rooms, efficient light sources and luminaires should be used to conserve energy and give good value for money throughout the life of the lighting installation. Lighting control must be extremely simple to operate with zoned control of lighting via manual switches. Luminaires that are easy to maintain and clean will help keep the room in good condition whilst reducing day-to-day running expense.

**Comfort** - Lighting should provide a calm and relaxing atmosphere. By designing in a more homely feel to the area, patients will be reassured through providing an ambience closer to their domestic norm. Whilst good levels of light throughout the room are necessary care should be taken to conserve the flow of light within the space, as contrast and (light) shadows aid in visual understanding of objects in the room, providing a safer environment.

**Technique** - Luminaires with a commercial appearance such as louvred or large prismatic fittings should be avoided. Wall and pendant lights or decorative ceiling mounted fittings can be used to create a more domestic appearance.
Cruz 205
- High performance downlight with excellent glare control. Compliance with EN 12464 and LG3/7 addendum in most wattages, with luminance limit of 1000cd/m² at 65° (specular reflector of type H versions) or 200cd/m² when used with attachments
- True ‘low height’ versions (type L, height 98mm) for 100mm void depth
- 3 hour, maintained emergency versions, manual test or Selftest/Addressable Test, with remote pack (battery and gears) available

Danube - IP65
- Stylish low profile wall/ceiling with a flat front diffuser. Available in two sizes in a circular or square design
- Grille and eyelid visor versions available for aesthetic appearance
- Integral 3 hour maintained emergency versions are available

Mandi - IP44
- Bathroom luminaire with smooth, curved diffuser to avoid water retention on top surface
- Body in white polycarbonate with opal diffuser. Integrated socket in end cap
- Good choice of lamps and lengths to cover different applications

Menlo
- Family of direct/indirect luminaires, offering greater choice, better performance and improved aesthetics through:
  - 3 mounting options - recessed, semi-recessed and surface
  - 3 optical choices - louvre, diffuser, Micro-Prism Technology
  - 3 geometric shapes - square, rectangular, circular
Performance - Carefully crafted lighting in a restaurant adds to the experience of the occasion. In the kitchen good lighting promotes safety, hygiene, productivity, job satisfaction and hopefully the quality of the food!

Efficiency - Energy efficiency is always important but in a restaurant it will need balancing against the requirements of appearance and ambience. In the kitchen preparation area luminaires that are impervious to steam or vapour should be used. The luminaires should provide even illumination with good colour rendering and a colour temperature of 3000K.

Comfort - Restaurant lighting should reflect the style of the food on offer, the type of location and the needs of the customer. Eating in the restaurant should be an enjoyable experience and the lighting should complement this, providing an atmosphere in which the visitor can appreciate the food and the full eating experience.

Technique - Uniform lighting using downlighters is common in dining areas with additional lighting on walls or from pendants to add visual variety. Luminaires over the table promotes intimacy. Localised lighting over the servery is useful in making this area attractive and easy to locate. In the kitchen IP rated luminaires with linear fluorescent lamps and high frequency electronic control gear are often suitable.

Dining room - Lighting considerations for a dining room may be considered similar to those for restaurants described above.
Restaurants and kitchens

Cruz 240/205 H
- High performance downlight available in 10 sizes with a wide range of decorative attachments
- True “low height” versions (type L, height 98mm) for 100mm void depth
- Excellent glare control - compliance with EN 12464 and LG3/7 addendum in most wattages, with luminance limit of 1000cd/m² at 65⁰ specular reflector of type H versions or 200cd/m² when used with attachments

Chalice 190
- A range of shallow recessed downlights for horizontal and vertically mounted compact fluorescent lamps (includes 32W and 42W ratings) with a variety of decorative attachments
- Recessed depth only 100mm (emergency versions 200mm)
- Extended range of attachments, including tri-vane louvre and silver painted bezel. Other attachments in opal or clear polycarbonate with frosted rim. Can be suspended, 12.5mm from bezel, or mounted flush to fitting for an IP44 seal.

Prisma - IP44
- A range of slim, 64mm deep, T16 fluorescent luminaires with prismatic diffusers for surface, and suspended mounting
- Low glare combined with high light output
- Emergency lighting and Sensor options available

Menlo³
- Family of direct/indirect luminaires, offering greater choice, better performance and improved aesthetics through:
  - 3 mounting options - recessed, semi-recessed and surface
  - 3 optical choices - louvre, diffuser, Micro-Prism Technology
  - 3 geometric shapes - square, rectangular, circular

Indiquattro
- A range of recessed modular fluorescent direct/indirect luminaires providing well balanced task lighting and ambient lighting (LOR exceeding 70%)
- Available with opal or micro perforated diffusers and satinbrite or mirrorbrite louvres (louvre versions have luminance <1500cd/m² at 65 degrees)
- Versions with emergency lighting facility are available

Omega FAST
- Recessed fluorescent luminaire designed for 15 - 24mm exposed grid ceilings or concealed grid with height 12.65mm (using wedge brackets)
- High performance with LOR >75% with good glare control
- Plug & Play variant, complete with lamps fitted, fast fit connector and film attached

Garbo Ceiling
- Stylish ceiling fitting featuring a cylindrical diffuser in satin polycarbonate
- Soft “mellow” lighting effect
- Throws light onto the ceiling, reduces contrast between ceiling and luminaire

Garbo Pendant
- A stylish pendant featuring the tubular shape that defines the family
- Soft “mellow” lighting effect
- Suitable for use with high ceilings. Comes with 2.6m cable
Glacier II
- An ultra-modern, decorative pendant with advanced direct/indirect optics.
- Available in two sizes, with a wide choice of reflectors and lamp types.
- 1 and 3 hour emergency versions as standard.

Amazon - IP65
- Striking aluminium wall/ceiling luminaire with floating halo lighting effect.
- Available in two sizes, circular or square design.
- Integral 3 hour maintained emergency versions are available.

CorrosionForce - IP65
- A high performance, corrosion resistant proof range of fluorescent luminaires.
- Choice of T26 or T16 lamps.
- Digital dimming and 3 hour maintained emergency versions available.

AquaForce II
- Durable fluorescent proof luminaire for use in wet/dusty environments.
- Tough polycarbonate body and diffuser.
- Good light performance and efficiency.

Voyager Sigma - IP40
- Single sided, wall mounting exit sign complying with the requirements of EN1838, with viewing distance of up to 30m.
- Choice of LED or fluorescent light sources manual, self and addressable test.
- Polycarbonate body, finished in white or silver with optional EU or ISO legend panels.
Common room/Day room

The purpose of these areas is to provide a more homely space away from clinical areas to allow patients to relax. This is especially important for long term patients.

Performance - Lighting should be suitable for the task being performed, with a sufficiently high level to allow easy discrimination of detail. Tasks may vary from reading, writing, playing board games, assembling puzzles, etc. In addition the lighting should be glare free and should not give annoying images on television or computer screens. Consideration should be given to the expected age of patients, as day rooms within wards with older long term patients will require higher levels of light to compensate for the deterioration of visual function with age.

Efficiency - Day rooms should be designed to be as pleasant as possible and therefore a good component of daylight should be included. In conjunction with this the use of a well-configured lighting system with daylight linking and presence detection can reduce power demand. However any lighting control system must be extremely simple to operate and require minimum patient interaction. Luminaires that are easy to maintain (including cleaning) are more likely to be kept in good condition, ensuring the area is maintained as designed.

Comfort - Lighting should provide a welcoming and pleasant space. A calm, relaxed ambience is preferred as people using this space will require a contrast to the more formal business-like atmosphere in clinical areas. The provision of a more homely area will also help reassure patients by providing an ambience closer to their domestic norm.

Technique - Luminaires with a commercial appearance such as louvred or large prismatic fittings should be avoided. Wall and pendant lights or decorative ceiling mounted fittings can be used to create a more domestic appearance, and the control of these should be flexible enough to allow multiple activities to be performed simultaneously within the space.
Common room/Day room

Cruz 205
- High performance downlight with excellent glare control. Compliance with EN 12464 and LG3/7 addendum in most wattages, with luminance limit of 1000cd/m² at 65° (specular reflector of type H versions) or 200cd/m² when used with attachments.
- True ‘low height’ versions (type L, height 98mm) for 100mm void depth.
- 3 hour, maintained emergency versions, manual test or SelfTest/Addressable Test, with remote pack (battery and gears) available.

Cetus
- Simple and quick to install downlight (low 100mm height/mounting void depth 120mm).
- Range of attachments, including tri-vane louvre and IP44 cover.
- 3 hour maintained emergency versions with remote gear.

Indiquattro
- A range of recessed modular fluorescent direct/indirect luminaires providing well balanced task lighting and ambient lighting (LOR exceeding 70%).
- Available with opal or micro perforated diffusers and satinbrite or mirrorbrite louvers (louvre versions have luminance <1500cd/m² at 65 degrees).
- Versions with emergency lighting facility are available.

Menlo²
- Family of direct/indirect luminaires, offering greater choice, better performance and improved aesthetics through:
  - 3 mounting options - recessed, semi-recessed and surface.
  - 3 optical choices - louvre, diffuser, Micro-Prism Technology.
  - 3 geometric shapes - square, rectangular, circular.

Garbo Ceiling
- Stylish ceiling fitting featuring a cylindrical diffuser in satin polycarbonate.
- Soft ‘mellow’ lighting effect.
- Throws light onto the ceiling, reduces contrast between ceiling and luminaire.

Garbo Pendant
- A stylish pendant featuring the tubular shape that defines the family of Garbo luminaires.
- Soft ‘mellow’ lighting effect.
- Suitable for use with high ceilings. Comes with 2.6m cable.

Garbo Wall
- Classic, retro look wall light with soft ‘mellow’ light.
- Half-tube diffuser in satin PC with optional decorative back plate in grey or white.
- Digital dimming (DS) and emergency options available.

Indiquattro
- A range of recessed modular fluorescent direct/indirect luminaires providing well balanced task lighting and ambient lighting (LOR exceeding 70%).
- Available with opal or micro perforated diffusers and satinbrite or mirrorbrite louvers (louvre versions have luminance <1500cd/m² at 65 degrees).
- Versions with emergency lighting facility are available.

Menlo²
- Family of direct/indirect luminaires, offering greater choice, better performance and improved aesthetics through:
  - 3 mounting options - recessed, semi-recessed and surface.
  - 3 optical choices - louvre, diffuser, Micro-Prism Technology.
  - 3 geometric shapes - square, rectangular, circular.

Garbo Ceiling
- Stylish ceiling fitting featuring a cylindrical diffuser in satin polycarbonate.
- Soft ‘mellow’ lighting effect.
- Throws light onto the ceiling, reduces contrast between ceiling and luminaire.

Garbo Pendant
- A stylish pendant featuring the tubular shape that defines the family of Garbo luminaires.
- Soft ‘mellow’ lighting effect.
- Suitable for use with high ceilings. Comes with 2.6m cable.

Garbo Wall
- Classic, retro look wall light with soft ‘mellow’ light.
- Half-tube diffuser in satin PC with optional decorative back plate in grey or white.
- Digital dimming (DS) and emergency options available.

Gino P360
- Classic range of pendants, with soft curves and geometric lines.
- Ideal for low voltage dimming applications.
- Three sizes of pendant shades: Ø185/360/525mm.
**Gino W3601**
- Indirect wall light for use with 26/32W TC-TEL lamp
- Made from aluminium with Ø360mm steel shade
- Strong lighting distribution with minimal glare

**Voyager Sigma** - IP40
- Single sided, wall mounting exit sign complying with the requirements of EN1838, with viewing distance of up to 30m
- Choice of LED or fluorescent light sources manual, self and addressable test
- Polycarbonate body, finished in white or silver with optional EU or ISO legend panels
Performance - Outdoor lighting for car parks and pathways presents a fresh set of challenges with safety and security being the prime objectives. The light should be sufficient for people to navigate safely at night, with good vertical illuminance and a wide distribution.

Efficiency - The luminaires must be fit for purpose and maintained to a high level to remove the impression of neglect in an area. Outdoor luminaires should be IP rated and IK rated for environmental conditions and vandalism. Outdoor lighting should also utilise lighting controls to conserve energy. Dimming or selective switching of some luminaires when appropriate helps reduce power demand. The control of upward light pollution is a further step on the path to sustainability.

Comfort - Safe and reassuring, pleasant and welcoming are the tenants of successful outdoor lighting. Outdoor luminaires should be architecturally compatible with the building and landscape. Car parks, pathways, and entrance areas will all benefit from an eco-conscious approach to visibility outdoors.

Technique - Efficient and effective performance combined with an aesthetically pleasing solution is the aim for outdoor lighting. Carefully positioned bollards are the preferred luminaire where the risk of vandalism is low. Luminaires on columns should be positioned away from buildings to negate the possibility of unwanted attempted intrusion. In-ground luminaires must be carefully installed to remove the potential hazard to wheelchair users and the less mobile.
**Amazon - IP65**
- Striking aluminium wall/ceiling luminaire with floating halo lighting effect
- Available in two sizes, circular or square design
- Integral 3 hour maintained emergency versions are available

**Prisma - IP44**
- A range of slim, 64mm deep, T16 fluorescent luminaires with prismatic diffusers for surface, and suspended mounting
- Low glare combined with high light output
- Emergency lighting and Sensor options available

**Civic 1 - IP66**
- 100W-250W for project optimisation
- Photocell, dimming and energy management versions for controlled carbon footprint
- RESidential Optic with wider distribution for pedestrian comfort

**Dyana - IP66**
- 70W-150W for adjusted output hence energy used
- Electronic benefit for longer lamp life and reduced maintenance
- Distinctive shape for night and day aesthetical appeal

**Orus - IP66**
- 0.9m height for all applications where columns are not suitable
- No beam towards car driver for maximum comfort and safety
- Engineered to resist the rigours of low mounting height operation (water, shocks and scratches)

**Victor 65 - IP54**
- Efficient optic for optimised distribution with low glare
- 100W-150W for adjusted output hence energy use
- Versatility of mounting for project flexibility

**Lemnis - IP65**
- 70W-150W for adjusted output hence energy used
- Low glare optics minimise the spread of light above the horizontal
- Distinctive shape for night and day aesthetical appeal

**Plurio O - IP66**
- Decorative and visually appealing, the Plurio has an aluminium canopy, which is coupled with a clear or opal bowl to avoid upward light (ULOR down to 0% with ULOR 0% accessory).
- Multifaceted optic version gives outstanding illuminance and uniformity
- Choice of lamp (including ‘white light’ options), gear and control packages to optimise energy consumption
Avenue XL - IP64
- An elegant post top mounted urban lantern, with complementary column
- Flat canopy minimises the spread of light above the horizontal
- Variety of perforated lamp shields

Avenue F
- Urban lantern designed to minimise the spread of light above the horizontal
- Choice of opal or clear conical shaped bollard, in two sizes
- A matching bollard and surface mounting wall light continues the design theme

Legend Modern - IP65
- Modern shaped range of low obtrusive light lanterns suitable for car parks and street lighting
- Choice of post top or suspended mounting
- Complementary ‘Legend Classic’ lanterns available which allows visual consistency through a variety of urban zones

Nella - IP65
- A conical shaped, silver-grey, post top mounted urban lantern
- Low obtrusive light and limitation of glare
- Designed for 70 to 100W HIT and HST lamps

Troika - IP65
- An asymmetric “flat glass” floodlight for 250-600W discharge lamps using adjustable lampholders
- Light output is finely controlled to minimise obtrusive light
- Four different light distributions for each lamp option. Troika Variable (60°-70°) uses a reflector in conjunction with a variable position lampholder, providing three distributions varying in intensity, beam width and peak angle intensity (I peak).

Areaflood II
- High performance aluminium area floodlights housing discharge or compact fluorescent lamps (42 to 600W), with asymmetric or ‘street’ reflectors
- The accurate optical system and integrated visor permits effective control of obtrusive light (0 cd at 90°)
- Options include: integral photocell, lighting controls, hot restrick, emergency lighting, optical attachments, colour filters and dedicated brackets

Qba - IP66
- Rectangular compact discharge projector with smooth edges and concealed stirrup, in cast aluminium
- Two body sizes for metal halide or high pressure sodium lamps (35W to 150W)
- Four available beam patterns, produced by precision reflector systems: circular reflector in intensive or extensive symmetrical distributions, and linear cylindrical parabolic reflector in asymmetrical or symmetrical distributions
Carparks/pathways

**Chartor** - IP44
- General purpose bollard for easy integration in a variety of applications
- Choice of fresnel lens or louvre optic
- Three choices of lamp type

**Avenue Deco bollard** - IP54
- Elegant bollard, complementing the Avenue Deco lantern and column range
- Characteristic cross design divides the light from the cone
- Shorter parapet model available

**EyeKon bollard** - IP65
- Attractive tubular section bollard, in two sizes and three colours, to complement the Eyekon bulkhead range
- Emergency options available suitable for muster areas
- Suitable for root mounting

**Promenade** - IP54
- Elegant, yet robust aluminium bollard providing light, colour and direction in exterior spaces
- Optimised output ensures no obtrusive light
- LEDs deliver energy savings, long life and reduced maintenance, other lamp types available

**E/Fact** - IP67
- A wide range of recessed luminaires
- Square and round luminaire with choice of semi-frosted or flat glasses and grey aluminium or stainless steel frames
- Choice of light source, including LEDs

**Via** - IP65
- A range of round and square wall recessed luminaires, with an indirect optical system, and offering high vandal resistance.
- As the lamp is hidden behind the fascia, it is impossible for passers by to receive any direct discomfort glare
- Light is directed to the ground, providing illumination where it is needed and minimising light spill
Case Study
Elsinore (Helsingør) psychiatric hospital

Designed by the architects PLOT, the new psychiatric hospital in Elsinore (Helsingør), Denmark breaks with tradition, both in its architecture and lighting.

In terms of function, the star shaped building is divided into two main areas: a ground floor for living and an upper level, which connects with the existing hospital, for treatment. All the various parts of the building merge together in the centre of the structure. The use of long corridors and open communal rooms meets the need for supervision without the patients being made to feel watched and shut in, whilst the lighting supports the needs of all occupants.

Performance
The luminaires achieve even lighting with good colour rendering, creating a bright, safe environment for the patients and staff. The patients’ apartments have special functionality and safety requirements. For instance, built-in LED wall lights at skirting board level function as night-lights.

Efficiency
To maximise lighting energy efficiency, the architect has optimised the use of available daylight. The living area is landscaped into the hospital grounds ensuring that there are green views from all the 48 single rooms. All linear fluorescent luminaires employed in the corridors, offices, treatment rooms and central area use advanced optics with T16 lamps to achieve low energy. The LED lights consume even less power and have a long operational life - ideal for the long burning hours. A lighting control system operates.

Comfort
For architectural integration, the architect chose oblong fittings for the whole upper floor, which is characterised by numerous corridors in various directions. These provide direction and follow the building’s movements. They are also adapted for exterior use - standing upright, they function as a unique cross between park lighting and low bollards and make a strong link between the internal and external environments. On the lower floor, classic glass fittings are used to focus on the directionless and openness of the large rooms. The discreet LED’s help the patients feel secure. Overall, the lighting echoes the efforts of the architecture to create a modern, functional hospital that radiates anything but a sterile hospital atmosphere.