LIGHT
AT WORK

OFFICE LIGHTING - 5 BIG TRENDS

WORKPLACE LIGHTING STANDARDS

THE COST OF GOOD LIGHTING

90 YEARS OF THORN

Light at Work helps contractors and installers provide more value to their clients through great lighting

THORN
LIGHTING


CAN YOU
PLEASE
SWITCH THE
LIGHT ON!
THORN
LIGHTING

EDITORIAL

Jakob Geppert
Senior Director Application OFFICE
Global Product Management

The benefits of better lighting in offices represent a huge opportunity for contractors to add more value for their clients. And we are here to help.

Businesses around the world are waking up to the incredible value of better light. Not only does good quality lighting save employers money on electricity bills by being more energy efficient, it also contributes to the health and wellbeing of employees, helping them perform better.

At Thorn, we've always believed in the value of great workplace lighting, and it's now easier than ever to create office lighting that contributes to greater productivity. After all, the amount businesses spend on the lights in their offices is tiny compared to what they spend on people who work there. So if better light gets people working more effectively, it's an investment that makes sense.

For suppliers and contractors, lighting represents an opportunity to provide more value to owners and operators of offices. Thorn's mission is to make it easy for you to bring that value to your clients, with products that do the job right and are straightforward to install and commission.

Another milestone in the lighting industry and a focus for us is the gradual digitalization of lighting systems, from simple daylight and presence management to complex data collection and management. Our goal: the perfect balance between user comfort, maximum energy savings and the lowest possible commissioning effort.

We hope this magazine provides useful advice and inspiration to help you achieve the best possible results with the best of today's technology.

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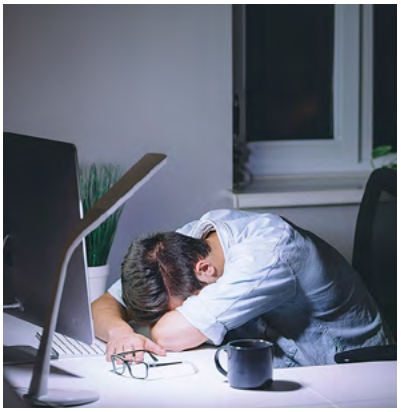

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As Thorn celebrates its 90th anniversary, we look to the past – and the future

5 BIG TRENDS

Offices – and the ways in which we use them –
are changing for good. Lighting has to change too.

01 Flexibility

02 Saving Energy

03 Control

04 Light for People

05 Making the most of daylight

Charter House, London, United Kingdom

01

FLEXIBILITY

The days when office workers simply sat at the same desk all day are gone. Open-plan offices have long been the norm, and more and more office workers now work flexible hours, meaning more hot-desking and remote working using mobile devices.

As a result, many offices now place an increasing emphasis on online and face-to-face meetings and conversations. Even workers who are mainly desk-based may be using portable devices, and may not be at the same desk from day to day. Laptops, tablets and phones with backlit screens are everywhere in the modern office, so glare that could make these difficult to use must be avoided.

02

SAVING ENERGY

Saving energy is one of the key ways lighting can add value for owners and operators of ofices. By spending a little more upfront, users can make big savings in the long run.

The good news is, it's easier than ever to save energy in offices with lighting. Most offices have been using energy-efficient T5 fluorescent lighting for years, so LED lighting has been slower to catch on in offices than in some other applications.

But now the efficacy of LED lighting is such that LEDs are replacing fluorescent in offices, and smart controls are getting energy consumption even lower.

03

CONTROL

Lighting controls are getting more sophisticated – but easier to use – by the day, helping offices to create a positive atmosphere while making significant savings on energy.

Giving workers more control over their light has been shown to increase job satisfaction, and controls can prevent light being wasted in areas near windows, or in places that are not always in use, such as meeting rooms, corridors and toilets. Many of today's control systems are wireless, making it easy for staff to control them from mobile devices or handheld controllers, and making installation and commissioning much simpler, because no new wiring is required.

04

LIGHT FOR PEOPLE

The most important assets within an office are the people, and in recent years it has become more and more clear that lighting has a big effect on people's wellbeing, alertness and productivity at work.

In the past, lighting standards have sometimes focused on how we light tasks, such as reading or looking at computer screens, at the expense of how light affects people.

To strike the right balance, we need to light not just the task, but also the space and the face, so people can feel comfortable and communicate well with each other.

05

MAKING THE MOST OF DAYLIGHT

Offices are increasingly seeking to maximise the amount of natural light they benefit from. People like having access to daylight in offices, and it has been shown to be good for us. It's also free.

This presents an opportunity to get energy costs down by dimming lights or turning them off when there is sufficient natural light available. To achieve it, you'll need good controls.

90% *01

of the cost of running an office is staffing costs – eclipsing the cost of buildings and maintenance

800lx *02

or higher is the level of light preferred by most office workers

85% *03

of people say lighting is one of the biggest influences on their wellbeing at work

BUT

24% *04

of people don't like the lighting in their office

*01 - 1. BOMA (2010) Benchmarking Reports, 2. Experience Exchange Report (EER) Hughes W., Ancell, D., Gruneberg, S. and Hirst, L. (2004) Exposing the myth of the 1:5:200 ratio relating initial cost, maintenance & staffing cost of office buildings. Proceedings 20th ARCOM Conference, September 2004, Heriot-Watt University, Edinburgh, 373-381 *02 - Kelter, J. and Merlin, C. (2014) Lighting quality perceived in offices, Phase 1, Fraunhofer IAO and Zumtobel Lighting GmbH *03 - Lang, S., Preece, S. (2016) What workers want [report based on a survey conducted for the BCO by YouGov], British Council for Offices *04 - "Steelcase report"

The modern workplace comprises a number of distinct areas & purposes – all of which need to be considered when planning lighting

LET´S GET TO

ORK

LIGHTING THE MODERN WORKPLACE

SEVEN KEY OFFICE AREAS, AND WHAT TO THINK ABOUT WHEN YOU LIGHT THEM

NBS, United Kingdom

01

RECEPTION

First impressions count. Here's where lighting can contribute to setting the right tone for your organisation, as well as supporting wayfinding and tasks at the reception desk.

02

OPEN PLAN AREAS

The main space in many modern offices is open plan. Balance is the keyword here, as light needs to support many people doing many different things.

03

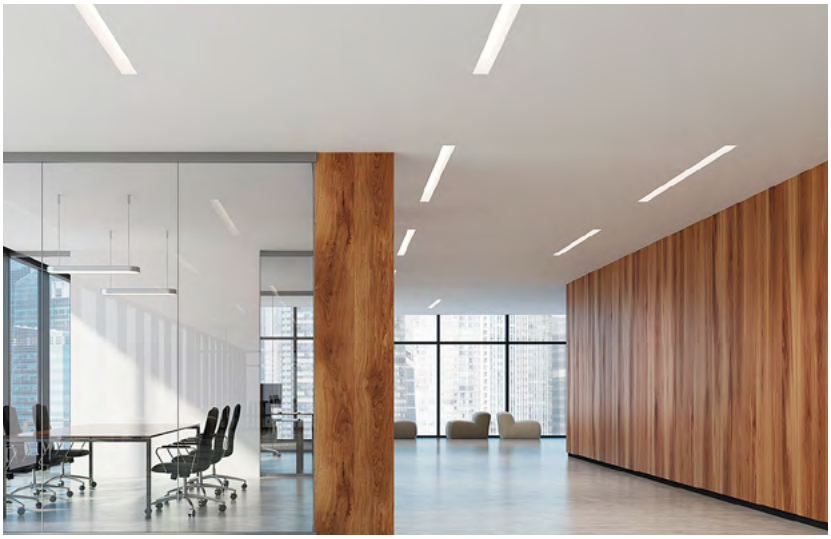
INDIVIDUAL OFFICES

These rooms may call for a different appearance, to add variety, or a more polished look if they are occupied by senior staff. There will be more opportunity to use wall-mounted fittings, and there are likely to be windows for daylight.

04

MEETING ROOMS

This is where staff come together to talk, listen and learn. They need good illumination of faces, and controls to adapt the lighting to a variety of uses.



05

CIRCULATION AREAS

The priority here is letting people find their way clearly and safely. Controls can help to reduce energy use by turning lights off when corridors are not in use.

06

SUPPORT SPACES

Less used areas of your offices will benefit from controls. In areas where there may be dust, moisture or extremes of temperature, robust luminaires will last longer.

07

BREAKOUT ZONES

These are areas where we can add some character and interest. Lighting can support relaxation and comfort, as well as highlighting decorative features and points of interest.

TOP TIPS

- Refer to the standard and provide enough light for the tasks being performed
- If possible, give workers some individual control over the lighting where they work
- Light walls and ceilings well, to help provide good vertical and cylindrical illuminance

EN 12464

THE STANDARD SPECIFIES

500 lux	for desk-based tasks
300 lux	for filing and administration
50 lux	on office ceilings
75 lux	on office walls
150 lux	cylindrical illuminance at head height
UGR	(unified glare rating) of 19 or lower for most office tasks

THE RIGHT LIGHT FOR OPEN-PLAN OFFICES

Lighting these general purpose areas is a question of balance

Open-plan areas are the most common type of office layout. And with workplaces becoming more flexible and less formal, it seems open-plan is here to stay. Today's open-plan offices must cater to remote and occasional workers as well as regulars. Even workers who are mainly desk-based may be using portable devices, and may not be at the same desk every day. From a lighting perspective, open-plan offices require a balanced approach: sufficient light for a variety of tasks being performed individually at desks, but also appropriate lighting for circulation areas and areas where people may talk face-to-face, and a positive atmosphere and appearance for the space as a whole. The absence of internal walls means open-plan areas are likely to be lit mainly with ceiling-mounted fittings. The workplace lighting standard EN 12464 specifies luminance levels for various tasks, including desk-based tasks and filing. But activities in an open-plan area are many and varied, so a degree of judgement is needed from the person planning the scheme. A good way to build flexibility into your design is to put control in the hands of employees. Research has shown that the more control people have over their workplace lighting, the more satisfied they are at work. This can be done by giving workers a degree of control over the illumination in their area, or by adding individual task lighting. It's vital to make sure there is good lighting for all tasks taking place in an open-plan office, as defined in the EN12464 standard. But that's not the only thing to think about. We must also consider how we like the space around us, creating an environment where workers feel comfortable and alert. Face-to-face communication is increasingly important in the modern workplace. Lighting needs to create an environment where people feel comfortable, look good, and can read each others' expressions and body language. Good lighting of faces requires sufficient vertical and cylindrical illuminance, which you'll get from diffuse lighting that illuminates walls and ceilings. By considering carefully how light fits into the modern workplace, contractors, specifiers and designers can add considerable value for clients, helping to create a healthy, happy and positive working environment, which pays off through the productivity and loyalty of employees. **For more on lighting for task, space and face, see page 28.**

"By considering carefully how light fits into the modern workplace, contractors, specifiers and designers can add considerable value for clients."

MORGAN SINDALL

RUGBY, UK

"Since changing we have noticed an overall improvement in the quality of the lighting throughout the building and to the exterior, making it a brighter, more pleasant work space. Additionally, the switch to Thorn's LED luminaires will provide financial savings in terms of energy and maintenance."

John Watson, facilities co-ordinator at Morgan Sindall

OMEGA PRO

IP44

4000K

50,000 HOUR LIFE

The open-plan areas of this office building benefit from reliable, low-glare ceiling luminaires In the open-plan areas, Morgan Sindall chose to replace the building's old fluorescent lighting on a one-for-one basis with Thorn's Omega Pro 600x600mm LED luminaires.

With its slim 12mm profile, Omega Pro incorporates a UV-stabilised opal acrylic diffuser, giving it a clean, minimal look. The IP44-rated luminaire provides excellent glare control (UGR <19/22) at a comfortable colour temperature of 4000K. Omega Pro is easily retrofitted and its 50,000-hour life means maintenance is significantly reduced.

Construction business Morgan Sindall's head office in Rugby, England, accommodates around 230 employees.

THE RIGHT LIGHT FOR MEETING ROOMS

Lighting in meeting rooms must cater for communication of various kinds

Meeting rooms are all about communication. Whether it's a discussion between two people across a table, or a presentation to a large group, these are the places where people come together to talk, listen and share.

The job of lighting is to create an atmosphere for effective communication. Facial modelling is obviously important. This is achieved through good vertical and cylindrical illuminance. Good horizontal illuminance on tabletops is also important to enable comfortable reading and writing. If projectors, monitors or whiteboards are being used for presentations, lighting should avoid creating glare or shadows. Controls are important in meeting rooms for a number of reasons. First, these rooms are used in a variety of ways: a presentation using a projector may require lights to be dimmed, or for only the speaker to be illuminated. By contrast, a face-to-face meeting will require the entire room to be lit. Secondly, meeting rooms are likely to benefit from daylight, so energy can be saved by dimming or turning lights off when there is sufficient natural light. Thirdly, meeting rooms tend to be used for short periods, and will sometimes be empty, so presence/absence controls can reduce electricity costs. By making clients aware of the varied requirements of meeting rooms, and of what is possible with today's technology, contractors and designers can help create a solution that gives their client much greater value.

MERCEDES BENZ

ROME, ITALY

Mercedes-Benz required a high-quality, modern solution for this new and innovative building, and benefitted from Thorn's expert advice and dedicated support.

Several meeting rooms at the prestigious offices of Mercedes-Benz in Rome benefit from high-quality LED lighting by Thorn. Working with Rome-based architecture studio MPPM, Thorn supplied its Omega LED fittings, in 1200mmx600m size.

Omega LED uses 50% less energy than T8 fluorescent, and provides good uniformity of light with a colour-rendering index (CRI) of 80. With a 50,000-hour lifetime, lamp changes are a thing of the past at this office, and little or no maintenance will be required for a very long time.

City, University of London, United Kingdom

LEAD THE WAY
CIRCULATION AREAS

LANGE, ALTHEIM, GERMANY

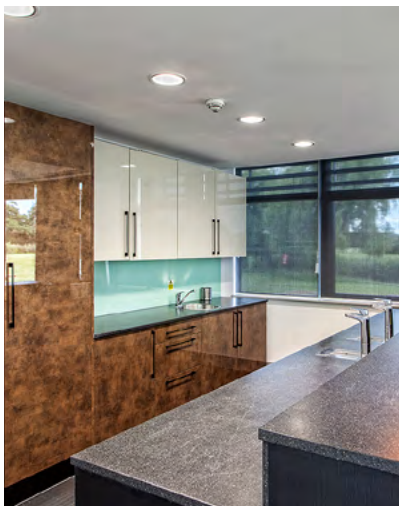
The corridors at this automotive painting and finishing company outside Munich are illuminated by Thorn's Omega recessed ceiling luminaire. Omega can be used as a direct replacement for traditional fluorescent fittings in offices, saving more than 50% on energy thanks to its efficiency of up to 110lm/W.

These fittings provide a high quality of light with minimal glare and excellent consistency of colour. As well as working as a recessed fitting, Omega can also be surface-mounted or suspended, giving more flexibility of installation and design.

AVTRADE, WEST SUSSEX, ENGLAND

Avtrade is a supplier of aircraft components based in the south of England. Thorn provided lighting for all parts of its new headquarters, including corridors, which are lit by Chalice luminaires. Offering an energy-efficient replacement for conventional CFL downlights, Chalice provides great performance, while keeping energy consumption and running costs to a minimum. Energy and maintenance demands have been significantly reduced thanks to Chalice's high efficacy of up to 110lm/W, IP54 rating for protection against dust and moisture, and 50,000-hour lifetime.

TIME OUT BREAKOUT ZONES



FEINSINN, MÜHLDORF, GERMANY

In the staff cafeteria area at this organic supermarket in Bavaria, light is provided by Thorn's Omega recessed modular ceiling luminaires. Designed for the workplace, Omega provides good uniformity, so all areas of the space are well lit and the atmosphere is comfortable. It also offers excellent colour consistency, so the colour of light won't vary between luminaires, or shift over time.

AVTRADE, WEST SUSSEX, ENGLAND

UK-based Avtrade wanted a sustainable solution for lighting the kitchen area at their new headquarters in the south of England. They chose Thorn's Chalice downlights. Chalice is available in two sizes, for 150mm and 200mm cutouts, with lumen packages ranging from 1,100lm to as high as 10,000lm in the high output version.

Avtrade now benefits from a robust and well-designed facility that meets the company's specific needs, complies with stringent planning requirements and meets high standards of sustainability.

CHALICE PRO

IP 54
10,000 LM
50,000 H LIFETIME
Ø 150 – 200 MM

City, University of London, United Kingdom

3 THINGS TO REMEMBER WHEN LIGHTING OFFICES

The science of how light influences our bodies has advanced hugely in the past two decades. But we still have much to learn, and there remains a lack of evidence for how best to put the knowledge into practice in the workplace. In the coming years we can expect to see our knowledge of this area continue to advance. In the meantime there are simple principles that every lighting professional can follow to make sure the lighting in an office creates a healthy, comfortable atmosphere. This means not just focusing on lighting for workplace "tasks", but taking a more holistic approach. The three essential elements to consider when lighting an office are: task, space and face. Lighting schemes that successfully combine all three of these elements will create an atmosphere that is pleasant and productive. Here's how!

01
TASK

02
FACE

03
SPACE

01
TASK

Lighting must provide the right level of light for people to carry out tasks effectively. EN12464 specifies luminance levels for various activities. Older workers and workers with poorer eyesight may need higher levels of light than others. Many offices now place an increasing emphasis on flexible working, online, face-to-face meetings and conversations. Lighting must be flexible enough to work well in all of these situations. Computers, tablets and phones with backlit screens are everywhere in the modern office, so glare that could make these difficult to use must be avoided.

02
FACE

Whether it's a meeting, a video conference or a chat by the water cooler, lighting needs to allow us to see each other's faces clearly. The key factors are cylindrical illuminance, facial modelling and good colour rendering. EN12464 specifies 150 lux cylindrical illuminance at head height and a modelling index of between 0.3 and 0.6. This creates an environment where we feel comfortable, look good, and can see each other clearly enough read our colleagues' expressions, mood and body language. It also makes sure that enough light is reaching people's eyes to keep them alert. Every workplace is unique and will require the lighting of task, space and face to be considered and balanced differently. But keep these three priorities in mind, and you can be confident that your lighting will keep workers performing effectively.

03
SPACE

In the past, office lighting has often focused only on lighting for the task, which usually meant lighting desk surfaces and avoiding glare on screens. This inadvertently created the so-called "cave effect", resulting in gloomy offices and drowsy workers. Considering carefully how we light the space around us avoids these problems, helping to create an environment where workers can feel comfortable and alert. Diffuse, well distributed light with a mix of vertical and horizontal illumination is important. Bright ceilings and upper walls also make a space feel more pleasant. EN12464 specifies light levels for the task area, the immediate surroundings, and areas beyond. It also specifies uniformity levels for task areas, as well as light to walls and ceilings, to make sure there isn't too much contrast between light and dimmer areas.

The colour of light also has an important influence on the ambience of an office. Warmer colour temperatures are associated with relaxation, while cooler lights are considered more appropriate for a work environment. Compromising on colour temperature or colour rendering will have a big impact on the working atmosphere you create. Just as important as making sure there's enough light in a space is making sure there isn't too much glare, which can cause headaches and eye strain, as well as making it harder to see what we're doing, and harder to use computers, phones and tablets. Glare can be controlled through careful lighting design and choosing luminaires with good optical design, to keep office workers comfortable and focused.

THE COST OF GOOD LIGHTING?

IT'S NOTHING COMPARED TO THE COST OF BAD LIGHTING

"IF BETTER LIGHTING CAN MAKE YOUR STAFF 1% MORE PRODUCTIVE, TAKE 1% LESS TIME OFF SICK, OR MAKE 1% FEWER MISTAKES, THEN IT PAYS FOR ITSELF."

There's no two ways about it: good lighting costs money. In fact, the upfront cost of lighting equipment has risen with the advent of LED, even though the whole-life cost of LED products is low thanks to lower energy use and longer life.

Partly because of this higher initial price hurdle, some sellers have focused on promoting the energy-saving potential of LED lighting at the expense of quality. But this has come at the same time as a revolution in the science of how light affects the body, which has produced more evidence than ever before that quality of light in the workplace is crucial for keeping employees healthy and productive. This presents a challenge for lighting professionals because, while the cost of lighting is easy enough to quantify in euros or pounds, it's tricky to put a number on the value of good lighting for businesses. Tricky – but not impossible. To understand the value of good lighting, we first need to understand the cost of people to a business. According to research in the US and the UK, staffing accounts for more than half of a business's total costs, and around 90% of the cost of running an office, eclipsing the cost of buildings and maintenance. With this in mind, the cost of lighting – whether upfront or over time – seems relatively trivial. Let's say that better lighting could make your staff 1% more productive, take 1% less time off sick, or make 1% fewer mistakes. Then the extra investment would easily have paid for itself.

And the evidence is mounting that lighting could easily have those effects.

In a recent study, researchers in the Netherlands placed two groups of office workers under different light conditions for an hour to see what happened – one group under dim lights, one under bright lights. Results showed that light levels affected how alert people felt, their level of attention, and their heart rate. Participants felt less sleepy and more energetic under brighter lights, and had quicker reaction times.

People who like their lights, like their jobs. A study in the United States found that people who said their office lighting was high quality were more comfortable, more satisfied and felt better at work. Other surveys have shown that people who feel disengaged at work are much more likely to say they dislike their lighting.

People are less productive when working under light they don't like. A 2009 survey of office design at banking organisations in Pakistan found a strong correlation between how employees rated their lighting conditions and their productivity at work.

A 1998 survey of six UK offices found a strong link between perceptions of office conditions, including lighting, and work-related illness. Dim lighting and a lack of control over lights have even been implicated as possible causes of so-called sick building syndrome.

WORKPLACE LIGHTING STANDARDS ONLY TELL HALF THE STORY.

Sigma House, Gothenburg, Sweden

Employers the world over are waking up to the huge influence that office lighting has on the health and productivity of their people. But many people still work under light they find uncomfortable. Key tools for fixing this are the various established standards and guidelines on office lighting. But simply adhering to the standards is not enough. It's perfectly possible to follow the recommendations and still come up with a poor lighting design. We need to look at the bigger picture.

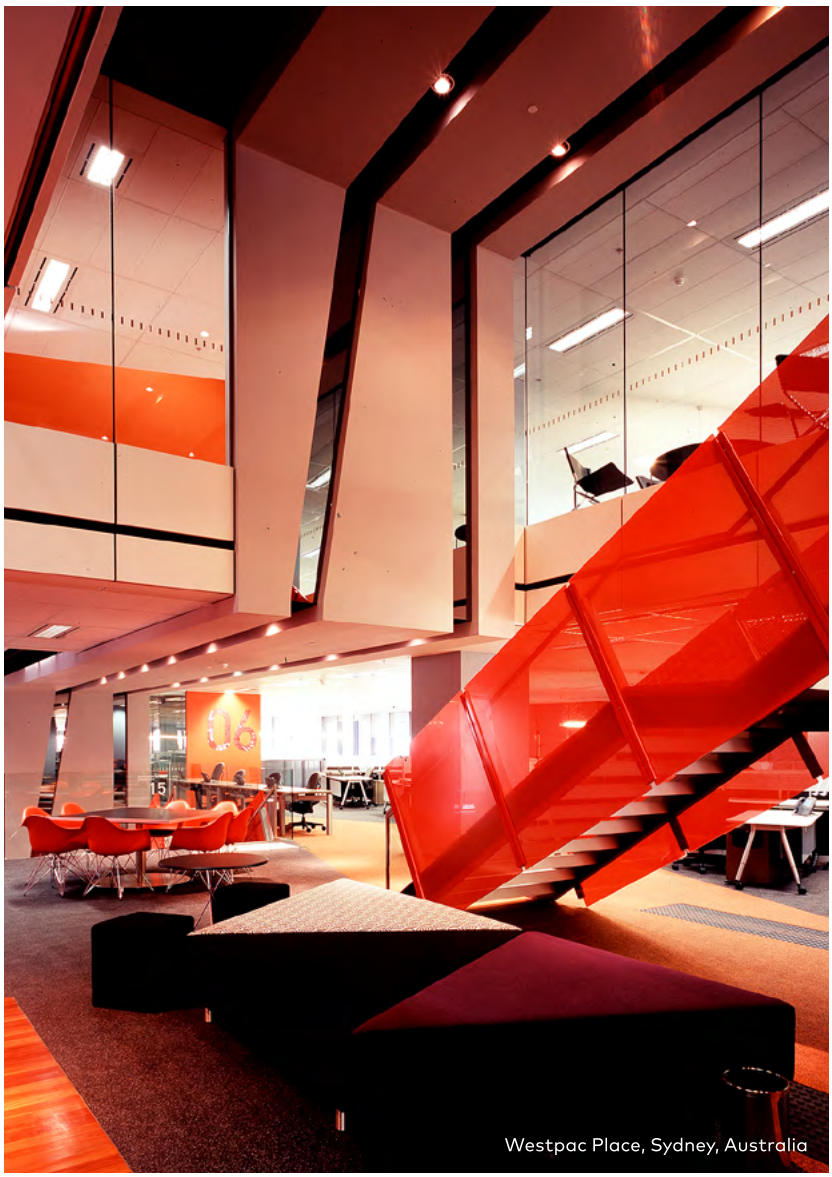
Historically, the focus of lighting for offices has been on visual performance, comfort and aesthetics. The most important factors are light levels, distribution, colour rendering and glare, all of which are covered in the European standard for workplace lighting, EN12464, and in numerous office lighting guidelines. But these factors only tell part of the story of how lighting affects people at work.

Going beyond Standards

Humans evolved by the light of the sun, and our bodies use the sun's light to see, but also to set our body clocks and control our sleep-wake cycles.

HERE'S THE OTHER HALF

This means the right light at the right time keeps our minds alert and our bodies running smoothly. Too little light – or too much at the wrong time – disrupts our natural rhythms. Unfortunately, most of the guidelines used for lighting offices were developed before such effects were understood. For example, when computers became commonplace in offices in the 1980s, it was recommended that offices be lit with high levels of horizontal illuminance and lower levels of vertical illuminance, to avoid glare on screens. Luminaires that met these requirements became the norm in offices. The unintended consequence was to limit the amount of light getting to people's eyes, meaning that workers weren't getting enough light to keep them alert. In a 2005 study using mock-up offices, lower levels of vertical illuminance were found to be linked to greater fatigue and worse sleep. The researchers came to the conclusion that the lighting in the majority of offices would not provide enough vertical illuminance, even if it met the standards. Similarly, a study by Thorn's sister company Zumtobel and the Fraunhofer Institute for Industrial Engineering found that a majority of people preferred light levels of 800 lux or higher in an office setting – even though EN12464 only specifies 500 lux for desk-based tasks and 300 lux for filing and administration. EN12464 also recommends maximum glare levels for different tasks, using the unified glare rating (UGR) metric. But UGR doesn't capture everything. Recent research shows that a direct view of multiple small, intense light sources, such as the bright spots of LEDs in a ceiling light, can appear more glary than a single source – something that UGR does not predict. Standards and guidelines provide a valuable baseline and help us avoid common mistakes, but coming up with a truly healthy lighting design requires a more holistic approach. What if, instead of judging the effectiveness of lighting by how much light the luminaires emit and how much electricity they use, we judged it by its value in creating a place to work that keeps people healthy and delivering their best? The knowledge, experience and judgement of a good contractor can make the difference between good and bad office lighting for the client. Thorn's workplace lighting products put people at the centre of lighting design. Good design and an appreciation of how light affects people allows us to create lighting that supports comfort and wellbeing, while also being affordable, and easy to install and maintain. We do this by following the simple principles of lighting for the task, space and face. If the task can be clearly seen, the space is comfortable to be in and faces are lit clearly and evenly, then we will have created a well-lit workplace.Lighting standards are a huge help, but use them with care. Your own advice and judgement on what works can add considerable value for your customers.



Westpac Place, Sydney, Australia

BAD OFFICE LIGHTING

For millions of office workers, poor lighting is a fact of life. But now, employers are waking up to the consequences


BAD OFFICE LIGHTING

FOR MILLIONS OF OFFICE WORKERS, BAD LIGHTING IS A FACT OF LIFE.

"The fact that so many employees dislike their lighting is worrying enough."

In a recent survey conducted across 17 countries by polling company Ipsos, a quarter of people said they were unhappy with the lighting in their offices. Another study by Zumtobel Lighting and the Fraunhofer Institute for Industrial Engineering found that four out of five workers had little or no control over their lighting – even though this was one of the most important factors affecting how satisfied people were with their working environment.

The fact that so many employees dislike their lighting is worrying enough in itself, but a wealth of evidence shows that it also has a very real impact on people's health and wellbeing – and therefore how well they perform at work. A number of studies have shown that people who like the lighting in their workplace are more satisfied with their jobs, less likely to take time off sick, and more productive.

In fact, employers the world over are waking up to the huge impact that the office environment has on the health and productivity of their people, and lighting is a key part of that picture.
So why does bad lighting persist? One reason is that employers don't realise how bad it is – or that it matters. It's only in recent years that scientists have really understood how light influences the body, however most of the guidelines for lighting offices were developed before such effects were known. As a result they have focused mainly on whether people could see well enough, and not on whether the light kept them comfortable and alert.

In some cases the guidelines may even have made problems worse – for years it has been recommended that offices be lit with high levels of horizontal illuminance (to light desks), and low levels of vertical illuminance, to avoid glare on computer screens. The unintended consequence was to limit the amount of light getting to people's eyes, making it harder to stay alert. The result? Gloomy offices and drowsy workers. It's an example of lighting that focused only on the task at hand, without considering people themselves and the office environment. To create a healthy, comfortable atmosphere, office lighting design should take into account three key considerations: task, space and face.

For an employer, the cost of upgrading lights pales in comparison to the cost of employing people, so better lighting can easily pay for itself. If lighting makes staff just a tiny bit more productive, take a little less time of sick, or make slightly fewer mistakes, then it's a wise investment - and evidence about lighting's effect on performance at work suggests it is possible for lighting users to make such improvements.

All that's needed is for businesses to assess their lighting not by how much light the fittings emit and how much electricity they use, but by the working environment they create.

OFFICE LIGHTING
THE GOOD & THE BAD

Lighting can make the difference between a comfortable, productive workplace and somewhere people can't wait to get away from. Here's how to get it right.

✓ GOOD

LIGHT DISTRIBUTION
Light is bright enough to see clearly, but not glary. Light should be soft and evenly distributed, with a good mix of light that falls on horizontal surfaces such as desks, and vertical surfaces such as displays and – crucially – faces.

CEILINGS AND UPPER WALLS
Bright ceilings and upper walls make the office feel spacious and airy. It also helps workers stay alert, as our eyes are designed to look for daylight from above.

EFFICIENCY
Lights use efficient modern light sources such as LED, and the lighting is properly designed to put light where it's needed without waste. Controls help keep energy use down even further.

PERSONALISATION
Task lighting and controls give workers the chance to adapt the light to their personal needs, preferences and tasks.

FLICKER
High-quality luminaires mean there's no flicker – either visible or invisible. Staff can relax and get on with their work.

LIGHT LEVELS
Lights are bright enough to see by, and appropriate for the tasks being carried out. Lighting standards give guidance on what levels to go for, but it also depends on individual preferences.

COLOUR
Good lighting has a high colour rendering index (CRI) to show colours faithfully. The colour temperature of the light will be appropriate for a workspace – typically around 4000K.

VISUAL INTEREST
Good lighting highlights areas of visual interest – e.g. breakout areas, displays or decorative items. It's good for our eyes to be able to focus on items nearby and far away, and it makes the whole space more pleasant.

EMPLOYEES
Happy, healthy and productive.

✗ BAD

LIGHT DISTRIBUTION
All the light reflects flat on to desks, with not enough falling on vertical surfaces. This makes it harder to see colleagues' faces, and can mean that not enough light reaches the eye to keep people alert.

CEILINGS AND UPPER WALLS
Poorly designed lighting sends all the light downwards, leaving ceilings and upper walls are dark and dim: the dreaded cave effect.

EFFICIENCY
Luminaires use inefficient sources and light is wasted shining out of windows or into areas where it isn't used. Lack of controls mean lights are left on even when no one is there.

PERSONALISATION
Without any control, staff are stuck with whatever the general lighting in the office is.

FLICKER
Poor-quality luminaires flicker – which is annoying and bad for the health. Even invisible flicker has been shown to have an effect on people's ability to work.

LIGHT LEVELS
Lighting that's too dim prevents people doing their jobs properly, and leaves staff feeling drowsy.

COLOUR
A low colour rendering index makes faces look unnatural and colours of objects hard to make. Colour temperature that's too low or high can also make offices uncomfortable.

VISUAL INTEREST
Care hasn't been taken to light items of interest, making the office dull and leaving workers stuck with only their own desks to look at.

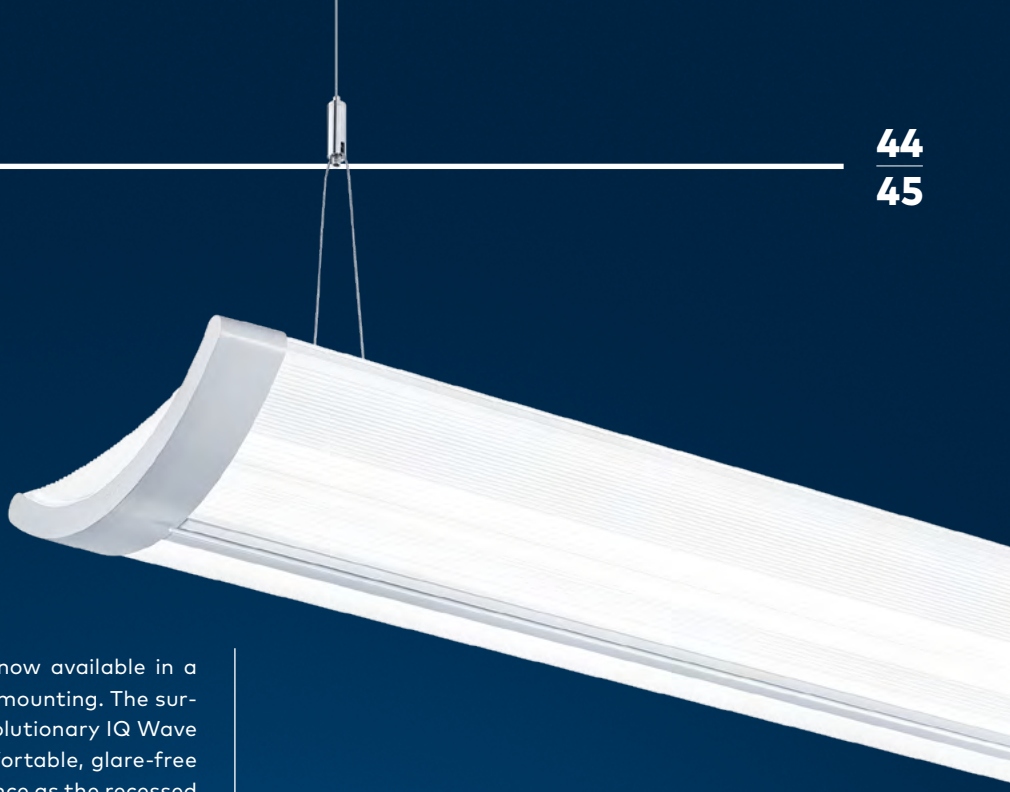
EMPLOYEES
Uncomfortable, sleepy, think they might be getting ill, so taking tomorrow off to look for other jobs.

CHALICE

Thorn's Chalice family of downlights are a popular choice for illuminating corridors, reception areas and more. Offering an energy-efficient replacement for conventional CFL downlights, Thorn's Chalice family of luminaires, including Chalice and Chalice Pro, provide great performance, while keeping energy consumption and running costs to a minimum. This highly versatile luminaire is ideal for a variety of office applications. Chalice is available in two sizes, for 150mm and 200mm cutouts, with lumen packages ranging from 1,100 to as high as 10,000lm in the high output version. And with our new surface-mount housing, Chalice can now be mounted in high-ceilinged areas or spaces with exposed ceilings. Fixed output, DALI dimming and emergency options are available. Efficacy reaches as high as 110lm/W, and maintenance costs are low, thanks to its IP54 rating and 50,000-hour lifetime.

EMERGENCY LIGHTING

When lighting any workplace, it's vital to consider emergency lighting - it's a legal requirement, and it can save lives. Choosing emergency lighting from a reputable supplier like Thorn gives you and your customer peace of mind that it meets the relevant standards and will perform when needed. By considering emergency lighting at an early stage in conjunction with general lighting, you can save time and money, and come up with a more elegant and less obtrusive solution for the client. Thorn's Voyager family of products covers every emergency lighting need. Voyager LED is Thorn's compact emergency ceiling luminaire, and is now compatible with central supply systems, as well as being available as a self-contained luminaire. Voyager Solid is a high-performance emergency bulkhead with a range of sizes and mounting options. Voyager Style is an ultra-slim emergency luminaire, just 37mm thick. Voyager Fit is a super-compact LED emergency module for installation in ceilings, requiring a ceiling hole of just 43mm and a void height of just 80mm. Voyager Twinspot LED is designed for large and high-risk outdoor areas, and features adjustable heads, making it suitable for any setting.



IQ WAVE

SURFACE/SUSPENDED

Our innovative IQ Wave luminaire is now available in a new version for surface or suspension mounting. The surface/suspended version of Thorn's revolutionary IQ Wave office luminaire shares the same comfortable, glare-free illumination and sleek, simple appearance as the recessed version. IQ Wave Surface/Suspended is available with lumen packages ranging from 2600 to 6700lm and in lengths of 1200mm and 1500mm, which can be joined together in an unbroken line, to create a clean, minimal look. The unique optical design also saves energy thanks to its exceptionally high efficacy of 103lm/W, and control options allow even more energy can be saved, with PIR and microwave sensors for presence/absence detection and daylight dimming.

RECESSED

The revolutionary IQ Wave ceiling luminaire creates comfortable light for healthier, more productive offices. IQ Wave is an innovative range of LED luminaires for offices. Building on Thorn's deep understanding of how light affects the human body, IQ Wave provides light to support comfort, wellbeing and alertness. It achieves this thanks to Thorn's patented MV-Tech optic, which creates homogenous, low-glare ambient light with no visible LED dots. The MV-Tech optic works by mounting the LEDs in the luminaire to point upwards, then reflecting light down from the back of the fitting to create a soft, even glow. IQ Wave comes in a standard 600mm x 600mm size, making it easy to install in new or retrofit projects. Integrated sensors make it easy to use with controls.

OMEGA

The Omega family of edge-lit luminaires cover all areas of the workplace, offering great visual comfort and efficiency. Designed specifically for offices and other workplaces, Thorn's Omega family of ceiling luminaires make it easy to directly replace traditional fluorescent fittings and save more than 50% on energy. These recessed fittings can now also be surface-mounted or suspended, giving more flexibility of installation and design, and covering numerous workplace applications. Omega's Light quality is better than ever, with colour consistency now within three MacAdam ellipses – so users know the colour of light won't vary or shift over time. Manufactured in Europe, Omega fittings are rated IP44 for protection against dust and moisture, making them suitablet for environments such as restrooms and hospitals.

"Our innovation rooms concept provides an experimentation area within our own office space where we can try new workspace technologies before we deploy them into our customer's buildings. Working in partnership with Zumtobel Group Services to test and develop their new lighting concepts, which both optimise energy consumption and gather useful data about how the space is utilised to improve the customer experience, is a great example of true innovation in action."

Neil Pennell, Head of Engineering and Design, Land Securities Group PLC recently realised a project with ZGS and is impressed.

LIGHT AS A SERVICE

In conversation with Florian Reithmeier, Executive Vice President of Zumtobel Group Services. In May 2017 the Zumtobel Group introduced a new brand to the lighting market: Zumtobel Group Services (ZGS). As the name suggests, ZGS offers one of the most comprehensive ranges of services in the lighting sector. We spoke with Florian Reithmeier, Executive Vice President of Zumtobel Group Services, about the role and objectives of this new organisation and asked specifically how ZGS is unlocking the potential of lighting solutions in the office sector.

Mr Reithmeier, the scope of Zumtobel Group Services extends far beyond conventional lighting solutions. What exactly is the concept behind the ZGS brand?

The advent of LED technology has revolutionised the lighting industry. We can now take advantage of unprecedented levels of intelligence and flexibility to help light meet defined needs. However, these changes have also made lighting installations even more complex. Clients increasingly want a centre of expertise to assist them with their projects - which is exactly where Zumtobel Group Services (ZGS) comes in. We bring together all the different services from the Zumtobel Group under one roof. It is our aim to be a full-service supplier, providing expert knowledge and support - from the initial concept through to installation, maintenance and beyond. Customers can access everything quickly and easily from one single source. All the Zumtobel Group brands now incorporate ZGS services into their offer and talk to clients about the benefits of services like lighting contracting, turnkey project management and maintenance contracts for lighting controls and emergency lighting systems.

Can you give us a full list of the services offered by ZGS?

As I mentioned earlier, we want to free clients from the burden of complexity associated with modern lighting installations by offering turnkey project management. ZGS looks after project specification and planning (including all the project and property documentation required by law) and manages the supply of luminaires and control modules, while also organising the removal of old systems and the installation of the new lighting solution. Our range of services even covers invitations to tender and the management of external service providers. In order to provide specialist planners and developers who can guarantee the best possible support, ZGS clients can additionally take advantage of turnkey project management with integrated maintenance and servicing contracts. Our technical experts help clients all over the world with their lighting needs and always ensure full compliance with relevant standards and official requirements – covering everything from com-

Florian Reithmeier
Executive Vice President
of Zumtobel Group Services

missioning and training to complete life-cycle management. The comprehensive ZGS portfolio also features an exciting optional extra: Clients can now choose to finance their full-service offer over several years in the form of a service contract. Our range of data-based services in the Internet of Things is another highlight, enabling us to give clients new insights into the processes and management of buildings and paving the way for pioneering initiatives in the sphere of connected buildings, shops and cities.

What role do digitisation and the Internet of Things play in your range of services? How can ZGS support clients in this area, especially in the office sector?

We believe that the Internet of Things will really come into its own in the sphere of lighting. Wherever there are people, there is artificial light. And where there is artificial light, there has to be a power supply and often also a data network that is already being used for lighting management. This network can easily be extended to cover additional functions. Ultimately, the purpose of the Internet of Things is to record and collect data for evaluation at a central point, creating fantastic new benefits for the client. That is our service offer.

This shift opens up completely new opportunities in office buildings. Using the sensors integrated into luminaires, we can obtain vast quantities of information and translate this into clear and relevant knowledge for the client via cloud-based data visualisation. This helps building operators to fully understand how areas are being used. For example, are flexible workstation concepts really a success? Is the use of space being truly maximised? Are there enough

meeting rooms? The ultimate aim is sustainability. Optimising the use of space can not only save energy but also costs, especially when it comes to extensions and modifications. One other data-based service offered to clients is remote monitoring. This enables building managers to actively monitor the entire system and easily access information about the energy consumption of the lighting system or the actual operating hours of individual luminaires.

What are your own thoughts about the launch of ZGS?

As part of the Zumtobel Group, ZGS means that we are fully prepared for the future – a future in which the Internet of Things will be everywhere and services will take on increasing importance. The last months have been just the start of an exciting journey. I am really looking forward to working with our team to offer clients the best possible service and genuine added value.

With the Land Securities Group PLC, the United Kingdom's largest commercial real estate company, ZGS has launched a joint demonstration project. It indicates opportunities for space management and the benefits offered by connected lighting for commercial buildings. At the Land Securities London headquarters, various data-based lighting solutions are currently being installed in three conference rooms.


90
YEARS
EST. 1928

LIGHTING THE PAST AND THE FUTURE

Thorn Lighting celebrates its milestone 90th anniversary on 29th March 2018 and the company remains a major force in the global lighting industry.

The Thorn story begins in March 1928 when Jules Thorn started what would become one of Britain's most successful businesses, with a simple mission: to make great lighting easy.

Born in Austria in 1899, Jules Thorn first came to Britain as a sales rep for a company making gas mantles. But he soon decided to set up on his own company, and founded the Electric Lamp Service Company Ltd.

The new company quickly went from servicing lamps to manufacturing them, and later diversified into luminaires, domestic appliances, TVs and radios. In 1936, under the new name Thorn Electrical Industries Ltd, the company floated on the London Stock Exchange. By 1959 it was the tenth biggest company in the UK, and in 1964 Jules Thorn received a knighthood from the Queen.The company has always been a pioneer of cutting-edge lighting technology, and was instrumental in developing and producing high-pressure sodium lamps in Europe, a full ten years ahead of its competitors. The company grew to become a major player in the global lighting industry, and in 1994 the lighting business broke off from the rest of the group. In 2000 Thorn joined the renowned Zumtobel Group, positioning it for further global growth.

Thorn's insistence on quality, and dedication to making lighting easy, has helped establish its reputation as a globally trusted supplier of smart, high-performance LED lighting. The future looks even brighter than the past.

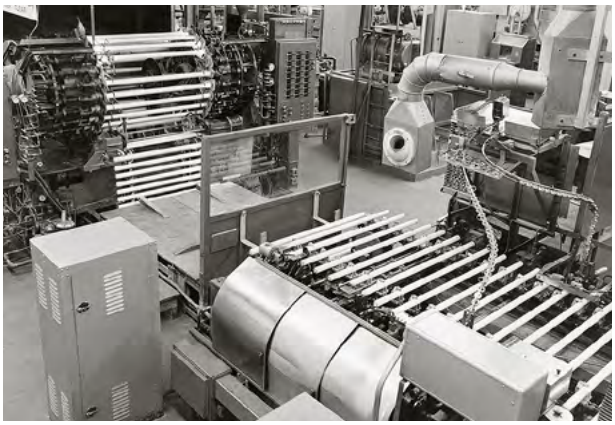
WATCH OUR ANNIVERSARY MOVIE
THORNLIGHTING.COM/90YEARS

1928

It was March 1928 when Jules Thorn started the Electric Lamp Service Company. The main focus was selling electric light bulbs and radio tubes.

1936

Thorn was listed on the London Stock Exchange in 1936, the five-shilling shares were oversubscribed 36 times!

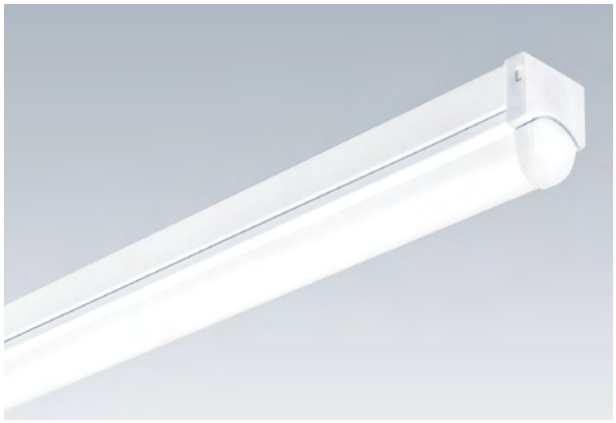


1948

Thorn Electrical Industries is the first European manufacturer to start the mass production of fluorescent tubes.

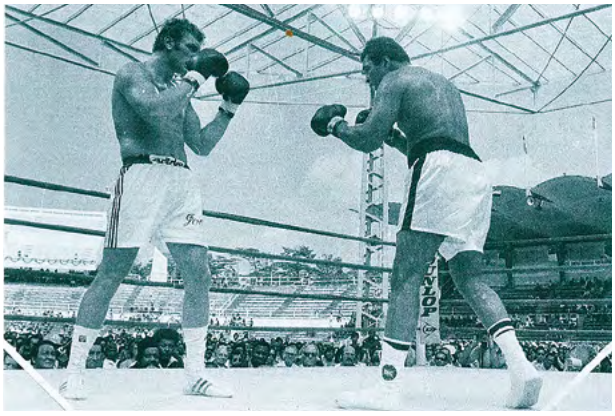
1954

The hugely successful PopPack (initially known as Popular Pack) was launched.



1967

Thorn starts the first production of high-pressure sodium lamps – 10 years ahead of the competition.



1975

Thorn illuminated the famous fight between Joe Bugner and Muhammad Ali in Kuala Lumpur

90 YEARS
EST. 1928

1983

Mission: SPACE! Well, almost! In 1983 we lit up the famous Epcot Centre in Disney World.

1995

By 1995 the famous batten luminaire Poppack had sold 60 million pieces, so the Queen paid a visit to Spennymoor on 13th October 1995.

2000

Thorn Lighting became part of the Zumtobel Group.

zumtobel group

2018

We are excited to be part of a technical revolution and we work constantly to maintain our high standards, helping you get your job done.

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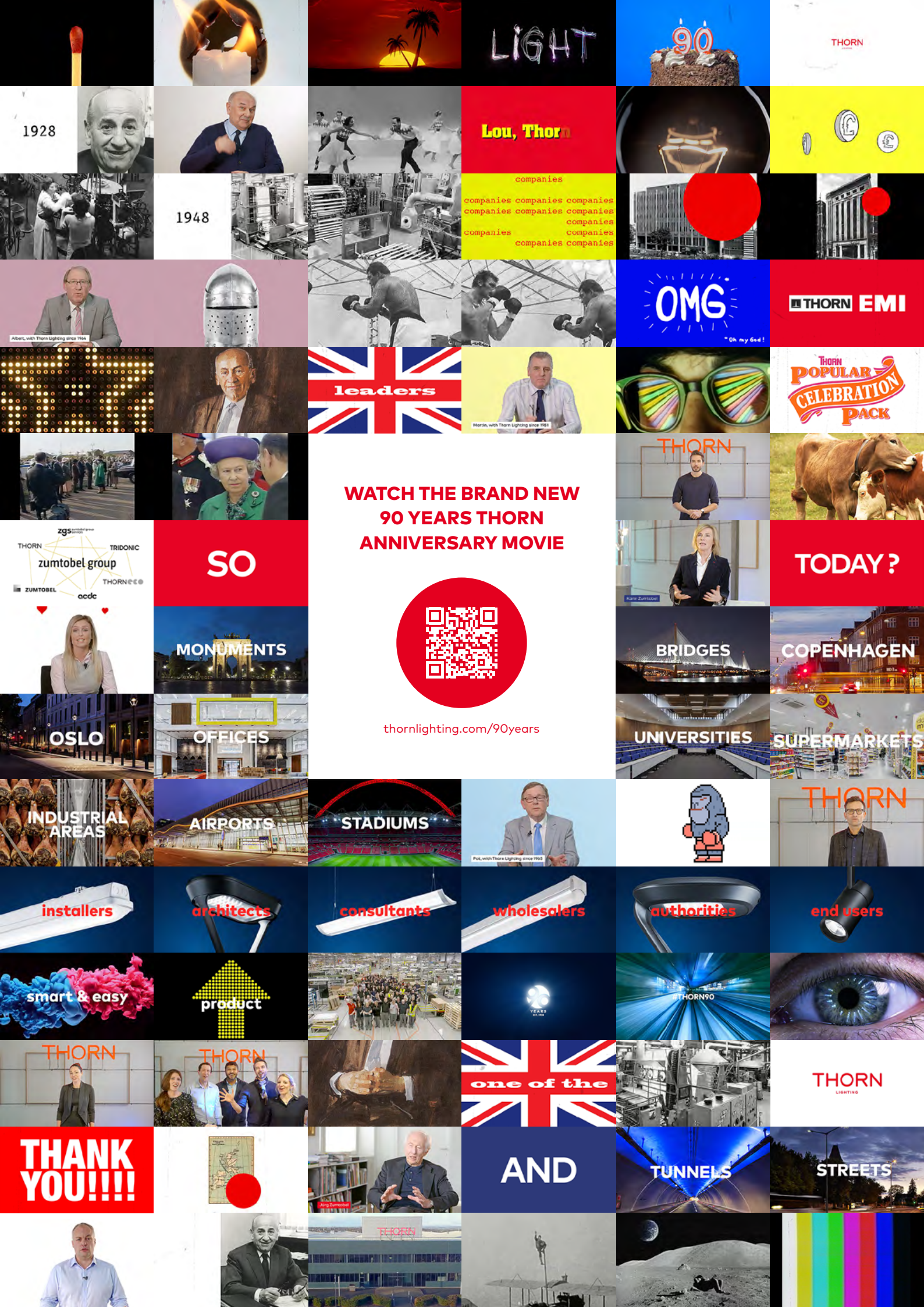
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