

THE BIG GUIDE TO GOOD WORK LIGHTING



“

A well-lit environment makes us feel safe and allows us to work easier. In a well-lit environment we can focus on the things we want to do instead of being disturbed by uncomfortable lighting, glare and hazy colour rendering.”

- PER-ARNE TORSTENSSON, SENIOR OPTICAL ENGINEER AT TYRI -



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WHEN QUALITY MATTERS THE MOST

While many LED work lights may look similar, what's inside them and how they are tested makes all the difference. TYRI uses premium components, precision manufacturing, and rigorous testing to ensure every light delivers reliable, consistent performance in demanding environments. When quality matters, TYRI delivers lighting you can depend on.

EFFECTIVE LUMENS — NOT JUST THEORETICAL

Many manufacturers highlight theoretical lumen values, but TYRI focuses on effective lumens — the actual usable light output under working conditions. This ensures you get the visibility you expect.

ENGINEERED FOR DURABILITY

TYRI lights are built to withstand the toughest environments. Most products are rated to IP69K, offering protection against dust, moisture, and even high-pressure cleaning.

PREMIUM BUILD AND COOLING SYSTEMS

Lower-cost alternatives frequently compromise on material quality, which can lead to early failure in demanding environments. TYRI uses high-grade components, advanced cooling systems, and corrosion-resistant coatings to maximise both performance and operational lifespan.

SEALED AND SECURE CONNECTIONS

Poor-quality connections are a frequent point of failure in

cheaper lights. TYRI lights use sealed Deutsch connectors, offering robust, long-lasting protection against moisture and vibration.

TAILORED LIGHT PATTERNS FOR MAXIMUM EFFICIENCY

Light scatter and poor beam patterns can render even a powerful light ineffective. TYRI offers a wide range of beam patterns tailored to specific applications — from forklifts to agricultural machinery — ensuring light goes exactly where it's needed, enhancing safety, reducing eye strain and increasing productivity.

ELECTROMAGNETIC COMPATIBILITY (EMC)

Every light emits electromagnetic fields, and low-grade options can interfere with nearby electronics. TYRI lights are tested for EMC compliance, meaning they won't disrupt onboard cameras, sensors, or control systems — especially important for modern machinery.

TESTED. TRUSTED. TYRI.

With decades of industry experience and partnerships with OEMs worldwide, TYRI has built a reputation for quality, performance and innovation. Every product is rigorously tested — including for shock, vibration, water ingress, electromagnetic compatibility, humidity and heat tolerance — to ensure it's ready for even the most demanding environments.

Whether you're harvesting crops, operating heavy machinery, or working in extreme conditions, TYRI delivers lighting solutions that are optimised, reliable, and built to last.





10 REASONS FOR UPGRADING FROM HALOGEN TO LED

1. PRICE

Halogen lights tend to come at a lower cost than LEDs and provide a reasonable level of light. However, once the bulb blows, you're forced to stop work to replace it, costing time, revenue, and productivity. While LEDs are more expensive initially, they reduce energy usage, lower running costs, and help prevent downtime. On average, LED work lights pay for themselves within 24 months.

2. EFFICIENCY

LEDs draw less power than halogens, reducing the load on your machine's battery. This frees up energy for other systems like GPS, onboard computers, or additional lighting. Additionally, with less energy required, fuel consumption is reduced, leading to lower operating costs.

3. REDUCED MAINTENANCE

LEDs contain no filaments or moving parts and can last up to 40,000 hours*, often matching the lifespan of your machine. This reduces maintenance requirements and cuts downtime caused by lighting failures.

4. DESIGN FLEXIBILITY

Thanks to their compact design, LEDs can be installed in tighter spaces for more precise illumination. TYRI works closely with equipment manufacturers to create lighting solutions that deliver on performance, quality, and visual appeal.

5. DURABILITY

LEDs are built using solid-state construction - no fragile filaments, bulbs, or electrodes. This makes them far more resistant to vibration and impact, ideal for vehicles operating on rough or uneven ground where halogen lights may fail.

6. LIGHT DISBURSEMENT

TYRI LEDs are available with a range of beam patterns, allowing light to be directed exactly where it's needed. This ensures optimal illumination while reducing glare for surrounding workers and other operators.

7. ECO FRIENDLY

TYRI uses high-quality materials, and many of our lights are designed for easy disassembly. Reusable parts are clearly marked for recycling. All our waste electronics are ground down, with recyclable metals recovered and reused.

8. REDUCED EYE FATIGUE

TYRI LED work lights typically emit light at a colour temperature of 5,700K - similar to the midday sunlight. This helps the human eye see more clearly and reduces strain during long working hours.

9. FASTER START-UP

LEDs reach full brightness almost instantly and operate at much lower temperatures than halogens, improving efficiency and increasing safety around the machine.

10. COMPLIANCE AND RATING

TYRI lights are built to withstand extreme environments. Each light undergoes thorough testing to ensure it performs reliably on all types of machines.

**40,000 hours are based on LED manufacturer data under test conditions and does not represent a warranty statement.*



High CRI



Low CRI

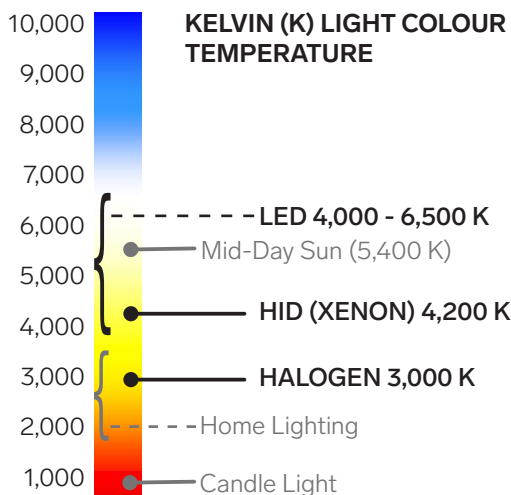
UNDERSTANDING COLOUR TEMPERATURE AND CRI

Colour temperature and Colour Rendering Index (CRI) are often confused, but they serve different purposes, and both play a critical role in effective work lighting. At TYRI, we use both to tailor lighting solutions to specific environments and applications.

WHAT IS COLOUR TEMPERATURE?

Colour temperature describes how “warm” or “cool” a light appears and is measured in Kelvins (K). LED lights range from warm yellow tones (lower K values) to cool blue tones (higher K values).

The human eye generally performs best under lighting that mimics natural midday sunlight, around 5,400 K. This level of light offers a balance of clarity, comfort, and visibility, helping to improve both safety and productivity.



It might seem intuitive to choose the brightest, whitest light available, but excessive brightness - especially with a high blue content above 6,000 K - can lead to glare and operator eye strain. In contrast, in snowy or dusty environments, warmer lights with lower colour temperatures can reduce glare and improve contrast.

TYRI helps you find the right balance, providing expert guidance to ensure your lighting suits your specific working conditions.

WHAT IS CRI (COLOUR RENDERING INDEX)?

While colour temperature defines the appearance of the light, CRI measures how accurately a light source reveals colours compared to natural daylight. The CRI scale runs from 0 to 100, with natural sunlight rated at 100.

A higher CRI means more natural and vivid colour reproduction, which is critical for applications where colour distinction matters. Low-CRI lighting can make colours appear dull or distorted, reducing visibility and increasing the risk of error.

Most standard LEDs offer a CRI of 70. However, TYRI also provides lights with a high CRI of 90, ideal for operators needing enhanced colour accuracy - whether distinguishing between rocks and soil or assessing the maturity of crops during harvest.

TYRI'S STANDARD & ADAPTIVE SOLUTIONS

TYRI's LED work lights typically have a colour temperature around 5,700 K and a CRI of 70, offering a strong balance of brightness and performance. Our popular 1010 range is available in various configurations, allowing you to choose the right brightness and colour temperature for your application.

All TYRI lights are manufactured in ISO-accredited facilities and undergo rigorous testing for durability and compliance — including IP69K sealing, CISPR 25/EN55025 EMC standards, and resistance to vibration, extreme temperatures, and salt spray.

INNOVATION WITH INTELLILIGHT®

At TYRI, we understand that the optimal colour temperature can vary depending on weather conditions, environment, and the task at hand. That's why we developed INTELLiLight® — a market-first system that allows operators to adjust both brightness and colour temperature in real time.

With a range from warm yellow (2,800 K) to cool blue (6,500 K), and dimming from 0–100%, INTELLiLight® gives operators complete control to adapt lighting to suit any condition.

This level of flexibility supports different operators and changing environments. For example, older operators may need more light due to natural changes in vision, while younger users may prefer lower intensity. INTELLiLight® lets each person customise their lighting to their exact needs — and save their preferences.

The system can be integrated into a vehicle's CANbus system for automatic adjustment, or controlled via TYRI's award-winning app or remote control, making it easy to respond to changing environments.

"INTELLiLight® improves the entire work environment for operators. It provides personalised lighting that adapts to each unique situation," explains Christian Wadell, TYRI's Head of Research and Development.

LIGHTING THAT WORKS FOR YOU

By understanding and combining colour temperature and CRI, TYRI ensures your lighting solution is tailored to your task and environment. Whether you're working in low contrast, dusty fields or colour-sensitive applications, we provide the visibility you need, without eye strain or glare.



THE GAME CHANGER

At TYRI, we've always been keen to understand our clients' working environments. That's how we continue to create innovative solutions that improve the operators' working conditions. INTELLiLight is our new and revolutionary way to connect light sources in a wireless network mesh. Allowing the operator to adjust colour temperature, actively dim and group/regroup all connected lamps. Designed and engineered for a better working environment.

A dream for operators.

ADJUST COLOUR TEMPERATURE



Operating in snow, fog or dust greatly reduces your line of sight. INTELLiLight enables the operator to seamlessly adjust colour temperature from 2 700 K to 6 500 K creating a clearer line of sight.

ACTIVELY DIM



Dealing with reflections off the bucket, other vehicles or even snow can create glare, this however can easily be adjusted by simply dimming your lights via the TYRI app or the remote control.

GROUP. REGROUP



Use the app or remote control to group and regroup an indefinite number of light sources in a wireless mesh network for perfect lighting in every unique working situation.

INTELLiLight®

For more information visit tyrilights.com



ANTI GLARE WORK LIGHTS

How Asymmetric Lenses Enhance the Work Environment

TYRI offers a wide range of work lights, including one of the most extensive offerings of lens pattern configurations on the market. Among these are asymmetric lens options, specifically designed to improve safety and reduce eye fatigue for those working around heavy machinery.

WHAT IS AN ASYMMETRIC LENS?

An asymmetric lens directs the light beam downward from the lamp. The light intensity distribution is tailored to give more uniform illumination than symmetric. This targeted illumination focuses light on a specific work area rather than spreading it broadly, making it ideal for applications where precision lighting is required.

By concentrating the light in this way, asymmetric lenses reduce glare for operators and nearby personnel, contributing to a safer, more comfortable work environment. This glare reduction also helps to minimise operator fatigue, which can lead to increased efficiency and productivity.

ENGINEERED FOR PERFORMANCE

TYRI's asymmetric lenses are developed by our in-house R&D team using advanced optical engineering software. These specially designed optics create a horizontal cut-off in the beam, redirecting light precisely where it's needed while limiting light that could cause discomfort or distraction.

KEY BENEFITS

- Improved safety: Minimises the risk of dazzling other operators or workers nearby.
- Enhanced productivity: A symmetric light helps reduce fatigue, supporting better performance.
- Optimised for machine cabs: Particularly effective when mounted on top of cabs, directing light to the ground where work is taking place instead of losing light above the machine.

FLEXIBLE OPTIONS

Asymmetric lens configurations are available across a variety of TYRI models, with different lumen outputs,

colour temperatures and horizontal spreads, to suit your specific needs.

Not sure which option is best for you? Our team is here to help - just get in touch and we'll guide you through the selection process.

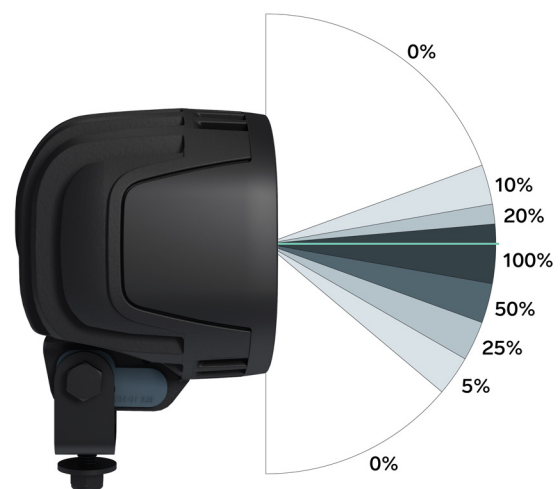
EASY INTEGRATION WITH TYRI LIGHTS

TYRI work lights are designed for flexibility and ease of use. Many models support interchangeable lenses, making it simple to switch to an asymmetric configuration without needing to replace the entire light unit. This can be done on-site, saving time and reducing machine downtime.

All TYRI lights are built to the highest standards:

- IP69K rated for maximum protection against dust and water ingress
- Rigorously tested for shock and vibration resistance
- Selected asymmetric patterns are certified to ECE R10 (E-rating) standards

With durable construction, broad compatibility, and easy maintenance, TYRI work lights deliver long-lasting performance in even the toughest environments.



Light intensity of an Assymmetric Lens Pattern.



DIFFUSED LIGHTING

How Diffused Lighting Improves Visibility in Confined Spaces

The lens pattern of a work light controls how light is distributed. TYRI develops advanced lens technologies that minimise glare and provide uniform light coverage, ideal for enclosed or compact spaces.

WHAT IS DIFFUSED LIGHTING?

TYRI's diffused lens spreads light widely, making it perfect for tight working areas where long-distance illumination isn't necessary. This soft, even light reduces glare and eye strain, especially when working close to the light source.

TYPICAL APPLICATIONS

Diffused lighting is ideal in areas where visibility and comfort are critical. Common applications include:

- Service lights under cabs or in engine compartments
- Ladder and hitch lights on tractors
- Wheel lighting on heavy trailers or drills
- Side lights on underground mining equipment
- Interior and exterior lighting on service vehicles

The broad light distribution helps the eye adjust quickly, reducing fatigue and improving clarity.

RECOMMENDED MODELS

TYRI offers a broad range of diffused lighting solutions. Here are two popular options:

- 0606 Diffused (400 and 700 effective lumen): Compact and low output, ideal for engine compartments and tight spaces.
- 1010 Diffused (500, 1000, 1500 effective lumen): Available in three outputs. The 500-lumen version has a 1.5 m reach with a soft spread. Higher outputs extend to 3 m for greater coverage.

TYRI's full range includes multiple sizes, outputs, and mounting options. Contact our team to find the best solution for your application.



TYRI 0606 Diffused & 1010 Diffused.



WHAT'S IN A LUMEN?

Understanding Theoretical vs Effective Lumen Output

When choosing LED work lights, understanding lumen ratings is key to making an informed decision. Here's a breakdown of what the most common terms mean—and which ones truly reflect real-world performance.

THEORETICAL / CALCULATED / RAW LUMEN

This is the maximum light output an LED can produce in ideal, lab-based conditions, before any external factors such as optics, reflectors, or heat are considered.

Think of it like a car's fuel economy rating: a manufacturer might claim 70 miles per gallon, but that's under perfect conditions—no wind, constant speed, and no gear changes. Similarly, theoretical lumen values rarely reflect the actual light you'll experience in the field.

COLD LUMEN

Cold lumen refers to the output measured immediately after the light is switched on. It accounts for some real-world factors and is lower than the theoretical rating. However, this output continues to drop as the light heats up during operation.

EFFECTIVE LUMEN

Effective lumen is the most accurate and practical measurement. It shows the actual light output after the LED has been running for a sustained period, typically around two hours, once it has reached its operating temperature. This value considers losses due to heat, lens materials, and optical design.

This is the number you should trust when comparing LED work lights.

WHAT SHOULD YOU LOOK FOR?

- Prioritise effective lumen ratings. If a supplier only provides theoretical values, be cautious - the light may not give the output stated.
- Check for quality standards. Look for IP (Ingress Protection) and EMC (Electromagnetic Compatibility) ratings to ensure you get a light which gives the output you need and stands up to the harsh environment your vehicle operates in.

SAFETY FIRST

Choosing the Right Visual Warning Lights

In today's bustling industrial environments, such as warehouses, ports, and factories, ensuring the safety of pedestrians and operators is more crucial than ever. With numerous machines functioning simultaneously, choosing the appropriate visual warning lights plays a vital role in minimising the risk of accidents.

BUT HOW DO YOU CHOOSE THE MOST EFFECTIVE SOLUTION?

Start by assessing the specific hazards in your workplace. Do you need to warn pedestrians of an approaching vehicle, mark a no-go safety zone, or alert workers to moving overhead machinery? Is the environment noisy, making audio alarms less effective?

TYRI offers a range of high-performance safety lighting solutions designed to meet these challenges.

BLUEPOINT & REDPOINT – CLEAR VISUAL WARNINGS

TYRI's BluePoint projects a bright square or dot of light onto the floor in front of or behind a moving vehicle, such as a forklift. This gives a clear visual alert of its approach,

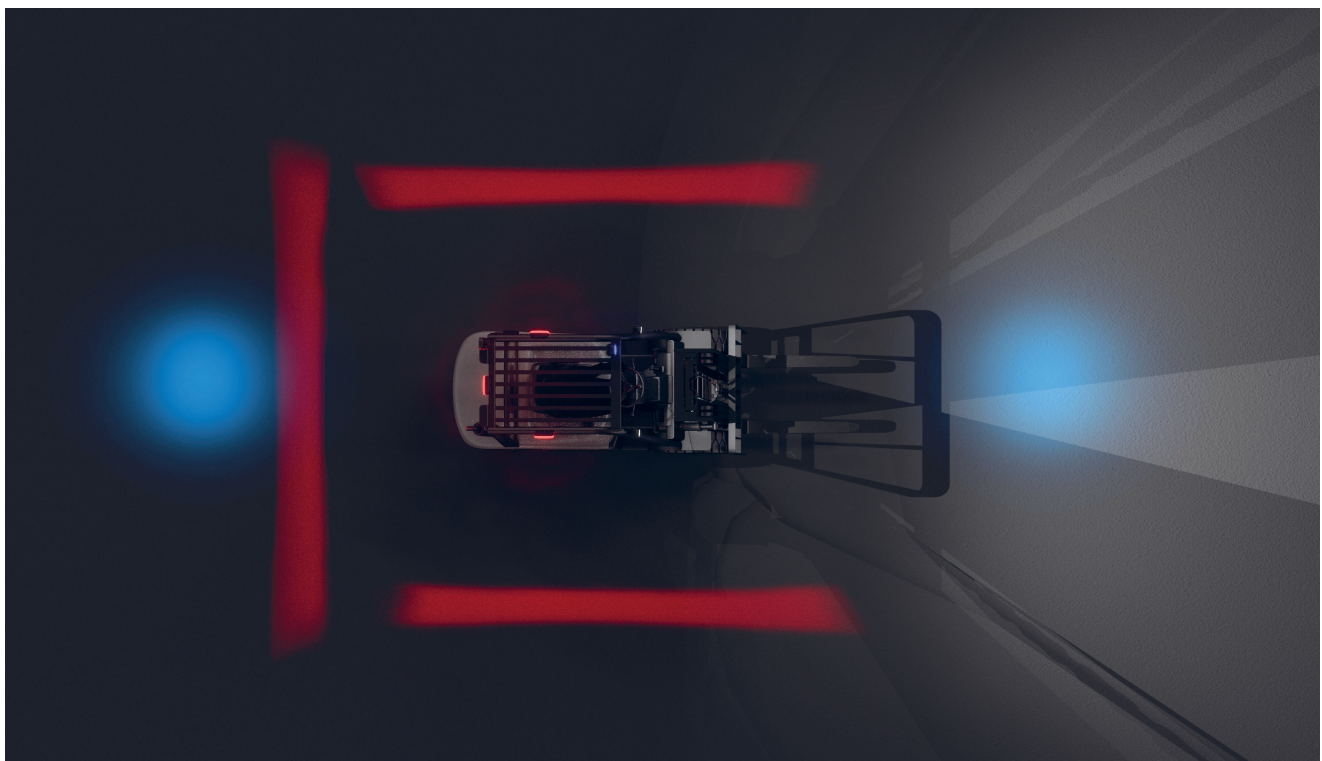
helping pedestrians react in time. It's also highly effective when mounted on overhead cranes, projecting a beam onto the floor to signal movement, especially useful in environments where workers don't often look up.

REDLINE & BLUELINE – DEFINING DANGER ZONES

In addition to BluePoint and RedPoint, TYRI also offers the RedLine and BlueLine safety lights. These project clear lines around a machine, visually defining a hazard zone. This helps prevent pedestrians from entering dangerous areas—ideal for equipment like forklifts, automated guided vehicles (AGVs), or rotating machinery.

EXPERT SUPPORT FOR SAFER WORKSPACES

TYRI's safety lights are built with precision and tested to withstand harsh environments. If you're unsure which solution is right for you, our team can assess your setup and recommend the best fit, or even develop a custom light tailored to your needs.



TYRI warning lights ; VL4 RedLine & 1010 BluePoint.

EMC TESTING IN-HOUSE FOR AGILE DEVELOPMENT

TYRI's EMC laboratory aims to test how the company's lights affect, and are affected by, other electronic components. The walls in the semi-anechoic test chamber, are covered in a 3D material which dampens signal reflection, increasing measurement accuracy. The lab is an important investment in TYRI's increasing self-sufficient in quality testing.

Håkan Dalsvik, Electronics Engineer at TYRI, oversees EMC testing at the company, and he shared the ins and outs of the tests with us. Håkan has worked at TYRI since the year 2000. At that time, TYRI's workforce consisted of seven individuals, and he was the first electronics designer to join the company. Since then, the company has grown, relocated, and expanded its premises. Today, Håkan is the Senior Electronics Engineer and oversees the company's EMC testing.

This involves checking how well electrical components operate in electromagnetic environments, ensuring they don't interfere with or get affected by other electrical

equipment. Interference in the electromagnetic environment can cause lights to malfunction. Such interference may originate from other equipment, through the air, via cabling, or as electrostatic discharge (ESD).

“

...in-house testing enables us to quickly and efficiently alternate between testing and experimentation in an agile process, resulting in better and more accurate tests at a lower cost...”

H. DALSVIK, TYRI SENIOR ELECTRONICS ENGINEER





When testing the interference levels produced by our lights, we use a full compliance receiver to measure both radiated and conducted electromagnetic emissions.

The newest addition to the lab is a comprehensive immunity testing package, which includes signal generators, amplifiers, antennas, coupling clamps, and software. This addition allows us to thoroughly test that our products have high levels of both conducted and radiated immunity against disturbances and, consequently, will not be affected by other electrical equipment.

The ability of the light to withstand electrostatic discharge is also tested in-house. This type of test provides a clear indication of whether the light will function in a statically charged environment. For example, if a light is not sufficiently immune to electrostatic discharge (ESD) from an ESD simulator gun, the LEDs may fail. In that case, the R&D department must find alternative solutions.

“Since the latest additions of equipment, we are self-sufficient when it comes to EMC testing. We can test both according to vehicle and industrial standards covering all the applications our lights are intended for,” says Håkan.

When interference and immunity levels are properly balanced, the components can work together and achieve electromagnetic compatibility. The goal of EMC testing is to ensure that one piece of equipment neither interferes with nor is affected by another.

Since TYRI’s lights contain electronic components, testing is essential whenever new products are developed. While many companies outsource EMC testing, TYRI conducts it in-house to ensure compliance with the specific standards required for different applications.

“

This will become of particular interest when our INTELLlight products broaden our range and contribute to increased EMC testing.”

H. DALSVIK, TYRI SENIOR ELECTRONICS ENGINEER

“If we encounter problems in our EMC tests, such as flickering in the light, we don’t want to have to wait for external testing or queue for new tests. In-house testing enables us to quickly and efficiently alternate between testing and experimentation in an agile process, resulting in better and more accurate tests at a lower cost. Moreover, it’s great to be able to conduct the tests ourselves since we trust our testing and know that they will be carried out meticulously with guaranteed quality,” says Håkan.

TYRI’s in-house EMC lab doesn’t just support internal development; it delivers real value to our customers. By testing every product for electromagnetic compatibility in a controlled, high-precision environment, we ensure that our lights perform reliably even in electrically complex settings. This means fewer disruptions in the field, faster development of new solutions, and the confidence that every TYRI product meets the highest standards of durability, safety, and electronic performance.

THE QUEST FOR OPTIMAL LIGHT DISTRIBUTION

Optical engineering is a challenging profession. This is particularly true when optical solutions must be adapted to design preferences while retaining optimal light distribution. Per-Arne Torstensson is a Senior Optical Engineer at TYRI whose workday consists of integrating lens systems and technologies in lights with a specific visual design. He tells us a bit more about important things to consider when attempting to create optimal light distribution.

Per-Arne Torstensson has worked with optics for over 30 years, the last three of which have been at TYRI. "The reason I applied to work at TYRI was because they utilised LightTools, one of the most sophisticated software tools for optical design. This piqued my curiosity immediately and I felt it would be an exciting challenge. At TYRI I can further develop my optics expertise in lighting, and I am also able to learn how a light and its technology can be integrated in a specific visual design," says Per-Arne.

OPTICAL ENGINEERING

A major part of Per-Arne's work involves designing optimal light distribution around heavy vehicles, which often have multiple lights that need to work together effectively. He also ensures the lighting meets customer design preferences without sacrificing performance.

"A forestry harvester usually has 25 to 30 lights, which frequently have different properties and light distributions. The lights must have different properties but still work together to achieve optimal light distribution around the vehicle. It's a fairly complex task getting this to work, and it is this knowledge that we at TYRI want to share with our customers. The correct lighting on a heavy vehicle is imperative for both safety and productivity," says Per-Arne.

LENS DESIGN

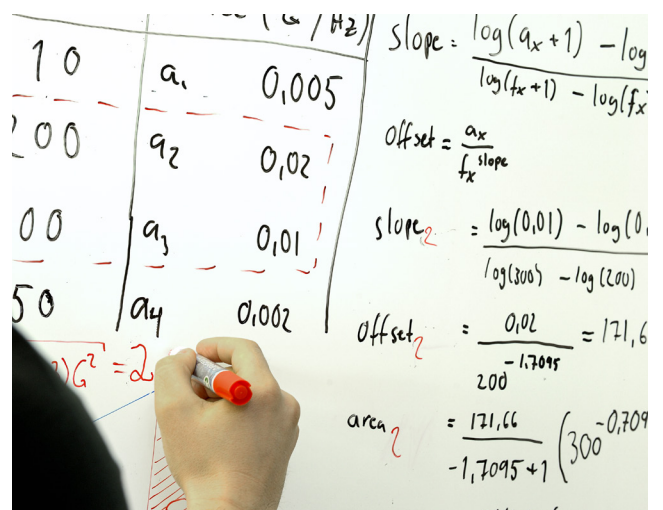
Lighting design has become more important over the years, and vehicle lights are now a key part of many brands' identities.

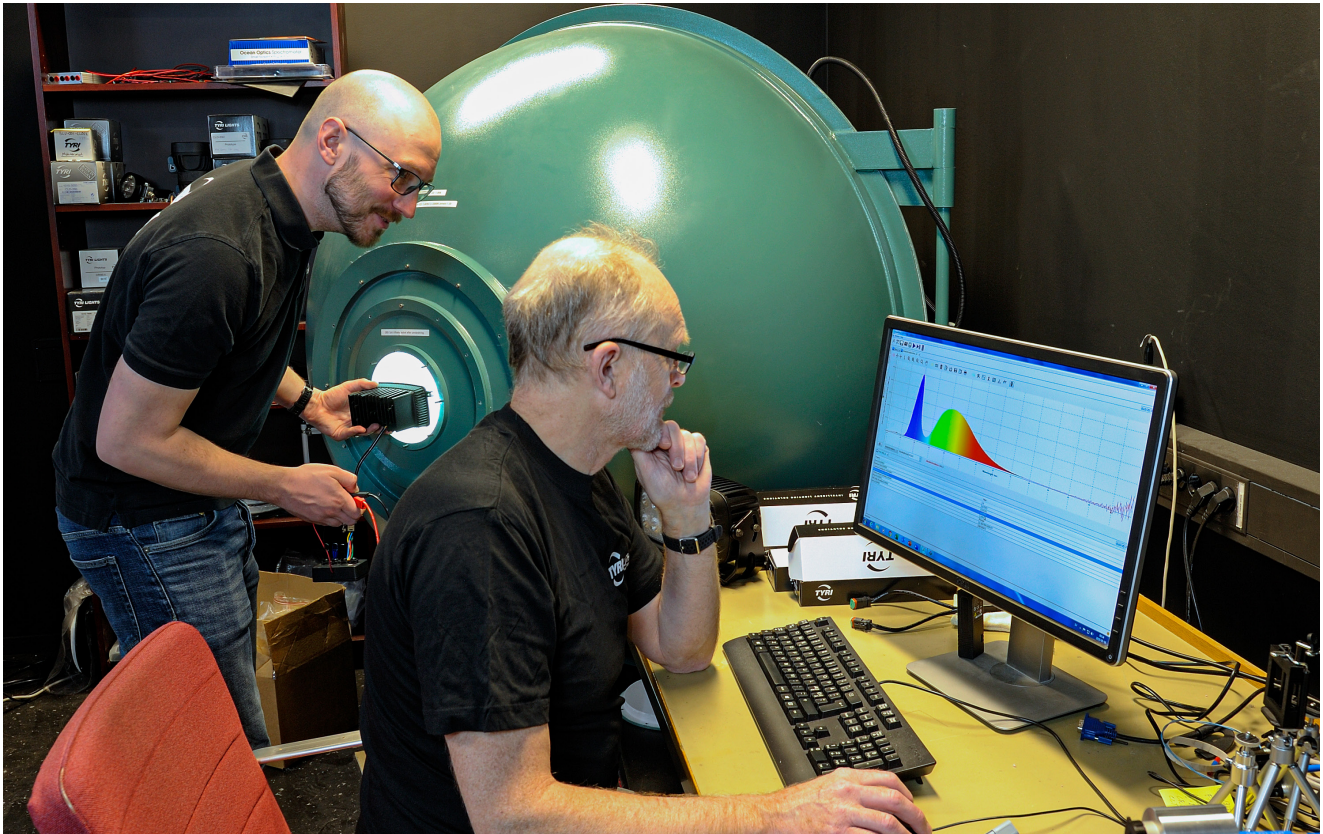
TYRI often collaborates on design development and is happy to create new lights based on customer preferences. However, when a customer's design is already finalized, it can be challenging to achieve the best optical performance. It's Per-Arne's job to address this by finding a lens design that meets the requirements.

Some complex designs use multiple lenses to create uniform and powerful lighting around heavy vehicles. These lenses are made through injection moulding using plastics like polycarbonate. To ensure optimal performance, the precise shape of each lens must be maintained during production. While plastic shrinkage can sometimes cause slight changes, these are usually anticipated and adjusted for in the design phase. Although working with multiple lenses can add complexity, it also allows us to fine-tune the lighting for the best possible results.

LIGHT GLARE

Important aspect of optical design is creating light distribution that minimises glare. Rather than relying on moving parts, TYRI uses intelligent control of the light's active components to adapt illumination as needed.





Per-Arne Torstensson (Senior Optical Engineer) & Anders Johansson (Test Engineer)

Per-Arne says, “In the INTELLi^{light}® system, glare can be managed automatically using optional sensors to adjust the brightness. For example, on wheeled loaders, a sensor can detect when the bucket is raised to a certain height, temporarily dimming the lights to reduce glare reflected at the operator. Once the bucket passes that point, the lights return to full brightness, improving visibility without compromising safety or comfort.”

“

Design within lighting has become increasingly important over the years, and vehicle lights are today a hallmark of many brands.”

PA. TORSTENSSON, TYRI SENIOR OPTICAL ENGINEER

LIGHT DISTRIBUTION AND LUMEN

An LED module distributes light in various directions, and the lens system shapes it to create the right light pattern. It's important to know that total lumens alone don't define

good lighting. For example, 2,500 lumens with a well-directed beam can be better than 4,000 lumens that are spread out and cause glare.

“What best describes a light's properties is its intensity distribution, in other words, how the light is distributed at different angles, not the LED light's maximum lumen. Many customers make the mistake of asking for the highest lumen total, but that does not necessarily provide the best light distribution. This can be compared to judging the performance of a car by only getting information about its horsepower, which says nothing about how fast the car accelerates or its top speed. Good light distribution is far more complicated than a high lumen total,” says Per-Arne.

Moreover, different companies and suppliers measure lumens based on different factors. Manufacturers in China, for example, frequently specify the theoretical lumen instead of the effective lumen retained after the light has passed through the lens system. In a best-case scenario, approximately 75-80 percent of the LED light's theoretical lumen can be collected by a lens. In inadequate optical solutions, not even half of the light's theoretical lumen may be attainable. At TYRI, we use our in-house test lab to measure all our lights in 'effective' lumens, not theoretical.

INNOVATION AT THE HEART OF WHAT WE DO

TYRI is proud to be a global leader in manufacturing high-quality LED work lights, producing nearly 2 million lights annually. But we go beyond manufacturing and supplying lights - we are constantly pushing the boundaries of LED innovation.

TYRI provides a world-class, standardised product range at the forefront of lighting technology, as well as collaborating with OEMs as a design partner, all over the world. Our attention to detail, coupled with high-quality products and high-quality light is essential for providing our customers with the best lighting solutions and user experience on the market.

TYRI's optical engineers, electrical engineers and mechanical engineers all collaborate with one goal in mind – to constantly improve our offer and create the next innovation in LED lighting.

Our wealth of expertise and experience led to TYRI

being the first to market with our adaptable lighting system *INTELLi*light. It allowed us to develop a new way of powering LED lights and creating ECO PWR technology. In addition our latest innovation, the DLM-F1 TRI LED, gives a road-legal drive light with a third beam providing double the reach!

INTELLILIGHT

At TYRI, we've always been committed to understanding our clients' working environments. That's how we continue to create innovative solutions that improve the operators' working conditions. *INTELLi*light is our new and revolutionary way to connect light sources in a wireless network mesh. This allows the operator to adjust both the colour temperature and brightness to improve their line of sight in varying conditions, and group/regroup all connected lamps to create different zones of light. Designed and engineered for a better working environment.



*INTELLi*light



Drive light: DLM-F1

DLM-F1

The new Drive Light Module (DLM-F1) from TYRI is our response to a long-standing customer demand. Developed in collaboration with one of our major OEM partners, this advanced lighting solution integrates all essential features into a single, compact module. With its sleek, contemporary design, the DLM-F1 is as stylish as it is functional. This advanced drive light features TYRI's innovative Tri-LED High Beam, delivering a beam that extends more than twice the distance of conventional headlights. What sets the DLM-F1 apart is its unique design—the first free-standing headlight on the market specifically engineered for high mounting positions, from 1.5 metres and above.

Six functions in one compact module: High Beam, Low Beam, Tri-LED High Beam, DRL (Daytime Running Light), Turn Marker, and Side Marker. Flexible mounting options: single M10 bolt for pedestal or back mounting.

Tri-LED – Double Reach: TYRI's Tri-LED technology is a groundbreaking innovation that delivers significantly greater illumination when mounted high on a vehicle. These light simulations compare a standard Bi-LED High Beam, commonly used in the market today, with the TYRI DLM-F1 Tri-LED, highlighting the extended reach and improved visibility.

ECO PWR TECHNOLOGY – UP TO 50% MORE EFFICIENT

With advanced technology and expertise, we are able to design high-quality work lights that consume up to 50% less energy. By utilising premium LEDs, PCBAs, optics, and innovative design solutions, we can significantly reduce power consumption throughout the product's entire life cycle. These energy-efficient lights not only lower the environmental impact but also help reduce operating costs, making them the ideal choice for businesses committed to sustainability.

BASELINE: TYRI QUALITY – HIGHLY COMPETITIVE PRICE

The *BASEline* range is a new cost-effective professional lighting solution from TYRI, designed to deliver reliability and performance without compromise. Combining TYRI's advanced production methods with precision engineering, *BASEline* offers exceptional light quality and durability at a highly competitive price. Each light undergoes rigorous testing to meet TYRI's strict quality standards, ensuring it performs in the toughest environments. Manufactured in Sweden, the UK, and the USA, the *BASEline* range provides up to 2,800 effective lumens, making it an ideal choice for applications that demand high performance at an affordable cost.

Get in touch to request a demonstration of our latest innovations.

Welcome to the future of work lighting.



TYRI'S CIRCUIT BOARD PRODUCTION

– Precision at the Heart of Electronics

In 2024, TYRI launched a new 1,800 square metre SMT (Surface Mount Technology) facility in Kungsbacka, Sweden, bringing circuit board production in-house. While often unseen by the end user, the Printed Circuit Board Assembly (PCBA) is at the core of every lighting system, and having full control over its production marks a significant step forward for TYRI in both quality assurance and sustainable manufacturing.

WHY THE PCBA MATTERS

The PCBA is the nerve centre of any electronic product. In TYRI's advanced lighting systems, it governs LED performance, communicates with vehicle systems, and manages protective functions such as EMC compliance. In short, it ensures that every light not only turns on but also performs to exacting standards in extreme environments.

TYRI's decision to bring PCBA production in-house is

rooted in one principle: quality starts at the source. By producing our own circuit boards, we eliminate dependency on third-party suppliers, improve consistency, and gain the agility to adapt quickly to evolving customer requirements or new technologies.

A COMPLEX PROCESS, NOW UNDER TYRI CONTROL

Manufacturing high-performance PCBAs is a precision-driven process requiring tight tolerances and expert handling. It involves stringent process monitoring and continuous in-line testing.

Even minor flaws can result in product failures in the field. That's why TYRI has invested in state-of-the-art machinery and a highly controlled production environment. With full visibility over the process, defects can be identified and corrected immediately, not after final assembly.

"Identifying and addressing potential defects immediately,

instead of discovering them during the final inspection, benefits our entire sustainability effort and contributes to our 'Zero Defect' goal. This means eliminating all errors during production, thereby maximizing quality and sustainability," explains Per-Johan Edgren, Production Manager for TYRI's circuit board operations in Kungsbacka

INTEGRATED DESIGN AND FASTER INNOVATION

Owning the PCBA process brings another key advantage: seamless integration with TYRI's other engineering disciplines. Our circuit boards are now developed in close collaboration with optical and mechanical designers, allowing us to create complete systems that are electrically robust and mechanically optimized.

This cross-functional integration speeds up product development cycles, enhances performance alignment across disciplines, and leads to innovations that truly reflect customer needs, whether for agricultural machinery, material handling machines, mining equipment, or construction vehicles.

SUSTAINABILITY THROUGH QUALITY AND CONTROL

The decision to localize circuit board manufacturing is not only a technical upgrade — it's a strategic sustainability move. By transferring production from Poland to Sweden, TYRI shortens the supply chain, cuts emissions related to transportation, and ensures that the entire process runs on 100% fossil-free electricity.

“

Identifying and addressing potential defects immediately, benefits our entire sustainability effort and contributes to our 'Zero Defect' goal.”

PER-JOHAN EDGREN, PRODUCTION MANAGER

In-house PCBA production also reduces the risk of scrapped or reworked assemblies, thanks to better traceability, process optimization, and immediate quality intervention. These operational efficiencies result in lower material waste, fewer rejected units, and less energy used per unit produced — all key contributors to a reduced environmental footprint.

BUILT FOR THE FUTURE

Bringing PCBA manufacturing in-house strengthens TYRI's position as a global leader in high-performance work lighting. It enhances reliability, ensures long-term availability of critical components, and reinforces the brand's reputation for precision, durability, and innovation.





EFFECTIVE LIGHTING

Designing lighting that works for all environments and conditions can be complex, but it's something TYRI does exceptionally well. One of the main challenges is seasonal variation, which affects how light behaves and what's needed for optimal visibility.

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In autumn, for example, when the days are short and there's no snow on the ground, light is easily absorbed by the dark earth. Only 5–10% of the light reflects back, especially in the blue part of the spectrum. That's why higher colour temperatures, similar to daylight, are important. A cooler, blue-toned light cuts through these low-reflective conditions to help you see more clearly.

In contrast, during winter, snow-covered landscapes reflect a lot of light, sometimes as much as 70–90%. This can create glare and reduce visibility. In these conditions, a lower colour temperature and lower brightness are better to minimise reflection and improve comfort.

In an ideal world, you'd adjust your lighting to match the season: cooler, brighter light in dark, snow-free conditions; warmer, softer light when there's snow. With TYRI INTELLi**light**, this is possible. It allows you to fine-tune both the colour temperature (from 2800 K to 6500 K) and the brightness (from 0–100%) to suit your environment.

This is especially useful for machines with multiple operators. For example, an older operator may require nearly twice as much light as a younger one due to natural changes in vision with age, including increased sensitivity to glare. INTELLi**light** lets each operator personalise their lighting, then save those settings for future use. No reprogramming needed between changeovers.

Settings can be adjusted via the INTELLi**light** app on a phone, or integrated directly into the machine using the TYRI Gateway and CAN-bus system.

The human eye is a powerful tool, capable of adapting to changing light conditions. However, poor lighting setups, such as excess brightness in one part of the field of view, cause eye fatigue. Over time, this reduces operator performance and productivity.

We've all experienced the effect of staring into a fire, then looking away and seeing nothing for a moment. That same

issue can occur with badly balanced work lighting, forcing the eye to constantly readjust, creating strain and slowing down the operator. TYRI INTELLi*light* helps avoid this, ensuring a more even, comfortable lighting experience that supports safe, productive work.

The key to lighting is uniformity; the less variation in luminance you have over the work area, the less the eyes need to adapt, and the operator maintains productivity levels.

The lumen value is less important than the uniformity of lighting over the whole field of view. You can have a very good, even lighting spread over your work area with an

array of 2,500 effective lumen work lights and very bad lighting with 4,000 effective lumen work lights without even coverage. It's all down to uniformity, avoiding hot spots in the field of view, and how you mount and use your lights.

At TYRI, we guarantee a uniform spread of light that delivers optimal visibility, no matter the task or environment. Our solutions are designed to minimise glare, reduce shadows, and provide consistent, high-quality illumination, so you can stay focused, work safely, and get the job done with confidence.



*INTELLi*light cold colour temperature



*INTELLi*light warm colour temperature

GREEN BY TYRI



www.tyrilights.com



THE SCIENCE BEHIND GOOD WORK LIGHTING

In demanding work environments, proper lighting is more than just a convenience — it's critical for safety, accuracy, and productivity. At TYRI, we understand that superior lighting is a blend of scientific principles and precision engineering. From colour temperature to build quality, every detail matters.

A well-lit environment allows us to perform tasks with greater focus and fewer mistakes. Poor lighting can cause eye strain, misjudgement, and fatigue. That's why TYRI takes an integrated approach, combining optical expertise with rugged durability, to ensure that our lights not only illuminate but also improve your workday.

Key Principles of Good Lighting Design

UNIFORM ILLUMINATION

The human eye is naturally drawn to the brightest point in view. Uneven lighting creates distracting hotspots and shadows, disrupting concentration and reducing efficiency. TYRI lights are designed to deliver even, consistent illumination across the entire work area.

MINIMAL GLARE

Glare doesn't just cause discomfort; it can create hazardous working conditions. Our light patterns are engineered to reduce glare by directing light precisely

where it's needed, enhancing visibility without excessive brightness or uncontrolled light spread.

THE RIGHT COLOUR TEMPERATURE

Different jobs and environments call for different lighting. For example, warm light (around 3000 K) is ideal in snowy environments, where natural light is already cold and blue-toned. Cooler light can be better for dark soils, but excessive blue light (above 6000 K) can cause more glare and reflect airborne particles, like dust and fog. TYRI offers a range of lighting options to suit your specific conditions and minimise visual fatigue.

ACCURATE COLOUR RENDERING

Colour Rendering Index (CRI) measures how true-to-life colours appear under artificial light. TYRI lights are built with high CRI values to ensure colours are accurate — a key factor in agriculture, food handling, and quality control. With CRI levels approaching that of natural sunlight (100), TYRI lights help your eyes function naturally and effectively.

By combining smart design with precision optics, TYRI delivers lighting solutions that not only meet the demands of your environment but also help you work safer, smarter, and more efficiently, every day.

TESTED & APPROVED

All you need to know about TYRI testing



EMC EN55025 / CISPR 25

It is of vital importance, especially on emergency or military vehicles, that lighting does not effect control systems, cameras, on-board computers and other radio sensitive equipment. This is why TYRI lights are scrutinised to ensure they do not interfere with EMC functionality.



VIBRATION TESTING

TYRI lights undergo extensive vibration testing, for up to 8 hours on all axes, above 10 Grms at a frequency range from 5 – 2000 Hz. This simulates the forces applied to the lights once mounted on off highway machines.



SHOCK TESTING

As well as vibration testing, TYRI lights undergo shock testing to a force of 50G. This ensures that TYRI lights will withstand punishment from your work environment.



IP 69K

IP 69K ratings offer complete peace of mind that the work light you are installing has undergone rigorous tests to ensure it is both durable and conforms to the highest standard on the scale of protection against water, moisture and dust ingress.



ENVIRONMENTAL TESTING

TYRI lights are tested in hot and cold temperatures, as well as humidity, for a minimum of 35 days. They are tested in conditions up to -40°C to + 85°C and up to 90% humidity.



SALT SPRAY TESTING

TYRI lights undergo rigorous salt spray testing to ensure they are approved to ASTM B117 standards. This ensures that even in corrosive environments, TYRI lights will continue to perform.

BUILT-IN PROTECTION

TYRI lights are designed with multiple built-in safety features to ensure long-lasting performance, even in challenging environments.



OVERHEAT PROTECTION

As well as vibration testing, TYRI lights undergo shock testing to a force of 50G. This ensures that TYRI lights will withstand punishment from your work environment.



REVERSE POLARITY PROTECTION

TYRI LED lights are protected against incorrect wiring during installation. If the power and ground wires are accidentally reversed, the light simply won't turn on—avoiding any damage to the LEDs or internal electronics. Once the wiring is corrected, the light functions normally.



OVER-VOLTAGE PROTECTION

Voltage spikes can occur due to fluctuations in vehicle electrical systems, which can damage sensitive components. TYRI lights are equipped with over-voltage protection that shields the internal circuits from excessive input voltage. This helps maintain consistent performance and protects the light from unexpected power surges.



Tested &
Approved

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