



## CREATIVITY AT WORK

*We know how to create inspiring lighting*

**FAGERHULT**



## Welcome to the creative office!

Where's your office? Freshly printed business cards tell about the changing world. Less and less people are showing a fixed phone line, as people prefer to be reached on their mobile. The need for a visiting address is not the same when you are easily connected anywhere. A new

generation of employees see a job in a different light and have established an office on the move; at home, on the train or in a hotel lobby.

But despite - or perhaps because of - this new freedom, the office has become more important than ever. It's a place



for creative, face to face meetings, where new ideas are born and where job satisfaction takes more space than the specific activities being undertaken. In the creative office, we unconventionally furnish spaces - to meet changing needs and to increase workplace appeal. Then the light is more important than ever.

We can help you develop the workplace of the future. LED luminaires inspire bright and varied environments that enhance creativity, at a lower energy cost. Wherever you hang your hat, we have the solution for your office.



Alexandra Moore.



## Good design promotes creativity

Design at the workplace makes you more creative – and reinforces the company’s attractiveness and brand. But just putting out a few beanbags, a game console and a table tennis table simply isn’t enough.

“A creative office needs a holistic approach. Lighting, noise, colour and ventilation are all important factors that affect our wellbeing and our ability to perform,” says Alexandra Moore, who is conducting research into the importance of design in the working environment.

### How does the design of the workplace affect our creativity?

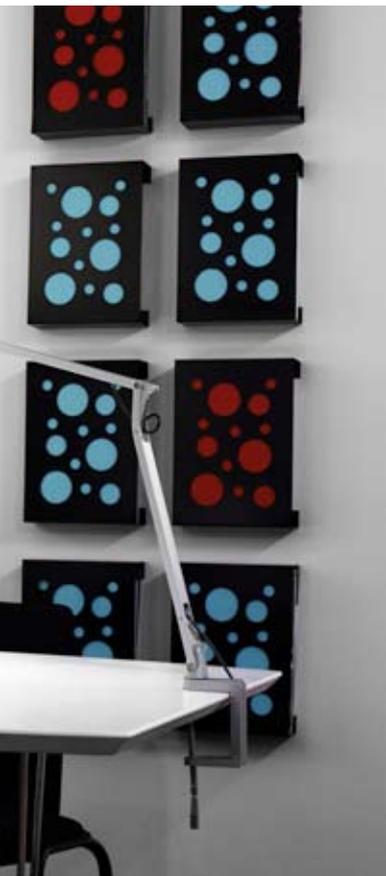
“Light is one of the absolute key factors. It controls the production of hormones and consequently how we feel. However, it’s not simply a question of providing enough light and avoiding the risk of glare, it’s also about variation. When I design offices, I look at the light from three different perspectives: natural light, artificial light and the relationship between light and shadow. But the light has

to be put into context. Noise, colour and ventilation are three other factors which play an incredibly important role in how we perceive our workplace.”

### Is it possible to consciously increase creativity at the office using design and furnishings?

“Yes! Although we have only recently begun to understand the link between how we are affected by our surroundings and its impact on how we feel and perform. A job used to be something you went to every day, almost like an administrative production line. Now, thanks to research, we know which factors have an impact – not just emotionally but also in pure biological terms.

This opens up interesting opportunities to make positive changes. In the long term, human wellbeing means greater profitability for the company as we will definitely be more productive. And if we’re talking about creativity in terms of ingenuity and innovativeness, then it’s essential for companies to invest in skills development. Creativity requires energy and this can be acquired through a good



*"A creative office needs a holistic approach. There is no 'quick fix'..*

working environment. Equally a well designed workspace can also strengthen the company's brand and help attract new and creative employees."

### **What is your approach to working with light?**

"Lighting is really important for creating different moods. Wherever possible I try to use lighting control, especially in conference rooms. The lighting now should be linked to the IT as there are so many different lighting scenarios and technical aids that feature in our meetings. I also like to work with LEDs. The initial investment costs are now at a reasonable level while the operating costs are minimal. From a creative perspective, LEDs are perfect as the technology provides so many opportunities to create beautiful effects, for example adding colour through glass."

### **Is the office on its way out?**

"No! The office will survive. But it's going through a major change in form. Nowadays we are just as likely to work at home as in a hotel lobby. And personally speaking, I think this is just the beginning. But even if we're not tied to our desks anymore, we still need to meet the requirements for ergonomics and proper equipment, not to mention the right working light. That will be the next big challenge."



*Jonas Källberg, product manager at the office furniture company Martela.*



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## Trends in office planning

What's going on at the office? And what isn't? Working life is changing. In a world in which we are constantly connected, everything no longer revolves around a single desk or a single room. And yet we still need an anchor in life. The office is still here; it just looks a bit different nowadays. These are the current trends.

### Activity Based Working (ABW)

Now that technology no longer ties us to a specific place, the office is becoming activity based. Rather than simply using a desk as the starting point, it's the type of activity and tasks that govern where and how we work. Often the starting point is allocating every employee some space for personal storage and documentation. Between 10 and 20 employees then share an area for their different needs during the working day. It is generally considered that 70% of the employees can work without a dedicated desk, while 30% need a permanent workstation. The latter applies particularly to administrative staff. These figures do, of course, vary considerably between different functions at the company. As, in order for ABW to work, extremely good technology and IT support is also required, this type of planning is more common in organisations with a strong focus on IT and communications.

### Meeting place in focus

Large offices and greater mobility among staff has led to an increased demand for places where people can meet their colleagues in peace and quiet and to make plans. Having extra meeting rooms is a clear trend in new build offices, with the most common layout is for four to eight seats. Not that everyone is always physically present at the meeting of course. The need for meeting rooms is also driven by many people opting for video and phone conferencing rather than travelling.



## The office as part of the brand

An exciting interior which matches the company's identity has become ever more important when it comes to attracting new staff and reflecting the brand. Ergonomics and functionality are today viewed as natural parts of working life. An inspirational working environment has now become the new competitive edge.

*Jonas Källberg, product manager at the office furniture company Martela.*

# New building and planning methods influence the type of lighting

More large offices, more open spaces with fewer walls and lots of glass are all clear trends in the open-plan office. Reorganisation is a part of everyday life and both employees and furniture swap places fairly regularly. This places totally different requirements for the lighting. Something which needs to be considered at the start!

## The flexible big office

Large offices have often been designed to allow for easy redecoration and new furnishings. The lighting needs to be planned at an early stage to reflect this flexibility. Where people are more mobile, and not just sitting at their desk, it would be advisable to opt for a recessed luminaire which provides not only a general light but also a decent working level. This approach avoids having to move the luminaires

every time you move or add new furniture in the space. Ideally the recessed solution should be supplemented by a good desk luminaire at each workstation, so that every employee is able to control their own light. The large open-plan office often presents a challenge when it comes to the vital ambient lighting. There are few walls, so it is a good idea to make the most of them and give them as much light as possible. If you use recessed luminaires, it is also important to try and get some indirect light on the ceiling, using luminaires placed on the wall or in the space where the ceiling and the wall meet.

## Large glazed areas

Glass is used regularly throughout contemporary build-



dings, in the form of both large window sections and glass walls which screen off cellular offices and conference rooms. The window sections are excellent, since they give lots of incidental daylight with the opportunity to save energy using daylight control. The glazed areas inside the office are more deceptive. It's important not to aim light directly towards the glass, as spotlights or wall luminaires can dazzle the person sitting and working on the other side. For this reason you should work with indirect wall and ceiling lighting as much as possible.

## Colours and structures

Make the most of the contrasts between a calmer base and the increasingly popular statement walls by lighting

them. Warmer colours, like beige and orange, work best with a light source that has a warmer colour temperature, around 3000 kelvin. Ideal for rooms intended for unwinding and time to think. Bold, plain colours look the best with a colder colour temperature of around 4000 kelvin. If you want to emphasise the texture of a wall, you can do this with direct-acting lighting, for instance spotlights.





Tommy Govén.



## Creative Light Planning Back up the light planning process with research

The message from the research is clear; if you light your premises in the right way, you achieve a working environment in which people feel at ease and think better. All you need is knowledge and good luminaires. Tommy Govén, head of research at Fagerhult, has identified the link between light and creativity.

### Does light really make us more creative?

“Research has shown this really is true. In 2009, we conducted a study at a primary school in London, in partnership with University College London and the Faculty of Engineering (LTH) at Lund University. We weren’t satisfied with simply finding out how the pupils felt, but also gathered biological evidence in the form of cortisol measurements. The results showed that the pupils in the classrooms which were lit with a higher proportion

of ambient light, i.e. more light on the walls and ceiling, actually performed better and got higher marks. In a room which is perceived as being bright, without dazzling us, we become more productive. Even if productivity shouldn’t be confused with creativity, the link is obvious. In a room with poor lighting, which is inadequate or dazzling, the effect is the opposite. We become tired, unproductive and – in the worst case scenario – aggressive.”

### Is the basis of this ambient light?

“Yes! The fact that we become more alert and happier when there is light around us goes without saying for most people. The best thing for us is the natural light, which is in fact a type of ambient light. The ‘light norm’ of humans is the celestial sphere, which extends from the ground towards the horizon and then upwards. Yet we rarely look directly at the sun because it is unpleasant to do so and

*"The best thing for us is the natural light, which is in fact a type of ambient light.."*



we are dazzled by the glare. Instead, we absorb the light which arrives vertically, from the side and just above us. By planning the artificial light in an office in a similar way – allowing it to bounce off indirectly from walls and ceilings – we can achieve the same effect.

### Why are LEDs so good in the office?

LED technology has undergone incredible developments in terms of not only light quality, anti-glare and efficiency but also price. Now the technology has matured we wanted to find out what people think of LEDs compared to a traditional T5 light source. In our latest study with the Faculty of Engineering (LTH), at Lund University, we built two identical office rooms which were both equipped with direct light above the workstation and supplementary ambient light on the walls. In one of the rooms we used LED lighting and in the other T5. The result was very clear: the LED light was perceived as being brighter and more pleasant with ambient lighting of 100 cd/m<sup>2</sup>, a feeling which persisted right up to 300 cd/m<sup>2</sup>. Consequently,

when using LED lighting in an office you achieve a brighter and better working environment while at the same time reducing your energy consumption. You could say that you get creativity for free!

### Are LEDs creative in other ways?

"In addition to having a better lit environment, which is perceived as being more attractive, LED technology provides more opportunities for variation and style. You can alter the light's colour temperature within the white field, known as 'tunable white', over the course of the day, depending on the daylight outside or according to your own daily routine. With LEDs it's possible to use an 'equaliser' for the light, just like with music, following the same principle that every office and space can have their own, individual tone. Another clear advantage is that you can work with coloured light and create accents and effects in the office design and also project different types of images. With LEDs the light really does become an integrated part of the interior design."



## How to make a creative lighting environment

There are many ways of coming up with creative lighting solutions using LED luminaires; from variations in light level and temperature to personal solutions based on shape and colour.

### **Go beyond the standard.**

All EU countries have a common standard for lighting of workplaces, EN 12464-1. For paper based activities the desk must be lit to 500lux, or 300 lux when working with monitors. The ambient light, that is the vertical light on walls and indirect light on the ceiling, must be at least 50 lux and 30 lux respectively. We don't think that's enough! Our research shows that a creative lit space requires an average illuminance of 250 lux both on the walls and in the ceiling. By opting for LED products you can give your staff more light without using more energy.

### **Choose the right light.**

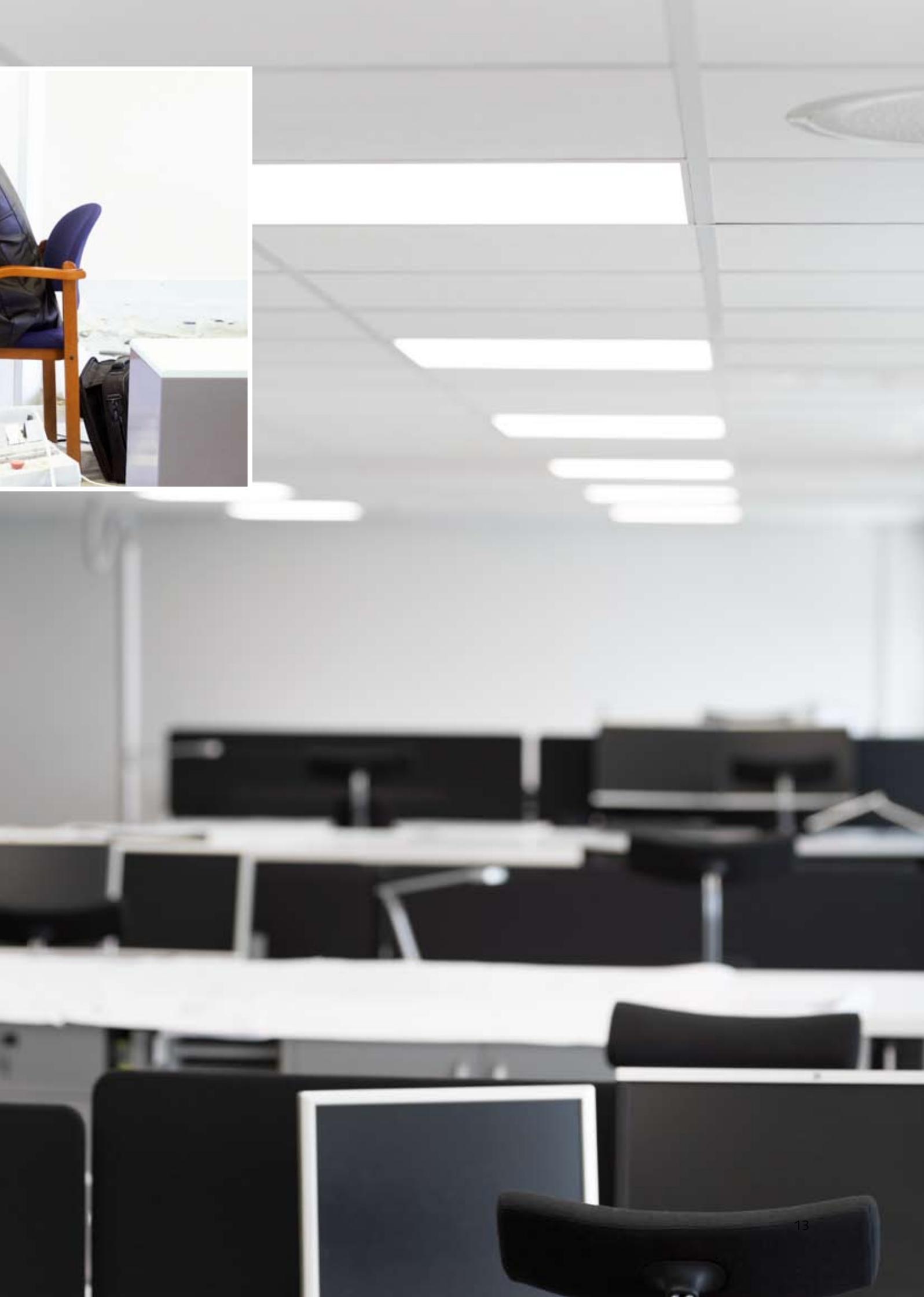
goes without saying that the amount of light is crucial for visual tasks and perception. However, it is by choosing the right type of light and varying it in the right way that the working environment becomes positive and inviting. Avoid having too much light directly at eye level, as it's easy to suffer from glare. The eye is more receptive to ambient light which enters from the sides than to light which is projected directly towards the eye.

### **Vary the light.**

A room that enhances creativity must be well lit. Light the walls and ceiling as well as the work surface. This can be done in several ways, but an effective solution is combining a suspended luminaire, with a certain amount of indirect light, supplemented by wallwashers or downlights located along the wall. Don't put the luminaires in the traditional location in the middle of the room and try to avoid harsh shadows. The light can also be varied in terms of intensity and colour; LED technology makes it possible to vary the colour temperature of the white light. And if you want to, you can also add colour with coloured light.

### **Work with textures.**

What are you lighting? A wall with texture and interplay between light and shadow can be more interesting than a smooth wall. Statement walls with colour, wallpaper or pictures can also be accentuated using lighting. Research shows that motifs taken from nature, with plants and greenery, are perceived as being more positive and enhance the room's creative atmosphere.





## How to light the entrance

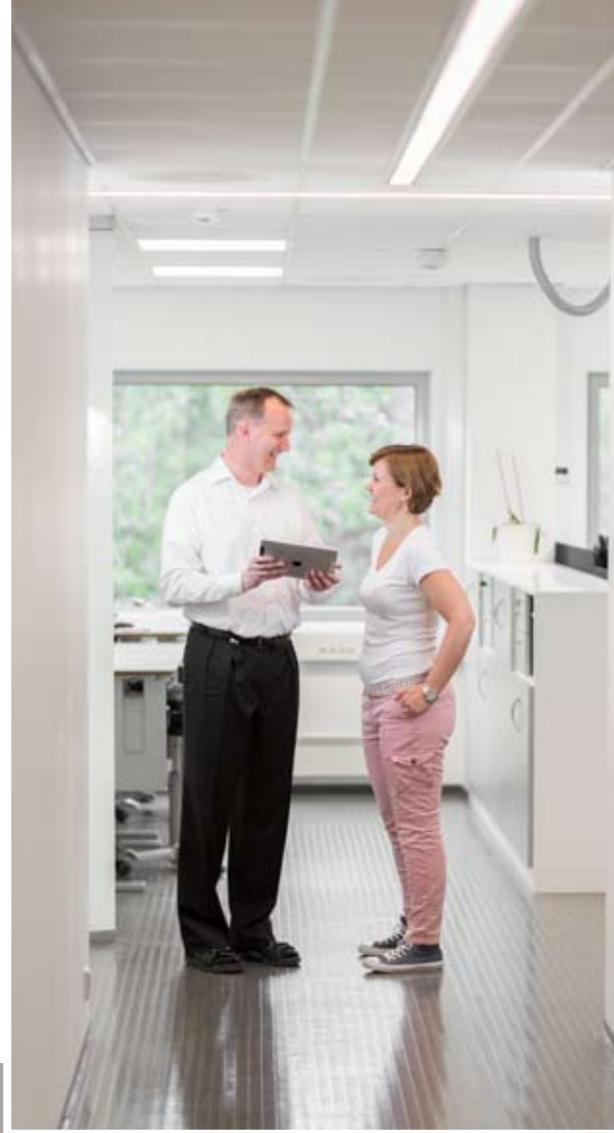
You never get a second chance to make a first impression. No matter how clichéd that may sound, it's still true. In the entrance, with adjoining reception, we have concentrated on creating a dynamic area where people first enter. Just inside the door we have 'painted with light' to create a decorative form which provides extra light at the entrance and emphasises the shape of the room. The luminaire (Freedom) is based on a modular concept which can be assembled in various configurations. In this application we have opted for a direct/indirect version which provides light both towards the floor and onto the ceiling, creating a sense of space. In the centre of the room we have suspended a cluster of large, round-beam luminaires (Tibi) which maximise the generous ceiling height to provide a general lighting solution. By combining different sizes close to the lounge furniture you can enhance the aesthetics within the space with a contemporary feel. The walls, with

paintings and pieces of artwork, are accentuated with recessed wallwashers (Pleiad G3) that provide comfortable ambient lighting and help define the room. In the reception area itself, it's essential there is a good working light and this is provided by circular, suspended luminaires (Appareo Circular), with a combination of direct and indirect light.

Within this building, based upon a converted industrial property, we have added a communication area between the entrance and the office. One of the walls is completely dominated by a generously proportioned window section, which lets in some welcome daylight. The round beam ceiling luminaire (Tibi) takes its design from the suspended luminaire in the reception, providing a consistent visual experience. A good direct light is complemented by indirect light towards the ceiling, further enhanced by the use of daylight control and presence sensors to optimise function and energy-saving.

## How to light communication areas

Further into the building the corridor consists of a long glass partition with meeting rooms and offices. The lighting in this area must not dazzle those working inside of the rooms, yet still provide an optimal journey through the space. Since we can only work with the ceiling and the wall opposite, we have opted for a corner-mounted luminaire (Vidi) that provides attractive incident light in the ceiling and on the wall. The art on the walls is accentuated with recessed spotlights (Easy LED). By focusing on both the ceiling and the walls it brings life to a space which may have been perceived as gloomy and boring.



## How to light the meeting room

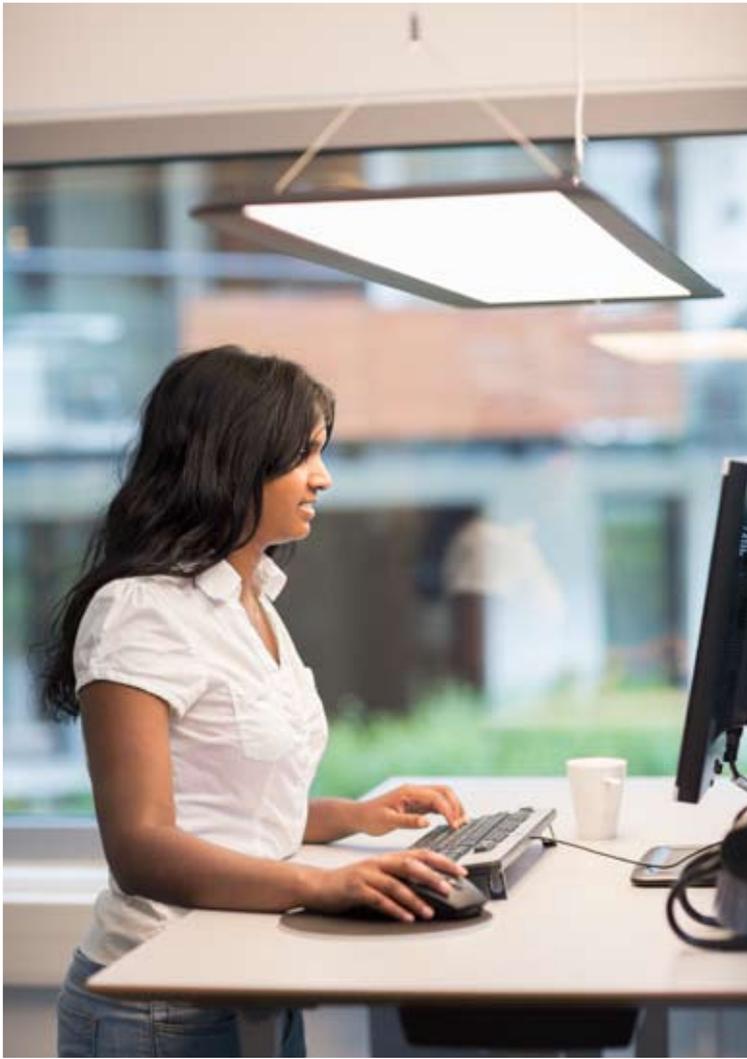
In the small meeting room we have created an intimate and varied atmosphere that emphasises the relaxed design style. The suspended luminaire (Appareo Circular) links the furnishing of the seating group together and provides essential working light and a certain amount of indirect light up towards the ceiling. Wallwashers (Pleiad G3) along both of the walls makes for a creative ambient light which helps define the space. The decorative, tree-shaped coat stands can be accentuated by spotlights (Easy LED) to become a functional piece of art in the room. Natural shapes and greenery have a positive influence on creativity – even if the plants aren't alive ...





## How to light the conference room

In the larger conference room, we have opted for an alternative to the more traditional suspended luminaire over the conference table. Two recessed luminaires (Nottor) mounted in parallel above the table provide a good working light and form two distinct 'tracks' in the ceiling. One of the short walls is accentuated by two wallwashers (Pleiad G3). This helps create comfortable ambient lighting on the wall, making the room more pleasant to be in and raising levels of concentration. All lighting in the conference room has been synchronised with the IT system to ensure automatic regulation of the light levels for video and projector presentations.



## How to light an individual office

Equipped with an individual workstation, visitor chair and a nice sofa, this room is fully furnished. It feels like it is a separate space, but still avoids exclusion thanks to the glass partition. The workstation lighting (Appareo Rectangular) over the desk provides a good general light, as well as indirect light up towards the ceiling. Appareo is available in rectangular and circular models; using a luminaire family with several variants is a simple way to maintain the style yet still create variation in the office. Three wallwashers (Pleiad G3) provide comfortable ambient lighting for the opposite wall and accentuate the sofa. The tree-shaped coat stands, this time in a different colour, can also be highlighted by spotlights (Easy LED).

*Appareo is available in rectangular and circular models; using a luminaire family with several variants is a simple way to maintain the style yet still create variation in the office.*



## How to light a big office

A large office with space for lots of workstations necessitates flexibility. To accommodate this, we have lit this office with a recessed luminaire (Multilume Flat) which provides the required general light without needing to be re-positioned should the layout change. Due to the ceiling level being 2.70 metres, it's important to select a luminaire with a powerful light distribution. To offer employees a greater control of their lit environment we have supplemented the general light with a workstation lighting solution (G5) at a local level. Installing wallwashers (Pleiad G3) across the short walls not only provides essential ambient light but also helps bring the designer's concept to life. The second

half of the office has been designed to function as an area for informal meetings and as a social hub. The furniture creates several rooms within the room. A slightly higher ceiling height, 3.40 metres, dictates the choice of suspended luminaires (Appareo Circular) that provide both direct and indirect light. One of the room's short walls is accentuated by wallwashers (Pleiad G3) while the kitchenette by the other short wall has been given a functional and decorative solution with a suspended luminaire (Gaudi). Wallwashers (Pleiad G3) continues the theme of ambient lighting in other parts of this office. The result is a large and well-lit room with a complete lighting pattern that can cope with changes.





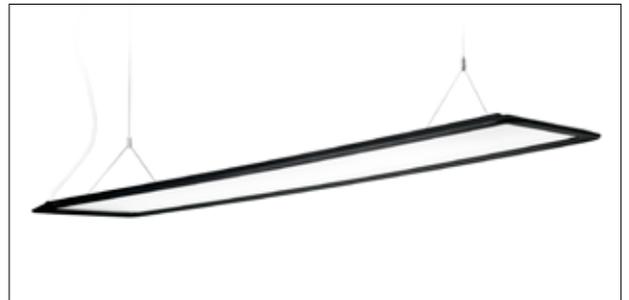
# Appareo



It's magic. The luminaire is lit, but where is the light source? Appareo is a suspended luminaire that drives LED technology to the extreme limits of design – without compromising on the requirements for efficiency and ergonomics. Choose from two designs – rectangular or circular. In Appareo we have successfully combined the need for work and ambient lighting in a single luminaire, thanks to new and exciting technology.

Appareo rectangular is available in black or white with 4000 K colour temperature and a luminous flux of 5210 lumen (efficacy 80 lm/W). Colour quality MacAdam 4 SDCM. DALI or e-Sense ActiLume as standard.

Appareo circular is available in black or white with 4000 K colour temperature and a luminous flux of 5000 lumen (efficacy 83 lm/W). Colour quality MacAdam 4 SDCM. DALI as standard.



# Tibi



Tibi produces a crisp, radiant light, floating in the space with its distinct form. Its spherical shape is maximised with advanced LED technology to create a stunning light experience. An entire luminaire family consisting of pendant, ceiling and wall luminaires makes it possible to plan complete environments in a varied way that also takes ambient lighting into account. Its distinctive shape is inspired by a Scandinavian design classic: Piet Hein's super ellipse.

Tibi Pendant is available with 4000 K colour temperature in three sizes and a luminous flux between 1653 lumen (Ø 400, 65 lm/W), 5414 lumen (Ø 600, 83 lm/W) and 6328 lumen (Ø 800, 87 lm/W). Colour quality MacAdam 4 SDCM. Tibi Pendant is supplied with DALI dimming as standard.

Tibi Ceiling/Wall is available with 4000 K colour temperature in two sizes and a luminous flux between 1708 lumen (Ø 400, 63 lm/W) and 3744 lumen (Ø 600, 76 lm/W). Colour quality MacAdam 4 SDCM. e-Sense Detect or e-Sense Move are available for lighting control.



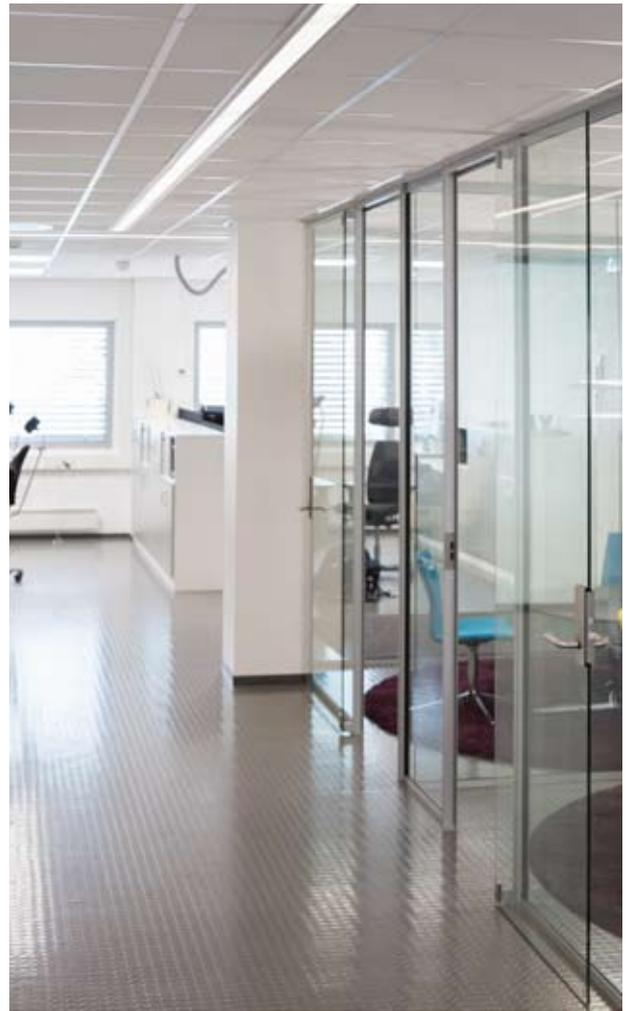
# Notor LED



Notors slim, minimalist profile has now been up-dated with an exciting modern twist. The original compact design has been equipped with LEDs to achieve the possibilities and demands for lines of light within a room. Surface mounted, recessed or suspended, each version is available with a range of connectors, with the scope to create various patterns and shapes with light.

Notor LED is available with 4000 K colour temperature and a luminous flux of 1800 lumen per 1200 mm (efficacy 82 lm/W). Colour quality MacAdam 4 SDCM.

The recessed variant is also available with 3000 K. Lighting control via DALI.



# Multilume Flat



More energy efficient than T5 with equal lighting ergonomics! With Multilume Flat, LED technology takes the step from the downlights into a viable solutions for complete general lighting. As part of a holistic approach, Multilume Flat has been designed to address the tight time requirements and restricted ceiling heights in many construction projects. Perfect for demanding lighting tasks in office environments.

Multilume Flat is available in three different sizes; 600×600, 1200×300 and 300×300 and 3000 or 4000 K colour temperature. Choose between an Opal or Delta louvre. Luminous flux up to 4481 lumen (efficacy 100 lm/W). Colour quality MacAdam 4 SDCM. Lighting control via DALI.

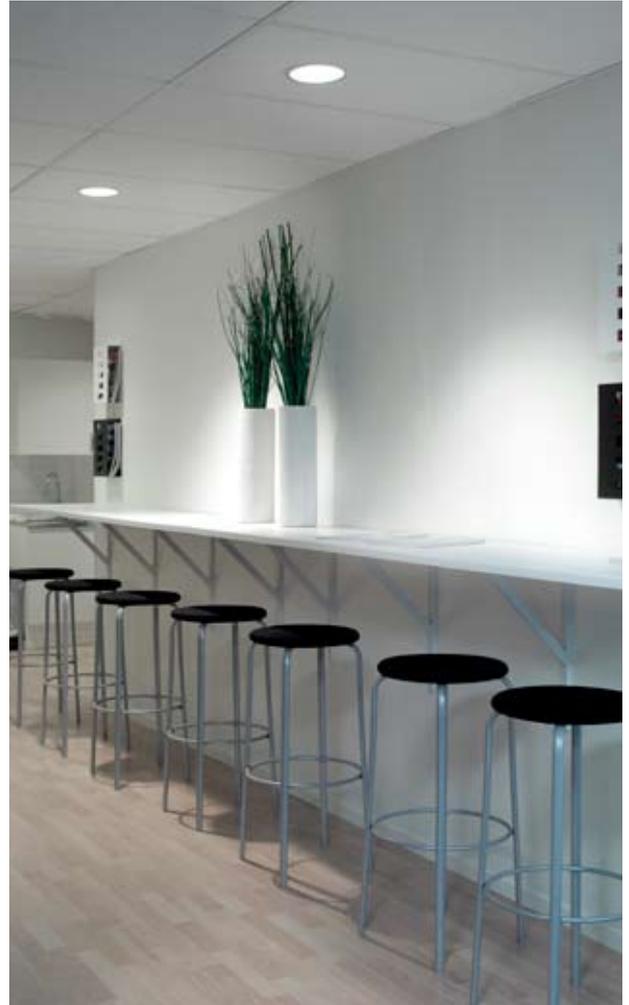


# Pleiad G3



Pleiad G3 is a complete LED lighting concept. Focusing on light quality, ergonomics and energy efficiency, G3 has now been expanded to include a surface mounted version. Its innovative reflector technology harnesses the efficiency of the LED light source without affecting the perception and quality of the light. Longevity and performance is complemented with a time conscious, tool-free assembly to offer a truly economical solution with a realistic payback time.

Pleiad G3 is available in recessed or surface mounted installation with 3000 or 4000 K colour temperature or tunable white. The luminous flux ranges from 900 lumen up to 1580 lumen (efficacy approx. 60 lm/W). Matt or specular reflector. Colour quality MacAdam 3 SDCM. Light control via TouchDIM/DALI.

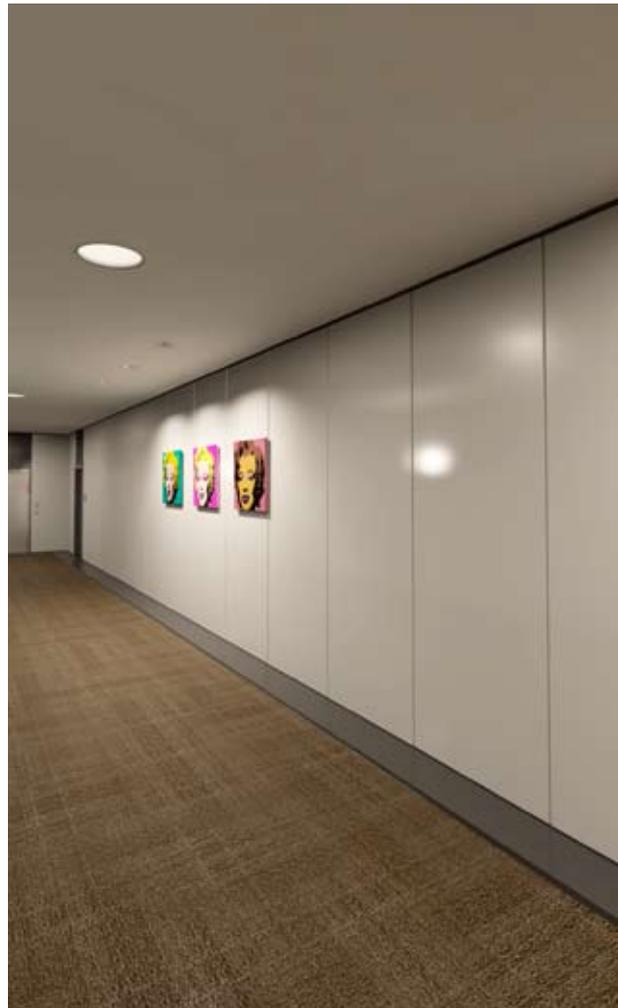


# Pleiad Wallwasher G3



Pleiad Wallwasher G3 is the optimum solution for creative lighting environments which focus on a greater proportion of ambient lighting. Powerful and well shielded, the luminaire sends a cascade of light over the wall – while still maintaining the energy efficiency. The light's colour temperature can be adjusted from cold to warm and it's even possible to opt for RGB technology to create effects with coloured light.

Pleiad Wallwasher G3 is available with 3000 or 4000 K colour temperature or tunable white. Luminous flux up to 1572 lumen (efficacy approx. 54 lm/W). Colour quality MacAdam 3 SDCM. Light control via TouchDIM/DALI.



## G5



G5 is an LED-based desk luminaire that provides supplementary working light and increases the employees' ability to influence their own lit environment. A discreet and stylish luminaire housing enables G5 to blend into many different types of environment and design themes. The user-friendly desk clamp makes it easy to move the luminaire when required.

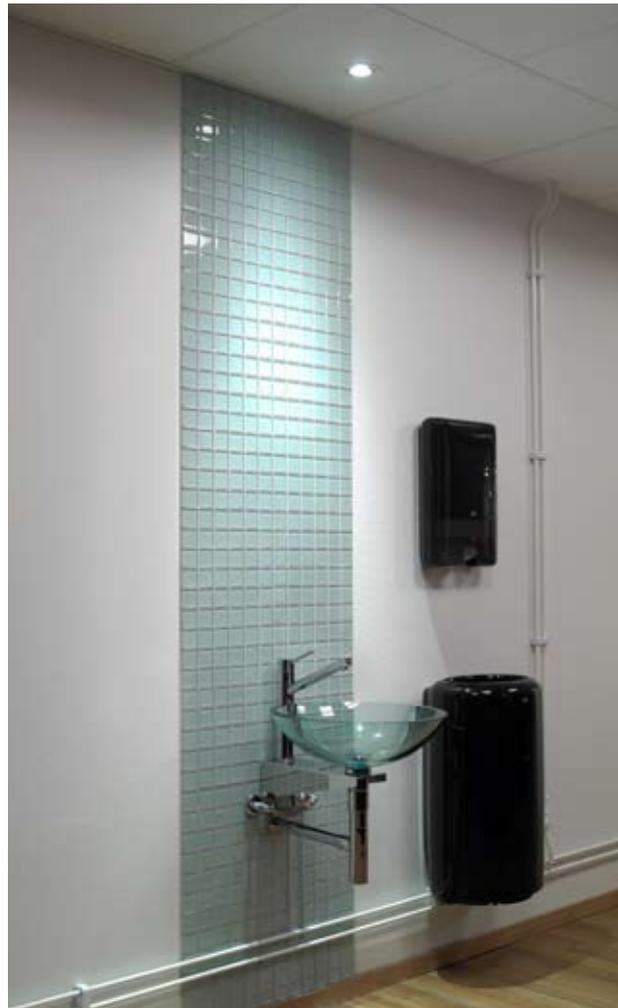


## Easy LED



A discreet and energy-efficient alternative to small, recessed halogen downlights. Easy LED has a lifespan of 50,000 hours and is three times as energy-efficient as a traditional halogen spot, yet the sparkling light and exclusive feel are just the same. An attractive and smart solution for hotels, offices and other representative environments which demand longevity.

Easy LED is available in two different models; fixed or tiltable. Both are available with various distribution angles, 3000 or 4000 K colour temperature and luminous flux from 377 up to 600 lumen (efficacy 44–71 lm/W). Colour quality MacAdam 4 SDCM. Lighting control via DALI/DSI/switchDIM or 1–10 V.

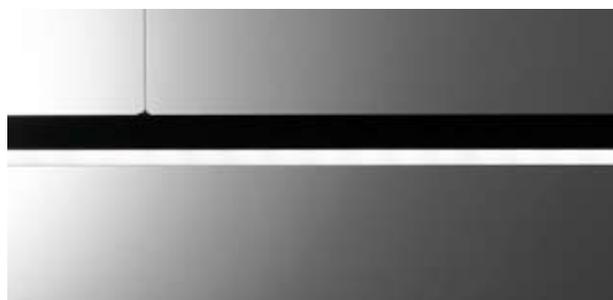


# Freedom



Freedom is a unique concept which takes flexibility onto the next level. With the help of two modules, one straight and one curved, the luminaire can be built up to follow the shape of the room or a creative concept. But Freedom is not just decorative! The LED modules, in combination with advanced reflector technology, provide a superb general lighting solution.

Freedom is available in three different black anodised models. Pendant with uplight and downlight, ceiling mounted with just downlight and a variant for wall mounting. 4000 K colour temperature and a luminous flux of approx. 1216 lumen per module. Colour quality MacAdam 5 SDCM. Light control via DALI or 1–10 V.



# Gaudi



Gaudi is inspired by classical architectural principles; a sculptural form that defines both the room and the direction of the light. New technology meets timeless elegance as the traditional suspended luminaire has been brought right up-to-date, using the latest evolution of LEDs. Developed by the architect trio of Claesson, Koivisto and Rune, Gaudi is available in one linear and one circular design.

Gaudi Linear LED is available with 4000 K colour temperature. Luminous flux of 1980 lumen (efficacy 50 lm/W). Colour quality MacAdam 3.5 SDCM. DALI dimming as standard.

Gaudi Circular is available with 4000 K colour temperature. Luminous flux of 350 lumen (efficacy 20 lm/W). Colour quality MacAdam 3 SDCM. 1–10 V dimming as standard.



Fagerhult develops, manufactures and markets professional lighting systems for public environments such as offices, schools, industries and hospitals. Our operations are run with a constant focus on design, function, flexibility and energy saving solutions.

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